

VCS VERIFICATION REPORT FOR ZIQIANG 18MW HYDROPOWER PROJECT IN GUIZHOU PROVINCE CHINA



Document Prepared By China Classification Society Certification Company

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Summary:

China Classification Society Certification Company(CCSC), commissioned by Guizhou Honor Carbon Asset Management Co., Ltd, has performed a Verification of the Ziqiang 18MW Hydropower Project in Guizhou Province, China (hereafter referred to as "the project"), on the basis of requirements of Verified Carbon Standard (VCS) Version 3.3.

The project is developed and operated by Guizhou Zhijin Ouhua Development Co. Ltd, which is located in Ziqiang town, Zhijin County, Bijie City, Guizhou Province, P.R. China. The project is a newly built hydropower project with total installed capacity of 18MW. The electricity generated by the proposed project will meet the electricity demand of industrial and agricultural production and local people's life, and assume the task to adjust the peak in the local grid, finally connected to China Southern Power Grid (CSPG).

The project has been registered as a CDM project on 23/10/2012 (UNFCCC reference No. 6696) with the renewable crediting period starting from 01/11/2012, which is within 2 years after the project start date, i.e. date of starting operation on 20/12/2010. The monitoring period of this verification is from 20/12/2010 to 22/10/2012 inclusive.

As the project has been validated and registered under the CDM, gap validation is carried out in accordance with the requirements in Para. 3.12.1 of VCS Standard (Version 3.3). The validation was undertaken and accompanied by a validation representation. The verification scope encompasses an independent and objective review and ex-post determination of the monitored reductions in GHG emissions by the CCSC.

The verification process includes three phases:

- 1) Desk review of documents;
- 2) On-site visit and follow-up interviews;
- 3) Resolution of outstanding issues and the issuance of the final verification report and opinion.

CCSC appointed a qualified verification team in accordance with internal procedures to perform the verification.

In the course of the verification, 1 Corrective Action Request (CAR) and 4 Clarification Requests (CLs) were raised and successfully closed.

As a result of this verification, the verification team confirms that:

- All operations of the project are implemented and installed as planned and described in the validated project design document(under CDM);
- The approved MP is in accordance with the applied approved CDM methodology, i.e., ACM0002 (Version 12.3.0);
- The monitoring system is in place and functional;
- The installed equipment for measuring parameters required for calculating emission reductions are calibrated appropriately.

Based on the information observed and evaluated, the verification team confirms that the emission reductions are correctly calculated in the MR (Version 02 dated 06/06/2013).

Therefore CCSC certifies the emission reductions amounting to 62,780 tCO₂e covering the monitoring period from 20/12/2010 to 22/10/2012 and requests issuance of the equivalent VCUs. VCUs achieved per year are shown as following:

Reporting period	ER _y (tCO ₂ e)	PE _y (tCO ₂ e)	ER _y = BE _y – PE _y (tCO ₂ e)
20/12/2010 to 31/12/2010	1,560	0	1,560
01/01/2011 to 31/12/2011	23,115	0	23,115
01/01/2012 to 22/10/2012	38,105	0	38,105
Total	62,780	0	62,780

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1 INTRODUCTION

1.1 Objective

Guizhou Honor Carbon Asset Management Co., Ltd has commissioned CCSC to validate conclusions regarding the additional project description produced in accordance with the VCS rules on participation under the CDM approved methodology ACM0002 (Version 12.3.0)/13/ and to verify and provide a verification statement of the emission reductions of the Ziqiang 18MW Hydropower Project in Guizhou Province China (hereafter referred to as “the project”), owned by Guizhou Zhijin Ouhua Development Co. Ltd (hereafter referred to as “the PP”), which is located in Ziqiang town, Zhijin County, Bijie City, Guizhou Province, P. R. China for the monitoring period from 20/12/2010 to 22/10/2012 inclusive prior to its first CDM crediting period, on the basis of requirement of VCS Standard (Version 3.3)/8/, CDM Validation and Verification Standard (VVS) (Version 03.0)/30/ and the approved methodology ACM0002 (Version 12.3.0)/13/.

CCSC as the validation/verification body (VVB) of the project has been accredited as a DOE by UNFCCC and also meets the competence requirements as set out in ISO 14065:2007.

Verification of “pre-CDM” emission reductions from a project activity is the independent review and ex post determination by VVB of the monitored reductions in GHG emissions during the period from the project start date until the date when the project got registered by CDM EB (the project was registered as a CDM project by CDM EB on 23/10/2012, and its first CDM credit period started from 01/11/2012). The objectives of verification are to:

- a) Ensure that the project activity has been implemented and operated as per the VCS project description (VCS-PD) and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- b) Ensure that the monitoring report and other supporting documents provided are complete in accordance with the latest applicable version of *Registration and Issuance Process*/9/ and in accordance with the additional requirements stated by the VCS Association (VCSA);
- c) Ensure that actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved methodology;
- d) Evaluate the data recorded and stored as per the monitoring methodology.

1.2 Scope and Criteria

As the project has been validated and registered under the CDM, gap validation was carried out in accordance with the requirements in para. 3.12.1 of VCS Standard (Version 3.3)/8/. The validation was undertaken and accompanied by a validation representation.

The verification scope encompasses an independent and objective review and ex-post determination of the monitored reductions in GHG emissions by the CCSC. The verification scope covers the relevant documents (e.g. the VCS-PD, the monitoring plan, the VCS monitoring report (VCS-MR), the emission reduction calculation spreadsheet, supporting documents available to the verifier and information collected through performing interviews and during the on-site assessment, VCSA's requirements publicly available, relevant rules, including the host country legislation, etc.) to be independently reviewed, the project geographical locations to be visited on-site, the related project local stakeholders to be interviewed with, and processes that are necessary to acquire objective evidence for the evaluation of the project compliance to the VCS requirements, CDM approved methodology ACM0002 (Version 12.3.0)/13/ and associated interpretations.

The above verification activities are conducted according to the VCSA requirements. In doing so, the principles of accuracy and completeness, relevance, reliability and credibility were followed.

The verification is not meant to provide any consulting service towards the PPs. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project.

1.3 Level of assurance

CCSC has undertaken a reasonable assurance engagement in accordance with VCS (Version 3.3)/8/. It requires a reasonable level of assurance in verification that GHG assertions are free of material errors, omissions and misrepresentations. The verification conclusion is based on the VCS-PD, VCS-MR, CDM-PDD, supporting evidences made available to the verifier and information collected through performing interviews and during the on-site inspection.

1.4 Summary Description of the Project

Ziqiang 18MW Hydropower Project in Guizhou Province China is a hydropower plant located in Ziqiang town, Zhijin County, Bijie City, Guizhou Province. The total installed capacity of the project is 18MW (3*6MW). The electricity generated by the project is connected to Guizhou Province Power Grid, and then to China Southern Power Grid. The designed annual electricity generation is 71,856 MWh, and the annual feed-in electricity to the grid is 60,955 MWh.

Electricity generated by the project displaces part of the electricity generated by the China Southern Power Grid which is dominated by fossil fuel-fired power plants, and thus the GHG emission reductions could be achieved.

The construction of the project started on 20/06/2007. The 1st, 2nd and 3rd turbine with an installed capacity of 6MW started operation on 20/12/2010.

The project has been registered as a CDM project activity on 23/10/2012 (UNFCCC ref. No. 6696) under approved CDM methodology ACM0002 (Version 12.3.0)/13/ "Consolidated methodology for grid-connected electricity generation from renewable sources". The first CDM crediting period started on 01/11/2012.

The project start date is 20/12/2010, when the first turbine generator started electricity generation. After verification, CCSC confirms that the net electricity supplied to the grid was 88,002.150MWh during this VCS monitoring period covers pre-CDM period from 20/12/2010 to 22/10/2012 inclusive which is prior to the CDM crediting period start date i.e. 01/11/2012. The total emission reductions achieved were 62,780 tCO₂e.

2 VALIDATION PROCESS, FINDINGS AND CONCLUSION

2.1 Validation Process

Method and Criteria:

The overall validation, from Contract Review to Validation Report & Opinion, was conducted using CCSC internal procedures.

CCSC validated the project against the requirements set in VCS (Version 3.3)/8/, issued by VCSA on 04/10/2012 and the version 03.0 of the Clean Development Mechanism Validation and Verification Standard/30/, issued by CDM Executive Board at its 70th meeting on 23/11/2012.

Document Review:

The VCS Project Description (VCS-PD)/32/ and the CDM Project Design Document (CDM-PDD)/3/ submitted by Guizhou Honor Carbon Management Co. Ltd and additional background documents related to the project design and baseline were reviewed by the validation team to verify the correctness, credibility and interpretation of presented information, and to cross check between information provided in the VCS-PD, CDM-PDD and information from sources other than that used, if available.

The validation conclusions presented in this report relate to the project as described in the VCS-PD/32/ version 01 dated 31/03/2013.

Site Inspection and Interviews:

After the projects listed on the project pipeline, the validation team performed a site visit to the project site from 25/04/2013 to 26/04/2013. During the site visit, the validation team interviewed with the relevant stakeholders and cross-checked the information provided by interviewed personnel to ensure that no relevant information has been omitted from the validation. Representatives of the PPs, and the consultant were interviewed. The interviewees and the main topics of the interview are summarized in the following table.

Date: 25/04/2013 to 26/04/2013	
Interview topics	Interviewed Organizations and persons
--Project background information. -- Project technology, operation and maintenance. --Project approval status and right of use -- Project implementation status --Project monitoring and management plan.	Guizhou Zhijin Ouhua Development Co. Ltd (the project owner): 1. Leng Jinzhong, Superintendent 2. Zhan Yi, Vice Superintendent
--Applicability of selected methodology --Baseline determination	Guizhou Honor Carbon Management Co., Ltd

Date: 25/04/2013 to 26/04/2013	
Interview topics	Interviewed Organizations and persons
--Emission reduction calculation and crediting period --Emission reduction monitoring plan	(the Consultant): 1. Yuan Sheng, Project Manager

Resolution of Any Material Discrepancy:

During the validation of a project activity, to identify issues that need to be further elaborated upon, researched or added to in order to confirm that the project activity meets the VCSA requirements and can achieve credible emission reductions, the validation team will issue a Corrective Action Request (CAR), a Clarification Request (CL) or a Forward Action Request (FAR) depending on different situations.

A CAR will be raised if one of the following occurs,

- (a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- (b) The applicable VCS requirements have not been met;
- (c) There is a risk that emission reductions cannot be monitored or calculated.

A CL will be raised if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met.

A FAR will be raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. However, FARs shall not relate to the VCSA requirements for registration.

To guarantee the transparency of the validation process, the issues raised, the responses provided by the project participants, the means of validation of such responses and references to any resulting changes in the VCS-PD or supporting annexes are documented in the Appendix A.

2.2 Validation Findings

2.2.1 Gap Validation

According to VCS (Version 3.3)/8/, for projects validated under the CDM, the cover page and sections 1.2, 1.3, 1.5, 1.6, 1.7, 1.9, 1.10, 1.12.1, 1.12.2, 1.12.3, 1.12.4 and 1.13 of the VCS Project Description Template shall be completed. A validation/verification body shall undertake a validation of same, to provide a gap validation for the project's compliance with the VCS rules. The approved GHG program validation i.e. CDM validation shall be completed within the relevant validation deadline. Non-AFOLU projects shall complete validation within two years of the project start date.

The validation report that is submitted to request for CDM registration has been issued on 16/07/2012/5/, therefore within two years of the project start date.

The detailed validation process is documented in the Table below

Criteria of VCS-PD	Ref	Validation Comments
1.2 Sectoral Scope and Project Type	VCS-PD, CDM-PDD, CDM Validation Report	As a hydropower project, the project is confirmed to fall in the sectoral scope 1: energy industries (renewable-/non-renewable sources), which has been correctly described in the VCS monitoring report/1/. In addition, the project is checked to be a pure registered CDM project activity, thus the project can be considered not to be a grouped project.
1.3 Project Proponent	VCS-PD, CDM-PDD, CDM Validation Report, UNFCCC website, PPA	The project owner of the project is verified to be Guizhou Zhijin Ouhua Development Co. Ltd. as same as demonstrated in the registered CDM-PDD/3/.
1.5 Project Start Date	VCS-PD, Daily operation & maintenance logs	The project start date in VCS Version 3.3 is defined as the date when the Project began generating GHG emission reduction or removals. The project start date of 20/12/2010 can be substantiated by the daily operation & maintenance logs/15/ and the Electricity Transaction Notes (ETN) issued by the Guizhou electric power company/20/.

1.6 Project Crediting Period	VCS-PD, CDM-PDD, Validation report, UNFCCC website, Daily operation & maintenance logs	The Project start date is 20/12/2010 and the CDM crediting period starting from 01/11/2012. (http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1342410613.58/view). Since 20/12/2010, the data have been monitored and collected following the monitoring procedure in the VCS-PD/32/. Therefore, starting date of the crediting period is 20/12/2010. The VCS crediting period is from 20/12/2010 to 22/10/2012, which does not overlap with the CDM crediting period starting from 01/11/2012.
1.7 Project Scale and Estimated GHG Emission Reductions or Removals	VCS-PD, CDM-PDD, CDM Validation report	The annual estimated GHG emission reductions are 43,486 tCO₂e. In accordance with the VCS program definitions/12/, Mega project is defined as the project that generates 1,000,000 tonnes CO₂e or more of GHG emissions reductions or removals per year. Thus, it is validated that the scale of the project with estimated emission reductions less than 1,000,000 tonnes CO₂e is "Project".
1.9 Project Location	Site visit, VCS-PD, CDM-PDD, CDM Validation report	The project is located in Ziqiang town, Zhijin County, Bijie City, Guizhou Province of China, which is consistent with the registered CDM-PDD/3/. The geographical coordinates of the power house is 106.1219°E, 26.6661°N and that of the dam is 106.0839°E, 26.6778°N. The data has been verified during the onsite visit.
1.10 Conditions Prior to Project Initiation	VCS-PD, CDM-PDD, CDM Validation report	The registered CDM-PDD/3/ was checked and found that the conditions prior to project initiation is that electricity will be supplied by the fossil-fuel based power plants dominated China Southern Power Grid (CSPG), and the project has not been implemented to generated GHG emissions for the purpose of their subsequent reduction, removal or destruction.

1.12.1 Right of use	Business license, FSR approval letter, EIA approval letter, the construction contract and purchase contract of main equipment.	The FSR approval letter/10/ issued by Guizhou Development & Reform Commission and the EIA approval letter/11/ issued by Environmental Protection Department of Guizhou were checked and found that the Guizhou Zhijin Ouhua Development Co. Ltd. is authorized to carry out the project activity. Further, the business license of Guizhou Zhijin Ouhua Development Co. Ltd. officially issued by the Administration for Industry and Commerce of Zhijin County of Guizhou province/26/ was checked to confirm its ownership of the project. The construction contract/16/ and purchase contract of main equipment/14/ were check and found the project is implemented by Guizhou Zhijin Ouhua Development Co. Ltd.
1.12.2 Emission Trading Programs and Other Binding Limits	VCS-PD	Via UNFCCC website http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1342410613.58/view , the project was registered as CDM project activity with UNFCCC Ref. No. 6696, indicating the first-7 years CDM crediting period starting from 01/11/2012, thus the net GHG emission reductions generated from the reporting period from 20/12/2010 to 22/10/2012 will not be used for compliance with the CDM trading program or to meet binding limits on GHG emissions other VCS.
1.12.3 Participation under Other GHG Programs	VCS-PD, CDM-PDD, CDM Validation report, UNFCCC website	The project was registered as CDM project activity with UNFCCC Ref. No. 6696, indicating the first-7 years CDM crediting period starting from 01/11/2012, details as shown in the UNFCCC website http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1342410613.58/view . The net GHG emission reductions generated from the reporting period from 20/12/2010 to 22/10/2012 could be verified as VCUs under the VCS program.
1.12.4 Other Forms of Environmental Credit	VCS-PD	During the on-site visit, the management representative, i.e. Mr Leng Jinzhong, was interviewed and confirmed that no other form of GHG-related environmental credit for GHG emission reductions or removals has been or will be claimed under the VCS program during the reporting period from 20/12/2010 to 22/10/2012.

1.13 Additional Information Relevant to the Project -Eligibility Criteria -Leakage Management -Commercially Sensitive Information -Further Information	VCS-PD	- It is not a grouped project; - Leakage is 0; - No commercial sensitive information has been excluded to the public - According to the information collected during the onsite visit, the project is confirmed to have positive impact on the local environment, economy and sustainable development.
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2.2.2 Methodology Deviations

No deviation from the methodology is needed to be submitted.

2.2.3 Project Description Deviations

No project description deviation has been identified during the validation.

2.2.4 New Project Activity Instances

Not Applicable since the project is a non-grouped project

2.3 Validation Conclusion

The review of the project design documentation and the subsequent follow-up interviews have provided CCSC with sufficient evidence to determine the fulfilment of stated criteria. In our opinion, the project meets all relevant VCS (Version 3.3)/8/ requirements and the relevant host country criteria. Hence CCSC requests registration of the project as a VCS project.

3 VERIFICATION PROCESS

3.1 Method and Criteria

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

CCSC verified the project against the requirements set in VCS (Version 3.3)/8/, issued by VCSA on 04/10/2012 and the version 03.0 of the Clean Development Mechanism Validation and Verification Standard/30/, issued by CDM Executive Board at its 70th meeting on 23/11/2012.

3.2 Document Review

A desk review of the VCS-PD, CDM-PDD, monitoring plan, the validation report, the applied monitoring methodology, VCS monitoring report (VCS-MR) and supporting documents was conducted by the verification team. The aim of the desk review of the documentation was to verify

the completeness of the data and the information presented, to carry out the compliance check of the VCS-MR with respect to the monitoring plan and the applied methodology. Particular attention was given to the frequency of measurements, the quality of the metering equipment including calibration requirements, and the quality assurance and quality control procedures. The evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions was also conducted.

To address the CCSC's corrective action and clarification requests, the VCS-MR was revised and resubmitted by PP. The final verification conclusion presented in this report is based on the revised VCS-MR/1/ (version02, dated on 06/06/2013).

Section 6 of this report contains a complete list of all documents and proofs reviewed by the verification team.

3.3 Interviews

From 25/04/2013 to 27/04/2013, CCSC performed an on-site assessment at the physical site of the project located in Ziqiang town, Zhijin County, Bijie City, Guizhou Province, P. R. China.

The on-site assessment involved following activities,

- 1) An assessment of the implementation and operation of the project activity as per the VCS-PD;
- 2) A review of information flows for generating, aggregating and reporting the monitoring parameters;
- 3) Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the approved monitoring plan;
- 4) A cross-check between information provided in the monitoring report and data from other sources such as operational records or similar data sources;
- 5) A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the VCS-PD and the selected methodology;
- 6) A review of calculations and assumptions made in determining the GHG data and emission reductions;
- 7) An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

The verification team verified that the actual implementation of the project was as described in the VCS-PD/32/ and VCS-MR/1/. This included the review of the project operation based on the evidence of on-site observation and presented documents.

During the on-site assessment, the verification team has interviewed with key personnel from the project owner (the project participant) and the consultancy.

The assessment content and topics/the persons interviewed at the on-site assessment were provided in the below table.

Date: 25/04/2013 to 26/04/2013	
Interview topics	Interviewed Organizations and persons
--The status of VCS project implementation. -- Any changes of the VCS project. -- The project on-site inspection—The evidences of construction, status and operation of key equipment, parameters monitoring and data processing activities, monitor equipment and calibration. -- Monitoring data. -- Quality Management; organizational structure, responsibilities and competencies. Internal QA/QC Management procedures and document control (QA/QC). -- Environmental Impacts. -- Compliance with National Laws and Regulations.	Guizhou Zhijin Ouhua Development Co. Ltd (the project owner): 1. Leng Jinzhong, Superintendent 2. Zhan Yi, Vice Superintendent
-- Preparation of Monitoring Report. -- Compliance of the monitoring plan with the monitoring methodology -- Compliance of monitoring with the monitoring plan -- Assessment of data and calculation of GHG emission reductions	Guizhou Honor Carbon Asset Management Co., Ltd (the Consultant): 1. Yuan Sheng, Project Manager

3.4 Site Inspections

Please refer to section 3.3 above.

3.5 Resolution of Any Material Discrepancy

During the verification of a project activity, to identify issues that need to be further elaborated upon, researched or added to in order to confirm that the project activity meets the VCSA requirements and can achieve credible emission reductions, the verification team will issue a Corrective Action Request (CAR), a Clarification Request (CL) or a Forward Action Request (FAR) depending on different situations.

The objective of this phase of the verification is to resolve issues related to the monitoring, implementation and operations of the registered project activity that could impair the capacity of the registered project activity to achieve emission reductions or influence the monitoring and reporting of emission reductions prior to CCSC's positive conclusion on the GHG emission reduction calculation.

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

A Corrective Action Request (CAR) will be raised if one of the following occurs:

- (a) Non-compliance with the monitoring plan or methodology are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
- (b) Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;
- (c) Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;
- (d) Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project participants.

A Clarification Request (CL) will be raised if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met.

A Forward Action Request (FAR) will be raised, for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

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

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

4.1.1 Implementation Status of the Project Activity

The verification team has performed an on-site visit to verify the real implementation of the project against the description in the registered CDM-PDD/3/.

The project was verified to be located in Ziqiang town, Zhijin County, Bijie City, Guizhou Province, P.R. China. As described in the VCS monitoring report/1/ and the registered CDM-PDD/3/, the geographical coordinates of the project are 106.0839 ° E, 26.6778 ° N for the dam and 106.1219 ° E, 26.6661 ° N for the powerhouse respectively, which has been verified during onsite visit.

The verification team confirmed that 3 sets of 6MW hydro turbine generators provided a total installed capacity of 18MW as described in the registered CDM-PDD/3/ have been installed in place and started operation on 20/12/2010 before the CDM registration date of 23/10/2012. The information of the installed turbines and generators is as follows:

Name of equipment	Item	Equipment parameter		
Turbine	Unit number	1#	2#	3#
	Equipment number	07003-01	07003-02	07003-03
	Model	HLA351-WJ-93		
	Rated water head	207 m		
	Rated flow rate	3.34 m ³ /s		
	Manufacturer	Fujian Nanping Nandian Hydropower Equipment Manufacturing Co., Ltd		
Generator	Unit Number	1#	2#	3#
	Equipment number	07003-01	07003-02	07003-03
	Model	SFW6000-6/1730		
	Rated power	6.0 MW		
	Rated voltage	6300 V		
	Manufacturer	Fujian Nanping Nandian Hydropower Equipment Manufacturing Co., Ltd		

By the means of checking nameplates/24/ on-site, the manufacturers and model of the generators and turbines are verified to be fully consistent with the description in the registered CDM-PDD/3/. In VCS-MR (Version 01)/1/, the technical information about turbine and generator was missed, therefore **CL1 was raised**. The project proponent has added the relevant information in VCS-MR (Version 02)/1/, and the information has been verified to be consisted with that in the registered CDM-PDD/3/ and the actual situation of the project, so **CL1 was closed**.

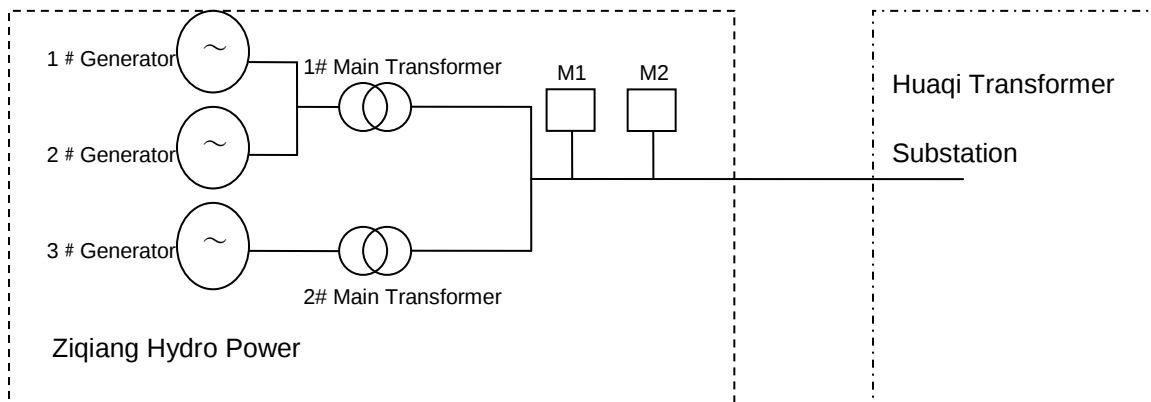
According to the information collected during on-site visit and the relevant evidence provided by project owner, CCSC can confirm that no project design change occurred during the monitoring

period and the project was implemented in accordance with the registered CDM-PDD/3/ and the VCS-PD/32/.

4.1.2 Implementation Status of the Monitoring Plan

As shown in the diagram of the electricity system, the electricity generated by the project is delivered to transformer substation, finally to China Southern Power Grid (CSPG).

The location of the metering system of the project is outlined as the following figure,



Seen from the above figure, the main meter M1 and backup meter M2 have been installed at the connection point to the grid for measuring the electricity supplied to and imported from the grid. However, the backup meter M2 was not installed until 17/04/2012. Besides, on 17/04/2012, the main meter (SN: 1006000001) was replaced by a new meter (SN: 208368946), and in VCS-MR (Version 01)/1/ the relevant information was not mentioned. **Therefore CL2 was raised.**

PP has clarified that as per the registered CDM-PDD/3/, when a malfunction of main meter occurs, the backup meter would be adopted. Since the main meter was operating in a good condition during the monitoring period and the export and import electricity was measured well by the main meter. And a backup meter has been installed on 17/04/2012 making the monitoring system fully consist with the approved MP/3/. The CCSC can confirm that the absence of the backup meter has no impact on the acquisition of electricity data during 20/12/2010 to 17/04/2012. Furthermore the information regarding the replacement of main meter has been added in VCS-MR (Version 02)/1/, the relevant evidence was also provided. Hence **CL2 was closed.**

The reading records of the electricity meters/19/, meter calibration certificates and records/21/, sales receipts and Electricity Transaction Notes (ETNs)/20/ were verified by the verification team during the on-site visit. All facilities and equipment are in place except the absence of backup meter which has been mentioned in **CL2**. The project participant has operated the project as per the registered CDM-PDD/3/. The electricity generated has been delivered properly to the grid as per the Power Purchase Agreements (PPA) signed with the local grid company/17/.

As described in the registered CDM-PDD/3/, a diesel generator was used to generate in case of emergency. According to the nameplate, the technical information is as follows:

Name of equipment	Item	Equipment parameter
Diesel engine	Model	GF
	Rated power	250 kW
	Manufacturer	Yangzhou Huayu power equipment factory
Power generator	Model	HD-250
	Rated power	250 kW
	Manufacturer	Yangzhou Huayu power equipment factory

Therefore, CCSC can confirm that the revised Monitoring Report (version02, dated on 17/05/2013)/1/ is complete, transparent and in accordance with the approved MP/3/ and other relevant requirements.

4.1.3 Remaining Issues from Previous Validation or Verification

After checking the CDM validation report of the project/4/, the verification team can confirm that there were no any remaining issues in the previous CDM validation.

4.2 Accuracy of GHG Emission Reduction or Removal Calculations

4.2.1 Parameters and information flow

The parameters required by the monitoring plan and the way CCSC has verified the information flow (from data generation, aggregation, to recording, calculation and reporting for these parameters including the values) in the monitoring reports are described below:

Parameters monitored:

- 1) $EG_{\text{delivery},y}$: Electricity delivered by the Project to CSPG;
- 2) $EG_{\text{import},y}$: Electricity imported by the Project from CSPG;
- 3) $EG_{\text{facility},y}$: Quantity of net electricity generation supplied by the project plant/unit to the grid.

According to the VCS-MR of the project/1/, the registered CDM-PDD/3/ and the approved monitoring plan, the parameter $EG_{\text{facility},y}$ of net electricity supplied to the grid is the electricity supplied to the grid ($EG_{\text{delivery},y}$) deducting the electricity purchased from the grid ($EG_{\text{import},y}$). And both parameters $EG_{\text{delivery},y}$ and $EG_{\text{import},y}$ shall be continuously measured and recorded monthly.

As indicated in the registered CDM-PDD/3/, the main meter M1 and backup meter M2 were installed at the connection point to the grid for continuously measuring and recording monthly the electricity supplied to and imported from the grid. The readings of M1 are monthly recorded by the designated persons from the grid company and the managers of the project at 24:00 of the last day every month. However, the backup meter M2 was missed from 20/12/2010 to 17/04/2012

and on 17/04/2012, the main meter was replaced by a new meter. The detailed information refers to **CL2** in section 4.1.

The grid company provided the PP monthly with the Electricity Transaction Notes (ETNs) which contain the electricity exported to the grid by the project and the electricity imported from the grid by the project. After a cross-check with its own monthly meter readings, the project owner archived the copy of these statements and receipts.

The monthly meter readings /19/ and the ETNs/20/ can cover this monitoring period from 20/12/2010 to 22/10/2012. The electricity amounts in monthly meter readings and the ETNs are not fully consistent with each other because of the different rounding way between the Project Owner and the power grid. While the conservative values have been applied in the calculation of net electricity supplied to the power grid, ie, for the electricity values of supplied to the power grid, smaller values were applied, for the electricity values of imported from the power grid, the larger value were applied. The verification team has verified the values provided in the VCS-MR/1/ and ER calculation spreadsheet/2/ against the relevant documented evidences i.e. the monthly meter readings and the ETNs and found them to be reasonable.

- 4) CAP_{PJ} : Installed capacity of the hydro power plant after the implementation of the project activity.

The installed capacity is verified by checking both the technical agreement for turbine generator units of the project/14/ and the on-site nameplates information of three turbine generator units/24/.

- 5) A_{PJ} : Area of the reservoir measured in the surface of the water, after the Implementation of the project activity, when the reservoir is full.

A_{PJ} is yearly measured by the qualified third party of Guizhou Survey & Design Research Institute for Water Resources and Hydropower (National level of Class I, Certification No., Jia Qianzizi 5204323)/23/, in accordance with the registered CDM-PDD/3/, the approved monitoring plan and the applied methodology ACM0002 (Version 12.3.0)/13/.

- 6) $FC_{diesel,y}$: Quantity of diesel combusted by diesel generator during the year y.

According to the registered CDM-PDD/3/, the consumed fuel will be monitored by the instrument and be recorded by the designated staff.

- 7) $NCV_{diesel,y}$: Weighted average net calorific value of diesel in year y

- 8) $EF_{CO_2,diesel,y}$: Weighted average CO₂ emission factor of diesel in year y

IPCC default value at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol.2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories/29/ was adopted for $NCV_{diesel,y}$ and $EF_{CO_2,diesel,y}$.

According to the registered CDM-PDD/3/, $FC_{diesel,y}$, $NCV_{diesel,y}$, and $EF_{CO_2,diesel}$ will be monitored by the instrument and be recorded by the designated staff. In VCS-MR (Version 01), these parameters were not mentioned in Section 3.2. Therefore **CL3 was raised**. The relevant

information has been added to the revised MR (version 02) /1/ and has been check to be consistent with the information in registered CDM-PDD/3/ and the actual situation of the project. **CL3 was closed.**

Parameter determined ex-ante:

- 1) EF_y : The grid CO_2 emission factor of the CSPG where the Project connected to.

The emission factor of the 1st crediting period of the Project has been determined ex-ante in the registered CDM-PDD/3/ and VCS-PD/12/. The emission factor used in the monitoring report has been verified against the registered CDM-PDD/3/ and VCS-PD/12/ and found them to be consistent.

- 2) Cap_{BL} : Installed capacity of the hydro power plant before the implementation of the project activity

For new hydropower plants the value is zero. The value used in the monitoring report has been verified against the registered CDM-PDD/3/ and found them to be consistent.

- 3) A_{BL} : Area of the reservoir measured in the surface of the water, before the implementation of the project activity

The value of A_{BL} is equal to area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full. For new reservoirs, this value is zero. The value used in the monitoring report has been verified against the registered CDM-PDD/3/ and found them to be consistent.

4.2.2 Calibration

All monitoring meters for the measurement of net electricity supplied to the grid have been calibrated during the monitoring period, detailed calibration information in their calibration certificates/21/ as shown in the below table:

Meter	Type	Accuracy	SN	Calibration frequency	Calibration certificate No.	Validity
M1(Old)	DTSD876	0.2s	1006000001	Yearly	2010500103	24/08/2010 to 23/08/2015
					-	23/08/2011 to 22/08/2012
M1(New)	MK6E	0.2s	208368946	Yearly	2012600056	16/04/2012 to 15/04/2017
M2	MK6E	0.2s	208368951	Yearly	2012600057	16/04/2012 to 15/04/2017

During verification, the validity of calibration certificate was found not fully consistent with the description in VCS-MR (Version 01)/1/. Therefore **CL4 was raised**. The description has been revised by the proponent and confirmed to be consistent by the verification team. Therefore **CL4 was closed**.

The calibration of meters was carried out by the Guizhou Electric Power Test & Research institute, whose accreditation (Certificated No. 2007240193D & 2010240168D)/22/ was provided to the verification team and could confirm that its accreditation validity is from 14/08/2007 to 01/11/2013.

The calibration of the old main meter dated on 23/08/2011 was carried out by Anshun Electricity Supplying Bureau of which the accreditation (Certificated No. [2011] Qian Dian Liang Biao Neng No. D133)/22/ was valid from 28/04/2011 to 27/04/2015. The calibration certificate/21/ was valid from 23/08/2011 to 22/08/2012. Just this clarification of the old meter was carried out by Anshun Electricity Supplying Bureau. All the clarifications were carried out by Guizhou Electric Power Test & Research institute.

Thus, the calibration certificates of meters are considered credible, and accordingly the accuracy and validity of meters can ensure the accurate measurement of net electricity supplied to the grid during the reporting period from 20/12/2010 to 22/10/2012.

All the meters meet the rated accuracy level as described in the monitoring plan and are in compliance with the industry standard Technical Administrative Code of Electric Energy Metering (DL/T 448-2000)/32/. The calibration frequency fulfils the requirement as described in the monitoring plan.

4.2.3 Assessment Data and Calculation

A complete set of data of monitoring parameter $EG_{\text{facility},y}$ /19/ from 20/12/2010 to 22/10/2012 are available for verification.

The critical parameter used for the determination of the Emission Reductions is the net electricity supplied to the grid by the project. The data pertaining to the above parameter are maintained in the identified records. All the data are in compliance with that stated in the VCS-MR (Version 02)/1/.

As per the methodology ACM0002 (Version 12.3.0)/13/ and the registered CDM-PDD/3/, the emission reductions for the project are calculated as the baseline emissions minus the project emissions and leakage. Hence the emission reduction is determined by the following formula:

$$ER_y = BE_y - PE_y$$

Where,

ER_y : Emission reductions

BE_y : Baseline emissions

PE_y : Project emissions

Baseline Emission

$$BE_y = EG_y \cdot EF_{grid,CM,y}$$

Where:

BE_y : Baseline emission in year y (tCO₂/yr)

EG_y : Net electricity supplied to the grid (MWh)

$EF_{grid,CM,y}$: CO₂ The emission factor in year y, calculated according to the registered CDM-PDD. The emission factor in registered CDM-PDD/3/ has been determined as 0.7134 tCO₂e/MWh.

While the EG_y is calculated as:

$$EG_y = EG_{facility,y} = EG_{delivery,y} - EG_{import,y}$$

Where:

$EG_{delivery,y}$: Electricity exported to the grid by the proposed project (MWh)

$EG_{import,y}$: Electricity imported by the proposed project bought from the power grid (MWh)

In order to ensure the accuracy of measurement, the net electricity supplied to the grid ($EG_{facility,y}$) has been cross-checked with the Electricity Transaction Notes(ETNs)/20/ and sales invoices covering the reporting period. If the measured electricity is different from invoiced electricity, the most conservative value is applied, in which the smaller value is taken as the electricity supplied to the grid, while the bigger value is taken as the electricity purchased from the grid, as presented in the emission reduction calculation spreadsheet/2/. Below table is the summary of monitored $EG_{facility,y}$ during the reporting period from 20/12/2010 to 22/10/2012.

Period	Exported electricity (MWh)	Electricity Transaction Note (ETN) (MWh)	$EG_{delivery,y}$ (MWh)	Imported electricity (MWh)	Electricity Transaction Note (ETN) (MWh)	$EG_{import,y}$ (MWh)	$EG_{facility,y}$ (MWh)
	A	B	C=MIN(A,B)	D	E	F=MAX(D,E)	G=C-F
20/12/2010-31/12/2010	2,220.750	2,190.000	2,190.000	3.150	3.150	3.150	2,186.850
01/01/2011-31/01/2011	1,339.800	1,340.000	1,339.800	14.175	14.175	14.175	1,325.625
01/02/2011-28/02/2011	1,920.450	1,920.000	1,920.000	14.700	14.700	14.700	1,905.300
01/03/2011-31/03/2011	1,169.700	1,170.000	1,169.700	13.650	13.650	13.650	1,156.050
01/04/2011-30/04/2011	1,030.050	1,030.000	1,030.000	12.075	12.075	12.075	1,017.925

01/05/2011-31/05/2011	1,929.900	1,930.000	1,929.900	8.925	8.925	8.925	1,920.975
01/06/2011-30/06/2011	7,029.750	7,030.000	7,029.750	7.875	7.875	7.875	7,021.875
01/07/2011-31/07/2011	3,220.350	3,220.000	3,220.000	5.775	5.775	5.775	3,214.225
01/08/2011-31/08/2011	3,799.950	3,800.000	3,799.950	5.775	5.775	5.775	3,794.175
01/09/2011-30/09/2011	1,210.125	1,210.000	1,210.000	8.400	8.400	8.400	1,201.600
01/10/2011-31/10/2011	5,359.725	5,360.000	5,359.725	6.300	6.300	6.300	5,353.425
01/11/2011-30/11/2011	2,940.525	2,940.000	2,940.000	7.350	7.350	7.350	2,932.650
01/12/2011-31/12/2011	1,569.750	1,570.000	1,569.750	11.550	11.550	11.550	1,558.200
01/01/2012-31/01/2012	1,529.850	1,530.000	1,529.850	12.600	12.600	12.600	1,517.250
01/02/2012-29/02/2012	1,220.100	1,220.000	1,220.000	8.400	8.400	8.400	1,211.600
01/03/2012-31/03/2012	1,240.050	1,240.000	1,240.000	9.975	9.975	9.975	1,230.025
01/04/2012-17/04/2012 ¹	1,168.650	1,400.000	1,399.650	7.350	8.400	8.400	1,391.250
17/04/2012-30/04/2012	231.000			1.050			
01/05/2012-31/05/2012	6,620.250	6,620.000	6,620.000	1.050	1.050	1.050	6,618.950
01/06/2012-30/06/2012	12,619.950	12,620.000	12,619.950	1.050	1.050	1.050	12,618.900
01/07/2012-31/07/2012	13,109.775	13,110.000	13,109.775	0.525	0.525	0.525	13,109.250
01/08/2012-31/08/2012	8,920.275	8,920.000	8,920.000	1.575	1.575	1.575	8,918.425
01/09/2012-30/09/2012	2,280.075	2,280.000	2,280.000	1.575	1.575	1.575	2,278.425
01/10/2012-22/10/2012	4,520.250	4,520.250	4,520.250	1.050	1.050	1.050	4,519.200
Total	88,201.050	88,170.250	88,168.050	165.900	165.900	165.900	88,002.150

Therefore, the baseline emissions (BE_y) are conservatively calculated as following:

¹ The old meter M1 was replaced by new meter on 17/04/2012./18///

$$\begin{aligned}
 BE_y &= EG_{\text{facility}, y} \times EF_{\text{grid}, \text{CM}, y} \\
 &= 88,002.150 \text{MWh} \times 0.7134 \text{ tCO}_2\text{e/MWh} \\
 &= 62,780 \text{ tCO}_2\text{e}
 \end{aligned}$$

Project Emission

According to the methodology, the project emissions shall be accounted for as project emissions by using the following equation:

$$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$$

Where:

PE_y = Project emissions in year y (tCO₂e/yr)

$PE_{FF,y}$ = Project emissions from fossil fuel consumption in year y (tCO₂/yr)

$PE_{GP,y}$ = Project emissions from the operation of geothermal power plants due to the release of non-condensable gases in year y (tCO₂e/yr)

$PE_{HP,y}$ = Project emissions from water reservoirs of hydro power plants in year y (tCO₂e/yr)

Fossil Fuel Combustion ($PE_{FF,y}$)

As per ACM0002 (Ver.12.3.0)/13/, $PE_{FF,y}$ shall be calculated as per the latest version of the “Tool to calculate project or leakage CO₂ emission from fossil fuel combustion”/6/. As per version 2 of the Tool mentioned above, CO₂ emission from fossil fuel combustion are calculated based on the quantity of fuels combusted and CO₂ emission coefficient of those fuels, as follows:

$$PE_{FF,y} = FC_{i,j,y} \cdot COEF_{i,y}$$

Where:

$PE_{FF,y}$ = CO₂ emission from fossil fuel combustion in process j during the year y (tCO₂/yr)

$FC_{i,j,y}$ = Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr)

$COEF_{i,y}$ = CO₂ emission coefficient of fuel type i in year y

i = Fuel types combusted in process j during the year y

$$COEF_{i,y} = NCV_{i,y} \cdot EF_{CO_2,i,y}$$

$NCV_{i,y}$ = The weighted average net calorific value of the fuel type i in year y (GJ/mass or

volume unit)

$EF_{CO_2,i,y}$ = The weighted average CO₂ emission factor of fuel type i in year y (tCO₂/GJ)

i = Fuel types combusted in process j during the year y

In VCS-MR (Version 01), the diesel consumption and operation time of the diesel generator was an estimated value, not the actual operation data. Therefore **CAR1 was raised**.

The project proponent has added the actual diesel consumption in VCS-MR (Version 02)/1/ and provided relevant evidence. The verification team has checked the operation log of the diesel generator/28/, the actual diesel consumption amount is 0.0966t during this monitoring period. Hence, **CAR1 was closed**.

IPCC default value at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol.2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories/29/ was adopted. The NCV of diesel oil is 42.652 GJ/ton. The upper value of CO₂ emission factor for diesel is 0.0748tCO₂/GJ. The verification team has verified that the data used for project emission calculation is consistent with IPCC default value.

Therefore, the actual CO₂ emission from diesel oil combustion can be calculated as follows:

$$PE_{FF,y} = 0.0966 \times 42.652 \times 0.0748 = 0.31 \text{ tCO}_2$$

Considering that the actual project emissions from diesel oil combustion is 0.31tCO₂, which is far less than 1% of the expected average annual emission reduction. Based on the VVS (Version 3.0)/30/, the verification team considers that the actual CO₂ emission from diesel oil consumption is negligible.

Thus, $PE_{FF,y} = 0 \text{ tCO}_2\text{e}$.

Emissions of non-condensable gases from the operation of geothermal power plants ($PE_{GP,y}$)

As the project is hydropower project activities, no emissions of non-condensable gases from the operation of geothermal power plant should be considered, i.e., the $PE_{GP,y}$ is zero.

Emissions from water reservoirs of hydro power plants $PE_{HP,y}$

According to the baseline methodology ACM0002 (Version 12.3.0)/13/, the power density of the project is calculated as follows:

$$PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}}$$

Where:

PD = Power density of the project activity (W/m₂)

Cap_{PJ} = Installed capacity of the hydro power plant after the implementation of the project activity (W)

Cap_{BL} = Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero

A_{PJ} = Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m^2)

A_{BL} = Area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m^2). For new reservoirs, this value is zero

The installed capacity of the hydro power plant after the implementation of the project is still 18 MW as same as reported in the registered CDM-PDD/3/.

The area of the reservoir measured in the surface of the water after the implementation of the project at full level (A_{PJ}) is shown as below table

Date	Result of A_{PJ}
17/06/2011	868,346 m^2
13/05/2012	849,697 m^2

Therefore, the power density in 2011 is calculated as follows:

$$PD=18MW/868,346m^2=20.7W/m^2;$$

The power density in 2012 is calculated as follows:

$$PD=18MW/849,697m^2=21.2W/m^2.$$

In accordance with the applied methodology ACM0002 version 12.3.0/13/, the power density of the project is greater than $10W/m^2$, thus the project emissions from water reservoirs of hydro power plants is 0, i.e. $PE_{HP,y}=0$.

In conclusion, the project emission PE_y is zero.

Leakage Emissions

According to the applied methodology ACM0002 version 12.3.0/13/, no leakage emissions are considered.

Emission reduction

The emission reductions of the project are calculated as follows:

Reporting period	ER _y (tCO ₂ e)	PE _y (tCO ₂ e)	ER _y = BE _y – PE _y (tCO ₂ e)
20/12/2010 to 31/12/2010	1,560	0	1,560
01/01/2011 to 31/12/2011	23,115	0	23,115
01/01/2012 to 22/10/2012	38,105	0	38,105
Total	62,780	0	62,780

Comparison of ERs

Based on the above assessment, the emission reduction during the monitoring period from 20/12/2010 to 22/10/2012 is verified as 62,780 tCO₂e. Compared with the estimated emission reductions under the same days of 673 from 20/12/2010 to 22/10/2012 in the registered CDM-PDD/3/, 80,181(=43,486*673/365) tCO₂e, the verified emission reduction is 22% less than the estimated value. CCSC considers the value of verified emission reduction is reasonable.

4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals

All necessary documentation is collected, referenced and is easily accessible in hard-copy or electronic format. The data pertaining to the monitored parameters are maintained in the identified internal records and consistent with the values stated in the Monitoring Report (version 02)/1/. Key data have been cross-checked via external sources, such as ETNs.

4.4 Management and Operational System

During on-site visit, the verification team observed that a CDM Project Monitoring Manuals/31/ had been prepared in 12/01/2011 and confirmed that the structure of monitoring management team and the responsibilities of team have been defined and followed well in accordance with the registered CDM-PDD/3/ and the approved monitoring plan. The monitoring personnel are well trained and have got relevant national operation qualifications/25/, which demonstrates that they have sufficient competence to carry out the relevant monitoring tasks.

The routine requirements and log of the internal training for operating and maintaining the equipment/15/ were provided by the project owner. During the on-site visit, it has been observed that the maintenance staffs have performed the routine equipment maintenance in accordance with the internal requirements for equipment tour inspection of the company.

CCSC can confirm that the personnel training and the equipment maintenance have been implemented properly by checking the training and maintenance records/15/, and by interviewing with site personnel.

An internal data are subjected to QA/QC measures. All monitored data will be archived in electronic form and be kept for at least 2 years after the end of the last crediting period or till the last issuance of VERs for the project activity whichever occurs later.

The QA/QC measures were further verified reliable by checking the daily operation & maintenance logs/15/.

5 VERIFICATION CONCLUSION

CCSC has carried out the verification of the project “Ziqiang 18MW Hydropower Project in Guizhou Province China” (UNFCCC Reference No. 6696). The verification was performed based on the requirements set by Voluntary Carbon Standard (VCS) Version 3.3/8/, as well as criteria given to provide for consistent project operations, monitoring and reporting. This verification covers the period from 20/12/2010 to 22/10/2012 inclusive.

In the course of the verification 1 Corrective Action Request (CAR) and 4 Clarification Requests (CLs) were raised and successfully closed. The verification is based on the VCS-MR (version01)/1/, the revised VCS-MR (version02)/1/, the registered CDM-PDD/3/and VCS-PD/32/, the validation report/4/, ER calculation spread sheet/2/ and supporting documents available to CCSC.

As the result of the verification, CCSC confirms that:

- The project activity has been implemented and operated as per the registered CDM-PDD,VCS-PD and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- The VCS-MR and other supporting documents provided are complete in accordance with the latest applicable version of the *Registration and Issuance Process/9/* and in accordance with the additional requirements stated by the VCS Association (VCSA);
- The actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved methodology i.e. ACM0002 (version 12.3.0)/13/;
- The GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

Based on the evidence and information that are considered necessary to guarantee that GHG emission reductions are appropriately calculated, CCSC confirms the following statement:

Reporting period: From 20/12/2010 to 22/10/2012

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

GHG Emission Reductions or Removals	tCO ₂ e
Baseline Emissions	62,780
Project Emissions	0
Leakage	0
Net GHG emission reductions or removals	62,780

6 REFERENCE

Documents provided by the Project Participant and relevant background documents have been reviewed or referenced for the periodic verification conclusions.

- /1/ VCS Monitoring report of Ziqiang 18MW Hydropower Project in Guizhou Province China
Version 01 dated 31/03/2013
Version 02 dated 06/06/2013
The monitoring period is 20/12/2010 to 22/10/2012.
- /2/ ER calculation spreadsheet for the period 20/12/2010 to 22/10/2012
- /3/ Registered Project Design Document of Ziqiang 18MW Hydropower Project in Guizhou Province China ref.number 6696
Version 05 submitted to EB for request for registration, dated on 16/10/2012
<http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1342410613.58/view>
- /4/ Validation Report for Ziqiang 18MW Hydropower Project in Guizhou Province China
Version 03 submitted to EB for request for registration, dated on 16/10/2012
<http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1342410613.58/view>
- /5/ CDM Project Activity Registration Form of Ziqiang 18MW Hydropower Project in Guizhou Province China submitted by the validation DOE of TÜV Rheinland, dated on 16/07/2012
- /6/ Tool to calculate project or leakage CO₂ emission from fossil fuel combustion, Version 02, EB 41 annex 11, dated on 02/08/2008
- /7/ VCS Project Description of Ziqiang 18MW Hydropower Project in Guizhou Province China
Version 01 dated 31/03/2013
- /8/ VCS Standard, version 3.3, dated 04/10/2012
- /9/ VCS Registration and Issuance Process, version 3.4, dated 04/10/2012
- /10/ FSR approval letter issued by Guizhou Development & Reform Commission, dated on 26/06/2006
- /11/ EIA approval letter issued by Environmental Protection Department of Guizhou, dated on 12/05/2006
- /12/ VCS Program Definitions, version 3.4, dated 04/10/2012
- /13/ Approved consolidated baseline and monitoring methodology ACM0002 “ Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, version 12.3.0, EB 66, Annex 35, dated on 02/03/2012
- /14/ Purchase contract of main equipment of Ziqiang 18MW Hydropower Project in Guizhou Province China signed between Fujian Nanping Nandian Hydropower Equipment Manufacturing Co., Ltd. and Guizhou Zhijin Ouhua Development Co. Ltd., dated on 21/09/2005
- /15/ Daily operation & maintenance logs
- /16/ Construction contract of Ziqiang 18MW Hydropower Project in Guizhou Province China, dated in 09/2005
- /17/ Power purchase agreement (valid from 01/01/2011 to 31/12/2011 and from 01/01/2012 to 31/12/2012) signed between Guizhou Electric Power Company and Guizhou Zhijin Ouhua Development Co. Ltd., dated on 04/01/2010 and 06/12/2011
- /18/ Operation log regarding replacement of main meter M1, dated on 07/04/2012
- /19/ Monthly meter readings during the monitoring period from 20/12/2010 to 22/10/2012

- /20/ Electricity Transaction Notes(ETNs) and electricity sales receipts during the monitoring period from 20/12/2010 to 22/10/2012
- /21/ Calibration certificates of electric meters of the project activity issued by Guizhou Electric Power Test & Research institute
Calibration certificate of electric meter SN: 1006000001 issued by Anshun electricity supplying Bureau dated on 23/08/2011
- /22/ Calibration Accreditation of Guizhou Electric Power Test & Research institute issued by Guizhou Quality Supervision Bureau, Accreditation Certificate No. 2007240193D and No. 2010240168D, valid from 14/08/2007 to 01/11/2013
Calibration Accreditation of Anshun electricity supplying Bureau issued by Guizhou province power company office of measurement, No. [2011] Qian Dian Liang Biao Neng No. D133, valid from 28/04/2011 to 27/04/2015.
- /23/ Survey Report of reservoir submerged surface area of Ziqiang 18MW Hydropower Project in Guizhou Province China issued by Guizhou Survey & Design Research Institute for Water Resources and Hydropower, dated on 17/06/2011 and 13/05/2012.
- /24/ Nameplate of turbine-generator units involved in the project, dated 25/04/2013
- /25/ Operation qualifications of staff
- /26/ Business license of Guizhou Zhijin Ouhua Development Co. Ltd. issued by the Administration for Industry and Commerce of Zhijin county Guizhou Province, Registration No. 522425000019502(1-1), dated on 04/12/2010
- /27/ Statement for the meter reading when (17/04/2012) the old main meter was replaced by new one, issued by Guizhou Electric Power Company, dated on 20/03/2013
- /28/ Operation log of diesel generator.
- /29/ 2006 IPCC Guidelines on National GHG Inventories
- /30/ Clean Development Mechanism Validation and Verification Standard (Version3.0), issued by CDM Executive Board at its 70th meeting on 23/11/2012
- /31/ Ziqiang hydropower station CDM monitoring manual
- /32/ Technical Administrative Code of Electric Energy Metering (DL/T 448-2000)

APPENDIX A: RESOLUTION OF CORRECTIVE ACTION REQUESTS AND CLARIFICATION REQUESTS

No.	CAR/CL/FAR	Response by Project Participants/ CCSC's conclusion of assessment
CAR1	The diesel consumption and operation time of the diesel generator in Monitoring report (Version01) is an estimated value, not the actual operation data. Please revise the diesel generator data and the calculation of CO₂ emission from diesel consumption as per the actual operation data. Furthermore, please provide the diesel generator operation records.	<u>Response by Project Participants:</u> The diesel generator was installed for the purpose of producing power in the case of emergency, If the project station is shut down and at the same time the electricity of the grid is unavailable, this diesel generator will be used to produce electricity at the emergency situation. According to operation records of diesel generator, the total operation time was 1.84 hours and diesel oil consumption amount was 0.0966t. The relevant data and the calculation process of CO₂ emission from diesel consumption have been revised in the MR. The operation log of diesel generator have been provided to DOE. <u>CCSC's conclusion of assessment:</u> As per the operation records of diesel generator, the verification team can confirm that the diesel generator operated once per month just for the purpose of regular maintaining of itself, there is no emergency issues occurred during this monitoring period. The relevant information has been revised in MR (version02)/1/ and accepted by CCSC. And the operation record of diesel generator has been provided and checked to be ok. Therefore, CAR1 was closed.
CL1	Please describe the detailed technical parameters of turbines and generators installed for the project in Section 1 of Monitoring report.	<u>Response by Project Participants:</u> The technical parameters of the turbines and generators installed for this project have been added in the Section 1 of MR. <u>CCSC's conclusion of assessment:</u> The relevant information has been added to the revised

No.	CAR/CL/FAR	Response by Project Participants/ CCSC's conclusion of assessment
		MR(version 02) /1/ and has been check to be consistent with the information in registered CDM-PDD/3/ and the actual situation of the project. Therefore, CL1 was closed.
CL2	(1) Since the generators started commissioning on 20/12/2010, the backup meter was installed on 17/04/2012, Please clarify how the absence of the backup meter impacts the acquisition of the electricity data during the period from 20/12/2010 to 16/04/2012. (2) In Table 1 of the Monitoring report (Version 01), it is stated that the main meter (SN:1006000001) was changed by a new meter(SN: 208368946) on 17/04/2012.Please provide the meter replacement record, Furthermore, the related information shall be described in the Section 2.1 of Monitoring report.	<u>Response by Project Participants:</u> (1)According to the registered MP, “When Main Meter has a breakdown, the readings of Backup Meter will be adopted”; while, in this monitoring period, the Main meter operated in a good condition, and the electricity supplied to and imported from grid can be measured by the main meter well. The absence of the backup meter has no impact on the acquisition of electricity data during 20/12/2010 to 17/04/2012. And a backup meter has been installed on 17/04/2012 making the monitoring system fully consistent with approved MP. (2)As per the regular replacement schedule of the power grid, the main meter was substituted by a new meter, and a backup meter was installed at the same site, so as to be consistent with the MP. The meter exchange does not have any impact on the monitoring plan and emission reductions. The substitution record of main meter has been provided to DOE. And the related information has been described in Section 2.1 of MR. <u>CCSC's conclusion of assessment:</u> (1) Through checking the meter reading records /19/of the project recorded by the Project Owner and the ETNs /20/ issued by the local power grid, verification team can conclude that the Main meter operated in a good condition, and the electricity supplied to and imported from grid can be measured by the main meter well during the period from 20/10/2010 to 17/04/2012. And a backup meter had been installed at the same site of the main meter on 17/04/2012. Verification team can conclude that the absence of the backup meter during 20/10/2010 to 17/04/2012 have not impacted the acquisition of the electricity data. (2) The replacement record of main meter/18/ has been provided and has been checked to be ok, and the relevant information added to the revised VCS-MR (version 02) /1/ has been checked to be ok.

No.	CAR/CL/FAR	Response by Project Participants/ CCSC's conclusion of assessment
		Therefore, CL2 was closed.
CL3	According to the applied approved methodology ACM0002 (Version12.3.0) and the registered CDM-PDD, the quantity of diesel combusted by diesel generator during the year y $FC_{diesel,y}$, the weighted average net calorific value of diesel in year y $NCV_{diesel,y}$ and the weighted average CO_2 emission factor of diesel in year y $EF_{CO_2,diesel,y}$ should be included in Section 3.2 Data and Parameters Monitored. Please revise the monitoring report to make Section 3.2 complete.	<u>Response by Project Participants:</u> Section 3.2 of MR has been revised. The relevant information about these three parameters has been added in revised MR. <u>CCSC's conclusion of assessment:</u> The relevant information has been added to the revised VCS-MR (version 02) /1/ and has been check to be consistent with the information in registered CDM-PDD/3/ and the actual situation of the project. Therefore, CL3 was closed.
CL4	Validity date of the meters in Table 1 of Monitoring report (Version 01) shall be revised as per the information in calibration report.	<u>Response by Project Participants:</u> The validity date of the meters in Table 1 of MR has been revised according to the calibration report. <u>CCSC's conclusion of assessment:</u> The revised validity dates of the meters in Table 1 of the revised MR have been check to be consistent with the calibration reports. Therefore, CL4 was closed.

Appendix B: Certificates of Competence



Appendix B

CERTIFICATE OF COMPETENCE

Date of Qualification: 10/03/2013

Mr. Liu Dongsan

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions* (CDMI0301) as

- ☒ CDM validator for Technical Area(s): TA1.2
- ☒ CDM verifier for Technical Area(s): TA1.2
- ☐ Technical expert for Technical Area(s): _____
- ☐ Technical reviewer
- ☐ Financial expert
- ☒ Team leader
- ☐ CDM validation/verification trainee

Huang ShiYuan
CCSC General Manager



Appendix B

CERTIFICATE OF COMPETENCE

Date of Qualification: 12/03/2013

Ms. Zheng Ling

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions* (CDMI0301) as

- ☐ CDM validator for Technical Area(s): _____
- ☐ CDM verifier for Technical Area(s): _____
- ☒ Technical expert for Technical Area(s): TA1.2/TA13.1
- ☐ Technical reviewer
- ☒ Financial expert
- ☐ Team leader
- ☒ CDM validation/verification trainee

Huang ShiYuan
CCSC General Manager



Appendix B

CERTIFICATE OF COMPETENCE

Date of Qualification: 12/03/2011

Mr. Shi Weiwei

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions* (CDMI0301) as

- ☐ CDM validator for Technical Area(s): _____
- ☐ CDM verifier for Technical Area(s): _____
- ☒ Technical expert for Technical Area(s): TA1.2
- ☐ Technical reviewer
- ☒ Financial expert
- ☐ Team leader
- ☒ CDM validation/verification trainee

Huang ShiYuan
CCSC General Manager



Appendix B

CERTIFICATE OF COMPETENCE

Date of Qualification: 10/03/2011

Mr. Rui Qiguang

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions* (CDMI0301) as

- ☒ CDM validator for Technical Area(s): TA2.2/TA3.1
- ☒ CDM verifier for Technical Area(s): TA2.2/TA3.1
- ☒ Technical expert for Technical Area(s): TA2.2/TA3.1
- ☒ Technical reviewer
- ☒ Financial expert
- ☒ Team leader
- ☐ CDM validation/verification trainee

Huang ShiYuan
CCSC General Manager