VERIFICATION/CERTIFICATION REPORT

PERIODIC VERIFICATION OF THE TROJES HYDROELECTRIC PROJECT IN MEXICO

(Registration Ref No. 0649)

Monitoring period: 01 April 2003-30 November 2006.

REPORT NO. 2006-2174

REVISION NO. 01

DET NORSKE VERITAS

VERIFICATION/CERTIFICATION REPORT

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Approved by: Einar Telnes Director	Organisational unit: DNV Certification, International Climate Change Services
Client: Impulsora Nacional de Electricidad S de R.L. de C.V.	Client ref.: Salomon Camhaji

DET NORSKE VERITAS
CERTIFICATION LTD

Palace House
3 Cathedral Street
London SE19DE
United Kingdom
Tel: +44 (0)20 7357 6080
Fax: +44 (0) 20 7407 1239
http://www.dnv.com

Summary:

Det Norske Veritas Certification Ltd has performed the first verification of the emission reductions reported for the "Trojes Hydroelectric Project in MEXICO"(UNFCCC Registration Ref. No.0649 for the period 01 April 2003-30 November 2006. In our oppinion, the GHG emission reductions reported for the Trojes Hydroelectric Project in the Monitoring Report of December 8th, 2006 are fairly stated.

The GHG emission reductions were calculated correctly on the basis of the approved monitoring methodology AMS-I.D /8/ and the monitoring plan and formulae given in the Project Design Document of July 8, 2005.

Det Norske Veritas Ltd. Is able to certify that the emission reductions from the first periodic verification of Trojes Hydropower Project in Mexico for the period 01 April 2003-30 November 2006 amount to 69 747 Tonnes of CO_2 equivalent

Report No.: 2006-2174	Subject Group: Environment	
Report title: Periodic Verification of the Trojes Hydroelectric Project in Mexico		
Work carried out by: Raul Rocha, Alfonso Capuchino, Gustavo Godinez, Simon Dawes		
Work verified by: Einar Telnes		
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Indexing terms

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

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Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction(s)
CFE	Comision Federal de Electricidad
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)
INELEC	Impulsora Nacional de Electricidad S de R.L. de C.V.
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
N_2O	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

Conversion Factors and Definitions

Emission Factor of 0.531 ton CO_2e / MWh defined ex-ante.

1 INTRODUCTION

Impulsora Nacional de Electricidad S de R.L. de C.V. (INELEC) has commissioned Det Norske Veritas Certification Ltd. (DNV) to carry out the verification and certification of emission reductions reported for the "Trojes Hydroelectric project" (the project) in the period 01 April 2003-30 November 2006.

This report contains the findings from the verification and a certification statement for the certified emission reductions.

1.1 Scope

The scope of the verification is:

- To verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan.
- 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 reported GHG emission data is sufficiently supported by evidence.

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

The validation team has, based on the recommendations in the Validation and Verification Manual /8/, applying a risk-based approach, focusing on the identification of significant reporting risks and verifying the mitigation measures for these.

1.2 Description of the Project Activity

Project Parties:	*México*
Title of project activity:	Trojes Hydroelectric project
UNFCCC registration No:	*0649*
Project Entity:	Impulsora Nacional de Electricidad S de R.L. de C.V. Ing.Salomon Camhaji Bosques de Ciruelos 190-303ª, Bosques de las Lomas, Mexico D.F. C.P.11700, México Phone:(52 55) 56968924 Email: scamhaji@asergen.com.mx
Location of the project activity:	Cortina BajaPresa Trojes, Municipality of Pihuamo in the state of Jalisco, 50 Km South East of the City of Colima, México.

The Trojes Hydropower Project reduces GHG emissions through its use of a natural renewable source of energy: the surface water runoff which is stored in a dam, released and passed through a hydraulic turbine to take advantage of the energy derived from its position. The project displaces energy generated by thermoelectric power plants using fossil fuel combustion, hence avoiding GHG emissions.

2 METHODOLOGY

A risk-based verification approach has been employed during the inspection of the facilities and visit to Impulsora Nacional de Electricidad S de R.L. de C.V. offices in Mexico City. The data collection process for the project was evaluated along all steps and the flow of information was assessed in order to identify that proper control over the accuracy were in place, also that only trained personnel is involved in the process. After being tested, the reporting system in place provides reasonable confidence over the data collection and recording and no reporting risks were identified during the inspection to the facilities.

The verification process was guided and supported by periodic verification checklist, which ensures a transparent and consistent periodic verification process(Annex 1), the water stored in the dam and later passed through an hydraulic turbine that in conjunction with a generator generates electricity that contributes to emission reductions. All arrangements were inspected and verified and the compliance with “As Built Drawings” was verified. The audit interviews of personnel and verification of documents allowed to identify and conclude on the proper operation and control over the project.

The verification includes the revision of the following:

i) The monthly electricity invoices issued by Hidroelectricidad del Pacifico. S. de R.L. de C.V. via its commercialization entity Impulsora Nacional de Electricidad S de R.L. de C.V. ,to their consumer partners in the period 01 April 2003-30 November 2006.
ii) Crosscheck of invoices with CFE generation reports for the same period.
ii) The amount of electricity supplied to the grid was multiplied with the validated CO_2 baseline emission factor of the Mexican grid calculated *ex-ante* for the project according to AMS-I.D /8/.

Verification team

Raul Rocha	DNV Mexico	GHG Auditor
Gustavo Godinez	DNV Mexico	Team Leader / GHG Verifier
Alfonso Capuchino	DNV Mexico	GHG Verifier
Simon Dawes	DNV Sydney	Sector Expert
Einar Telnes	DNV Norway	Technical Reviewer

Duration of verification

Preparations: *06-December-2006 to 08-December-2006*

On-site verification: *12-December-2006*

Reporting*:* *21-December-2006 to 22-December-2006*

2.1 Review of Documentation

The monitoring report /2/including the electricity generation reported by Hidroelectricidad del Pacifico. S. de R.L. de C.V., invoices for their customers /5/; CFE generation reports for the verification period /4/, metering verification/calibration records /3/ and readings from the generation meters owned by Comision Federal de Electricidad (CFE) for the period 01 April 2003-30 November 2006 were reviewed as a part of the verification.

In addition the project's Project Design Document (PDD) /1/ in particular the monitoring plan contained in the PDD, and the project's validation report was assessed /6/ as a part of the preparations.

2.2 Site Visit

A visit to the Trojes dam was made on 12 December 2006 with the purpose of inspecting the operation of the project and verify the operational routines. On 13 December 2006 a visit to Impulsora Nacional de Electricidad S de R.L. de C.V. offices in Mexico City was performed to assess management system procedures and commercial invoices.

2.3 Assessment

On 12 of December, 2006, DNV inspected the Trojes facilities and confirmed that all systems were operational at the moment of the inspection and that nameplate capacity and actual implementation of the project was as defined in the PDD. The effectiveness of the generating set and the accuracy of the electricity generated and measured by the CFE were also assessed.

Additionally during the same site visit, the daily, weekly and monthly reports and records of the electricity generation were cross-checked.

The information contained in the monitoring report was assessed by:

- Verifying the implementation and the effectiveness of operation and maintenance of the equipments, including turbines and generator.
- Verifying that all data is collected correctly and personnel is aware of the accuracy of the readings.
- Verifying that the readings of electricity produced and sent to the grid is measured through reliable and calibrated instruments.
- Cross checking the invoices produced by Hidroelectricidad del Pacifico. S. de R.L. de C.V. versus CFE monthly generation reports /4/.

- Verifying that monitoring and measuring equipment is calibrated and correctly operated and maintained; and
- Verifying the effectiveness of the data quality assurance and control performed by the owners and operators (MYOCEN). In addition, DNV performed control calculations to verify the results of the monitoring report reported for the Trojes project/2/.

In addition to the dam visit, the project owner's office in Mexico City was audited on the 14th of December, 2006. During this meeting the Impulsora Nacional de Electricidad S de R.L. de C.V. (INELEC) employees provided relevant information about the FARs reported and other technical information identified during the site audits. Moreover, the INELEC personnel established milestones to solve the FAR's encountered during the site visit. These actions will be verified during the next verification audit.

2.4 Reporting of Findings

The objective of this phase of the verification is to resolve the requests for clarification and any other outstanding issues which needed to be clarified for DNV's positive conclusion on the GHG emission reduction calculations.

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 request (FAR) should be issued, where:

i) The actual project monitoring and reporting practices requires attention and /or adjustment for the next consecutive verification period, or

ii) An adjustment of the MP is recommended.

Corrective action requests (CAR) should be issued, where:

i) There is a clear deviation concerning the implementation of the project as defined by the PDD;

ii) Requirements set by the MP or qualifications in a validation opinion have not been met; or

iii) There is a risk that the project would not be able to deliver (high quality) CERs.

3 VERIFICATION FINDINGS

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

There are no open findings from the validation and since this is the first verification there are no CARs nor any FARs from previous verifications.

3.2 Project Implementation

The inspections of project facilities in Presa Trojes in Jalisco, Mexico and the review of the "as built" drawings /7/, records and other documentary evidence of the construction and operation of the hydroelectric plant provided DNV with sufficient assurance that the project and its systems for energy production is in operation and consistent with the emission reductions that have been reported.

The project was commissioned in 01 April, 2003. DNV could verify that the nameplate capacities of turbine are consistent with the capacity given in the PDD /1/.

Calibration of the electricity meter serial number 7EY981 was carried out by CFE, in 03 March, 2003 /3/ which was before project initiation and no further evidence of calibration were found after this date. No such evidence of calibration was present at the Trojes dam and this initiated a FAR 5. However, a cross-check of records confirmed that although the electricity generation meter on site had not been calibrated since 2003, no discrepancies in recorded, invoiced and accepted data from the different parties involved were found.

The generating set and auxiliary equipments were inspected and the maintenance program shows an adequate compliance in accordance with manufacturer recommendations and best practices.

3.3 Completeness of Monitoring

All generated electricity submitted to the grid is in accordance with validated monitoring plan and the monitoring methodology AMS-I.D /9/. A sampling of records was made to confirm that data have been reported accordingly and no defect in records was found.

Moreover, during the site visit, the electricity invoices and the daily, weekly and monthly records of the electricity generation were cross-checked in order to confirm that invoices matched with the sampled cases. This cross-check also confirmed that although the electricity generation meter on site had not been calibrated since 2003, no discrepancies in recorded data were found.

The lack of description of the process in a formal procedure that indicates data flow and responsibilities of the persons monitoring and reporting project performance initiated FAR 3.

In cases where generation record was found to be above the actual theoretical capacity, this was investigated specifically to identify reasons for the deviation. It was found that the project operator had sandbagged the dam in order to increase the dam capacity, thus resulting in an increased storage capacity and related increased generation, which was possible due to a better

that expected rainy season. The operational log records of the dam were cross checked and found to be in consistent with the increased generation.

3.4 Accuracy of Emission Reduction Calculations

The CO_2 emission reductions in the project and the baseline scenario during the reporting period were correctly calculated based on reported generated energy and using the validated emission factor contained in the PDD. The grid emission factor was calculated *ex-ante* in accordance to the baseline methodology AMS-I.D /9/ as of 0.531 ton CO_2e / MWh.

3.5 Quality of Evidence to Determine Emission Reductions

The monitoring and reporting of energy produced data is in accordance with well established and effective operational practices; however there are not any well defined procedures that accurately describe responsibilities for project monitoring and reporting and other activities as performed.

The responsibility for data collection and recording is with the superintendent in charge of the facilities. There is a daily report of the readings of the measuring instrument and this is internally verified on a weekly and monthly basis as well as in an Annual Report. These data are ultimately confirmed in the Mexico City offices and audited on a monthly basis and also cross checked with CFE. There are presently no formal procedures for recording data of the readings. Nonetheless, the audits of Trojes Hydroelectric project facilities and offices in México city confirmed that monitoring and reporting are carried out consistently and in line with well established practices and no risk to the accuracy or reliability of the collection was identified. However, in order to strengthen the actual controls and systematic a FAR 2 were issued.

The verification of invoices and records of generation are accurate and showed no deviation, hence providing sufficient evidence of the claimed emission reductions.

3.6 Management System and Quality Assurance

Even when there are defined roles, the interviews indicated an insufficient knowledge of structure and responsibilities of the operating personnel. There is not an adequate implementation of control over records and documents like manuals and procedures. A need for a formal training for the scope of the project and the necessary controls is requested, this initiated FAR 1 and FAR 4.

Training has been consistently focused on occupational health and safety issues and the program does not clearly encompass the training regarding the QA/QC requirements of the project.

4 PROJECT SCORECARD

Risk Areas		Conclusions			Summary of findings and comments	Error/Discounted Uncertainty Tonnes
		Baseline Emissions	Project Emissions	Calculated Emission Reductions		
Completeness	• Source coverage/ boundary definition	Ok	Ok	Ok	All relevant sources are covered by the monitoring plan and the boundaries of the project are defined correctly and transparently.	None
Accuracy	• Physical Measurement and Analysis	Ok	FAR 5	FAR 5	Evidence of calibration was not available in place for the measuring instrument. There are no clear indication of the calibration frequency, however the last calibration made by the CFE was made previous to the commissioning of the project and performed in March 2003 before the initialization of the commercial operation. No other periodical calibrations had since been performed in order to ensure measurements accuracy.	None
	• Data calculations	Ok	Ok	Ok	Verification indicates that emission reductions are correctly calculated	None
	• Data management & reporting	Ok	FAR 1 FAR 2 FAR 3	FAR 1 FAR 2 FAR 3	There were not clear documented procedures for data collection and record control, and the awareness of responsibilities and knowledge over the project can be improved.	None
Consistency	• Changes in the project	Ok	FAR 4	FAR 4	Accessibility of data is difficult and the track of changes can not be easily made. Personnel showed little skills when there is a need to identify changes in the project.	None

4.1 Summary of periodic verification findings

Finding No.	Description of the finding	Summary of how findings have been addressed by Project Participant	Assessment of how findings have been addressed
FAR 1	The position and role of each person is not clearly and formally defined.	Clear job descriptions will be issued for the key employees involved in the project	The project participant delivered job descriptions for Superintendent, Operations Manager and CDM Technical Supervisor. This forward action request is considered closed.
FAR 2	No specific monitoring and reporting tasks are given in the regular training, a CDM course may have to be taken by the employees in order to gain awareness of the importance of the monitoring and reporting tasks.	A CDM course will be included in the training program for 2007.	This forward action request will be reviewed during the next verification.
FAR 3	Even when the operating personnel showed knowledge of the data flow and recording, there is no documented procedures for data control established.	Formal documented procedures will be issued in order to describe verification data flow and for reporting.	The project participant delivered a documented procedures for data flow and for electricity generation reporting. This forward action request is considered close.
FAR 4	The operating personnel showed a reduced skill to track data changes in design drawing and as built drawings	A procedure will be developed to include records and information control.	This forward action request will be reviewed during the next verification.
FAR 5	No evidence of metering calibration were available on site.	Deliver metering calibration records	Project Participant delivered metering calibration records dated 28 March 2003. This forward action request is considered closed.

5 VERIFICATION STATEMENT

Introduction

Det Norske Veritas Certification (DNV Certification) has been engaged by Impulsora Nacional de Electricidad S de R.L. de C.V. to examine the greenhouse gas (GHG) emission reductions reported from the Trojes Hydroelectric project for the period 01 April 2003-30 November 2006, equating to 69 747 tonnes of CO_2 equivalents.

Our opinion relates to the project's reported GHG emissions reductions for the period 01 April 2003-30 November 2006 and relates to the validated and registered project baseline and its associated documents. We express no opinion on baseline methodology of the project nor on the Project Design Document nor on any projections regarding GHG emission performance. We express no opinion on applied emission factors published by the official and recognised sources in Mexico.

Responsibilities of the Trojes Hydroelectric project management of Impulsora Nacional de Electricidad S de R.L. de C.V. and DNV Certification

The management of the Trojes Hydroelectric project 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 dated 19 April 2006. 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 Trojes Hydroelectric project.

It is our responsibility to express an independent GHG verification opinion on the calculation of GHG emission reductions presented from the project for the for the period 01 April 2003-30 November 2006 based on the validated and approved baseline.

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, of evidence relevant to the amounts and disclosures in relation to the project's GHG emission reductions reported for the period 01 April 2003-30 November 2006.

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 calculated GHG emission reductions for the period 01 April 2003-30 November 2006, prepared on the basis of the Monitoring and Verification Plan dated 19 April, 2006, are fairly stated.. This assessment included:

- *Collection of evidence supporting the reported data*
- *Checking whether the provisions of the Monitoring and Verification Plan dated 19 April 2006, were consistently and appropriately applied*

Opinion

In our opinion, Impulsora Nacional de Electricidad S de R.L. de C.V. 's GHG emission reductions reported for the Trojes Hydroelectric project in the period 01 April 2003-30 November 2006 in the Monitoring report version 1 dated 08 December 2006, are fairly stated.

The GHG emission reductions were calculated correctly on the basis of the Project Design Document and the Trojes Hydroelectric project's Monitoring and Verification Plan and the applied emission factors for the production of electricity in Mexico published by Comisión Federal de Electricidad.

The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology AMS-I.D version 08 and the monitoring plan and formulae provided in the validated PDD of 19 April, 2006.

Det Norske Veritas Certification Ltd. is able to certify that the emission reductions from the Trojes Hydroelectric project" for the period 01 April 2003-30 November 2006 amount to 69 747 (sixty nine thousand seven hundred and forty seven) ton CO_2 equivalent.

London. January 8th, 2007

Det Norske Veritas Certification Ltd

Einar Telnes
Director
DNV Certification
International Climate Change Services

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

/1/ INELEC: *Project design document for the "Trojes Hydroelectric Project"*, Version of 7 April 2004, version 2 of October 2005 and version 3 of 19 April 2006.

/2/ INELEC *Monitoring Report Trojes 01/06 Version 1*, 08 December, 2006

/3/ Comisión Federal de Electricidad *measuring devices test report* 28 March 2003

/4/ Comisión Federal de Electricidad *monthly generation report* April 2003 to November 2006

/5/ Hidroelectricidad del Pacifico. S. de R.L. de C.V. *monthly electricity invoices* April 2003 to November 2006

/6/ Det Norske Veritas Certification Ltd. *Validation Report No. 2004-0050*, 13 September 2006

/7/ INELEC *As built draws* August 2005

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.

/8/ International Emission Trading Association (IETA) & World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. http://www.vvmanual.info.

/9/ CDM Executive Board: *Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories - AMS-I.D I.D. Grid connected renewable electricity generation*, version 08 of 3 March 2006

/10/ CDM Executive Board: *Attachment A to the simplified modalities and procedures for* small–scale CDM project activities, Version 06: 30 September 2005

Persons interviewed:

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

/11/ Salomón Camhaji Impulsora Nacional de Electricidad S de R.L. de C.V.

/12/ Jacobo Mekler Impulsora Nacional de Electricidad S de R.L. de C.V.

/13/ José Antonio Mendoza MYOCEN

/14/ Martín Ramirez Vargas MYOCEN

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