



VERIFICATION REPORT

BRASCAN ENERGÉTICA S.A.

VERIFICATION OF THE RIALMA COMPANHIA ENERGÉTICA I S/A – SANTA EDWIGES I SMALL HYDRO POWER PLANT – SMALL SCALE CDM PROJECT

REPORT No. BRAZIL-VER/00099E/2009-CUR
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BUREAU VERITAS CERTIFICATION

VERIFICATION REPORT

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Client: Brascan Energética S.A.	Client ref.: Julien Dominic Publio

Summary:

Bureau Veritas Certification has made the verification of the Rialma Companhia Energética I S/A – Santa Edwiges I Small Hydro Power Plant – Small Scale CDM Project, CDM Registration Reference Number 0830, project of Brascan Energética S.A., located in in the Midwest of Brazil, in the Piracanjuba River, between Mambaí, Buritinópolis and Posse, state of Goiás, at the intersection of longitude 46°12'55" W and latitude 14°18'46"S, about 300 Km from Brasília (Federal District), on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

The verification scope is defined as a periodic independent review and ex post determination by the Designated Operational Entity of the monitored reductions in GHG emissions during defined verification period, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the verification process is a list of Clarification, Corrective Actions Requests, Forward Actions Requests (CL, CAR and FAR), presented in Appendix A.

In summary, Bureau Veritas Certification confirms that the project is implemented as planned and described in validated and registered project design documents. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is already generating GHG emission reductions. The GHG emission reduction is calculated without material misstatements.

Our opinion relates to the project's GHG emissions and resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring, and its associated documents.

Report No.: BRAZIL-VER/00099E/2009-CUR	Subject Group: CDM
Project title: Rialma Companhia Energética I S/A – Santa Edwiges I Small Hydro Power Plant – Small Scale CDM Project	
Work carried out by: Marco F. Prauchner – Team Leader, Climate Change Verifier Marcelo A. Porto – Team Member, Climate Change Verifier	
Work verified by: Antonio Daraya – Internal Technical Reviewer	
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Indexing terms

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Abbreviations change / add to the list as necessary

ANEEL	Brazilian Electricity Regulatory Agency
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CCEE	Chamber of Electric Energy Commercialization
CER	Certified Emission Reductions
CL	Clarification Request
CO ₂	Carbon Dioxide
DOE	Designated Operational Entity
FAR	Forward Action Request
GHG	Green House Gas(es)
I	Interview
IETA	International Emissions Trading Association
MoV	Means of Verification
NGO	Non Government Organization
ONS	National Electric System Operator
PCF	Prototype Carbon Fund
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change
VVM	Validation and Verification Manual



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1 INTRODUCTION

Brascan Energética S.A. has commissioned Bureau Veritas Certification to verify the emissions reductions of its CDM project Rialma Companhia Energética I S/A – Santa Edwiges I Small Hydro Power Plant – Small Scale CDM Project (hereafter called “the project”) at the Midwest of Brazil, in the Piracanjuba River, between Mambaí, Buritinópolis and Posse, state of Goiás, at the intersection of longitude 46°12’55” W and latitude 14°18’46”S, about 300 Km from Brasília (Federal District).

This report summarizes the findings of the verification of the project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

Verification is the periodic independent review and ex post determination by the DOE of the monitored reductions in GHG emissions during defined verification period.

The objective of verification can be divided in Initial Verification and Periodic Verification.

UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

1.2 Scope

The verification scope is defined as an independent and objective review of the project design document, the project’s baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

The verification is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.

1.3 GHG Project Description

The Small Hydro Power Plant Santa Edwiges I uses the renewable hydro potential of the Piracanjuba River to supply electricity to a distribution system (Brazilian South-Southeast-Midwest interconnected grid) that is supplied too by fossil fuel fired generated electricity. Santa Edwiges I is a two-generating-unit (turbine + generator set) plant with an installed capacity of 12.6 MW.

Plant is currently operational and in accordance with registered PDD, *i.e.* no modifications in major equipments have taken place since the CDM project activity was registered.



1.4 Verification Team

The verification team consists of the following personnel:

Marco Francisco Prauchner
Bureau Veritas Certification Team Leader, Climate Change Verifier

Marcelo Antoniazzi Porto
Bureau Veritas Certification Climate Change Verifier

Antonio Daraya
Bureau Veritas Certification Internal Technical Reviewer

2 METHODOLOGY

The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

In order to ensure transparency, a verification protocol was customized for the project, according to the version 1.1 of the Clean Development Mechanism Validation and Verification Manual, issued by the Executive Board at its 51 meeting on 04/12/2009. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from verifying the identified criteria. The verification protocol serves the following purposes:

- It organizes, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent verification process where the verifier will document how a particular requirement has been verified and the result of the verification.

The completed verification protocol is enclosed in Appendix A to this report.

2.1 Review of Documents

The Monitoring Report (MR) submitted by Brascan Energética S.A. and additional background documents related to the project design and baseline, i.e. country Law, Project Design Document (PDD), Approved methodology, Kyoto Protocol, Clarifications on Verification Requirements to be Checked by a Designated Operational Entity were reviewed.

The verification findings presented in this report relate to the project as described in the PDD version 08, of 10 November, 2006.

2.2 Follow-up Interviews

On 30/01/2010, 01/02/2010 and 02/02/2010, Bureau Veritas Certification performed interviews with project participant to confirm selected information and to resolve issues identified in the document review. Representatives of Brascan Energética S.A. and of Ecopart Assessoria Ltda., the consulting company, were interviewed (see References). The main topics of the interviews are summarized in Table 1.

**Table 1 Interview topics**

Interviewed organization	Interview topics
Brascan Energética S.A.	Technical Equipment and Operation Monitoring Plan Monitored Data Data uncertainty and residual risks GHG Calculation Environmental Impacts Compliance with National Laws and Regulations
Ecopart Assessoria Ltda.	Project Design and Implementation Technical Equipment and Operation Monitoring Plan Monitored Data Data uncertainty and residual risks GHG Calculation Compliance with National Laws and Regulations

2.3 Resolution of Clarification, Corrective and Forward Action Requests

The objective of this phase of the verification is to raise the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the GHG emission reduction calculation.

Findings established during the initial verification can either be seen as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified.

Corrective Action Requests (CAR) is issued, where:

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

Forward Action Requests (FAR) are issued, for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

The verification team may also use the term Clarification Request (CL), if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

To guarantee the transparency of the verification process, the concerns raised are documented in more detail in the verification protocol in Appendix A.



3 VERIFICATION CONCLUSIONS

In the following sections, the conclusions of the verification are stated.

The findings from the desk review of the original monitoring documents and the findings from interviews during the follow up visit are described in the Verification Protocol in Appendix A.

The Clarification, Corrective and Forward Action Requests are documented in the Verification Protocol in Appendix A. The Verification of the Project resulted in 05 Corrective Action Requests, 03 Clarification Requests and no Forward Action Requests.

All these Corrective Actions and Clarification Requests have been closed, and the means of their resolution have been documented in the Protocol. Details of the CAR(s) and CL(s) are on the Appendix A of this Verification Report.

The number between brackets at the end of each section corresponds to the VVM paragraph.

3.1 Project implementation in accordance with the registered project design document (197)

During the verification, a site visit to Santa Edwiges I SHPP and a review on the project documentation (please refer to Section 5, Category 1 Documents), was carried out, and the DOE verified that the project has been implemented as in the registered PDD, and there is no change in the major equipments. The main project equipments, the Hydropower Plant operation, the monitoring equipment and procedures are in accordance with the registered PDD, Version 08. As per ANEEL's Dispatch 2546/2006, Santa Edwiges I SHPP is operational since November 2, 2006.

The implementation status of the project is as follows:

The project has a 7 year crediting period, renewable two times. The first crediting period is from March 11, 2007 to March 10, 2014. The total Emission Reductions forecasted for this period are 91,968 tCO₂e. The following verifications have already been made except for the third one that is being carried out:

- Initial and First Periodic Verification: From March 11, 2007 to December 31, 2007.
Emission Reductions of 10,650 tCO₂e.
- Second Periodic Verification: From January 1, 2008 to December 31, 2008.
Emission Reductions of 12,785 tCO₂e.
- Third Periodic Verification: From January 1, 2009 to December 31, 2009.
Emission Reductions of 14,005 tCO₂e.

A nonsignificant increase (6.6%) has been verified in the emissions reductions claimed, compared to the estimated amount (13,138 tCO₂e).



3.2 Compliance of the monitoring plan with the monitoring methodology (202)

The monitoring plan is in accordance with the approved methodology applied by the proposed CDM project activity.

3.3 Compliance of monitoring with the monitoring plan (205)

Monitoring has been carried out in accordance with the monitoring plan contained in the registered PDD.

The parameters required by the monitoring plan and the way the Verification Team has verified the values in the monitoring reports are described below:

EG_y – Electricity generation of the project delivered to the grid

This is the only parameter to be monitored, according to methodology AMS-I.D – Grid connected renewable electricity generation – Version 9.

During the on-site visit at Brascan's Operational and System Management Center (from the Portuguese, *Centro de Operação e Gestão do Sistema – COGS*) in Curitiba city, one of PP's operational programmer* was asked to access and download CCEE's CB02 reports, that contain official monthly data on energy generation, displayed on a weekly basis.

DOE's verifier then checked the monitoring reports' monthly energy generation data against official reported numbers by CCEE. 100% of the weekly data was added in order to confirm monthly energy generation. This addition and cross-check has been carried out for 100% of the months under the monitored period.

Plant's energy generation is measured on a continuous mode by two EG meters, a main meter and a back-up one. Measures are added each 5 minutes. Hourly data is transferred to CCEE's Sinercom system, that will then consolidate it on a weekly basis. So the measurement frequency verified fulfils the requirements of the registered PDD, where a 15-minute interval was defined. A more frequent interval adds confidence to the measurement reading process.

Santa Edwiges I individual meters are linked to a substation, in the same local region of the plant, that is called Alvorada do Norte. Total energy exported to the grid by the plant is a result of the application of an algorithm that takes into account transmission losses and individual meters' readings, as described in Section 3.4.

* CCEE's reports used to confirm energy generation of the plant (CB02), as provided by the PP to the verification team, can only be accessed and downloaded at the COGS by authorized personnel.



3.4 Assessment of data and calculation of greenhouse gas emission reductions (208)

All the necessary data for the parameters that needed to be monitored, as per the registered PDD, were available and in accordance with the monitoring plan.

There is a procedure NPE016 – Carbon Credit, version 02/2009, regarding all the monitoring content, responsibilities and procedures of the PDD monitoring plan.

There are two meters (one primary and a backup one) at Alvorada do Norte substation. These meters make a continuous reading of the combined total energy generated by three hydropower plants: Santa Edwiges I, II and III. The first one being covered by this project activity.

Each of these plants has its own set of primary and backup meters, reading continuously the energy generated by them. These meters are linked to Alvorada do Norte's meters through a transmission line, which results in transmission losses between Santa Edwiges I individual meters' readings and their actual contribution to the combined total that is read by Alvorada do Norte's meters.

CCEE – The Brazilian Electric Power Commercialization Chamber – has remote access to the individual readings of all three plants as well as of Alvorada do Norte's meters. Through an algorithm that considers such transmission losses and the balance between each of these plants, CCEE presents official energy generation data for Santa Edwiges I.

The reading of the amount of electricity supplied to the grid by Santa Edwiges I SHPP is sent from the relevant readers to the Remote Operational Center in Curitiba city through a satellite communication link. These data are analysed and have a well defined back-up procedure to store and keep information.

At Remote Operational Center the data of the energy dispatched to the grid are sent to CCEE, a private and State owned company administrated by the Ministry of Mines and Energy, which controls and monitors the electricity available on the national interconnected grid, and is responsible to carry out the wholesale transactions and commercialization of electric power within the National Interconnected System. The electricity exported to the grid is validated each month. CCEE through its CB02 report informs all the energy generated, which is checked with Brascan records. This report is a receipt of sales and consequently an authorization to invoice the final client of Brascan.

This measurement system is established by ANEEL, which is the agency that regulates energy generation, transmission and distribution in Brazil and documented according to CCEE's procedure PdC ME.01 version 2 (26/04/2007) approved by ANEEL's dispatch nr. 1.247, of April 26, 2007, which covers the requirements for the commercialization of the energy and how the data are transferred from the generators to CCEE and how CCEE confirms the information.



The following action was taken to ensure that the most conservative assumption theoretically possible has been made:

PP has committed to follow the National Electric System Operator's (ONS') calibration procedures, that establish a two-year maximum interval between calibrations. Due to a 12- and 13-day delays in the calibrations of Santa Edwiges I SHPP's main and back-up meters, respectively, the provisions of the *Guidelines for assessing compliance with the calibration frequency requirements* (EB 52 Annex 60) have been applied, as follows:

Main meter's calibration was overdue from October 2nd (Friday) to 13th (Tuesday), 2009 and the back-up one, from October 1st (Thursday) to 13th (Tuesday), 2009. CCEE's week runs from Saturday to Friday. Due to ease of calculation (CCEE's CB02 report contains generation data on a weekly basis) and conservative reasons (considering entire CCEE's weeks goes beyond the overdue dates), the provisions of EB 52 Annex 60 were applied by the PP over the first three weeks of October, 2009, from the 1st to the 2nd (first week), the 3rd to the 9th (second week), and the 10th to the 16th (third week). Calculations are as follows:

- Maximum error found as result of the delayed calibration: $-0.156\% \pm 0.071\%$ (Source: calibration certificate 0013/09).
- Maximum permissible error of both instruments: 0.2% (Source: Power Measurement, manufacturer)

As the error found in the delayed calibration result is beyond the maximum permissible error, paragraph 4(b) of the Guidelines applies: *Applying the error identified in the delayed calibration test, if the error is beyond the maximum permissible error of the measuring equipment.*

- EG_{1st week Oct 2009}: 490.391 MWh (Source: CCEE CB02 October 2009 report)
- EG_{2nd week Oct 2009}: 796.147 MWh (Source: CCEE CB02 October 2009 report)
- EG_{3rd week Oct 2009}: 1,916.450 MWh (Source: CCEE CB02 October 2009 report)
- EG_{1st+2nd+3rd weeks Oct 2009}: 3,202.988 MWh
- EG to be subtracted: 7.271 MWh (= 0.227% of EG_{1st+2nd+3rd weeks Oct 2009})
- EG_{Oct 2009}: 6,523.421 MWh (Source: CCEE CB02 October 2009 report)
- Adjusted EG_{Oct 2009}: 6,516.150 MWh

As previously mentioned, the reported energy generation data was cross-checked by comparing the monitoring report's monthly information against CCEE's CB02 report, which presents official data on a weekly basis. During the on-site visit at Brascan's Operational and System Management Center, one of PP's operational programmer was asked to access and download such reports. Based on them, the DOE's verifier then checked the monitoring reports' data against official reported numbers by CCEE. 100% of the weekly data was added in order to confirm monthly energy generation. This addition and cross-check has been carried out for 100% of the months under the monitored period.

Appropriate methods and formulae for calculating baseline emissions, project emissions and leakage have been followed.



The assumptions, emission factors and default values that were applied in the calculations have been justified.



4 VERIFICATION OPINION

Bureau Veritas Certification has performed a verification of the Rialma Companhia Energética I S/A – Santa Edwiges I Small Hydro Power Plant – Small Scale CDM Project in Brazil. The verification was performed on the basis of UNFCCC criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

The verification consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion.

The management of Brascan Energética S.A. is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the project on the basis set out within the project Monitoring and Verification Plan indicated in the final PDD version 08. 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.

Bureau Veritas Certification verified the Project Monitoring Report version 3 for the reporting period as indicated below. Bureau Veritas Certification confirms that the project is implemented and described in validated and registered project design documents. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is already generating GHG emission reductions

Bureau Veritas Certification can confirm that the GHG emission reduction is calculated without material misstatements. Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the valid and registered project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated, we confirm the following statement:

Reporting period: From 01/01/2009 to 31/12/2009

Baseline emissions : 14,005 t CO2 equivalents.

Project emissions : 0 t CO2 equivalents.

Emission Reductions : 14,005 t CO2 equivalents.

23 March 2010

Antonio Daraya
Internal Technical Reviewer

23 March 2010

Marco F. Prauchner
Team Leader



5 REFERENCES

Category 1 Documents:

Documents provided by Brascan Energética S.A. that relate directly to the GHG components of the project.

- /1/ "Rialma Companhia Energética I S/A – Santa Edwiges I Small Hydro Power Plant – Small Scale CDM Project" PDD, version 08, November 10, 2006
- /2/ Monitoring Report "Santa Edwiges I Small Hydroelectric Power Plant Project", version 1, December 29, 2009
- /3/ CERs calculation sheet "Riachão-CERs_2009.12.29_v.1.xls", December 29, 2009
- /4/ Monitoring Report "Santa Edwiges I Small Hydroelectric Power Plant Project", version 2, March 12, 2010
- /5/ CERs calculation sheet "StaEdwiges-CERs_2010.03.12d.xls", version 2, March 12, 2010
- /6/ Monitoring Report "Rialma Companhia Energética I S/A – Santa Edwiges I Small Hydro Power Plant – Small Scale CDM Project", version 3, March 22, 2010
- /7/ PP's answers to Verification Protocol's CARs and CLs, "CDM_General_Protocol_Verification_rev02_-_830c.doc", March 12, 2010
- /8/ First Verification Report, BRAZIL-VER/0005/2008 revision 01 – Bureau Veritas Certification
- /9/ Second Verification Report, BRAZIL-VER/0005/2009 revision 03 – Bureau Veritas Certification
- /10/ Santa Edwiges I SHPP's calibration certificates of primary energy meter #PT-0707A117-01 (CC-0013/09 and CC DC SLM 0170/07) and back-up one #PT-0707A207-01 (CC-0014/09 and CC DC SLM 0169/07)
- /11/ Alvorada do Norte Substation's calibration certificates of current primary energy meter #PT-0905A133-01 (CC-DC-SLM-0160/09) and back-up one #PT-0905A314-01 (CC-DC-SLM-0161/09)
- /12/ Alvorada do Norte Substation's calibration certificates of replaced primary energy meter #PS-0510A013-01 (CC DC SLM 0177/07) and back-up one #PT-0804A390-01 (CC DC SLM 0077/08)
- /13/ CELG's meters replacement records: "Boletim de Ocorrência PCH Riachão 14.10.2008.pdf" and "document2010-03-12-154829.pdf"
- /14/ CCEE's CB02 monthly reports, covering the entire monitored period.
- /15/ Internal procedure NPE-016 – Carbon Credit, version 2/2009

Category 2 Documents:

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

- /1/ AMS-I.D – Grid connected renewable electricity generation – Version 9
- /2/ Guidelines for assessing compliance with the calibration frequency requirements (EB 52 Annex 60)
- /3/ Clean Development Mechanism Validation and Verification Manual, version 01.1, EB 51, Annex 3, of December 04th, 2009.

**Persons interviewed:**

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

- /1/ Osmar Ormianin Filho – Operational Manager
- /2/ Julien Dominic Publio Dias – Project Manager
- /3/ Amarildo Genheveski de Souza – Operational Programmer
- /4/ Marília Salustiano Menegazzo Souza – Environmental Coordinator
- /5/ Alexandre Moraes de Moraes – IT Automation & Control
- /6/ Rogério Pereira Pires – Plant Supervisor
- /7/ Ana Paula Beber Veiga – Ecopart Assessoria Ltda.
- /8/ Renata O. Freitas – Ecopart Assessoria Ltda.

6. CURRICULA VITAE OF THE DOE'S VERIFICATION TEAM MEMBERS

Bureau Veritas Certification – Lead GHG Verifier

Marco F. Prauchner – is graduated in Mechanical Engineering with experience in Quality and Environmental management in mechanical, plastic and chemical industries. He is ISO 9001:2008 and ISO 14001:2004 Lead Auditor and has also experience in the implementation of Environmental Management Systems. Marco is qualified as Lead Verifier and Internal technical reviewer to the GHG – Green House Gases.

Bureau Veritas Certification – Team member, GHG Verifier

Marcelo A. Porto – is graduated in Electrical Engineering, with a graduate specialization in Quality Engineering and a Master's degree in Industrial Engineering. Quality management expert and auditor – he worked in the electro-electronic, mechanical, medical devices, leather and shoes industries –, trained as a lead auditor in the fields of quality (ISO 9001), environment (ISO 14001), social responsibility (SA 8000), and organizational health and safety (OHSAS 18001).

Bureau Veritas Certification – Internal Technical Reviewer

Antonio Daraya – is graduated in Chemical Engineering with a very large experience in Industrial and Environmental management in several industrial fields. He is ISO 9001:2000, ISO 14001:2004 and OHSAS 18001 Lead Auditor and has also experience in the implementation of Quality and Environmental Management Systems. Antonio is qualified as Lead Verifier GHG – Green House Gases.



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APPENDIX A: BRASCAN ENERGÉTICA S.A.'S RIALMA COMPANHIA ENERGÉTICA I S/A – SANTA EDWIGES I SMALL HYDRO POWER PLANT – SMALL SCALE CDM PROJECT VERIFICATION PROTOCOL

Table 1 - Verification requirements based on the Validation and Verification Manual (EB51 - Annex 3)

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
1 Project implementation in accordance with the registered project design document					
Any concerns related to the conformity of the actual project activity and its operation with the registered PDD are identified.*	VVM	194			
a Are all physical features of the proposed CDM project activity, proposed in the registered PDD, in place?	VVM	195	Yes. However: CAR1: <i>The information stated at Section A.2. of the MR Version 1 (last paragraph), regarding the changing of the corporate name of the Special Purpose Company is the same as the stated in the MR from the previous period.</i>	CAR1	OK
b Have the project participants operated the proposed CDM project activity as per the registered PDD?	VVM	195	Yes.	OK	OK
c Was an on-site visit conducted?	VVM	195	Yes. On Jan. 30 th 2010, Feb. 1 st 2010 and Feb 2 nd 2010.	OK	OK
d If not, justify the rationale of the decision.	VVM	195	N/A	OK	OK
e Is the proposed CDM project implemented as per the registered PDD? (If not, the DOE shall conduct an assessment on the potential impacts	VVM	196	Yes. Plant is currently operational and in accordance with registered PDD, i.e. no modifications in major	OK	OK

* This Q is 'Requirement to be verified' in VVM.



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
due to the changes and based on this assessment, the DOE shall submit a notification or a request for approval of changes prior to the conclusion of the verification/certification for the corresponding monitoring period.)			equipments have taken place since the CDM project activity was registered.		
2 Compliance of the monitoring plan with the monitoring methodology					
It is assessed if the monitoring plan of the proposed CDM project activity complies with the applied methodology	VVM	198			
a Is the validated monitoring plan in accordance with the approved methodology applied by the proposed CDM project activity?	VVM	199	<p>There are two sealed meters (one primary and a backup one) at Alvorada do Norte substation. These meters make a continuous reading of the combined total energy generated by three hydropower plants: Santa Edwiges I, II and III. The first one being covered by this project activity.</p> <p>Each of these plants has its own set of primary and backup meters, reading continuously the energy generated by them. These meters are linked to Alvorada do Norte's meters.</p> <p>CCEE – The Brazilian Electric Power Commercialization Chamber – has remote access to the individual readings of all three plants as well as of Alvorada do Norte's meters. Through an algorithm that considers losses and the balance between each of these plants, CCEE presents</p>		



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<p>official energy generation data for Santa Edwiges I.</p> <p>As an official agent that controls and monitors the electricity available on the national interconnected grid, CCEE is responsible to carry out the wholesale transactions and commercialization of electric power within the National Interconnected System. The electricity exported to the grid is validated each month. CCEE through CB02 report informs all the energy dispatched to the grid, which is checked with Brascan records. This report is an authorization to invoice the final client of Brascan.</p> <p>This measurement system is established by ANEEL which is the agency that regulates energy generation, transmission and distribution in Brazil and documented according to CCEE procedure PdC ME.01 version 2 (26.04.07) approved by ANEEL dispatch n° 1.247, of April 26, 2007, which covers the requirements for the commercialization of the energy and how the data are transferred from the generators to CCEE and how CCEE confirms the information.</p> <p>Brascan also developed a formal procedure NPE-016 – Carbon Credit, version 2/2009, which describes all details regarding operational, management and monitoring activities related to emission reductions. This procedure describes that the spreadsheet Brazil Operations is sent to the</p>		



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<p>Financial area, until the second day after the last day of every month. After being available on the CCEE website, the report CB002 is sent to the Financial area. The CB 002 presents the energy readings of the energy dispatched to the grid in the last two months. The report Brazil Operations is elaborated monthly by the Operational Area and presents the amount of the daily and monthly energy generated by the Power Plant, and information about PPA – Power Purchase Agreement contracts.</p> <p>These reports result from the measurement of the energy generated and are used as input to the process of billing, information management and other.</p>		



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
b If no, was a request for revision of the monitoring plan was done? (The DOE may request for revision of the monitoring plan covering the monitoring period under verification, for approval by the CDM Executive Board.)	VVM	200	N/A	OK	Ok
c Are there any monitoring aspects of the project activity that are not specified in the methodology, particularly in the case of small-scale methodologies (e.g. additional monitoring parameters, monitoring frequency and calibration frequency)?	VVM	201	No	OK	Ok
3 Compliance of monitoring with the monitoring plan					
It is assessed if monitoring of reductions in GHG emissions to result from the proposed CDM project activity is implemented in accordance with the monitoring plan contained in the registered PDD or the accepted revised monitoring plan .	VVM	203			
a Have the monitoring plan and the applied methodology been properly implemented and followed by the project participants?	VVM	204	Yes.	OK	OK
b Have all parameters stated in the monitoring plan, the applied methodology and relevant CDM Executive Board decisions been sufficiently monitored and updated as applicable, including:	VVM	204	Yes.	OK	OK
i Project emission parameters?	VVM	204	Yes.	OK	OK
ii Baseline emission parameters?	VVM	204	CL1: Please, retype $E_{f_{BM,y}}$ correctly, in the table under Section B.3.	CL1	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
iii Leakage parameters?	VVM	204	N/A.	OK	OK
iv Management and operational system: the responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the monitoring plan?	VVM	204	Yes. The procedure NPE-016 – Carbon Credit, version 2/2009, describes all details regarding operational, management and monitoring activities related to emission reductions, including authorities and responsibilities.	OK	OK
c Is the accuracy of equipment used for monitoring in accordance with the relevant guidance provided by the CDM Executive Board and are equipment controlled and calibrated in accordance with the monitoring plan?	VVM	204	<p>The only variable that needs to be monitored is the generated electricity delivered to the grid.</p> <p>As mentioned before, there are two meters (one primary and a backup one) at Alvorada do Norte substation. These meters make a continuous reading of the combined total energy generated by three hydropower plants: Santa Edwiges I (the one covered by this project activity), and Santa Edwiges II and III.</p> <p>Each of these plants has its own set of primary and backup meters, reading continuously the energy generated by them. These meters are linked to Alvorada do Norte's meters.</p> <p>Information on each meter's calibration:</p> <p>- Santa Edwiges II and III's primary and backup meters calibration CELG certificates: 11/09, 12/09, 75/08 and 76/08. These plants are not covered by the project activity, but the readings of their meters are relevant, due to the algorithm used by CCEE.</p>	CAR2 CAR3	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<p>- Santa Edwiges I's primary meter: Power Measurement ION 8600, #PT-0707A117-01, CELG certificate 0013/09, calibrated on 14/10/2009. Previous calibration: CELG certificate DC SLM 170/07, calibrated on 2/10/2007. Two years and 12 days between calibrations.</p> <p>- Santa Edwiges I's backup meter: Power Measurement ION 8600, #PT-0707A207-01, CELG certificate 0014/09, calibrated on 14/10/2009. Previous calibration: CELG certificate DC SLM 169/07, calibrated on 1/10/2007. Two years and 13 days between calibrations.</p> <p>CAR2: <i>More than two years have elapsed between the last two calibrations of both Santa Edwiges I's meters. This is not in accordance with the 2-year max. limit established by ONS – the Brazilian Electric System National Operator –, in Annex 1 of its procedure for maintenance of measurement systems for invoicing (Submodule 12.3, revision 1.0). And as per Item 5.4 of internal procedure NPE-016, version 02/2009, the calibration of invoicing meters is carried out according to ONS's Module 12 procedure.</i></p> <p>- Alvorada do Norte's current primary meter: Schneider Electric Power Logic ION 8600, #PT-0905A133-01, CELG certificate DC-SLM-0160/09, calibrated on 8/9/2009. Previous meter: PS-</p>		



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<p>0510A013-01, CELG certificate DC-SLM-0177/07, calibrated on 8/10/2007. Less than two years between calibrations. SCDE/CCEE's replacement date of meters, as per SCDE/CCEE: 9/9/2009.</p> <p>- Alvorada do Norte's current backup meter: Schneider Electric Power Logic ION 8600, #PT-0905A314-01, CELG certificate DC-SLM-0161/09, calibrated on 8/9/2009. Previous meter: PT-0804A390-01, CELG certificate DC-SLM-0077/08, calibrated on 14/10/2008. Less than two years between calibrations.</p> <p>CAR3: <i>There is no record of replacement of the previous meter by the current one. Neither of PS-0410A148-01 by PT-0804A390-01. Response to clarification CL02 of last verification report states 14/10/2008 for the latter replacement. SCDE/CCEE records show a direct replacement of PS-0410A148-01 by PT-0905A314-01.</i></p>		



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
i Are monitoring results consistently recorded as per approved frequency?	VVM	204	CL2: There is a 5-minute interval between recorded measurements. CCEE's records present hourly measurements. Monthly records exist as well. However, recording frequency of EG _y , as per table under Section B.3, is "15 minutes measurement and Monthly Recording". Please, clarify.	CL2	OK
ii Have quality assurance and quality control procedures been applied in accordance with the monitoring plan monitoring plan?	VVM	204	Yes.	OK	OK
4 Assessment of data and calculation of greenhouse gas emission reductions					
It is assessed if GHG emission reductions achieved by / resulting from the proposed CDM project activity are calculated applying the selected methodology					
a Is a complete set of data for the specified monitoring period is available? (If no, i.e., only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, the DOE shall opt to either make the most conservative assumption theoretically possible in finalizing the verification report, or raise a request for deviation prior to submitting request for issuance, if appropriate).	VVM	207	CAR4: Based on CCEE's official data, 104,571 MWh have been generated in addition to the total informed in the monitoring report and its supplemental Excel document "Riachão-CERs 2009.12.20 v.1". Monitoring report × CCEE: 7,288.660 MWh × 7,288.664 MWh (January), 6,844.511 MWh × 6,844.516 MWh (May), 7,091.913 MWh × 6,987.333 MWh (November), 82,917.269 MWh × 82,812.698 MWh (total) . Besides this discrepancy, CCEE's December data is not available yet.	CAR4	OK
b Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory	VVM	207	100% of energy generation data from January to November has been crosschecked against CCEE's data. As mentioned before, CCEE's December	CAR4	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
analysis?			data is not available yet (see CAR4).		
c Have calculations of baseline emissions, proposed CDM project activity emissions and leakage, as appropriate, been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology document?	VVM	207	Yes. The baseline emissions are the MWh produced by the renewable generating unit multiplied by an emission factor (measured in tCO ₂ e/MWh), calculated in a transparent and conservative manner. According to the applicable methodology, project emissions and leakage are considered null.	OK	OK
d Have any assumptions used in emission calculations been justified?	VVM	207	No assumptions have been used.	OK	OK
e Have appropriate emission factors, IPCC default values and other reference values been correctly applied?	VVM	207	The emission factors to be used in the PDD have been calculated according to the applicable methodology. The calculated emission factors will be used <i>ex ante</i> for the calculation of the emission reductions during the first 7-year crediting period.	OK	OK

VERIFICATION REPORT

Table 2 - Verification requirements based on the Guidelines on Completeness Check of Requests for Issuance (EB48 - Annex 68)

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
1 Ensure that:	EB48	9			
a Spreadsheet are supplied in an assessable (unprotected) format.	EB48	9b	Yes.	OK	OK
b Relevant annexes have been provided and are in an appropriate format.	EB48	9c	Yes.	OK	OK
c All documents are in English or contain a full translation of relevant sections into English in cases where the DOE considers the provision of the original document to be necessary for the purposes of transparency.	EB48	9d	Yes.	OK	OK
d Cross-referencing and versioning, including number of Certified Emission Reductions (CERs), within and between the documents is correct and accurate.	EB48	9e	See CAR4.	CAR4	OK
e The monitoring periods and crediting periods throughout the documentation are consistent.	EB48	9f	Yes.	OK	OK
2 Does Monitoring Report contain:	EB48	10a			
a The implementation status of the project during the monitoring period under consideration?	EB48	10a (i)	Yes.	OK	OK
b Monitoring systems and procedures, including any quality assurance and quality control system employed by the project activity?	EB48	10a (ii)	Yes.	OK	OK
c All parameters required to be monitored and reported at the intervals required by the monitoring plan	EB48	10a (iii)	Yes.	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
and the applied methodology?					
d Information on calibration of monitoring instruments as specified by the monitoring methodology and the monitoring plan?	EB48	10a (iv)	CAR5: The monitoring report does not contain any information on the calibration of monitoring instruments.	CAR5	OK
e Emission factors, IPCC default values, and other reference values used in the calculation of emission reductions?	EB48	10a (v)	Yes.	OK	OK
f Reference to any deviation request approved by the Executive Board for the monitoring period in consideration?	EB48	10a (vi)	CL3: Section A.2 mentions a "request for deviation related to this project activity". Same request had already been mentioned in the monitoring report of the last monitoring period. Please, clarify.	CL3	OK
g Calculations of baseline emissions, project emissions, leakage (if any), and emission reductions, including reference to formulae and methods used?	EB48	10a (vii)	Yes.	OK	OK
h Comparison of the actual emission reduction claimed in the monitoring period with the estimate in the registered PDD, and explanation on any significant increase?	EB48	10a (viii)	Yes. A nonsignificant increase of 6.6% has been verified.	OK	OK
2 Does Spreadsheet of Calculation of Emission Reductions contain:	EB48	10b			
a Values of the monitored parameters?	EB48	10b (i)	Yes.	OK	OK
b Formulae of calculation are shown in the spreadsheet cells for ease of assessment, whenever possible?	EB48	10b (ii)	Yes.	OK	OK
c Any other explanation with regard to application of formulae in the spreadsheet?	EB48	10b (iii)	N/A.	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
3 Does Verification Report contain:	EB48	10c			
a The information specified in the reporting requirements of the latest version of the “Validation and Verification Manual”, that all corrective action and/or clarification requests have been closed and the means of their resolution has been documented, and that all Forward Action Requests (FAR) raised in the validation or previous verification are addressed?	EB48	10c	Yes.	OK	OK

**Table 3 – Resolution of Corrective Action / Forward Action / Clarification Requests**

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
<u>CAR1:</u> <i>The information stated at Section A.2. of the MR Version 1 (last paragraph), regarding the changing of the corporate name of the Special Purpose Company is the same as the stated in the MR from the previous period.</i>	VVM 195	Relevant sentence has been changed to correct verification period.	Monitoring report, version 1, mentioned that the company's name had changed since "the last verification" (the 2 nd one, since this is the 3 rd verification), while such change occurred between the 1 st and the 2 nd verifications. Monitoring report, version 2, reflects the correction required. CAR1 is closed.
<u>CAR2:</u> <i>More than two years have elapsed between the last two calibrations of both Santa Edwiges I's meters. This is not in accordance with the 2-year max. limit established by ONS – the Brazilian Electric System National Operator –, in Annex 1 of its procedure for maintenance of measurement systems for invoicing (Submodule 12.3, revision 1.0). And as per Item 5.4 of internal procedure NPE-016, version 02/2009, the calibration of invoicing meters is carried out according to ONS's Module 12 procedure.</i>	VVM 204	Project owner and operator, since the first verification of the CDM project activity, is committed to follow ONS' procedure. The dates of the last calibrations of the energy meters (principal and back-up) were included in the Monitoring Report. As noticed by the DOE, some of the calibrations were delayed. For these situations, the provisions of Annex 60, EB52 were applied. Please	Santa Edwiges I main and back-up meters presented, respectively, a 12- and 13-day delays in their calibration. The main meter was overdue from October 2 nd (Friday) to 14 th (Sunday), 2009 and the back-up one, from October 1 st (Thursday) to 14 th (Sunday). CCEE's week runs from Saturday to Friday. Due to ease of calculation and conservative reasons, the provisions of EB 52 Annex 60 were applied by the PP over the first three weeks of



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Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
		refer to the revised version of the Monitoring Report.	<p>October, 2009, from the 1st to the 2nd, the 3rd to the 9th, and the 10th to the 16th. Calculations are as follows:</p> <p>EG_{1st week Oct 2009}: 490.391 MWh</p> <p>EG_{2nd week Oct 2009}: 796.147 MWh</p> <p>EG_{3rd week Oct 2009}: 1,916.450 MWh</p> <p>EG_{1st+2nd+3rd weeks Oct 2009}: 3,202.988 MWh</p> <p>Maximum error found as result of delayed calibration: -0.156%±0.071%</p> <p>Maximum permissible error of the instrument: 0.2%</p> <p>EG to be subtracted: 7.271 MWh</p> <p>EG_{Oct 2009}: 6,523.421 MWh</p> <p>Adjusted EG_{Oct 2009}: 6,516.150 MWh</p> <p>Monitoring report and calculation sheet have been updated accordingly.</p> <p>CAR2 is closed.</p>
CAR3: <i>There is no record of replacement of the previous meter by the current one. Neither of PS-0410A148-01 by PT-0804A390-01. Response to clarification CL02 of last</i>	VVM 204	Information was missing in CCEE's maintenance notification database. Meters' replacement records have then been retrieved	The following records have been provided by CELG – the calibration company, who also performs replacement services – in order to



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Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
<i>verification report states 14/10/2008 for the latter replacement. SCDE/CCEE records show a direct replacement of PS-0410A148-01 by PT-0905A314-01.</i>		from CELG, the calibration company, who also performs replacement services. CELG's records attached.	evidence replacement dates of meters, as follows: - Record of Measurement Occurrence (Equipment Replacement), dated 14/10/2008: replacement of PS-0410A148-01 by PT-0804A390-01 - Communication of Equipment Replacement #1482/09, dated 09/09/2009: replacement of PT-0804A390-01 by PT-0905A314-01 CAR3 is closed.
<u>CAR4</u> : Based on CCEE's official data, 104,571 MWh have been generated in addition to the total informed in the monitoring report and its supplemental Excel document "Riachão-CERs 2009.12.20 v.1". Monitoring report × CCEE: 7,288.660 MWh × 7,288.664 MWh (January), 6,844.511 MWh × 6,844.516 MWh (May), 7,091.913 MWh × 6,987.333 MWh (November), 82,917.269 MWh × 82,812.698 MWh (total) . Besides this discrepancy, CCEE's December data is not available yet.	VVM 207	Energy generation as informed in the monthly reports issued by CCEE was corrected in the Monitoring Report. In addition, the discount regarding the delayed calibration was applied to the 1 st , 2 nd and 3 rd weeks of October. The corrected values were amended in the second version of the monitoring Report and second version of CERs calculation spreadsheet.	PP provided CCEE's CB02 reports for November and December, updated the monitoring report and calculation sheet accordingly, as well as corrected January and May data in the same documents. CAR4 is closed.



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Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
CAR5: <i>The monitoring report does not contain any information on the calibration of monitoring instruments.</i>	EB48 10a (iv)	The requested information was included in the second version of the Monitoring Report.	Monitoring report, version 2, contains information on the calibration of monitoring instruments. CAR5 is closed.
CL1: <i>Please, retype $E_{f_{BM,y}}$ correctly, in the table under Section B.3.</i>	VVM 204	This parameter as well as E_{f_y} and $E_{f_{OM,y}}$ was excluded from section B.2. of the Monitoring Report since it is a validated parameter.	Table under Section B.2, of monitoring report, has been corrected. CL1 is closed.
CL2: <i>There is a 5-minute interval between recorded measurements. CCEE's records present hourly measurements. Monthly records exist as well. However, recording frequency of E_{G_y}, as per table under Section B.3, is "15 minutes measurement and Monthly Recording". Please, clarify.</i>	EB48 10a (vi)	The energy meters register the energy delivered to the grid on a continuous basis. The project measures E_{G_y} every 5 minutes; which is even more frequent than stated in the registered PDD. The monitoring report presents the consolidated monthly data which is used to calculate the emission reductions by the proposed CDM project activity.	Plant's energy generation is measured on a continuous mode by two EG meters, a main meter and a back-up one. Measures are added each 5 minutes. Hourly data is transferred to CCEE's Sinercom system, that will then consolidate it on a weekly basis. So the measurement frequency verified fulfils the requirements of the registered PDD, where a 15-minute interval was defined. A more frequent interval adds confidence to the measurement reading process.



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Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
			CL2 is closed.
CL3: Section A.2 mentions a “request for deviation related to this project activity”. Same request had already been mentioned in the monitoring report of the last monitoring period. Please, clarify.	VVM 204	The request for deviation was incorrectly inserted at the monitoring report, and has been excluded.	Incorrect reference to an inexistent request for deviation has been removed from Monitoring report, version 2. CL3 is closed.