

VERIFICATION AND CERTIFICATION REPORT

86 MW Hydro Project in Himachal Pradesh

Monitoring Period: 05-07-2011 to 31-08-2012
(incl. both days)

Report No: CCP.VOL0908 MP01 (CP2)

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Summary:

Malana Power Company Limited has commissioned the SGS Climate Change Programme to carry out the first periodic verification of the second crediting period of VCS project “86 MW Hydro Project in Himachal Pradesh”, with regard to the relevant requirements of VCS standard version 03.3.

The project activity involves generation of electricity by using the renewable energy source (hydro) for a grid system in the state of Himachal Pradesh, India. Thus, the project activity displaces electricity and green house gas (GHG) emissions currently produced by fossil fuel-burning Power plants. The generated electricity by the project activity is being exported to the Northern regional grid (now a part of NEWNE grid) in India.

Reporting period: From 05-07-2011 to 31-08-2012 (including both days)

In the course of the verification six (06) Corrective Action Requests (CARs) were raised and all these CARs were successfully closed.

The verification is based on the draft monitoring report^{1.1/}, final monitoring report^{1.5/}, emission reduction calculation spreadsheet^{2.1//2.2/}, the monitoring plan as set out in the validated PD^{12/}, the validation report^{13/}, the seventh verification report^{14/}, and supporting documents^{7//4//17//6/} made available to the SGS Climate Change Programme by the project participant.

As the result of the 1st periodic verification of the second crediting period, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. SGS Climate Change Programme herewith confirms that the project has achieved emission reductions in the above mentioned reporting period (05-07-2011 to 31-08-2012 (incl. both days)) as follows:

Emission reductions 398735 t CO₂ equivalents

The monitoring period has been split into monthly emission reductions achieved and the verified emission reductions are as follows:

- from 05-07-2011 to 31-07-2011 is 47444 tCO₂e
- from 01-08-2011 to 31-08-2011 is 60770 tCO₂e
- from 01-09-2011 to 30-09-2011 is 40571 tCO₂e
- from 01-10-2011 to 31-10-2011 is 17420 tCO₂e
- from 01-11-2011 to 30-11-2011 is 9341 tCO₂e
- from 01-12-2011 to 31-12-2011 is 6952 tCO₂e
- from 01-01-2012 to 31-01-2012 is 5330 tCO₂e
- from 01-02-2012 to 28-02-2012 is 4567 tCO₂e
- from 01-03-2012 to 31-03-2012 is 9961 tCO₂e
- from 01-04-2012 to 30-04-2012 is 14349 tCO₂e
- from 01-05-2012 to 31-05-2012 is 21379 tCO₂e
- from 01-06-2012 to 30-06-2012 is 34911 tCO₂e
- from 01-07-2012 to 31-07-2012 is 59968 tCO₂e
- from 01-08-2012 to 31-08-2012 is 65772 tCO₂e

Totalling to 398,735 t CO₂ equivalents for the monitoring period.

Abbreviations

CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CL	Clarification Request
CO₂	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
CP	Certification Program
cumecs	cubic metre per second
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
HEP	Hydro Electric Project
HPSEB	Himachal Pradesh State Electricity Board
IPCC	Intergovernmental Panel on Climate Change
JMR	Joint Meter Reading
Km	Kilo meter
KV	Kilo Volt
kWh	Kilo Watt Hour
m	Meter
MP	Monitoring Plan
MPCL	Malana Power Company Limited
MR	Monitoring Report
MWh	Mega Watt Hour
NEWNE	North East West North East (Grid of India)
PD	Project Description (VCS V01)
QC/QA	Quality control/Quality assurance
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCU	Verified Carbon Unit
VVM	Validation and Verification Manual

Table of Contents

Table of Contents	5
1 INTRODUCTION	6
1.1 Objective	6
1.2 Scope and Criteria	6
1.3 Level of assurance	7
1.4 Summary Description of the Project.....	7
1.4.1 Project Characteristics	7
1.4.2 Project Location.....	7
1.4.3 Technical Project Description.....	8
2 VALIDATION PROCESS, FINDINGS AND CONCLUSION.....	9
2.1 Validation Process.....	10
2.2 Validation Findings	10
2.2.1 Gap Validation	10
2.2.2 Methodology Deviations.....	10
2.2.3 Project Description Deviations.....	10
2.2.4 New Project Activity Instances	10
2.3 Validation Conclusion.....	10
3 VERIFICATION PROCESS	10
3.1 Method and Criteria	10
3.2 Document Review	11
3.3 Interviews	11
3.4 Site Inspections	12
3.5 Resolution of Any Material Discrepancy	14
4 VERIFICATION FINDINGS.....	15
4.1 Project Implementation Status.....	15
Accuracy of Equipment	23
4.2 Accuracy of GHG Emission Reduction or Removal Calculations.....	24
4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals	26
4.4 Management and Operational System	28
5 VERIFICATION CONCLUSION	29
ANNEX 1: VERIFICATION STATEMENTS.....	31
ANNEX 2: DOCUMENT REFERENCES	34
ANNEX 3: OVERVIEW OF FINDINGS.....	38
ANNEX 4: TEAM MEMBERS STATEMENTS OF COMPETENCY.....	47

1 INTRODUCTION

The Malana Power Company Limited has commissioned the SGS Climate Change Programme to carry out the verification of the project:

“86 MW Hydro Project in Himachal Pradesh”

with regards to the relevant requirements of the Verified Carbon Standard; VCS version 03.3^{/15/}. The verifiers have reviewed the implementation of the monitoring plan (MP) in the validated VCS project for the monitoring period 05-07-2011 to 31-08-2012 (incl. both days).

The applied monitoring methodology is ACM0002, version 12.3.0¹ “consolidated baseline methodology for grid-connected electricity generation from renewable sources”^{/9/}.

1.1 Objective

The purpose of this verification, by independent checking of objective evidence, is as follows:

- to verify that the project is implemented as described in the project description;
- to assess the implementation of the monitoring plan (MP) content in the registered VCS PD version 03 dated 20-03-2012 (Revalidated for the revision in crediting period)
- to assess the project's compliance with other relevant rules, including the host country (India) legislation;
- to confirm that the monitoring system is implemented and fully functional to generate verified carbon units (VCUs) without any double counting; and
- to establish that the data reported are accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation.

1.2 Scope and Criteria

The verification of this project is based on the validated project document^{/12/}, the monitoring report^{/1.1-1.5/}, emission reduction calculation spread sheet^{/2.1///2.2/}, supporting documents^{/7//4//6/} made available to the verifier and information collected through performing interviews and during the on-site assessment. Furthermore publicly available information was considered as far as available and required.

¹ As per validated VCS PD^{/12/} (Re-validated for the revision in crediting period) and corresponding validation report^{/13/}, the applied methodology version is ACM0002 Version 12.1.0. However, in compliance with Para 13 of EB 61 annex 25, PP has updated the version of the applied methodology from ACM0002 Version 12.1.0 to ACM0002 Version 12.3.0.

The SGS Climate Change Programme has employed a risk-based approach in the verification, focusing on the identification of significant risks and reliability of project monitoring and generation of emission reductions.

1.3 Level of assurance

The verification has been planned and organized to achieve a

- ☒ reasonable level of assurance
- ☐ limited level of assurance.

1.4 Summary Description of the Project

1.4.1 Project Characteristics

Essential data of the project is presented in the following Table 1-4.1, Table 1-4.2 and Table 1-4.3.

Table 1-4.1: Project Characteristics

Item	Data
Project title	86 MW hydro project in Himachal Pradesh
Project owner	Malana Power Company Limited
Any specific project categories	☐ Mega project ($> 10^6$ t CO _{2eq} / a) ☒ Project (5000 t CO _{2eq} / a to 10^6 t CO _{2eq} / a) ☐ Micro project (< 5000 t CO _{2eq} / a) ☐ AFOLU project ☐ Grouped project ☐ No specific project category
VCS MR dated	Draft: 11-09-2012 Final: 15-12-2012 (Version 05)
Applied Methodology	ACM0002, version 12.3.0
Scope/Technical area	01/Renewable Hydro
Project starting date	2001-07-05
Crediting period	☐ Renewable Crediting Period (7 y) ☒ Renewable Crediting Period (10 y)
Start of crediting period	Start date of first crediting period: 05-07-2001 Start date of second crediting period: 05-07-2012

1.4.2 Project Location

The details of the project location are given in Table 1-4.2:

Table 1-4.2: Project Location

No.	Project Location
Host Country	India
Region:	Himachal Pradesh
Project location address:	Jari village, Kullu district

No.	Project Location
Latitude (Power house):	32° 0' 12" N
Longitude (Power house):	77° 14' 30" E

1.4.3 Technical Project Description

The project is a grid connected hydro power plant which is run of the river type with a small reservoir. It involved construction of a barrage across Malana River, 3 Km downstream of Malana village, a head regulator, a de-silting basin storage reservoir to divert water draft of 21 cumecs through a 3.2 Km long headrace tunnel, ending in a 5 m diameter surge shaft.

The water discharged is channelled through a 2.85 m wide D- shaped pressure tunnel or head race tunnel. At the end of headrace tunnel, a surge shaft has been provided which is 72 m high and has an orifice diameter of 1.4 m to certain the height of surges.

A vertical pressure shaft of 2.5 m diameter followed by a steel lined horizontal pressure tunnel of 2.2 m diameter which runs down the hill slope and bifurcates into two branches of 1.5 m diameter each to feed the two vertical axis type Pelton units. To exploit the net head of 480 meters, a power house has been created with two units of 43 MW each and is also housing the step-up transformer. The generated electricity is fed into NEWNE grid through 132 KV transmission lines.

At the project site, there is another hydro power project owned by other project developer i.e. TOSS HEP connected to the same feeders at the substation. The TOSS HEP was allowed to utilise the Malana HEP (the VCS project) bus bar for transmitting the electricity to the substation. Thus, this VCS project activity shares common metering arrangement with TOSS HEP as connected to NEWNE grid interface through same feeder lines. A common metering system is used to measure the electricity sent out by Malana HEP (The VCS project) and TOSS HEP at the Manala Switchyard.

The monitoring of the net electricity supplied to grid at substation is under sole jurisdiction of the HPSEB. Hence, in order to calculate the net electricity supplied to the grid by the present VCS hydro project (Malana HEP), the auxiliary electricity consumption and transmission losses are apportioned based on the total energy sent out & total energy injected at Bajaura Sub Station. The calculation for auxiliary consumption and transmission losses for Malana HEP is described in the section 4.2 of the VCS PD validated by DOE, dated 23/04/2012. The key parameters of the project are given in Table 1-4.3:

Table 1-4.3a: Technical data of the project

Parameter	Unit	Value
Capacity of Reservoir	cubic meter	2,35,000
Diameter of Penstock	meter	2.2
Design Discharge	cubic meter/ second	21
Head race tunnel	meter	One head race tunnel with 3280m length
Installed Capacity	MW	86
Size of Power House	-	55m X 18.7m X 28.9 m
Type of Turbines	-	Pelton , Vertical Axis

Parameter	Unit	Value
Generating Units	-	2 Units of 43 MW each
Maximum Gross Head	meter	505

Table 1-4.3b: Parameters confirmed during verification

Parameter	Name	Unit	Value
Energy Generated by Malana HEP(kWh)		MWh	469766.66
Net energy Generated by Malana HEP(kwh) and injected into NEWNE grid	EG _y	MWh	464733.54
Toss HEP electricity injected into Malana yard	EG _{y Toss}	MWh	74170.60

2 VALIDATION PROCESS, FINDINGS AND CONCLUSION

Validation process is not applicable as this is a verification report.

The VCS project was already validated and registered under VCS registry. The detail of the VCS validations is given below:

VCS Validation= 25-04-2007

Re-validation (for renewable of the crediting period) = 23-04-2012

VCS validation and re-validation was performed by TÜV NORD CERT GmbH.

2.1 Validation Process

Not Applicable

2.2 Validation Findings

Not Applicable

2.2.1 Gap Validation

Not Applicable

2.2.2 Methodology Deviations

Not Applicable

2.2.3 Project Description Deviations

Not Applicable

2.2.4 New Project Activity Instances

Not Applicable

2.3 Validation Conclusion

Not Applicable

3 VERIFICATION PROCESS**3.1 Method and Criteria**

The verification of the project consisted of the following steps:

- Contract review
- Appointment of team members and technical reviewers
- Desk review of the Monitoring Report^{1.1/} submitted by the client and additional supporting documents.
- Verification planning,
- On-Site assessment,
- Background investigation and follow-up interviews with personnel of the project developer and its contractors,
- Draft verification reporting
- Resolution of corrective actions (if any)
- Final verification reporting
- Technical review

- Final approval of the verification.

Verification is based on the criteria laid down by VCS version 03.3.

The sequence of the verification is given in the table 3.1 below:

Table 3.1: Verification sequence

Topic	Time
Assignment of verification	14-09-2012
On-site visit	19-09-2012 & 20-09-2012
Draft reporting finalised	08-11-2012
Technical review	17-12-2012
Final reporting finalised	17-12-2012

The main verification steps are described below.

3.2 Document Review

The validated VCS PD^{/12/}, the VCS MR^{/1.1-1.5/}, the emission reduction calculation spread sheet^{//2.1-2.2//} and supporting background documents^{/7//6//4//17/} related to the project implementation, project design, monitoring and baseline were reviewed.

The project participant furnished performance records of the project in form of data logs, registers^{/7/}, generation reports^{/6/}, training records^{/17/} and calibration certificates^{/4/} etc. VER Calculation sheet^{//2.1-2.2//} was checked thoroughly by the verification team for correctness of calculation approach. Data input values were also checked from the records maintained by the project participant. Result of calculations reported in the Monitoring Report^{/1.1-1.5/} was checked against data values as available from the project participant in VER calculation sheet^{//2.1-2.2//}. These data values and other information related to project performance including calibrations details are available in the form of data logs and records duly archived and maintained as per the quality assurance/quality control procedure specified as a part of monitoring plan given in the validated PD^{/12/}.

Furthermore, the verification team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

The references used in the course of this verification are summarized in Annex 2.

3.3 Interviews

The verification team has carried out interviews in order to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable for the VCS.

Before and during the on-site visit, the verification team performed interviews with the representative of project participant to confirm selected information and to resolve issues identified in the document review.

Representatives of Malana Power Company Limited (MPCL) and Emergent Ventures India Pvt. Ltd. (project consultant) including the operational staff of the plant were interviewed. Details of the interviewed persons are included in Table: Annex 2.4. The main topics of the interviews are summarised in Table 3-4.1.

Table 3-4.1: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
1. Projects & Operations personnel from MPCL 2. Project consultant (Refer below)	- General aspects of the project - Technical equipment and operation - Changes since validation - Monitoring and measurement equipment - Calibration procedures - Quality management system - Involved personnel and responsibilities - Training and practice of the operational personnel - Implementation of the monitoring plan - Monitoring data management - Data uncertainty and residual risks - GHG emission reduction calculation - Procedural aspects of the verification - Maintenance - Environmental aspect

3.4 Site Inspections

As most essential part of the verification exercise, it is indispensable to carry out an inspection on site in order to verify that the project is implemented in accordance with the applicable criteria. Furthermore the on-site assessment is necessary to check the monitoring data with respect to accuracy to ensure the calculation of emission reductions. The main tasks covered during the site visit include, but are not limited to:

- The on-site assessment included an investigation of whether all relevant equipment is installed and works as anticipated.
- The operating staff was interviewed and observed in order to check the risks of inappropriate operation and data collection procedures.
- Information processes for generating, aggregating and reporting the selected monitored parameters were reviewed.
- The duly calibration of all metering equipment was checked.
- The monitoring processes, routines and documentations were audited to check their proper application.
- The monitoring data were checked completely.
- The data aggregation trails were checked via spot sample down to the level of the meter recordings.

Vishnu Patidar having technical expertise for the Renewable hydro projects attended the site visit.

Before and during the on-site visit the verification team performed interviews with the project participants to confirm selected information and to resolve issues identified in the document review. Representatives of Malana Power Company Limited (MPCL) (Project Participant) and Emergent Ventures India Pvt. Ltd. (Project Consultant) including the operational staff of the plant were interviewed. The main topics of the interviews are summarised in Table below.

Date²	Name	Position	Short Description of Subject Discussed
19/09/2012 & 20/09/2012	Mr. M. A. Rafiq	Manager-Electrical (Malana Power Company Limited)	• Technical specifications, Installed capacity • Project commissioning • Plant Operations • Project boundary • Monitoring & Measuring System • Collections and recoding of data • Data archiving system • Calibration of measuring Equipments • Operation and Maintenance procedures • VCS monitoring & Reporting documentation • Quality Assurance-Management & Operating System • Internal audits • Training procedures
19/09/2012 & 20/09/2012	Mr. Abhishek Garg	Executive- Commercial (Malana Power Company Limited)	• Plant Operations • VCS monitoring records & Reporting documentation • Internal audits • Invoicing against the supply of electricity supplied to grid • Quality Assurance-Management & Operating System • Training procedures
19/09/2012 & 20/09/2012	Mr. Chandan Thakur	Electrical Engineer (Malana Power Company Limited)	• Plant Operations • Monitoring & Measuring System • Collections and recording of data • Data archiving system • Calibration of measuring Equipments • Operation and Maintenance procedures • CDM monitoring & Reporting documentation • Training procedures

²Means of Interview: (Telephone, E-Mail, Visit)

Date ²	Name	Position	Short Description of Subject Discussed
19/09/2012	1. Mr. Hemchand Bandhu 2. Mr. Ratan Lal	S.S.S., HPSEB Limited Foreman, HPSEB Limited	- Data recording at substation plant log books - Calibration requirements, certificates
19/09/2012 & 20/09/2012	Mr. Satyapal Singh	Sr. Consultant, Carbon Advisory Business (Emergent Ventures (EVI))	- Preparation of monitoring report - ER calculations - VCS standard version 3.2, - VCS standard version 3.3

3.5 Resolution of Any Material Discrepancy

Material discrepancies identified in the course of the verification are addressed either as CARs, CLs or FARs.

A **Corrective Action Request (CAR)** is established where:

- mistakes have been made in assumptions, application of the methodology or the project documentation which will have a direct influence the project results,
- the requirements deemed relevant for verification of the project with certain characteristics have not been met or
- there is a risk that the project would not be registered or that emission reductions would not be able to be verified and certified.

A **Clarification Request (CL)** will be issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

A **Forward Action Request (FAR)** will be issued when certain issues related to project implementation should be reviewed during the first verification.

A detailed list of the CARs CLs and FAR raised and discussed in the course of this verification is included in the next section 4 of this report.

4 VERIFICATION FINDINGS

In this section the assessments and findings from the desk review of the VCS PD, the MR, the site visit, interviews and supporting documents as well as the final assessments are summarised. Detailed closure of the finding raised during verification process is described in Annex-3 of the report.

4.1 Project Implementation Status

4.1.1 Implementation status of the project activity

During the verification, a site visit was carried out. On the basis of this site visit, physical verification and the reviewed project documentation it can be confirmed that with regards to the realized technology, the project equipments, as well as the monitoring and metering equipment has been implemented and operated as described in the re-validated VCS PD^{/12/}.

The project participant i.e. Malana Power Company Limited has successfully commissioned unit 2 (43 MW) of project activity on 05-07-2001 followed by unit 1 (43 MW) on 09-07-2001, since then project is operational with some planned/unplanned shutdowns. The phase wise commissioning dates of unit 1 and unit 2 have been addressed in the Annex 2 and confirmed from the commissioning certificates^{/6/}. Project activity was operational during the current monitoring period with minor shutdowns. Shutdown/outages details were included in section 5.2 of final Monitoring Report^{/1.5/} and same are checked and verified from the Plant records^{/7/} as well.

As per the onsite assessment, observations, interviews and collected evidences, it is concluded that project activity has been implemented as described in the Project Description^{/12/} re-validated as per VCS standard version 3.2 (for the revision in the crediting period). There is no change in the key equipments as described in Table 1-4.3a of this report. During the monitoring period covering 05/07/2011 to 31/08/2012 (both days included), the project displaced 464733.542 MWh of NEWNE grid in India. This was verified by the verification team during the on site visit by checking the recorded generation data^{/7/}, plant records, joint metering report^{/6/} and invoices against the power supplied to the grid^{/5/}.

The requirement for data recording as envisaged as per VCS validated PD^{/12/}. The project boundary is consistent with the Validated VCS PD^{/12/} and there are no additional sources of GHG which are attributable to the project activity.

The information's on project crediting period are given below:

Event	Date
Project VCS Validation	27-04-2005
Crediting period	10 years and 0 month; May be Renewed twice (Voluntary Carbon Standard 2007.1; Program Guidelines; VCSA Rules ;and VCS Guidance Document) ^{/15/}
First crediting Period	05/07/2001 – 04/07/2011 (Both days included); VCUs issued
Second crediting period:	05/07/2011 – 04/07/2021

First Monitoring Period (Present)- Second crediting Period	05/07/2011 – 31/08/2012 (Including both days); Current Monitoring period
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The comparison of actual values of the ER achieved in 1st monitoring period (second crediting period) with the estimations in the VCS validated PD^{/12/} have been included in section 5.3 of MR^{/1/}. The actual emission reduction for the current monitoring period are higher than what estimated in VCS PD as presented below:

Item	Values applied in ex-ante calculation of the registered VCS-PD	Actual values reached during the current monitoring period (of 424 days)
Emission reductions (tCO ₂ e)	320,070 tCO ₂ (Estimated for 424 days)	398,735 t CO₂

The reported emission reduction in the current monitoring period is 398735 tCO₂e. The estimated emission reduction in the VCS PD^{/12/} is 320,070 tCO₂e for the duration of the present monitoring period (the current monitoring period consisting of 424 days). The actual emission reductions achieved for current monitoring period are 28.55% higher than the estimated in the VCS PD. This difference between estimated and actual VCUs was due to the variability in the hydro potential (i.e. PLF) during the monitoring period. Verification team independently reviewed last three year historical energy generation by Malana HEP^{/18/} and confirmed that this difference is due to higher PLF achieved during the current monitoring period which is primarily because of two peak season (July-August) covered during current monitoring period. The historical records of energy generation during Financial Year -2010-11, 2011-12 and 2012-13) are thoroughly reviewed and verification team confirmed that the difference of ~28% in estimated VCUs in the PD and actual VCUs achieved for the current monitoring period is justifiable and acceptable due to the fact that the current monitoring period covers two peak season which contributes historically ~60% of energy generation in the year and thus higher number of emission reduction attributed to overall higher PLF of the project activity during the monitoring period. Further, as checked from the VCS validated PD^{/12/} and the VCS validation report (Report number 53213807- 07/36)^{/13/} dated 25/04/2007, it is found that additionality of the VCS project was demonstrated based on the “Test-1: Project Test” predominantly by demonstrating the implementation barrier and thus investment analysis was not conducted. Thus, the higher PLF achieved during the monitoring period does not impact on the additionality of the VCS project.

Discussions of CAR/CLs

CAR 01 (#1) was raised to include the Report ID in page 1 of the MR as required by the VCS Monitoring Report Template. In response, the PP has submitted revised the MR and the PP has included the report

ID (Report ID: MPCL/CP-02/MP-01) as required by the VCS Monitoring Report Template, version 3.2. Thus, CAR 01 (#1) is closed out.

CAR 01 (#2) was raised to correct the duration of the second crediting period in section 1.6 of MR as per the VCS PD version 03, dated 20/03/2012 (Revalidated for the renewable in the crediting period). In the response, the duration of the second crediting period is corrected in section 1.6 of MR version 02 as per the VCS PD version 03, dated 20/03/2012 (Revalidated for the renewable in the crediting period). Thus, CAR 01 (#2) is closed out.

CAR 01 (#3) was raised as the reference of the applied methodology is not found correct in section 1.8 of MR as per the VCS PD version 03, dated 20/03/2012 and the validation report dated 23/04/2012 (Revalidated for the renewable in the crediting period). In response, the reference of the applied methodology is corrected as per the VCS PD version 03, dated 20/03/2012 and validation report dated 23/04/2012 (Revalidated for the renewable in the crediting period) in section 1.8 of the final MR. Also, the web link of the applied methodology ACM0002, Version 12.3.0 is found correct. Thus, CAR 01 (#3) is closed out.

CAR 01 (#4) was raised to provide the information regarding the operation of the project activity during this monitoring period. In response, the PP has provided additional information related to the VCS project activity and accordingly, the details of the outages/breakdowns of the project activity during the monitoring period in section 5.2 of the MR. Verification team has checked the details of the outages from the daily plant records and compiled breakdown report as well. Based on the daily plant records, it is confirmed that the project activity is continuously operated during the monitoring period. Thus, CAR 01 (#4) is closed out.

CAR 02 was raised as per FAR 3.4.1 raised in the validation report of the renewable of crediting period (Report No: 8107173618-11/154, Date: 2012-04-23) and accordingly the PP was requested to demonstrate that no claim were made for same emission reductions (other environmental credits) under two GHG programs. In response, the PP has submitted the self declaration by General Manager-Commercial (Malana Power Company Limited) dated 03/10/2012 and 11/10/2012 stating that the VCS registered project activity "86 MW Hydro Project in Himachal Pradesh" is only registered with the VCS and neither claiming the emission reductions credits (or other environmental credits) under other GHG programs and nor rejected under any GHG programs and Verification team has further confirmed based on the interviewed during the on-site assessment and done independent web-search at CDM UNFCCC and found that the project activity "86 MW Hydro Project in Himachal Pradesh" is not registered with CDM scheme of UNFCCC as well. Hence FAR 3.4.1 raised in the validation report of the renewable of crediting period (Report No: 8107173618-11/154, Date: 2012-04-23) is closed. Thus, CAR 02 is closed out.

4.1.2 Implementation status of the monitoring plan and the completeness of monitoring

The monitoring and reporting procedures reflect the requirements of the monitoring plan of the validated PD^{12/} (re-validated as per VCS standard version 3.2 (for the revision in the crediting period) and the monitoring parameters are recorded as per the monitoring plan and methodology^{9/}.

Following metering and measurement was verified during onsite visit dated 19/09/2012 & 20/09/2012:

1. Net Electricity supplied to the NEWNE grid by the project activity during the year y (Malana HEP) (EG_y):

This is calculated parameter. In line with the validated PD^{/12/}, energy meters installed at three different locations i.e. at generation point (Malana Power plant), plant sent out point- Malana Switch Yard, (at the Malana Switch yard, the injection from the TOSS HEP is also monitored) and at Bajaura Substation, are being accurately monitors the electricity units and Joint Meter readings (JMR) in presence of authorised representative of HPSEB and MPCL are being taken at all three stations. These JMR readings are used to determine the intermediate parameters used for the calculation of EG_y.

The formulae used in the calculation of this parameter is as follows:

$$EG_y = [EG_{Malana} - EG_{Aux,Malana} - L_{Malana}]$$

All parameter used in the above calculations are explained below.

The verification team has checked all the monthly JMRs^{/6/} and confirms that the values considered for the calculation of EG_y are accurate and in line with the JMR. These readings were also cross checked from the check meters located all three monitoring locations as mentioned above. The verification team has further crosschecked the data of EG_y from the invoices^{/5/} to ensure the correctness of applied data.

Hence, there are no possibilities of errors to be occurred during the transposition between data sets and the calculation. The same was confirmed and checked by the verification team during the site visit.

2. Energy generated by Malana Hydro Power project at the Generation point (EG_{Gen,Malana}):

This parameter is being continuously monitored through a calibrated tri-vector energy meter installed at the generation point. The plant operator (Support staff) logged the reading in the plant log books on hourly basis, which are further reviewed by the shift in-charge and further, on weekly and monthly basis, the Joint Meter readings (JMR) are being taken in presence of authorised representative of HPSEB and MPCL.

The verification team has checked all the monthly JMRs^{/6/} and confirms that the reported values of the parameter **EG_{Gen,Malana}** are accurate and in line with the JMR. These readings were also cross checked from the check meters located at the generation end (Malana Power plant). The verification team has cross verified the JMR reading with the hourly plant log records and confirmed that there is no discrepancy observed. As the reading of this parameter is being taken in presence of a regulatory body (HPSEB) hence, there are no possibilities of errors to be occurred during the transposition between data sets and the calculation. The same was confirmed and checked by the verification team during the site visit.

The details of the energy meter installed and their calibration requirement, accuracy of the measurement are explained in below section 4.1.3.

3. Energy supplied by the Malana Hydro Power Project to the Malana transmission line at Malana Yard (EG_{Malana})

This is calculated parameter. In line with the validated PD^{/12/}, energy meters for Line 1 and Line 2 installed at generation point (Malana Power plant) are being accurately monitors the electricity generated by the two units of the project activity.

These JMR readings are used to determine the parameter EG_{Gen,Malana}. The formulae used in the calculation of this parameter is as follows:

$$EG_{Malana} = (EG_{Gen,Malana} - EG_{Aux,Malana})$$

All parameter used in the above calculations are explained separately.

4. The units/ Energy supplied by the Toss Hydro Power Project to the Malana transmission line at Malana Yard. (EG_{y, TOSS})

This parameter is being continuously monitored through a calibrated tri-vector energy meter installed at the Malana Yard. On monthly basis, the Joint Meter readings (JMR) are being taken in presence of authorised representative of HPSEB and TOSS (another hydro electric power project injecting the electricity in same transmission Line-1 and Line-2 to the Bajaura substation (HPSEB). However, these JMR are not under the purview of the MPCL and thus, based on the JMR, HPSEB issued monthly meter readings to MPCL and same is used in the further calculations.

The verification team has checked all the monthly reports issued by HPSEB^{/6/} and confirms that the reported values of the parameter $EG_{Y,TOSS}$ are accurate and in line with the monthly report and confirmed that there is no discrepancy observed. As the reading of this parameter is being taken in presence of a regulatory body (HPSEB) hence, there are no possibilities of errors to be occurred during the transposition between data sets and the calculation. The same was confirmed and checked by the verification team during the site visit.

The details of the energy meter installed and their calibration requirement, accuracy of the measurement are explained in below section.

5. Total Energy sent out both Malana and Toss hydro power project to the Malana transmission line at Malana yard ($EG_{M\&T}$).

This parameter is being continuously monitored through a calibrated tri-vector energy meter installed at the Malana Yard. This parameter represents the total Energy sent out by both MPCL (VS Project) and TOSS (another hydro project) using the same transmission lines at Malana yard. The representative of HPSEB logged the reading in the plant log books on hourly basis, and further, on weekly and monthly basis, the Joint Meter readings (JMR) are being taken in presence of authorised representative of HPSEB and MPCL.

The verification team has checked all the monthly JMRs^{/6/} and confirms that the reported values of the parameter $EG_{M\&T}$ are accurate and in line with the JMR. As the reading of this parameter is being taken in presence of a regulatory body (HPSEB) hence, there are no possibilities of errors to be occurred during the transposition between data sets and the calculation. The same was confirmed and checked by the Verification team during the site visit.

The details of the energy meter installed and their calibration requirement, accuracy of the measurement are explained in below section.

6. Auxiliary consumption by Malana hydro power project ($EG_{Aux,Malana}$)

This is calculated parameter. In line with the validated PD^{/12/}, the JMR readings and monthly report by HPSEB are used to determine the parameter $EG_{Aux,Malana}$. The formulae used in the calculation of this parameter is as follows:

$$EG_{Aux,Malana} = [EG_{Gen,Malana} + EG_{Toss} - EG_{M\&T}]$$

All parameter used in the above calculations are explained separately.

7. Energy injected at Bajoura substation by both Malana and Toss hydro power project ($EG_{Bajoura, M\&T}$)

This parameter is being continuously monitored through a calibrated tri-vector energy meter installed at the Bajaura Substation. This parameter represents the total Energy injected by both MPCL (VCS Project) and TOSS (another hydro project) using the same transmission lines at Bajaura Substation. The representative of HPSEB logged the reading in the substation books on hourly basis, and further, on weekly and monthly basis, the Joint Meter readings (JMR) are being taken in presence of authorised representative of HPSEB and MPCL. The verification team evidences the substation logbooks during the on-site assessment.

The verification team has checked all the weekly and monthly JMRs^{/6/} and confirms that the reported values of the parameter $EG_{Bajoura, M\&T}$ are accurate and in line with the JMR. As the reading of this

parameter is being taken in presence of a regulatory body (HPSEB) hence, there are no possibilities of errors to be occurred during the transposition between data sets and the calculation. The same was confirmed and checked by the Verification team during the site visit.

The details of the energy meter installed and their calibration requirement, accuracy of the measurement are explained in below section.

8. Total transmission losses between Malana yard and Bajoura substation ($L_{Transmission}$)

This is calculated parameter. This parameter represents the total transmission losses during transmission of electricity from Malana Yard to Bajoura substation. In line with the validated PD^{/12/}, The JMR readings and monthly report by HPSEB are used to determine the parameter $L_{Transmission}$. The formulae used in the calculation of this parameter is as follows:

$$L_{Transmission} = (EG_{M\&T} - EG_{Bajoura, M\&T})$$

All parameter used in the above calculations are explained separately.

9. Share of losses of Malana hydro power project (L_{Malana})

This is calculated parameter. This parameter represents the share of the transmission losses during transmission of electricity from Malana Yard to Bajoura substation to be taken by MPCL head.

In line with the validated PD^{/12/}, the JMR readings and monthly report by HPSEB are used to determine the parameter $L_{Transmission}$. The formulae used in the calculation of this parameter is as follows:

$$L_{Malana} = \frac{L_{Transmission} * EG_{Malana}}{EG_{MT}}$$

All parameter used in the above calculations are explained separately.

10. Share of losses of Toss hydro power project (L_{Toss})

This is calculated parameter. This parameter represents the share of the transmission losses during transmission of electricity from Malana Yard to Bajoura substation to be taken by TOSS head.

In line with the validated PD^{/12/}, the JMR readings and monthly report by HPSEB are used to determine the parameter $L_{Transmission}$. The formulae used in the calculation of this parameter is as follows:

$$L_{Toss} = \frac{L_{Transmission} * EG_{Toss}}{EG_{MT}}$$

All parameter used in the above calculations are explained separately.

11. 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})

As per the applied methodology ACM002 version 12.3.0, this parameter A_{PJ} is kept as monitoring parameter, however it is mentioned that is required to be measured in the surface of the water, after the implementation of the project activity, when the reservoir is full. At the time of re-validation (during the renewable to crediting period) it is validated by the validating DOE^{/13/} that the reservoir is having surface area of 18250 m² at the time of implementation and same is found in line with the methodology and found appropriate.

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

As per the on-site assessment and by confirming from the various evidences i.e. commissioning certificates^{/19/} issues by the technology supplier (BHEL), Name plate capacity of generator as verified during the site visit^{/8/}, it is confirmed that the installed capacity of the VCS hydro power plant is 86 MW and is remain same after the implementation of the project activity.

Thus, based on the above, verification team confirmed the following:

- For the monitoring purpose, there are four meters (2 main and 2 check meters) at the generation point for measuring electricity generated by the two generators, and another four meters (2 main and 2 check meters) for measuring electricity transferred from the plant to the substation at the outgoing point through the two lines. Further there are four meters (2 main and 2 check) at the substation for measuring the electricity supplied to the grid.
- There are two meters (1 Main and 1 check meter) at the injection point of Toss electricity into the Malana yard.
- The meter readings at all the monitoring points i.e. at Malana generation end, at Malana Transmission end (Malana switch Yard) and Malana Receiving end (at Substation) are found to be recorded at an hourly basis in the log sheets by the shift in-charge at Malana HEP and by representative of HPSEB at the substation. Also, it is found during on-site assessment that, at the Malana Switchyard, representative of TOSS HEP records the energy injected by TOSS HEP on hourly basis.
- Daily, weekly and monthly generation reports are also found to be archived.
- Invoices^{/5/} to the grid company were available for verification, which was used for comparisons of the JMR values and other archived records^{/7/}.
- The submitted monitoring report^{/1.1-1.5/} which forms the basis of the verification was observed to be prepared by summarizing consolidated monthly data^{/6/} over the whole monitoring period in accordance with the monitoring plan.
- All necessary monitoring instruments are found to be installed. The measuring devices are well known to the personnel and calibrated annually by authorised agency^{/4/} as defined in the VCS PD^{/12/}.
- The calibration records of all the installed energy meters and backup (spare) meters were made available to the verification team^{/4/}. As from the previous verification, some of energy meters are replaced with the spare meters during the said monitoring period. The details of the calibrations and the replacement are found to be provided in section 5.4 of the monitoring report^{/1.5/}. The calibration certificate of the replaced energy meters are also submitted to the verification team. No abnormality was observed in the metering.
- The reporting procedures reflect the requirements of the monitoring report^{/1.1//1.5/}. The net electricity replaced is recorded hourly, summarized daily, weekly and month.
- Archiving is found to be appropriate during the whole monitoring period^{/7/}. The daily, weekly and monthly data also was found to be reviewed by the Assistant manager (Electricals) to check any anomaly.
- It has been found to the verification team's satisfaction that the data from Toss HEP is also being monitored from the date of installation, as mentioned above^{/7/}.
- Periodic Internal audits for VCS data monitoring, QA/QC (calibrations, generation records etc.) have been evidenced^{/3/}.
- The personnel involved have been found to be given training which also involved skill development in job safety analysis from the experience of other hydro projects. During the interviews it was known that further training was planned^{/17/}.

- The verification team has verified the monthly generation reports^{/6/}, log books^{/7/}, invoices^{/5/} and found they are recorded and maintained in line with monitoring plan of the validated PD^{/12/}, methodology ACM0002 Version 12.3.0. Thus the DOE confirms the completeness of the monitoring in the key areas.

Furthermore, there are no open/pending issues (i.e. FARs) indicated in the previous verification report (Report No. 8108126612-11/358-V07)^{/13/}, dated 28/07/2011 issued by the DOE i.e. TÜV NORD CERT GmbH.

Discussions of CAR/CLs:

CAR 05 was raised:

CAR 05(#a) was raised to ask the PP to include the details of the monitoring equipments as required by the VCS MR template Version 3.2. In response, the PP has submitted revised MR and same is checked and found that the details of all the monitoring equipments (energy meters) are already included in section 5.4 of the MR. It is checked and found that in section 3.2 of revised MR transparently referred the monitoring equipments details for each relevant parameters. Thus, finding CAR 05(#a) is closed.

CAR 05(#b) was raised to ask the PP to include the monitoring frequency for all the relevant parameters transparently as required by the VCS MR template Version 3.2. In response to same, the PP has submitted the revised MR. The frequency of the monitoring for each monitoring parameters is found included in section 3.2 of the MR. Based on the on-site assessment and verification of the evidences i.e. plant log records, joint meter readings etc. it is found that the all relevant parameters are being monitored with the calibrated energy meters on continuous basis and recording of the same is done based on the joint meter reading taken in presence of HPSEB representative on weekly and monthly basis. The same information is found included in section 3.2 of the revised MR and found correct, in line with the applied methodology and validated VCS PD. Thus, finding CAR 05(#b) is closed.

CAR 05(#c) was raised to justify the accuracy of energy meters used for the monitoring purpose in line with the validated VCD PD. In response the PP has clarified that the accuracy of energy meters are 0.2s which is more accurate than the accuracy class of meters mentioned in the validated VCS PD. The statement made by the PP is further evaluated based on metering standards. As checked from international standard IEC 60044-1, the table 12, energy meter having accuracy 0.2s are special purpose meters and are more accurate. Further, it is verified from the Notified Regulations under the Electricity Act 2003 “the Central Electricity Authority (Installation and Operation of meters) (Amendment) Regulations 2010” (No.:502/6/2009/DP&D/D-I) dated 04/06/2010 released by CEA which clearly mentions that “In generating stations, the accuracy class of meters at a point after the generator stator terminals and before the tap off to the unit auxiliary transformer(s) shall not be inferior to that of 0.2S accuracy class”. This confirms that energy meter having accuracy class 0.2s are more accurate and mandatory to use by the Central Electricity Authority (regulatory body), Government of India. Thus, found to be appropriate as installing the better accuracy energy meters will enhance the measurement and further enhance the accuracy of the ERs calculation. Thus, finding CAR 05(#c) is closed.

CAR 06 was raised as to correct the version of methodology in section 1.2, section 1.8 of MR as ACM0002 Version 12.1.0 is superseded with ACM0002 Version 12.3.0 in line with Para 13 of EB 61 Annex 25. In response, PP has submitted revised MR/version 05. The applicable version of applied methodology ACM0002 Version 12.3.0 is found mentioned in section 1.2, section 1.8 of MR/version 05 which is checked from the information available on UNFCCC CDM webpage (<http://cdm.unfccc.int/methodologies/DB/UB3431UT9I5KN2MUL2FGZXZ6CV71LT>)

) and verification team confirmed that Version 12.1.0 of ACM0002 as applied in the re-validated VCS PD is superseded with Version 12.3.0. As per Para 12 (a) of EB 61 Annex 25, "Editorial Revision: At its twenty-seventh meeting.....when editorial changes are made to a document, the document is re-issued under the same primary version number", Further, Para 13 of EB 61 Annex 25 clearly mentions that "changes of an editorial nature will be published on the public website and will become applicable upon date of publication". Accordingly, Version 12.3.0 of ACM0002 is used for the assessment of the verification, which is appropriate in line with Para 12 and Para 13 of EB 61 Annex 25. Thus, finding CAR 06 is closed.

4.1.3 Accuracy of Equipment

The accuracy class of the all the energy meters involved in the monitoring is 0.2s. As per the validated VCS PD⁽¹²⁾, the energy meters installed for the electricity exported to the grid are calibrated once in a year. There are total three metering locations involved in the project activity for both Line 1 and Line 2. The calibration details of the monitoring equipments i.e. energy meters as verified are mentioned below. The black shaded cells are representing the energy meters which are currently installed (verified at the time of site visit) for metering the electricity.

Location1: Calibration Details of Trivector Meters installed at Malana Generation End:

Main/ Check	End	Meter Sr. No.	Installation Date	Calibration Valid from	Calibration Valid up to	Remarks
Main Meter(Accuracy class=0.2s)	Line-1	KRB00279	04.05.2011	28.03.2011	27.03.2012	For whole monitoring period (05-07-2011 to 31-08-2012), calibrated meters were used
		KRB00 281	02.03.2012	17.01.2012	16.01.2013	
	Line-2	KRB00280	04.05.2011	28.03.2011	27.03.2012	
		KRB00 282	02.03.2012	18.01.2012	17.01.2013	
Check Meter(Accuracy class=0.2s)	Line-1	KRB00 281	09.03.2011	22.02.2011	21.02.2012	
		AB0013A	31.12.2011	14.11.2011	13.11.2012	
	Line-2	KRB00 282	09.03.2011	23.02.2011	22.02.2012	
		AB0014A	31.12.2011	18.11.2011	17.11.2012	

Location 2: Calibration Details of Trivector Meters installed at Malana Transmission end:

Main/Check	End	Meter Sr. No.	Installation Date	Calibration Valid from	Calibration Valid up to	Remarks
Main Meter (Accuracy class=0.2s)	Line-1	AB0008A	09.03.2011	22.02.2011	21.02.2012	For whole monitoring period (05-07-2011 to 31-08-2012), calibrated meters i.e. were used
		AB000 1A	31.12.2011	17.11.2011	16.11.2012	
	Line-2	AB0012A	09.03.2011	22.02.2011	21.02.2012	
		AB000 3A	31.12.2011	17.11.2011	16.11.2012	
Check Meter(Accuracy	Line-1	AB0009A	09.03.2011	23.02.2011	22.02.2012	
		AB000 2A	31.12.2011	16.11.2011	15.11.2012	

class=0.2s)	Line-2	AB0011A	04.05.2011	29.03.2011	28.03.2012
		AB000 5A	02.03.2012	17.01.2012	16.01.2013

Location 3: Calibration Details of Trivector Meters installed at Malana Receiving End (Bajaura Substation):

Main/ Check	End	Meter Sr. No.	Installation Date	Calibration Valid from	Calibration Valid up to	Remarks
Main Meter(Accuracy class=0.2s)	Line-1	AB0005A	09.03.2011	23.02.2011	22.02.2012	For whole monitoring period (05-07-2011 to 31-08-2012), calibrated meters i.e. were used
		AB000 4A	31.12.2011	15.11.2011	14.11.2012	
	Line-2	AB0010A	04.05.2011	29.03.2011	28.03.2012	
		AB000 8A	02.03.2012	17.01.2012	16.01.2013	
Check Meter(Accuracy class=0.2s)	Line-1	AB0006A	04.05.2011	29.03.2011	28.03.2012	
		AB000 7A	02.03.2012	16.01.2012	15.01.2013	
	Line-2	KRB09865	04.05.2011	28.03.2011	27.03.2012	
		AB000 9A	02.03.2012	16.01.2012	15.01.2013	

4.2 Accuracy of GHG Emission Reduction or Removal Calculations

Baseline Emissions

The verification team confirms that the project participant has computed the baseline emissions in accordance with the guidance provided in the methodology. The net electricity supplied by the project activity to the grid has been multiplied with the NEWNE grid electricity emission factor.

In line with section 3 of the VCS PD^(12/), (revalidated during renewable of crediting period), the emission reduction is calculated as follows:

$$\begin{aligned}
 \text{Baseline emission} &= \text{Net electricity supplied to grid (MWh)} \times \text{Grid emission Factor (t CO}_2\text{e/MWh)} \\
 &= 464733.542 \times 0.858 \\
 &= 398741.3789 \text{ tCO}_2\text{e (rounded down to 398741)}
 \end{aligned}$$

Note: This is to be noted that, in order to divide the monthly vintage wise VCU, PP has calculated monthly VCUs after rounded down the value and based on the rounded down function, the cumulatively VCUs (after rounding off monthly emission reductions to the lower value) are 398735 tCO₂, from 05/07/2011 to 31/08/2012 (including both days). The approach of monthly vintage wise VCUs is found appropriate on the principle of conservativeness.

Project and leakage Emissions

Further, as per section 3 of the VCS PD^(12/) and applied methodology i.e. ACM0002 version 12.3.0, leakage emissions and project emissions are zero. Further, based on on-site verification, it is confirmed that there are no sources of GHG emissions which lead to emissions which contributes more than 1%.

Emission Reductions

Thus emission reductions are calculated as follow:

$$\begin{aligned}
 \text{Emission reductions} &= \text{Baseline emissions} - \text{Project emissions} - \text{Leakage emissions} \\
 &= 398735 - 0 - 0
 \end{aligned}$$

= 398,735 t CO₂e

Considering the emission reduction computation, the cumulatively achieved VCU (after rounding off monthly emission reductions to the lower value) are 398735 tCO₂, from 05/07/2011 to 31/08/2012 (including both days).

The calculations of emission reductions are found to be correct. The baseline for the northern (NEWNE) grid has been taken for arriving at emission reductions. The grid emission factor of 0.858 tCO₂/MWh, fixed ex ante, was applied correctly for the baseline emission calculations.

Based on the document review and assessment of the calculation approach, verification team confirm the following:

- The approved CDM baseline and monitoring methodology ACM0002 Version 12.3.0^{/9/}, is applied to the project activity. GHG emission reduction is calculated as baseline emission minus project emission minus leakage.
- The formula and emission factor used in the calculations of emission reductions are in accordance to the approved methodology ACM0002, Version 12.3.0 and monitoring plan of the validated PD^{/12/}.
- Baseline emission is net electricity delivered to the grid multiplied with emission factor (EF), in compliance with ACM0002Version 12.3.0. EF is calculated *ex-ante* as 0.858 tCO₂e/MWh.
- As referred in section 4.1, the calibration frequency is defined as once in one year as per validated VCS PD^{/12/}. The calibration certificates of all the meters (including spare meters) were checked and calibration was found to be within one year in all the cases.
- The generation records^{/7/} were found to be of adequate quality. The verification team has cross checked the resulted value of units supplied by the project activity to the grid (EG_v) with the measurements observed at plant's generation^{/7/} and transmission (outgoing) points^{/6/} and are found to be correct.
- The outage detail during the monitoring period was also checked^{/7/} and is found to be appropriately recorded.
- Moreover the verification team has interviewed the HPSEB engineers at Bajaura substation and understood the total energy received at Bajaura substation (kWh) is recorded daily. The data will be sent to higher authorities and also there is mechanism of weekly billing. Moreover, apportioning was further discussed, and it was observed that the HPSEB was closely monitoring the generation data and apportioning details to a satisfactory level. Moreover, the resulted value of units supplied by the project activity to the grid (EG_v) was found to be correctly calculated from the approved formula for apportioning. During the site visit, the verification team has verified the daily, weekly and monthly generation reports^{/7/} to cross check the reliability of data and were satisfied.
- The set of calculations for the actual emission reduction of the 1st verification period (05-07-2011 to 31-08-2012 (incl. both days) are transparently computed and presented in the spread sheet of VER calculation^{/2./} with the reference sources of data. A correct and appropriate grid emission factor in accordance validated PD^{/12/} is applied. The sources of project specific electrical energy generation data were cross-checked with the JMR reports^{/6/7/} and found to be correctly applied.

Final Assessment

The emission reduction spreadsheet is transparent and clearly referenced. The excel sheets were rigorously cross checked with the archived monitored data and no discrepancies were found. All the formulae have been found to be correctly applied in the emission reduction calculations. Thus, the verification team is confident that the ER calculation is correct and accurate.

Discussions of CAR/CLs

CAR 03 was raised to demonstrate the excess VCUs achieved during the current monitoring period as compared to the estimated emission reductions in the VCS PD version 03, dated 20/03/2012 (Revalidated for the renewable in the crediting period) for the same duration with the help of verifiable evidences. In response, the PP has clarified that the difference between estimated VCUs in the PD and actual generated VCUs (tCO₂e) is 78665 (28.55%) on yearly basis. This difference is due to higher PLF achieved during the current monitoring period which is primarily because of two peak season (July-August) covered during current verification period. The clarification provided by the PP is further assessed based on the historical records of energy generation during Financial Year -2010-11, 2011-12 and 2012-13) and verification team confirmed that the difference of ~28% in estimated VCUs in PD and actual VCUs achieved for the current monitoring period is justifiable and acceptable due to the fact that the current monitoring period covers two peak season which contributes historically ~60% of energy generation in the year and thus higher number of emission reduction attributed to overall higher PLF of the project activity during the monitoring period. Thus, CAR 03 is closed.

CAR 04 was raised to correct the value mentioned for the estimated VCUs as per the registered PD for the verification period 05/07/2011 to 31/08/2012 and the value of actual VCUs generated during the current monitoring period. In response, the PP has corrected the section 5.3 of the MR version 02. The value for the estimated VCUs as per the registered PD for the verification period 05/07/2011 to 31/08/2012 and the value of actual VCUs generated during the current monitoring period is now corrected as per the ER computation sheet. Thus, CAR 04 is closed.

CAR 05 (#d) was raised to report the year wise emission reduction in section 4.4 of the VCS MR. In response, PP has accurately provided year wise emission reduction achieved in section 4.4 of the revised VCS MR. Thus, CAR 05 (#d) is closed.

CAR 05 (#e) was raised to correct the number of days in the monitoring period used for the estimated ER calculation from the PD. The PP has submitted corrected MR. In the revised MR, the PP has corrected the number of days in the estimation of the ERs from the PD in section 5.3 of the MR. The no. of days in the monitoring period is reported as 424 days and same is found correct. Accordingly, the calculation of the estimated ERs from the Validation VCS PD for the duration of the monitoring period is found to be correct. The calculation of the same is checked and found appropriate. Thus, CAR 05 (#e) is closed.

4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals

Description

The critical parameters used for the determination of emission reductions are a) the Joint Meter Readings (JMRs) for determining the power export to the grid, b) the electricity imports for use at the project site to meet the daily electricity requirements. The data pertaining to the above-mentioned parameters are maintained in identified records for the entire monitoring period.

- Several documents were submitted by the project participant as evidence to determine emission reductions which form apart of Annex 2.
- All energy generation reports^{/6/} used for EG_y and EG_{loss} are duly signed by the authorised signatory from the HPSEB-Bajaura sub-station. All third party calibration reports are also found valid in the

current verification period. These documents were verified through site visit interviews and found to be authentic.

- The reported data was verified and found to be matching with the other recorded data in the log records^{7/}. The energy generation by Malana HEP and energy measured at outgoing point are collected using the DCD as stated above which completely avoids the manual errors.
- Furthermore competent employees are recruited, who are found knowledgeable not only about the plant operations but also ensuring the quality of the data and recording and maintaining.
- The verification team finds the quality to be of adequate level to assure confidence in the accurate quantification of the emission reductions.

The following table provides the details on the reliability of the essential data used for the calculation of emission reductions:

Parameter	description	Source Reliability of the evidence
EG _y	Electricity supplied to the grid by the project activity during the year y in MWh	Based on the above discussions, this parameter (EG_y) is calculated based on the following parameters: 1. Energy generated by Malana Hydro Power project at the Generation point (EG_{Gen,Malana}) 2. Auxiliary consumption by Malana hydro power project (EG_{Aux,Malana}) 3. Total transmission losses between Malana yard and Bajoura substation (L_{Transmission}) Verification team has assessed the calculation approach and found exactly in-line with the validated PD ^{12/} (SECTION 4.2). As the reading of all these parameter used in the calculation is being taken in presence of a regulatory body (HPSEB) hence, there are no possibilities of errors to be occurred during the transposition between data sets and the calculation. The same was confirmed and checked by the Verification team during the site visit. Further, verification team has adopted following additional crosschecking measures to ensure the reliability of the data: 1. Invoices raised by MPCL to the grid company were used for comparisons of the JMR values. 2. The electricity supplied to the grid by the project activity during the monitoring period is further compared with the monitored data of energy generated by Unit 1 and Unit 2 of Malana Hydro Power project at the Generation point (EG_{Gen,Malana}) and it is assessed that
		<table><tr><td>Parameter</td><td>Value (MWH)</td></tr></table>
Parameter	Value (MWH)	

		EG _y	464733.542
		EG _{Gen,Malana}	469766.656
		% difference	1.07%
		It is verified that the net electricity supplied to the grid by the project activity during the present monitoring period is 1.07% lesser than the total energy generation from the Malana HEP (VCS project), which is due to HEP auxiliary electricity consumption and transmission losses from the generation end till the Bajaura Substation. The share of auxiliary electricity consumption and transmission losses is further verified from the historical records from April 2010 to August 2012, which is found in the range of 0.70%-1.36% of total generation with average value of 1.01%. Further, as mentioned in the validated VCS PD^{/12/} (section 3.1), the historical average share of the auxiliary electricity consumption and transmission losses is 0.33% and 0.76% respectively which is in total 1.09%. Since, the actual auxiliary consumption and losses (transmission losses) verified during this monitoring period falls in the historical average range, hence verification team concludes that the reported value of EG_y is correct and the emission reduction based on the same are accurate.	
EF _y	CO ₂ baseline emission factor for the electricity displaced due to the project activity in during the year y in tons CO ₂ /MWh.	This is an ex-ante fixed parameter, validated at the time of re-validation (during renewable of crediting period) by the validated DOE and thus found to be reliable, appropriate.	

Final Assessment

Documents used as evidences for input values of ER calculation were assessed and found to be reliable and authentic. The verification team concludes that the evidence and the data are of at acceptable level of quality.

4.4 Management and Operational System

Description

The organizational structure includes site shift-in-charges, involved in the day-to-day operations of the plant. Site supervisors are responsible for checking the reliability of data and also monthly report preparation. The Staff (Technicians and Officers) involved in day to day operation of the Power plant has adequate experience and all the equipments essential for the GHG emission reductions are operating smoothly. All the collated data are reviewed by the senior management at site and also by the top management at Head Office.

The verification team has done the site visit on 19/09/2012 & 20/09/2012 and verified the procedures being followed at site in monitoring and calculating the electricity generation which is exported to the grid. The verification team confirmed that the PP follows the procedures as mentioned in the VCS validated PD

- During the verification site visit it was found the operational structure and operation of the structure is found as stated in the monitoring plan of the VCS PD^{/12/} and the monitoring report^{/1.1//1.5/}.
- Moreover the competent staff is employed to ensure the data quality as discussed in section 4.3.
- An operational structure is established with responsibilities identified. Personnel are also sent for training as against the identified requirements^{/17/}.
- Data collection, measurement, calibration, recording and archiving was found to be carried out as per the monitoring plan as described in the validated PD^{/12/} and
- The weekly and monthly summary report is submitted to the head office located at Noida, Uttar Pradesh.
- Internal audit of the data monitored and procedures followed are in place. Thus, verification team has confirmed that data management, archiving procedures are appropriate.

Final Assessment

An organogram describing the hierarchy of management and operation system related to the project activity GHG monitoring and QA/QC has been included as section 3.3 in the final monitoring report^{/1.5/} and no other discrepancy was identified from the designed management and operation system as described in the validated PD^{/12/}. The final monitoring report^{/1.5/} clearly describes the management and operational system for the current monitoring period.

5 VERIFICATION CONCLUSION

The scope of the verification

We, SGS have been engaged by MPCL Limited to certify that the greenhouse gas (GHG) emission reductions reported for the VCS Project “86 MW Hydro Project in Himachal Pradesh” in India for the period from 05-07-2011 to 31-08-2012 (both days included) in the verification report and the final monitoring report version 05 dated 15-12-2012 are eligible for registration as Verified Carbon Units.

This engagement covers the verification of emission reductions from anthropogenic sources of greenhouse gases included within the project boundary of the VCS project “86 MW Hydro Project in Himachal Pradesh” in India, as well as an additional confirmation of the compliance of the VCS PD with the requirements of VCS Standard version 3.3.

Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. Our examination includes assessment, on a test basis, of evidence relevant to the amounts and disclosures in relation to the project’s GHG emission reductions for the defined reporting period.

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

Conclusions of the verification

(a) SGS is an entity accredited by the United Nations Framework Convention on Climate Change (UNFCCC) to undertake certification and verification services in the sector in which the Project is undertaken. The accreditation is accepted by VCSA as indicated in Clause 5 of VCS Program Guide Version 3.4.

(b) The monitoring report, together with other information examined, was prepared as per the VCS Monitoring Report Template, Version 3.2.

(c) The information in the monitoring report together with other information examined by the assessment team, including all the information necessary to determine that the emission reductions achieved have been determined correctly.

(d) Based on the examination of the monitoring report and other relevant information, the project meets all the requirements of the VCS Standard Version 3.3.

(e) Based on our examination of the monitoring report and other relevant information, the claiming emission reductions during the monitoring period from 05-07-2011 to 31-08-2012 (including both days) are verified as 398735 tonnes CO₂ equivalent.

Liability statement with regards to the accuracy of the verification statement

The management of MPCL Limited is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions. SGS is responsible for verification and confirming emission estimates for the project, as described in the monitoring report.

Our certification approach draws on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. Our examination includes an assessment of evidence, through desk review, and where necessary, interviews, stakeholder discussions and site visits, relevant to certifying the rightfulness of the amounts and disclosures in relation to the Project's GHG emission reductions.

We planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that the amount of GHG emission reductions for the given period, prepared on the basis of the monitoring report, are fairly stated.

The conclusions can be summarised as follows:

- All operations of the project are implemented and installed as planned and described in the validated project description and project activity confirms with the verification criteria for project and their GHG emission reductions or removals set out in the VCS rules i.e. VCS version 03.3.
- The monitoring plan is in accordance with the applied approved methodology, i.e., ACM0002, Version 12.3.0
- The installed equipments essential for measuring parameters (energy meters) required for calculating emission reductions are calibrated appropriately.
- The monitoring system is in place and functional. The project has generated verifiable GHG emission reductions.

As the result of the 1st periodic verification of the second crediting period, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. SGS Climate Change Programme herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows.

Reporting period: From 05-07-2011 to 31-08-2012 (incl. both days)

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

GHG Emission Reductions or Removals	tCO ₂ e
Baseline Emissions	398735
Project Emissions	0
Leakage	0
Net GHG emission reductions or removals	398,735

Annex 1: Verification statements

Malana Power Company Limited has commissioned the SGS Climate Change Programme to carry out the 1st verification (second crediting period) of the Project “86 MW Hydro Project in Himachal Pradesh” at Jari village in Kullu district of Himachal Pradesh, India with regard to the requirements of VCS standard version 03.3^{/15/}.

The project activity involves generation of electricity by using the renewable energy source (hydro) for a grid system in the state of Himachal Pradesh, India. Thus the project activity displaces electricity and green house gas (GHG) emissions currently produced by fossil fuel based power plants. The generated electricity by the project activity is being exported to the Northern regional grid (now a part of NEWNE grid) in India.

Reporting period: From 05-07-2011 to 31-08-2012 (incl. both days)

In the course of the verification six (06) Corrective Action Requests (CARs) were raised and all these CARs were successfully closed.

The verification is based on the draft monitoring report^{/1.1/}, final monitoring report version 05^{/1.5/}, the monitoring plan as set out in the validated PD^{/12/}, emission reduction calculation spreadsheet^{/2.1///2.2/}, the validation report^{/13/}, the previous verification reports^{/14/} and supporting documents^{/7//4//17//6/} made available to the SGS Climate Change Programme by the project participant.

In detail the conclusions can be summarised as follows:

- All operations of the project are implemented and installed as planned and described in the validated project description and project activity confirms with the verification criteria for project and their GHG emission reductions or removals set out in the VCS rules i.e. VCS version 03.3^{/15/}.
- The monitoring plan is in accordance with the applied approved methodology, i.e., ACM0002, version 12.3.0
- The installed equipments essential for measuring parameters (energy meters) required for calculating emission reductions are calibrated appropriately.
- The monitoring system is in place and functional. The project has generated verifiable GHG emission reductions.

As the result of the 1st periodic verification of the second crediting period, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. SGS Climate Change Programme herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Project emissions: 00 t CO₂ equivalents

Baseline emissions: 398735 t CO₂ equivalents

Emission reductions: 398735 t CO₂ equivalents.

The summary of the annual emission reductions is as follows:

Monitoring duration from 05/07/2011 to 31/12/2011: 182498 tCO₂e

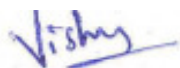
Monitoring duration from 01/01/2012 to 31/08/2012: 216237 tCO₂e

Further, the monitoring period has been split into monthly emission reductions achieved and the verified emission reductions are as follows:

- from 05-07-2011 to 31-07-2011 is 47444 tCO₂e
- from 01-08-2011 to 31-08-2011 is 60770 tCO₂e
- from 01-09-2011 to 30-09-2011 is 40571 tCO₂e
- from 01-10-2011 to 31-10-2011 is 17420 tCO₂e
- from 01-11-2011 to 30-11-2011 is 9341 tCO₂e
- from 01-12-2011 to 31-12-2011 is 6952 tCO₂e
- from 01-01-2012 to 31-01-2012 is 5330 tCO₂e
- from 01-02-2012 to 28-02-2012 is 4567 tCO₂e
- from 01-03-2012 to 31-03-2012 is 9961 tCO₂e
- from 01-04-2012 to 30-04-2012 is 14349 tCO₂e
- from 01-05-2012 to 31-05-2012 is 21379 tCO₂e
- from 01-06-2012 to 30-06-2012 is 34911 tCO₂e
- from 01-07-2012 to 31-07-2012 is 59968 tCO₂e
- from 01-08-2012 to 31-08-2012 is 65772 tCO₂e

Totalling 398,735 t CO₂ equivalent for the monitoring period.

17-12-2012



(Vishnu Patidar)
SGS India Pvt. Ltd.
Verification Team Leader

17-12-2012



(Nayan Jyoti Deka)
SGS Climate Change Programme
Technical Reviewer

Annex 2: Document References

Table: Annex 2.1: Documents provided by the project participant

Reference	Document
/1/	1. Monitoring Report “86 MW Hydro project in Himachal Pradesh” for the period 05/07/2011 to 31/08/2012 version 01, dated 11-09-2012 2. Monitoring Report “86 MW Hydro project in Himachal Pradesh” for the period 05/07/2011 to 31/08/2012 version 02, dated 03-10-2012 3. Monitoring Report “86 MW Hydro project in Himachal Pradesh” for the period 05/07/2011 to 31/08/2012 version 03, dated 18-10-2012 4. Final monitoring Report “86 MW Hydro project in Himachal Pradesh” for the period 05/07/2011 to 31/08/2012, version 04, dated 23-11-2012 (Report ID: MPCL/CP-02/MP-01) 5. Final monitoring Report “86 MW Hydro project in Himachal Pradesh” for the period 05/07/2011 to 31/08/2012, version 05, dated 15-12-2012 (Report ID: MPCL/CP-02/MP-01)
/2/	1. Data monitoring and emission reduction calculation spread sheets provided by the project participant explaining the emission reductions achieved during the monitoring period (related to MR1). 2. Final Data monitoring and final emission reduction calculation spread sheets provided by the project participant explaining the emission reductions achieved during the monitoring period (related to MR4).
/3/	1. Internal audit report, conducted for VCS data monitoring of registered project activity “86 MW Hydro Project in Himachal Pradesh”, dated 05/11/2011, 03/05/2012 and 06/09/2012 2. Monthly statements of unit wise energy generated/transmitted from Malana Hydro Electric Project, reviewed by General Manager, Malana Power Plant.
/4/	The calibration of all energy meters were conducted by NABL accredited agency i.e. Electronic regional Test Laboratory (North), Standardisation, Testing & Quality Certification Directorate, Department of Information Technology, Government of India 1. Calibration records for the generation, transmission and sub-station energy meters for the monitoring period from 05/07/2011 to 31/08/2012. 2. Calibration records for the meters at the Toss injection point at Malana yard for the monitoring period from 05/07/2011 to 31/08/2012. 3. Details of changes in the tri-vector meters at generation, injection, substation points and the Toss injection point during the monitoring period. - Minutes of meeting held on 02/03/2011, 09/03/2011, 04/05/2011. 31/12/2011 at

Reference	Document
	HPSEB Ltd. and MPCL regarding replacement of meters
/5/	1. Monthly invoice copies to cross check the energy supplied to the grid during the monitoring period from 05/07/2011 to 31/08/2012. 2. Weekly invoice copies to cross check the energy supplied to the grid during the monitoring period from 05/07/2011 to 31/08/2012.
/6/	1. Monthly Joint Meter Reading (JMR) certificates of Malana HEP indicating main and check meter numbers and the energy total generated at the project site (Malana project), energy sent out from the power station (including TOSS energy) and that injected at Sarabai Sub-station at Bajaura by HPSEB covering entire reported monitoring period (01/07/2011 to 31/08/2012), (thus, already incorporates the auxiliary consumption and transmission losses. 2. Weekly Joint Meter Reading (JMR) certificates of Malana HEP indicating main and check meter numbers and the energy generated at the site and that injected at Sarabai Sub-station at Bajaura by HPSEB covering entire reported monitoring period (01/07/2011 to 31/08/2012) (thus, already incorporates the auxiliary consumption and transmission losses. 3. Joint meter readings of Toss HEP covering entire reported monitoring period (01/07/2011 to 31/08/2012) in the form of monthly report.
/7/	1. Sample of daily log book records showing Malana HEP generation. 2. Sample of weekly data from the Data Collecting Device (DCD). 3. Sample of daily reports sent to the head office (HO). 4. Records of the electricity from the Toss Hydro project injected at Malana yard from 05/07/2011 to 31/08/2012. 5. Plant log records showing details of the outages occurred during the monitoring period.
/8/	Photographs of the site visit.
/9/	ACM0002: "Consolidated baseline methodology for grid connected electricity generation from renewable sources" (ACM0002, Version 12.3.0) EB 66, Annex 35, 02-03-2012 Web link: http://cdm.unfccc.int/methodologies/DB/UB3431UT9I5KN2MUL2FGZXZ6CV71LT
/10/	The signed contract between SGS India Pvt. Ltd. and Malana Power Company Limited for carrying out verification of voluntary emission reduction dated 14-09-2012.

Reference	Document
/11/	1. CO2 Baseline Database for the Indian Power Sector, version 06, published by Central Electricity Authority, Ministry of Power, Government of India. 2. The electricity Act, 2003. 3. National Action Plan on Climate Change, Prime Minister's Council On Climate Change
/12/	Validated project document of the project "86 MW Hydro project in Himachal Pradesh" against VCS Standard Version 3.2, version 03 dated 20-03-2012 (Re-validated for the revision in crediting period).
/13/	1. Validation Report and opinion for the project "86 MW Hydro Project in Himachal Pradesh" issued by TUV Nord, Report number 8107173618-11/154 dated 23/04/2012 for the re-validation of the VCS project (Renewable of crediting period) 2. 1. Validation Report and opinion for the project "86 MW Hydro Project in Himachal Pradesh" issued by TUV Nord, Report number 53213807- 07/36 dated 25/04/2007 for the validation of the VCS project
/14/	7th Periodic Final Verification Report No. 8108126612-11/358-V07 for the VCS project: "86 MW Hydro Project in Himachal Pradesh" for the period, 01/10/2010 to 30/06/2011, dated 28/07/2011
/15/	1. Verified Carbon Standard VCS Version 3 Requirements Document, version 3.3 dated 04/10/2012 2. Validation and Verification Manual, dated 04/10/2012, version 3.0 3. VCS Program Guide, VCS Version 3, dated 04/10/2012, version 3.4 4. Program Definitions, VCS Version 3, dated 04/10/2012, version 3.4 5. Registration and Issuance Process, VCS Version 03, Procedural Document, dated 04/10/2012, version 3.4 6. Voluntary Carbon Standard 2007.1; Program Guidelines; VCSA Rules ;and VCS Guidance Document
/16/	Technical specification of Generator (Provided by Bharat Heavy Electricals Limited)
/17/	1. Records of training organised by BHEL Bhopal ON HYDRO Power station held on 16/12/2011 to 17/12/2011 2. Health and safety training records conducted on 30/04/2012

Reference	Document
/18/	Detail of Energy Generated, Transmitted, consumption & Losses by Malana H.E.P. during Financial Year -2010-11 ,2011-12 and 2012-13
/19/	Commissioning certificates issued by Bharat Heavy Electricals Limited for 2x43 MW hydro generating units of Malana Hydro Electric Project. 1. Unit 1 (43 MW) on 09/07/2001 2. Unit 2 (43 MW) of project activity was commissioned on 05/07/2001
/20/	1. Declaration to substantiate that the project activity is not register under any other GHG programme by General Manager (Commercial), Malana Power Company Limited dated 11/10/2011 2. Declaration to substantiate that the project activity is not rejected by any other GHG programme by General Manager (Commercial), Malana Power Company Limited dated 03/10/2012
/21/	Accuracy class of energy meters: 1. Central Electricity Authority (Installation and Operation of meters) (Amendment) Regulations 2010, (No.:502/6/2009/DP&D/D-I) dated 04/06/2010 released by CEA 2. Table 12 - Limits of current error and phase displacement for measuring current transformers for special application- IEC 60044-1

Table: Annex 2.2: Websites used

Link	Organisation
http://www.cea.nic.in/	Central Electricity Authority, India
www.iso.org/iso/en	The International Organisation for Standardisation
http://www.hpseb.com/	Himachal Pradesh State Electricity Board Limited
http://www.ieta.org/	International Emissions Trading Association
http://www.malanamodelhep.com/	Malana Power Company Limited

Link	Organisation
http://cdm.unfccc.int/	UNFCCC-CDM
http://www.v-c-s.org/	The Verified Carbon Standard

Annex 3: Overview of Findings

	CARs	CLs	OBSs
Total Number raised	06	0	0

Date:	19/09/2012		Raised by:	Assessment Team		
Type:	CAR	Number:	01		Reference:	AU4

Lead Assessor Comment:

Following editorial issued have been identified in the monitoring report:

1. In page 1 of MR, the Report ID is not provided as required by the VCS Monitoring Report Template.
2. In section 1.6 of MR, the duration of the second crediting period is not found correct as per the VCS PD version 03, dated 20/03/2012 (Revalidated for the renewable in the crediting period)
3. In section 1.8 of MR, the reference of the applied methodology is not found correct as per the VCS PD version 03, dated 20/03/2012 and validation report dated 23/04/2012 (Revalidated for the renewable in the crediting period)
4. Please provide the information regarding the operation of the project activity during this monitoring period, including any information on events that may impact the GHG emission reductions or removals and monitoring as required by the VCS Monitoring Report Template.

Project Participant Response:

Date: 11/10/2012

1. in page 1 of revised MR, Report ID has been incorporated.
2. There was a typo error which has been corrected in the revised MR
3. There was a typo error in the section 1.8 of MR. Reference of the correct methodology has been included in the revised MR.
4. Information regarding the operation of the project activity is already mentioned under section 2.1 of the MR.

Documentation Provided by Project Participant:	
<i>MR version 02</i>	
Information Verified by Lead Assessor:	
<i>MR version 02 dated 03/10/12</i>	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 14/10/2012
1. In revised MR version 02, PP has included the report ID (Report ID: MPCL/CP-02/MP-01) as required by the VCS Monitoring Report Template. Closed. 2. The duration of the second crediting period is corrected in section 1.6 of MR version 02 as per the VCS PD version 03, dated 20/03/2012 (Revalidated for the renewable in the crediting period). Closed. 3. The reference of the applied methodology is now corrected as per the VCS PD version 03, dated 20/03/2012 and validation report dated 23/04/2012 (Revalidated for the renewable in the crediting period) in section 1.8 of MR version 02. However, the web link of the applied methodology is not found correct. Kindly correct the same. Open 4. In section 2.1 of revised MR version 02, the details of the outages/downtime of the project activity during the monitoring period is not reported. Please provide the information regarding the operation of the project activity during this monitoring period, including any information on events that may impact the GHG emission reductions or removals and monitoring as required by the VCS Monitoring Report Template. Open 5. Further as the VCS standard 3.3 has been released on 04/10/2012. Accordingly the VCS MR version 3.2 has been released by VCS board. Kind request you to submit the MR in applicable version of the template. Open	
Project Participant Response:	Date: 18/10/2012
3. The web link of applicable methodology has been corrected in the revised MR dated 18/10/2012 4. Outage detail of the current monitoring period is given in section 5.2 of the monitoring report. 5. Revised MR is already as per the VCS MR Version 3.2.	
Documentation Provided by Project Participant:	
<i>Revised MR</i>	
Information Verified by Lead Assessor:	
<i>Revised MR in latest available template version 3.2 (MR version 03 dated 18/10/2012)</i>	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 20/10/2012

3. The reference of the applied methodology is now corrected as per the VCS PD version 03, dated 20/03/2012 and validation report dated 23/04/2012 (Revalidated for the renewable in the crediting period) in section 1.8 of MR version 02. Also, the web link of the applied methodology ACM0002, Version 12.3.0 is found correct. Closed.	
4. As per the MR template version 3.2, PP has provided additional information related to the VCS project activity and accordingly, the details of the outages/breakdowns of the project activity during the monitoring period in section 5.2 of MR. Verification team has checked the details of the outages from the daily plant records and compiled breakdown report as well. Based on the daily plant records, it is confirmed that the project activity is continuously operated during the monitoring period. Closed.	
5. In line with the revised VCS standard 3.3, PP has submitted revised VCS MR version 02 in the VCS MR version 3.2. Verification team has found that the revised MR is filled properly as per the guidelines mentioned in MR template version 3.2. Hence, the finding is closed.	
Acceptance and Close out by Lead Assessor:	Date: 20/10/2012

Date:	19/09/2012		Raised by:	Assessment Team	
Type:	CAR	Number:	02		Reference: AU4
Lead Assessor Comment:					
In compliance with clause 3.12.5 of VCS standard V3.2, and FAR 3.4.1 raised in the validation report of the renewable of crediting period (Report No: 8107173618-11/154, Date: 2012-04-23), PP is requested to demonstrate that no claim were made for same emission reductions (other environmental credits) under two GHG programs.					
Project Participant Response:				Date: 11/10/2012	
Project activity is registered only under VCS program. Undertaking from the PP has been provided to the DOE.					
Documentation Provided by Project Participant:					
Self declaration by PP					
Information Verified by Lead Assessor:					
Self declaration by General Manager-Commercial (Malana Power Company Limited) dated 03/10/2012 and 11/10/2012					

Reasoning for not Acceptance or Acceptance and Close Out:	Date: 14/10/2012
Verification team has confirmed based on the interviewed during the on-site assessment and further reviewed the self declaration by General Manager-Commercial (Malana Power Company Limited) dated 03/10/2012 and 11/10/2012 stating that the VCS registered project activity "86 MW Hydro Project in Himachal Pradesh" is only registered with the VCS and neither claiming the emission reductions credits (or other environmental credits) under other GHG programs and nor rejected under any GHG programs. Further verification team has done independent web-search at CDM UNFCCC and found that the project activity "86 MW Hydro Project in Himachal Pradesh" is not registered with CDM scheme of UNFCCC as well. Hence FAR 3.4.1 raised in the validation report of the renewable of crediting period (Report No: 8107173618-11/154, Date: 2012-04-23) is closed now.	
Acceptance and Close out by Lead Assessor:	Date: 14/10/2012

Date:	19/09/2012		Raised by:	Assessment Team	
Type:	CAR	Number:	03	Reference:	AU4
Lead Assessor Comment:					
As per section 5.3 of MR, it is found that the actual VCUs generated during the current monitoring period is in excess (more than 28%) as compared to the estimated emission reductions in the VCS PD version 03, dated 20/03/2012 (Revalidated for the renewable in the crediting period) for the same duration (equivalent to the no. of days in this monitoring period). PP is requested to demonstrate the same with the help of verifiable evidences.					
Project Participant Response:				Date : 11/10/2012	
Difference between estimated VERs in PD and actual generated VERs (tCO2e) is 77916 (-28.28%) on yearly basis. This difference is due to higher PLF achieved during the current monitoring period which is primarily because of two peak season (July-August) covered during current verification period.					
Comparing the emission reductions of the immediate one year (Sep 11- Aug 11), the actual emission reductions are 5.44 % higher then what has been estimated for the complete year. The actual emission reductions for the complete one year (Sep 11 – Aug 11) are 290526 as compares to estimated emission reductions 275532. Higher number of emission reduction could be attributed to higher PLF of the project activity during the monitoring period.					
Documentation Provided by Project Participant:					
Revised MR version 02 dated 03/10/12.					
Data Monitoring and ER computation sheet version 02					

Information Verified by Lead Assessor:

Revised MR version 02 dated 03/10/12.

Data Monitoring and ER computation sheet version 02

Historical data (Detail of Energy Generated, Transmitted, consumption & Losses by Malana H.E.P. during Financial Year -2010-11 ,2011-12 and 2012-13)

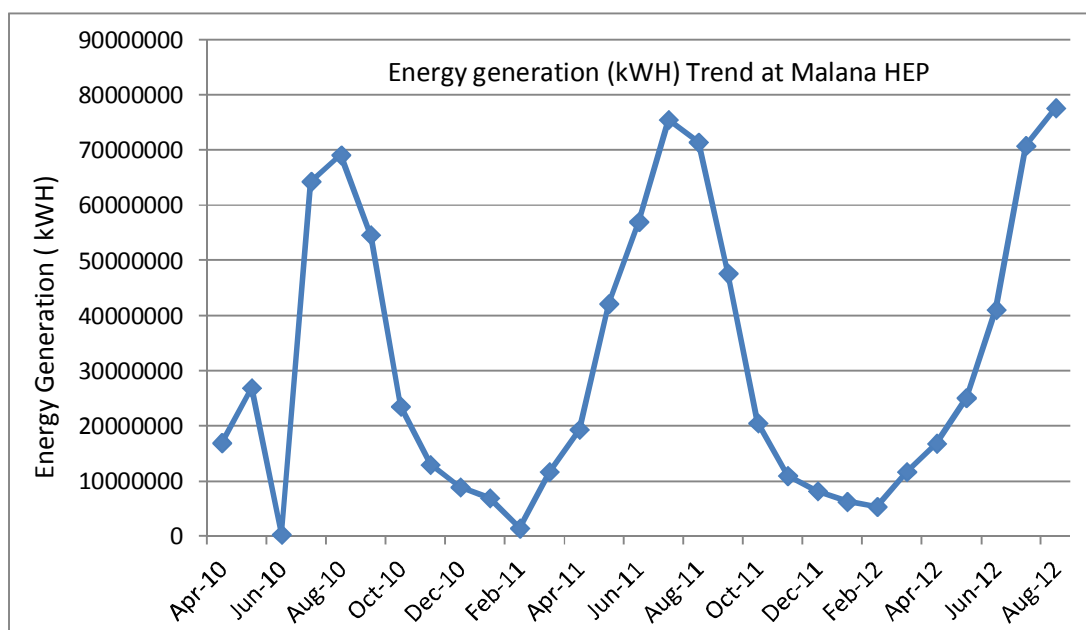
Reasoning for not Acceptance or Acceptance and Close Out:

Date: 14/10/2012

Verification team has assessed the historical energy generation by Malana H.E.P. (project activity) during Financial Year -2010-11, 2011-12 and 2012-13.

Based on the actual energy generation records of the Malana H.E.P. (project activity) it is assessed that:

1. The month of July-September covers the peak generation period due to high water availability and based on the historical energy generation records it is found that in FY 2010-11, the period July-September consist of ~63% of annual energy generation and in FY 2011-12, the period July-September consist of ~52% of annual energy generation. This confirms that the period from July-September covers the peak generation.
2. The duration of this monitoring period i.e. 05-July-2011 to 31-August-2012 covers two peak season (first from July-2011 to September 2011 and second be from July 2012-August 2012).



Based on the above assessment, the difference of ~28% in estimated VCUs in PD and actual VCUs achieved for the current monitoring period is justifiable and acceptable due to the fact that the current monitoring period covers two peak season which contributes historically ~60% of energy generation in the year and thus higher number of emission reduction attributed to overall higher PLF of the project activity during the monitoring period. Closed.

Acceptance and Close out by Lead Assessor:	Date: 14/10/2012
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Date:	19/09/2012		Raised by:	Assessment Team		
Type:	CAR	Number:	04		Reference:	AU4

Lead Assessor Comment:

In section 5.3 of MR, The value mentioned for the estimated VCUs as per the registered PD for the verification period 05/07/2011 to 31/08/2012 and the value of actual VCUs generated during the current monitoring period is not found in compliance with the ER computation sheet. Kindly correct the same.

Project Participant Response:

Date : 11/10/2012

There were type error in section 5.3 of MR. The correct value of estimated ERs and actual generated ERs have been incorporated in the revised MR version 02 dated 03/10/12.

Documentation Provided by Project Participant:

Revised MR version 02 dated 03/10/12.

Information Verified by Lead Assessor:

Revised MR version 02 dated 03/10/12 is checked for the corrections made in section 5.3 regarding VCU comparison.

Data Monitoring and ER computation sheet version 02is checked for the final ER calculations

Reasoning for not Acceptance or Acceptance and Close Out:

Date: 18/10/2012

In section 5.3 of MR, The value for the estimated VCUs as per the registered PD for the verification period 05/07/2011 to 31/08/2012 and the value of actual VCUs generated during the current monitoring period is now corrected as per the ER computation sheet. Closed.

Acceptance and Close out by Lead Assessor:	Date: 18/10/2012
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Date:	23/11/2012		Raised by:	Assessment Team	
Type:	CAR	Number:	05	Reference:	AU4/SG10
Lead Assessor Comment:					
a) Section 3.2 of MR does not provide the details of the monitoring equipments as required by the VCS MR template Version 3.2. Kindly include the same. b) In Section 3.2 of MR, the monitoring frequency for all the parameters is not transparently included as required by the VCS MR template Version 3.2. Kindly include the same. c) Section 3.3 of MR refers the accuracy class of energy meters as 0.2s while the validated VCD PD refers the energy meters of 0.2 accuracy class. Please justify this anomaly. d) In section 4.4 of MR, Kindly include the year wise emission reduction in the VCS MR e) The number of days in the estimation of ERs from the PD is considered as 425 which work out to be 424 days considering the current monitoring period. Kindly correct the same.					
Project Participant Response:				Date: 28/11/2012	
<i>[a) Details of the monitoring equipments is provided in the Table 1, Table 2 and Table 3 under section 5.4 of the MR</i> <i>b) Monitoring frequency of the required parameters have been provided under section 3.2 of the revised MR</i> <i>c) As per metering agency, 0.2s meters accuracy is better than 0.2 accuracy class.</i> <i>d) Under section 4.4 of the MR, yearly emission reduction have been incorporated</i> <i>e) Number of days considered for the estimation of emission reductions have been corrected</i>					
Documentation Provided by Project Participant:					
MR version 04 dated 23/11/2012					
Information Verified by Lead Assessor:					
1. MR version 04 dated 23/11/2012 2. Accuracy level of energy meters is verified from the CEA regulation (the Central Electricity Authority (Installation and Operation of meters) (Amendment) Regulations 2010" (No.:502/6/2009/DP&D/D-I) dated 04/06/2010 released by CEA 3. The International standard IEC 60044-1, the table 12					

Reasoning for not Acceptance or Acceptance and Close Out:	Date: 29/11/2012
a) It is checked from the revised MR and found that the details of all the monitoring equipments (energy meters) are already included in section 5.4 of the MR. It is checked and found that in section 3.2 of revised MR transparently referred the monitoring equipments details for each relevant parameters. Closed. b) Based on the on-site assessment and verification of the evidences i.e. plant log records, joint meter readings etc. it is found that the all relevant parameters are being monitored with the calibrated energy meters on continuous basis and recording of the same is done based on the joint meter reading taken in presence of HPSEB representative on weekly and monthly basis. The same information is found included in section 3.2 of the revised MR and found correct, in line with the applied methodology and validated VCS PD. Closed. c) As checked from international standard IEC 60044-1, the table 12, energy meter having accuracy 0.2s are special purpose meters and are more accurate. Further, it is verified from the Notified Regulations under the Electricity Act 2003 "the Central Electricity Authority (Installation and Operation of meters) (Amendment) Regulations 2010" (No.:502/6/2009/DP&D/D-I) dated 04/06/2010 released by CEA which clearly mentions that "In generating stations, the accuracy class of meters at a point after the generator stator terminals and before the tap off to the unit auxiliary transformer(s) shall not be inferior to that of 0.2S accuracy class". This confirms that energy meter having accuracy class 0.2s are more accurate and mandatory to use by the Central Electricity Authority (regulatory body), Government of India. Thus, found to be appropriate. Closed. d) PP has accurately provided year wise emission reduction achieved in section 4.4 of the revised VCS MR. Closed. e) In the revised MR, PP has corrected the number of days in the estimation of ERs from the PD in section 5.3 of MR. The no. of days in the monitoring period is reported as 424 days and same is found correct. Accordingly, the calculation of the estimated ERs from the Validation VCS PD for the duration of the monitoring period is found to be correct. The calculation of the same is checked and found appropriate. Thus, closed.	
Acceptance and Close out by Lead Assessor:	Date: 29/11/2012

Date:	15/12/2012	Raised by:	Assessment Team		
Type:	CAR	Number:	06	Reference:	MR
Lead Assessor Comment:				Date: 15/12/2012	
ACM0002 Version 12.1.0 is superseded with ACM0002 Version 12.3.0, thus, PP shall refer correct version of methodology in section 1.2, section 1.8 of MR as per Para 13 of EB 61 Annex 25.					
Project Participant Response:				Date: 17/12/2012	
As per revalidated VCS PD, applied methodology version is ACM0002 Version 12.1.0. However, due to editorial change methodology version has been updated by CDM EB from ACM0002 Version 12.1.0 to ACM0002 Version 12.3.0. Hence, updated in the MR which is in line with Para 13 of EB 65 annex 25					
Documentation Provided as Evidence by Project Participant:					
MR version 05 dated 15/12/2012					

Information Verified by Lead Assessor:	
1. MR version 05 dated 15/12/2012 2. EB 61 Annex 25 is referred to check the CDM EB decision on the release of editorial changes in the EB documents (i.e. methodologies, guidelines, tools etc.)	
Reasoning for not Acceptance or Acceptance and Close Out:	
PP has submitted revised MR/version 05. The applicable version of applied methodology ACM0002 Version 12.3.0 is found mentioned in section 1.2, section 1.8 of MR/version 05 which is checked from the information available on UNFCCC CDM webpage (http://cdm.unfccc.int/methodologies/DB/UB3431UT9I5KN2MUL2FGZXZ6CV71LT) and verification team confirmed that Version 12.1.0 of ACM0002 as applied in the re-validated VCS PD is superseded with Version 12.3.0. As per Para 12 (a) of EB 61 Annex 25, "Editorial Revision: At its twenty-seventh meeting.....when editorial changes are made to a document, the document is re-issued under the same primary version number", Further, Para 13 of EB 61 Annex 25 clearly mentions that "changes of an editorial nature will be published on the public website and will become applicable upon date of publication". Accordingly, Version 12.3.0 of ACM0002 is used for the assessment of the verification, which is appropriate in line with Para 12 and Para 13 of EB 61 Annex 25. Thus, finding CAR 06 is closed.	
Acceptance and Close out by Lead Assessor:	Date: 17/12/2012

Annex 4: Team Members Statements of Competency

Name: Vishnu Patidar

Status

- Lead Assessor	x	- Expert	x
- Assessor	x	- Financial Expert	
- Local Assessor	India	- Technical Reviewer	

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	x
Technical Area(s): TA 1.2 Energy generation from renewable energy sources	
2. Energy Distribution	
Technical Area(s):	
3. Energy Demand	
Technical Area(s):	
4. Manufacturing	
Technical Area(s):	
5. Chemical Industry	
Technical Area(s):	
6. Construction	
Technical Area(s):	
7. Transport	
Technical Area(s):	
8. Mining/Mineral Production	
Technical Area(s):	
9. Metal Production	
Technical Area(s):	
10. Fugitive Emissions from Fuels (solid, oil and gas)	
Technical Area(s):	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	
Technical Area(s):	
12. Solvent Use	
Technical Area(s):	
13. Waste Handling and Disposal	
Technical Area(s):	
14. Afforestation and Reforestation	
Technical Area(s):	
15. Agriculture	
Technical Area(s):	
Approved Member of Staff by: Siddharth Yadav	Date: 15/02/2012

Statement of Competence

Name: NAYAN JYOTI DEKA

Status

- Lead Assessor	☒	- Expert	☒
- Assessor	☒	- Financial Expert	☐
- Local Assessor	☒	- Technical Reviewer	☒

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	☒
Technical Area(s): TA 1.1 Thermal energy generation from fossil fuels and biomass	
1.2 Energy generation from renewable energy sources	
2. Energy Distribution	☐
Technical Area(s):	
3. Energy Demand	☐
Technical Area(s):	
4. Manufacturing	☐
Technical Area(s):	
5. Chemical Industry	☐
Technical Area(s):	
6. Construction	☐
Technical Area(s):	
7. Transport	☐
Technical Area(s):	
8. Mining/Mineral Production	☐
Technical Area(s):	
9. Metal Production	☐
Technical Area(s):	
10. Fugitive Emissions from Fuels (solid, oil and gas)	☐
Technical Area(s):	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	☐
Technical Area(s):	
12. Solvent Use	☐
Technical Area(s):	
13. Waste Handling and Disposal	☐
Technical Area(s):	
14. Afforestation and Reforestation	☐
Technical Area(s):	
15. Agriculture	☐
Technical Area(s):	
Approved Member of Staff by: Siddharth Yadav	Date: 20/07/2012

Statement of Competence

Name: Nareshkumar Suneja

Status

- Lead Assessor	x	- Expert	x
- Assessor	x	- Financial Expert	
- Local Assessor	India	- Technical Reviewer	

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	x
Technical Area(s): TA 1.2 Energy generation from renewable energy	
2. Energy Distribution	
Technical Area(s):	
3. Energy Demand	
Technical Area(s):	
4. Manufacturing	
Technical Area(s):	
5. Chemical Industry	
Technical Area(s):	
6. Construction	
Technical Area(s):	
7. Transport	
Technical Area(s):	
8. Mining/Mineral Production	
Technical Area(s):	
9. Metal Production	
Technical Area(s):	
10. Fugitive Emissions from Fuels (solid, oil and gas)	
Technical Area(s):	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	
Technical Area(s):	
12. Solvent Use	
Technical Area(s):	
13. Waste Handling and Disposal	
Technical Area(s):	
14. Afforestation and Reforestation	
Technical Area(s):	
15. Agriculture	
Technical Area(s):	
Approved Member of Staff by: Siddharth Yadav	Date: 15/02/2012