



VERIFICATION / CERTIFICATION REPORT

11.3 MW RENEWABLE ENERGY PROJECT FOR A GRID SYSTEM BY K.M. POWER (P) LIMITED IN INDIA

(CDM REGISTRATION REFERENCE NO. 0750)

VERIFICATION PERIOD:

25 March 2006 to 23 March 2007.

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DET NORSKE VERITAS



VERIFICATION / CERTIFICATION REPORT

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Summary:

Det Norske Veritas Certification AS. has performed a verification of the “11.3 MW Renewable Energy project for a grid system by K.M. Power (P) Limited” (Registration Ref. No. 0750) managed by K.M. Power Private Limited for the period 25 March 2006 to 23 March 2007.

In our opinion, the GHG emissions reductions reported for the project in the monitoring report dated 15 October 2007 / 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 9 / 5/ and the monitoring plan and formulae provided in the validated PDD of 12 October 2006 / 2/.

Det Norske Veritas Certification AS is able to certify that the emission reductions from the “11.3 MW Renewable Energy project for a grid system by K.M. Power (P) Limited”, managed by K.M. Power Private Limited for the period 25 March 2006 to 23 March 2007 amount to 24 911 tCO₂ equivalent.

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***Abbreviations***

APTRANSCO	Transmission Corporation of Andhra Pradesh Limited
AP	Andhra Pradesh
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 _{2e}	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
ERU	Emission Reduction Units(s)
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MR	Monitoring Report
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
GWP	Global Warming Potential



1 INTRODUCTION

K.M. Power Private Limited has commissioned Det Norske Veritas Certification AS (DNV) to carry out the verification of emission reductions reported by the “11.3 MW Renewable Energy project for a grid system by K.M. Power (P) Limited” in Velugonda mandal, Kurnool district, Andhra Pradesh state, India, for the period 25 March 2006 to 23 March 2007. 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 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 team has, based on the recommendations in the Validation and Verification Manual / 6/, employed a risk based approach, focussing on the identification of significant reporting risks and verifying the mitigation measures for these.

1.3 Description of the Project Activity

Project Party	India
Title of the project activity	11.3 MW Renewable Energy project for a grid system by K.M. Power (P) Limited
Registration Reference No	0750
Project Participants	K.M. Power Private Limited
Location of the project activity	Velugonda mandal, Kurnool district, Andhra Pradesh state, India
Project's crediting period start date	6 February 2002 (Fixed crediting period of 10 years)



Verification period

25 March 2006 to 23 March 2007

The project activity is a bundle of three small hydro power projects with an aggregated gross capacity of 11.3 MW, connected to the Andhra Pradesh state electricity grid. The first project, Guntakandala mini hydel scheme (4.0 MW capacity) was commissioned in February 2002. The second project, Velpanuru mini hydel scheme (3.3 MW) was commissioned in November 2002 and the third project, Madhavaram mini hydel scheme (4.0 MW) was commissioned in October 2003. The project utilises the head available in the Nippulavagu natural stream (used as a carrier canal for Kurnool-Cuddapa canal) located in Andhra Pradesh region, for generation of electricity. The projects have a diversion structure for the stream, intake chamber, de-silting chamber, fore bay, and tail race for creating the additional head to run the turbines. The technology used in this project is indigenous.

The project's emission reductions are determined by multiplying the amount of net electricity generated in by the project in a year with a grid emission factor calculated as the weighted average of current generation mix, determined ex-post for the southern regional grid. According to the validated project design, there are no project emissions and leakage effects associated with the project. The project has already had CERs issuance from UNFCCC once, for the period of 06 February 2002 to 24 March 2006.

2 METHODOLOGY

The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project. As the CDM Executive Board has not yet formally endorsed the application of any materiality principle for verification of emission reductions from CDM projects - implying that emphasis should be on the significant contributors to emission reductions - the DNV team has for this assignment decided to check all factors and issues with the same emphasis. The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project.

The verification process was guided by a verification checklist, which aims to ensure a transparent verification process. This documents in detail how emission reductions have been verified and how the verification findings have been reached. The statement "data are found to be correct" refer to a situation where the auditors through the testing processes have found no discrepancies in the reported data and that these, in the opinion of the auditors, are free from material misstatements.

Verification team

K Venkata Raman	DNV, India	Team Leader, CDM Verifier
Astakala Vidyacharan	DNV, India	GHG Auditor
Michael Lehmann	DNV, Norway	Sector expert
Chandrashekara Kumaraswamy	DNV, India	Technical reviewer

Duration of verification

Preparations: From 01 October 2007 to 04 October 2007

On-site verification: From 05 October 2007 to 06 October 2007



Completion of Reporting: 11 October 2007 – 25 February 2008

2.1 Review of Documentation

The monitoring reports / 1/ and the emission reduction calculations, provided in the form of spreadsheets submitted by K.M. Power Private Limited, were assessed as a part of the verification. In addition the Project Design Document / 2/, the monitoring plan contained in the PDD as well as the validation report / 3/ were also assessed. Other operational documents were also assessed as evidence.

2.2 Site Visits

On 05-06 October 2007, DNV carried out a site visit at K.M. Power Private Limited. During the site visit, DNV verified the actual operation of the project as described in the PDD. The instruments used for monitoring electricity in all the three project locations were checked, including the calibration records for these instruments and these were found to be in order. Evidence for the reported net generation of electricity was verified i.e., the electricity supplied to the grid minus the electricity consumption of the project (electricity imported from the grid).

2.3 Assessment

The data presented in the monitoring report were assessed in detail through a review of the detailed project documentation and production records, interviews with personnel at K.M. Power 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. Data from other sources include the grid emission factor which is calculated ex-post based on electricity generation mix in the southern region grid through out the crediting period, have been assessed and verified.

2.4 Reporting of Findings

Findings established during the verification may be that:

- i) the verification is not able to obtain sufficient evidence for the reported emission reductions or part of the reported emission reductions. In this case these emission reductions shall not be verified and certified;
- ii) the verification has identified material misstatements in the reported emission reductions. Emission reductions with material misstatements shall be discounted based on the verifiers' ex-post determination of the achieved emission reductions.

A forward action requests (FAR) should be issued, where:

- a. the actual project monitoring and reporting practices requires attention and /or adjustment for the next consecutive verification period, or
- b. an adjustment of the MP is recommended.

In the context of FARs, risks have been identified, which may endanger the delivery of high quality CERs in the future, i.e. by deviations from standard procedures as defined by the MP. As a consequence, such aspects should receive a special focus during the next consecutive verification. A FAR may originate from lack of data sustaining claimed emission reductions.



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. One CAR that was raised during previous verification has been fairly addressed during this verification period. This has again been confirmed by DNV. During this periodic verification no CARs/FARs have been raised by DNV.

3.2 Project Implementation

The project has been implemented as planned. The actual project construction activity started in 7 May 2001 with the installation of diversion structure, power canal, penstocks, powerhouse, and power evacuation system and tailrace canal. The first sub-project at Guntakandala site was commissioned on 6 February 2002. Hence the crediting period is chosen as starting from 6 February 2002. The second sub-project at Velpanuru was commissioned in November 2002 and the third at Madhavaram site was commissioned in October 2003. Electricity generation and supply to APTRANSCO grid is enabled through independent transmission lines for each part of the project. Synchronization reports for the three sub-projects have been verified by DNV.

After implementation and commissioning of the project technology, no changes have been carried out or are envisaged. The project has got CER issuance for the period of 06 February 2002 to 24 March 2006.

The following plant outages during the chosen verification period (25 March 2006 to 23 March 2007) have been recorded and verified to be correct:

- Total forced outage : 5235.0 hrs
- Total planned outage hours : 22968.0 hrs
- Total outage hours : 28203.0 hrs

3.3 Completeness of Monitoring

The approved baseline methodology AMS-I.D (version 09) has been applied for the project activity. In accordance with AMS-I.D, the baseline for the project activity has been calculated ex-post by determining the CO₂ emissions from the electricity generation from the southern regional grid using the weighted average of current generation mix approach. It is confirmed that these emission factors indicated in the registered PDD for the period 2002 to 2006 have been validated and are, as reported in the validation report. However, for the period 2006-2007, the PDD has considered an emission factor of 735.29 tCO₂/GWh (as per CO₂ database from official CEA website determined for 2005-2006); Since electricity generation data for southern grid for the year 2006-07 is not available on the CO₂ data base of official website of Central Electricity Authority of India, which is the only authentic and reliable source, the emission factor taken as the weighted average of the current generation mix for the most recent year (2005-06) available has been used for estimating baseline emissions. It is confirmed that emission factor of 735.29 tCO₂/GWh for southern region of India has been correctly applied as per the clarification given on approved methodologies through F-CDM-AM-Clar_Resp_ver 01.1 - AM_CLA_0038 by the Executive Board. Though registered PDD contains a calculated emission factor for 2005-06 as



739.14 tCO₂/GWh, as a conservative approach, authentic data from CO₂ data base of CEA website as 735.29 tCO₂/GWh has been used. This is considered acceptable and conservative, given that the CEA website now has the correct data published. Based on the validated emission factors and actual electricity generation and net power export to grid, the emission reduction has been verified to be 24 911 tCO₂ equivalent for the period 25 March 2006 to 23 March 2007.

As required by the monitoring methodology AMS I.D, version 09 monitoring of parameters essentially comprises:

- Electricity generation - net export to grid, import from grid during off season and auxiliary consumptions
- Leakages due to project activity, if any.

During previous verification a CAR was raised as it was observed that imported electricity during off season was not captured for CER calculations, although metered and monitored by APTRANSCO officials every month. This has been effectively monitored during the chosen monitoring period. It has been confirmed by DNV.

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 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.

The PP has opted to revise the monitoring report on account of editing issues and enabling a better presentation. DNV confirms that there have been no changes to the data or the CER's reported.

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 for each project individually. These are then transferred to spreadsheets for emission reduction calculations.

All other data are culled out either from the log books or daily power generation reports. Log books are having provisions to indicate forced and planned shutdowns of projects.

The calibration of monitoring equipments is being maintained and same has been verified by DNV. Daily power generation data (including total power and auxiliary power) is monitored and recorded from duly calibrated energy meters, and APTRANSCO officials monitor the export/import power meters on monthly basis. All the power generation, export data are maintained daily in electronic as well as hard print form, and have been assessed for correctness.

3.5 Quality of Evidence to Determine Emission Reductions

The emission reductions reported per month in the period 25 March 2006 to 23 March 2007 was verified to be 24 911 tCO₂e.

Sufficient evidence was presented for the reported net emission reductions.



3.6 Management System and Quality Assurance

K.M. Power 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. Calibration process is followed as per defined procedures and carried out annually and the calibration certificates of the instruments used for data monitoring and recording were also verified during the site visit.

4 VERIFICATION STATEMENT

Det Norske Veritas Certification AS (DNV Certification) has been commissioned by K.M. Power Private Limited to examine the greenhouse gas (GHG) emission reductions reported from the "11.3 MW Renewable Energy project for a grid system by K.M. Power (P) Limited" (CDM registration reference no. 0750) for the period, 25 March 2006 to 23 March 2007, equating to 24 911 tonnes of CO₂ equivalents.

The project has applied the approved baseline and monitoring methodologies AMS-I.D, version 09, and emissions reductions are reported in the monitoring report received on 15 October 2007. We express no opinion on the baseline methodology neither of the project or on the validated and registered PDD.

Responsibilities of K.M. Power Private Limited and DNV Certification Limited.

The management of the 11.3 MW Renewable Energy project for a grid system by K.M. Power (P) Limited is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project Monitoring and Verification 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 25 March 2006 to 23 March 2007.

Basis of GHG verification opinion

Our verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakech accord, as well as those defined by the CDM Executive Board.

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, on a test basis, of evidence relevant to the amounts and disclosures in relation to the project's GHG emissions for the period from 25 March 2006 to 23 March 2007.

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 25 March 2006 to 23 March 2007 are fairly stated.

We conducted our verification on the basis of the monitoring methodology AMS-I.D, version 09, and the monitoring plan included in the PDD of the project. The verification included:



- collection and assessment of evidence supporting the reported data,
- checking whether the provisions of the monitoring methodology AMS-I.D, version 09, and the monitoring plan in the PDD were consistently and appropriately applied.

We have verified whether the information included in the monitoring report of version 01 of 28 September 2007 and version 02 of 15 October 2007 is correct and that the emissions reductions achieved have been determined correctly.

Opinion

In our opinion, GHG emissions reported for the project in monitoring report version 01 of 28 September 2007 and version 02 of 15 October 2007/ 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 09 and the monitoring plan and formulae provided in the validated PDD of 12 October 2006.

Det Norske Veritas Certification AS is able to certify that the emission reductions from the “11.3 MW Renewable Energy project for a grid system by K.M. Power (P) Limited” for the period 25 March 2006 to 23 March 2007 amount to 24 911 ton CO₂ equivalent.

Bangalore & Oslo, 25 February 2008

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Manager (South Asia)
Climate Change Services
Det Norske Veritas Certification AS

Michael Lehmann
Technical Director
International Climate Change Services
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5 REFERENCES

Category 1 Documents:

Documents provided by the Project Participants that relate directly to the GHG components of the project.

- / 1/ K.M. Power Private Limited: “11.3 MW Renewable Energy project for a grid system by K.M. Power (P) Limited” Monitoring report version 01 of 28 September 2007 and version 02 of 15 October 2007.
- / 2/ K.M. Power Private Limited: CDM PDD for “11.3 MW Renewable Energy project for a grid system by K.M. Power (P) Limited” version 02 dated 12 October 2006.
- / 3/ DNV Validation report for “11.3 MW Renewable Energy project for a grid system by K.M. Power (P) Limited”. Report No. 2006-9064 dated 28 October 2006.
- / 4/ Verification/Certification report for “11.3 MW Renewable Energy project for a grid system by K.M. Power (P) Limited”. Report No. 2007-2019 dated 26 April 2007.

Category 2 Documents:

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

- / 5/ Appendix B of the simplified modalities and procedures for small-scale CDM project activities: *Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories* - AMS-I.D, version 9
- / 6/ Version 09: 28 July 2006. International Emission Trading Association (IETA) & the World Bank’s Prototype Carbon Fund (PCF): *Validation and Verification Manual*. <http://www.vvmanual.info>
- / 7/ Copies of APTRANSCO generation Certificates for all months
- / 8/ Test certificate for Energy meters for all three projects (Main meter and check meter) from Central Power Distribution Company of Andhra Pradesh Limited.
- / 9/ Daily generation reports including down times.
- / 10/ Production log records, Maintenance records, Internal calibration records, Internal audit reports.

Persons interviewed:

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

- | | | |
|-------|-----------------|--|
| / 11/ | Mr. G.R. Reddy | Managing Director, K.M. Power Private Limited |
| | Mr. Y. Timmayya | Executive Director, K.M. Power Private Limited |
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