VERIFICATION REPORT
CPFL GERAÇÃO

VERIFICATION OF THE
REPOWERING SMALL HYDRO PLANTS (SHP) IN THE STATE OF SÃO PAULO, BRAZIL PROJECT

(CDM Registration Reference Number 0489)

REPORT NO. BRAZIL - VER/4951/2008

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BUREAU VERITAS CERTIFICATION

VERIFICATION REPORT

Date of first issue:	Organizational unit:
18/02/2009	Bureau Veritas Certification Holding SAS
Client:	**Client ref.:**
CPFL Geração	Rodolfo Nardez Sirol

Summary:

Bureau Veritas Certification has made the verification of the Repowering Small Hydro Plants (SHP) in the State of São Paulo, Brazil project, CDM Registration Reference Number 0489, project of CPFL Geração, located in Rodovia Campinas Mogi-Mirim, km 2.5, Campinas – São Paulo, Brazil, 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 (CR, 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 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.:	Subject Group:
BRAZIL -ver/4951/2008	CDM
Project title:	
Third Periodic Verification of "Repowering Small Hydro Plants (SHP) in the State of São Paulo, Brazil".	
Work carried out by:	
Antonio Daraya – Team Leader, Climate Change Verifier	
Work verified by:	
Ashok Mammen - Internal Technical Reviewer	

Date of this revision:	Rev. No.:	Number of pages:
13/04/2009	03	28

Indexing terms

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Abbreviations change / add to the list as necessary

ANEEL	Electricity Regulatory Agency (Agência Nacional de Energia Elétrica)
CAR	Corrective Action Request
CCEE	Camera of Commercialization of Electric Power (Câmara de Comercialização de Energia Elétrica)
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CL	Clarification Request
CO_2	Carbon Dioxide
COG	Central de Operações de Geração – Generation Central Operation Room
CPFL	Companhia Paulista de Forca e Luz
DOE	Designated Operational Entity
EB	Executive Board
ERU	Emission Reduction Unit
FAR	Forward Action Request
GHG	Green House Gas(es)
I	Interview
IETA	International Emissions Trading Association
IVC	Initial Verification Checklist
KP	Kyoto Protocol
MoV	Means of Verification
MP	Monitoring Plan
MVP	Monitoring and Verification Protocol
NGO	Non Government Organization
ONS	Operador Nacional do Sistema Eletrico (National Grid Operator)
PCF	Prototype Carbon Fund
PCF	Prototype Carbon Fund
PDD	Project Design Document
PPA	Power Purchase Agreement
PVC	Periodical Verification Checklist
SHP	Small Hydro Plant
UNFCCC	United Nations Framework Convention for Climate Change
VVM	Validation and Verification Manual

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1 INTRODUCTION

CPFL Geração has commissioned Bureau Veritas Certification to verify the emissions reductions of its CDM project Repowering Small Hydro Plants (SHP) in the State of São Paulo, Brazil. (hereafter called "the project") at Rod. Campinas Mogi-Mirim, km 2,5, Campinas – SP – Brazil.

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 purpose of the project "Repowering Small Hydro Plants (SHP) in the State of São Paulo, Brazil" is the upgrade of CPFL´s SHPs in the State of Sao Paulo, south-eastern Brazil. In this region, all major hydropower potential have long been tapped, together with most of the smaller ones as well. Expanding generation in the region brings the advantage of increasing energy supply in the country´s richest region with lower transmission losses and thus avoiding the more environmentally damaging thermal plants and hydropower plants in the Amazon region.
All the repowering projects maintained the same reservoir area and were authorized to run with the same head, meaning that no additional

environmental impact will be brought by these projects. The whole gain is an efficiency upgrade by using modern generation technology.
The project comprises six SHPs, however only four of them make part of this third periodic verification. Three SHPs have been repowered between 2001 and 2003, namely – Esmeril, Dourados and São Joaquim. The SHP Gavião Peixoto started its commercial operation after the repowering in 2007. The following upgrade has taken place:

- SHP Esmeril: The three old hydro-generators were replaced by two new 2.5 MW ones, or a total of 5.0 MW (Turbines type Francis).

- SHP Dourados: One old 6.4 MW hydro-generator was replaced by one new 10.8 MW (Turbine type Francis).

- SHP São Joaquim: The four old hydro-generators were replaced by three new 2.79 MW ones, or a total of 8.37 MW (Turbines type Kaplan).

- SHP Gavião Peixoto: The four old hydro-generators were replaced by two new 2.4 MW ones, or a total of 4.8 MW (Turbines type Francis).

The equipment and technology used in the project has been successfully applied to similar projects in Brazil and around the world.
CPFL Geração is responsible for the assets of the registered project and is 100% owned by CPFL Energia, a holding company that, through its subsidiaries, distributes, generates and commercializes electricity in Brazil. CPFL Geração is located in Campinas, São Paulo and the four SHPs are located in the south-eastern region in the State of Sao Paulo, Brazil.
From January 01, 2008 to December 31, 2008, SHPs Esmeril, Dourados, São Joaquim and Gavião Peixoto generated Electrical Energy and, consequently, CERs.

1.4 Verification Team

The validation team consists of the following personnel:

Antonio Daraya
Bureau Veritas Certification Team Leader, Climate Change Verifier

Ashok Mammen
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 01 of the Clean Development Mechanism Validation and Verification Manual, issued by the Executive Board at its 44 meeting on 28/11/2008. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from verifying the identified criteria. The validation 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 validation protocol is enclosed in Appendix A to this report.

2.1 Review of Documents

The Monitoring Report (MR) submitted by CPFL Geração 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 06, of 16 October 2006.

2.2 Follow-up Interviews

On 14/01/2009 to 16/01/2009, Bureau Veritas Certification performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of CPFL Geração and of C-Trade Comercializadora de Carbono Ltda were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
Company: CPFL Geração	Project Design and implementation Technical Equipment and operation Monitoring Plan Monitored data Data uncertainty and residual risks GHG Calculation Environmental Impacts Stakeholder Process Compliance with National Laws and regulations.
Consultant: C - Trade Comercializadora de Carbono 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 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 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 stated, where applicable, in the following sections and are further documented in the Verification Protocol in Appendix A. The Verification of the Project resulted in Zero Corrective Action Requests and Zero Clarification Requests.

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

3.1 Remaining issues CARs, CLs and FARs from previous verification

3.1.1 Discussion

There are not any pending CARs and CRs.
The pending issues were only related to the Forward Action Requests.

FARs

Forward Action Request 01:
The Basic Operation Guide (Guia de Operação Básico do ZFA-F), utilized for the training on the ZFA-F System should be a controlled document.
Resolution: The Basic Operation Guide (Guia de Operação Básico do ZFA-F) has been updated during 2008 in the CPFL System, as a controlled document, as follows:
Document number 12730, version 01 of July 22, 2008, “Operation Manual – Measurement and Invoicing Software ZFA-A”.
Issue is considered resolved and FAR 01 is considered closed.

3.2 Project implementation in accordance with the registered project design document (189)

The implementation status of the project is as follows:

The project has a 7 year crediting period, renewable two times.

The first 7 year crediting period is from January 01, 2003 to December 31, 2009. The total Emission Reductions forecasted for that period are 133,657 tCO2e.

The following Verifications have already been made:

- First and Initial Periodic Verification: From January 01, 2003 to November 30, 2006.
  Emission Reductions of 31,190 tCO2e.
- Second Periodic Verification: From December 01, 2006 to December 31, 2007.
  Emission Reductions of 7,160 tCO2e.
- Third Periodic Verification: From January 01, 2008 to December 31, 2008.
  Emission Reductions of 14,032 tCO2e.

Total Emission Reductions for the three verifications: 52,382 tCO2e.

The progress of the proposed CDM project activity achieved is as follows:

Project has been implemented as defined in the PDD and there is no change in the major equipments.

This project encompasses the upgrade of CPFL's SHPs in the State of São Paulo, south-eastern Brazil. In this region, all major hydropower potential have long been tapped, together with most of the smaller ones as well. Expanding generation in the region brings the advantage of increasing energy supply in the country's richest region with lower transmission losses and thus avoiding the more environmentally damaging thermal plants and hydropower plants in the Amazon region. The plants were built in the early 1900s and have been running basically with the original turbines and generators. As they were extending their lifetime, CPFL sought options to repowering them.

All the repowering projects maintained the same reservoir area and were authorized to run with the same head, meaning that no additional environmental impact will be brought by these projects. The whole gain is an efficiency upgrade by using modern generation technology. In four of the plants, the extra power is achieved with fewer turbines than before. One of plants always operated with one turbine, and the sixth plant replaced its two turbines for two new ones.

The project comprises six SHPs, however only four of them make part of this third periodic verification. Three SHPs have been repowered between 2001 and 2003, namely – Esmeril, Dourados and São Joaquim. The SHP Gavião Peixoto started its commercial operation after the repowering in 2007. The following upgrade has taken place:

- SHP Esmeril: The three old hydro-generators were replaced by two new 2.5 MW ones, or a total of 5.0 MW (Turbines type Francis).

- SHP Dourados: One old 6.4 MW hydro-generator was replaced by one new 10.8 MW (Turbine type Francis).

- SHP São Joaquim: The four old hydro-generators were replaced by three new 2.79 MW ones, or a total of 8.37 MW (Turbines type Kaplan).

- SHP Gavião Peixoto: The four old hydro-generators were replaced by two new 2.4 MW ones, or a total of 4.8 MW (Turbines type Francis).

The other two hydro plants that make part of the project, Chibarro and Capão Preto, have started-up generation during the year 2008 and were not included in this Third Periodic Verification.
On-site visits have been conducted in the period of January 14 to January 16, 2009 to all the four Small Hydro Power Plants included in this Third Periodic Verification Report, Esmeril, Dourados, São Joaquim and Gavião Peixoto. The COG - Generation Central Operation Room, located in the city of Campinas – SP, has been visited on January 14, 2009.
It was verified that the physical features of the proposed CDM project activity, proposed in the registered PDD, are in place (generators, turbines, installations and auxiliary equipments).
The operation of the four Small Hydro Plants is totally controlled by the COG, located at the Campinas Headquarters. The four plants are fully automated. The hydro plants operators are only performing maintenance tasks. There are controlled working instruction covering all the tasks and defining functions involved in the GHG data management. The accessibility of such documentation to persons working on the project is secured.
All the data and variables provided in the monitoring report are according to the registered PDD.

3.3 Compliance of the monitoring plan with the monitoring methodology (194)

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

3.4 Compliance of monitoring with the monitoring plan (197)

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

3.5 Assessment of data and calculation of greenhouse gas emission reductions (200)

All the necessary data and all the parameters foreseen to be monitored in the registered PDD were available to the DOE.

There are monitoring report procedures, defining the monitoring plan content, according to the monitoring plan indicated in the PDD.
As seen in Table D.2.1.3 of the PDD, data to be collected for the preparation of the monitoring reports are the updates of the emission factors (EFOM,y, EFBM,y , EFy) and the monthly electricity generation (EGy). The emission factors are updated yearly by requesting dispatch data to ONS.
Procedure to collect the monthly electricity generation: All the energy substations of the power plants have two sealed meters, one primary and another as a backup for the primary meter. Both energy meters make continuous and simultaneous readings of the electricity dispatched to the grid. The readings of the amount of electricity supplied to the grid are sent from these readers, through a satellite communication link, to the CPFL Central Office in Campinas and to CCEE (Electric Power Commercialization Chamber, a Private and State owned company administrated by the Ministry of Mines and Energy, which controls and monitors the electricity available in the national interconnected grid , and is responsible to carry out the wholesale transactions and commercialization of electric power within the National Interconnected System). The information received in CPFL is stored in a software system, with a back-up system. The COG - Generation Central Operation Room in Campinas uses the information to generate electrical energy production reports for each one of the power plants, with hourly, daily and monthly information.
Every month, the electricity exported to the grid is validated and is available at CCEE's website. This information of the dispatched energy to the Grid is checked against CPFL's monthly reports. The information available in the CCEE's website is printed and is a receipt of sales of the energy exported to the grid.
This measurement system is established by ANEEL, and documented in a written procedure, PdC ME.01 version 2 (26.04.07), approved by ANEEL's dispatch nº 1.247, of April 26, 2007. The procedure covers the energy commercialization requirements and the data process transfers from the electricity generators.
According to the selected approved methodology (ACM0002, version 06, the baseline emission factor (EFy) is calculated as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) emission factors. At the project validation, the calculation for the CO2 emission factor of the interconnected grid, including the Operating and Build Margin of the CO2 emission factor of the interconnected grid was necessary to estimate the emission reductions. According to the monitoring plan of the registered PDD, for verification purposes the emission factor of the grid has to be updated yearly by requesting data from the dispatch center ONS for project activities on a Large Scale for the interconnected grid South-Southeast-Central West. The CO2 emission factor of the grid is 0.2628 tCO2e/MWh (in 2007). As the 2008 emission factor of the grid was not available yet, according to an

EB answer to a request for clarification, if OM and BM emission coefficient is monitored ex-post and it is not available for the current year, it can be used the emission factor of the previous year.

According to the applicable methodology and to section E.5 of the PDD, the net energy generated by project activity in year y in plant j is:

$\Delta EGj,y = EGj,y - EGj,baseline$, where:

EGj,y = energy output of plant j during year y;

$EGj, baseline$ = baseline energy output of plant j taken from the column EGbaseline of the table of section A.2 of the monitoring report.

As direct project emissions are zero, emission reductions of the project activity are given by the product of the baseline emission factor by the net energy output of the plant:

$ERj,y = EFy \cdot \Delta EGj,y$

The baseline electricity generation data was calculated from a 10-year historical average, as determined by ACM0002.

4 VERIFICATION OPINION

Bureau Veritas Certification has performed a verification of the Repowering Small Hydro Plants (SHP) in the State of São Paulo, Brazil 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.

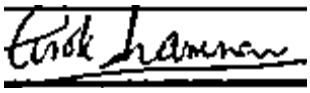
The management of CPFL Geração is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the project on the basis set out within the project Monitoring and Verification Plan indicated in the final PDD version 06. The development and maintenance of records 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 03 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 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 01/01/2008 to 31/12/2008
Baseline emissions : 14,032 t CO_2 equivalents.
Project emissions : 0 t CO_2 equivalents.
Emission Reductions : 14,032 t CO_2 equivalents.

23 February 2009	23 February 2009
Ashok Mammen Internal Technical Reviewer	Antonio Daraya Lead GHG Verifier



5 REFERENCES

Category 1 Documents:
Documents provided by CPFL Geração, that relate directly to the GHG components of the project.

/1/ Repowering Small Hydro Plants (SHP) in the State of São Paulo, Brazil – CPFL Geração – Project Design Document, version 6, October 2006.
/2/ Monitoring Report – Repowering Small Hydro Plants (SHP) in the State of São Paulo, Brazil Project, version 3, February 11, 2009 – C-Trade Comercializadora de Carbono Ltda.
/3/ Initial and First Verification Report - Repowering Small Hydro Plants (SHP) in the State of São Paulo, Brazil Project, final report, of July 4, 2007 – Tud-Sud Industrie Service GmbH.
/4/ Second Periodic Verification Report - Repowering Small Hydro Plants (SHP) in the State of São Paulo, Brazil Project, Revision 01, of February 11, 2008 – Bureau Veritas Certification.

Category 2 Documents:
Background documents related to the design and/or methodologies employed in the design or other reference documents.

/1/ ACM0002 – "Consolidated baseline methodology for grid-connected electricity

generation from renewable sources", rev 6, 19, may 2006.

/2/ Calibration Documents of all ELO 2180 Electricity Meters of the four Hydro Plants Dourados, Esmeril, São Joaquim and Gavião Peixoto.

/3/ CDM's response on "Clarification on data vintage if OM or BM emission coefficient is monitored ex-post (ACM0002 ver. 6)/AM_CLA_0038".

/4/ CCEE Letter CT-016/09, of Jan 07, 2009, informing the quantity of Energy received in MWh, in Nov 2008, from Dourados, Esmeril, São Joaquim and Gavião Peixoto Hydro Plants.

/5/ CCEE Letter CT-176/09, of Jan 22, 2009, informing the quantity of Energy received in MWh, in Oct 2008, from Dourados, Esmeril, São Joaquim and Gavião Peixoto Hydro Plants.

/6/ CCEE Letter CT-293/09, of Feb 03, 2009, informing the quantity of Energy received in MWh, in Dec 2008, from Dourados, Esmeril, São Joaquim and Gavião Peixoto Hydro Plants.

/7/ CPFL's EGbaseline for Dourados, Esmeril, São Joaquim and Gavião Peixoto Hydro Plants, for a period of 10 year historical average.

/8/ Procedure # 3908, version 1.7, to control the electricity meters, defining the monitoring and control system to guarantee the quality and traceability of the meters. It also defines the calibration frequency as every two years.

/9/ Procedure # 4987, version 1.1 Operation procedure of the ZFA System that includes a process flow diagram, describing the entire process from raw data generation to reported totals, including the process for validating the readings.

/10/ Controlled working instructions covering all the tasks and defining functions involved in the GHG data management.

Persons interviewed:

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

/1/	Tiago Favarin	COG - CPFL Geração
/2/	José A. de Carvalho	CPFL Geração
/3/	Rodolfo Nardez Sirol	Environmental Manager
/4/	Eurípedes G. Lima	Generation Technician – Jr.
/5/	Paulo R.B. Peres	Operation Technician
/6/	Elídio Pereira	Hydro Power Plant Supervisor
/7/	Carlos A. Aguiar	Generation Technician – Jr.
/8/	Valdemar Pinto	Operation Technician
/9/	Gustavo Demarchi Salvagni	C-Trade Com de Carbono Ltda

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

Bureau Veritas Certification, Lead GHG Verifier
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.

Bureau Veritas Certification, Internal Technical Reviewer
Ashok Mammen - PhD (Oils & Lubricants), MsC (Analytical chemistry). Over 20 years of experience in petrochemical sector. Dr. Mammen is a lead auditor for environment, safety and quality management systems and a lead verifier for GHG projects. He has been involved in the validation and verification processes of more than 50 CDM and other GHG projects.

APPENDIX A: **THIRD PERIODIC VERIFICATION PROTOCOL REPOWERING SMALL HYDRO PLANTS (SHP) IN THE STATE OF SÃO PAULO, BRAZIL**

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
1. Project implementation in accordance with the registered project design document					
a. Have CDM project activities been implemented and operated as per the registered PDD?	VVM	187	Yes.	OK	OK
b. Are all physical features of the proposed CDM project activity, proposed in the registered PDD, in place?	VVM	188	Yes. During the site visit to all the four Small Hydro Power Plants included in this Third Periodic Verification Report, Esmeril, Dourados, São Joaquim and Gavião Peixoto, made in the period of January 14 to January 16, 2009, it was verified that the physical features of the proposed CDM project activity, proposed in the registered PDD, are in place (generators, turbines, installations and auxiliary equipments).	OK	OK
c. Have the project participants operated the proposed CDM project activity as per the registered PDD?	VVM	188	Yes.	OK	OK
d. Is the proposed CDM project implemented against the description in the PDD?	VVM	188	Yes.	OK	OK
e. Was an on-site visit conducted?	VVM	188	Yes. On-site visits have been conducted in the period of January 14 to January 16, 2009 to all the four Small Hydro Power Plants included in this Third Periodic Verification Report, Esmeril, Dourados, São Joaquim and Gavião Peixoto. The COG - Generation Central Operation Room, located in the city of Campinas – SP, has been visited on January 14, 2009.	OK	OK
f. If not, justify the rationale of the decision.	VVM	188	N.A.	-	-
2. Compliance of the monitoring plan with the					

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
monitoring methodology					
a. Is the monitoring plan of the proposed CDM project activity in accordance with the applied methodology?	VVM	190	Yes. The project applies the Consolidated Methodology ACM0002, revision 6, "Consolidated monitoring methodology for zero-emissions grid-connected electricity generation from renewable sources.	OK	OK
b. Is the validated monitoring plan in accordance with the approved methodology applied by the proposed CDM project activity?	VVM	191	There are monitoring report procedures, defining the monitoring plan content, according to the monitoring plan indicated in the PDD. As seen in Table D.2.1.3 of the PDD, data to be collected for the preparation of the monitoring reports are the updates of the emission factors (EFOM,y, EFBM,y , EFy) and the monthly electricity generation (EGy). The emission factors are updated yearly by requesting dispatch data to ONS. Procedure to collect the monthly electricity generation: All the energy substations of the power plants have two sealed meters, one primary and another as a backup for the primary meter. Both energy meters make continuous and simultaneous readings of the electricity dispatched to the grid. The readings of the amount of electricity supplied to the grid are sent from these readers, through a satellite communication link, to the CPFL Central Office in Campinas and to CCEE (Electric Power Commercialization Chamber, a Private and State owned company administrated by the Ministry of Mines and Energy, which controls and monitors the	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			electricity available in the national interconnected grid , and is responsible to carry out the wholesale transactions and commercialization of electric power within the National Interconnected System). The information received in CPFL is stored in a software system, with a back-up system. The COG - Generation Central Operation Room in Campinas uses the information to generate electrical energy production reports for each one of the power plants, with hourly, daily and monthly information. Every month, the electricity exported to the grid is validated and is available at CCEE's website. This information of the dispatched energy to the Grid is checked against CPFL's monthly reports. The information available in the CCEE's website is printed and is a receipt of sales of the energy exported to the grid. This measurement system is established by ANEEL, and documented in a written procedure, PdC ME.01 version 2 (26.04.07), approved by ANEEL's dispatch nº 1.247, of April 26, 2007. The procedure covers the energy commercialization requirements and the data process transfers from the electricity generators. This monitoring report, version 3, of February 11, 2009, has been prepared by C-Trade Comercializadora de Carbono Ltda, which is responsible for the calculation of the emission reductions.		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
c. 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 Board)	VVM	192	N.A.	-	-
3. Compliance of monitoring with the monitoring plan					
a. Was Monitoring of reductions in GHG emissions to result from the proposed CDM project activity implemented in accordance with the monitoring plan contained in the registered PDD or the accepted revised monitoring plan?	VVM	195	The monitoring of reductions in GHG emissions to result from the proposed CDM project activity implemented is in accordance with the monitoring plan contained in the registered PDD.	OK	OK
b. Have the monitoring plan and the applied methodology been properly implemented and followed by the project participants?	VVM	196	Yes.	OK	OK
c. 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	196	Yes.	OK	OK
i. Project emission parameters?	VVM	196	Yes. According to the selected approved methodology (ACM002/Version 06), the baseline emission factor (EFy) is calculated as a combined margin (CM), consisting of the combination of operating margin (OM) factors and the build margin (BM). At the project validation, the calculation for the CO2 emission factor of the interconnected grid, including the Operating and Build Margins of the CO2 emission factor of the interconnected grid was necessary to estimate the emission	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			reduction. According to the monitoring plan of the registered PDD, for verification purposes the emission grid factor has to be updated yearly by requesting data of the Brazilian dispatch center ONS. The Monitoring Report applied the emission factors which are updated yearly by requesting data from the dispatch center ONS for Project Activities on a Large Scale for the interconnected grid, South-Southeast- Central West. The CO2 emission factor of the grid is 0.2628 tCO2e/MWh (2007). Due to there's no available emission factor data of 2008, according to the EB answer for the request of clarification: "Clarification on data vintage if OM or BM emission coefficient is monitored ex-post (ACM0002 ver. 6) / AM_CLA_0038", it is being used the emission factor of the previous year of the generation, 2007.		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
ii. Baseline emission parameters?	VVM	196	Yes. The GHG emissions by the project activities are zero.	OK	OK
iii. Leakage parameters?	VVM	196	Yes. All existing reservoirs will remain with the same volume as prior to project activities and, therefore, there are no additional leakages in the form of carbon dioxide or methane emissions. As the repowering involved minor changes to the existing facilities, leakages due to construction material and transport of equipments were not considered significant.	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	196	The overall responsibility of the project is with the Environmental Department Manager. The Operation of the four Small Hydro Plants that are included in this verification report (São Joaquim, Dourados, Esmeril and Gavião Peixoto) is totally controlled by the COG, located at the Campinas Headquarters. The four plants are fully automated. The Small Hydro Plants Operators are only performing maintenance tasks. There are controlled working instructions covering all the tasks and defining functions involved in the GHG data management. The accessibility of such documentation to persons working on the project is secured.	OK	OK
d. Is the accuracy of equipment used for monitoring is in accordance with the relevant guidance provided by the CDM Executive Board and is	VVM	196	The variable that needs to be monitored is the generated electricity delivered to the grid, which is monitored by the project (seller) and by the energy	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
controlled and calibrated in accordance with the monitoring plan?			buyer. There is a procedure # 3908, version 1.7, to control the electricity meters, defining the monitoring and control system to guarantee the quality and traceability of the meters. It also defines the calibration frequency as once every two years. The verification team had access to the calibration certificates of the main and back-up meters of all the four hydro plants included in this verification: São Joaquim, Dourados, Esmeril and Gavião Peixoto. The meters "ELO.2180" are: USJO: # 40071231-8 (Main) # 40071229-6 (Back-up) USDO: # 40071233-4 (Main)/ # 40060784-0 (Back-up) USES: # 40071230-0 (Main)/ # 40071228-8 (Back-up) USPE: # 40060768-9 (Main)/ # 40060769-7 (Back-up) They were calibrated in 2007 and 2008. The calibrations were made in the period of June 2007 to December 2008, and are valid for a period of two years.		
i. Are monitoring results consistently reccorded as per approved frequency?	VVM	196	Yes. Refer to items 2 b and 3 d.	OK	OK
ii. Have quality assurance and quality control procedures been applied in accordance with	VVM	196	Yes. The quality assurance routines are developed according to the procedure # 4987, version 1.1	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the monitoring plan?			Operation procedure of the ZFA System, defining the responsibilities to gather the data and prepare the monitoring report. In order to comply with existing regulations, CPFL developed a set of manuals and internal procedures concerning measurement, operations, maintenance, calibration and emergency & failures. These procedures received ISO 9002 certification that are annually revalidated. All written procedures are stored electronically in the company's intranet where all operators have direct access in case of need. The electronic documentation system is called GED - Gerenciador Eletrônico de Documentos.		
4. Assessment of data and calculation of greenhouse gas emission reductions					
a. Are GHG emission reductions achieved by/resulting from the proposed CDM project activity calculated applying the selected methodology?	VVM	198	Yes. Emission reductions are calculated applying the approved methodology ACM0002, version 06 – "Consolidated monitoring methodology for grid-connected electricity generation from renewable sources".	OK	OK
b. 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	VVM	199	Three SHPs have been repowered between 2001 and 2003, namely – Esmeril, Dourados and São Joaquim. The SHP Gavião Peixoto started its commercial operation after the repowering in 2007. All these plants were originally built between 1910 and 1930 when turbine-generator efficiency was significantly lower than today. So, the extra power is being tapped without any change to the existing	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
raise a request for deviation if appropriate).			reservoirs and therefore without adding any environmental impact. The monitoring report has all the necessary information for the specified monitoring period: the baseline electricity generation data, calculated from a 10-year historical average as determined by ACM0002; the monthly and yearly total energy generation for the four hydro power plants included in the verification; the calculation of the ex-post emission factor; the net energy produced and the corresponding emission reductions generated.		
c. Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?	VVM	199	The information provided in the monitoring report has been cross-checked with other sources. The electricity exported to the grid is validated each month by CCEE. This information is available in CCEE's website. All the energy imported, is checked against CPFL records. CPFL-Geração developed and implemented the procedure # 4987, version 1.1 Operation procedure of the ZFA1 System which includes a process flow diagram, describing the entire process from raw data generation to reported totals, including the process for validating the readings. There are calibrated energy measurement equipments, with back-ups, for all the four plants. The electrical energy generation data collection is made automatically, via satellite communication, with the utilization of the ZFA-F Remote Reading System and stored in the Data Base. This	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			information is utilized by the COG Engineer to generate the Energy Production Report, used for the GHG monitoring report. Data recorded as per the monitoring plan has been used for determining the emission reductions. Actual emission reductions are being determined using the formulae as given in the Section E.5 of the PDD.		
d. 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	199	Yes. According to the applicable methodology and to section E.5 of the PDD, the monitoring report calculates, in its section D.1, the emission reductions by the project activity (ERy) during a determined period of the year y are the product of the yearly updated emission factor (EFy, in tCO2e/MWh) multiplied by the supply of electricity by the project to the interconnected grid in the same period of year y (EGy, in MWh), as follows: ERy = EFy . EGy	OK	OK
e. Have any assumptions used in emission calculations been justified?	VVM	199	There were no assumptions used in emission calculations.	OK	OK
f. Have appropriate emission factors, IPCC default values and other reference values been correctly applied?	VVM	199	The ex-post emission factors used in the monitoring report have been calculated accordingly to the applicable methodology ACM0002, version 6.	OK	OK

Table 2 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1	Summary of project owner response	Validation team conclusion

No CARs, CLs and FARs have been identified in the third periodic verification.