

VERIFICATION REPORT

FINAL



Document Prepared By RINA Services S.p.A. (RINA)

Project Title	Nansha Hydro Power Project in Yunnan Province China
Version	1.4
Report ID	2012-SH-48-MD

Report Title	VERIFICATION REPORT
Client	GUIZHOU PHENIX LOW-CARBON CONSULTING CO.,LTD
Pages	321
Date of Issue	15-August-2012
Prepared By	RINA Services S.p.A. (RINA)
Contact	Address: Via Corscia 12, 16128 Genova, Italy Phone: (39) 01053851 Email: ghg.services@ring.org Website: http://www.rina.org
Approved By	Roberto Cavanna 
Work Carried Out By	Team leader and Verifier – Yan TONG Training Team leader and Verifier – Xia ZHENG Verifier – Li XU Technical Expert – Fanlin RAN

Summary:

RINA Services S.p.A. (RINA), commissioned by GUIZHOU PHENIX LOW-CARBON CONSULTING CO.,LTD, has verified of the greenhouse gas emission reductions reported for the project activity “Nansha Hydro Power Project in Yunnan Province China” in China, CDM Registration Reference N° 2133, for the pre-CDM VCS monitoring period from 28/12/2007 to 11/01/2009.

The project was validated by TÜV SÜD Industrie Service GmbH (CDM validation report N° 1053560 version 5 of 07/08/2008) and it was registered as CDM project activity on 12/01/2009. The purpose of the project is to newly build a hydropower project to utilize the water energy to generator electricity and replace the equivalent electricity supplied by the SCPG, which is dominated by the fossil fuel-fired power plants. The project activity will contribute to the GHG emission reductions and is expected to generate totally 519,768tCO₂e annually as estimated in the registered CDM PDD.

The purpose and scope of this verification is to ensure that reported emission reductions are complete and accurate in accordance with applicable VCS/CDM requirements in order to be certified.

The GHG emission reductions were calculated on the basis of the approved methodology ACM0002, version 06, “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” of 12/05/2006, and the monitoring plan included in the registered Project Description Document, 02 of 25/07/2008.

During this verification, 1 Corrective Action Requests (CARs) and 2 Clarification Requests (CLs) were identified related to the monitoring, implementation or operations of the proposed VCS project activity (Monitoring Report version 01 of 21/03/2012) in relation to all relevant VCS and UNFCCC requirements and all relevant host Party criteria and the applied baseline and monitoring methodology, and these CARs and CLs are successfully closed after necessary corrections/clarifications by the client.

In conclusion, it is RINA’s opinion that the project activity “Nansha Hydro Power Project in Yunnan Province China”, in China, as described in the Monitoring Report version 03 of 10/07/2012, meets all relevant requirements for VCS/CDM activities and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0002, version 06, “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” of 12/05/2006. Hence RINA is able to certify that the emission reductions from the project during the monitoring period 28/12/2007 to 11/01/2009 amount to 478,420 tCO₂e.

Table of Contents

1	Introduction	4
2	Validation Process, Findings and Conclusion.....	6
3	Verification Process.....	12
4	Verification Findings	17
5	Verification conclusion.....	30

1 INTRODUCTION

GUIZHOU PHENIX LOW-CARBON CONSULTING CO.,LTD has commissioned RINA to carry out the verification and certification of emission reductions reported for the registered CDM project “Nansha Hydro Power Project in Yunnan Province China” in China, CDM Registration Reference N° 2133, for the VCS monitoring period from 28/12/2007 to 11/01/2009. This verification aims to assess and verify the emission reduction occurred before the registration of the “Nansha Hydro Power Project in Yunnan Province China” as a CDM project activity.

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

1.1 Objective

The objective of the verification is to have an independent review ex post determination by a Designated Operational Entity (DOE) of the monitored reductions in GHG emissions that have occurred as a result of the pre-registered CDM project activity during the monitoring period from the date when the project started to operate until the date when the project was actually registered as a CDM project activity by the CDM-EB. Certification is the written assurance by the DOE that, during a specific time period, a proposed VCS project activity achieved the reductions in anthropogenic emissions by sources of GHGs as verified.

The objective of this verification/certification is to verify and certify pre-registration emission reductions, reported for the “Nansha Hydro Power Project in Yunnan Province China” project in China for the period 28/12/2007 to 11/01/2009 (pre-CDM registration).

1.2 Scope and Criteria

The verification scope is:

- to verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan;
- to evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement;
- to verify that reported GHG emission data is sufficiently supported by evidence.

Verification shall ensure that reported emission reductions are complete and accurate in accordance with applicable UNFCCC criteria for CDM and VCS in order to be certified.

UNFCCC criteria for CDM refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, and the subsequent decisions by the CDM Executive Board.

The VCS criteria refer to VCS Standard: VCS Version 3 and VCS Programme Guidelines: VCS Version 3.

As the VCS recognizes the CDM as a GHG Program that meets its VCU Verification Criteria, this verification report thus only addresses VCS specific and unique criteria in terms of project design, applicability to the adopted methodology and additionality that have not been so far addressed in the Validation Report as per CDM requirements.

Verification is not meant to provide any consultancy towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the monitoring.

1.3 Level of assurance

All the revisions of the verification report before being submitted to the client were subjected to an independent internal technical review to confirm that all verification activities had been completed according to the pertinent RINA instructions.

The technical review was performed by a technical reviewer(s) qualified in accordance with RINA's qualification scheme for VCS and CDM validation and verification.

The verification team and the technical reviewers consist of the following personnel:

Role	Last Name	First Name	Country
Team Leader Verifier	TONG	Yan	China
Training Team leader and Verifier	ZHENG	Xia	China
Verifier	XU	Li	China
Technical Expert	RAN	Fanlin	China
Technical Reviewer	ZHOU	Jun	China

1.4 Summary Description of the Project

The purpose of the proposed project is to sufficiently utilize the water energy resources of the Honghe River to generate electricity, which is delivered to the South China Power Grid (SCPG). All the electricity supplied by the proposed project to the grid substitutes the equivalent electricity of SCPG, which is dominated by fossil-fuel fired power plants, to avoid GHG emissions.

The proposed project is a newly-built hydropower project involves the installation of total capacity of 150MW power plant (3 sets of water turbines and generators with unit capacity 50MW). The proposed project is a run-of-river station with water diversion and a new dam reservoir. It is estimated that the net electricity supplied to the grid by the proposed project is 616,314MWh annually, which generates emission reductions of total 519,768tCO₂e as estimated in the CDM PDD. The project also contributes to sustainable development of the local community with environmental and economic benefits. The project is located on Honghe River in Honghe Hani and Yi Autonomous State, Yunnan Province, People's Republic of China.

The main information of the CDM project is summarized in the table below.

Project Participant(s)	Honghe Guangyuan Hydro Power Development Co.Ltd		
Project Title	Nansha Hydro Power Project in Yunnan Province China		
Location of the project	Honghe River in Honghe Hani and Yi Autonomous State, Yunnan Province, People's Republic of China		
Methodology(ies)	ACM0002, version 06, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" of 12/05/2006		
Sectoral Scope(s)	01	RINA's Technical Area(s)	1.2
Registered PDD	Revision 02 of 25/07/2008		
Date of CDM registration	12/01/2009	CDM Registration Reference N°	2133
Starting date of the crediting period	12/01/2009		
Project's crediting period	12/01/2009 to 11/01/2016		
Project documentation link	http://cdm.unfccc.int/Projects/DB/TUEV-SUED1218613554.96/view		

2 VALIDATION PROCESS, FINDINGS AND CONCLUSION

2.1 Validation Process

Method and Criteria: Validation was conducted using RINA procedures in line with the requirements specified in the VCS Standard, i.e. VCS Version 3 Requirements Document, v3.2 of 01/02/2012

Document Review: The VCS Project Description, version 01 of 22/05/2012 /a/, was assessed as part of the validation. The following table lists the documentation that was reviewed during the validation.

/a/	GUIZHOU PHENIX LOW-CARBON CONSULTING CO.,LTD: VCS Project Description (PD) for project activity "Nansha Hydro Power Project in Yunnan Province China" in China, version 01 of 22/05/2012
/b/	CDM Executive Board: ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 06 of 12/05/2006
/c/	Beijing Haohua Rivers International Water Engineering Consulting Co. Ltd.: Registered CDM PDD Nansha Hydro Power Project in Yunnan Province China, in China, version 02 of 25/07/2008 Linkage: UNFCCC website http://cdm.unfccc.int/Projects/DB/TUEV-SUED1218613554.96/view , English language and retrieved on 18/04/2012
/d/	VCSA, VCS Standard: VCS Version 3 Requirements Document, version 3.1 of 15/07/2011 and version 3.2 of 01/02/2012
/e/	VCSA, VCS Program Guide: VCS Version 3 Requirements Document, version 3.3 of 01/05/2012
/f/	VCSA: Registration and Issuance Process: VCS Version 3 Procedural Document, version 3.3 of 01/05/2012
/g/	VCSA: Program Definitions: VCS Version 3 Requirements Document, version 3.3 of 01/05/2012
/h/	VCSA: VCS Project Description Template, version 3.0 of 08/03/2011
/i/	Honghe Guangyuan Hydro Power Development Co.Ltd, Operation Records on the commissioning of the electricity generation, dated 28/12/2007, 17/06/2008 and 16/08/2008
/j/	Honghe Guangyuan Hydro Power Development Co.Ltd and Yunnan Grid Company, Power Purchase Agreement for Year 2008, dated on 08/04/2008
/k/	TÜV SÜD Industrie Service GmbH: Validation Report for project activity "Nansha Hydro Power Project in Yunnan Province China" in China, Project Reference 1053560, version 5 of 07/08/2008
/l/	Honghe Guangyuan Hydro Power Development Co.Ltd, Business Licence, valid period from 13/01/2004 to 31/12/2016
/m/	China National Development and Reform Committee (NDRC), Project Approval of "Nansha Hydro Power Project in Yunnan Province China", dated on 25/05/2006
/n/	China NDRC, Letter of Approval for "Nansha Hydro Power Project in Yunnan Province China" As a Clean Development Mechanism Project by National Development and Reform Commission of the People's Republic of China, dated on 27/07/2007

Interviews: The key personnel interviewed and the main topics of the interviews are summarized in the table below.

	Date	Name and Role	Organization	Topic
1	05/04/2012	Xiaoqing YANG, Safety Manager	Honghe Guangyuan Hydro Power Development Co.Ltd	Project description, evidences for proof of title, Monitoring plan, ownership of GHG emission reductions, Project Start Date, Commercially Sensitive Information, Other Programs
2	05/04/2012	Zhanwen ZHOU, Power Section Manager	Honghe Guangyuan Hydro Power Development Co.Ltd	Project description, evidences for proof of title, Monitoring plan, ownership of GHG emission reductions, Project Start Date, Commercially Sensitive Information, Other Programs
3	05/04/2012	Junhong MIAO, Financial Expert	Honghe Guangyuan Hydro Power Development Co.Ltd	Project description, evidences for proof of title, Monitoring plan, ownership of GHG emission reductions, Project Start Date, Commercially Sensitive Information, Other Programs
4	05/04/2012	Keye SHEN, Technical Director	GUIZHOU PHENIX LOW-CARBON CONSULTING CO.,LTD	Project description, evidences for proof of title, Monitoring plan, ownership of GHG emission reductions, Project Start Date, Commercially Sensitive Information, Other Programs

Site Inspections: On 05/04/2012, RINA visited the project site on Honghe River in Honghe Hani and Yi Autonomous State, Yunnan Province, People's Republic of China. During the on-site assessment of the project RINA assessed the implementation and operation of the proposed project activity, accessed the installed equipment directly, interviewed key personnel of the plant to confirm the operation information, the Project Start Date, the GHG Programs undertaken.

Resolution of Any Material Discrepancy: The objective of this phase of the validation is to resolve any outstanding issues which need to be clarified for RINA's positive conclusion on the project description. To guarantee transparency any findings raised regarding to the validation are incorporated in the this report.

2.2 Validation Findings

2.2.1 Gap Validation

In accordance with the requirements of section 3.12.8 of VCS Standard, v3.2, RINA performed a gap validation for the project to confirm its compliance with the VCS rules, as the proposed project activity has been registered (UNFCCC Ref. No. 2133) /c/ under an approved GHG program – CDM program under Kyoto Protocol.

Sectoral Scope and Project Type:

According to the VCS Version 3 Requirements Document, and the list of Sectoral Scopes of the UNFCCC, and confirmed by review of the registered CDM PDD /c/ and the applied CDM methodology ACM0002 /b/, there is no additional instances of the project activity added subsequent to the project validation, hence the project is not a grouped project and is applicable under the following sectoral scope:

- Sectoral Scope 01: Energy industries (renewable-/non-renewable sources)

Project Proponent:

The Project Proponents are Honghe Guangyuan Hydro Power Development Co.Ltd as the project owner from China.

Project Start Date and Project Crediting Period:

The start date of the project activity was on 28/12/2007 when the project plant started commissioning for the first set of turbine and generator and connected to the grid for electricity generation according to the operation records on site /i/. The date represents the date from which the emissions reductions under VCS will be claimed. And the CDM emission reduction start date was on the date of CDM registration, i.e. 12/01/2009 /c/. Therefore RINA confirmed that the project crediting period for VCS verification is from 28/12/2007 to 11/01/2012.

The start date of this monitoring period is 28/12/2007 which is the project start date and the end date of this monitoring period is 11/01/2009 which is prior to the CDM crediting period. RINA thus confirmed that the monitoring period for VCS verification is within the valid crediting period under VCS regulation /d/.

Based on the information above, RINA confirmed that the period from the project start date 28/12/2007 to the registration date of the CDM project 12/01/2009 is within two years and therefore confirmed the CDM validation has been completed within two years of the project start date. Furthermore, through the UNFCCC website information in relation to the project activity /c//k/, the registered validation report was issued on 07/08/2008, which is before 19/11/2008. Therefore RINA confirmed that the completion of project validation fully satisfied the requirement of section 3.8.2 of VCS Standard: VCS Version 3 Requirements Document, version 3.2 of 01/02/2012 and the criteria iii) of a) of section 4.1.5 of Registration and Issuance Process: VCS Version 3, v3.3 /f/.

Project Scale and Estimated GHG Emission Reductions or Removals:

The proposed project activity was categorized as Project, since the estimated average annual GHG emission reductions is 519,768tCO₂e, which is less than 1,000,000tCO₂e per year as per the registered CDM PDD /c/.

Project Location:

The project is located on Honghe River in Honghe Hani and Yi Autonomous State, Yunnan Province, People's Republic of China. The geographic coordinates of the project is 102°51'21" east longitude and 23°13'46" north latitude. This has been crosschecked by GPS measures during site visit.

The project boundary has been identified in the registered CDM PDD /c/ as the geographical extent project boundary of the project, consisting of the project site and all power plants connected physically to the electricity system that the project power plant is connected to, i.e. SCPG. The physical site visit confirmed that the project boundary in place is consistent with the registered CDM PDD /c/ and the registered validation report /k/.

Conditions Prior to Project Initiation:

Prior to the proposed project initiation, the electricity consumed was imported from the SCPG, which is dominated by fossil fuel-fired power plants. These conditions have been validated by the validation DOE in the registered CDM validation report /k/.

Ownership and Other Programs:

Proof of Title: The owner of the emission reductions generated by the proposed project is Honghe Guangyuan Hydro Power Development Co, Ltd. It is verified that the project participant Honghe Guangyuan Hydro Power Development Co.Ltd had obtained all relevant permits for operating the project including the business license of the project owner (Honghe Guangyuan Hydro Power Development Co.Ltd) /l/, the approval of the project by Government /m/, Letter of Approval (LoA) for CDM issued by the Chinese DNA /n/ and the Power Purchase Agreement with the Grid Company /j/. It was thus confirmed that Honghe Guangyuan Hydro Power Development Co.Ltd possesses the ownership that allows the implementation of the project, including the plants, equipments and the process that generate the emission reductions.

Emissions Trading Programs and Other Binding Limits: The project activity contributes to reductions in CO₂ emissions by displacing electricity generation based on fossil fuels in the South China Power Grid (SCPG). It was confirmed by the PP that no rejection was received by other GHG programs as per on-site interview. The CDM Program is a GHG program approved by the VCS program. Emission reductions since the CDM registration date will be claimed by PP as CERs under the CDM program in accordance with the LoA issued by Chinese DNA /n/. Therefore RINA confirmed that the GHG emission reductions generated by the project have not and will not be used in the emissions trading program or for the purposed of demonstrating compliance with the binding limits that are in place in that jurisdiction or sector.

The proposed project activity has been registered under CDM programs of Kyoto Protocol. The registration number is 2133 with registration date 12/01/2009 /c/. There is no other form of GHG-related environmental credit generated by the proposed project activity.

Eligibility Criteria, Leakage Management, Commercially Sensitive Information:

As confirmed above, the project activity is not a grouped project, the eligibility criteria is not applicable to the project.

No leakage is applicable under the applied methodology ACM0002 /b/ for the project since the main emissions potentially giving rise to leakage in the context of hydropower projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use which are neglected and this is in accordance with the registered CDM PDD/c/, therefore no leakage management is considered.

All information in the project documents is available for the public review, as claimed by PP in the VCS Project Description /a/.

2.2.2 Methodology Deviations

There is no methodology deviations applied to the project.

2.2.3 New Project Activity Instances

N/A

2.3 Validation Conclusion

RINA is of opinion that the proposed project activity conforms with the validation criteria for projects, as set out in VCS Version 3.

3 VERIFICATION PROCESS

3.1 Method and Criteria

Verification was conducted using RINA procedures in line with the requirements specified in the VCS Requirements, CDM M&P, the latest version of the CDM Validation and Verification Manual, and relevant decisions of the COP/MOP and the CDM EB and applying standard auditing techniques.

The verification consisted of the following three phases:

- Document review;
- On-site assessment including Interviews and Site Inspections;
- Resolution of Any Material Discrepancy and the issuance of the final verification report and certification.

The following sections outline each step in more detail.

3.2 Document Review

The VCS monitoring report (MR), version 01 of 21/03/2012, version 02 of 22/05/2012 and version 03 of 10/07/2012 /01/, the emission reduction calculations provided in the form of a spreadsheet, "ER Calculation Nansha" version 01 of 21/03/2012 (ERCS) /02/, were assessed as part of the verification. In addition the registered Project Design Document (CDM PDD) /06/ in particular the baseline estimations and the monitoring plan, and the registered CDM validation report, version 5 of 07/08/2008 /07/ for the project were reviewed.

The following table lists the documentation that was reviewed during the verification.

/01/	GUIZHOU PHENIX LOW-CARBON CONSULTING CO.,LTD: VCS Monitoring report (MR) for project activity "Nansha Hydro Power Project in Yunnan Province China" in China, version 01 of 21/03/2012, version 02 of 22/05/2012 and version 03 of 10/07/2012 related to the monitoring period 28/12/2007 to 11/01/2009
/02/	GUIZHOU PHENIX LOW-CARBON CONSULTING CO.,LTD: VCS ER calculation Sheet for Nansha Hydro Power Project in Yunnan Province China, "ER Calculation Nansha" (ERCS) version 01 of 21/03/2012 related to the monitoring period 28/12/2007 to 11/01/2009
/03/	CDM Executive Board: ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 06 of 12/05/2006
/04/	CDM Executive Board: Tool for the demonstration and assessment of additionality. version 05.2 of 26/08/2008
/05/	CDM Executive Board: Validation and Verification Manual, version 01.2 of 30/07/2010
/06/	Beijing Haohua Rivers International Water Engineering Consulting Co. Ltd.: Registered CDM PDD Nansha Hydro Power Project in Yunnan Province China, in China, version 02

	of 25/07/2008 Linkage: UNFCCC website http://cdm.unfccc.int/Projects/DB/TUEV-SUED1218613554.96/view , English language and retrieved on 18/04/2012
/07/	TÜV SÜD Industrie Service GmbH: Validation Report for project activity “Nansha Hydro Power Project in Yunnan Province China” in China, Project Reference 1053560, version 5 of 07/08/2008
/08/	VCSA, VCS Standard: VCS Version 3 Requirements Document, version 3.2 of 01/02/2012
/09/	VCSA, VCS Program Guide: VCS Version 3 Requirements Document, version 3.3 of 01/05/2012
/11/	VCSA: Registration and Issuance Process: VCS Version 3 Procedural Document, version 3.3 of 01/05/2012
/12/	VCSA: Program Definitions: VCS Version 3 Requirements Document, version 3.3 of 01/05/2012
/13/	VCSA: VCS Project Description Template, version 3.0 of 08/03/2011
/14/	Economic and Trade Commission of P.R. China, DL/T448-2000 Technical administrative code of electric energy metering, dated 03/11/2000
/15/	Honghe Guangyuan Hydro Power Development Co.Ltd, Business Licence, valid period from 13/01/2004 to 31/12/2016
/16/	China National Development and Reform Committee (NDRC), Project Approval of “Nansha Hydro Power Project in Yunnan Province China”, dated on 25/05/2006
/17/	China NDRC, Letter of Approval for “Nansha Hydro Power Project in Yunnan Province China” As a Clean Development Mechanism Project by National Development and Reform Commission of the People's Republic of China, dated on 27/07/2007
/18/	Honghe Guangyuan Hydro Power Development Co.Ltd, Operation Records on the commissioning of the electricity generation, dated 28/12/2007, 17/06/2008 and 16/08/2008
/19/	Honghe Guangyuan Hydro Power Development Co.Ltd, Parameter Nameplates of the main equipment Water Turbines and Generators, visited on site on 05/04/2012
/20/	Electric Power Research Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd, Verification Certificate (No. 2007N-28364) of Meter (M1 with Serial No. 206659001), (No. 2007N-28366) of Meter (M3 with Serial No. 206659280), dated on 19/10/2007 and valid date to 18/10/2012
/21/	Electric Power Research Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd, Verification Certificate (No.2007N-28367) of Meter (M2 with Serial No. 206659630), (No. 2007N-28365) of Meter (M4 with Serial No. 206659002), dated on 19/10/2007 and valid date to 18/10/2012
/22/	China National Accreditation Service for Conformity Assessment, Quality Certificate for Electric Power Research Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd, CNAS L3356, date of first conformity 04/02/2008 and updated on 28/04/2011
/23/	Zhujiang Water Resource Protection Science Institute, Measurement of the area of the reservoir for “Nansha Hydro Power Project in Yunnan Province China”, dated on 07/12/2007
/24/	Honghe Guangyuan Hydro Power Development Co.Ltd, Meter Reading Records, Electricity Trading Notes and Sales Invoices, monthly from 12/2007 to 01/2009
/25/	Honghe Guangyuan Hydro Power Development Co.Ltd and Yunnan Grid Company, Power Purchase Agreement for Year 2008, dated on 08/04/2008
/26/	Honghe Guangyuan Hydro Power Development Co.Ltd, CDM Monitoring and Management Manual, version 01 and dated on 28/10/2008

/27/	Honghe Guangyuan Hydro Power Development Co.Ltd, CDM Training Records, dated during 25/10/2007-29/10/2007
/28/	Website information, historical rainfall in Yunnan Province, http://www.docin.com/p-349193089.html http://www.ynf.gov.cn/ynczt_model/article.aspx?id=866458 http://www.ynswj.gov.cn/article_show.asp?ID=649 http://www.ynswj.gov.cn/article_show.asp?ID=652 , Chinese language and retrived on 16/07/2012
/29/	Zhongshui Zhujiang Survey and Design Co., Ltd., Statistics about the runoff in 2008 from Yuanjiang and Manhao hydrometric station, dated on 13/07/2012
/30/	Bureau Veritas Cerification, CDM verification report revision No. 01 covering CDM monitoring period 12/01/2009-31/03/2009, dated on 20/08/2009 http://cdm.unfccc.int/Projects/DB/TUEV-SUED1218613554.96/Process/BVQI1246619572.31/view CER issuance information for the CDM project activiity: http://cdm.unfccc.int/Projects/DB/TUEV-SUED1218613554.96/view

3.3 Interviews

The key personnel interviewed and the main topics of the interviews are summarized in the table below.

	Date	Name and Role	Organization	Topic
/a/	05/04/2012	Xiaoqing YANG, Safety Manager	Honghe Guangyuan Hydro Power Development Co.Ltd	Project activity description, Quality control and quality assurance procedures, Monitoring equipments, Calibration, Monitoring Procedures and records
/b/	05/04/2012	Zhanwen ZHOU, Power Section Manager	Honghe Guangyuan Hydro Power Development Co.Ltd	Project activity description, Quality control and quality assurance procedures, Monitoring equipments, Calibration, Monitoring Procedures and records
/c/	05/04/2012	Junhong MIAO, Financial Expert	Honghe Guangyuan Hydro Power Development Co.Ltd	Project activity description, Quality control and quality assurance procedures, Monitoring equipments, Calibration, Monitoring Procedures and records
/d/	05/04/2012	Keye SHEN, Technical Director	GUIZHOU PHENIX LOW-CARBON CONSULTING CO.,LTD	Project activity description, Quality control and quality assurance procedures, Monitoring equipments, Calibration, Monitoring Procedures and records

3.4 Site Inspections

On 05/04/2012, RINA visited the hydropower plant of Honghe Guangyuan Hydro Power Development Co.Ltd, which is situated on Honghe River in Honghe Hani and Yi Autonomous State, Yunnan Province, People's Republic of China. During the on-site assessment of the project RINA assessed the implementation and operation of the proposed project activity, accessed the installed equipment directly, reviewed the information flows for generating, aggregating and reporting the monitoring parameters, interviewed key personnel of the plant to confirm the operational and data collection procedures, cross-checked between information provided in the monitoring report and data plant, checked the monitoring equipment including calibration performance, reviewed calculations and assumptions made in determining the GHG data and emission reductions, checked the quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

3.5 Resolution of Any Material Discrepancy

The objective of this phase of the verification is to resolve any outstanding issues which need to be clarified for RINA's positive conclusion on the monitoring report and emission reductions. To guarantee transparency a verification protocol has been customized for the project. The protocol shows in a transparent manner the requirements, means of verification and the results from verifying the identified criteria.

A corrective action request (CAR) is raised if one of the following occurs:

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

A clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A forward action request (FAR) is raised during verification for actions if the monitoring and reporting require attention and/or adjustment for the next monitoring period.

In summary for the project, 1 Corrective Action Requests (CARs) and 2 Clarification Requests (CLs) were identified related to the monitoring, implementation or operations of the proposed VCS project activity (Monitoring Report version 01 of 21/03/2012) and these CARs and CLs are successfully closed after necessary corrections/clarifications by the client as following:

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Verification Conclusion
CAR 1 <i>The value of the parameters $EG_{PJ \text{ to } SCPG,y} / EG_{SCPG \text{ to } PJ,y}$ were not reported in the tables in section 3.2 of VCS MR.</i>	B.3.1	<i>The value of the parameters $EG_{PJ \text{ to } SCPG,y} / EG_{SCPG \text{ to } PJ,y}$ were added into the tables in section 3.2 of MR</i>	The value of the parameters were correctly reported in tables in section 3.2 of MR, which was consistent with the monitoring records. Hence CAR1 is closed.
CL 1 <i>The information of implementation, i.e. the date of construction 18/07/2006 was not substantiated.</i> <i>The CDM registration date reported in MR (11/01/2009) for the project activity is not consistent with the CDM project information on UNFCCC site (12/01/2009).</i>	A.2	The construction permit was provided. The CDM registration date in MR has revised to be consistent with the information on UNFCCC site.	The construction start order was provided and it indicated clearly that the project starts construction on 18/07/2006. The registration date was corrected to be 12/01/2009 which is consistent with the information of the CDM project activity on UNFCCC website. Hence CL1 is closed.
CL 2 <i>The backup meters (M5, M6, M7) were included in the monitoring equipment as per the registered monitoring plan in PDD. PP is requested to clarify whether the backup meters (M5, M6, M7) were calibrated and provide the calibration records if any.</i>	B.3.3	the certification of meters (M5,M6,M7) was provided with attachment According to the section 3.3 in MR, the backup meters (M5,M6,M7) are installed at the outlets of the three generators inside the proposed project, they are not related to the monitoring of the electricity exchange with the grid. In actual fact only the meters (M1,M2,M3,M4) involved monitoring of the parameters. The calibration of the meters (M5,M6,M7) will not affect the emission reduction calculation.	As confirmed by physical site visit, the three meters have been inspected in 10/2007 before installation. PP could not provide the calibration of the three meters covering the proposed monitoring period. This is noted as deviation of monitoring in this report. RINA checked the CDM verification report revision No. 01 issued by Bureau Veritas Certification on 20/08/2009 /30/, which was issued on 04/11/2009, and found the same situation. As assessed in CDM verification report, the calibration of meters were agreed in the signed PPA between the project developer and the grid company and PPA did not require the calibration of the three meters M5, M6 and M7 which was out of PP's control. Considering the meters M1, M2, M3, M4 were well operated and calibrated and the calibration validity covered the VCS monitoring period, RINA is of opinion that the electricity import and export were correctly and completely monitored. the calibration of meters M5, M6, M7 would not affect the monitoring. Hence CL2 is closed.

4 VERIFICATION FINDINGS

The findings of the verification related to the monitoring period from 28/12/2007 to 11/01/2009 as documented and described in the VCS monitoring report version 01 of 05/04/2012, version 02 of 22/05/2012 and version 03 of 10/07/2012 /01/ are stated in the following sections. The verification requirements, the means of verification and the results from verifying the identified criteria are documented in more detail in the verification protocol in Appendix A.

4.1 Project Implementation Status

RINA confirmed that the project implementation is in line with the description in registered CDM PDD /06/ by site visit. RINA performed a physical site visit on 05/04/2012 to verify the actual implementation of the project against the description in its registered CDM PDD /06/ and found that: 3 sets of turbines and generators of 50MW unit capacity with a total installed capacity of 150MW have been put into operation, which is in line with the registered PDD /06/. Other facilities and equipment as mentioned in the registered PDD are also in place and operated by the PP in line with the description in the registered PDD. The project started commissioning of the first set of turbine and generator on 28/12/2007 /18/ before CDM registration; the second one was commissioned on 17/06/2008 and the third one was commissioned on 16/08/2008 as per the operation records on the site /18/. All the generators and other equipment were in normal operation at the time of the physical site visit by RINA. Crosschecking with the nameplates of the equipment, the model of the water turbines is HL-LJ-420 and the model of the generators is SF50-52/9200 and the technical information of the equipment was consistent with that described in registered PDD. The project is connected to the power grid SCPG as per the signed power purchase agreement with the grid company /25/. 7 bidirectional electricity meters (including the gateway meters and backup meters) were installed at the project site, used for measuring the electricity supplied to and imported from the grid. These implementations are in line with the description in registered PDD /06/. The description in MR Version 03 /01/ is also consistent with the actual implementation confirmed as above. Therefore RINA confirmed that there is no material discrepancy between the actual project information and the project description.

Based on the review of registered CDM validation report /07/, no FAR was raised during the validation and/or no FAR to be addressed during previous verification since this is the only one Pre-CDM VCS verification before the CDM crediting period.

4.2 Accuracy of GHG Emission Reduction or Removal Calculations

Emission Reductions Calculation:

According to the applied methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 06 of 12/05/2006 /03/ and the registered PDD /06/, the emission reductions have been calculated based on the following formula:

Emission Reductions:

$$ER_y = BE_y - PE_y - L_y$$

Where:

ER_y is the emission reductions in year y ;

BE_y is the baseline emissions in year y ;

PE_y is the project emissions in year y ;

L_y is the leakage in year y ;

Baseline emissions:

$$BE_y = EG_y \times EF_y$$

Where:

EG_y is the quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y ;

EF_y is the combined margin CO₂ emission factor of SCPG in year y .

Project emissions:

According to the ACM0002 version 06 /03/ and the registered PDD /06/, the project emissions PE_y is regarded as ZERO since the power density of the project is 16.8W/m² /23/, larger than 10W/m².

Leakage emissions:

No leakage is applicable under this methodology and in accordance with the registered PDD /06/.

RINA was able to confirm that the methodology for determining emission reductions is in line with the applied methodology ACM0002 version 06 /03/ and the registered PDD /06/.

Parameters available at Validation and Data Fixed Ex-ante:

The following parameters were available at validation as per the registered CDM PDD /06/ and the validation report /07/:

DATA/ PARAMETER	Source of data	Reported value for the project period	Assessment/Observation
$EF_{\text{grid,CM,y}}$	Registered PDD /06/	0.84335tCO ₂ /MWh	This is an ex-ante fixed value for the crediting period as per the registered PDD /06/.

Parameters and Data Monitored:

DATA/PARAMETER	EG _{PJ} to SCPG,y																																								
Data Unit	MWh																																								
Description	Quantity of electricity supplied by the project to the grid in year y																																								
Source of data to be used	Monitoring records from the power meter.																																								
Value data for the monitoring period	567,450.07																																								
Measuring frequency	Continuously.																																								
Reporting frequency and recording procedure	The electricity is measured continuously and recorded every month. The data is aggregated monthly and yearly. The project owner and the grid company jointly recorded the readings on the last day of every month as per the meter reading records /24/; the data notes was issued by the grid company and confirmed by the project owner and then invoices were issued for electricity trade.																																								
Type of monitoring equipment	<table border="1"> <tr><td>Meter</td><td>M1 (Main meter)</td></tr> <tr><td>Type/Model</td><td>Mk6E</td></tr> <tr><td>Manufacturer</td><td>EDMI Limited</td></tr> <tr><td>SN</td><td>206659001</td></tr> <tr><td>Accuracy</td><td>0.2S</td></tr> </table> <table border="1"> <tr><td>Meter</td><td>M2 (Main meter)</td></tr> <tr><td>Type/Model</td><td>Mk6E</td></tr> <tr><td>Manufacturer</td><td>EDMI Limited</td></tr> <tr><td>SN</td><td>206659630</td></tr> <tr><td>Accuracy</td><td>0.2S</td></tr> </table> <table border="1"> <tr><td>Meter</td><td>M3 (backup meter)</td></tr> <tr><td>Type/Model</td><td>Mk6E</td></tr> <tr><td>Manufacturer</td><td>EDMI Limited</td></tr> <tr><td>SN</td><td>206659280</td></tr> <tr><td>Accuracy</td><td>0.2S</td></tr> </table> <table border="1"> <tr><td>Meter</td><td>M4 (backup meter)</td></tr> <tr><td>Type/Model</td><td>Mk6E</td></tr> <tr><td>Manufacturer</td><td>EDMI Limited</td></tr> <tr><td>SN</td><td>206659002</td></tr> <tr><td>Accuracy</td><td>0.2S</td></tr> </table>	Meter	M1 (Main meter)	Type/Model	Mk6E	Manufacturer	EDMI Limited	SN	206659001	Accuracy	0.2S	Meter	M2 (Main meter)	Type/Model	Mk6E	Manufacturer	EDMI Limited	SN	206659630	Accuracy	0.2S	Meter	M3 (backup meter)	Type/Model	Mk6E	Manufacturer	EDMI Limited	SN	206659280	Accuracy	0.2S	Meter	M4 (backup meter)	Type/Model	Mk6E	Manufacturer	EDMI Limited	SN	206659002	Accuracy	0.2S
Meter	M1 (Main meter)																																								
Type/Model	Mk6E																																								
Manufacturer	EDMI Limited																																								
SN	206659001																																								
Accuracy	0.2S																																								
Meter	M2 (Main meter)																																								
Type/Model	Mk6E																																								
Manufacturer	EDMI Limited																																								
SN	206659630																																								
Accuracy	0.2S																																								
Meter	M3 (backup meter)																																								
Type/Model	Mk6E																																								
Manufacturer	EDMI Limited																																								
SN	206659280																																								
Accuracy	0.2S																																								
Meter	M4 (backup meter)																																								
Type/Model	Mk6E																																								
Manufacturer	EDMI Limited																																								
SN	206659002																																								
Accuracy	0.2S																																								

	<table><tr><td>Meter</td><td>M5 (backup meter)</td></tr><tr><td>Type/Model</td><td>DTSD341</td></tr><tr><td>Manufacturer</td><td>Changsha Weisheng</td></tr><tr><td>SN</td><td>20070940010005</td></tr><tr><td>Accuracy</td><td>0.5S</td></tr></table> <table><tr><td>Meter</td><td>M6 (backup meter)</td></tr><tr><td>Type/Model</td><td>DTSD341</td></tr><tr><td>Manufacturer</td><td>Changsha Weisheng</td></tr><tr><td>SN</td><td>20070940010006</td></tr><tr><td>Accuracy</td><td>0.5S</td></tr></table> <table><tr><td>Meter</td><td>M7 (backup meter)</td></tr><tr><td>Type/Model</td><td>DTSD341</td></tr><tr><td>Manufacturer</td><td>Changsha Weisheng</td></tr><tr><td>SN</td><td>20070940010007</td></tr><tr><td>Accuracy</td><td>0.5S</td></tr></table>	Meter	M5 (backup meter)	Type/Model	DTSD341	Manufacturer	Changsha Weisheng	SN	20070940010005	Accuracy	0.5S	Meter	M6 (backup meter)	Type/Model	DTSD341	Manufacturer	Changsha Weisheng	SN	20070940010006	Accuracy	0.5S	Meter	M7 (backup meter)	Type/Model	DTSD341	Manufacturer	Changsha Weisheng	SN	20070940010007	Accuracy	0.5S
Meter	M5 (backup meter)																														
Type/Model	DTSD341																														
Manufacturer	Changsha Weisheng																														
SN	20070940010005																														
Accuracy	0.5S																														
Meter	M6 (backup meter)																														
Type/Model	DTSD341																														
Manufacturer	Changsha Weisheng																														
SN	20070940010006																														
Accuracy	0.5S																														
Meter	M7 (backup meter)																														
Type/Model	DTSD341																														
Manufacturer	Changsha Weisheng																														
SN	20070940010007																														
Accuracy	0.5S																														
Is accuracy of the monitoring equipment as stated in the PDD?	The accuracy of the meters is in line with that indicated in the registered monitoring plan /06/.																														
Calibration frequency/interval	<table><tr><td>Meter</td><td>M1</td></tr><tr><td>Calibration Entity</td><td>Electric Power Research Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd /20//21/</td></tr><tr><td>Calibration date</td><td>19/10/2007</td></tr><tr><td>Calibration Standard</td><td>JJG 596-1999</td></tr><tr><td>Validity period</td><td>19/10/2007-18/10/2012</td></tr></table> <table><tr><td>Meter</td><td>M2</td></tr><tr><td>Calibration Entity</td><td>Electric Power Research Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd /20//21/</td></tr><tr><td>Calibration date</td><td>19/10/2007</td></tr><tr><td>Calibration Standard</td><td>JJG 596-1999</td></tr><tr><td>Validity period</td><td>19/10/2007-18/10/2012</td></tr></table> <table><tr><td>Meter</td><td>M3</td></tr><tr><td>Calibration Entity</td><td>Electric Power Research</td></tr></table>	Meter	M1	Calibration Entity	Electric Power Research Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd /20//21/	Calibration date	19/10/2007	Calibration Standard	JJG 596-1999	Validity period	19/10/2007-18/10/2012	Meter	M2	Calibration Entity	Electric Power Research Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd /20//21/	Calibration date	19/10/2007	Calibration Standard	JJG 596-1999	Validity period	19/10/2007-18/10/2012	Meter	M3	Calibration Entity	Electric Power Research						
Meter	M1																														
Calibration Entity	Electric Power Research Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd /20//21/																														
Calibration date	19/10/2007																														
Calibration Standard	JJG 596-1999																														
Validity period	19/10/2007-18/10/2012																														
Meter	M2																														
Calibration Entity	Electric Power Research Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd /20//21/																														
Calibration date	19/10/2007																														
Calibration Standard	JJG 596-1999																														
Validity period	19/10/2007-18/10/2012																														
Meter	M3																														
Calibration Entity	Electric Power Research																														

		Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd /20//21/
	Calibration date	19/10/2007
	Calibration Standard	JJG 596-1999
	Validity period	19/10/2007-18/10/2012
	Meter	M4
	Calibration Entity	Electric Power Research Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd /20//21/
	Calibration date	19/10/2007
	Calibration Standard	JJG 596-1999
	Validity period	19/10/2007-18/10/2012
	As confirmed by physical site visit, the three backup meters (M5, M6 and M7) have been inspected in 10/2007 before installation. PP could not provide the calibration documents for the three meters covering the proposed monitoring period. This is noted as deviation of monitoring in this report. please refer to “<u>Deviation of the Monitoring</u>” below in this section.	
Is the calibration interval in line with the monitoring plan of the PDD?	Calibration of above meters was conducted in accordance with the Chinese regulation DL/T448-2000 and in line with the registered monitoring plan. The calibration certificate /21//22/ confirmed proper functioning of monitoring equipment and valid for the whole monitoring period from 28/12/2007 to 11/01/2009	
How were the values in the monitoring report verified and cross-checked?	The electricity was monitored by meters and also supervised by the grid company as per the signed Power Purchase Agreement by the project developer with the grid company /25/. RINA has verified the data in the VCS MR /01/ and the ERCS /02/ against the records of on-site (the meter reading records), the Electricity Transaction Notes (ETNs) and the sales invoices /24/ by cross-checking and found to be correct. In conclusion, the values in the monitoring report are consistent with the site records and the value recording was in line with the registered monitoring plan and the lowest value of the records and ETNs were used in the calculation which is conservative.	
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions?	RINA has verified the data management system on the project site and confirmed that: The maintenance and calibration of this meter was in line with the registered monitoring plan and in accordance with the Chinese regulation DL/T448-	

	2000 /14/. Before this monitoring period, Meter M1, M2, M3 and M4 were verified by Electric Power Research Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd on 19/10/2007 /20//21/ and the validity was 5 years and satisfied the requirement of calibration. Therefore the maintenance and calibration of this meter is deemed appropriate. The project owner and the grid company jointly recorded the readings on the last day of every month as per the meter reading records /24/; the data notes was issued by the grid company and confirmed by the project owner and then invoices were issued for electricity trade. RINA confirmed that the data management was in line with the registered monitoring plan and ensured correct transfer of data.
If only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	All the data are available for this monitoring period.

DATA/PARAMETER	EG _{SCPG to PJ,y}																																														
Data Unit	MWh																																														
Description	Quantity of electricity imported by the project from the grid in year y																																														
Source of data to be used	Monitoring records from the power meter.																																														
Value data for the monitoring period	164.12																																														
Measuring frequency	Continuously.																																														
Reporting frequency and recording procedure	The electricity is measured continuously and recorded every month. The data is aggregated monthly and yearly. The project owner and the grid company jointly recorded the readings on the last day of every month as per the meter reading records /24/; the data notes was issued by the grid company and confirmed by the project owner and then invoices were issued for electricity trade.																																														
Type of monitoring equipment	<table border="1"> <tr><td>Meter</td><td>M1 (Main meter)</td></tr> <tr><td>Type/Model</td><td>Mk6E</td></tr> <tr><td>Manufacturer</td><td>EDMI Limited</td></tr> <tr><td>SN</td><td>206659001</td></tr> <tr><td>Accuracy</td><td>0.2S</td></tr> </table> <table border="1"> <tr><td>Meter</td><td>M2 (Main meter)</td></tr> <tr><td>Type/Model</td><td>Mk6E</td></tr> <tr><td>Manufacturer</td><td>EDMI Limited</td></tr> <tr><td>SN</td><td>206659630</td></tr> <tr><td>Accuracy</td><td>0.2S</td></tr> </table> <table border="1"> <tr><td>Meter</td><td>M3 (backup meter)</td></tr> <tr><td>Type/Model</td><td>Mk6E</td></tr> <tr><td>Manufacturer</td><td>EDMI Limited</td></tr> <tr><td>SN</td><td>206659280</td></tr> <tr><td>Accuracy</td><td>0.2S</td></tr> </table> <table border="1"> <tr><td>Meter</td><td>M4 (backup meter)</td></tr> <tr><td>Type/Model</td><td>Mk6E</td></tr> <tr><td>Manufacturer</td><td>EDMI Limited</td></tr> <tr><td>SN</td><td>206659002</td></tr> <tr><td>Accuracy</td><td>0.2S</td></tr> </table> <table border="1"> <tr><td>Meter</td><td>M5 (backup meter)</td></tr> <tr><td>Type/Model</td><td>DTSD341</td></tr> <tr><td>Manufacturer</td><td>Changsha Weisheng</td></tr> </table>	Meter	M1 (Main meter)	Type/Model	Mk6E	Manufacturer	EDMI Limited	SN	206659001	Accuracy	0.2S	Meter	M2 (Main meter)	Type/Model	Mk6E	Manufacturer	EDMI Limited	SN	206659630	Accuracy	0.2S	Meter	M3 (backup meter)	Type/Model	Mk6E	Manufacturer	EDMI Limited	SN	206659280	Accuracy	0.2S	Meter	M4 (backup meter)	Type/Model	Mk6E	Manufacturer	EDMI Limited	SN	206659002	Accuracy	0.2S	Meter	M5 (backup meter)	Type/Model	DTSD341	Manufacturer	Changsha Weisheng
Meter	M1 (Main meter)																																														
Type/Model	Mk6E																																														
Manufacturer	EDMI Limited																																														
SN	206659001																																														
Accuracy	0.2S																																														
Meter	M2 (Main meter)																																														
Type/Model	Mk6E																																														
Manufacturer	EDMI Limited																																														
SN	206659630																																														
Accuracy	0.2S																																														
Meter	M3 (backup meter)																																														
Type/Model	Mk6E																																														
Manufacturer	EDMI Limited																																														
SN	206659280																																														
Accuracy	0.2S																																														
Meter	M4 (backup meter)																																														
Type/Model	Mk6E																																														
Manufacturer	EDMI Limited																																														
SN	206659002																																														
Accuracy	0.2S																																														
Meter	M5 (backup meter)																																														
Type/Model	DTSD341																																														
Manufacturer	Changsha Weisheng																																														

	<table><tr><td>SN</td><td>20070940010005</td></tr><tr><td>Accuracy</td><td>0.5S</td></tr></table>	SN	20070940010005	Accuracy	0.5S						
	SN	20070940010005									
	Accuracy	0.5S									
	<table><tr><td>Meter</td><td>M6 (backup meter)</td></tr><tr><td>Type/Model</td><td>DTSD341</td></tr><tr><td>Manufacturer</td><td>Changsha Weisheng</td></tr><tr><td>SN</td><td>20070940010006</td></tr><tr><td>Accuracy</td><td>0.5S</td></tr></table>	Meter	M6 (backup meter)	Type/Model	DTSD341	Manufacturer	Changsha Weisheng	SN	20070940010006	Accuracy	0.5S
	Meter	M6 (backup meter)									
	Type/Model	DTSD341									
	Manufacturer	Changsha Weisheng									
	SN	20070940010006									
	Accuracy	0.5S									
	<table><tr><td>Meter</td><td>M7 (backup meter)</td></tr><tr><td>Type/Model</td><td>DTSD341</td></tr><tr><td>Manufacturer</td><td>Changsha Weisheng</td></tr><tr><td>SN</td><td>20070940010007</td></tr><tr><td>Accuracy</td><td>0.5S</td></tr></table>	Meter	M7 (backup meter)	Type/Model	DTSD341	Manufacturer	Changsha Weisheng	SN	20070940010007	Accuracy	0.5S
	Meter	M7 (backup meter)									
	Type/Model	DTSD341									
	Manufacturer	Changsha Weisheng									
	SN	20070940010007									
	Accuracy	0.5S									
	Is accuracy of the monitoring equipment as stated in the PDD?	The accuracy of the meters is in line with that indicated in the registered monitoring plan /06/.									
	Calibration frequency/interval	<table><tr><td>Meter</td><td>M1</td></tr><tr><td>Calibration Entity</td><td>Electric Power Research Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd /20//21/</td></tr><tr><td>Calibration date</td><td>19/10/2007</td></tr><tr><td>Calibration Standard</td><td>JJG 596-1999</td></tr><tr><td>Validity period</td><td>19/10/2007-18/10/2012</td></tr></table>	Meter	M1	Calibration Entity	Electric Power Research Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd /20//21/	Calibration date	19/10/2007	Calibration Standard	JJG 596-1999	Validity period
Meter	M1										
Calibration Entity	Electric Power Research Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd /20//21/										
Calibration date	19/10/2007										
Calibration Standard	JJG 596-1999										
Validity period	19/10/2007-18/10/2012										
<table><tr><td>Meter</td><td>M2</td></tr><tr><td>Calibration Entity</td><td>Electric Power Research Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd /20//21/</td></tr><tr><td>Calibration date</td><td>19/10/2007</td></tr><tr><td>Calibration Standard</td><td>JJG 596-1999</td></tr><tr><td>Validity period</td><td>19/10/2007-18/10/2012</td></tr></table>	Meter	M2	Calibration Entity	Electric Power Research Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd /20//21/	Calibration date	19/10/2007	Calibration Standard	JJG 596-1999	Validity period	19/10/2007-18/10/2012	
Meter	M2										
Calibration Entity	Electric Power Research Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd /20//21/										
Calibration date	19/10/2007										
Calibration Standard	JJG 596-1999										
Validity period	19/10/2007-18/10/2012										
<table><tr><td>Meter</td><td>M3</td></tr><tr><td>Calibration Entity</td><td>Electric Power Research Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd /20//21/</td></tr><tr><td>Calibration date</td><td>19/10/2007</td></tr></table>	Meter	M3	Calibration Entity	Electric Power Research Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd /20//21/	Calibration date	19/10/2007					
Meter	M3										
Calibration Entity	Electric Power Research Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd /20//21/										
Calibration date	19/10/2007										

	Calibration Standard	JJG 596-1999
	Validity period	19/10/2007-18/10/2012
	Meter	M4
	Calibration Entity	Electric Power Research Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd /20//21/
	Calibration date	19/10/2007
	Calibration Standard	JJG 596-1999
	Validity period	19/10/2007-18/10/2012
	As confirmed by physical site visit, the three backup meters (M5, M6 and M7) have been inspected in 10/2007 before installation and the calibration was conducted on 30/09/2009 and valid for 5 years as per the certificates provided /20//21/. PP could not provide the calibration documents for the three meters. This is noted as deviation of monitoring in this report. However considering the meters M1, M2, M3, M4 were well operated and calibrated and the calibration validity covered the VCS monitoring period, also only the monitoring data from the main meters was applied in the emission reductions calculation, RINA is of opinion that the electricity import and export were correctly and completely monitored by the meters M1, M3 and the calibration of meters M5, M6, M7 is not necessary and would not affect the monitoring for this VCS monitoring period.	
	Is the calibration interval in line with the monitoring plan of the PDD?	Calibration of above meters was conducted in accordance with the Chinese regulation DL/T448-2000 and in line with the registered monitoring plan. The calibration certificate /21//22/ confirmed proper functioning of monitoring equipment and valid for the whole monitoring period from 28/12/2007 to 11/01/2009
	How were the values in the monitoring report verified and cross-checked?	The electricity was monitored by meters and also supervised by the grid company as per the signed Power Purchase Agreement by the project developer with the grid company /25/. RINA has verified the data in the VCS MR /01/ and the ERCS /02/ against the records of on-site (the meter reading records and the Electricity Transaction Notes (ETNs) /24/ by cross-checking and found to be correct. In conclusion, the values in the monitoring report are consistent with the site records and the value recording was in line with the registered monitoring plan and the lowest value of the records and ETNs were used in the calculation

Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions?	which is conservative. RINA has verified the data management system on the project site and confirmed that: The maintenance and calibration of this meter was in line with the registered monitoring plan and in accordance with the Chinese regulation DL/T448-2000 /14/. Before this monitoring period, Meter M1, M2, M3 and M4 were verified by Electric Power Research Institute of Yunnan Electric Power Test & Research Institute (Group) Co., Ltd on 19/10/2007 /20//21/ and the validity was 5 years and satisfied the requirement of calibration. Therefore the maintenance and calibration of the meters is deemed appropriate. The project owner and the grid company jointly recorded the readings on the last day of every month as per the meter reading records /24/; the data notes was issued by the grid company and confirmed by the project owner and then invoices were issued for electricity trade. RINA confirmed that the data management was in line with the registered monitoring plan and ensured correct transfer of data.
If only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	All the data are available for this monitoring period.

DATA/PARAMETER	A_{PJ}
Data Unit	m^2
Description	Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full.
Source of data to be used	Topographical surveys, maps
Value data for the monitoring period	8,930,000
Measuring frequency	Monitored once at start of the project. This frequency is in line with the registered monitoring plan.
Reporting frequency and recording procedure	The value was reported in Measurement of the area of the reservoir for the project by Zhujiang Water Resource Protection Science Institute on 07/12/2007 /23/, which is very close to the estimated value in project design and the power density calculated with this value is larger than 10W/m ² which have no impact on emission reductions..
Type of monitoring equipment	N/A
Is accuracy of the monitoring equipment as stated in the PDD?	N/A
Calibration frequency/interval	N/A
Is the calibration interval in line with the monitoring plan of the PDD?	N/A
How were the values in the monitoring report verified and cross-checked?	The value was reported by an independent third party who is qualified for the monitoring the topographical data of the local area /23/.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions?	The record of the data was documented and maintained by the project owner and will be kept for two years after the end fo the crediting period.
If only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	The data was available for this monitoring period.

Deviation of the Monitoring:

As confirmed by physical site visit, the three meters have been inspected in 10/2007 before installation. PP could not provide the calibration of the three meters covering the proposed monitoring period. This is noted as deviation of monitoring and has been reported in VCS Monitoring Report version 03 /01/. However considering the meters M1, M2, M3, M4 were well operated and calibrated and the calibration validity covered the VCS monitoring period, also only the monitoring data from the main meters (M1, M3) was applied in the emission reductions calculation, RINA is of opinion that the electricity import and export were correctly and completely monitored by the meters M1, M3. RINA checked the CDM verification report revision No. 01 issued by Bureau Veritas Certification on 20/08/2009 /30/, which was issued on 04/11/2009, and found the same situation. As assessed in CDM verification report, the calibration of meters were agreed in the signed PPA between the project developer and the grid company and PPA did not require the calibration of the three meters M5, M6 and M7. Therefore the calibration of meters M5, M6, M7 would not affect the monitoring for this VCS monitoring period.

Emission Reductions Achieved:

The emission reductions calculation reported in the VCS Monitoring Report version 03 /01/ and calculation spreadsheet ERCS version 01 /02/ have been verified to be correct. The emission reductions by the project activity for the monitoring period from 28/12/2007 to 11/01/2009 are equivalent to 478,420 tCO₂e, as reported in the VCS monitoring report version 03 /01/. The data presented in the VCS MR /01/ and ERCS /02/ was assessed by reviewing in detailed project documentation, collection of monitored data, observation of established monitoring and reporting practices and assessment of the reliability of monitoring equipment. Sufficient evidence was presented and verified by RINA for the reported emission reductions as listed in the above.

RINA compared the actual emission reductions with the estimates in the registered CDM PDD /06/ as follows:

The reported emission reductions are equivalent to 478,420 tCO₂e (on average 38,424tCO₂e per month) during the monitoring period from 28/12/2007 to 11/01/2009 (totally about 1 year and a half month). According to the registered CDM PDD /06/, the estimated emission reductions are equivalent to 519,768tCO₂e annually, on average 43,314tCO₂e per month. The reported averaged emission reductions are 11.3% lower than the estimated average emission reductions.

The VCS monitoring report compared the emission reductions when three generators were on operation from 01/09/2008 to 11/01/2009 (total 133 days) within this monitoring period which resulted that the actual emission reductions (252,276tCO₂e) were more than the estimations (189,394tCO₂e = 519,768/365d*133days). RINA has noted that the commissioning of generators was conducted one by one staged as on 28/12/2007 for the first set of turbine and generator, on 17/06/2008 for the second one and on 16/08/2008 for the third one, as per the operation records on the site /18/. For fairly comparing the emission reductions, the average emission reductions per set of generator per day was calculated in the MR /01/ based on the estimated annual emission reductions in registered PDD and resulted as 475tCO₂e per set per day (=519,768tCO₂e/365/3). Taking the actual emission reductions into consideration, the emission reductions were generated by three generators within different periods, i.e. the first generator operated in period from 28/12/2007 to 11/01/2009 (totally 381 days), the second in period from 17/06/2008 to 11/01/2009 (totally 209 days) and the third in period from 16/08/2008 to 11/01/2009 (totally 149 days). Supposing the emission reductions would be generated by one set of generator, the average emission reductions per day per set is calculated as 647tCO₂e (478,420tCO₂e/(381+209+149)days), which was 36% higher than the estimations. However this over generation would be temporary and not durative in the long-term period, which was reasonably justified in the VCS monitoring report and assessed as following:

PP demonstrated that the exceeding of the electricity generation was resulted from the rich rainfall in Yunnan province in year 2008. RINA has crosschecked the website information /28/ and found that 1) China meet the most heavy rainfall in year 2008 and in South China the rainfall increased 20%~50% according to the data from National Climate Center /28/; 2) the precipitation of Yunnan Province from 01/2008 to 04/2008 is 123.7mm, it is 21% more than the previous average level and from 05/2008 to 08/2008, the average precipitation is 749.4mm, it is 5% more than previous average level /28/. As evidenced by Zhongshui Zhujiang Survey and Design Co., Ltd., the runoff in upstream and downstream of the project plant in year 2008 is 39% more than the historical average value, due to the abundant rainfall /29/. Hence, RINA confirmed that the actual emission reductions reported during the monitoring period are reasonable due to the over-generated rainfall /06/.

Extending the assessment period from this monitoring period to the following years and comparing the actual emission reductions with estimations for the period from 01/09/2008 to 31/08/2010 taking the issued CERs into consideration, RINA found that the actual emission reductions were 678,398tCO₂e (= 252,276tCO₂e + 426,122tCO₂e CERs as per issuance published on UNFCCC website /30/), which is much lower than the estimations (1,039,536tCO₂e = 519,768tCO₂e * 2 years) as per the registered PDD. Therefore RINA confirmed that the long-term emission reductions by the project would not exceed the estimations in the registered CDM PDD /06/.

4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals

RINA reviewed all the evidences to determine GHG emission reductions during the site visit. The original monitoring records were provided in paper format that indicating monthly electricity records /24/ made by project owner internally and the value was crosschecked with the electricity transaction notes (ETNs) in paper format /24/ confirmed with stamp seals by both the project owner and the electricity buyer Yunnan Grid Company (external). The monitoring records covered the entire monitoring period from 28/12/2007 to 11/01/2009.

RINA thereby ensured that the quantity of evidences to determine GHG emission reductions are sufficient and appropriate and these evidences are reliable as crosschecked consistency. RINA is of opinion that the electricity records used in the calculation are correct.

4.4 Management and Operational System

The project activity was managed during the monitoring period in accordance with the monitoring plan as reported in MR version 03 /01/. The monitoring and reporting of all parameters are in accordance with the registered monitoring plan. The site visit confirmed that the management system for the CDM project activity is in place and can be traced, such as the organizational structure with responsibilities, monitoring procedure and monitoring management, calibration and maintenance, internal audit and competence criteria of CDM personnel involved in the CDM project, as established in the CDM Monitoring and Management Manual /26/. The QA/QC system was established, including the daily data collecting performance, the calibration procedures, the training /27/, the emergency procedures and the internal audit to ensure the ex post report and the verification performance. By verifying the site records and the interview with the relevant staffs, RINA confirm that the data management and QA/QC procedures are sufficient. The records of calibration and maintenance /20//21/, internal audit /24/ and CDM training /27/, as well as the meter reading records, the electricity transaction notes and the sales invoices /24/ were provided. A document control system was available and stored in a proper manner as per the physical site visit. The Monitored data will be kept until 2 years after the crediting period which is consistent with the requirement. Therefore RINA confirmed the suitability of the management system.

5 VERIFICATION CONCLUSION

RINA Service S.p.A (RINA) has performed verification of the emission reductions reported for the project activity "Nansha Hydro Power Project in Yunnan Province China" in China, CDM Registration Reference N° 2133, for the pre-CDM VCS monitoring period from 28/12/2007 to 11/01/2009, with regard to the relevant requirements for VCS and CDM activities. The project participants of the "Nansha Hydro Power Project in Yunnan Province China" project are responsible for:

- the preparation of greenhouses gas emissions data and the reported greenhouse gas emission reductions from the project on the basis set out in the monitoring plan contained in the registered CDM project design document version 02 of 25/07/2008
- the development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of greenhouse gas emission reductions of the project

It is the responsibility of RINA to express an independent verification opinion about the project's conformity with the requirements of paragraph 62 of the CDM modalities and procedures and on the reported greenhouse gas emission reductions from the project.

Based on documented evidence and corroborated by an on-site assessment RINA can confirm that:

- the project has been implemented and operated as per the registered CDM PDD;
- the monitoring plan in the registered CDM PDD is as per the applied baseline and monitoring methodology.
- the monitoring report and other supporting documents provided are complete and verifiable and in accordance with the applicable VCS and CDM requirements;
- the monitoring complies with the monitoring plan in the registered CDM PDD;
- the monitoring plan in the registered CDM PDD is as per the applied baseline and monitoring methodology.

It is RINA's opinion that the GHG emission reduction stated in the VCS monitoring report version 03 of 10/07/2012 for the "Nansha Hydro Power Project in Yunnan Province China" in China for the period 28/12/2007 to 11/01/2009 are fairly stated. The GHG emission reductions were calculated correctly on the basis of the baseline and monitoring methodology ACM0002, version 06, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" of 12/05/2006.

Hence RINA is able to certify that the emission reductions from the project during the monitoring period 28/12/2007 to 11/01/2009 amount to 478,420 tCO₂e.

Reporting period: From [28-12-2007] to [11-01-2009]

Verified GHG emission reductions or removals in the above reporting period:

GHG Emission Reductions or Removals	tCO ₂ e
Baseline Emissions	478,420
Project Emissions	0
Leakage	0
Net GHG emission reductions or removals	478,420