FIFTH 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 fifth 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 Sept 2010 to 30th April 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 Sept. 2010 to 30th April 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 Sept. 2010 to 30th April 2011 (including both days). Two numbers of Clarification Request (CL) and one Forward Action Request (FAR) 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. However, the Forward Action Request will be applicable for the subsequent monitoring period. The verification team confirms that total GHG reductions achieved during the current monitoring period are 490753 tCO2e and that emission reductions are calculated without material misstatements.

Table of Contents

1 Introduction 5

1.1 Objective 5

1.2 Scope and Criteria 5

1.3 Level of assurance 5

1.4 Summary Description of the Project 6

2 Validation Process, Findings and Conclusion 6

2.1 Validation Process 6

2.2 Validation Findings 6

- Gap Validation 6
- Methodology Deviations 6
- New Project Activity Instances 6

2.3 Validation Conclusion 6

3 Verification Process 7

3.1 Method and Criteria 7

3.2 Document Review 8

3.3 Interviews 8

3.4 Site Inspections 8

3.5 Resolution of Any Material Discrepancy 9

4 Verification Findings 9

4.1 Project Implementation Status 9

4.2 Accuracy of GHG Emission Reduction or Removal Calculations 14

4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals 14

4.4 Management and Operational System 16

5 Verification conclusion 16

6 References 18

7 C.V. of THE DOE'S VERIFICATION TEAM MEMBERS 19

8 Appendix A: Verification Protocol 20

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 fifth 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 and emission reduction spreadsheet 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 VSC 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 Sept. 2010 to 30th April 2011. Based on this documentation, a document review and a physical site inspection (from 08/09/2011 to 09/09/2011) was conducted. The Monitoring Report – Version 2.0, dated 23/09/2011 covering the period of 1st Sept. 2010 to 30th April 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 has 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. 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 fifth verification period of the project activity which starts from 1st Sept. 2010 to 30th April 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 Sept. 2010 to 30th April 2011), emission reduction spreadsheet and other supporting documents (JMR, data log sheets, calibration certificates, 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 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 SF_6 gas cylinders stored at the project site and calibration certificates of the Weighing machine
- Daily alarm log sheets of the SF_6 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 08/09/2011 to 09/09/2011 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 one member of the verification team from 08/09/2011 to 09/09/2011 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 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 Hydro Power Project of 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 SF_6 pressure in the switchgear assembly) and the new instrument has been used for the monitoring of SF_6 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 8th & 9th September 2011 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 gird 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. Hence, the verification team raised CL 1 (please refer to Appendix A of the verification report for details). 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 and hence the this change in the monitoring arrangement is not applicable to the current verification period with ends on 30th April 2011 and provided JMR report of May 2011 in support of the justification. The verification team reviewed the JMR report which was duly signed by the HPSEB Superintending Engineer, Generation Circle Bhaba and the Joint Vice President of the company (JPVL) and confirms that the monitoring arrangement of the project activity was in accordance with the registered PD until 13:00 hrs of the day 12th May 2011 (which is after the last date of the current verification period of 30th April 2011). Until 13:00 hrs of the day 12th May 2011, the energy meters were installed at HPSEB substation located at Jhakri. Hence, it can be concluded that the change in the monitoring arrangement of the project activity does not affect the current monitoring period. In view of the above facts, the verification team accepted the response of the project participant and closed CL 1.

- Any remaining issues from previous validation or verification.

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 fourth verification period of the project activity. The FAR raised in the fourth verification has been reproduced here *"The main and check meters on Line 1 and Line 2 at the Jhakri sub-station were replaced on 10th July 2010 by a fresh set of already calibrated meters. It is understood that the replaced meters would be undergoing calibration not before July 2011. Hence, the results of the calibration that will be carried out for these meters at such future date needs to be verified in order to confirm the accuracy of readings reported during the present verification period. The meters in question are bearing the following serial numbers: -UPU 01237 -UPU 01235 -UPU 01238 -UPU 01236"* 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 -UPU 01237 -UPU 01235 -UPU 01238 -UPU 01236. The verification team reviewed the calibration certificates (Ref 9 to 12 in section 6 of the report) of the energy meters used for the monitoring of the electricity in the fourth 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 have been concluded that the errors as found for the meter under test are within the specified limits of IEC-62053". 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 fourth verification period bearing serial numbers -UPU 01237 -UPU 01235 -UPU 01238 -UPU 01236, 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 2.0 dated 23/09/2011. 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,

ERy = BEy - PEy1 - PEy2 - PEy3 - Ly

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 has been changed after the end current monitoring period which has no impact on the current monitoring period (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 Sept. 2010 to 30th April 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 that the net electricity supplied to the grid values are taken from the JMR (which has been used for the emission reduction calculations after applying the maximum permissible error limits of 0.2 class energy meters on both export and import side) were same as delivered energy claimed in the invoices

raised by the project participant. During site visit, the verification team physically verified the energy meters and found that the installed meters were of the same accuracy class as stated in the VCS-PD.

However, the calibration certificates of the meters, after the end of the current monitoring period, were not provided to the verification team and verification team raised CL 2 (b). The project participant provided a response to CL 2 (b) that results of the calibration are not yet available and the calibration certificates of the meters, bearing serial numbers GEC04052, -GEC04054, -UPU01762, -UPU01763, will be submitted to the DOE during subsequent verification. However, each month, HPSEB issues a document titled "Annex A –1" to the project participant, along with the JMR. The Annex A-1 of the JMR is used by HPSEB 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 in the current monitoring period (1st Sept. 2010 to 30th April 2011). 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, 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. However, the calibration results, available at such future dates, may also show an error percentage beyond the permissible limit of accuracy of the energy meters. Hence, in response to the reply provided by the project participant on CL 2 (b), the verification team raised a Forward Action Request (FAR), which will be applicable for the subsequent monitoring period, is reproduced here as *"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".*

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)	(tCO2)
Sep-10	4041	11.072
Oct-10	5523	15.133
Nov-10	10012	27.432
Dec-10	17160	47.018
Jan-11	19574	53.632
Feb-11	17915	49.086
Mar-11	17834	48.864
Apr-11	11289	30.931
Total	**103348**	**283.169**

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 EFdiesel (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 (PEy2):

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 Sept. 2010 to 30th April 2011 (current monitoring period) have been referred to by verification team to crosscheck the electricity import from 22 kV line. The verification team confirms (after reviewing the third party invoices of HPSEB) that the total grid electricity import from 22kV line for the current monitoring period is 6736200 kWh and the project emissions reported in the monitoring report due to the grid electricity import from 22kV line are 5422.641tCO2 are without any material misstatement.

c. Leakage of SF_6 Gas (PEy3):

There is storage of SF_6 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 SF_6. It is only in the event of leakage of the SF_6 gas that the stored SF_6 would be needed to top up the quantity leaked. The project participant has regularly inspected and maintained the records of the pressure of SF_6 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 SF_6 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 SF_6 cylinders on regular

basis. The project participant has also provided the log sheets of records of the SF_6 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 SF_6 gas cylinders during the current monitoring period was carried out on 09/09/2010, 26/12/2010 and 15/03/2011 and the weighing balance was under valid calibration during that time period as validity of last calibration of weighing balance was up to 14/04/2011. Moreover, the latest calibration report of the weighing balance dated 01/09/2011 also confirmed that the weighing balance was working without any error. Hence, the verification team confirms that there was no consumption from the SF_6 gas stock.

The project participant also monitors the SF_6 gas pressure in the various compartments of the switchgear assembly through a handheld Digital Pressure Indicator (DPI) on annual basis. The project participant has submitted the log sheet of the measurements of the SF_6 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 09/09/2010 and the SF_6 pressure measurement took place on 31st Oct. 2010 (which is after the calibration date of the DPI instrument). Therefore, it could be confirmed that there had been no leakage of SF_6 gas during this period and hence the project emissions due to SF_6 leakage were Nil. From the monthly records of SF_6 gas pressure monitoring and the records of the SF_6 gas cylinders it was observed by the verification team that there was not any abnormal situation of SF_6 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

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 SF_6 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 SF_6 (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 SF_6 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.
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.
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. 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 as project participant also measures the SF_6 pressure in the switchgear assembly (GIS) on annual basis. 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).

4.4 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 fifth verification of the '300 MW Hydro Power Project of JHPL' for the monitoring period covering 1st Sept. 2010 to 30st Apr. 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 490753 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 490,753 tCO2, from 01/09/2010 to 30/04/2011 (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 2.0) 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 01/09/2010 to 30/04/2011 (including both days)

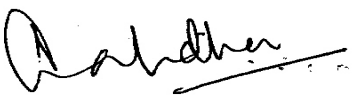
Voluntary Emission Reductions during the reporting period are as follows:

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

GHG Emission Reductions or Removals	tCO_2e
Baseline Emissions	496,462
Project Emissions	5,705
Leakage	0
Net GHG emission reductions or removals	**490,753***

*The project participant has rounded down decimals values of the monthly emission reductions to arrive at the total emission reduction value of 490753 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_2e
September 2010	186,319
October 2010	99,391
November 2010	53,876
December 2010	38,367
January 2011	29,453
February 2011	22,740
March 2011	22,536
April 2011	38,071
Total (from Sept. 2010 to Apr. 2011)	490,753



H.B. Muralidhar

(Internal Technical Reviewer)

Anupam Badola

(Team Leader)

6 REFERENCES

1. Monitoring report version 1.0 dt. 16/08/2011
2. Monitoring report version 2.0 dt. 23/09/2011
3. JMR's for the Months Sept. 2010 to May 2011
4. Invoices raised by the project proponent for the period Sept. 2010 to Apr. 2011
5. Energy meter calibration certificate No. RTL/NR-II/CAL/201011-23/2010, dated 16.07.2010
6. Energy meter calibration certificate No. RTL/NR-II/CAL/201011-24/2010, dated 16.07.2010
7. Energy meter calibration certificate No. RTL/NR-II/CAL/201011-25/2010, dated 16.07.2010
8. Energy meter calibration certificate No. RTL/NR-II/CAL/201011-26/2010, dated 16.07.2010
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. 0450467 dated 15/04/2010
14. Electronic balance calibration certificate no. 0434775 dated 01/09/2011
15. Monthly HPSEB invoices for 22 kV line import for the period Sept. 2010 to April 2011
16. DPI calibration certificate No. QLC/CAL/10/032064 dated 09/09/2010
17. Daily GIS Alram log sheets (consolidated monthly) for the current monitoring period
18. 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 Sept. 2010 to 31st Apr. 2011
19. Registered VCS-PD
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

Post Graduate in Environmental Science with four years of work experience in climate change services. He has previously worked with a manufacturing organisation 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 is the Lead Auditor for Environment Management System and involved in the validation and verification of the CDM/VCS projects.

Anurag Juyal (Team Member)

Mr. Anurag Juyal is a Post-graduate in Energy Systems with over 3 years of experience in the field of clean development mechanism. He is working in Bureau Veritas Certification (India) Pvt. Ltd. as Verifier - Climate Change. Prior to joining Bureau Veritas, he worked on GS/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 Clean Development Mechanism Validation and Verification Manual (Version 01.2)

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
1 Project implementation in accordance with the registered project design document					
a Are all physical features of the proposed VCS project activity proposed in the registered PD in place?			It was observed during the on-site visit and document review that the monitoring of electricity supplied to the grid is taking place through energy generation 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. Please clarify.	CL 1	OK
b Have the project participants operated the proposed VCS project activity as per the registered PD?			It was observed during the on-site visit and document review that the monitoring of electricity supplied to the grid is taking place through energy generation 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. Please clarify.	(CL 1)	OK
c Was an on-site visit conducted?			Yes. The onsite visit was conducted on 08/09/2011 and 09/09/2011.	OK	OK

	CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
d	If not, justify the rationale of the decision.			The onsite visit was conducted on 08/09/2011 and 09/09/2011.	OK	OK
e	Does the implementation or operation of VCS project activity conform with the description contained in the registered PD?			It was observed during the on-site visit and document review that the monitoring of electricity supplied to the grid is taking place through energy generation 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. Please clarify.	(CL 1)	OK
f	Was a notification or a request for approval of changes from the project activity as described in the registered PD submited prior to the conclusion of the verification/certification for the corresponding?			It was observed during the on-site visit and document review that the monitoring of electricity supplied to the grid is taking place through energy generation 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. Please clarify.	(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 activity?			The validated monitoring plan of the project activity is based on previously approved CDM methodology ACM0002/Version 8, "*Consolidated baseline methodology for grid-connected electricity generation from renewable sources*".	OK	OK
b	If no, was a request for revision of the monitoring plan was done? (The DOE may request for			The validated monitoring plan, adopted in the project activity is as per the requirements of the	OK	OK

	CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
	revision of the monitoring plan covering the monitoring period under verification, for approval by the VCS Board)			methodology ACM0002/Version 8. Hence, revision of the monitoring plan was not required.		
c	Are there any monitoring aspects of the project activity that are not specified in the methodology, particularly in the case of small-scale methodologies (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: 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.	OK	OK
3	***Compliance of monitoring with the monitoring plan***					

	CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
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 the previous monitoring reports been reviewed?			All the previous monitoring reports have been reviewed by the verification team.	OK	OK
c	Where applicable, has the impact of revision in the monitoirng plan on the current verification been reviewed ?			It was observed during the on-site visit and document review that the monitoring of electricity supplied to the grid is taking place through energy generation 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. Please clarify.	(CL 1)	OK
d	Does the registered/approved monitoring plan have any description of an illustration to calculate net electricity supplied to the grid by the project activity ?			It has been explicitly specified in the registred PD that net electricity exported to the gird would be the difference of the measured values of the electricity export to the grid and import from the grid. This is also in accordance with the applied methdology ACM 0002.	OK	OK
e	If yes to (d) above, has the verification team verified /confirmed the validity of such illustration with supporting documents ?			Yes, the verification team has reviewed the JMRs for the project activity for the current monitoring period and confirms that net electricity supplied to the grid has been arrived upon taking the difference between grid export and grid import.	OK	OK
f	Have all parameters stated in the monitoring plan, the applied methodology and relevant VCS Board decisions been sufficiently monitored and updated as applicable, including:			-	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
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 Validation of entire procedure of apportioning, if applicable			The apportioning procedures have not been applied by the project participant. This is in accordance with the monitoring plan contained in	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			the registered PD.		
v Management and operational system: the responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the monitoring plan?			The management and operational staff structure assigned towards performing duties at the project activity site, is in 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.	OK	OK
g Is the accuracy of equipment used for monitoring in accordance with the relevant guidance provided by the VCS Board and are equipment controlled and calibrated in accordance with the monitoring plan?			-	-	
i Are monitoring results consistently recorded as per approved frequency?			Yes, the monitoring results have been recorded consistently as per the approved frequency.	OK	OK
ii Have quality assurance and quality control procedures been applied in accordance with the monitoring plan?			Part A Following FAR was raised during the previous verification period - "The main and check meters on Line 1 and Line 2 at the Jhakri sub-station were replaced on 10th July 2010 by a fresh set of already calibrated meters. It is understood that the replaced meters would be undergoing calibration not before July 2011. Hence, the results of the calibration that will be carried out for these meters at such future date needs to be verified in order to confirm the accuracy of readings reported during the present verification period. The meters in question are bearing the following serial numbers : -UPU 01237 -UPU 01235	CL 2(a)	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			-UPU 01238 -UPU 01236 Please clarify the adherence to the above FAR raised during the previous verification. <u>Part B</u> The main and check meters on Line 1 and Line 2 at the Jhakri sub-station were calibrated and installed on 10th July 2010. The set of meters (2 main and 2 check meters), bearing serial number -GEC04052, -GEC04054, -UPU01762, -UPU01763, were used for monitoring of electricity during the current monitoring period from 1st Sept. 2010 to 30th April 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. <u>Part C</u> Please clarify that the calibration frequency specified for all equipments in the registered monitoring plan has been followed during the current verification period.	CL 2(b) CL 2(c)	
iii Has the verification team confirmed whether the applicability and correct implementation of any procedure that replaces direct calibration of			The project participant has carried calibration of the energy meters, weighing scale, DPI Instruments, etc. which meets the frequency of the calibration of	OK	OK

	CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
	meters, and any procedure that leads to calculation of parameters used in the ER determination ?			the registred monitoring plan. Any procedure, replacing the direct calibration of the meters has not been applied by the project participant. Hence, this condition is not applicable to the project activity.		
4 Assessment of data and calculation of greenhouse gas emission reductions						
a	Is a complete set of data for the specified monitoring period is 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 DOE shall opt to either make the most conservative assumption theoretically possible in finalizing the verification report, or raise a request for deviation prior to submitting request for issuance, if appropriate).			The project participant has provided the complete dataset for the current monitoring period from 1st September 2010 to 30th Apr. 2011 for the purpose of the verification of emission reductions achieved by the project activity.	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 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 period 1st Sep 2010 to 30th Apr. 2011. The same has been verified during site visit by cross-checking the physical stock of SF6	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			quantity in the cylinders taken on 18/06/2010 and on 18/06/2011 (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 Sep 2010 to 30th Apr. 2011, there was no incident of tripping of the alarm. e. The Diesel consumption for the current monitoring period from 1st Sep 2010 to 30th Apr 2011 has been crosschecked with the daily diesel consumption records maintained in DG set Log book.		
c Have calculations of baseline emissions, proposed VCS project activity emissions and leakage, as appropriate, been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology document?			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
d Have any assumptions used in emission calculations been justified?			The project participant has used grid electricity emission factor of 0.805 tCO2/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

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
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 tCO2/MWh) for the purpose of calculation of baseline emissions. The grid emission factor has been determined ex ante and the value of 0.805tCO2/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 during the on-site visit and document review that the monitoring of electricity supplied to the grid is taking place through energy generation 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. Please clarify.	1.a	The metering arrangement from sub station to power house has changed on 12/05/2011. The present verification period is from 01/09/2010 to 30/04/2011. Hence, the transfer of meter does not affect the present monitoring period. Please refer to the JMR reading for the month of May, 2011 to support the change of monitoring system.	Project participant has provided the Joint Meter Reading (JMR) Report of the project activity for the month of May 2011. The report is duly signed by the Superintending Engineer of HPSEB and Sr. Joint President of the project participant (Jaiprakash Power Ventures Limited). The JMR report clearly states installation of new meter taken place at sending end (i.e. power house of the project activity). Since this change in the monitoring arrangement has taken place in the month of May 2011, this is not applicable to the current monitoring period from 1st Sept. 2010 to 30th Apr. 2011. Hence, CL 1 has been closed by the verification team.

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 2 (a) Following FAR was raised during the previous verification period - "The main and check meters on Line 1 and Line 2 at the Jhakri sub-station were replaced on 10th July 2010 by a fresh set of already calibrated meters. It is understood that the replaced meters would be undergoing calibration not before July 2011. Hence, the results of the calibration that will be carried out for these meters at such future date needs to be verified in order to confirm the accuracy of readings reported during the present verification period. The meters in question are bearing the following serial numbers : -UPU 01237 -UPU 01235 -UPU 01238 -UPU 01236 Please clarify the adherence to the above FAR raised during the previous verification.	3.g.ii	The main and check meters no. - UPU 01237, UPU 01235, UPU 01238, UPU 01236, which were used for monitoring the net generation by the project activy during previous verification period have been calibrated and found to be within the permissible limit. Please refer to the calibration certificate of the meters no. UPU 01237, UPU 01235, UPU 01238, UPU 01236.	Project participant has provided the calibration certificates of the energy meters dated 01/03/2011, bearing sr. no. UPU 01237, UPU 01235, UPU 01238, UPU 01236. The verification team has reviewed the calibration certificates. The calibration has been carried out by Power Grid Corporation of India (a Govt. entity) based on international traceable standard of IEC 62053:-22: 2003. The results of the calibration have also been specified in the calibration report. It was observed by the validation team that all the energy meters (bearing sr. no. UPU 01237, UPU 01235, UPU 01238, UPU 01236) were within their permissible limits of accuracy. Hence, FAR raised in the fourth monitoring period has

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
			been closed by the verification team. CL 2(a) closed.
CL 2 (b) The main and check meters on Line 1 and Line 2 at the Jhakri sub-station were calibrated and installed on 10th July 2010. The set of meters (2 main and 2 check meters), bearing serial number -GEC04052, -GEC04054, -UPU01762, -UPU01763, were used for monitoring of electricity during the current monitoring period from 1st Sept. 2010 to 30th April 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.	3.g.ii	The meters no. GEC04052, GEC04054, UPU01762, UPU01763 were used to monitor the net power export to the grid during the present monitoring period. The meters were calibrated on 08/07/2010. The validity of calibration of meters are one year and hence the validity of calibration of meters were upto 07/07/2011. The present monitoring period is from 01/09/2010 to 30/04/2011 and hence the above mentioned meters were calibrated during the verification period. However, in a conservative approach PP has considered 0.2% error, which is the	It has been understood by the verification team that energy meters installed for the monitoring of the energy for the current monitoring period (bearing sr. no. no. GEC04052, GEC04054, UPU01762, UPU01763) were calibrated before the installtion i.e. 08/07/2010 and the calibration results showed that meters were within the accuracy limits. However, the calibration certificates of the energy meters after the end of the current monitoring period are not available at present (as calibration frequency is annual). The verification team has also

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
		permissible error of the meters while calculating the net generation to calculate the emission reduction. The last calibration certificates have already been submited to the DOE. The next calibration certificates of the above mentioned meters will be presented to the DOE during the next verification period.	noted that the energy meters are electronic trivector meters of high accuracy class (0.2), main and check meters have not shown any erroneous results in the comparision of the readings for the current monitoring period and JMR of each month (which is duly signed by the HPSEB, a Govt. entity) provides a main and check meter comparision sheet specifying that “Reading of main and check meters are within permissible class of accuracy”. In addition, project participant has also applied the maximum permissible error of the meters (0.2 class) on both export and import side for the conservative estimation of emission reductions. Hence, CL 2 (b) has been closed.

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
			However, the verification team has rasied following Forward Action Request applicable for the subsequent monitoring period. FAR 1 *"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*

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
			readings reported during the current verification period".
CL 2 (c) Please clarify that the calibration frequency specified for all equipments in the registered monitoring plan has been followed during the current verification period.	3.g.ii	*Calibration of Energy Meters:* The PP use two set of meters (each set contains 2 main meteres and 2 check meters) placed at the sub-station for monitoring the the net energy export to the grid. Each set of meters is installed just after calibration and used for monitoring the net energy export to the grid for the period of one year. The set of energy meters (2 main and 2 check meters), bearing serial number -GEC04052, -GEC04054, -UPU01762, -UPU01763, were installed in July, 2010 just after calibration on 08/07/2010. The present monitoring period is from 1st Sept. 2010 to 30th April 2011, which is within one year period from the date of calibration i.e. 8/07/2010 as well as the installation	*Calibration of Energy Meters:* It has also been verified by the verification team during the site visit that there are two sets of energy meters (total 8 meters) and at a time only four meters are in operation (two main and two check meters). The calibrated set of energy meters were replaced on the line last time on 10/07/2010 which is before the current monitoring period and another replacement of the calibrated meters (with spare set) was carried out on 12/05/2011 (which is after the current monitoring period). Hence, the verification team has accepted the response provided by the project participant and confirms that frequency of the calibration of energy meters has been

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
		(July, 2010) of this set of meters. This is in line with the monitoring plan proposed in the registered PD. *Calibration of Digital Pressure Indicator (DPI) meter:* The DPI meter was calibrated on 09/09/2010. Though the present verification starts from 01/09/2010 and the DPI meter calibrated on 09/09/2010, the DPI meter was not used for any measurement from 01/09/2010 to 09/09/2010. Hence, there was no impact on SF_6 pressure measurement due to non calibration of DPI meter. Please refer to the DPI pressure measurement sheet to justify the same. *Calibration of Electronic Balance:* The electronic balance was calibrated on 15/04/2010. The	maintained. *Calibration of Digital Pressure Indicator (DPI) meter:* The Digital Pressure Indicator is used by the project participant for the monitoring of the SF_6 in the various compartments. The frequency of the SF_6 measurement as per the registered monitoring plan is once a year and it was carried out on 4th Nov. 2009 last year. It was observed by the verification team that DPI was calibrated on 09/09/2010 and the SF_6 pressure measurement took place on 31st Oct. 2010 (which is after the calibration date of the DPI instrument). Hence, the verification team has accepted the response of the project participant.

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
		validity of calibration was up to 14/04/2011. Hence, from 15/04/2011 to 30/04/2011 the electronic balance was not calibrated during the present verification period. The last measurement was taken on 15/03/2011 during the present verification period, when the calibration was valid. Hence, the electronic balance was not used for any measurement during the non calibrating period. However the latest calibration report dated 01/09/2011 of the electronic balance shows that the electronic balance is within the permissible limit. Please refer to the calibration reports of electronic balance attached herewith.	*Calibration of Electronic Balance:* The electronic balance at site is used for the measurement of the SF_6 gas cylinder weight stored at the project site. The verification team observed that the electronic balance remained non-calibrated at site from 15/04/2011 to 30/04/2011 during the current monitoring period. The weighing measurement for SF_6 gas cylinders during the current monitoring period was carried out on 09/09/2010, 26/12/2010 and 15/03/2011 and the weighing balance was under valid calibration during that time period as validity of last calibration of weighing balance was upto 14/04/2011. Moreover the latest calibration report of the weighing balance dated 01/09/2011 also confirmed

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			that the weighing balance was working without any error. Based on the observations discussed above, CL 2 (c) has been closed by the verification team.