VERIFICATION / CERTIFICATION REPORT

DEMAND SIDE ENERGY CONSERVATION AND REDUCTION MEASURES AT ITC TRIBENI UNIT IN INDIA

CDM REFERENCE NO. UNFCCC 0745

THIRD PERIODIC VERIFICATION
MONITORING AND REPORTING PERIOD
1 JANUARY 2008 TO 31 DECEMBER 2008

REPORT NO. 2009-1436
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DET NORSKE VERITAS

VERIFICATION / CERTIFICATION REPORT

Date of first issue: 2009-10-08	Project No.: PRJC-157200-2009-CCS-IND
Approved by: Ole Andreas Flagstad	Organisational unit: Climate Change Services
Client: ITC Limited- Paperboards and specialty papers division, Tribeni unit	Client ref.: Mr. S. K. Sarkar

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Summary:

Det Norske Veritas Certification AS (DNV) has performed a verification of the emission reductions reported for the "Demand side energy conservation and reduction measures at ITC Tribeni Unit" in India, managed by ITC Limited- Paperboards and specialty papers division, Tribeni unit of India and ABN AMRO Bank N.V. of the United Kingdom for the period of 1 January 2008 to 31 December 2008.

In our opinion, the GHG emissions reductions reported for the project in the revised CDM monitoring report version 2 dated 23 July 2009 and submitted to DNV are fairly stated.

The GHG emission reductions were calculated correctly on the basis of the approved simplified baseline and monitoring methodologies AMS-II.D, version 7 and AMS-I.D, version 9 and the validated project design document, version 3, dated 28 August 2006. Det Norske Veritas Certification AS is able to certify that the emission reductions from the project for the period 1 January 2008 to 31 December 2008 amount to 8 848 tonnes of CO_2 equivalent.

Report No.: 2009-1436	Subject Group: Environment	
Report title: Verification of Demand side energy conservation and reduction measures at ITC Tribeni Unit in India		
Work carried out by: Soumik Biswas, Sasim Chattopadhyay		
Work verified by: Hendrik W. Brinks		
Date of this revision: 2009-10-16	Rev. No.: 01	Number of pages: 13

Indexing terms

Key words Climate Change Kyoto Protocol Validation Clean Development Mechanism	Service Area Verification Market Sector Manufacturing Industry

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Abbreviations

BM	Build Margin
CER	Certified Emission Reduction(s)
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CEF	Carbon Emission Factor
CM	Combined margin
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNA	Designated National Authority
DNV	Det Norske Veritas
EREG	Eastern Regional Electricity Grid
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
OM	Operating Margin
PDD	Project Design Document
PSPD	Paperboards and Specialty Papers Division
TG	Turbo Generator
UNFCCC	United Nations Framework Convention for Climate Change
WBPCB	West Bengal Pollution Control Board

1 INTRODUCTION

ITC Limited- Paperboards and specialty papers division, Tribeni unit has commissioned Det Norske Veritas Certification AS (DNV) to carry out a verification and certification of the GHG emission reductions reported by the "Demand side energy conservation and reduction measures at ITC Tribeni Unit" in India for the period of 1 January 2008 to 31 December 2008. This report summarizes the findings of the verification of the emission reductions of the project.

The verification team consists of the following personnel:

				Type of involvement					
Role / Qualification	***Last Name***	***First Name***	***Country***	Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	Expert input
CDM verifier / technical team leader	Biswas	Soumik	India	✓	✓	✓	✓		
CDM verifier/ Sector expert	Chattopadhyay	Sasim	India	✓	✓				✓
Technical reviewer	Brinks	Hendrik	Norway					✓	

1.1 Objective

Verification is the independent review and ex-post determination by the Designated Operational Entity (DOE) of the monitored reductions in GHG emissions that have occurred as a result of the registered project activity during a defined verification period.

1.2 Scope

The verification scope is:

- To verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan for the project activity,
- To evaluate the GHG emission reduction data and express a conclusion with a high level of assurance about whether the reported GHG emission reduction data is free from material misstatement,
- To verify that the reported GHG emission data is sufficiently supported by evidence.

The verification shall ensure that the reported emission reductions are complete and accurate in order to be certified.

The verification has also been guided by the recommendations in the Validation and Verification Manual /18/.

1.3 GHG Project Description

The project involves a phase wise implementation of the following measures to reduce energy consumption and recovery of waste heat:

- Replacement/retrofit of oversized drives and inefficient equipment with energy efficient alternatives to reduce the energy consumption.
- Redesigning of compressed air system for energy conservation.
- Redesigning of flocculation unit, air diffusion system and sludge handling system of effluent treatment plant for energy conservation and
- Recovery and reuse of the waste heat from streams coming from the paper machine, boiler and turbine unit resulting in reduction of primary energy consumption like steam/coal.

In the absence of the project the inefficient drives would have continued in operation resulting in excess power consumption and the waste heat would have been lost to the atmosphere. One electrical energy efficiency measures identified in the registered PDD have been implemented during this monitoring period.

- Process re-designing at Paper Machine no 4 approach flow system with replacement/retrofit of Fan Pump and Centricleaners (ID no. P26) has been implemented since 7 February 2008 /10/

The project was estimated to reduce on an average of 8 195 tonnes of CO_2e per annum. The project has been validated and registered as a CDM project on 16 December 2006. The project has accounted for emission reductions due to demand side energy efficiency measure for the period of 1 January 2008 to 31 December 2008 during this periodic verification.

Project Parties	:	*The Republic of India as the host Party* *The United Kingdom as the annex-I Party*
Title of the project activity	:	*Demand side energy conservation and reduction measures at ITC Tribeni Unit*
Project Participants	:	*ITC Limited- Paperboards and specialty papers division, Tribeni unit of India* *ABN AMRO Bank N.V., London of the United Kingdom*
Location of the project activity	:	*The project is located at the site of Tribeni unit of ITC limited, located at Tribeni, West Bengal, India*
Methodology used	:	*AMS-II.D, version 7* *AMS-I.D, version 9*
Crediting period	:	*1 January 2006 to 31 December 2015*

Verification period	:	*1 January 2008 to 31 December 2008*
Project operation start date	:	*The project involves a stage wise implementation of the energy efficiency measure in electrical utility and thermal utility. Additional to the measures already implemented during the first two verification periods, one electrical energy efficiency measure has been implemented in this monitoring period. 'Process re-designing at Paper Machine no 4 approach flow system with replacement/retrofit of Fan Pump and Centricleaners' (ID no. P26) has been implemented since 7 February 2008.*

2 METHODOLOGY

The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project, including,

- The net electricity generated in the in-house power plant
- Total electricity consumed in all the units of the plant
- Total energy consumed by all the equipments which are involved in the project.
- Calibration of the monitoring equipment e.g., energy meters, etc involved in the project activity
- Coal analysis for NCV and fixed carbon percentage.

Duration of verification:

Preparations	: *6 July to 7 July 2009*
On-site verification	: *9 July 2009*
Reporting	: *24 July to 30 September 2009*

2.1 Review of Documentation

The basis for the verification has been the initial monitoring report dated 20 April 2009 /1/, the revised monitoring report dated 23 July 2009 /1/, the registered version of the project design document (PDD) dated 28 August 2006 /14/ and the approved small scale baseline and monitoring methodologies AMS-II.D, version 7 and AMS-I.D version 9 /13/. The project proponent has in addition supplied the verification team with emission reduction calculations provided in the form of spreadsheets and relevant back-up documents along with plant data sheets /2/ - /11/.

2.2 Site Visits

Detailed verification of all data contained in the monitoring report was performed during a site visit at ITC Limited, PSPD Tribeni unit on 9 July 2009. During the site visit, the following personnel were interviewed or assisted the verification team:

Name	Organisation	Position
Mr. S K Sarkar	ITC Limited, PSPD Tribeni Unit	Deputy General Manager
Mr. Sudip Chakraborty	ITC Limited, PSPD Tribeni Unit	Manager (Electrical)
Mr. Mrinal Sengupta.	ITC Limited, PSPD Tribeni Unit	Asst. Manager (Energy & utility)
Mr. Debashish Mukherjee	ITC Limited, PSPD Tribeni Unit	Asst. Manager (Energy & utility)
Mr. S. K. Das	ITC Limited, PSPD Tribeni Unit	Officer
Mr. R. Bhaumik	Pricewaterhouse Coopers	Consultant

2.3 Reporting of Findings

Findings established during the verification may be as follows:

A corrective action request (CAR) is issued, where:

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

A clarification request (CL) shall be raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A forward action request (FAR) is issued for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

Two FARs had been identified in the previous verification which has been successfully closed during this verification. One CAR was identified during this periodic verification which has also been adequately addressed by the project proponent.

3 VERIFICATION FINDINGS

3.1 Remaining issues, CARs, FARs from previous validation

During the previous verification two FARs were raised. These FARs have been assessed during this verification and they are described in the following table:

FAR #	Description of the FAR	Comments	Conclusions
FAR 1	In thermal projects, total twelve readings have been taken for every monitoring parameter daily and the average has been calculated manually to obtain the daily average value. The project proponent is requested to streamline the data collection procedure by monitoring the daily average directly from the DCS in the next verification period.	Necessary action has been initiated and handed over to the technical team to stream-line the data collection procedure by monitoring the daily average directly from the DCS.	**OK.** The data collection process has been streamlined and direct collection of daily average data from the DCS has been implemented since 14 August 2008. FAR is closed
FAR 2	Internal audit was conducted by the management for review of the project performance. The internal audit conducted during the verification period was found to be adequate. However personnel from different fields were not involved in the internal audit team and hence further improvement opportunities could not be identified. Project proponent is requested to involve all the personnel who are associated with the project during future audits. Also procedures for recording and proper logging of audit findings need to be firmed up prior to next verification.	Necessary recommendations mentioned above will be considered during next internal audit for review of the project performance. Also the internal audit findings as well as corrective measures taken will be properly logged and made available during next verification.	**OK.** Internal audit procedures have been firmed-up and cross-functional personnel have been involved in the audit. Proper log of audit findings are being maintained. FAR is closed.

3.2 Project Implementation

The measures included under the project activity have been under implementation in a phased manner from 2004 onwards. Additional to the measures already implemented during the first two verification periods, one electrical energy efficiency measure has been implemented in this monitoring period. 'Process re-designing at Paper Machine no 4 approach flow system with replacement/retrofit of Fan Pump and Centricleaners' (ID no. P26) has been implemented since 7 February 2008. The measures implemented are in line with the measures as mentioned in the registered PDD.

3.3 Assessment of data

The data presented in the monitoring report were assessed in detail by reviewing the operational data of the plant and production records, by interviews with personnel at ITC Limited- Paperboards and specialty papers division, Tribeni unit, collection of measurement data, assessment of established monitoring and reporting practices and an assessment of the reliability of monitoring equipment. This has enabled the verification team to assess the accuracy and completeness of the reported monitoring results and verify the correct application of the approved monitoring methodology. One CAR was identified during the verification of the project. The issue identified as well the response provided are as presented below:

CAR #	Description of the CAR	Comments	Conclusions
CAR 1	Data mismatch between log-books and Excel worksheet have been observed for the following measures: 1. MDS TEM P4B (December 2008) 2. MDS TEM P9 (September to December 2008). 3. Coal carbon% for C grade coal for IJT (August 2008) 4. Coal carbon% for E grade coal for IBIL (March 2008) The project proponent is requested to rectify the same in the CER calculations.	All the following data mismatch between log-books and excel worksheet have been checked and corrected: 1. MDS TEM P4B (December 2008) 2. MDS TEM P9 (September to December 2008). 3. Coal carbon% for C grade coal for IJT (August 2008) 4. Coal carbon% for E grade coal for IBIL (March 2008) With the above mentioned correction total CER value has reduced to 8848 units from the previous claimed CER value of 8881 units mentioned in the earlier monitoring report submitted to DOE for verification. Accordingly both the CER calculation Excel file as well as the monitoring report has been corrected.	**OK.** The necessary changes have been made to the monitoring report and the Excel sheet. CAR is closed.

3.3.1 Factors used for project emission reduction calculations

"ΣEqu_i", Number of equipment / devices replaced / retrofitted under the project activity:

The final monitoring report details the list of electricity saving activities undertaken and successfully implemented previously and during this verification period. Additional to the measures already implemented during the first two verification periods, one electrical energy efficiency measure has been implemented in this monitoring period. 'Process re-designing at Paper Machine no 4 approach flow system with replacement/retrofit of Fan Pump and Centricleaners' (ID no. P26) has been implemented since 7 February 2008. This has been verified from the commissioning statement of the measure /10/.

"$\Sigma P_{I, prj}$", Actual electricity consumed by the equipment after implementation of project:

The actual electricity consumed by the equipment after the implementation of the project has been measured through cumulative energy meters. Meter readings from the energy meters have been taken to arrive at annualized energy consumption after activity implementation /5/.

Parameters required for calculating heat recovery from IJT boiler flue gas exhaust & de-aerator system to preheat the induced air to the boiler

For this project activity measure the air flow to the IJT boiler has been measured daily through flow meters. Daily bi-hourly flow readings have been taken and the daily average has been calculated from the same. Similarly the inlet temperature and outlet temperature have been recorded on bi-hourly basis and the daily average has been calculated from the same. The daily averages are also available directly from DCS since 16 August 2008. The emission reductions have been calculated on the basis of the maximum inlet temperature and the minimum outlet temperature over the month thus making the emission reduction calculations

conservative. The data has been checked from the IJT Log Book /7/ and found to be correct. The calibration certificates for the air flow meter and the temperature gauges from the manufacturers were evidenced during the verification and found to be in order /3/.

Parameters required for calculating heat recovery from turbine gland vent condenser in turbo generator no 3 and reutilization in heating the return condensate of the boiler
For this project activity measure the quantity of condensate returned to the boiler has been measured daily through mass flow meters. The condensate inlet temperature to the boiler in the project scenario and the condensate inlet temperature at the gland vent condenser inlet, which represents the condensate inlet temperature to the boiler in the baseline scenario, have been recorded on bi-hourly basis and the daily average has been calculated from the same. The data has been checked from the TG3 Log Book /6/ and found to be correct. The original calibration certificates for the mass flow meter and the temperature gauges from the manufacturers were evidenced during the verification and found to be in order /3/.

"$EG_{y,grid}$", Electricity imported from the grid:
The amount of electricity imported from the grid has been metered and recorded in generation log book of the plant. As specified in the final PDD, the imports are recorded at a monthly frequency in the generation log. The figures as reported in the log were cross verified with the monthly bills generated by the electrical authorities against the power imported at plant and found to be in order. The accuracy level of the meters as assessed during the calibration by external agencies (Electronics Regional Testing Laboratories) was found to be within the specification limit of the meters.

"$EG_{y,inhouse}$", Electricity generated in house gross:
The in-house power generation in the plant is from 2 TG's, TG2 and TG3. Gross power generated in TG2 and TG3 are metered and recorded in TG2 log book and TG3 log book respectively /6/. As specified in the final PDD the generation is recorded at a daily frequency in the respective logs and is consolidated to get the monthly generation values. The accuracy level of the meters as assessed during the calibration by external agencies was found to be within the specification limit of the meters /3/.

"FF_i" Quantity of coal utilized by the unit for generation of electricity:
The amount of coal utilised at the boilers for generation of steam and power is recorded at the IJT and IBIL boiler log book. The quantity of coal consumed is monitored grade wise and separately reported in the log books. The coal consumption figures as reported in the plant logs were cross verified against the procurement figures of the plant and daily stock report of the unit. The consumption figures were also cross verified against the monthly performance reports of the unit, which are presented to the management for review.

"$NCV_{ff,i}$" average net calorific value of coal on dry basis:
The gross calorific value of coal consumed in the boilers is measured daily in an in-plant laboratory. Periodically the coal samples are analyzed by an external laboratory for cross verifying the in-house results /8/. The moisture content of coal is analyzed in in-plant laboratory based on a 4 day composite sample and correction made to the gross calorific value to estimate the net calorific value of coal consumed at boilers. Measurements of GCV and moisture content are carried out for each grade of coal used in boilers and reported separately.

Competence and training records of in plant personnel engaged in measurement of in plant parameters were presented during verification and found to be in order.

"EF_y" In house electricity emission factor.
As specified in the registered PDD, emission factor of self generated electricity is calculated annually based on monitored amount of coal fired in boilers, boiler efficiencies and gross amount of power generated in TG2 and TG3. TG2 turbine produces power and steam simultaneously as it is an extraction type turbine. Amount of energy extracted from turbines as thermal output is adjusted against the energy input to the turbines to estimate the emission factor for self generation.
The in-house electricity emission factor has been calculated to be 1.570 tCO_2/MWh for the period under verification. The calculation of in-house electricity emission factor has been presented during verification and is found to be correct. The grid emission factor was determined *ex-ante* to 1.136 tCO_2/MWh. The total emission factor for electricity consumption of 1.5217 tCO_2/MWh was determined by the weighted average of the in-house emission factor and grid emission factor.

3.4 Accuracy of emission reduction calculations

The emission reduction calculations have been based on actual monitored data in the plant. The calculation of emission reductions have been verified by DNV. The project has resulted in electricity savings of 4.842 GWh per annum and thermal energy savings of 17.63 TJ per annum.
Records of energy imported from the regional grid were cross verified with the monthly bills generated by the electrical authorities against the power imported at plant and found to be in order. The accuracy level of the meters as assessed during the calibration by external agencies was found to be within the specification limit of the meters. Coal consumption data for in plant power generation were cross verified against the coal procurement figures as received from the finance department.

Fluke meter measurement was performed for the following pumps during this period:
• TEM P5: (PM1 Edge Cutter Pump) and (PM3 Edge Cutter Pump)
• TEM P6: (PM3 VHP Pump)
• TEM P11: (PM3 Drum Thickener Water Pump)
• TEM UT4: (PM1 VHP Pump)
• TEM UT6: (PM4 VHP Pump)
Following the apprehension of the Executive Board regarding the use of this alternative method of measurement instead of the cumulative energy metering approach /17/, it was decided during the previous verification not to claim any CER arising due to the reduced energy consumption by the above mentioned pumps on account of conservativeness. The same approach has also been adopted during this verification period and no CERs have been claimed from the above-mentioned measures. Cumulative energy meters have been installed for all these measures in December 2008 to account for the CERs from these measures in the next verification period.

Calibration records of instruments used in measurements were made available during the verification visit and found to be in order. Competence and training records of in plant

personnel engaged in measurement of in plant parameters were presented during verification and found to be in order DNV has assessed the calculations to be accurate.

3.5 Quality of evidence to determine emission reductions

The emission reductions reported during the period 1 January 2008 to 31 December 2008 was verified to be 8 848 tCO_2e.

ITC Limited, Tribeni unit's established Quality and Environment Management Systems has enabled sufficient evidence to be presented for the reported net emission reductions. Internal calibrations and external calibration are carried out as per the calibration plan. The calibration certificates of the instruments used for data monitoring and recording were also verified during the site visit.

3.6 External data

The only external data used in the project is the specific heat of air used for calculating the heat savings for measures B11 and B12 mentioned in PDD. The specific heat of air has been taken from publicly available sources /12/. The value has been checked against the source and found to be correct.

3.7 Management and Operational System

In order to ensure a successful operation of the project and the credibility and verifiability of the ERs achieved, the project must have a well defined management and operational system. The organisational structure, responsibilities, competencies, non-conformance handling, internal audits and management review for the project was found to be adequate.

3.8 Environmental and Social Indicators

The DNA of India does not require the monitoring of sustainable development indicators and hence no such parameter was identified or monitored. The organisation holds valid 'consent to operate' issued by WBPCB which is valid up to 31 December 2009. The organisation has also obtained authorisation for Management & Handling of Hazardous Waste. Annual environmental statement submitted to the state pollution control board has been verified and found to be in order.

4 VERIFICATION AND CERTIFICATION STATEMENT

Det Norske Veritas Certification AS (DNV) has performed a verification of the emission reductions reported for the "Demand side energy conservation and reduction measures at ITC Tribeni Unit" in India (CDM Registration Reference No. 0745), for the period 1 January 2008 to 31 December 2008.

The project has applied the approved simplified baseline and monitoring methodology AMS-II.D, version 7 and AMS-I.D, version 9. DNV has assessed the emissions reductions reported in the revised monitoring report dated 23 July 2009 and found them to be correct.

The management of ITC Limited- Paperboards and specialty papers division, Tribeni unit is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions.

It is DNV's responsibility to express an independent verification statement on the reported GHG emission reductions from the project for the period 1 January 2008 to 31 December 2008.

Our verification approach draws on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. Our examination includes assessment of evidence relevant to the amounts and disclosures in relation to the project's GHG emission reductions for the period 1 January 2008 to 31 December 2008.

We 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 the amount of GHG emission reductions for the period 1 January 2008 to 31 December 2008 are fairly stated.

We conducted our verification on the basis of the monitoring methodology AMS-II.D, version 7 and the monitoring plan included in the PDD of the project. The verification included:

- *collection of evidence supporting the reported data,*
- *checking whether the provisions of the monitoring methodology AMS-II.D, version 7, and the monitoring plan in the PDD were consistently and appropriately applied.*

We have verified whether the information included in the revised monitoring report dated 23 July 2009 is correct and that the emissions reductions achieved have been determined correctly.

In our opinion the GHG emissions reductions reported for the project in the revised monitoring report of 23 July 2009 are fairly stated and the monitoring report is complete as per EB guidance.

The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodologies AMS-II.D, version 7, AMS-I.D, version 9 and the monitoring plan and formulae provided in the registered PDD.

Det Norske Veritas Certification AS is able to certify that the emission reductions from the "Demand side energy conservation and reduction measures at ITC Tribeni Unit" for the period 1 January 2008 to 31 December 2008 amount to 8 848 tonnes CO_2 equivalent.

Kolkata and Oslo, 16 October 2009

Soumik Biswas
CDM Verifier

Ole Andreas Flagstad
Approver

5 REFERENCES

Category 1 Documents:

Documents provided by the Project Participants that relate directly to the GHG components of the project. These have been used as direct sources of evidence for the initial verification conclusions, and are usually further checked through interviews with key personnel.

/1/ *"Demand side energy conservation and reduction measures at ITC Tribeni Unit" in India; Monitoring Report dated 20 April 2009 and version 2 dated 23 July 2009*

/2/ *ITC Limited, Tribeni Unit:Emission reduction calculation excel sheets*

/3/ *ITC Limited, Tribeni Unit: Calibration reports of energy meter, weigh feeders, temperature gauges and flow meters*

/4/ *ITC Limited, Tribeni Unit: Generation log book for the period 1 January 2008 to 31 December 2008*

/5/ *ITC Limited, Tribeni Unit: Field measurement books for each of the measures for the period 1 January 2008 to 31 December 2008*

/6/ *ITC Limited, Tribeni Unit: TG2 and TG3 log book for the period 1 January 2008 to 31 December 2008*

/7/ *ITC Limited, Tribeni Unit: IJT and IBIL log book for the period 1 January 2008 to 31 December 2008*

/8/ *ITC Limited, Tribeni Unit: In house laboratory analysis reports and external agency periodic reports for the period 1 January 2008 to 31 December 2008*

/9/ *ITC Limited, Tribeni Unit: Ultimate analysis reports from external agency for coal consumed for the period 1 January 2008 to 31 December 2008*

/10/ *ITC Limited, Tribeni Unit: Commissioning statement dated 7 February 2008 for measure P26*

/11/ *ITC Limited, Tribeni Unit: Finance report for the period 1 January 2008 to 31 December 2008*

/12/ *http://www.engineeringtoolbox.com/dry-air-properties-d_973.html*

Category 2 Documents:

Background documents related to the design and/or methodologies employed in the design or other reference documents. Where applicable, Category 2 documents have been used to cross-check project assumptions and confirm the validity of information given in the Category 1 documents and in verification interviews.

/13/ *AMS-II.D – Energy efficiency and fuel switching measures for industrial facilities, version 7, 28 November 2005 and AMS-I.D – Grid connected renewable electricity generation, version 9, 19 May 2006*

/14/ *Project Design Document "Demand side energy conservation and reduction measures at ITC Tribeni Unit ", version 3 dated 28 August 2006*

/15/ *DNV validation report, local assessment checklist, findings overview and report on comments by Parties, stakeholders and NGOs*

/16/ *DNV verification report for the second monitoring period 1 January 2007 to 31 December 2007*

/17/ *CDM-EB: Scope of review, http://cdm.unfccc.int/Projects/DB/DNV-CUK1161959975.46/iProcess/DNV-CUK1211009159.59/UnderReviewScope/scope.pdf*

/18/ *CDM-EB: Validation and Verification Manual, version 1*

Persons interviewed:

Persons interviewed during the verification, or persons contributed with other information that are not included in the documents listed above.

/19/ *ITC Limited, Tribeni Unit: Mr. S K Sarkar, Deputy General Manager*

/20/ *ITC Limited, Tribeni Unit: Mr. Sudip Chakraborty, Manager (Electrical)*

/21/ *ITC Limited, Tribeni Unit: Mr. Mrinal Sengupta. Asst. Manager (Energy & utility)*

/22/ *ITC Limited, Tribeni Unit: Mr. Debasish Mukherjee, Asst. Manager (Energy & utility)*

/23/ *ITC Limited, Tribeni Unit: Mr. S. K. Das, Officer*

/24/ *PWC: Mr. Ritwik Bhaumik, consultant*

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APPENDIX A

CORRECTIVE ACTION REQUESTS AND FORWARD ACTION REQUESTS

Corrective action requests

CAR #	Description of the CAR	Comments	Conclusions
CAR 1	Data mismatch between log-books and excel worksheet have been observed for the following measures: 1. MDS TEM P4B (December 2008) 2. MDS TEM P9 (September to December 2008). 3. Coal carbon% for C grade coal for IJT (August 2008) 4. Coal carbon% for E grade coal for IBIL (March 2008) The project proponent is requested to rectify the same in the CER calculations.	All the following data mismatch between log-books and excel worksheet have been checked and corrected: 1. MDS TEM P4B (December 2008) 2. MDS TEM P9 (September to December 2008). 3. Coal carbon% for C grade coal for IJT (August 2008) 4. Coal carbon% for E grade coal for IBIL (March 2008) With the above mentioned correction total CER value has reduced to 8848 units from the previous claimed CER value of 8881 units mentioned in the earlier monitoring report submitted to DOE for verification. Accordingly both the CER calculation Excel file as well as the monitoring report has been corrected.	**OK.** The necessary changes have been made to the monitoring report and the excel sheet. CAR is closed.

Forward action requests from previous verification

FAR #	Description of the FAR	Comments	Conclusions
FAR 1	In thermal projects, total twelve reading has been taken for every monitoring parameter daily and the average has been calculated manually to obtain the daily average value. The project proponent is requested to stream line the data collection procedure by monitoring the daily average directly from the DCS in the next verification period.	Necessary action has been initiated and handed over to the technical team to stream-line the data collection procedure by monitoring the daily average directly from the DCS.	**OK.** The data collection process has been streamlined and direct collection of daily average data from the DCS has been implemented since 14 August 2008. FAR is closed
FAR 2	Internal audit was conducted by the management for review of the project performance. The internal audit conducted during the verification period was found to be adequate. However personnel from different fields were not involved in the internal audit team and hence further improvement opportunities could not be identified. Project proponent is requested to involve all the personnel who are associated with the project during future audits. Also procedures for recording and proper logging of audit findings need to be firmed up prior to next verification.	Necessary recommendations mentioned above will be considered during next internal audit for review of the project performance. Also the internal audit findings as well as corrective measures taken will be properly logged and made available during next verification.	**OK.** Internal audit procedures have been firmed-up and cross-functional personnel have been involved in the audit. Proper log of audit findings are being maintained. FAR is closed.

Forward action requests raised in this verification

No FARs have been issued during this verification.

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APPENDIX B

MONITORING PARAMETERS CHECKLIST

Data / Parameter: (as in monitoring plan of PDD):	TEM F5 – Energy in kWh	TEM UT 2 – Energy in kWh	TEM V 5 – Energy in kWh
Measuring frequency:	Monthly	Monthly	Monthly
Reporting frequency:	Monthly	Monthly	Monthly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. As per the registered PDD recording frequency is annual.	Yes. As per the registered PDD recording frequency is annual.	Yes. As per the registered PDD recording frequency is annual.
Type of monitoring equipment:	Energy meter Make - Industrial Meters, Sl. No. 7F50857 Accuracy: Class1.	Energy meter L&T Make, Sl.No.5871914 Accuracy: Class1.	Energy meter L&T Make, Sl.No.4703591 Accuracy: Class1.
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	There is no mention about any monitoring equipment accuracy in the registered PDD. The meter is of accuracy class 1.	There is no mention about any monitoring equipment accuracy in the registered PDD. The meter is of accuracy class 1.	There is no mention about any monitoring equipment accuracy in the registered PDD. The meter is of accuracy class 1.
Calibration frequency /interval:	Once in two years	Once in two years	Once in two years
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	The monitoring plan of the registered PDD does not specify about calibration frequency for any of the measuring equipment. The calibration frequency represents good monitoring practices since the calibration frequency is less than 3 years.	The monitoring plan of the registered PDD does not specify about calibration frequency for any of the measuring equipment. The calibration frequency represents good monitoring practices since the calibration frequency is less than 3 years.	The monitoring plan of the registered PDD does not specify about calibration frequency for any of the measuring equipment. The calibration frequency represents good monitoring practices since the calibration frequency is less than 3 years.
Company performing the calibration:	In-house (Master meter L&T make Sl. No. 5871926, calibrated by Electro meter corporation on 11 Jan 2007 valid till 10 Jan 2009)	Electro Meter Corporation & In house (Master meter L&T make Sl. No. 6886248, calibrated by Electro meter corporation on 22 Nov 2008 valid till 21 Nov 2009).	In-house (Master meter L&T make Sl. No. 5871926, calibrated by Electro meter corporation on 11 Jan 2007 valid till 10 Jan 2009)
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes	Yes	Yes
Is(are) calibration(s) valid for the whole reporting period?	Yes, reporting period covered. (Last calibration date: 5 Jan 2008, valid till 4 Jan 2010)	Yes, reporting period covered. Last calibration date: 6 Jan 2009, valid till 5 Jan 2011; earlier calibration date was 12 Jan 2007 valid till 11 Jan 2009	Yes, reporting period covered. Last calibration date: 5 Jan 2008, valid till 4 Jan 2010, previous calibration on: 12 Jan 2007 valid till 11 Jan 2009.
If applicable, has the reported data been cross-checked with other available data?	NA	NA	NA
How were the values in the monitoring report verified?	Field Measurement Book, Doc. No.: EP/E&U/4.5.1/01/01/01	Field Measurement Book, Doc. No.: EP/E&U/4.5.1/01/01/01	Field Measurement Book, Doc.No.: EP/E&U/4.5.1/01/01/01
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Senior officers review the data for correct transfer and reporting of emission reduction prior to its submission to DOE.	Senior officers review the data for correct transfer and reporting of emission reduction prior to its submission to DOE.	Senior officers review the data for correct transfer and reporting of emission reduction prior to its submission to DOE.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA	NA	NA

Data / Parameter: (as in monitoring plan of PDD):	TEM F7 & F4A – Energy in kWh	TEM P 7 – Energy in kWh	TEM P 8 – Energy in kWh
Measuring frequency:	Monthly	Monthly	Monthly
Reporting frequency:	Monthly	Monthly	Monthly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. As per the registered PDD recording frequency is annual.	Yes. As per the registered PDD recording frequency is annual.	Yes. As per the registered PDD recording frequency is annual.
Type of monitoring equipment:	2 nos. L&T Make, Sl.No.6872042 & 6872094, and 2 nos. EM3360 meters EM30/43-0102-5 & EM30/38-0102-5 respectively.	Energy meter -2 nos. L&T Make, Sl.No.5864747 & 4763575.	6 nos. L&T Make energy meters, Sl.No.5864743, 5864728, 5871924, 5867506, 5867504 & 6872021
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	There is no mention about any monitoring equipment accuracy in the registered PDD. The meters are of accuracy class 1.	There is no mention about any monitoring equipment accuracy in the registered PDD. The meters are of accuracy class 1.	There is no mention about any monitoring equipment accuracy in the registered PDD. The meters are of accuracy class 1.
Calibration frequency /interval:	Once in two years	Once in two years	Once in two years
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	The monitoring plan of the registered PDD does not specify about calibration frequency for any of the measuring equipment. The calibration frequency represents good monitoring practices since the calibration frequency is less than 3 years.	The monitoring plan of the registered PDD does not specify about calibration frequency for any of the measuring equipment. The calibration frequency represents good monitoring practices since the calibration frequency is less than 3 years.	The monitoring plan of the registered PDD does not specify about calibration frequency for any of the measuring equipment. The calibration frequency represents good monitoring practices since the calibration frequency is less than 3 years.
Company performing the calibration:	6872042 & 6872094: Electro Meter Corporation & In-house (Master meter L&T make Sl. No. 6886248, calibrated by Electro meter corporation on 22 Nov 2008 valid till 21 Nov 2009). EM30/43-0102-5: EMC, Conzerv & In-house. EM30/38-0102-5: Conzerv & In-house (Master meter. L&T make sl. no. 5871907 calibrated by Electro meter corporation on 11 Jan 2007, valid till 10 Jan 2009).	Electro Meter Corporation & In house (Master meter L&T make Sl. No. 6886248, calibrated by Electro meter corporation on 22 Nov 2008 valid till 21 Nov 2009).	Electro Meter Corporation and In-house (Master meter L&T make Sl. No. 6886248, calibrated by Electro meter corporation on 22 Nov 2008 valid till 21 Nov 2009)
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes	Yes	Yes
Is(are) calibration(s) valid for the whole reporting period?	Yes, reporting period covered. 6872042: last calibration on 6 Jan 2009, valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009 6872094: last calibration on 6 Jan 2009, valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009 EM30/43-0102-5: last calibration on 6 Jun 2008 valid till 5 Jun 2010, previous calibration on 10 Jun 2006 valid till 9 Jun 2008 EM30/38-0102-5: last calibration on 6 Jun 2008 valid till 5 Jun 2010, previous calibration on 10 Jun 2006 valid till 9 Jun 2008.	Yes, reporting period covered. 5864747: last calibrated on 5 Jan 2009, valid till 4 Jan 2011, previous calibration on 11 Jan 2007, valid up to 10 Jan 2009 4763575: last calibrated on 05 Jan 2009, valid till 4 Jan 2011, previous calibration on 11 Jan 2007, valid up to 10 Jan 2009	Yes, reporting period covered. 5864743: last calibration on 5 Jan 2009 valid till 4 Jan 2011, previous calibration on 11 Jan 2007 valid till 10 Jan 2009. 5864728: last calibration on 5 Jan 2009 valid till 4 Jan 2011, previous calibration on 11 Jan 2007 valid till 10 Jan 2009. 5871924: last calibration on 6 Jan 2009 valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009. 5867506: last calibration on 6 Jan 2009 valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009. 5867504: last calibration on 6 Jan 2009 valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009. 6872021: last calibration on 6 Jan 2009 valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009.
If applicable, has the reported data been cross-checked with other available data?	Not applicable	Not applicable	Not applicable
How were the values in the monitoring report verified?	Field Measurement Book, Doc. No.: EP/E&U/4.5.1/01/01/01	Field Measurement Book, Doc. No.: EP/E&U/4.5.1/01/01/01	Field Measurement Book, Doc. No.: EP/E&U/4.5.1/01/01/01
Does the data management (from	Senior officers review the data for	Senior officers review the	Senior officers review the

monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	correct transfer and reporting of emission reduction prior to its submission to DOE.	data for correct transfer and reporting of emission reduction prior to its submission to DOE.	data for correct transfer and reporting of emission reduction prior to its submission to DOE.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA	NA	NA

Data / Parameter: (as in monitoring plan of PDD):	F 1,2,3 – Energy in kWh	P 15 B – Energy in kWh	P 16 – Energy in kWh
Measuring frequency:	Monthly	Monthly	Monthly
Reporting frequency:	Monthly	Monthly	Monthly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. As per the registered PDD recording frequency is annual.	Yes. As per the registered PDD recording frequency is annual.	Yes. As per the registered PDD recording frequency is annual.
Type of monitoring equipment:	Energy meter -2 nos. L&T Make, Sl.No. 5871909 & 5871932.	Energy meter -2 nos.L&T Make, Sl.No. 5871915 & 5871929. Accuracy: Class1.	Energy meter - 4 nos.L&T Make, Sl.No. 6872062, 5871917, 6872073 & 6872048. Accuracy: Class1.
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	There is no mention about any monitoring equipment accuracy in the registered PDD. The meter is of accuracy class 1.	There is no mention about any monitoring equipment accuracy in the registered PDD. The meter is of accuracy class 1.	There is no mention about any monitoring equipment accuracy in the registered PDD. The meter is of accuracy class 1.
Calibration frequency /interval:	Once in two years	Once in two years	Once in two years
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Yes	Yes	Yes
Company performing the calibration:	Electro Meter Corporation & In house (Master meter L&T make Sl. No. 6886248, calibrated by Electro meter corporation on 22 Nov 2008 valid till 21 Nov 2009).	Electro Meter Corporation and In-house (Master meter Sl no. 6886248 calibrated by Electro meter corporation on 22 Nov 2008 valid till 21 Nov 2009).	Electro Meter Corporation and In-house (Master meter Sl no. 6886248 calibrated by Electro meter corporation on 22 Nov 2008 valid till 21 Nov 20009).
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes	Yes	Yes
Is(are) calibration(s) valid for the whole reporting period?	Yes, reporting period covered. 5871909: last calibration on 6 Jan 2009 valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009. 5871932: last calibration on 6 Jan 2009 valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009	Yes, reporting period covered. 5871915: last calibration on 6 Jan 2009 valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009. 5871929: last calibration on 6 Jan 2009 valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009.	Yes, reporting period covered. 6872062 & 5871917 last calibrated on 5 Jan 2009 valid till 4 Jan 2011, previous calibration on 11 Jan 2007 valid till 10 Jan 2009. 6872073 & 6872048 last calibrated on 6 Jan 2009 valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009.
If applicable, has the reported data been cross-checked with other available data?	NA	NA	NA
How were the values in the monitoring report verified?	Field Measurement Book, Doc. No.: EP/E&U/4.5.1/01/01/01	Field Measurement Book, Doc. No.: EP/E&U/4.5.1/01/01/01	Field Measurement Book, Doc .No.: EP/E&U/4.5.1/01/01/01
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Senior officers review the data for correct transfer and reporting of emission reduction prior to its submission to DOE.	Senior officers review the data for correct transfer and reporting of emission reduction prior to its submission to DOE.	Senior officers review the data for correct transfer and reporting of emission reduction prior to its submission to DOE.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically	NA	NA	NA

possible been applied or has a request for deviation been approved?			

Data / Parameter: (as in monitoring plan of PDD):	P 4A – Energy in kWh	P 4B – Energy in kWh
Measuring frequency:	Monthly	Monthly
Reporting frequency:	Monthly	Monthly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. As per the registered PDD recording frequency is annual.	Yes. As per the registered PDD recording frequency is annual.
Type of monitoring equipment:	Energy meter – 3 nos. L&T Make, Sl. No. Sl.No.5867500, 5867486, & Enercon make Sl. No. DM 5230/83648/473-450-S. Accuracy: Class1	Energy meter – 3 nos. Enercon make DM5240/F40/9573-303, E30/36-0102-S, E30/40-0102-S. Accuracy: Class1.
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	There is no mention about any monitoring equipment accuracy in the registered PDD. The meter is of accuracy class 1.	There is no mention about any monitoring equipment accuracy in the registered PDD. The meter is of accuracy class 1.
Calibration frequency /interval:	Once in two years	Once in two years
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Yes	Yes
Company performing the calibration:	Electro Meter Corporation & In house (Master meter L&T make Sl. No. 6886248, calibrated by Electro meter corporation on 22 Nov 2008 valid till 21 Nov 2009 & Master 5871907 calibrated by Electro meter corporation on 11 Jan 2007 valid till 10 Jan 2009)	Conzerv & In house (Master meter no. 5871907 calibrated by Electro meter corporation on 11 Jan 2007 valid till 10 Jan & Master meter no. 5871923 calibrated by EMC on 11 Jan 2007 valid till 10 Jan 2009).
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes	Yes.
Is(are) calibration(s) valid for the whole reporting period?	Yes, reporting period covered. Meter no 5867500 & 5867486 last calibrated on: 5 Jan 2009 valid till 4 Jan 2011, previous calibration on 11 Jan 2007 valid till 10 Jan 2009. Meter no. DM 5230/83648/473-450-S last calibrated on 11 Nov 2007 valid till 10 Nov 2009	Yes, reporting period covered. DM5240/F40/9573-303: last calibration on 11 Nov 2007 valid till 10 Nov 2009. E30/36-0102-S: last calibration on 6 Jun 2008 valid till 5 Jun 2010, previous calibration on 11 Jun 2006 valid till 10 Jun 2008. E30/40-0102-S: last calibration on 6 Jun 2008 valid till 5 Jun 2010, previous calibration on 10 Jun 2006 valid till 9 Jun 2008
If applicable, has the reported data been cross-checked with other available data?	NA	NA
How were the values in the monitoring report verified?	Field Measurement Book, Doc. No.: EP/E&U/4.5.1/01/01/01	Field Measurement Book, Doc .No.: EP/E&U/4.5.1/01/01/01
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Senior officers review the data for correct transfer and reporting of emission reduction prior to its submission to DOE.	Senior officers review the data for correct transfer and reporting of emission reduction prior to its submission to DOE.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA	NA

Data / Parameter: (as in monitoring plan of PDD):	P 26 – Energy in kWh	TEM C (1 to 5) – Energy in kWh
Measuring frequency:	Monthly	Monthly
Reporting frequency:	Monthly	Monthly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. As per the registered PDD recording frequency is annual.	Yes. As per the registered PDD recording frequency is annual.
Type of monitoring equipment:	Energy meter – 1 nos. L&T Make, Sl. no.5871912. Accuracy: Class1.	Energy meter – 1 L&T Make, Sl. no. 4703585, and 4 Nos. Conzerv Make Sl. Nos. 6436 -106338/925-4106, 6436-106338/928-4106, EM6436/106338/9427-4106, EM6400/78413/6802-3405. Accuracy: Class1.
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	There is no mention about any monitoring equipment accuracy in the registered PDD. Meter is of accuracy class 1.0	There is no mention about any monitoring equipment accuracy in the registered PDD. Meter is of accuracy class 1.0
Calibration frequency /interval:	Once in two years	Once in two years
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Yes	Yes
Company performing the calibration:	In house (Master meter L&T make sl. no 5871923 calibrated by EMC on 11 Jan 2007 valid till 10 Jan 2009)	4703585: Electro Meter Corporation & In house (Master meter no. 6886248 calibrated by Electro meter corporation on 22 Nov 2008 valid till 21 Nov 2009) , 6436 -106338/925-4106: EMC & Conzerv EM 6436/106338/928-4106: EMC & Conzerv. EM6436/106338/9427-4106: In house (Master meter no. 5871923 calibrated by EMC on 11-Jan 2007 valid till 10 Jan 2009). EM6400/78413/6802-3405: Conzerv & In house (Master 5871907 calibrated by EMC on 11 Jan 07 valid till 10 Jan 2009).
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes	Yes
Is(are) calibration(s) valid for the whole reporting period?	Yes, reporting period covered. Last calibrated on 1 Mar 2008 valid till 28 Feb 2010, previous calibration on 4 Mar 2006 valid till 3 Mar 2008	Yes, reporting period covered. 4703585: last calibration on 5 Jan 2009 valid till 4 Jan 2011, previous calibration on 11 Jan 2007 valid till 10 Jan 2009. 6436 -106338/925-4106: last calibration on 23 Dec 2008 valid till 22 Dec 2009. Previous calibration on 11 Jan 2007 & valid till 10 Jan 2009 EM 6436/106338/928-4106: last calibration on 23 Dec 2008 valid till 22 Dec 2009. Previous calibration 12 Jan 2007 & valid till 11 Jan 2009. EM6436/106338/9427-4106: Last calibration on 1 Mar 2008 valid till 28 Feb 2010. Previous calibration 12 Mar 2006 & valid till 11 Mar 2008. EM6400/78413/6802-3405: last calibration on 5 Jun 2008 valid till 4 Jun 2010. Previous calibration 10 Jun 2006 & valid till 10 Jun 2008.
If applicable, has the reported data been cross-checked with other available data?	NA	Not applicable
How were the values in the monitoring report verified?	Field Measurement Book, Doc. No.: EP/E&U/4.5.1/01/01/01	Field Measurement Book, Doc. No.: EP/E&U/4.5.1/01/01/01
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Senior officers review the data for correct transfer and reporting of emission reduction prior to its submission to DOE.	Senior officers review the data for correct transfer and reporting of emission reduction prior to its submission to DOE.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA	NA

Data / Parameter: (as in monitoring plan of PDD):	TEM P 9 – Energy in kWh	TEM ETP1 – Energy in kWh
Measuring frequency:	Monthly	Monthly
Reporting frequency:	Monthly	Monthly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. As per the registered PDD recording frequency is annual.	Yes. As per the registered PDD recording frequency is annual.
Type of monitoring equipment:	Energy meter – 5 nos. L&T Make, Sl. nos. 6872000, 6872020, 6872017, 6872058 & 6871995. Accuracy: Class1.	Energy meter – 8 nos. L&T Make, sl. nos. 5864729, 5864722, 5864737, 5864744, 5864748, 5864735, 5864745 & 5864724. Accuracy: Class1.
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	There is no mention about any monitoring equipment accuracy in the registered PDD. Meter is of accuracy class 1.0	There is no mention about any monitoring equipment accuracy in the registered PDD. Meter is of accuracy class 1.0
Calibration frequency /interval:	Once in two years	Once in two years
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Yes	Yes
Company performing the calibration:	6872000: EMC & In house 6872020: EMC & In house 6872017: EMC & In house 6872058: EMC & In house 6871995: EMC & In house (For all in-house calibrations master meter no. 6886248 calibrated by Electro meter corporation on 22 Nov 2008 valid till 21 Nov 09)	5864729: EMC & In house 5864722: EMC & In house 5864737: EMC & In house 5864744 : EMC & In house 5864724 : EMC & In house 5864748 : EMC & In house 5864735 : EMC & In house 5864745 : EMC & In house (For all in-house calibrations master meter no. 6886248 calibrated by Electro meter corporation on 22 Nov 2008 valid till 21 Nov 09)
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes	Yes
Is(are) calibration(s) valid for the whole reporting period?	Yes, reporting period covered. 6872000: last calibration on 6 Jan 2009 valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009 6872020: last calibration on 6 Jan 2009 valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009 6872017: last calibration on 6 Jan 2009 valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009 6872058: last calibration on 6 Jan 2009 valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009 6871995: last calibration on 6 Jan 2009 valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009	Yes, reporting period covered. 5864729: Last calibration on 6 Jan 2009 valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009 5864722: Last calibration on 6 Jan 2009 valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009 5864737: Last calibration on 6 Jan 2009 valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009 5864744: Last calibration on 6 Jan 2009 valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009 5864724: Last calibration on 6 Jan 2009 valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009 5864748: Last calibration on 6 Jan 2009 valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009 5864735: Last calibration on 6 Jan 2009 valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009 5864745: Last calibration on 6 Jan 2009 valid till 5 Jan 2011, previous calibration on 12 Jan 2007 valid till 11 Jan 2009
If applicable, has the reported data been cross-checked with other available data?	NA	NA
How were the values in the monitoring report verified?	Field Measurement Book, Doc. No.: EP/E&U/4.5.1/01/01/01	Field Measurement Book, Doc. No.: EP/E&U/4.5.1/01/01/01
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Senior officers review the data for correct transfer and reporting of emission reduction prior to its submission to DOE.	Senior officers review the data for correct transfer and reporting of emission reduction prior to its submission to DOE.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA	NA

Data / Parameter: (as in monitoring plan of PDD):	B 11-B12 – Air Flow rate (TPH) & Temperature (^oC)	WH1 – TG3 Condensate Flow (Kg/hr), TG3 GVC Inlet Condensate Temperature(^oC), TG3 GVC Outlet Condensate Temperature(^oC)
Measuring frequency:	Daily	Daily
Reporting frequency:	Daily	Daily
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes	Yes
Type of monitoring equipment:	IJT Boiler Total Air Flow: Air flow transmitter, make – ABB (Inst. Code - 0138000FT1000), IJT Air Pre-Heater Inlet Temperature: RTD, make- Ohio (Inst. Code - OP/TC-GC/0201/06-07), IJT Air Pre-Heater Outlet Temperature: RTD, make- Ohio (Inst. Code - OP/TC-GC/0202/06-07).	TG3 Total Condensate flow: Flow Transmitter make-ABB (Inst. Code - 019300FT3300), TG3 Condensate at GVC Inlet Temperature: RTD, make-Ohio (Inst. Code - OP/TC-GC/0203/06-07), TG3 Condensate at GVC Outlet Temperature: RTD, make-Ohio (Inst. Code - OP/TC-GC/0203A/06-07).
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	The PDD does not mention the accuracy of the monitoring equipment. The accuracy as determined during the calibration of the equipment was found to be adequate.	The PDD does not mention the accuracy of the monitoring equipment. The accuracy as determined during the calibration of the equipment was found to be adequate.
Calibration frequency /interval:	Yearly	Yearly
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Yes	Yes
Company performing the calibration:	In-house	In-house
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes	Yes
Is(are) calibration(s) valid for the whole reporting period?	Yes, reporting period covered. Inst. Code - 0138000FT1000: last calibration on 15 Dec 2008 valid till 14 Dec 2009, previous calibration on 20 Dec 2007 valid till 19 Dec 2008 (Master – Pressure Calibrator, make - Fluke, Sl. Nos. 9136035 calibrated by EMC on 15 Nov 2008 valid till 14 Nov 2009 & 7150087 calibrated by EMC on 9 Oct 2007 valid till 8 Oct 2008) Inst. Code - OP/TC-GC/0201/06-07: last calibration on 1 Oct 2008 valid till 30 Sep 2009, previous calibration on 7 Oct 07 valid till 6 Oct 2008. Inst. Code - OP/TC-GC/0202/06-07): last calibration on 18 Aug 2008 valid till 17 Aug 2009, previous calibration on 7 Oct 2007 valid till 6 Oct 2008. (For both temperature meters Master calibrator: Digital Thermometer, Sl. no. 80250035, make Fluke, calibrated by EMC on 13 Jun 2008 valid till 12 Jun 2009 & Digital Multimeter - Sl. no. 81004956, make Metravi, calibrated by EMC on 6 May 2008 valid till 5 May 2009)	Yes, reporting period covered. Inst. Code - 19300FT3300: Last calibration on 18 Dec 2008 valid till 17 Dec 2009, previous calibration on 20 Dec 2007 valid till 19 Dec 2008 (Master – Pressure Calibrator, make - Fluke, Sl. Nos. 9136035 calibrated by EMC on 15 Nov 2008 valid till 14 Nov 2009 & 7150087 calibrated by EMC on 9 Oct 2007 valid till 8 Oct 2008) Inst. Code - OP/TC-GC/0203/06-07: last calibration on 24 Aug 2008 valid till 23 Aug 2009, previous calibration on 5 Oct 2007 valid till 4 Oct 2008. Inst. Code - OP/TC-GC/0203A/06-07: last calibration on 24 Aug 2008 valid till 23 August 2009, previous calibration on 5 Oct 2007 valid till 4 Oct 2008 (For both temperature meters Master calibrator: Digital Thermometer, Sl. no. 80250035, make Fluke, calibrated by EMC on 13 Jun 2008 valid till 12 Jun 2009 & Digital Multimeter - Sl. no. 81004956, make Metravi, calibrated by EMC on 6 May 2008 valid till 5 May 2009)
If applicable, has the reported data been cross-checked with other available data?	NA	NA
How were the values in the monitoring report verified?	IJT Log Book E&U/7.5/09, for Air flow & temperature. Finance Monthly Figures (Run Hrs Record) for IJT run hrs.	TG3 Log Book E&U/7.5/2.7, for TG3 GVC Inlet Condensate Temperature & TG3 GVC Outlet Temperature (^oC). Log Book E&U/7.5/02 for TG3 Condensate Flow.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Senior officers review the data for correct transfer and reporting of emission reduction prior to its submission to DOE.	Senior officers review the data for correct transfer and reporting of emission reduction prior to its submission to DOE.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA	NA

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