VALIDATION OPINION FOR REVISION OF REGISTERED MONITORING PLAN

Rio Taquesi Hydroelectric Power Project

UNFCCC Ref. No. 1031

SGS Climate Change Programme
SGS United Kingdom Ltd
SGS House
217-221 London Road
Camberley Surrey
GU15 3EY
United Kingdom

Date of Issue:		**Project Number:**	
23/09/2008		CDM.VER0285	
Project Title:			
Rio Taquesi Hydroelectric Power Project			
Organisation:		**Client:**	
SGS United Kingdom Limited		Hidroelectrica Boliviana S.A.	
Subject:			
Validation Opinion for Revision of Registered Monitoring Plan			
Validation Team:			
Carolina Campos – Lead Assessor Fabian Goncalves – Expert Alicia Fernández – Local Assessor			☒ No Distribution (without permission from the Client or responsible organisational unit)
Technical Review:	**Trainee Technical Reviewer:**		
Date: 26/09/2008 Name: Siddharth Yadav	Name: N/A		☐ Limited Distribution
Authorised Signatory:			
Name: Siddharth Yadav Date: 2nd October 2008			☐ Unrestricted Distribution
Revision Number:	**Date:**	**Number of Pages:**	
0	23/09/2008	12	
1	-	-	
2	-	-	

Table of Content

1. Validation Opinion

Paragraph 57 of the modalities and procedures for the CDM allow project participants to revise monitoring plans in order to improve accuracy and/or completeness of information, subject to the revision being validated by a Designated Operational Entity.

SGS United Kingdom Ltd has been contracted by *Hidroelectrica Boliviana S.A.* (HB) to perform such a validation of the revision of monitoring plan according to the procedure detailed in annex 34 to EB 26 meeting report, of registered CDM project Rio Taquesi Hydroelectric Power Project UNFCCC reference number 1031. The purpose of this validation is to have an independent third party assessment of the revision of the registered monitoring plan. In particular, the level of accuracy or completeness in the proposed revision of the monitoring plan, and the conformity with approved monitoring methodology applicable to the project activity.

The revision of the monitoring plan is done to include in the document:

- The approved request for deviation approved for the previous monitoring period: (http://cdm.unfccc.int/UserManagement/FileStorage/AM_CLAR_JUD0LAONM4AZPTNBDV3CHY440FDQCG) is valid for the following monitoring periods. This request for deviation was done to clarify the mechanism used by the project participant to discount the energy generated by Chojlla Antigua, an older smaller power plant not part of the CDM project, from the ER calculations, because Chojlla Antigua is out of the project boundaries (details available at, http://cdm.unfccc.int/UserManagement/FileStorage/2158D409AF7YNAJN1S3ANDMJC3WNA7).

- Further details were added to the description of the parameter $F_{i,y}$ (Amount of fossil fuel consumed by each power source/plant). This parameter is calculated using official information provided by the CNDC (the National Load Dispatch Committee by its short form in Spanish), instead of using a measured value because that information is not available in the host country as it was confirmed with the CNDC (ref 3).

Furthermore, we confirm that:

(a) The proposed revision of the monitoring plan ensures that the level of accuracy or completeness in the monitoring and verification process is not reduced as a result of the revisions;

(b) The proposed revision of the monitoring plan is in accordance with the approved monitoring methodology applicable to the project activity

(c) This is the second verification for the said project activity.

Signed on Behalf of the Validation Body by Authorized Signatory

Signature: 

Name: Siddharth Yadav

Date: 2nd October 2008

2. Introduction

2.1 Objective

Paragraph 57 of the modalities and procedures for the CDM allow project participants to revise monitoring plans in order to improve accuracy and/or completeness of information, subject to the revision being validated by a Designated Operational Entity.

SGS United Kingdom Ltd has been contracted by Hidroelectrica Boliviana S.A. to perform such a validation of the revision of monitoring plan according to the procedure detailed in annex 34 to EB 26 meeting report, the original monitoring plan is part of the Revised Monitoring Plan during third verification of registered CDM project: Rio Taquesi Hydroelectric Power Project in Bolivia UNFCCC reference number 1031. The purpose of this validation is to have an independent third party assessment of the revision of registered monitoring plan. In particular, the level of accuracy or completeness in the proposed revision of the monitoring plan, and the conformity with the approved monitoring methodology applicable to the project activity.

The Validation was performed in accordance with the UNFCCC criteria for the Clean Development Mechanism (CDM) and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

SGS reviewed of the project design documentation, using a risk based approach and conducted follow-up interviews.

2.2 Scope

The scope of the validation 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. SGS has employed a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs.

The validation 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 design.

2.3 GHG Project Description

The project was registered on 16 June 2007 with reference number 1031. The first verification was conducted pertaining to the monitoring period from 01 July 2002 to 30 April 2007 applying the registered monitoring plan, a request for deviation pertaining to the first monitoring period was approved (http://cdm.unfccc.int/UserManagement/FileStorage/2158D409AF7YNAJN1S3ANDMJC3WNA7, http://cdm.unfccc.int/UserManagement/FileStorage/AM_CLAR_JUD0LAONM4AZPTNBDV3CHY440FDQCG). The request for issuance of the second monitoring period will be issued after the confirmation from the EB to this revision.

2.4 The Names and Roles of the Validation Team Members

Name	Role	Affiliate
Carolina Campos	Lead Assessor	SGS Chile
Fabian Goncalves	Expert	SGS Brasil
Alicia Fernandez	Local Assessor	SGS Chile

3. Methodology

3.1 Review of CDM-PDD and Additional Documentation

The validation is performed primarily as a document review of the publicly available project documents. The assessment is performed by trained assessors using a validation protocol.

3.2 Use of the Validation Protocol

The validation protocol used for the assessment is partly based on the templates of the IETA / World Bank Validation and Verification Manual and partly on the experience of SGS with the validation of CDM projects. It serves the following purposes:

- it organises, details and clarifies the requirements the project is expected to meet; and
- it documents both how a particular requirement has been validated and the result of the validation.

The validation protocol consists of several tables. The different columns in these tables are described below.

Checklist Question	Ref ID	Means of Verification (MoV)	Comment	Draft and/or Final Conclusion
The various requirements are linked to checklist questions the project should meet.	Lists any references and sources used in the validation process. Full details are provided in the table at the bottom of the checklist.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (Y), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). New Information Request (NIR) is used when the validation team has identified a need for further clarification.

The completed validation protocol for this project is attached as Annex (no annex is added to this report) to this report

3.3 Findings

As an outcome of the validation process, the team can raise different types of findings

In general, where insufficient or inaccurate information is available and clarification or new information is required the Assessor shall raise a **New Information Request (NIR)** specifying what additional information is required.

Where a non-conformance arises the Assessor shall raise a **Corrective Action Request (CAR).** A CAR

is issued, where:

I. mistakes have been made with a direct influence on project results;

II. validation protocol requirements have not been met; or

III. there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be verified.

The validation process may be halted until this information has been made available to the assessors' satisfaction. Failure to address a NIR may result in a CAR. Information or clarifications provided as a result of an NIR may also lead to a CAR.

Observations may be raised which are for the benefit of future projects and future verification or validation actors. These have no impact upon the completion of the validation or verification activity.

Corrective Action Requests and New Information Requests are raised in the draft validation protocol and detailed in a separate form (No Annex is attached to this report). In this form, the Project Developer is given the opportunity to "close" outstanding CARs and respond to NIRs and Observations.

3.4 Internal Quality Control

Following the completion of the assessment process and a recommendation by the Assessment team, all documentation will be forwarded to a Technical Reviewer. The task of the Technical Reviewer is to check that all procedures have been followed and all conclusions are justified. The Technical Reviewer will either accept or reject the recommendation made by the assessment team.

4. Validation Findings

4.1 Participation Requirements

As per http://cdm.unfccc.int/UserManagement/FileStorage/215ZJICOEPPGVFJGA85W0T7U72NAWD validation report dated 21 March 2007 available on UNFCCC http://cdm.unfccc.int/Projects/DB/DNV-CUK1174992011.56 No Change.

4.2 Project Design

As per http://cdm.unfccc.int/UserManagement/FileStorage/215ZJICOEPPGVFJGA85W0T7U72NAWD validation report dated 21 March 2007 available on UNFCCC website http://cdm.unfccc.int/Projects/DB/DNV-CUK1174992011.56 No Change.

4.3 Eligibility as a Small Scale Project

As per http://cdm.unfccc.int/UserManagement/FileStorage/215ZJICOEPPGVFJGA85W0T7U72NAWD validation report dated 21 March 2007 available on UNFCCC http://cdm.unfccc.int/Projects/DB/DNV-CUK1174992011.56 No Change.

4.4 Baseline Selection and Additionality

As per http://cdm.unfccc.int/UserManagement/FileStorage/215ZJICOEPPGVFJGA85W0T7U72NAWD validation report dated 21 March 2007 available on UNFCCC website http://cdm.unfccc.int/Projects/DB/DNV-CUK1174992011.56 No Change.

4.5 Application of Baseline Methodology and Calculation of Emission Factors

As per http://cdm.unfccc.int/UserManagement/FileStorage/215ZJICOEPPGVFJGA85W0T7U72NAWD validation report dated 21 March 2007 available on UNFCCC website http://cdm.unfccc.int/Projects/DB/DNV-CUK1174992011.56 No Change.

4.6 Application of Monitoring Methodology and Monitoring Plan

The project activity uses ACM0002 version 06. The revision of the registered monitoring plan is needed because the approved Request for Deviation of the previous monitoring plan (http://cdm.unfccc.int/UserManagement/FileStorage/2158D409AF7YNAJN1S3ANDMJC3WNA7, http://cdm.unfccc.int/UserManagement/FileStorage/AM_CLAR_JUD0LAONM4AZPTNBDV3CHY440FDQCG) should be valid for subsequent monitoring periods.

The Taquesi project comprises a run-of-river hydroelectric project with an effective capacity of 89.5 megawatts of renewable electricity. The project was validated against the methodology ACM0002 version 6, using for the "Calculation of the Emission Factor Operating Margin ($EF_{OM,y}$)" the Dispatch Data Analysis (option C).

As it was stated in the Request for Deviation, dated 04 February 2008 and approved by the EB, HB owns and operates another facility, Chojlla Antigua, which produces around 1.3% of HB's generation and does not belong to the CDM project. For the ER calculations, the energy generated by Chojlla Antigua has to be discounted from the total HB's injections to the grid. Since this step was not made explicit in the PDD, a Request for Deviation was presented to clarify how HB subtracts the energy produced in Chojlla Antigua from its total injections to the grid. The existence and production of Chojlla Antigua, as well as the need of subtracting the said production values from HB's total injections to the grid, are still taking place for the current monitoring period (01 May 2007 to 30 June 2008).

It was verified that the steps described in the approved Request for Deviation are being followed by the project emission reductions calculation and now are further explained in the revision of monitoring plan (ref2).

The revised version of the monitoring plan also contains a more precise information regarding the determination of the parameter $F_{i,y}$ (Amount of fossil fuel consumed by each power source / plant) which is *calculated* instead of *directly measured* as the methodology states, please refer to the PDD page 31 (ref 2). The project participant calculates this parameter because, as it was verified with the CNDC, there are no measurements of the amount of fossil fuel available in the country (ref 3). The approach is considered acceptable since it uses official information obtained from the CNDC and procedures deemed correctly the same body.

1. For each fossil fuel unit of the Bolivian system, the "Heat rate (HR)" is obtained from the CNDC for three load levels (L) (50%, 75% and 100%). The Heat Rate corresponds to the caloric energy used (BTU) to generate certain amount of electrical energy (KWh) at a given load level.

2. The load level and the heat rate are used to build the following regression model for each natural gas generating unit:

$$HR_{j,h} = aL^2{}_h + bL_h + c \quad \text{Eq. 1}$$

For dual fuel (natural gas and diesel) units, a dual regression model is used:

$$NGHR_{j,h} = aL_h + b \quad \text{Eq. 2}$$

for the natural gas Heat Rate, and

$$DHR_{j,h} = aL_h^{\ b} \quad \text{Eq. 3}$$

for the diesel Heat Rate.

With the above regression models, $HR_{j,h}$ (heat rate, for unit j at hour h) [Btu/MWh] is obtained hourly for every generating unit, using as independent variable the load level, calculated with the available information from the CNDC. The L_h is the ratio between the energy dispatched by the unit (hourly mean) and its installed capacity, being both values available from the CNDC.

3. The $HR_{j,h}$ (obtained from Eq. 1 or 2 and 3) is later multiplied by the amount of electrical energy generated by the unit j at hour h,. This gross (generated) energy is calculated from SMEC records by affecting such records (which register the energy injected to the grid) by the corresponding loss factor.

$$CE_{j,h} = HR_{j,h} \times \left[\frac{GEN_{j,h}}{1 - \%\,Losses} \right] \quad \text{Eq.4}$$

The resulting $CE_{j,h}$ is the caloric energy (BTU) used by every unit, on an hourly basis, and it is equivalent to the value that would be obtained with the relation:

$$CE = F \times NCV \quad \text{Eq.5}$$

where *NCV* is the Net Caloric Value and *F* the amount of the fuel. Since the NCV is available at CNDC and CE is obtained from the Equation 4, equation 5 makes possible to obtain the amount of Fuel for every unit hourly.

4. Since the $EF_{DD,h}$ is calculated according the next formula (stated in the methodology)

$$EF_{DD,h} = \frac{\sum F_{i,n,j} \times COEF_{i,n}}{\sum Gen_{n,h}} \quad \text{Eq. 6}$$

Given that COEF = NCVxEF_{CO2}x$OXID_i$, the following formula (Eq 7) replace the upper part of the Eq. 6

$$F \times COEF = CE \times EF_{CO2} \times OXID \quad \text{Eq 7}$$

4.7 Choice of the Crediting Period

As per http://cdm.unfccc.int/UserManagement/FileStorage/215ZJICOEPPGVFJGA85W0T7U72NAWD validation report dated 21 March 2007 available on UNFCCC http://cdm.unfccc.int/Projects/DB/DNV-CUK1174992011.56 No Change.

4.8 Environmental Impacts

As per http://cdm.unfccc.int/UserManagement/FileStorage/215ZJICOEPPGVFJGA85W0T7U72NAWD validation report dated 21 March 2007 available on UNFCCC http://cdm.unfccc.int/Projects/DB/DNV-CUK1174992011.56 No Change.

4.9 Local Stakeholder Comments

As per http://cdm.unfccc.int/UserManagement/FileStorage/215ZJICOEPPGVFJGA85W0T7U72NAWD validation report dated 21 March 2007 available on UNFCCC http://cdm.unfccc.int/Projects/DB/DNV-CUK1174992011.56 No Change.

5. List of Persons Interviewed

Date	Name	Position	Short Description of Subject Discussed
15/09/2008	Mr. Ricardo Michel	Responsible Person (Commercial and Development Manager)	Monitoring practice adopted at plant site and requirement under methodology ACM0002 version 06 parameter 5 (page 17).

6. Document References

Category 1 Documents (documents provided by the Client that relate directly to the GHG components of the project, (i.e. the CDM Project Design Document, confirmation by the host Party on contribution to sustainable development and written approval of voluntary participation from the designated national authority):

/1/ Revised Monitoring plan dated 15th September 2008
/2/ Registered PDD version PDD-RTHPP_03 dated on 15th September 2006.
/3/ Letter issued by CNDC on July 25th 2007

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