



VERIFICATION / CERTIFICATION REPORT

“4.5 MW BIOMASS (LOW
DENSITY CROP RESIDUES)
BASED POWER GENERATION
UNIT OF MALAVALLI POWER
PLANT PVT LTD.”

IN INDIA

(UNFCCC Ref.No. 0298)

VERIFICATION PERIOD:
1 OCTOBER 2007 TO 31 JULY 2008

REPORT No. 2009-0210

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DET NORSKE VERITAS



VERIFICATION / CERTIFICATION REPORT

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Approved by: Lai Chee Keong	Organisational unit: Climate Change Services
Client: Malavalli Power Plant (P) Ltd.	Client ref.: K. Krishan - Managing Director

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Summary:

Det Norske Veritas Certification AS (DNV) has performed a verification of the emission reductions reported for the CDM project "4.5 MW biomass (low density crop residues) based power generation unit of Malavalli Power Plant Pvt Ltd." Project (Ref.No.0298), by Malavalli Power Plant Private Limited located at Kirugaval village, Malavalli Taluka, Mandya District, Karnataka state, India for the period 1 October 2007 to 31 July 2008.

In our opinion the GHG emissions reductions reported for the project in the revised monitoring report version 01 dated 21 August 2009 are fairly stated.

The GHG emission reductions were calculated correctly on the basis of the baseline and monitoring methodology AMS-I.D Version 7 and the monitoring plan provided in the registered PDD of 13 February 2006.

Hence, DNV is able to certify that the emission reductions from the "4.5 MW biomass (low density crop residues) based power generation unit of Malavalli Power Plant Pvt Ltd." Karnataka state, India, during the period 1 October 2007 to 31 July 2008 amount to 8 191 tCO₂ equivalent.

Report No.: 2009-0210		Subject Group: Environment	
Report title: “4.5 MW biomass (low density crop residues) based power generation unit of Malavalli Power Plant Pvt Ltd.”			
Work carried out by: Astakala Vidyacharan, Anjana Sharma, Gaurav Srivastava			
Work verified by: Kakaraparthi Venkata Raman			
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***Abbreviations***

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction(s)
CH ₄	Methane
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
ERU	Emission Reduction Units(s)
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
JRR	Joint Reading Records
KPTCL	Karnataka Power Transmission Corporation Limited
MESCL	Mangalore Electricity Supply Company Limited
MP	Monitoring Plan
MPPPL	Malavalli Power Plant Pvt Ltd
MVP	Monitoring and Verification Plan
N ₂ O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change



1 INTRODUCTION

Malavalli Power Plant Pvt. Ltd has commissioned Det Norske Veritas Certification AS (DNV) to carry out the third verification of the emission reductions reported for the “4.5 MW biomass (low density crop residues) based power generation unit of Malavalli Power Plant Pvt Ltd.” by Malavalli Power Plant Private Limited located at Kirugaval village, Malavalli Taluka, Mandya District, Karnataka state, India for the monitoring period of 1 October 2007 to 31 July 2008. This report contains the findings from the verification and a certification statement for the certified emission reductions.

1.1 Objective

Verification is the periodic 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 CDM project activity during a defined verification period.

Certification is the written assurance by the DOE that, during a specific period in time, a project activity achieved the emission reductions as verified.

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 reasonable 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.

1.3 Description of the Project Activity

The project activity is a 4.5 MW (gross) capacity grid connected biomass residues based renewable energy power plant with high pressure steam turbine configuration that comprises a condensing steam turbo generator unit with a matching boiler of travelling grate type capable of firing multi fuel of low density crop residues and produces steam at 22 tonnes per hour. Biomass residues for the activity are sourced from the surrounding regions of Kirugavalu village, Malavalli Taluka in Karnataka state. The generated electricity is exported to the state owned power utility company Karnataka Power Transmission Corporation Ltd. (KPTCL). Auxiliary plant facilities such as biomass storage and handling systems, ash handling system, air pollution control devices and cooling water systems have all been established.

The project activity results in the reduction of GHG emissions through displacement of fossil fuel based state grid power by the 4.5 MW biomass residues based renewable power plant.



Project Parties:	The Republic of India & Switzerland.
Title of project activity:	4.5 MW biomass (low density crop residues) based power generation unit of Malavalli Power Plant Pvt Ltd. by Malavalli Power Plant Private Limited.
UNFCCC registration No:	0298
Methodology applied:	AMS-I.D Version 07
Project Entities:	Malavalli Power Plant Private Limited from India & Myclimate Foundation – The Climate Protection Partnership & South Pole Carbon Asset Management Ltd. from Switzerland.
Location of the project activity:	Kirugaval village, Malavalli Taluka, Mandya District, Karnataka state, India
Project's crediting period	1 August 2001 to 31 July 2008 (renewable)
Verification period	1 October 2007 to 31 July 2008
Project's actual starting date	1 April 2000 (start of construction activity) 1 August 2001 (start of operation)
Following the registration of the project activity, the project has been issued with CER's for the period from 1 August 2001 to 30 September 2007 (in two issuances).	

2 METHODOLOGY

The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project. These include:

- Electricity generated: - net electricity exported to grid (calculated as the difference of the export and the import) and auxiliary consumption on a monthly basis.
- Biomass residues consumed (daily basis)
- leakage due to transportation of biomass residue (daily basis)
- Net Calorific Value of Biomass residue from independent third party (for each type of biomass residue).
- Grid emission factor as weighted average of current generation mix (refer completeness of monitoring section of report).

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

**Verification team**

Role/Qualification	Last Name	First Name	Country	Type of involvement					
				Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	Expert input
CDM verifier / technical team leader	Astakala	Vidyacharan	India	✓	✓	✓	✓		✓
GHG Auditor	Anjana	Sharma	India	✓	✓				
GHG Auditor	Gaurav	Srivastava	India	✓	✓	✓			
Technical reviewer	Kakaraparthi	Venkata Raman						✓	

Duration of verification

Preparation (review of monitoring report, Emission réduction estimations, etc.):

27 May 2009

Site visit:

28 May 2009

Reporting & QA:

29 May 2009 – 12 November 2009

2.1 Review of Documentation

The monitoring reports version 00 & 01 / 1/ and the emission reduction calculations, provided in the form of spreadsheets submitted by Malavalli Power Plant Private Limited, were assessed as a part of the verification /17/. In addition, the Project Design Document / 2/, in particular the monitoring plan contained in the PDD, as well as the validation & previous verification reports / 3/ was also assessed. Other relevant documents were also assessed as evidence /4/-/20/.

2.2 Site Visits

On 28 May 2009, DNV carried out a site visit at Malavalli Power Plant Private Limited. During the site visit, DNV has verified the actual implementation and operation of the project as described in the PDD. The instruments used for monitoring electricity and biomass weight were checked, including the calibration records for these instruments. These were found to be in order.



Interviewed organisation	Interview topics
Malavalli Power Plant Private Limited	<ul style="list-style-type: none"> ➤ Whether the project has been implemented as planned. ➤ Application of baseline emission factor. ➤ Adherence to monitoring plan established in registered Project Design Document. ➤ Management procedures like internal audits and reviews to minimise uncertainties in data monitoring and data management. ➤ Project performance. ➤ Resources, training needs and procedures for operation and maintenance.

Following people were interviewed or assisted the verification team during site visit.

Name	Position	Interview topics
1. Mr. K. Krishan,	Managing Director	<ul style="list-style-type: none"> • Detailed checking of the daily monitoring records & spreadsheets, as per monitoring plan and report. • Assessment of calibration records • Environmental permits
2. Mr. Nara Singh,	Project coordinator	
3. Mr. M. A. Sharief,	Plant Manager	

2.3 Assessment

The data presented in the monitoring report were assessed in detail by a thorough review of the detailed project documentation and production records, interviews with personnel at Malavalli Power Plant Private Limited, collection of measurements, observation of established monitoring and reporting practices and assessment of the reliability of monitoring equipment. This has enabled the verification team to assess the accuracy and completeness of reported monitoring results and verify the correct application of the approved monitoring methodology AMS I.D version 7 /4/. Data from other sources include the weighted average grid emission factor of current generation mix (for year 2006-07) and the value is 0.72193 tCO₂/MWh /7/ (refer CAR 3 as stated in Appendix A of the report).

2.4 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.

During this periodic verification, three CAR has been raised by DNV (refer to Appendix A).

3 VERIFICATION FINDINGS

3.1 Remaining Issues, CARs, FARs from Previous Validation or Verification

According to the validation report /3/, no CAR or CL's were required to be closed out during verification.

Similarly, no CAR's / FAR's were required to be closed following the previous verifications.

3.2 Project Implementation

The project has been implemented as planned. The project boundaries and key equipments for the project activity are in line with the registered CDM PDD /2/. The project boundary covers the fuel storage, boiler, steam turbine generator, other accessory equipments and KPTCL grid. The following equipment has been installed as mentioned in the registered PPD.

- 4.5 MW gross capacity steam turbine
- Travelling grate technology type boiler (capacity 22 tons/hour steam at 42 ata and 440⁰C temperature)
- Ash handling system for effective disposal of fly ash
- Demineralised water plant for boiler feed water supply
- Electro static precipitator
- Energy meters for monitoring electricity

After trial operations, commercial power generation from CPP started from 1 August 2001 after obtaining all statutory clearances. After implementation and commissioning of the project technology, no changes have been carried out. These facts have been verified by DNV during the site visit.

Valid air and water consents have also been obtained from the Karnataka State Pollution Control Board /14/ /15/. In addition the verification of air and effluent reports confirm that relevant pollution parameters as specified in the consents are within the specified limits.

The plant uses agriculture wastes, comprising of crop residues like cane trash, coconut fronds, toppings of casuarinas & eucalyptus, mill residues like saw mill waste, rice husk etc. as residue fuel. This has been confirmed through the verification of invoices / receipts from suppliers of biomass and the records maintained at the weigh bridge centre and daily log sheets /18/.



The total plant outages of 2744 Hours & 42 min have been recorded (during the monitoring period of 01 October 2007 to 31 July 2008) & have been verified from plant performance sheet /20/.

3.3 Completeness of Monitoring

As required by the monitoring methodology AMS-I.D. (version 7), monitoring of parameters essentially comprises:

- Baseline emissions calculated based on the weighted average grid emission factor of current generation mix & net electricity exported to grid (calculated as the difference of the export and the import) and auxiliary consumption on a monthly basis.
- Emissions due to transportation of biomass residues (fuel).

During the site visit following documents were verified:

- Month wise details of the net energy exported to the grid, as provided in sales invoices issued to Mangalore Electricity Supply Company Limited (MESCL) a distribution wing of KPTCL.
- Net Calorific Value of Biomass residues from independent third party (for each type of biomass residue).
- Month wise details, for determination of the transportation emission, such as
 - a) Average distances of the biomass transported
 - b) Fuel consumption particulars such as biomass type, quantity, location and distance.
 - c) Consignment wise details of biomass residues procurement.

The registered PDD is not clear whether the actual emission reduction during the crediting period will be claimed based on the validated weighted average grid emission factor or ex-post updated weighted average grid emission factor of current generation mix of southern regional grid of India. However DNV has accepted the use of 0.72193 tCO₂/MWh, updated weighted average grid emission factor (ex post) of current generation mix of southern regional grid for year 2006-07 as this is conservative than the validated grid emission factor of 0.7659 tCO₂/MWh provided in the registered PDD (refer CAR 3 as stated in Appendix A of the report) and is the latest available data for the period considered for verification.

The baseline emissions are determined by multiplying the amount of net electricity supplied to the grid by project activity with weighted average grid emission factor of current generation mix of southern regional grid of India. The weighted average grid emission factor of current generation mix of southern regional grid of India to which project activity is connected has been calculated at 0.72193 tCO₂/MWh. The weighted average grid emission factor of current generation mix of southern regional grid of India has been sourced from data by the Central Electricity Authority (CEA) of the Ministry of Power, Government of India. CEA has published a database of carbon dioxide emission factors from the power sector in India based on detailed authenticated information obtained from all operating power stations in the country /7/.

Based on the weighted average emission coefficient of 0.72193 tCO₂/MWh /7/ and net electricity exported, the baseline emissions have been verified to be 8 441.307 tCO₂ equivalent for the period 1 October 2007 to 31 July 2008 /17/.



It was verified during the site visit that project proponent has separately monitored each type of biomass residues used during the verification period. The biomass is weighed at the plant entrance on Weigh Bridge that is calibrated /18/ & /13/, and purchase receipts have been maintained.

As per the monitoring plan of the registered PDD, project proponent is required to monitor the net calorific value of each kind of biomass residues on monthly basis by independent third party. However, during the site visit it was noticed that the project proponent has records of monitored net calorific value of each kind of biomass residues by a third party only on annual basis. DNV has accepted the annual monitoring of NCV for each kind of biomass residues by an independent third party as a) the monitoring plan in the *applied baseline & monitoring methodology AMS I.D version 7* does not require this parameter to be monitored and b) taking into account the Executive Board guidance (EB 41 Annexure 20, Para 12 (b), which states that "Data elements that are generally constant and indirectly related to the emission reductions (E.g. Emission factors, Calorific Value, System Efficiencies) should be measured or calculated at least once in a year, unless detailed specifications are provided as part of the indicated methodology". It is observed that the net calorific value of the biomass does not have any effect on the emission reduction calculation, as it does not figure in the calculations of emission reductions (refer CAR 2 as stated in Appendix A of the report).

For calculation of transport related leakage project proponent has monitored the total biomass residues purchased, average distance from the source of biomass residues, number of trips, specific fuel consumption of each type of vehicle, however the emission factor of diesel validated ex antea value of 2.815 tCO₂per kilo liter of diesel consumed has been used. Leakage due to transportation of biomass for the verification period under consideration (1 October 2007 to 31 July 2008) has been verified to be 249.476 tCO₂ equivalents /17/.

During the chosen verification period, it has been verified and confirmed that the project activity has generated a gross power of 13 567 160 kWh and has displaced a net electricity of 11 692 695 kWh (after deducting power import from grid) in the southern electricity grid, by consuming various types of renewable biomass equivalent to 24 534.2 tons. The electricity generation figures in the month of March 2008 is low as plant was under major restructuring of Operating system / Plant Interventions during this period and has been verified from Plant performance sheet & daily and monthly generation records for the month of March 2008 /8/ & /20/. It has also been confirmed that the project has generated the electricity within the registered capacity, during all months of the chosen verification period.

The electricity imported from the connected grid is also measured with the same meters which are used for measuring the electricity exported. Hence, the net power export to grid after deducting import from grid has been considered for emission reduction calculations.

The main energy meter and check meter (of class 0.5 accuracy) which are under control of KPTCL are tested and calibrated periodically /11/ as per procedures defined in the power purchase agreement by the electricity board /10/.

The parameters reported, including source, frequency and review criteria as indicated in the monitoring plan were verified to be correct and in line with the validated monitoring plan of the registered PDD. Necessary management system procedures including responsibility and authority of monitoring activities have been verified to be consistent with the PDD. Knowledge of personnel associated with the project activity was also found to be satisfactory.



3.4 Accuracy of Emission Reduction Calculations

No significant reporting risks have been identified for the data reported. All the data required for emission reduction calculations are manually recorded in log sheets once in each shift i.e., after every 8 hours. The net electricity supplied to the grid by the project activity is also measured on a monthly basis from the two way KPTCL Meters (Main Meter: Tag no: 01955018 & Check Meter: Tag no: 01955020), jointly by the officials of KPTCL and MPPL. The net electricity exported is also addressed in the invoices raised to Mangalore Electricity Supply Company limited. These records have been verified and found to be correct. These are, then, transferred to spread sheets for emission reduction calculations. Except for the data on weighted average grid emission factor of current generation mix of southern regional grid of India to which project activity is connected, all other data are culled out either from the log books or daily power generation records and fuel consumption reports. The biomass residues consumption data is recorded on a daily basis /18/.

The calibration of monitoring equipments is being maintained and same has been verified by DNV /11/ & /13/. Quantity of biomass received is weighed on duly calibrated and checked weigh bridge and subjected to quality check and rejection criteria of MPPL. Daily power generation data (including total power and auxiliary power) is monitored and recorded from duly calibrated energy meters. All the power generation, fuel receipt and consumption data is maintained in daily power report in electronic as well as hard print form and have been verified by DNV.

The responsibility of ensuring that there is no data misstatement is with general manager of the plant, subsequently the verified reports are sent to head office for management reference. Periodical internal audits are carried out by the CDM team from head office to ensure the transparency and accuracy of the data being monitored and recorded.

3.5 Quality of Evidence to Determine Emission Reductions

The calculations have been verified and are deemed correct. The emission reductions from the project for the period from 1 October 2007 to 31 July 2008 as reported in the revised monitoring report of 21 August 2009 and actually verified at site equals to 8 191 tonnes of CO₂ equivalent. The emission reductions reported in the revised monitoring report are lower (- 52.49%) than the estimated emission reduction of 17 242.5 (estimated for the same period as per the registered PDD of 13 February 2006). This variation in comparison to the registered PDD is due to lesser number of actual operating hours & updated lower weighted average grid emission factor of current generation mix of southern regional grid of India used at the time of validation. The decrease in the reported emission reductions from the first monitoring report to the second monitoring report is due to use of wrong weighted emission factor of the current generation mix for the southern regional grid of India in the first monitoring report as described in the CAR 3.

	As per PDD	Initial Monitoring CERs	Webhosted Report	Revised Monitoring Report CERs
Emission reductions	17 242.5	8 705		8 191
Deviation (+/- %)	0	(-) 49.51%		(-) 52.5



Sufficient evidence was presented for the reported net emission reductions.

3.6 Management System and Quality Assurance

Malavalli Power Plant Private Limited has established management procedures and implemented effectively to ensure that the process is consistent. The procedures cover management responsibilities, data monitoring procedures, training procedures, periodical internal audits, management reviews and corrective actions in case of any deviations effectively.



4 CERTIFICATION STATEMENT

Introduction

Det Norske Veritas Certification AS (DNV) has been engaged by Malavalli Power Plant Private Limited to examine the greenhouse gas (GHG) emission reductions reported for the “4.5 MW biomass (low density crop residues) based power generation unit of Malavalli Power Plant Private Ltd” (CDM registration reference no. 0298) for the period 1 October 2007 to 31 July 2008, equating to 8 191 tonnes of CO₂ equivalents.

The project has applied the approved baseline and monitoring methodologies AMS-I.D version 7, and emissions and emissions reductions are reported in the revised monitoring report received on 21 August 2009.

The project participants are responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project monitoring plan. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the project is the responsibility of the management of the project.

It is DNV’s responsibility to express an independent verification statement on the reported GHG emission reductions from the project for the period 1 October 2007 to 31 July 2008.

Basis of GHG verification opinion

Our approach is risk-based, drawing 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 emissions for the period from 1 October 2007 to 31 July 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 October 2007 to 31 July 2008 are fairly stated.

- We conducted our verification on the basis of the monitoring methodology AMS-I.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-I.D version 7 and the monitoring plan in the PDD were consistently and appropriately applied.*

We have verified whether the information included in the monitoring report version 01 dated 21 August 2009 is correct and that the emissions reductions achieved have been determined correctly.

Certification Statement

In our opinion, the GHG emissions reported for the project in the revised monitoring report version 01 dated 21 August 2009 / 1/ are fairly stated,



The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology AMS-I.D version 7 and the monitoring plan and formulae provided in the validated PDD of 13 February 2006.

Det Norske Veritas Certification AS is able to certify that the emission reductions from the "4.5 MW biomass (low density crop residues) based power generation unit of Malavalli Power Plant Pvt Ltd." for the period 1 October 2007 to 31 July 2008 amount to 8 191 tons of CO₂ equivalent.

Bangalore & Oslo, 16 November 2009

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5 REFERENCES

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 periodic verification conclusions, and are usually further checked through interviews with key personnel.

- / 1/ Malavalli Power Plant Pvt Ltd.: Monitoring report for “4.5 MW biomass (low density crop residues) based power generation unit of Malavalli Power Plant Pvt Ltd.” for period 1 October 2007 to 31 July 2008, Version: 00 & and version: 01, dated 21 August 2009.
- / 2/ Malavalli Power Plant Pvt Ltd.: CDM-PDD for “4.5 MW biomass (low density crop residues) based power generation unit of Malavalli Power Plant Pvt Ltd.”, dated 13 February 2006.
- / 3/
 - a) Det Norske Veritas Certification AS: Validation report for “4.5 MW biomass (low density crop residues) based power generation unit of Malavalli Power Plant Pvt Ltd.”, DNV Report No. 2005-9065, revision 02 dated 24 February 2006.
 - b) Det Norske Veritas Certification AS: Previous Verification reports for “4.5 MW biomass (low density crop residues) based power generation unit of Malavalli Power Plant Pvt Ltd.”

Background documents related to the design and/or methodologies employed in the design or other reference documents.

- / 4/ CDM Executive Board: Simplified baseline and monitoring methodology AMS-I.D - Grid connected renewable electricity generation, Version 7.
- / 5/ CDM Executive Board: *Validation and Verification Manual*. Version 01.
- / 6/ Monthly records of net energy exported in FORM-B by KPTCL and Proforma for bill payment towards power purchased from MPPL between October 2007 and July 2008.
- / 7/ CEA: CO2 Baseline Database for the Indian Power Sector:
<http://www.cea.nic.in.planning.c%20and%20e.Government%20of%20India%20website.htm>
- / 8/ Daily and Monthly electricity generation reports of MPPPL.
- / 9/ Power purchase agreements signed between KPTCL and MPPL.
- / 10/ Internal Audit records for period 1 October 2007 to 31 July 2008.
- / 9/ Calibration Certificates of Main Meter and Check Meter dated 02 January 2007 & 12 February 2008 by KPTCL.
- / 10/ Certificate from Boiler inspectorate valid from 18 June 2008 to 17 June 2009 & previous period 08/07/2007 till 07/07/2008.
- / 11/ Weighing bridge calibration record “Controller of Weights and Measures” department of Karnataka, dated: 26/04/2008 and valid from 26/04/2008 till 25/04/2009 & previous period dated 17/04/2007 and valid from 17/04/2007 till 16/04/2008.
- / 12/ Consent for operation from Karnataka Pollution control board KSPCB/SEO-4/EO/DEO/2007-08/42 valid from 1 July 2007 to 30 June 2008 under water act.
 Consent for operation from Karnataka Pollution control board



- KSPCB/APC/SEO/EO/DEO/2007-08/432 valid from 1 July 2007 to 30 June 2008 under Air Act.
- / 13/ Consent for operation from Karnataka Pollution control board KSPCB/SEO-4/EO/DEO/AEO/0809-256 valid from 1 July 2008 to 30 June 2009.
 - / 14/ Net Calorific Value of Biomass residue from independent third party (for each type of biomass residue) dated 20/11/2007 & 23/09/2008 on annual basis.
 - /17/ Malavalli emission reduction spreadsheet (1 October 2007-31 July 2008) .xls
 - /18/ Fuel purchase receipts & biomass residues consumption data sheet.
 - /19/ Indicative simplified baseline & monitoring methodologies for selected small-scale CDM project activity categories EB 41 Annexure- 20.
 - /20/ Plant Performance sheet Oct 07-July 08.xls

APPENDIX A

**CORRECTIVE ACTION REQUESTS
AND
FORWARD ACTION REQUESTS**

Corrective action requests

CL ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CAR 1	Project proponent is requested to revise the monitoring report in order to meet the requirement of EB 48 Annexure- 68 (GUIDELINES ON COMPLETENESS CHECK OF REQUESTS FOR ISSUANCE).	The monitoring report has been revised & details regarding monitoring reporting calibration & comparison of actual emission reductions with estimated emission reduction reported in the registered PDD have been now reported in revised MR version 01.	The monitoring report for the project activity has been revised by project proponent details of monitoring, reporting & calibration has been now included in the revised MR. Comparison of actual emission reductions with estimated emission reduction reported in the registered PDD have been now reported in revised MR version 01 Revised MR dated 21 August 2009 has been reviewed by DNV. OK Accepted. CAR 1 Closed.
CAR 2	It was witnessed during the site visit the NCV of each kind of biomass residues were monitored on annual basis which is not inline with the monitoring plan of the registered PDD, as registered PDD requires this parameter to be monitored on monthly basis by an independent third party.	The NCV of each kind of biomass residues by third party were monitored on annual basis, however this does not have any effect on the CER calculation.	DNV has accepted the monitoring of NCV from independent third party for each kind of biomass residues on annual basis though this is not inline with the monitoring plan of the registered PDD. DNV's conclusion is based on the fact that monitoring plan of the <i>applied baseline & monitoring methodology AMS I.D version 7</i> does not require this parameter to be monitored. In addition to this, considering Executive Board guidance (EB 41 Annexure 20, Para 12 (b) which states that "Data elements that are generally constant and indirectly related to the emission reductions (E.g. Emission factors, Calorific Value, System Efficiencies) should be measured or calculated at least once in a year, unless detailed specifications are provided as part of the indicated methodology" & monitoring of this parameter will not have any effect on the emission reduction calculation. OK Accepted. CAR 2 Closed.

CL ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CAR 3	<p>During the verification it was noted that the project proponent has used weighted average emission factor of the generation mix of southern regional grid of year 2001 provided in the registered PDD. Though it is not clear from the registered PDD that this parameter will be updated ex post or validated values provided in the registered PDD will be used, PP is requested to use the latest value of weighted average emission factor of the current generation mix of southern regional grid available for the verification period as this value is more conservative than the value provided in registered PDD.</p> <p>PP is requested to correct the emission reduction spreadsheet & MR accordingly.</p>	<p>The MR & emission reduction sheet has been corrected & now latest data of weighted average emission factor of the current generation mix of southern regional grid available for the verification period has been used for emission reduction.</p>	<p>DNV has verified that the weighted average emission factor of the current generation mix of southern regional grid available for the verification period has been used for emission reduction calculation and has been sourced from Central Electricity Authority (CEA) database of carbon dioxide emission factors from the power sector in India.</p> <p>Revised MR & emission reduction has been reviewed by DNV.</p> <p>OK Accepted CAR 3 Closed.</p>

Forward action requests from previous verification

FAR ID	Forward action request	Summary of how FAR has been addressed in this reporting period	Assessment of how FAR has been addressed
FAR #	No Forward Action Request (FAR) was identified from the previous verification process.	Not applicable.	Not applicable.

Forward action requests from this verification

FAR ID	Forward action request	Response by Project Participants	DNV's assessment of response by Project Participants
FAR #	No forward action request was identified for the next verification process.	Not applicable.	Not applicable.

APPENDIX B

**MONITORING, REPORTING
AND
CALIBRATION CHECKLIST**

Data / Parameter: (as in monitoring plan of PDD):	Net Electricity Supplied to the southern Grid (EG _V) Main Meter: Tag no: 01955018.	Net Electricity Supplied to the southern Grid (EG _V) Check Meter: Tag no: 01955020.	Fuel Quantity (Biomass residues consumption)
Measuring frequency:	Continuously (Online)	Continuously (Online)	Daily
Reporting frequency:	Daily	Daily	Daily
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes	Yes	Yes
Type of monitoring equipment:	Energy Meter	Energy Meter	Weigh Bridge
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?	Yes	Yes	Yes
Calibration frequency /interval:	Annual	Annual	Annual
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:	Karnataka Power Transmission Corporation Limited	Karnataka Power Transmission Corporation Limited	"Controller of Weights and Measures" Department of Karnataka
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes	Yes	Yes
Is (are) calibration(s) valid for the whole reporting period?	Yes, the calibration is valid for complete monitoring period (02 January 2007 & 12 February 2008).	Yes, the calibration is valid for complete monitoring period (02 January 2007 & 12 February 2008).	Yes, the calibration is valid for complete monitoring period (26/04/2008 till 25/04/2009 & previous period valid from 17/04/2007 till 16/04/2008).
How were the values in the monitoring report verified?	JMR & Sales invoices	JMR & Sales invoices	Shift log book and purchase receipts
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?	The electrician records the data on a continuous basis from the respective energy meters in the log books. The data is then compiled and finalized by the shift in charge, who is responsible for data recording as	The electrician records the data on a continuous basis from the respective energy meters in the log books. The data is then compiled and finalized by the shift in charge, who is responsible for data recording	The amount of biomass residues entering the plant is measured using duly calibrated electronic weigh bridge and records of the same are maintained. The data is recorded for further

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	per the monitoring plan of the registered PDD. The daily generation log book records are then forwarded to the Manager Power Plant who verifies the authenticity of the data. Any discrepancies observed are dealt with immediately. The verified report is sent for archive	as per the monitoring plan of the registered PDD. The daily generation log book records are then forwarded to the Manager Power Plant who verifies the authenticity of the data. Any discrepancies observed are dealt with immediately. The verified report is sent for archive	verification from the amount of each kind of biomass residues purchased based on invoices / receipts from fuel contractors.
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?	Not Applicable	Not Applicable	Not Applicable