

SIXTH VERIFICATION REPORT OF '300 MW HYDRO POWER PROJECT OF JHPL



Document Prepared By Bureau Veritas Holdings SAS

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Summary:

Bureau Veritas Certification has conducted the sixth verification of the '300 MW Hydro Power Project of JHPL' project of Jai Prakash Power Ventures Limited, located at Kuppa in Himachal Pradesh State, India on the basis of Voluntary Carbon Standard 3.0 for the period starting from 1st May 2011 to 31st Dec 2011. The project activity is a 300 MW Hydro-electric project located across river Baspa in Himachal Pradesh, India. The project activity supplies electricity to the state electricity utility (Himachal Pradesh State Electricity Board).

The verification scope is defined as a periodic independent review and ex post determination by the Designated Operational Entity of the monitored reductions in GHG emissions during defined verification period, and consisted of the following three phases:

- i) Desk review of the registered project document including the baseline and the monitoring plan;
- ii) Physical site inspection and follow-up interviews with project stakeholders;
- iii) Resolution of outstanding issues and the issuance of the final verification report including verification opinion.

The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures. On the basis of the physical site inspection of the project activity and review of the documents submitted by the project participant, the Bureau Veritas Certification confirms that, for the current verification period from 1st May 2011 to 31st Dec 2011, the project has been implemented as planned and described in the registered Project Document. The necessary equipments, Installed for generating emission reductions in the project activity, runs reliably and the measuring equipments, essential for the measurement of the electricity and thermal energy supplied to the process from the power plant, have been calibrated appropriately. This verification report pertains to the current monitoring period starting from 1st May 2011 to 31st Dec 2011 (including both days). Two numbers of Clarification Request (CL) were raised during this verification activity. All the Clarification Requests (CL) have been successfully closed by the verification team based on the satisfactory response from the project participant on each CL. The verification team confirms that total GHG reductions achieved during the current monitoring period are 1,002,913 tCO₂e and that emission reductions are calculated without material misstatements.

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Abbreviations

VCS:	Verified Carbon Standard
VER:	Verified Emission Reduction
BMS:	Bureau Veritas Certification's Management System
CAR:	Corrective Action Request
FAR:	Forward Action Request
CO ₂ :	Carbon Dioxide
tCO ₂ :	Tonnes of Carbon Dioxide
DOE:	Designated Operational Entity
DR:	Document Review
GHG:	Green House Gases
I:	Interview
IETA:	International Emissions Trading Association
MV:	Means of Verification
MP:	Monitoring Plan
MR:	Monitoring report
PD:	Project Document
PP:	Project participant
UNFCCC:	United Nations Framework Convention for Climate Change
MW:	Megawatt
VR:	Verification report
JMR	Joint Meter Reading
NEWNE:	North-East-West-North-East

1 INTRODUCTION

1.1 Objective

Verification is the periodic independent review and ex-post determination by the verifier of the monitored reductions in GHG emissions during defined verification period. This is the sixth verification of the project activity '300 MW Hydro Power Project of JHPL'. The objective of the verification is:

- i. To verify that the project activity is implemented as per the description contained in the registered VCS PD.
- ii. To confirm that the monitoring system is in place and fully functional,
- iii. To assure that the project has generated verifiable emission reductions.

The verification process considers both qualitative and quantitative information on emission reductions. Quantitative data comprises the monitoring reports, emission reduction spreadsheet and sources of input values to the monitoring report submitted by the project entity to the verification team. Qualitative data comprises information on internal management controls, calculation procedures, and procedures for transfer, frequency of emission reports, review and internal audit of calculations/data transfers.

1.2 Scope and Criteria

The verification scope is defined as an independent and objective review of the VCS Project Document (PD), the project's baseline study and monitoring plan, including the monitored data and other relevant documents. The verification follows VCS Standard Version 3.0 criteria and latest policy announcements, from VCS Board, presently applicable to the verification of project activity.

The verification is not meant to provide any consulting towards the Client. However, stated requests for forward actions and/or corrective actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.

The verification team was provided with a monitoring report, covering the period 1st May 2011 to 31st Dec 2011. Based on this documentation, a document review and a physical site inspection from 22/03/2012 to 23/03/2012 was conducted. The Monitoring Report – Version 1.0, dated 10/02/2012 covering the period of 1st May 2011 to 31st Dec 2011 serves the basis for the verification assessment presented herewith.

1.3 Level of assurance

Verification is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of emission reductions. Based on the process and procedure conducted, it can be concluded that the GHG assertion is materially correct and is a fair representation of GHG data and information which has been prepared in accordance with the VCS Standard 3.0 for the current verification period. The verification team considers the assurance level as 'limited' since some of the data used (E.g. Emission factor) are from the publicly available databases such as the IPCC database, CEA database for emission factor of the grid, for which detailed testing of GHG assertion is beyond the domain of project proponent, stake holder and the verification team.

1.4 Summary Description of the Project

The project is a run-of-the-river hydroelectric power plant with an installed capacity of 300 MW. The diversion barrage of the project is located across river Baspa, at Kuppa in Himachal Pradesh. The powerhouse is located at Karcham village in Kinnaur District. The project activity is an initiative of Jaiprakash Power Ventures Limited, a part of the Jaypee Group. Jaypee is a well-known business group of India and had entered into agreement with State Government of Himachal Pradesh to implement the project. The purpose of the project activity is to generate renewable electricity from hydropower and sell it to Himachal Pradesh State Electricity Board (HPSEB). The project participant has also installed two DG sets of 625kVA capacity at the project site which are used by the project participant in case of the exigency. In addition, grid electricity import also takes place from a separate 22 kV line to the project site and an energy meter is located at HPSEB sub-station to monitor the grid electricity import from the 22 kV line.

The electricity generated by the project activity is stepped up to 400 kV and is evacuated by two circuits of 400 kV lines for the power station to Jhakri substation, which is about 55 Km from the site. The transmission line from the power station to Jhakri consisting of 121 towers have been installed as a part of the project. From Jhakri, 400 kV transmission system is utilized to evacuate the full output of JPVL (300 MW) hydro electric project. During the current monitoring period, the location of the main and check meters have been changed from Jhakri sub-station to the powerhouse of the project activity from 12/05/2011 onwards. The continuous monitoring and hourly measurement of the electricity is carried out on both the circuits by a set of main and check electronic tri-vector meters of 0.2 accuracy class. The recording of the net electricity supplied to the grid is carried out jointly on monthly basis by the representatives of HPSEB and project participant which forms the basis for the monthly JMR (Joint Meter Reading) Report.

2 VALIDATION PROCESS, FINDINGS AND CONCLUSION

2.1 Validation Process

Not applicable as the project activity has already been validated as per the VCS 2007.1 Standard.

2.2 Validation Findings

▪ Gap Validation

Not applicable as the project activity has already been validated as per the VCS 2007.1 Standard.

▪ Methodology Deviations

Not applicable as the project activity has already been validated as per the VCS 2007.1 Standard. The validation report of the project activity was also reviewed and it was observed that no methodology deviations have been sought during the validation of the project activity.

▪ New Project Activity Instances

The project activity is not a grouped project.

2.3 Validation Conclusion

Not applicable as the project activity has already been validated as per the VCS 2007.1 Standard. This report pertains to the sixth verification period of the project activity which starts from 1st May 2011 to 31st Dec 2011.

3 VERIFICATION PROCESS

3.1 Method and Criteria

The overall verification, beginning from the Contract Review to Verification report, certification statement & opinion, was conducted using Bureau Veritas Certification internal procedures. The project is already validated and registered as a VCS project with the registry (Project ID 92). The verification criteria followed by the project participant is based on the VCS Standard 3.0. The verification process consists of following activities:

- i) Desk review of the registered project document including the baseline and the monitoring plan;

This process consists of the review of the current and previously approved documents related to the project activity including validation report, registered Project Document (PD), and previously approved monitoring report and the verification report. The current documents include the Monitoring report for the current verification period (1st May 2011 to 31st Dec 2011), emission reduction spreadsheet and other supporting documents (JMR, data log sheets, calibration certificates, invoices etc.) pertaining to the current verification period.

- ii) Physical site inspection and follow-up interviews with project stakeholders;

The second step involves the physical site visit to ensure that project activity is being implemented and operated as per the project description contained in the registered PD. The

activity also includes the follow-up interviews with the various plant personals involved in the operation of the project activity.

iii) Resolution of outstanding issues and the issuance of the final verification report including verification opinion

The third step involves the resolution of the CAR/CL raised. Verification process also includes raising the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification before conclusion on the GHG emission reduction calculation.

Findings established during the initial verification could either be seen as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified. Corrective Action Requests (CAR) is issued, where:

- Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions, which will impair the estimate of emission reductions;
- Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.
- The verification team may also use the term Clarification Request (CL), if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met.

3.2 Document Review

The verification team has assessed the accuracy of the project description through a combination of steps consisting of review of contract related to the project activity, Scrutiny of technical specification, site visit and interview of the project proponent and their representatives. Following supporting documents were reviewed for the current verification period:

- Registered PD, Validation Report, previously approved Monitoring Report and the previous Verification Report of the project activity.
- Monitoring report and emission reduction spreadsheet for the current verification period.
- Monthly JMR reports, monthly Invoices and calibration certificates of the energy meters pertaining to the current verification period.
- Log books of diesel consumption, invoices of HPSEB for 22 kV line grid import by the project activity.
- Log book records of the weight measurement of the SF₆ gas cylinders stored at the project site and calibration certificates of the Weighing machine.

- Daily alarm log sheets of the SF₆ gas pressure dip, pressure measurement log sheets in various compartments and calibration certificates of the digital pressure indicator.

3.3 Interviews

The verification team from Bureau Veritas Certification performed site visit on 22/03/2012 to 23/03/2012 and conducted interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of M/s Jaiprakash Power Ventures Ltd. and M/s. Emergent Ventures India Private Limited were interviewed. The main topics of the interviews are summarized in Table below:

Interviewed organization	Interview topics
M/s. Jaiprakash Power Ventures Ltd	- Project description - Operational aspects - Monitoring plans and Data recording procedures - QA/ QC Procedures - Internal review / verification mechanism - Emission reduction calculation procedures
M/s. Emergent Ventures India Private Limited	- Monitoring report - Emission reduction calculation procedures

3.4 Site Inspections

The physical site inspection was carried out by two member of the verification team from 22/03/2012 to 23/03/2012 to cover following objectives:

- To ensure that project activity has been implemented and operated as per the description contained in the registered PD
- To ensure that the monitoring and data recording has been carried out in accordance with the applied monitoring methodology ACM 0002. version 08 (applied by the project participant) and the registered monitoring plan contained in the registered PD

The methods adopted to meet the above-mentioned objectives consists of the interaction with the plant personnel, visit to the major equipments (powerhouse, switchyard, DG room, etc.) and measuring points of the electricity sold to the grid (HPSEB, Jhakri substation), etc. In addition, the plant records maintained at the project site were reviewed by the verification team followed by discussions with the personnel's involved in the management and operation of the project activity.

3.5 Resolution of Any Material Discrepancy

The project activity is already registered as a VCS project with the registry under the project title '300 MW Hydropower Project by JHPL'. The verification team confirms that there are no remaining issues or any material discrepancy in the project activity as the project is already registered under VCS (Project ID 92).

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

- Implementation status of the project activity(s), including any material discrepancies between the project and the project description

It has been observed during site visit that the project activity consists of renewable electricity generation from three Pelton wheel turbines with installed capacity of 100 MW each. The electricity is generated at 13.8 kV and supplied to Jhakri sub-station after stepping up to 400kV through two transmission lines. The meter reading is taken on 1st day of each month in the presence of the representatives of project participant and HPSEB. In addition, grid electricity import also takes place from a separate 22 kV line to the project site and an energy meter is located at HPSEB sub-station to monitor the grid electricity import from the 22 kV line. The HPSEB generates monthly invoice to the project participant against the grid electricity import from the 22 kV line.

The project participant has installed two D.G. sets of 625 KVA each for the back up purpose. The project participant has also stored SF₆ gas in five cylinders at site in case of requirements of filling of SF₆ gas in the switchgear assembly. It has been observed that the project participant has bought a new Digital Pressure Indicator (a hand held instrument for the monitoring of SF₆ pressure in the switchgear assembly) and the new instrument has been used for the monitoring of SF₆ pressure in the switchgear assembly during the current monitoring period as per the monitoring frequency specified in the registered VCS PD.

The document review and subsequent physical verification carried out on 22nd & 23rd March 2012 confirmed that project proponent has implemented the project activity as per the description provided in the registered VCS PD and the equipments, specified in the registered PD are in place and operational. The ownership of the project activity also remains with Jaiparkash Power Ventures Limited (JPVL) only.

However, the verification team member, during the site visit, noted that the monitoring arrangement of the electricity supplied to the grid is not in accordance with the registered PD as the main and check meters of the electricity monitoring were installed at the powerhouse itself which is against the description of the project activity contained in the monitoring plan of the registered PD. Hence, the verification team raised CL 1 (please refer to Appendix A of the

verification report for details). With reference to CL 1, the project participant responded that the location of the main and check meters have been changed from Jhakri Sub-station to power house of the project activity itself. The verification team also confirms the same based on the physical site visit conducted on 22nd and 23rd March 2012. Besides, the verification team also reviewed the JMRs of the project activity and confirm the location of the main and check meters were from Jhakri sub-station to the powerhouse of the project was changed from 12/05/2011. The JMR reports are duly signed and detailed energy generation statement of the project activity recorded jointly on monthly basis by the HPSEB Superintending Engineer and the Joint Vice President of the company (JPVL). Hence the verification team confirms that the monitoring arrangement of the project activity is in accordance with revised monitoring plan mentioned in the revised PD of the project activity. Since change of location of the main and check meters is a permanent change in the monitoring arrangements, the project participant, along with the response to CL 1, provided the revised PD with current monitoring arrangements. Accordingly, the monitoring arrangements were revised by the project participant in the monitoring report for the current verification period from 1st May 2011 to 31st Dec. 2011. The project participant provided the response against CL 1 that the change in the monitoring arrangement has taken place in the month of May 2011. Hence, the permanent revision in the monitoring plan has been carried out in registered PD and accordingly Current monitoring report for the period 1st May 2011 to 31st Dec 2011 was also revised. Hence CL 1 was closed.

The verification team reviewed the previously issued validation and verification reports to the project activity. It was observed by the verification team that a Forward Action Request (FAR), which is applicable to the current monitoring period, was raised in the fifth verification period of the project activity. The FAR raised in the fifth verification has been reproduced here “ *The main and check meters installed on line 1 and line 2 of the Jhakri Sub-station, applicable for the current monitoring period and bearing sr. no. GEC04052, GEC04054, UPU01762, UPU01763 have not been calibrated after the completion of the current monitoring period (i.e. 1st Sept. 2010 to 30th Apr. 2011) till present date. Hence, the results of the calibration that will be available at such future date need to be verified in order to confirm the accuracy of readings reported during the current verification period*”. In order to assess the adherence to the FAR the verification team raised CL 2(a) during the current verification period. In response to the CL 2(a) the project participant provided the calibration certificates of the energy meters bearing serial numbers - GEC04052, GEC04054, UPU01762, UPU01763. The verification team reviewed the calibration certificates (Ref 5 to 8 in section 6 of the report) of the energy meters used for the monitoring of the electricity in the fifth verification period and noted that calibration has been carried out by an independent third party which is a Government entity and results of the calibration confirm that “the errors as found for the meter under test are within the specified limits of IEC-62053-22”. The IEC-62053 is an internationally traceable energy meter calibration standard published by International Electro-technical Commission (IEC) for Static meters for active energy (classes 0.2S and 0.5S). Hence, it can be concluded that the energy meters, operational during the fifth verification period bearing serial numbers - GEC04052, GEC04054, UPU01762, UPU01763, were within the permissible limits of accuracy and based on the above-

facts, the verification team accepted the response of the project participant and closed FAR raised during the previous monitoring period and also closed CL 2 (a) raised during the current verification period.

- Implementation status of the monitoring plan and the completeness of monitoring, including any material discrepancies between the project and the project description.

The verification report is based on the observations/ discussions during the site visit and the monitoring report submitted by the Project Participant, Version 4.0 dated 01/06/2012. The monitoring methodology used for the project activity is as per the methodology ACM 0002, Version 8. The title of the monitoring methodology is “Consolidated monitoring methodology for grid connected electricity generation from renewable sources”.

The parameter to be monitored for calculation of emission reductions is the “net electricity supplied to the grid by the project activity”.

Emission Reductions:

The following algorithm calculates the emission reductions,

$$ER_y = BE_y - PE_{y1} - PE_{y2} - PE_{y3} - L_y$$

The emission factor is calculated based on the “Tool to calculate the emission factor for an electricity system” Version 1.1, as indicated in the approved methodology ACM 0002, Version 8. Since the project activity would supply electricity to NEWNE grid, the value of the grid emission factor, utilized for the project activity, is based on the version 4 of the CEA (Central Electricity Authority) CO₂ database for the NEWNE grid. The grid emission factor, calculated on the basis of the combined margin is 0.805 tCO₂/MWh and is fixed ex-ante.

The electricity generated by the project activity is supplied to the substation located at Jhakri through two transmission lines of 400 KV each. The substation is owned and operated by the HPSEB. Each of these transmission lines consists of a main meter and a check meter. The meters are tri-vector meters of 0.2 accuracy class. The net electricity supplied to the grid by the project activity is calculated based on 100% measured values of electricity export and import (export-import). Based on the readings of the main meters, a monthly statement “Joint Meter Reading (JMR) for energy received at Jhakri from Baspa II Hydro Electric Project (3*100 MW)” is generated by HPSEB. However, the location of the main and check meters have been changed from 12th May 2011 (please refer to section 4.1 of the report and CL 1 in the Appendix A of the report for details). Apart from the system of monitoring the net electricity supplied to the grid by the project activity, there is also a monitoring system in the control room of the powerhouse of the project activity wherein monitoring of the data on a real time basis is also carried out. The monitoring period is from 1st May 2011 to 31st Dec 2011 (both days inclusive), as indicated in the monitoring report.

Baseline emissions:

The net electricity supplied to the grid by the project activity, during the current monitoring period, was monitored by means of metering arrangements on the 400 kV lines from the project activity site to the Jhakri sub-station. The meters are capable of monitoring the exports as well as imports from and to the project activity. The difference between the total exports and the total imports is the net electricity export by the project activity to the grid.

The net electricity supplied to the grid by the project activity was also crosschecked with the invoices for energy sale raised by the project participant for the respective months of the verification period. It was observed by the verification team during the current monitoring period that energy delivered to the grid was deducted by 0.65% considered as a transmission losses by the state electricity utility due to the change in the locations of the main and check meters from the Jhakri sub-station to the power house of the project activity from 12th May 2011 onwards (this is the date when meter location was changed). For the conservative estimation of the emission reductions and in accordance with the applied methodology ACM 0002, the net electricity supplied to the grid (after deduction of the transmission losses till the grid injection point) have been considered by the project participant for emission reduction computation. In addition, the project participant has also applied 0.2% of the maximum permissible errors (which is the accuracy class of the energy meters) on both import and export side for the conservativeness of the emission reductions. The net electricity delivered to the grid, which is sourced from the JMR, has also been crosschecked by the verification team with the invoices raised by the project participant to the state electricity utility (HPSEB).

The meters GEC04052, GEC04054, UPU01762, UPU01763 were used in current monitoring period (1st May 2011 to 31st Dec 2011). The calibration certificates for meters bearing serial number GEC04052, GEC04054, UPU01762, UPU01763, after the replacement of meters, were not provided to verification team and verification team raised CL 2(b). In response to CL 2 (b) the project participant provided the calibration certificates of the above-mentioned energy meters. were provided in. The verification team reviewed the calibration certificates of the energy meters used for 12 days of the current monitoring period and noted that calibration has been carried out by an independent third party (Power Grid Corporation of India; a Government Entity) and results of the calibration conclude (on the basis on international test standard IEC 62053-22) that the errors as found for the meter under test are within the permissible class of accuracy for energy meters (which is 0.2). Hence, CL 2 (b) has been closed by the verification team.

The meters UPU01235, - UPU01236, - UPU01237, and - UPU01238 were used for rest of the current monitoring period i.e. from 12th May 2011 to 31st Dec 2011. However, the calibration certificates of the meters bearing serial numbers UPU01235, - UPU01236, - UPU01237, and - UPU01238, after the end of the current verification period, were not provided to the verification team and verification team raised CL 2 (c). The project participant provided a response to CL 2 (c) that the calibration frequency is mentioned as one year in the registered PD and the

calibration certificates dated 24/02/2011 and 25/02/2011 of the meters, bearing serial numbers UPU01235, - UPU01236, - UPU01237, and - UPU01238 is provided, which is valid for one year and the same is accepted by HPSEB. The verification team reviewed the calibration certificates for the above-mentioned energy meters and confirms that, at the time of installation (12th May 2011), the energy meters were within the permissible limits of accuracy (0.2) as confirmed from the calibration certificates issued by the Power Grid Corporation of India (prior to the installation of the meters). However, due to the annual calibration frequency, the calibration certificates are not available for the meters after the completion of the monitoring period. It was further observed by the verification team that HPSEB (which is a state electricity utility) issues a document titled “Annex A –1” to the project participant, along with the JMR. The Annex A-1 of the JMR is used for the purpose of comparison of main and check meter readings. It was noted by the verification team that Annex A-1 of JMR, in a brief remark, certifies that “Reading of Main and Check meters are within permissible class of accuracy”, for every month. Since HPSEB is a reliable Government entity, the remark on the Annex A-1 JMR has been considered authentic by the verification team. Although the Annex A-1 records available from the HPSEB (A Government entity) certify that the main and check meters were functioning within their permissible class of accuracy for each month, for the conservativeness of the emission reductions, the project participant has also deducted the export values by 0.2% while at the same time increasing the import values by 0.2% for the present monitoring period. The said percentage corresponds to the specified error limit of the main and check meters and a calculation of the net energy exports arrived at in such a manner would be on the conservative side. Hence the verification team closed the CL 2(c). Thus, the verification team confirms that the baseline emissions computed by the project participant for the current monitoring period are appropriate, based on 100% monitored data in accordance with applied methodology ACM 0002 and follows a conservative approach.

Project emissions:

The project participant monitored the following sources of Project emissions in the project activity:

a. Emissions due to operation of two DG sets of 625 KVA each (PEy1):

Monitoring of the diesel consumed in these DG sets is done on a daily basis. The consumption of diesel is recorded in a daily logbook, which is common for both the DG sets. The diesel tanks for the DG sets have been provided with a graduated level tube on which the start and end level readings of the diesel inside the tank can be taken. The diesel consumption in DG set is calculated taking the difference between the measured initial and final level readings of the level tube. The monthly diesel consumption data as verified by the verification team during site visit from the DG log books and presented in the monitoring report is as follows:

Month	Diesel consumption	Project Emission (PE _{Y1})
	(litres)	(tCO ₂)
May-11	2634	7.217
June-11	3738	10.242
July-11	3827	10.486
Aug-11	2625	7.129
Sep-11	3343	9.160
Oct-11	3073	8.420
Nov-11	8130	22.276
Dec-11	5412	14.829
Total	32782	89.821

The project emissions for the verification period have been calculated based on the quantity of diesel consumed (in litres), density of diesel and the emission factor as per the IPCC default values. The values of density of the diesel (0.860 kg/litre) and EF_{diesel} (3.186tCO₂/tonne) taken for the calculation of project emissions due to diesel are based on IPCC published data and have been fixed ex ante. The verification team during the site visit has crosschecked the data provided to them with the daily logbook and confirms that diesel consumption and project emissions reported in the monitoring report due to consumption of diesel are without any material misstatement.

b. Electricity imports from the grid to meet the daily electricity requirements at the project site (PE_{Y2}):

Electricity is imported into the project activity through the 22 kV line to meet the daily power needs of the project activity. The metering of this electricity import is done through a separate energy meter. The meter located at 22kV line is HPSEB (a govt. entity) property and HPSEB is responsible for the calibration of the meter. The verification team has observed during site visit that the meter installed to measure grid import on the 22 kV line is of 0.5 accuracy class with a multiplication factor of 2000. The HPSEB generates monthly invoice for the electricity import from 22kV line and the HPSEB invoices from 1st May 2011 to 31st Dec 2011 (current monitoring period) have been referred to by verification team to crosscheck the electricity import from 22 kV line. The total grid electricity import from 22kV line for the current monitoring period is 2206700 kWh and the project emissions reported in the monitoring report due to the grid electricity import from 22kV line are 1776.394 tCO₂, without any material misstatement. The verification team verifies the grid electricity import as presented in monitoring report after reviewing the third party invoices of HPSEB and the same is presented as follows:

Month	Power Consumption	Project Emission (PE _{Y2})
	(KWh)	(tCO ₂)
May-11	310000	249.550
June-11	245200	197.386
July-11	255200	205.436
Aug-11	256000	206.080
Sep-11	227600	183.218
Oct-11	249500	200.848
Nov-11	288800	232.484
Dec-11	374400	301.392
Total	2206700	1776.394

c. Leakage of SF₆ Gas (PE_{Y3}):

There is storage of SF₆ at site, in cylinders (5 number of cylinders in total), which is used as top-up material in the switchgear assembly, in case of any loss of SF₆. It is only in the event of leakage of the SF₆ gas that the stored SF₆ would be needed to top up the quantity leaked. The project participant has regularly inspected and maintained the records of the pressure of SF₆ gas in the feeders, breakers and bays as per the description stated in the registered VCS PD. For the purpose of monitoring, the quantity of SF₆ gas that could be required for top up filling, an electronic balance is also available at the project site. The project participant measures and records the weight of the all the 5 SF₆ cylinders on regular basis. The project participant has also provided the log sheets of records of the SF₆ gas cylinder weight measured during the current monitoring period. The project participant also provided the calibration certificates of the weight scale. Based on the supporting evidences provided by the project participant, it was observed that weighing measurement for SF₆ gas cylinders during the current monitoring period was carried out on 18/06/2011, 24/09/2011 and 22/12/2011. The weighing balance was under valid calibration during the current monitoring period (1st May 2011 to 31st Dec 2011). The last calibration of weighing balance was done on 01/09/2011 and next calibration is due on 31/08/2012. Hence, the verification team confirms that the weighing balance was working without any error and there was no consumption from the SF₆ gas stock.

The project participant also monitors the SF₆ gas pressure in the various compartments of the switchgear assembly through a Digital Pressure Indicator (DPI) once in a calendar year. The project participant has submitted the log sheet of the measurements of the SF₆ gas pressure in

the various compartments of the switchgear assembly for the current monitoring period. The calibration certificates of the DPI were also submitted by the project participant. It was observed by the verification team that DPI was calibrated on 08/09/2011 and the due date for next calibration is 07/09/2012, which is after the current monitoring period. Therefore, it could be confirmed that there had been no leakage of SF₆ gas during this period and hence the project emissions due to SF₆ leakage were Nil. From the monthly records of SF₆ gas pressure monitoring and the records of the SF₆ gas cylinders it was observed by the verification team that there was not any abnormal situation of SF₆ pressure drop necessitating top up filling during the current verification period.

Overall, the verification team confirms that the project participant has monitored all the parameters necessary for the monitoring of baseline and project emissions during the current verification period. The monitoring of these parameters has been carried out as per the requirements of the monitoring specified in the methodology applied to this project and the monitoring plan contained in the registered PD. Also, the data obtained as a result of the monitoring is accurate and reliable for the purpose of correct computation of the emission reductions.

4.2 Accuracy of GHG Emission Reduction or Removal Calculations

Project participant provided the spreadsheet versions of calculations of emission reductions, project emissions and leakage, including the algorithms used in the calculations. The spreadsheet contains a detailed calculation of the baseline emissions, project emissions and leakage emissions. The leakage emissions were Nil in the current monitoring period. The default data used in the emission reduction calculations is the grid emission factor. The value of the grid emission factor 0.805 tCO₂e, fixed ex-ante for the project activity, is taken from the version 4 of the publicly available CO₂ database of the Central Electricity Authority (CEA) and the same is considered to be appropriate by the verification team. Similarly, the project emissions from the diesel consumption have also been computed based on the IPCC default emission factor of diesel.

4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals

4.4 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) project emissions due to the use of diesel for operation of the Diesel Generator sets, c) the electricity imports for use at the project site to meet the daily electricity requirements and d) the leakage due to the use of SF₆ in the switchgear assembly. The data pertaining to the above-mentioned parameters are maintained in identified records for the entire monitoring period. All the data is in compliance with the figures stated in the monitoring report. Moreover, it was observed during site visit that stored quantity of SF₆ (kept in five cylinders at project site) did not change during the current verification period. Hence, it was concluded by the verification team that the available evidence related to monitoring of SF₆ gas leakage was sufficient for the purpose of estimation of the project emissions occurred. 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
Net electricity supplied to the grid (baseline emission parameters)	Monthly JMR Reports issued by the HPSEB	The data is reliable as it is based on 100% monitored electricity from high accuracy electronic tri-vector meters and certified by a Government entity (HPSEB). The JMR also forms the basis for the invoice raised by the project participant and payments released by the HPSEB. In addition, the value has also been crosschecked from the invoices raised by the project participant for the sold electricity to HPSEB.
Quantity of electricity imported by the project participant through 22kV line (project emission parameter)	Electricity consumption bills raised by the HPSEB	The data is reliable as it is based on 100% monitored electricity from the energy meter located at the HPSEB sub-station. The electricity consumption bills have been raised by the HPSEB which is a government entity and the meter is in the custody of the HPSEB and located at the sub-station of the HPSEB.

Quantity of diesel consumed during the current monitoring period in DG (a project emission parameter)	Diesel consumption log sheets	The data is reliable as it is based on the daily diesel consumption log sheets monitored and recorded by the project participant at site. The verification team has checked the diesel consumption data provided in the monitoring report with the daily log sheets available at the project site of the project participant.
Leakage of the SF ₆ gas consumed from the SF ₆ stock available at the project site (project emission parameter)	Log sheets of the SF ₆ gas cylinder weight measurement	The data is reliable as it is based on calibrated weighing machine measurements of SF ₆ gas cylinders. In addition, there is a crosschecking mechanism also for this monitoring parameters as project participant also measures the SF ₆ pressure in the switchgear assembly (GIS) once in a calendar year. Further, the PP also maintains the records of the tripping of the DCS alarms of the SF ₆ pressure drop in GIS on daily basis (consolidated monthly).

4.5 Management and Operational System

The organizational structure includes site shift-in-charges, involved in the day-to-day operations of the plant. They are also responsible for the preparation of daily reports. 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.

5 VERIFICATION CONCLUSION

Bureau Veritas Certification has performed sixth verification of the '300 MW Hydro Power Project of JHPL' for the monitoring period covering 1st May 2011 to 31st Dec 2011 (including both days). The verification scope is as an independent and objective review of the VCS project description document, the project's baseline study and monitoring plan and other relevant documents. The review is to verify the implementation of the monitoring plan as defined in the VCS PD. The verification of the monitoring data indicate that total amount of emission reductions for the monitoring period (after rounding off monthly emission reductions to the lower value) to be 1,002,913 tCO₂ equivalent.

Considering the emission reductions computation the cumulatively achieved VERs (after rounding off monthly emission reductions to the lower value) have the figure of 1,002,913 tCO₂, from 01/05/2011 to 31/12/2011 (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 due to the project activity. The grid emission factor of 0.805 tCO₂/MWh was found to be correct. Appropriate procedures for maintaining the confidentiality and safe custody of the validation or verification documentation and for retaining them for a sufficient period to meet the needs of the client, the responsible parties, the GHG programmes to which they subscribe, and in accordance with legal and professional requirements of record retention have been established.

Bureau Veritas Certification verified the contents of the current Monitoring Report (Version 4.0) for the reporting period as indicated below. Bureau Veritas Certification confirms that the project is implemented and described in validated and registered VCS-PD. The energy meters deployed for the measurement of electricity export and import are calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions. Bureau Veritas Certification can confirm that the GHG emission reductions are calculated without material misstatements. Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the registered project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated, we confirm the following statement:

Reporting period: From 01/05/2011 to 31/12/2011 (including both days)

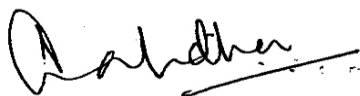
Voluntary Emission Reductions during the reporting period are as follows:

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

GHG Emission Reductions or Removals	tCO ₂ e
Baseline Emissions	1,004,784
Project Emissions	1,866
Leakage	0
Net GHG emission reductions or removals	1,002,913*

*The project participant has rounded down decimals values of the monthly emission reductions to arrive at the total emission reduction value of 1,002,913 for the current monitoring period. This is conservative and hence, accepted by the verification team. The rounded down values of monthly emission reductions have also been produced in the Table below:

GHG Emission Reductions or Removals	tCO ₂ e
May 2011	1,40,662
June 2011	1,74,662
July 2011	1,92,964
August 2011	1,88,768
September 2011	1,61,061
October 2011	73,469
November 2011	40,324
December 2011	31,003
Total (from May 2011 to Dec 2011)	10,02,913



H.B. Muralidhar

(Internal Technical Reviewer)



Anupam Badola

(Team Leader)

6 REFERENCES

1. Monitoring report version 1.0 dt. 10/02/2012
2. Monitoring report version 4.0 dt. 01/06/2012
3. JMR's for the Months 1st May 2011 to 31st Dec 2011
4. Invoices raised by the project proponent for the period 1st May 2011 to 31st Dec 2011
5. Energy meter calibration certificate No. RTL/NR-II/CAL/201213-009/2012, dated 03.05.2012
6. Energy meter calibration certificate No. RTL/NR-II/CAL/201213-010/2012, dated 03.05.2012
7. Energy meter calibration certificate No. RTL/NR-II/CAL/201213-007/2012, dated 03.05.2012
8. Energy meter calibration certificate No. RTL/NR-II/CAL/201213-008/2012, dated 03.05.2012
9. Energy meter calibration certificate No. RTL/NR-II/CAL/201011-126/2011, dated 01.03.2011
10. Energy meter calibration certificate No. RTL/NR-II/CAL/201011-123/2011, dated 01.03.2011
11. Energy meter calibration certificate No. RTL/NR-II/CAL/201011-124/2011, dated 01.03.2011
12. Energy meter calibration certificate No. RTL/NR-II/CAL/201011-125/2011, dated 01.03.2011
13. Electronic balance calibration certificate no. 0434775 dated 01/09/2011
14. Monthly HPSEB invoices for 22 kV line import for the period 1st May 2011 to 31st Dec 2011
15. DPI calibration certificate No. QLC/CAL/11/044483 dated 08/09/2011
16. Daily GIS Alram log sheets (consolidated monthly) for the current monitoring period
17. Log book weighing record of SF6 gas cylinder and Log books of diesel consumption in the DG set for the current monitoring period from 1st May 2011 to 31st Dec 2011

18. Registered VCS-PD
19. Revised VCS PD submitted by the project participant due to permanent change in the monitoring arrangements took place in the current verification period
20. Emission reduction spreadsheet
21. VCS Programme Guide, Version 3.0 dated 8th March 2011 and VCS Standard Version 3.0 dated on 8th March 2011
22. CDM Approved methodology ACM 0002 version 8 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, EB 44

7 C.V. OF THE DOE'S VERIFICATION TEAM MEMBERS

Anupam Badola (Team Leader)

Bureau Veritas Certification, Lead Verifier – Climate Change

Mr. Anupam Badola is Post Graduate in Environmental Science with five years of work experience in climate change services. He has previously worked with a manufacturing organization and a carbon advisory firm in India on CDM project development, CDM project due diligence, stack, ambient air pollution monitoring, water pollution monitoring, etc. He has undergone intensive training on Clean Development Mechanism and presently involved in the Validation and verification of CDM/VCS projects with Bureau Veritas Certification (India) Private Limited since October 2009.

Rakesh Tripathi (Team Member)

Bureau Veritas Certification, Verifier – Climate Change

Mr. Rakesh Tripathi is graduate (B.Tech) in Electronics and communication and Post-graduate (MBA) in Power management with around 2.5 years of experience in the field of climate change services. He is working with Bureau Veritas Certification (India) Pvt. Ltd. as Verifier-Climate Change. Prior to joining Bureau Veritas, he worked on CDM/VCS projects as a consultant. He has received extensive training in CDM validation and verification processes and participated in assessment of CDM projects.

H B Muralidhar (Internal Technical Reviewer)

Bureau Veritas Certification, - Operations Manager

Lead auditor with Bureau Veritas Certification for Environment Management System, Quality Management System and Occupational Health and Safety Management System. Graduate in Electrical Engineering with 25 year work experience related to power generation and distribution as well as management system auditing. He is the Lead auditor for Environmental Management System, Quality Management system and Occupational Health and Safety Management System. He is the technical expert & conducted Validation / Verification for more than 50 CDM/VCS Projects.

8 APPENDIX A: VERIFICATION PROTOCOL

VERIFICATION PROTOCOL

Table 1 Verification requirements based on the Voluntary Carbon Standard 3.0

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
1 Project implementation in accordance with the registered project document			
a Are all physical features of the proposed VCS project proposed in the registered PD in place?	It was observed by the verification team during on-site visit and document review that the monitoring of electricity supplied (Export-Import) to the grid is taking place through energy meters installed at the power house of the project activity. The same is not in line with the monitoring arrangement described in the registered VCS PD.	CL 1	OK
b Have the project participants operated the proposed VCS project as per the registered PD?	It was observed by the verification team during on-site visit and document review that the monitoring of electricity supplied (Export-Import) to the grid is taking place through energy meters installed at the power house of the project activity. The same is not in line with the monitoring arrangement described in the registered VCS PD.	(CL 1)	OK
c Was an on-site visit conducted?	Yes. The onsite visit was conducted on 22/03/2012 and 23/03/2012.	OK	OK
d If not, justify the rationale of the decision.	The onsite visit was conducted on 22/03/2012 and 23/03/2012.	OK	OK

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
e Does the implementation or operation of VCS project conform with the description contained in the registered PD?	It was observed by the verification team during on-site visit and document review that the monitoring of electricity supplied (Export-Import) to the grid is taking place through energy meters installed at the power house of the project activity. The same is not in line with the monitoring arrangement described in the registered VCS PD.	(CL 1)	OK
f If not, which are the potential impacts due to these changes?	It was observed by the verification team during on-site visit and document review that the monitoring of electricity supplied (Export-Import) to the grid is taking place through energy meters installed at the power house of the project activity. The same is not in line with the monitoring arrangement described in the registered VCS PD.	(CL 1)	OK
2 Compliance of the monitoring plan with the monitoring methodology			
a Is the validated monitoring plan in accordance with the approved methodology applied by the proposed VCS project?	The validated monitoring plan of the project activity is based on previously approved CDM methodology ACM0002/Version 8, <i>“Consolidated baseline methodology for grid-connected electricity generation from renewable sources”</i> .	OK	OK
b Are there any monitoring aspects of the project that are not specified in the methodology (e.g. additional monitoring parameters, monitoring frequency and calibration frequency)?	There are some additional parameters besides the requirement of the methodology ACM0002 and have been already identified in the validated monitoring plan. As per requirements of the validated monitoring plan (based on large scale CDM methodology ACM0002/Version 8), following additional parameters needs to be monitored:	OK	OK

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
	1) Q_{SF6} – Quantity of SF6 loss during the year 2) $P_{BAY VT}$, $P_{BREAKER}$ & P_{feeder} Pressure of SF6 gas in the breaker, bay and feeder. 3) Q_{diesel} – Quantity of diesel consumed in the DG sets 4) $E_{22 kV}$ – Electricity imports from the 22kV line. These parameters, although not specified by the methodology for the project activity, were required to be monitored by the project participant in order to calculate the emissions arising as a result of the project activity.		
3 Compliance of monitoring with the monitoring plan			
a Have the monitoring plan and the applied methodology been properly implemented and followed by the project participants?	The monitoring plan and the applied methodology ACM0002 have been properly implemented and followed by the project participants.	OK	OK
b Have all parameters stated in the monitoring plan, the applied methodology been sufficiently monitored			

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
and updated as applicable, including:			
i Project emission parameters?	The project emission parameters stated in the monitoring plan are: 1) Q_{SF6} – Quantity of SF6 loss during the year. 2) $P_{BAY\ VT}$, $P_{BREAKER}$ & P_{feeder} Pressure of SF6 gas in the breaker, bay and feeder. 3) Q_{diesel} –Quantity of diesel consumed in the running of D.G. sets. 4) $E_{22\ kV}$ – Electricity imports from the 22kV line. The above parameters are appropriately monitored and updated as per the validated monitoring plan stated in the registered VCS PD.	OK	OK
ii Baseline emission parameters?	The baseline emission parameter to be monitored is the “Net Electricity supplied to the grid by the project activity during the year y”. It is monitored continuously with monthly recording in the presence of SEB (State Electricity Board) officials and the PP representative as per the monitoring plan.	OK	OK
iii Leakage parameters?	There are no leakages associated with the project activity. Hence this is not applicable.	OK	OK
iv Management and operational system: the responsibilities and authorities for monitoring and	The management and operational staff structure assigned towards performing duties at the project activity site, is in	OK	OK

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
reporting are in accordance with the responsibilities and authorities stated in the monitoring plan?	accordance with that envisaged in the VCS-PD monitoring plan. The personnel interviewed were having adequate knowledge and experience in the management and operations of the hydro-power plant.		
c Are equipment controlled and calibrated in accordance with the monitoring plan?	Equipment used for measuring monitored values are controlled and calibrated in accordance with the monitoring Plan	OK	OK
d Are monitoring results consistently recorded as per approved frequency?	Yes, the monitoring results have been recorded consistently as per the approved frequency.	OK	OK
e Have quality assurance and quality control procedures been applied in accordance with the monitoring plan?	a) Following FAR was raised during the previous verification period – <i>“It has been observed by the verification team that main and check meters installed on line 1 and line 2 of the Jhakri Sub-station, applicable for the current monitoring period and bearing sr. no. GEC04052, GEC04054, UPU01762, UPU01763 have not been calibrated after the completion of the current monitoring period (i.e. 1st Sept. 2010 to 30th Apr. 2011) till present date. Hence, the results of the calibration that will be available at such future date need to be verified in order to confirm the accuracy of readings reported during the current verification period</i> Please clarify the adherence to the above FAR raised during the previous verification. b) The main and check meters on Line 1 and Line 2 at the Jhakri substation bearing sr. no. GEC04052, GEC04054,	CL 2 (a)	OK

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
	UPU01762, UPU01763 were used from 1/05/2011 to 12/05/2011 for current monitoring period (from 1st May 2011 to 31st Dec 2011). PP is requested to provide the Calibration certificate for the above mentioned meters. c) The meters bearing serial number –UPU01235, - UPU01236, - UPU01237, and - UPU01238 are used for rest of the monitoring period i.e. from 12/05/2011 to 31/12/2011, which is calibrated on 24/02/2011 and 25/02/2011. The project participant has provided the calibration certificates of the above-mentioned energy meters before the start of the current monitoring period. However, the calibration certificates, after the end of the current monitoring period have not been provided and hence, it is not clear whether the energy meters were within the permissible limits of accuracy throughout the current monitoring period.	CL 2 (b) CL 2 (c)	

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
4 Assessment of data and calculation of greenhouse gas emission reductions			
a Is a complete set of data for the specified monitoring period available? (If no, i.e., only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, the validator shall make the most conservative assumption theoretically possible in finalizing the verification report).	The project participant has provided the complete data set for the current monitoring period from 1st Mat 2011 to 31st Dec 2011 for the purpose of the verification of emission reductions achieved by the project activity. The set of data includes:- 1. JMRs for the current monitoring period 2. Electricity Bills raised by the project participants for current monitoring period 3. Diesel Consumption for the monitoring period	OK	OK
b Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?	The information provided in the monitoring report has been cross-checked by the following: a. The net electricity supplied by the project activity to the grid has been cross-checked with the invoices raised for sold electricity to HPSEB. b. The grid electricity import data from 22kV line have been	OK	OK

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
	cross-checked against the invoices raised by HPSEB (state electricity grid) to the project participant c. The Quantity of SF6 loss, which is zero for the monitoring period from 1st May 2011 to 31st Dec 2011. The same has been verified during site visit by cross-checking the physical stock of SF6 quantity in the cylinders taken on 30/04/2011 and on 1/01/2012 (i.e. before and after the current monitoring period), which reveals that there is no consumption from the stock. d. SF6 loss was further crosschecked with the daily alarm log sheet. There is an alarm system for monitoring of the pressure drop in bay, breaker and bus coupler compartments filled with SF6 gas. If there is pressure drop (from the prescribed limit) in any of the compartment, it triggers an alarm in the DCS of the plant. The PP maintains daily log of the alarm. It has been crosschecked that for the current monitoring period from 1st May 2011 to 31st Dec 2011, there was no incident of tripping of the alarm. e. The Diesel consumption for the current monitoring period from 1st May 2011 to 31st Dec 2011 has been crosschecked with the daily diesel consumption records maintained in DG set Log book.		
c Have calculations of baseline emissions, proposed project emissions and leakage, as appropriate, been carried out in accordance with the formulae and methods described in the monitoring plan and the	The calculations of baseline emissions and project emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan and methodology ACM 0002 version 8.	OK	OK

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
applied methodology document?			
d Have any assumptions used in emission calculations been justified?	The project participant has used grid electricity emission factor of 0.805 tCO ₂ /MWh which has been fixed ex ante at the time of validation (It has been computed in accordance with the Tool to calculate emission factor for an electricity system and CEA official data).	OK	OK
e Have appropriate emission factors, IPCC default values and other reference values been correctly applied?	The project participant has used grid emission factor (0.805 tCO ₂ /MWh) for the purpose of calculation of baseline emissions. The grid emission factor has been determined ex ante and the value of 0.805tCO ₂ /MWh as specified in registered VCS PD, has been used by the project participant.	OK	OK

Table 2 Resolution of Corrective Action / Forward Action / Clarification Requests.

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
CL 1 It was observed by the verification team during on-site visit and document review that the monitoring of electricity supplied (Export-Import) to the grid is taking place through energy meters installed at the power house of the project activity. The same is not in line with the monitoring arrangement described in the registered VCS PD.	Table 1 1.a	PP Reply: 1 There is a revision in the monitoring plan in the current monitoring period. The location of both main meters and check meters used for monitoring of net export to the grid has been shifted from Jhakri substation to the power house on 12/05/2011. After 12/05/2012, the net energy supplied to the grid is being monitored with the main and check meters located in the power house and the same monitoring system would continue in future. Since this is a permanent change, the revision in the monitoring plan has been carried out in the registered PD and the revised PD has been submitted to DOE as Annexure 1. PP Reply: 2	Verification Conclusion: 1 The project participant has provided the revised PD. However, there are some inadequacies in the revised PD submitted. CL 1 not Closed. Verification Conclusion: 2 The project participants has submitted the revised PD, which includes the monitoring arrangements as per the actual scenario observed during site visit. The verification team confirms that the change in the location of the energy meters at the power house of the project activity has been correctly provided in the revised VCS PD and the revised monitoring report. Hence,

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion										
		PD has been revised to remove the inadequacies. Revised PD has been attached as Annexure 1.	CL 1 has been closed.										
CL 2a Following FAR was raised during the previous verification period – <i>“It has been observed by the verification team that main and check meters installed on line 1 and line 2 of the Jhakri Sub-station, applicable for the current monitoring period and bearing sr. no. GEC04052, GEC04054, UPU01762, UPU01763 have not been calibrated after the completion of the current monitoring period (i.e. 1st Sept. 2010 to 30th Apr. 2011) till present date. Hence, the results of the calibration that will be available at such future date need to be verified in order to confirm the accuracy of readings reported during the current verification period</i> Please clarify the adherence to the above	Table 1 3.e	PP Reply: 1 The meters, bearing sr. no. GEC04052, GEC04054, UPU01762, UPU01763, which were used for previous monitoring period has been calibrated after the end of the monitoring period (1st Sept. 2010 to 30th Apr. 2011). <table border="1"><tr><td>Meter No.</td><td>Date of calibration</td></tr><tr><td>GEC04052</td><td>02/05/2012</td></tr><tr><td>GEC04054</td><td>02/05/2012</td></tr><tr><td>UPU01762</td><td>01/05/2012</td></tr><tr><td>UPU01763</td><td>01/05/2012</td></tr></table> The results showing that the error of all	Meter No.	Date of calibration	GEC04052	02/05/2012	GEC04054	02/05/2012	UPU01762	01/05/2012	UPU01763	01/05/2012	Verification Conclusion: 1 The project participant has provided the calibration certificates of the energy meters used in the previous monitoring period bearing serial no. GEC04052, GEC04054, UPU01762, UPU01763. The verification team has reviewed the calibration certificates which have been issued by the Government entity Power Grid Corporation of India Limited with reference to the test standard IEC 62053-22. The same is internationally accepted energy meter test standard. The results of the calibration show that meters bearing sr. no. GEC04052, GEC04054, UPU01762, UPU01763 are within the permissible limits of accuracy. Hence, CL 2 (a) has been
Meter No.	Date of calibration												
GEC04052	02/05/2012												
GEC04054	02/05/2012												
UPU01762	01/05/2012												
UPU01763	01/05/2012												

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion										
FAR raised during the previous verification.		the meters are within the permissible limit. Please find attached the calibration certificates of the meters attached as Annexure 2.	closed by the verification team. In addition, the verification team confirms that FAR 1 raised during the previous monitoring period (from 1st Sept. 2010 to 30th Apr. 2011) has been addressed. Hence, FAR 1 raised in the previous verification period has been closed.										
CL 2b The main and check meters on Line 1 and Line 2 at the Jhakri substation bearing sr. no. GEC04052, GEC04054, UPU01762, UPU01763 were used from 1/05/2011 to 12/05/2011 for current monitoring period (from 1 st May 2011 to 31 st Dec 2011). PP is requested to provide the Calibration certificate for the above mentioned meters.	Table 1 3.e	PP Reply: 1 The calibration details of the meters bearing sr. no. GEC04052, GEC04054, UPU01762, UPU01763 are as follows: <table><tr><td>Meter No.</td><td>Date of calibration</td></tr><tr><td>GEC04052</td><td>07/07/2010</td></tr><tr><td>GEC04054</td><td>08/07/2010</td></tr><tr><td>UPU01762</td><td>08/07/2010</td></tr><tr><td>UPU01763</td><td>08/07/2010</td></tr></table>	Meter No.	Date of calibration	GEC04052	07/07/2010	GEC04054	08/07/2010	UPU01762	08/07/2010	UPU01763	08/07/2010	Verification Conclusion: 1 The calibration certificates have been provided by the project participant. However, in the response submitted by the PP it has been specified that calibration is valid for one year. Please clarify. CL 2b not closed. Verification Conclusion: 2 The project participants has indicated that the frequency of the calibration of the meters mentioned in the
Meter No.	Date of calibration												
GEC04052	07/07/2010												
GEC04054	08/07/2010												
UPU01762	08/07/2010												
UPU01763	08/07/2010												

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion		
		The validity of calibration of the meters are one year, which also covers the period from 1/05/2011 to 12/05/2011. Please find the calibration certificates of the meters attached as Annexure 3. PP Reply: 2 Though the validity of calibration is not mentioned in the certificate but as per the registered PD calibration is done annually considering validity of the calibration is one year and HPSEB has also no objection in it. However, PP has calibrated the meters recently (after the monitoring period of the current verification). The details is as follows: <table><tr><td>Meter No.</td><td>Date of calibration</td></tr></table>	Meter No.	Date of calibration	registered PD is annually and valid for one year, the same is also accepted by the HPSEB (Government entity) However, PP has provided the calibration certificates of the meters used in current monitoring from 1st May 2011 to 31st Dec 2011 before and after the period for which the energy meters were used. The verification team has also checked the calibration certificates dated 1/05/2012 and 2/05/2012 (after the meter use) and found that the meters are in permissible limit of accuracy. Hence CL 2b is Closed
Meter No.	Date of calibration				

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response		Verification team conclusion
		GEC04052	02/05/2012	
		GEC04054	02/05/2012	
		UPU01762	01/05/2012	
		UPU01763	01/05/2012	
		As per the calibration certificates the meters are in permissible limit. The calibration certificates are already provided to the DOE.		
CL 2c The meters bearing serial number – UPU01235, - UPU01236, - UPU01237, and - UPU01238 are used for rest of the monitoring period i.e. from 12/05/2011 to 31/12/2011, which is calibrated on 24/02/2011 and 25/02/2011 (i.e. before the installation of meters for the current monitoirng period). The project participant	Table 1 3.e	PP Reply: 1 The calibration details of the meters bearing serial number –UPU01235, - UPU01236, - UPU01237, and - UPU01238 are as follows:		Verification Conclusion: 1 It is not clear how calibrations are valid till 20/01/2012. Please clarify. CL 2c not closed. Verification Conclusion: 2 The project participant has explained

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response			Verification team conclusion
has provided the calibration certificates of the above-mentioned energy meters before the start of the current monitoring period. However, the calibration certificates, after the end of the current monitoring period have not been provided and hence, it is not clear whether the energy meters were within the permissible limits of accuracy throughout the current monitoring period.		Meter No.	Date of calibration	Valid Up-to	that the calibration frequency mentioned in the registered PD is one year and the same is accepted by HPSEB (A government entity). The verification team accepts that the meters –UPU01235, - UPU01236, - UPU01237, and - UPU01238 used for the current monitoring period were calibrated on 24/02/2011 and 25/02/2011 (i.e. prior to the installation of the meters for the current verification) and the results of calibration show that meters were within the permissible limits of accuracy. However, calibration certificates for the above-mentioned energy meters, after the end of the monitoring period are not available. This is due to the fact that calibration frequency is though annual, the project participant and HPSEB uses set of the spare meters and replaces them annually with calibrated set of meters (This is a HPSEB approved
		UPU01235	24/02/2011	20/01/2012	
		UPU01236	25/02/2011	20/01/2012	
		UPU01237	25/02/2011	20/01/2012	
		UPU01238	24/02/2011	20/01/2012	
		These meters are used to monitor the energy generation for the period from 12/05/2011 to 31/12/2011. The meters are calibrated well before the start of this period and these calibartions are vaild till 20/01/2012. Moreover, as per registered PD, the meter calibration has to be done once in a year. Considering both registered PD and calibration certificates (date of calibration 24/02/2011 & 25/02/2011), the above calibration certificates cover the current			

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		monitoring period and it is observed from these certificates, the meters are working within the permissible limit. Hence the calibration certificates after the end of the current monitoring period is not required. DOE is requested to refer Annexure 4 for the above mentioned certificates. PP Reply: 2 The dates of valid up to mentioned in the calibration certificates are basically the validity of the master calibrator. There was a misunderstanding of the PP. Though the validity of calibration is not mentioned in the certificate but as per the registered PD calibration is done annually considering validity of the calibration is one year and HPSEB has	procedure). In such a case, though the calibration frequency is annual, due to having spare meters for replacement each year, the effective calibration frequency for the same energy meter is two years. Hence, the validation team confirms that results of calibration for the energy meters after the end of the monitoring period will only be available next year when the meters will be replaced again. However, HPSEB (A government entity) issues a document titled “Annex A –1” to the project participant, along with the JMR. The Annex A-1 of the JMR is used for the purpose of comparison of main and check meter readings. Verification team checked the main and check meter readings for each month of the current monitoring period and found that the meters are in permissible limit of accuracy class. In addition,

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		also no objection in it. In addition to that in each monthly JMRs (Annexure 1) of the present monitoring period, HPSEB has certified that main and check meters of both the lines are within the permissible limits. Hence the calibration certificates after the end of the current monitoring period is not required. DOE is requested to refer to the JMRs submitted for the present monitoring period.	there was no meter failure incident was reported as confirmed by the validation team from the review of the JMRs of the project activity during the current monitoring period. In addition, the PP has already adjusted 0.2% of the maximum permissible error in both export and import direction for the conservative value of emission reductions. Hence, CL 2 c is Closed