300MW HYDROPOWER PROJECT BY JHPL

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Summary:

LGAI Technological Center, S.A. (hereafter referred to as Applus+ Certification) has been contracted by EKI Energy Services Limited to conduct the verification of the project "300MW Hydropower project by JHPL ", VCS ID 0092, against VCS Standard Version 4.1.

The verification includes confirming the implementation of the monitoring plan of the registered VCS PD and MR (Project ID 92) and the application of the monitoring methodology as per ACM0002 version 17 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources".

The project activity involves generation of electricity by using the renewable energy source (Hydro) supplying to the Indian Grid. The project is environmentally benign as it results in the reduction of emissions from grid connected fossil fuel-based power plants. Therefore, the project reduces greenhouse gas emissions and thereby contributes to sustainable development.

A risk based approach has been followed to perform this verification. In the course of verification, 06 Corrective Action request (CARs), 00 Forward Action Request (FAR) and 02 Clarification request (CLs) were raised and successfully closed.

The review of the project design documentation, monitoring report and additional documents related to baseline and monitoring methodology; the subsequent background investigation, telephonic interviews and stakeholders have provided Applus+ Certification with sufficient evidence to validate the fulfillment of the stated criteria.

Applus+ Certification confirms that the project is implemented in accordance with the registered VCS- PD. The monitoring system is in place and the emission reductions are calculated without material misstatements. Our opinion relates to the project's GHG emissions and the resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring and its associated documents. Based on the information seen and evaluated we confirm that the

emission reductions from the project activity “300MW Hydropower project by JHPL ” in Himachal Pradesh, India during the period 01-November-2020 to 31-July-2021 (including both days) amount to 669,802tCO_2e.

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1 INTRODUCTION

1.1 Objective

Applus+ Certification has been contracted by JSW Hydro Energy Limited (project proponent), to undertake the verification of the renewable energy project titled "300MW Hydropower project by JHPL" (VCS ID92). The verifiers have reviewed the GHG data collected to date for the monitoring period from 01-November-2020 to 31-July-2021 (including both days) covered in this verification. The objective of this verification is a thorough and independent assessment of registered project activities against the applicable VCS requirement by the VVB. The verification process shall determine whether the proposed project activity complies with the requirements of latest VCS guidelines, applicability conditions of the selected methodology, relevant host country regulations and guidance issued by the VCS Board.

1.2 Scope and Criteria

The scope of the verification was the independent and objective review and ex-post determination of the monitored reductions in GHG emissions from "300MW Hydropower project by JHPL". The verification of this project was based on the registered project description/1.1,1.2/ & monitoring report /4/ and supporting documents submitted by the project proponent to the verification team. The documents were reviewed against the following guidance and protocols:

VCS standard Version 4.1, Issued: 19-September-2019; Updated: 22-April-2021/16/

Approved baseline and monitoring methodology ACM0002 version 17 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"/14/

VCS Program Guide, Version 4.0, dated 19-September-2019 /17/

CDM VVS for project activities version 02.0 /22/

CDM PS for project activities version 02.0 /21/

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

1.3 Level of Assurance

The level of assurance of the verification report falls under reasonable assurance engagements as selected by the Client. The verification team verified the complete monitoring data for all the parameters of the monitoring plan and confirms that the reported emission reductions are free from any type of material errors.

1.4 Summary Description of the Project

The project activity is generation of electricity by using hydro-electricity generators. The energy generated is supplied to the Indian Grid /9/, which operates the national grid system. The project is environmentally benign as it results in the reduction of emissions from grid connected fossil fuel-based power plants. The project activity leads to reduction of greenhouse gas (GHG), as the energy is generated from renewable source. The emission reduction were real, measurable, and verifiable and plays a beneficial role in the mitigation of climate change.

The Project activity involves installation of a run-of river hydropower plant system with capacity 300 MW/1.2/. The unit consists of three phase of capacity 100 MW and two synchronous generators manufactured by Siemens A.G rated 111 MVA with 10% overload margin with

higher temperature rise, resulting in net generation capacity of 300MW/18/.

The project activity use water diverted from the flow of river Baspa. The flow in the river Baspa is contributed by several nullahs and khuds and numerous glaciers. The diversion barrage of the project is located across river Baspa, one of the major tributaries of river Satluj, at Kuppa in Himachal Pradesh. Location of the project was verified through Google Map (https://www.gps-coordinates.net/) as well as through sharing of live coordinates by onsite PP representatives and found consistent with the data provided in the registered VCS-PD/1.1/.

The Turbine Generators were commissioned on 24-May-2003 unit-1, 29-May-2003 Unit-II and 08-June-2003 unit-II, which was verified against the registered VCS-PD/1.2/ and commissioning certificates/9/.

By document review and online interview with PP representative's present onsite of the project activity, the verification team confirms that all the components of installed technology are fully functional. The total emission reductions achieved under the monitoring period01-November-2020 to 31-July-2021 are 669,802tCO2e/5/.

2 VERIFICATIONPROCESS

The registered VCS project is undergoing periodic verification under VCS, the approach adopted to ensure the quality of emission reductions is described in the following sections.

2.1 Method and Criteria

Verification was conducted using Applus+ Certification procedures in line with the requirements specified in the VCS standard Version 4.1 Requirements, CDM M&P, the latest version of the CDM Validation and Verification Standard, and relevant decisions of the COP/MOP and the CDM EB and applying standard auditing techniques. The project activity does not fall under category "grouped projects", hence any sampling methods not to be employed by the validation/verification body for the verification of GHG emission reductions or removals generated by the project.

It is to be assessed and determined whether the proposed implementation and operation of the project activity, and the steps taken to report emission reductions comply with the criteria and relevant guidance provided by the VCS Board. The verification process consists of the following three phases;

- A desk review of the VCS PD and VCS MR
- Telephonic interviews with project stakeholders
- The resolution of outstanding issues and issuance of final report and opinion.

2.2 Document Review

The verification is performed primarily as a document review of the registered VCS PD/1.1/, previous MR and Verification report and associated documents as stated in details in appendix 1 of this document. The assessment is performed by a verification team referring the Applus+ Certification internal procedures in line with latest VCS requirements. The cross checks between information provided in the Monitoring report, VCS PD and information from sources other than those used, if available, the team's sectoral or local expertise and, if necessary, independent background investigations.

2.3 Interviews

Due to the current situation with the global COVID-19 pandemic scenario and country wide lock down in most of countries across the globe, an on-site inspection has not been performed by the assessment team. However, the representatives of the PPs and onsite staff of PP were interviewed online via Skype/WhatsApp on 28-August-2021i.e. personnel responsible for monitoring of the project activity, data collection and management, and QA/QC procedure. The details of the people interviewed are mentioned in the table below –

S N	Name	Organization
1	Mr. Anil Thakur	Sr. Manger ,JSW Hydro Energy Limited
2	Mr.SouvikMitra	Manger - Operations ,EKI Energy Services Limited
3	Mr.Barun Sharma	DGM-Operations, EKI Energy Services Limited
4	Mr. Manik	Operation, JSW Hydro Energy Limited

The topics covered during interview ranges from general features and implementation of project to technical details of the project like calibration details, monitoring and measuring system and data collection, recording and archiving procedures. The assessment was drawn based on the feedback received during interview coupled with the review of supporting documents.

2.4 Site Inspections

As discussed in the above section, physical site inspection is not done for the current verification. However, to achieve a reasonable level of assurance, the assessment team has followed the alternative means to substantiate the verification criteria as described in the below table –

Assessment Criteria	Means of verification/source documents	Assessment opinion
Description of project activity	i. Commissioning certificates /9/ ii. PPA signed with SEB/10/ iii. Latest VCS verification report /2.1/. iv. Interview with PP representatives on 28-August-2021	The information's with reference to project capacity, technology, plant equipment's and commissioning dates as provided in section 1.1 of MR are found consistent with the documents.
Compliance of the project implementation with the	i. Monthly JMRs signed by SEB and JSWHEL/8/	Verified documents indicated the following information:

Assessment Criteria	Means of verification/source documents	Assessment opinion
registered project designdocument	ii. Geographical co-ordinates (Location of Project activity) verified through Google Map[1] as well as sharing of live location from PP representative onsite. iii. Latest VCS verification report /2.1/. iv. PPA signed with SEB /10/ v. Interview with PP representatives on 28-August-2021 vi. Latest photographs of major project equipment's installed at site (i.e. Turbine, generators, energy meters, weir intake, penstock, tailrace etc.)/18/	• Serial number of energy meters (Main and Check) • Capacity of project • Name of project participant (Ownership of the project activity) Location of power house is verified through Google Map. Daily generation records are verified on sample basis to check the operational status of project activity. Grid connectivity of the project is confirmed through the PPA. All the information's regarding the project implementation as discuss above are further verified through previous VCS verification report/2.1/ and found consistent.
Compliance of the registered monitoring plan with applied methodologies andstandardized baselines	i. Interview with PP representatives on 28-August-2021 ii. PPA signed with SEB /10/ iii. Monthly JMRs signed by SEB and JSWHEL/8/ iv. Invoices raised by project developer to SEB/7/ v. Photograph of all the WTGs, energy meters installed at site and screen shots of online monitoring system/18/	The organizational structure, responsibilities and competencies of the personnel confirmed through interview with PP representatives. Frequency of monitoring of parameters listed under approved monitoring plan is verified through JMRs /Invoices. The methods used for measuring, recording, storing, aggregating, and reporting the data on monitored parameters are verified though PPA and

[1] https://www.gps-coordinates.net/

Assessment Criteria	Means of verification/source documents	Assessment opinion
		interactions with site personnel. Procedure for data uncertainty, emergency preparedness, roles and responsibility, operational and management structure are mentioned in the MR is confirmed through interview with PP representativesand found satisfactory.
Compliance with the calibration frequency requirements for measuring instruments	i. Calibration certificates of energy meters/6/ ii. Monthly JMRs signed by SEB and JSWHEL/8/ iii. PPA signed with UETCL/10/	Calibration frequency and energy meter specifications (Sr.No., make, accuracy class) is verified through calibration certificates, photographs of energy meters and further verified through monthly JMRs and found consistent. Responsibility of calibration and maintenance of energy meters is solely under control of SEB; this is verified through the PPA.
Assessment of data and calculation of emission reductions or net removals	i. Monthly JMRs signed by SEB and JSWHEL/8/ ii. Invoices raised by project developer to SEB/7/ iii. Latest VCS verification report for last verification/2.1/	Monthly values of monitoring parameters used in ER calculation are verified through JMRs and cross verified with the invoices. Methods, formulae and emission factor for calculating baseline emissions have been followed are in accordance with the applied methodology /14/ and as described in the previous approved VCS verification report/2.1/.

It is noteworthy that no sampling plan for verification is applied as 100% data is verified for the current monitoring period. Most of the reference document referred by the assessment team (above table) are either issued /endorsed by grid utility (SEB) Power Grid Corporation of India Ltd., a government agency, hence is deemed authentic.

The assessment team has also used documents such as validation report/2.2/ and verification reports/2.1/ available publicly. Furthermore, the project activity already verified under VCS previously and currently undergoing periodic verificationunder second crediting period.Hence, based on the information's available through approved documents (VCS verifications), it can be confirmed that project is implemented and being operated as described in the registered PD/1.1/.

The assessment team has verified sufficient appropriate audit evidences, to reduce audit risk to an acceptably low level as requisite to achieve reasonable level of assurance for the current verification.

2.5 Resolution of Findings

The objective of this step is to identify, discuss and conclude on the issues related to the monitoring, implementation and operations of the registered project activity that could impair the capacity of the registered project activity to achieve emission reductions or influence the monitoring and reporting of emission reductions. This is done based on the desk review and Verification On-site assessment. The verification team prepares and/or updates a verification protocol (internal document) that records the conformities and non-conformities, which may be of following types;

CAR (Corrective Action Request) is raised if one of the following occurs:

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

Clarification request (CR) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met. All CARs and CRs raised by the Applus+ Certification during verification shall be resolved prior to submitting a request for issuance.

FAR (Forward Action Request) is raised during verification if the monitoring and reporting require attention and/or adjustment for the next verification period.

During the current verification, 06 Corrective Action request (CARs) and 02 Clarification request (CRs) and 00 Forward Action Request (FARs) were raised and successfully closed.

All the findings that are raised and communicated to project participant during the verification are included under Appendix 3. The section also includes the response, if provided, by the project participants and an assessment by the verification team if it was closed out or otherwise.

2.5.1 Forward Action Requests

The project activity is undergoing periodic verification under VCS; there were no FARs raised during the validation and previous verification. Also, no FAR is raised during the current verification.

2.6 Eligibility for Validation Activities

This section is not applicable for present verification, as Applus+ Certification holds the accreditation for Validation of projects under this Sectoral Scope

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project activity is neither registered nor seeking registration in any other GHG program. The project proponent has also provided undertaking that it will not claim any GHG credits in any GHG program other than that under VERRA during the current monitoring period. This was verified from the search data base available in CDM registry web-page and GS registry web page. Any project with same technology, geographical location and the same PP has not been found to be neither registered nor seeking registration in any other GHG program.

3.2 Methodology Deviations

There is no methodology deviation identified during the current monitoring period.

3.3 Project Description Deviations

Deviation request has been submitted for approval during the previous monitoring period are as follows:

Since 01-September-2015, project activity ownership rests on the Himachal Baspa Power Company Ltd. The change the company name during Joint validation and verification project for monitoring period from 01-September-2018. During last joint validation and verification assessment, a requested for deviation for change of project title has been submitted. The project title has been revised and approved by VERRA. The new title of project is “300MW HYDROPOWER PROJECT BY JHPL” and new name is “Jaiprakash Hydro Power Limited”. This is approved from VERRA as confirmed from website (https://registry.verra.org/app/projectDetail/VCS/92).

3.4 Grouped Project

Not applicable. The project activity is not a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The 1st unit of the 300 MW run-of-river hydro power project of installed capacity 100 MW got commissioned on 24-May-2003, the second unit on 29-May-2003 and third unit on 08-June 2003that corresponds to the date when the project got fully commissioned.
The project, being a run-of-river type Hydro-Power project, would generate power by utilizing the water diverted from the flow of river Baspa. The flow in the river Baspa is contributed by several nullahs and khuds and numerous glaciers. The diversion barrage of the project is located across river Baspa, one of the major tributaries of river Satluj, at Kuppa in Himachal Pradesh. Water is diverted from the barrage to the power house through a diversion barrage. Two open sedimentation chambers are used after the diversion barrage to exclude the silt from water used for power generation. The water is passed through a head race tunnel of about 7.95 km long and steel lined pressure shaft (about 885 meters long to create a design head of 702 meters) which is branching into three penstocks for running 3 pelton turbines of 100 MW each. A surge shaft has been constructed between the head race tunnel and the pressure shaft which would be used to regulate the flow.
Online interview with PP representatives of the project activity was carried out on 28-August-2021 by the verification team to check the implementation status of the project activity and the instrumentation installed for the project activity.

The Monitoring Report, provided the downtime of the plant, occurred during this monitoring period is given in the table below.

Month/Year	Description	Time(hours)
December 2020	Unit 3 forced outage due to Deflectors Hunting Issue on 12-December-2020	06:17
February 2021	Unit 1j under forced outage due to Cooling water tank level too low Switch Malfunctioning. This resulted shutdown on 27-February-2020	08:30
March 2020	a) Unit 2 under planned shutdown for Annual Maintenance Works from 00:00 hours of 01-March-2021 to 07:30 hours of 04-March-2021 b) Unit 3 under planned shutdown for Annual Maintenance Works from 14:00 hours of 14-March-2021 to 14:30 hours of 17-March-2021	152.00

The PP	June 2021	a)Unit 1 under forced outage due to failure of Cooling Water pumps for 01:10 hours on 10-June-2021 b) Unit 2 under forced outage due to failure of Cooling Water pumps for 02:16 hours on 14-June-2021	03:26

has provided the photograph and plant log book to verification of breakdown due to not functioning of the Unit-II during the period 01-March 2021 till 04-March-2021. The same has been verified also through Interview with the personnel (plant operator) from the operation team and found to be correct, hence accepted.

Interview of the personnel was conducted by the verification team, which revealed that all the QA/QC procedures listed in the registered PD/1.2/ have been followed while operating the project activity.

All parameters stated in the monitoring plan in registered PD/1.2/ and the applied methodology/14/ has been fulfilled in the current monitoring report. All baseline emission parameters have been verified and found satisfactory. The discussion regarding each parameter has been elaborated in the further section of this report.

PP will not claim the carbon credits under any other GHG emission reduction scheme (including CDM) for the present monitoring period under VCS and PP has provided declaration on the same during this verification. Hence, there is no possibility of double counting.

Assessment team concludes the following:

- The implementation status of project activity was found to be in compliance with registered PD /1.2/
- VVB has conducted the online interviews with PP representative's present onsite to confirm the implementation status of the project.
- The commissioning date of the project activity was found to be accurately and consistently recorded.
- The actual operation of project activity was found to be following the flow diagram provided in revised PDD/1.2/.
- There was no increase in emission reduction from estimates made in revised PDD/1.2/, therefore no additional explanation was sought from PP regarding the same.
- The project is registered under VCS program with reference number 92/13/

4.2 Safeguards

4.2.1 No Net Harm

This project activity will not involve any negative environmental or socio-economic impacts, as the generation of power is by using hydro which is a clean source of energy.

4.2.2 Local Stakeholder Consultation

Local stakeholder consultation has been conducted at the time of project registration. As confirmed by PP during interviews, for on-going stakeholder's communication, PP has maintained feedback/complaint register at the site office. Local stakeholders can anytime lodge their grievances if any in the register over the operational life time of the project. During current monitoring period no grievance was received. Thus, assessment team is of the opinion that the ongoing stakeholder mechanism is adequate and appropriate.

4.3 AFOLU-Specific Safeguards

For non-AFOLU projects, this section is not required.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

The project activity has been monitored as per the monitoring plan mentioned in registered PD/1.2/. All the deviations identified during the previous monitoring periods have been approved by VERRA. The verification team confirms that the flow of information (from data generation, aggregation, to recording, calculation and reporting for these parameters including the values) is as per the monitoring plan mentioned in PD/1.2/.

The assessment of each parameter identified in the project activity to calculate the GHG emission reductions have been done in the tables given below –

1. **Data/Parameter, Unit** Net Electricity supplied to the grid by the project activity during the year y (**$EG_{PJ,y}$/$EG_{facility,y}$**) inMWh

<table>
<tr><td></td><td>Discussion and verification assessment</td></tr>
<tr><td>Purpose of data</td><td>Baseline emissions</td></tr>
<tr><td>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</td><td>The quantity of net electricity generation supplied by the project plant to the grid are monitored from the bi-directional energy meter of accuracy class 0.2s.
Make - SECURE
Accuracy class by energy meter – 0.2s
Calibration Frequency – Once in 5 years
<table>
<tr><td></td><td></td><td>01-November-2020 to 10-November-2020</td><td>11-November-2020 to 31-July-2021</td></tr>
<tr><td>Feeder 1</td><td>Main Meter</td><td>HPU06260</td><td>HPU 06213</td></tr>
</table>
</td></tr>
</table>

		(Main-1)		
		Check Meter (Check-1)	HPU06261	HPU 06214
	Feeder 2	Main Meter (Main-2)	HPU06262	HPU 06215
		Check Meter (Check-2)	HPU06263	HPU06216

Meter calibration details:

Serial No.	Date of calibration	Validity till
HPU06260	05-December-2017	04-December-2022
HPU06261	05-December-2017	04-December-2022
HPU06262	06-December-2017	05-December-2022
HPU06263	06-December-2017	05-December-2022
HPU 06213	20-December-2016	19-December-2021
HPU06214	20-December-2016	19-December-2021
HPU06215	20-December-2016	19-December-2021
HPU06216	20-December-2016	19-December-2021

Measuring/Reading/ Recording frequency	Continuous monitoring of electricity generation and import, monthly recording of net electricity export (Joint Meter Reading Reports)/8/
Data collection (from data generation, aggregation, to recording, calculation and reporting)	At the end of each month, the data from the monthly meter readings as provided in Joint Meter Reading Report/8/, will be added up to obtain the total monitoring period net electricity generation. The revised PDD/1.2/ states that the calibration frequency of the equipment should as per the manufacturer specification i.e., once in five years. However, there is no delay in calibration has been observed as the calibration does not cover the present monitoring period. Therefore, it was accepted by the assessment team.
Verified value	722,315.23MWh
Cross checks	The verified values were crosschecked from the monthly invoices raised to SEB/7/. The values in Joint Meter reading reports/8/ and Invoices raised to SEB /7/are same.
QA/QC procedures applied	The necessary QA/QC procedures are in place and the data management system is effective and reliable.Thetechnical

	details of the meters are specified in the MR/4/ are found consistent with calibration certificates/6/.

The above-mentioned parameter was measured in accordance with the approved revised PDD/9/ and monitoring plan of the applied methodology/11/ as *ex-post*. The following parameters were directly taken from the approved revised PDD/9/ to calculate the emission reduction as *ex-ante* fixed:

a) **EF $_{Grid, CM,y}$**: The parameter is CO2 emission factor of the grid. The value of the parameter is 0.9273 as per the registered PD/1.2/.

GHG Calculations:

The calculation of emission reduction has been done in accordance to the applied methodology/11/. As per the applied methodology, the values of project emission and leakages are considered as zero for the project activity. The equation used for calculation of baseline emission is given below:

Baseline emissions are calculated as follows:

$$BEy = EG_{PJ,y} X EF_{grid,CM,y}$$

Where,

BE_y = Baseline Emissions (tCO_2/year)

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project activity in year y (MWh/year)

$EF_{grid, CM, y}$ = Baseline Emission Factor (Combined margin CO_2 emission factor for grid)

Therefore, the baseline emissions for Year 2020 (from 1-November- 2020 till 31- December 2020)

= 79,963.83MWh * 0 .9273 tCO2/MWh

= 74,150tCO_2e (Round down Value)

Therefore, the baseline emissions for Year 2021 (from 01-January 2021 till 31-July- 2021)

= 642351.40MWh * 0 .9273 tCO2/MWh

= 595652tCO_2e (Round down Value)

The Total baseline Emissions = 74150+ 595652= 669,802tCO_2e

Project emissions are calculated as follows:

As per para 38 of ACM0002 Version 17.0, for all renewable energy power generation project activities, emissions due to the use of fossil fuels for the backup generator can be neglected. It has been clearly shown by the PP in the MR/4/ that the power density of the project activity is 909 W/m^2, which is greater than 10W/m^2. Therefore, as per ACM0002 it can be taken as zero. This consideration was found to be in line with the applied methodology ACM0002 version 17/14/.

Leakages have been considered as zero for the project activity as per the applied methodology/14/.

Therefore,

Net Emission reductions = Baseline emissions - Project emissions – Leakage

$$= 669{,}802 - 0 - 0 = 669{,}802\ tCO_2e$$

The verification team confirms that appropriate methods and formulae for calculating baseline emissions have been followed. The assumptions, emission factors and default values that were applied in the calculations are justified. All the data were made available and have monitored as per required monitoring frequency. The means of verification for the values of parameters, used for baseline emission calculation, is described above.

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

The project activity under consideration consists of a well-defined management structure which ensures the quality of data monitored. The project monitoring system and reporting procedure are well managed by State Electricity Board. The project facility has a dedicated team comprising of the members having vast standing experience in the said field of operations and the roles and responsibilities towards the project operation and management are well structured. The project activity ensures the data acquisition and data processing system in two parallel ways, one is automatically online registering procedure through online data logging and another is the manual logging procedure in the log book. The project activity employs trained personnel at project site as per the operational responsibility to monitor and archive data.

All the parameters used for the determination of the Emission Reductions are discussed in previous section of this report. All the data recorded are in compliance with the monitoring plan. During the interview with onsite personnel's the assessment team interviewed employees from all the departments for understanding the entire data flow system and ensures the robustness of the data corroboration procedure maintained in the SEB.

VVB verification team has verified that the actual VER is about 26.1% lower than the estimated VER. Furthermore, verification team has confirm that this variation is majorly due to the variations in water flow which is mainly dependent rainfall and other parameters including grid availability – these factors are not in the control of project proponent. Hence, variation in VER is accepted by VVB verification team.

The emission reduction calculation for the project activity is estimated based on the electricity supplied by the TG sets installed at site. Monthly values of electricity generated inserted in the ER sheet was verified with the Joint Meter Reading Report/8/ and Invoices provided by the project proponent/7/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors. Therefore, the assessment team confirms that the emission reductions are free from any omissions, misstatement and material errors.

4.6 Non-Permanence Risk Analysis

Not Applicable as this section is not applicable for non-AFOLU projects.

5 VERIFICATION CONCLUSION

LGAI Technological Center, S.A. (also referred to as Applus+ Certification), contracted by JSW Hydro Energy Limited, has performed the independent verification of the emission reductions for the VCS project activity (VCS ID- 92) "300MW Hydropower project by JHPL" in India for the monitoring period 01-November-2020 to 31-July-2021 as reported in the Monitoring Report Version 02.0 dated 02- September-2021/4/. The JHPL is responsible for the collection of data in accordance with the monitoring plan and responsible for the reporting of GHG emissions reductions from the project activity.

It is our responsibility to express an independent verification statement on the reported GHG emission reductions from the project activity

Applus+ Certification commenced the verification on the basis of the baseline and monitoring methodology ACM0002 version 17/14/, the monitoring plan contained in the approved VCSPD/1.2/ and VCS guidelines version 4.0, Monitoring Report Version 02.0 dated 02-September-2021/4/as per the process described under Section 2 of this report.

Applus+ Certification verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. Applus+ Certification planned and performed the verification by obtaining evidence and other information and explanations that Applus+ Certification considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion the GHG emissions reductions reported for the project activity for the period 01-November-2020 to 31-July-2021 are fairly stated in the Monitoring Report Version 02.0 dated 02-September-2021/4/. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology ACM0002 version 17/14/, and the VCS standard 4.1.

Verification period:From01-November-2020 to 31-July-2021 (including both days)

Verified GHG emission reductions and removals in the above verification period:

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
Year 2020 (from 01-11-2020 to 31-12-2020)	74,150	0	0	74,150
Year 2021 (from 01-01-2021 to	595,652	0	0	595,652

31-07-2021)				
Total	**669,802**	**0**	**0**	**669,802**

APPENDIX 1: DOCUMENT REFERENCES

S.No	Title of Document				Version	Date
1	Registered VCS-PD				01	28-02-2014
	Approved latest VCS-PD for RCP				02	21-03-2018
2	VCS Verification Report for previous monitoring period from 01/01/2018 to 31/10/2020				2.0	19-12-2020
3.	VCS Monitoring Report (Draft)				01	24-08-2021
4.	VCS Monitoring Report (Final)				02	02-09-2021
5.	ER spread sheet (corresponding to the final monitoring report)				02	10-09-2021
6	Certificates of Calibration for all the meters belongs to project activity					
6.1	Feeder 1	Main Meter (Main-1)	HPU06260 (Installed from 01-November-2020 to 10-Npvember-2020)	HPU 06213 (Installed from 11-November-2020 to 31-July-2021)	-	05-12-2017 06-12-2017 20-12-2016
		Check Meter (Check-1)	HPU06261 (Installed from 01-November-2020 to 10-Npvember-2020)	HPU 06214 (Installed from 11-November-2020 to 31-July-2021)		
6.2	Feeder 2	Main Meter (Main-2)	HPU06262 (Installed from 01-November-2020 to 10-Npvember-2020)	HPU 06215 (Installed from 11-November-2020 to 31-July-2021)	-	05-12-2017 06-12-2017 20-12-2016
		Check Meter (Check-2)	HPU06263 (Installed from 01-November-2020 to 10-Npvember-2020)	HPU06216 (Installed from 11-November-2020 to 31-July-2021)		
7.	Invoices addressed to State Electricity Board (SEB) for this monitoring period				-	01-11-2020 to 31-07-2021
8.	Joint Monthly Meter Readings for this monitoring period				-	

S.No	Title of Document	Version	Date
9.	Commissioning certificate of Project activity	-	Unit I commissioned on 24/05/2003, followed by Unit II on 29/05/2003 and Unit III on 08/06/2003
10.	• Power Purchase Agreement • Subsequent amendment in PPA	-	04/06/1997 28/02/2003
11.	Environmental Clearance by MoEF GOI- No J-12011/j/87-IA-I d for the project activity Transfer of EC from JIL to JHPL- No J-13011/j/87-IA-I	-	17-12-1993 16-10-1996
12.	JHPL project Layout plan	-	-
13.	VCS webpage for the project, VCS ID 92; https://registry.verra.org/app/projectDetail/VCS/92	-	-
14.	"Consolidated baseline methodology for grid-connected electricity generation from renewable sources", ACM0002	17	03-06-2011
15.	VCS Standard	4.1	Issued:19-09-2019 Updated: 22-04-2021
16.	VCS Program Guide	4.0	19-09-2019
17.	Latest photographs of major project equipment's installed at site(i.e. Turbine, generators, energy meters, weir intake, penstock, tailrace etc.)	-	28-08-2021
18.	CDM Project Standard for Project activity	02.0	29-11-2018
19.	CDM Validation and Verification Standard for Project activity	02.0	29-11-2018
20.	JHPL Self Declaration Letter	-	02-09-2021

APPENDIX 2: ABBREVIATIONS

Abbreviations	Full texts
CAR	Corrective Action Request
CDM PCP	Clean Development Mechanism Project Cycle Procedure
CDM PS	Clean Development Mechanism Project Standard
CDM VVS	Clean Development Mechanism Validation and Verification Standard
EB	Executive Board
EF	Emission Factor
EPC	Engineering ,Procurement and Construction
ER	Emission Reductions
CEA	Central Electricity Authority
CER	Certified Emission Reduction
CR	Clarification Request
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
GOI	Government of India
IPCC	Intergovernmental Panel on Climate Change
MGR	Monthly Generation Reports
MP	Monitoring Plan
MR	Monitoring Report
MWh	Megawatt hour
PD	Project Description
PP	Project Proponent
PS	Project Standard
TR	Technical Review
UNFCCC	United Nations Framework Convention on Climate Change
VVB	Validation and Verification Body
VVS	Validation and Verification Standard

APPENDIX 3: FINDINGS OVERVIEW

Findings Overview Summary

Type	CAR	CL	FAR
Total Number raised	06	02	00

Remaining FAR from validation and/or previous verification

~~FAR ID~~	~~N/A~~	~~Section no.~~	~~N/A~~	~~Date:N/A~~
~~Description of FAR~~				
~~N/A~~				
~~Project participant response~~				~~Date:N/A~~
~~N/A~~				
~~Documentation provided by project participant~~				
~~N/A~~				
~~VVB assessment~~				~~Date:N/A~~
N/A				

Table 1. CR from this verification

CL ID	01	Section no.	MR	Date :30/08/2021
Description of CL				
PP to submit documentary evidence for change in ownership to JHPL. The PP is requested to provide declaration document pertaining to section 1.10 of VCS MR version 01				
Project participant response				Date :02/09/2021
Evidence for change in ownership has been provided to the VVB PP has provided declaration in accordance with section 1.10 of VCS MR to avoid double accounting of GHG emission reductions				
Documentation provided by project participant				
1. Documentary evidence for change in project ownership 2. Declaration from PP to avoid double accounting of GHG emission reductions				
DOE assessment				Date: 09/09/2021

1. Evidence has not been found for ownership in last submission to assessment team. **Hence issue is not closed.** 2. Declaration letter date 07/09/2021 and found in line with the requirement. Hence Point is closed
Project participant response **Date :10/09/2021**
Evidence for change in ownership (previous owner declaration and communication agreement to VERRA) has been provided to VVB. Both are available in VERRA project portal https://registry.verra.org/app/projectDetail/VCS/92
Documentation provided by project participant
Transfer Letter and Communication Agreement
DOE assessment **Date: 13/09/2021**
Letter has been provided by PP. Hence CL#1 is closed

CL ID	02	**Section no.**	ER Sheet	**Date : 30/08/2021**
Description of CL				
PP has submitted the MR Version 2 dated 30-November- 2020, however, the signed contract is for period of **01/11/2020** to **31/07/2021,** PP need to clarify the same.				
Project participant response				**Date :02/09/2021**
Correct VCS MR dated 24-August-2021 has been submitted to VVB (monitoring period of **01/11/2020** to **31/07/2021)**and later the MR (Version 02) has been updated according to the DVR points.				
Documentation provided by project participant				
VCS MR v02				
DOE assessment				**Date:09/09/2021**
PP has updated the MR with required correction. Hence CL#2 is closed.				

Table 2. CAR from this verification

CAR ID	01	Section no.	B.1	Date 30/08/2021
Description of CAR				
Project participant mentioned the details regarding the technologies used in the project activity but to verify the same, no such document has been provided by the PP (i.e., technical equipment's details, Commissioning certificates, power purchase agreements, O&M agreement etc.) is provided to DOE team. Corrective action is sought for the same. PP is requested to provide the above documents to assessment team.				
Project participant response				**Date :02/09/2021**
Commissioning certificate, PPA, technical equipment details provided to VVB				
Documentation provided by project participant				
1. Commissioning certificate 2. PPA 3. Technical equipment details				
DOE assessment				**Date:09/09/2021**
PP has provided the required documents. However, the technical details has not been found in last submission by PP. Hence issue is not closed.				
Project participant response				**Date :10/09/2021**
Technical details of turbine provided to VVB				
Documentation provided by project participant				
Technical specifications of Turbine				
DOE assessment				**Date: 13/09/2021**
PP has provided the technical specification of turbine. Hence CAR #01 is closed.				

CAR ID	02	Section no.	E.3	Date :30/08/2021
Description of CAR				
The breakdown details of the power plant are provided in the MR. Further, supporting document regarding the breakdown details are not provided to the assessment team. PP is requested to provide the above documents to assessment team.				
Project participant response				**Date :02/09/2021**
Supporting document for plant breakdown have been provided to VVB				
Documentation provided by project participant				
Logbook for plant breakdown				

DOE assessment	Date:09/09/2021
Breakdown details is provided in appendix 2 of the updated MR. Hence CAR#2 is closed.	

CAR ID	03	Section no.	D.2	Date :30/08/2021
Description of CAR				
The values as mentioned in the MR are reserved till supporting is submitted. Thus, PP is requested to submit JMR&Invoicesfor the complete monitoring period. PP is requested to provide the above documents to assessment team.				
Project participant response				Date :02/09/2021
JMRs and invoices have been provided to VVB				
Documentation provided by project participant				
1. Monthly Daily Performance Reports (DPRs) 2. Energy bills				
DOE assessment				Date:09/09/2021
PP has provided the JMR and Invoices. Hence CAR#3 is closed.				

CAR ID	04	Section no.	D.2	Date :30/08/2021
Description of CAR				
The details of monitoring meters and its calibration are provided in the MR. Moreover, Calibration certificates for the complete monitoring period are also missing. As Actual ER sheet is not submitted the delayed calibrated period (if any) cannot be confirmed. Corrective action is raised for the same.				
Project participant response				Date :02/09/2021
Calibration reports have been provided to VVB. Actual ER sheet has been provided to VVB; as calibration has been down in accordance with QA/QC procedures, there has not been any delayed calibration				
Documentation provided by project participant				
1. Calibration reports of meters 2. Ex-post ER sheet				
DOE assessment				Date:09/09/2021
PP has provided the ER sheet but some values in “ER Summery”tab are not showing, error showing in the provided ER sheet. Hence issue is not closed.				
Project participant response				Date :10/09/2021

Revised ER calculation sheet provided
Documentation provided by project participant
Ex-post ER sheet v02
DOE assessment | **Date: 13/09/2021**
PP has submitted the revised ER sheet and same has been acceptable to the verification team. Hence CAR#4 is closed

CAR ID	05	**Section no.**	D.2 & ER Sheet	**Date :30/08/2021**
Description of CAR				
ER sheet is not provided to the auditor. PP is requested to provide the same also provide the evidence to verify the values.				
Project participant response				**Date :02/09/2021**
ER sheet has been provided to VVB				
Documentation provided by project participant				
Ex-post ER sheet				
DOE assessment				**Date:09/09/2021**
PP has provided the ER sheet but some values in “ER Summery”tab are not showing, error showing in the provided ER sheet. Hence issue is not closed.				
Project participant response				**Date : 10/09/2021**
Revised ER calculation sheet has been provided to VVB				
Documentation provided by project participant				
Ex-post ER sheet v02				
DOE assessment				**Date: 13/010/2021**
PP has submitted the revised ER sheet and same has been acceptable to the verification team. Hence CAR#5 is closed				

CAR ID	06	**Section no.**	D.2	**Date :30/08/2021**
Description of CAR				

PP is requested to provide the status of on going input mechanism for stakeholders as a part of any grievance mechanism.	
Project participant response	**Date :02/09/2021**
Ongoing local stakeholder consultation has been provided in section 2.2 of VCS MR In support of local stakeholder consultations, grievance register has been provided to VVB	
Documentation provided by project participant	
1. VCS MR v02 2. Grievance register	
DOE assessment	**Date:09/09/2021**
Grievance register has not found in last submission by PP. Hence issue is not closed.	
Project participant response	**Date :10/09/2021**
Grievance register (sample) provided to VVB	
Documentation provided by project participant	
Grievance register	
DOE assessment	**Date: 13/09/2021**
Grievance register has been submitted by the PP. Hence CAR#06 is closed.	

Table 3. FAR from this verification

~~**FAR ID**~~	~~N/A~~	~~**Section No.**~~	~~N/A~~	~~**Date:**N/A~~
~~**Description of FAR**~~				
~~N/A~~				
~~**Project participant response**~~				~~**Date:**N/A~~
~~N/A~~				
~~**Documentation provided by project participant**~~				
~~N/A~~				
VVB assessment				**Date:**N/A
N/A				

APPENDIX 2: COMPETENCY STATEMENT

According to the sectoral scope / technical area and experience in the sectoral or national business environment, Applus+ Certification has composed a project assessment team in accordance with the appointment rules in the internal Quality Management System of Applus+ Certification.

The composition of audit team shall be approved by the Applus+ Certification ensuring that the required skills are covered by the team.

The four qualification levels for team members that are assigned by formal appointment rules are as presented below:

- Lead Auditor (LA).
- Auditor (A) / Auditor in Training (AiT).
- Technical Expert (TE).
- Technical Reviewer (TR).

The sectoral scope / technical area knowledge linked to the applied methodology/ies shall be covered by the assessment team.

Name	Qualification	Coverage of scope	Coverage of technical Area	Financial aspect	Host country Experience	Attendance to the Assessment (remote)
VivekAhirwar	Lead Auditor (LA)	Yes (1)	Yes (1.2)	N/A	Yes	Yes
VivekAhirwar	Technical Expert (TE)	Yes (1)	Yes (1.2)	N/A	Yes	Yes
Simon Shen	Technical Reviewer (TR)	Yes (1)	Yes (1.2)	N/A	N/A	N/A

The curricula vitae of the VVB's team members are provided below:

Vivek Kumar Ahirwar is a BEE-Certified Energy Auditor by Govt of India with over eight years of relevant experience in energy efficiency, energy audit, thermal and electrical energy generation technology from renewable source and energy conservation in energy intensive industries, designated consumers and commercial buildings, implementation of energy conservation building codes, research, process and green building projects. He is a certified lead auditor for ISO 14001 EMS and 14064. He has experience under various categories of projects stating from renewable to waste to supercritical projects and WCD. He has successfully audited more than 100 GHG (CDM/VCS/GS) projects in different states across the India. He has done Mater in Technology (Energy Management) from a premier institute, School of Energy & Environmental Studies, DAVV, Indore (M.P.), India and Bachelor of Engineering (Mechanical Engineering) from Govt. Engineering college, Rewa, RGPV, India.

Simon Shen (master degree in thermal energy engineering, bachelor degree in environmental engineering) is a lead auditor appointed by Applus+ certification for the GHG project assessment. He is based in Shanghai. He has several years of work experience in environmental protection field. Before he joined Applus+ certification, he had been worked for TÜV SÜD as a GHG validator/verifier and ISO 9001/14001 lead auditor for 3.5 years.