



VERIFICATION REPORT “KISHANGANGA HYDROELECTRIC PROJECT”



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Project Title	Kishanganga Hydroelectric Project
Version	2.2
Report ID	BELL_VCS_VER_15922

Report Title	Verification Report for “Kishanganga Hydroelectric Project”
Client	NHPC Ltd
Pages	43
Date of Issue	17-05-2024
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Summary:

NHPC Ltd has commissioned the LGAI Technological Center, S.A. (Applus+ Certification) to carry out the verification of the project “Kishanganga Hydroelectric Project” (VCS ID:1891) with regard to the relevant requirements of [VCS Program Guide, v4.4](#) and [VCS standard, version 4.5^{7/}](#). The project is located on Kishanganga River, a tributary of river Jhelum in Bandipora District of Jammu & Kashmir state of India. The hydel energy generated from the hydel power plant is evacuated to the State Grid System which is part of NEWNE Grid^{1/}. An undertaking has been submitted by PP for double counting would never happens with the any other GHG program. During the current monitoring period, project activity was operational during the current monitoring period and there were no major breakdowns (except the one stated under Appendix-I of MR).

The monitoring period covered in the verification is 01-06-2019 to 31-03-2021 (inclusive both days). During the current verification period, the project activity has supplied 1,728,176.9194 MWh of electricity, and thus contributing to the GHG reductions of 1,577,127 tCO₂e^{3/4/}. A risk-based approach has been followed to perform this verification activity. In the course of verification, 05 Corrective Action requests (CAR), 01 Clarification Requests (CLs) and 00 Forward action requests (FARs) were raised and successfully closed. The review of the monitoring report^{3/} and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews^{23/} and PP have provided VVB with sufficient evidence to verify the fulfilment of the stated criteria of VCS.

The objective of this verification activity is to have an independent third party for the assessment of the project design, monitoring report and Final Verification Report and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular;

- the project's baseline is assessed against “ACM0002: Grid-connected electricity generation from renewable sources — Version 19”^{6/}
- the project's monitoring plan is assessed against “ACM0002: Grid-connected electricity generation from renewable sources — Version 19”^{6/}

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 Verified Carbon Units (VCUs).

The assessment team has employed a risk-based approach to assess the completeness and accuracy of the claims and conservativeness of the assumptions in the MR^{3/}. The main focus of the assessment team is to identify the significant risks for the project implementation and the generation of VCU.

This project has supplied 1,728,176.9194 MWh of electricity to the grid and achieved 1,577,127 tCO₂e emission reductions during the current monitoring period i.e., 01-06-2019 to 31-03-2021.

The verification has been planned and organized to achieve a Reasonable Level of assurance as per the requirement of VCS. No sampling procedure applied for remote assessment or document verifications. The entire documents checked/plant verification conducted to arrive at positive verification conclusions.

CONTENTS

1	Introduction	6
1.1	Objective	6
1.2	Scope and Criteria	6
1.3	Level of Assurance.....	7
1.4	Summary Description of the Project	7
2	Verification Process	9
2.1	Method and Criteria.....	9
2.2	Document Review	11
2.3	Interviews	12
2.4	Site Visits	13
2.5	Resolution of Findings	13
2.5.1	Forward Action Requests	14
2.6	Eligibility for Validation Activities	14
3	Validation Findings	15
3.1	Participation under Other GHG Programs	15
3.2	Methodology Deviations.....	15
3.3	Project Description Deviations.....	15
3.4	Grouped Project	16
4	Verification Findings	17
4.1	Project Implementation Status	17
4.2	Safeguards	18
4.2.1	No Net Harm	18
4.2.2	Local Stakeholder Consultation	18
4.3	AFOLU-Specific Safeguards	18
4.4	Accuracy of GHG Emission Reduction and Removal Calculations	19
4.5	Quality of Evidence to Determine GHG Emission Reductions and Removals	22
4.6	Non-Permanence Risk Analysis.....	28
5	VERIFICATION opinion	29
	APPENDIX 1: References	31

APPENDIX 2: VERIFICATION FINDINGS	33
APPENDIX 3: Competency statement	38
APPENDIX 4: ABBREVIATIONS	40
APPENDIX 5: Calibration DETAILS	42
APPENDIX 6: DECLARATION by PP	43

1 INTRODUCTION

1.1 Objective

Applus+ Certification has been appointed to perform the verification of the project titled “Kishanganga Hydroelectric Project” that is managed by NHPC Limited under VCS Program Guide, v4.4 and VCS standard, version 4.5^{7/}. The verification is the independent review and ex post determination by VVB of the monitored reductions in GHG emissions that have occurred as a result of the registered VCS project activity during a defined monitoring period.

During the verification the VVB perform, the assessment of the project design, monitoring report and final verification report and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular;

- the project's baseline is assessed against “ACM0002: Grid-connected electricity generation from renewable sources — Version 19”^{6/}
- the project's monitoring plan is assessed against “ACM0002: Grid-connected electricity generation from renewable sources — Version 19”^{6/}
- the project's compliance with the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1^{21/}, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS Program Guide, v4.4 and VCS standard, version 4.5^{7/}
- CDM Validation and Verification Standard for project activities, version 03.0^{24/}
- CDM Project Standard for project activities, version 03.0^{25/}
- 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 estimated verified emission reductions (VERs).

1.2 Scope and Criteria

The scope is defined as an independent and objective review of the Monitoring report (MR) prepared as per the registered Joint Project Description & Monitoring Report^{1/} and registered approved methodology ACM0002: Grid-connected electricity generation from renewable sources — Version 19^{6/}.

The MR is reviewed against the criteria stated in Article 12 of the Kyoto Protocol^{21/}, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board, and guideline v4.4 and VCS standard, version 4.5^{7/}. and, including the approved baseline and monitoring methodology ACM0002: Grid-connected electricity generation from renewable sources — Version 19^{6/}. The verification was based on the requirements in the VCS Program Guide, v4.4 and VCS standard, version 4.5^{7/}, CDM validation and verification standard for project activities, Version 03.0^{24/} and CDM Project Standard for project activities, version 03.0^{25/}.

The verification is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the Monitoring Report. In line with VCS Standard, version 4.5 requirements (para 3.10, 3.10.2, 4.1.10,

4.1.13) and Guidelines for Application of materiality, version 02, the verification team has conducted a complete verification of all the information presented in the monitoring report and data monitored as presented in the emission reduction calculation spread sheet. It follows the paper trail back to the raw data such as meter reading records and (captured under the deviation settlement account statements). There are no material errors, overestimation of ER, omission, or misstatement. The verification team has reviewed all the documents like commissioning certificates^{/9/}, deviation settlement account statements^{/10/}, calibration certificates^{/13/}, etc.

1.3 Level of Assurance

The verification has been planned and organized to achieve a Reasonable Level of assurance as per the requirement of VCS. The entire documents checked/Power plant verification conducted to arrive at positive verification conclusions.

In our opinion the GHG emissions reductions reported for the project activity for the period 01-06-2019 to 31-03-2021 are fairly stated in the Monitoring Report Version 5.2 dated 17-05-2024^{/3/}. The GHG emission reductions were calculated correctly based on the approved baseline and monitoring methodology ACM0002, Version 19^{/6/}, and the VCS standard. For more information, please refer to section 4 of this Verification Report.

1.4 Summary Description of the Project

The project activity is named as Kishanganga Hydroelectric Project (3x110MW). It is Run of the River with pondage scheme (ROR with pondage), Greenfield Hydro Power Project located in the Bandipora District of Jammu & Kashmir state of India^{/4/}, envisaging diversion of water of Kishanganga (a tributary of river Jhelum) into an underground power house and discharging the tail race water into Wular Lake.

It is a Concrete Faced Rockfill Dam 37 m high (above deepest river bed level). The underground power house is (113m x 21.3m x 46.5m) with aggregated installed capacity of 330 MW encompassing 3 Pelton turbines and each of 110 MW and designed to operate under the net rated head of 646 m with potential to generate 1712.96 MU in a 90% dependable year with 95% machine availability.

The energy from the hydropower plant is a cleaner form of energy and displaces electricity that would otherwise be generated by fossil fuel dominated grid. The commissioning details of the project are as follows^{/9/}:

Unit No	Project Name	Capacity	Commissioning date
I	Kishanganga Hydroelectric Project	110 MW	13-03-2018
II		110 MW	21-03-2018
III		110 MW	30-03-2018

The commissioning details were already verified from the commissioning certificate^{9/} during the Joint Validation and Verification^{2/}. The commissioning date of the first turbine has been considered the start date of the project crediting period. The project activity contributes to sustainable development through infrastructure development and providing job opportunities.

Assessment concludes the following:

- a) The capacity of the project activity was found to be in compliance with registered Joint Project Description & Monitoring Report^{1/}.
- b) VVB has conducted the desk review and remote audit to confirm the implementation status of the project.
- c) The commissioning date of the project activity was found to be accurately and consistently recorded.
- d) The actual operation of project activity was found to be in compliance with the flow diagram provided in registered Joint Project Description & Monitoring Report^{1/}.
- e) There was no increase in emission reduction from estimates made in registered Joint Project Description & Monitoring Report^{1/}, therefore no additional explanation was sought from PP regarding the same.
- f) The project is only registered under VCS program and is not opting for any other GHG programs.

The project has undergone the first verification for the monitoring period 13-03-2018 (project commissioning date) to 31-05-2019. This is the second verification for the project, and the monitoring period for the same is 01-06-2019 to 31-03-2021. 1,728,176.9194 MWh of electricity was exported to grid during the monitoring period and the total emission reductions achieved is 1,577,127 tCO_{2e}.

2 VERIFICATION PROCESS

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

2.1 Method and Criteria

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

The Project was verified against the latest requirements and guidance set out in VCS and CDM standards. No sampling approach has been applied by the verification team as all the monthly reported figures in the MR/^{3/} and the ER sheet/^{4/} were checked from the actual records.

Verification Process:

The project assessment is based on the CDM Validation and Verification Standard for project activities, version 03.0, and VCS Program Guide, v4.4 and VCS standard, version 4.5/^{7/} and is conducted using standard auditing techniques to assess the correctness of the information provided by the project participants. Before the assessment begins, members of the team covering the technical scope(s), sectoral scope(s), and relevant host country experience for evaluating the VCS project activity are appointed.

Once the project is received by the assessment team, the members of the assessment team carried out:

- i. A desk review of the Monitoring Report/^{3/} against the registered Joint Project Description & Monitoring Report/^{1/};
- ii. Follow-up interviews with project participant;
- iii. The resolution of outstanding issues and the issuance of the final verification report and opinion.

The prepared verification report and other supporting documents then undergo an internal quality control at the HQ before being submitted to the VCS executive board.

In order to ensure transparency, assumptions must be clear and stated explicitly and background material must also be referenced. Applus+ Certification has developed a specific checklist customized for the project. The checklist demonstrates, in a transparent manner, the project criteria (requirements), discussion on each criterion by the assessment team, and the results from verifying the identified criteria.

Appointment of the assessment team

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 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).
- Any of the above-mentioned roles in training (iT)

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

Name	Role	SS Coverage	TA Coverage	Financial Aspect	Host Country Experience
Mr. Srikanth Meesa	LA/TE	YES	YES	NA	YES
Mr. Simon Shen	TR	YES	YES	NA	No

The complete list of CVs is included as Appendix 3 of this report.

Document Review

The Monitoring Report draft version was submitted by the PP was reviewed against the approved methodology, registered Joint Project Description & Monitoring Report^{1/}, Joint Validation & Verification Report^{2/} and other relevant criteria to verify the correctness, credibility, and interpretation of the presented information. Furthermore, a cross-check between information provided and information from other sources has been done. A complete list of all documents and evidence material reviewed is included in this report below in Appendix 1.

No sampling is used as the VVB has reviewed all the documents like Commissioning Certificates^{9/}, Deviation Statements^{10/}, etc.

Follow-up Interviews

A remote audit was conducted by Applus+ Certification who performed interviews^{23/}, telephone conferences with project stakeholders to confirm selected information and to resolve issues identified in the document review. The detail is provided in this report in the below sections.

Resolution of Clarification and Corrective Action Request

The objective of this phase of the Verification was to resolve the requests for corrective actions and clarification and any other outstanding issues which need to be clarified for Applus+ Certification positive conclusion on the Monitoring Report^{3/}. The Corrective Action Requests and Clarification Requests raised by Applus+ Certification were resolved during communications between the Client and Applus+ Certification to guarantee the transparency of the verification process, the concerns raised and responses given are summarized below in the Appendix 2.

The final Monitoring Report Version 5.2 dated 17-05-2024^{3/}, serves as the basis for the final assessment presented. Additional changes to the project during the verification process are not considered to be significant with respect to the main VCS objectives. The two VCS main objectives are

the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Internal Quality Control

As final step of a verification of the final documentation including the verification report and the checklist have to undergo an internal quality control by the technical review committee. Once approved by the Technical Review Team, each report has to be finally approved by the authorized personnel of the VVB (either the Technical Manager or other authority in case the Technical Manager is part of the Validation and/or Verification-Certification (VVC) Team for the project.

After confirmation of the project owners the positive verification opinion and relevant documents are submitted to the VCS secretariat through the VCS web-platform.

2.2 Document Review

The verification is performed primarily as a document review of the documents submitted at various stages of assessments. The review is performed by assessment team using dedicated protocols. The assessment team cross checks the information provided in the documents (Joint Project Description & Monitoring Report/^{1/}, MR/^{3/}, ER spread sheet/^{4/}, Joint Validation & Verification Report/^{2/}) and information from sources other than those used, if available, and conducts independent background investigations. VVB conducted a desk review as under;

- a) A review of the data and information presented to verify their completeness.
- b) A review of the monitoring plan/^{1/}, the monitoring methodology/^{6/} including applicable tool(s) /^{6/} and, where applicable, the applied standardized baseline (not applicable to this project activity), paying particular attention to the frequency of measurements/^{1/}/^{10/}, the quality of metering equipment including calibration requirements/^{13/}, and the quality assurance and quality control procedures/^{1/}.
- c) An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

The details of the document reviewed has been provided in above Section 2.1 and complete list of references used during the verification process are listed in Appendix 1 of this report.

2.3 Interviews

VVB performed a remote audit and interviews on 09-12-2022 with project stakeholders to confirm selected information and to resolve issues identified in the document review. During the remote audit, the representatives of PP were interviewed.

Sr. No.	Name	Subject	Organization
1.	Dr. Avinash	Project implementation	GM, Environment
2.	Kumar Manish	Plant maintenance and operational data	Sr. Manager, Environment
3.	Mr. Chuotal Meena	Monitoring procedures	Group Sr. Manager, Mechanical
4.	Kanchan Kumar Thahoke	CSR activities	Group Sr. Manager, Industrial Enff
5.	Abhigna P	Emission reduction calculation, Queries on the MR	Consultant, CoreCarbonX

An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

The VVB has taken necessary measures for ensuring a reasonable level of assurance while conducting the Verification process, using standard auditing techniques and advanced communication solutions in order to be able to interview the relevant stakeholders and to cross-check the relevant documentation, implementation of the project activity and its design, monitoring performance, equipment in the project activity, etc. (all the evidences and processes of cross-check are detailed within this Verification Report).

The interviewed personnel and the scope and mean of interview are listed in above Section 2.3 of this Verification Report.

Technical details & metering/monitoring arrangement verified through remote audits/name plates and calibration certificates/^{13/} shared by PP. All the documents were cross checked to ensure conservative estimation of emission reduction.

During the remote audit, the PP representatives personal were interviewed about the implementation of the project activity. Several topics like the verification of commissioning date of project activity/^{9/}, performance of monitoring system, the generation, recording, and monitoring of the data and the error accountability were discussed. Various documents like the Deviation Settlement Account document/^{10/}, inspection of name plates through on-line tour during the remote audit, meter specifications, key technical specifications of major equipment like panel, consistency check between the serial number of installed meter and the calibration certificates/^{13/}, review of single line diagram, and allied metering system and bills etc. were verified to establish the current status and the implementation of the Project Activity.

2.4 Site Visits

As per section 4.1.12 of the [VCS standard, version 4.5](#)

A site visit that includes a visit to facilities and/or project areas shall be conducted at validation. Such a site visit shall be conducted at verification under the following circumstances:

1. The first verification of the project after validation;
2. Verification of project baseline reassessments;
3. Verifications that assess a project description deviation where the deviation impacts the applicability of the methodology, additionality, or the appropriateness of the baseline scenario.

It is to be noted that the project has undergone first verification for the following monitoring period: 13-03-2018 to 31-05-2019 (the site visit was carried out on 25-06-2019). Currently, the project is undergoing 2nd verification. Hence, as per the VERRA guidelines site visit is not mandatory for the 2nd verification of the project activity.

Based on the above, verification team has performed the remote audit and ensured that there is no risk to perform the audit and the audit criteria.

2.5 Resolution of Findings

The objective of this phase of the verification was to resolve the requests for corrective actions and clarification and any other outstanding issues which need to be clarified for Applus+ Certification's positive conclusion on the project design and Monitoring Report^{/3/}. The Corrective Action Requests and Clarification Requests raised by Applus+ Certification were resolved during communications between the Client and Applus+ Certification to guarantee the transparency of the validation process, the concerns raised and responses given are summarized below in the Appendix 2.

The final Monitoring Report Version 5.2 dated 17-05-2024^{/3/} serves as the basis for the final assessment presented. Additional changes to the project during the verification process are not considered to be significant with respect to the main VCS objectives. The two VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Project design document and Monitoring report	1	1	-
Description of project activity		2	
Application of selected baseline and monitoring methodology and selected standardized baseline			
Applicability of methodology and standardized baseline			
Deviation from methodology			
Clarification on applicability of methodology, tool and/or standardized baseline			
Project boundary			
Establishment and description of baseline scenario			
Demonstration of additionality			
Emission reductions			
Calibration details		1	
Monitoring plan		1	
No Net harm assessment			

Local stakeholder consultation			
Others (please specify)			
Total	01	05	-

The list of findings and their resolution is presented in Appendix 2 of this report.

2.5.1 Forward Action Requests

This is 2nd verification of the project activity. There were no FARs raised during the validation or previous verification.

2.6 Eligibility for Validation Activities

This section is not applicable for present verification as Applus+ Certification holds the accreditation to perform Validation and Verification Activities under the VCS <https://verra.org/validation-verification/lgai-technological-center-s-a-applus/> , and it holds the accreditation for validation/verification for the sectoral scope: “1. Energy (renewable/non-renewable)” (valid from 14-11-2011), to which the project belongs.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project activity has not participated under any other GHG program, apart from Verified Carbon Standard. PP will not claim benefits of carbon emission reduction credits achieved through this project activity under any other GHG programme for the crediting period claimed under VCS. Also, the project has not generated any other form of environmental credit and a declaration for the same has been submitted to the assessment team and the same is acceptable. This project activity is not a result of any binding limit of National/International bodies. The project is purely voluntary in nature. The project is also not participated in any other emission trading programs. Further, the project is not registered under the REC mechanism of India and the same is cross-checked at <https://recregistryindia.nic.in>. This was confirmed through a declaration submitted by the PP and hence accepted by the assessment team. Project Proponent has provided a declaration that the PP will not claim emission reduction from any other GHG program for the current monitoring period.

3.2 Methodology Deviations

The project activity used ACM0002: Grid-connected electricity generation from renewable sources -- Version 19/6/ which is as per the registered Joint Project Description & Monitoring Report/^{1/} and thus no deviation is sought regarding the methodology. The project complies with all the requirement of the methodology and thus deviation to the methodology is not a requirement for the present project activity.

3.3 Project Description Deviations

It is to be noted there were no project description deviations during the previous monitoring period.

PP has requested the following deviations under the current monitoring period:

Deviation
In section 4.3 of the registered PD, all meter details are provided. These meters are installed at the time of commissioning. In due course, three of these meters have been changed due to the meters being faulty. Thus, a deviation is requested to change the meter numbers of the locations KG-04, KG-07, and KG-11 from NR-3236-A, NR-3245-A, and NR-3291-A to WR-2169-A, WR-2167-A, and NR-3493-A respectively. The change of these meters does not affect the reading of energy generation. The meter at the location KG-07 is a main meter, the readings were taken from the check meter when the faulty meter was being replaced. The other two meters at locations KG-04 and KG-11 are Check meter and Standby Meter respectively. The readings from the main meters were taken while the faulty meters were being replaced. The meter reading hence will not be affected due to the change in meters.
Justification provided by the PP
The meter number NR-3291-A in the location number KG-11 was replaced with the meter NR-3493-A on 15/02/2020. The meter number NR-3236-A located in location number KG-04 was replaced with the meter WR-2169-A on 13/06/2022. The meter number NR-3245-A located in location number KG-07 was replaced with the meter WR-2167-A on 05/03/2022. Only one meter (located in KG-11) was changed in the current monitoring period. The rest two meters were changed in 2022 which does not cover the current monitoring period. A total of three energy meters were changed due to the meters being faulty. Since the meters are under the control of PGCIL, they have replaced the faulty meter with the new meter. The readings were taken from the check meter when the faulty meters were being replaced. As the new meter data has been found correct and in line with the previous readings, there is no impact on the baseline emissions of the Project.
Verification Team assessment
The deviation proposed by the PP was accepted by the VVB as there was change of three main energy meters during the current monitoring period and in 2022 i.e. the energy meters stated in the registered PD were replaced with new energy meters as the energy meters stated in the registered PD were found faulty. However, it is to be noted that there is no deviation in the energy monitoring as the energy generation data is continuously measured by the check meters inline with the registered PD. Further, it was assessed that there is no replacement of check meters. Based on the above, assessment team confirms that this project deviation does not impact the applicability of the methodology, additionality, or the appropriateness of the baseline scenario. Lastly, the Deviation is accepted as it will not lead to over-estimation of emission reductions.

3.4 Grouped Project

The project is not a grouped project activity. thus, section is not applicable for this project activity.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity is named as Kishanganga Hydroelectric Project (3x110MW). It is Run of the River with pondage scheme (ROR with pondage), Greenfield Hydro Power Project located in the Bandipora District of Jammu & Kashmir state of India, envisaging diversion of water of Kishanganga (a tributary of river Jhelum) into an underground power house and discharging the tail race water into Wular Lake.

It is a Concrete Faced Rockfill Dam 37 m high (above deepest river bed level). The underground power house is (113m x 21.3m x 46.5m) with aggregated installed capacity of 330 MW encompassing 3 Pelton turbines and each of 110 MW and designed to operate under the net rated head of 646 m with potential to generate 1712.96 MU in a 90% dependable year with 95% machine availability. The generated electricity is exported to the regional electricity grid as per the signed power purchase agreement^{/8/}.

The commissioning details of the project are as follows^{/10/}:

Unit No	Project Name	Capacity	Commissioning date
I	Kishanganga Hydroelectric Project	110 MW	13-03-2018
II		110 MW	21-03-2018
III		110 MW	30-03-2018

The commissioning details were already verified from the commissioning certificate^{/9/} during the Joint Validation and Verification^{/2/}. The commissioning date of the first turbine has been considered the start date of the project crediting period and the current monitoring period. The project activity contributes to sustainable development through infrastructure development and providing job opportunities.

Assessment concludes the following:

- The capacity of the project activity was found to be in compliance with registered Joint Project Description & Monitoring Report^{/1/}.
- VVB has conducted the desk review and remote audit to confirm the implementation status of the project^{/23/}.
- The commissioning date^{/9/} of the project activity was found to be accurately and consistently recorded.
- The monitoring plan in terms of the installed monitoring equipment and monitoring systems in line with the Joint Project Description & Monitoring Report^{/1/} in terms of compiling and analyzing the monitored data and parameters.
- The actual operation of project activity was found to be in compliance with the flow diagram provided in registered Joint Project Description & Monitoring Report^{/1/}.

- f) There was no increase in emission reduction from estimates made in registered Joint Project Description & Monitoring Report^{1/}, therefore no additional explanation was sought from PP regarding the same.
- g) The project is only registered under VCS program and is not opting for any other GHG programs.
- h) The project activity does not claim any other form of environmental credit, or has become eligible to do so since previous Joint Validation & Verification, also refer the undertaking by Project Developer under Appendix-5 of this report.
- i) The project has implemented the activities that result in the SDG contributions described in the monitoring report.
- j) The audit history table included under the MR is accurately reported.

Thus, based on above assessment, it is confirmed that the project has been implemented as described in the project description.

4.2 Safeguards

4.2.1 No Net Harm

There were no harms identified from the implementation of the project. It is confirmed that the project is a clean renewable energy project and did not result in any negative environmental or social economic impacts during this monitoring period. Also, the EIA of the project is performed by “The Environment and Pollution Control Division of Forest Department and the State Land Use and Environment Board which confirms that there are not adverse impacts on the Water, Land, Air and noise, biological environment as well as socio-economic environment (refer the Joint Project Description & Monitoring Report^{1/} (section 5.2 Environmental Impacts) and corresponding Joint Validation & Verification Report.

Also, no potential environment or social economic matter was found during the review and interviews with the project developer.

4.2.2 Local Stakeholder Consultation

As per the remote audit interviews^{23/}, the PP confirmed that there were no major issues which would affect the life of the local community or raise any environment related problems in the region by the implementation of the project activity were identified during the discussion with stakeholders. All the minor issues were addressed and also the concerned departments are keeping a tight vigil for assessing any changes likely that may take place. The VVB also confirmed during the interviews that there is interaction between PP and the local stakeholders on a regular basis. As per verified records (sample basis), the meeting with the local village panchayat were taking place on monthly basis and regular feedback is taken. No adverse comments /incidents were registered by the PP.

4.3 AFOLU-Specific Safeguards

For Non AFOLU projects, this section is not required.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the MR^{/3/}. The verification team has checked whether calculations of baseline GHG emissions, project GHG emissions and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the monitoring plan of the Joint Project Description & Monitoring Report^{/1/} and MR^{/3/}. Baseline emission: The baseline Emissions for power generation in the kWh produced by the renewable generating unit multiply by an emission coefficient (measured in kgCO_{2e}/kWh) calculated in a transparent and conservative manner as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the “Tool to calculate the emission factor for an electricity system (version 07.0.0). Formula Used: BE_{y,electricity} - baseline emissions in year y (tCO₂) EG_{PJY} – Quantity of electricity that has been displaced by the project activity (MWh) EF_{grid,CM,Y} – The grid CO₂ emission factor in year y (tCO₂/MWh) Ex-ante parameters: The baseline emission factors are taken ex-ante in line with the registered Joint Project Description & Monitoring Report^{/1/} as well as cross checked with section validation report and found correct. Combined margin CO₂ emission factor (EF_{grid,CM,y}) is equal to 0.9126 tCO₂/MWh. The calculation approach was in line with the Joint Project Description & Monitoring Report^{/1/}. Values of ex-ante parameters are as follows: EF_{grid,OM,y} = 0.9610 tCO₂/MWh “Tool to calculate the emission factor for an electricity system, version 07.0.0” as 3-year generation weighted average using data for the years 2015-16, 2016-17 & 2017-18. The data are obtained from “CO₂ Baseline Database for Indian Power Sector” Version 14.0 published by the Central Electricity Authority, Ministry of Power, Government of India. Verification team checked the Joint Project Description & Monitoring Report^{/1/} and confirms that value reported in MR and ER is correct.
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EF_{grid,BM,y} = 0.8644 tCO₂/MWh (Calculated as per “Tool to calculate the emission factor for an electricity system, version 07.0.0” for the year 2017-18. The data are obtained from “CO₂ Baseline Database for Indian Power Sector” Version 14.0, published by the Central Electricity Authority, Ministry of Power, Government of India. Verification team checked the Joint Project Description & Monitoring Report^{/1/} and confirms that value reported in MR and ER is correct. EF_y= EF_{grid,CM,y}= 0.9126 tCO₂/MWh The combined margin emissions factor is calculated as follows: EF_{grid,CM,y}= EF_{grid,OM,y}*WOM + EF_{grid,BM,y}*WBM Where: EF_{grid,BM,y} = Build margin CO₂ emission factor in year y (tCO₂/MWh) EF_{grid,OM,y} = Operating margin CO₂ emission factor in year y (tCO₂/MWh) WOM = Weighting of operating margin emissions factor (%) = 50% WBM = Weighting of build margin emissions factor (%) = 50% After calculation, the Combined Emission factor is obtained as 0.9126 tCO₂/MWh. Verification team checked the Joint Project Description & Monitoring Report^{/1/} and confirms that value is correct. EGPJ,y - Quantity of electricity generation supplied by the project/unit to the grid in year y: The parameter EGPJ,y has been measured continuously by bi-directional (Special Energy Meters SEM) main and check energy meters of accuracy class 0.2s. This parameter sourced from the “Deviation Settlement Account Document”^{/10/} in line with applied monitoring plan. The details of Meter location Id No., Meter Serial Number, Meter No., Date of Installation, Category, Date of Calibration/ Meter Testing, Validity, Place of Installation of SEM are provided in the below table. Meters were calibrated by Elster (meter supplier) vide the manufacturer test reports (at the time of installation), followed by the calibration by NABL accredited lab. The applied calibration frequency as per registered monitoring plan is once in 05 years, However, during the calibration performed in the calendar year 2023, the calibration agency has mentioned the validity as 02 years. The VVB noted the same and confirms that the PP has appropriately applied conservative validity of calibration and limited the same by 02 years. The details of Elster make meters, with accuracy 0.2 class are provided in Appendix 5. There was delay in the calibration of the installed meters and error is also calculated and applied as per the guidelines. More details are provided and assessed in the next section. During the current monitoring, the net electricity supplied to grid by the project activity is 1,728,176.9194 MWh (after application of provisions of delayed calibration, refer section 4.5 of this FVR for details). The same has been verified with the Deviation Settlement Account Document^{/10/} prepared by NRPC. Also, the monthly Deviation Settlement Account Document^{/10/} are cross checked and found consistent. PP has
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	considered the actual net electricity supplied by the project activity to grid as per Deviation Settlement Account Document/^{10/} (MWh) on monthly basis for ER calculations. During the verification all relevant monitoring parameters (as listed in section 3.1 of PD) have been verified with regard to the appropriateness of the applied measurement / determination method, the correctness of the values applied for ER calculation/^{4/}, the accuracy, and applied QA/QC measures. The Verification team identified that the correct emission factor is reported under the section 4.1 of the monitoring report/^{3/} to apply the appropriately report the emission factor. Based on above assessment the verification team confirms that requisite parameters are monitored in line with registered monitoring plan/^{1/}. Baseline emissions are calculated as follows: $BE_y = EGPJ_y \times EF_{grid,CM,y}$ BE_y - baseline emissions in year y (tCO₂) $EGPJ_y$ – Quantity of electricity generation supplied by the project plant/unit to the grid in year y in MWh $EF_{grid,CM,y}$ - Combined Margin CO₂ emission factor in year y (Where $EGPJ_y = EGPJ_{y,electricity}$) $EGPJ_{y,electricity} = 1,728,176.9194$ MWh $EF_{grid,y} = 0.9126$ tCO₂/MWh $BE_{y,electricity} = 1,728,176.9194 \text{ MWh} \times 0.9126 \text{ tCO}_2/\text{MWh}$ $= 1,577,127 \text{ tCO}_2$ (rundown) As per applied methodology ACM0002: Grid-connected electricity generation from renewable sources — Version 19/^{6/} and the registered Joint Project Description & Monitoring Report/^{1/}, project emission is considered zero as the project activity involved hydro power generation. Leakage: As per applied methodology ACM0002: Grid-connected electricity generation from renewable sources — Version 19/^{6/} and Joint Project Description & Monitoring Report/^{1/} Leakage emissions are not considered for the project activity. Hence, $ER_y = BE_y - PE_y$ $= 1,577,127 \text{ tCO}_2 - 0$ $= 1,577,127 \text{ tCO}_{2e}$
Findings	CAR 05 was raised on this section and closed successfully. Please refer Appendix 2 for further details

Conclusion	Verification team confirms that The monitoring has been carried out in accordance with the monitoring plan contained in the registered Joint Project Description & Monitoring Report/1/. The methods and formulae set out in the project description for calculating baseline emissions have been followed (the project emissions and leakage are not applicable for this project). The default values (grid emission factor) used in the monitoring report are in line with the Joint Project Description & Monitoring Report/1/. The quality of external backup evidences was satisfactory (refer section 4.5 below for details) The manual transfer of the “EGPJ,y” can be deemed as accurate after addressing all the errors as identified under CAR 05. Assessment team confirmed that the GHG emission reductions and removals have been quantified correctly in line with the registered Joint Project Description & Monitoring Report/1/. It is confirmed that overall GHG emission reductions and removals have been quantified correctly in accordance with the project description, and applied methodology (refer closure of all the raised findings).
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4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

Monitored Parameters

- a) Quantity of net electricity generation supplied by the project plant/unit to the grid in year y; EGPJ,y; MWh

Parameter	EGPJ,y (MWh)	
Means of verification	Criteria / Requirements	Assessment / Observations
	Measuring / Reading / Recording frequency	The parameter is continuously measured and monthly recorded.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The monitoring and reporting frequency is in line with the monitoring plan as outlined in the registered Joint Project Description & Monitoring Report/1/ and monitoring methodology/06/.
	Monitoring equipment	The metering system includes total 12 energy meters (04 Main meters, 04 Check meters and 04 stand by meters) in the switch yard at power station. All 3 units are further connected via 4 feeders or transmission lines of 220 kV to 4 feeders. Each feeder having one set (main, check and standby meter), for monitoring of net electricity

		supplied to the grid at the power station. Standby Metering: Failure of Main meter The check meter shall be used during the period the main metering system is not in service. Failure of Main and check meter: In case of failure of both main meter and check meter, sum of the net electricity generation recorded by three individual special energy meters (SEMs) and individual auxiliary meters shall be used for accounting and billing purpose. There are 3 individual special energy meters (SEMs) of accuracy 0.2 class installed for each generating unit called standby meters for monitoring of power generation. One auxiliary power consumption meter (of same technical specification) is also installed at power station switch yard for monitoring of auxiliary power consumption of power plant. Conclusion: During the applied monitoring period, there was no application of the "Standby metering." This was confirmed based on the remote interviews.
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Yes, 0.2 Class.
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Yes, the calibration results confirmed the operation of the installed meters employed for the monitoring operating within allowable accuracy limits.
	Calibration frequency /interval:	Once in 5 years, however, during the calibration performed in the calendar year 2023, the calibration agency has mentioned the validity as 02 years (PP has appropriately applied conservative

		validity of calibration and limited the same by 02 years, the MR is updated). There was a delay in calibration, refer below table:																
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, pending until the findings are closed or as per the manufacturer's specifications?	<table><tr><td>Meter Number</td><td>NR-3292-A, NR-3314-A, NR-3504-A, NR-3236-A, NR-3241-A, NR-3243-A,</td></tr><tr><td>Date of calibration</td><td>17/11/2015: 17/12/2015 05/10/2015</td></tr><tr><td>Validity (years)</td><td>05</td></tr><tr><td>Date of Validity</td><td>16/11/2020 16/12/2020 04/10/2020</td></tr><tr><td>Date of calibration</td><td>13/09/2023 - NR-3504-A, NR-3241-A, NR-3243-A, 16/09/2023 - NR-3292-A, NR-3314-A, NR-3236-A,</td></tr><tr><td>Delay in calibration</td><td>A table is provided below in this section</td></tr><tr><td>Factor for delayed calibration</td><td>(1-0.2%)</td></tr><tr><td>Assessment</td><td>The VVB verified and confirmed that the PP has applied appropriate error factor for the entire monitoring period, which is conservative.</td></tr></table>	Meter Number	NR-3292-A, NR-3314-A, NR-3504-A, NR-3236-A, NR-3241-A, NR-3243-A,	Date of calibration	17/11/2015: 17/12/2015 05/10/2015	Validity (years)	05	Date of Validity	16/11/2020 16/12/2020 04/10/2020	Date of calibration	13/09/2023 - NR-3504-A, NR-3241-A, NR-3243-A, 16/09/2023 - NR-3292-A, NR-3314-A, NR-3236-A,	Delay in calibration	A table is provided below in this section	Factor for delayed calibration	(1-0.2%)	Assessment	The VVB verified and confirmed that the PP has applied appropriate error factor for the entire monitoring period, which is conservative.
		Meter Number	NR-3292-A, NR-3314-A, NR-3504-A, NR-3236-A, NR-3241-A, NR-3243-A,															
Date of calibration	17/11/2015: 17/12/2015 05/10/2015																	
Validity (years)	05																	
Date of Validity	16/11/2020 16/12/2020 04/10/2020																	
Date of calibration	13/09/2023 - NR-3504-A, NR-3241-A, NR-3243-A, 16/09/2023 - NR-3292-A, NR-3314-A, NR-3236-A,																	
Delay in calibration	A table is provided below in this section																	
Factor for delayed calibration	(1-0.2%)																	
Assessment	The VVB verified and confirmed that the PP has applied appropriate error factor for the entire monitoring period, which is conservative.																	
		<table><tr><td>Meter Number</td><td>NR-3245-A, NR-3247-A, NR-3258-A, NR-3288-A, NR-3291-A, NR-3325-A</td></tr><tr><td>Date of calibration</td><td>05/10/2015 17/11/2015</td></tr><tr><td>Validity (years)</td><td>05</td></tr><tr><td>Date of Validity</td><td>04/10/2020</td></tr><tr><td>Date of calibration</td><td>13/09/2023 - NR-3247-A 15/09/2023 - 3258-A, 3288-A, 16/09/2023 - NR-3245-A, NR-3291-A, NR-3325-A</td></tr><tr><td>Delay in calibration</td><td>05/10/2020 to 31/03/2021</td></tr><tr><td>Factor for delayed calibration</td><td>(1-0.2%)</td></tr><tr><td>Assessment</td><td>The VVB verified and confirmed that the PP has applied appropriate error factor for the entire monitoring period, which is conservative.</td></tr></table>	Meter Number	NR-3245-A, NR-3247-A, NR-3258-A, NR-3288-A, NR-3291-A, NR-3325-A	Date of calibration	05/10/2015 17/11/2015	Validity (years)	05	Date of Validity	04/10/2020	Date of calibration	13/09/2023 - NR-3247-A 15/09/2023 - 3258-A, 3288-A, 16/09/2023 - NR-3245-A, NR-3291-A, NR-3325-A	Delay in calibration	05/10/2020 to 31/03/2021	Factor for delayed calibration	(1-0.2%)	Assessment	The VVB verified and confirmed that the PP has applied appropriate error factor for the entire monitoring period, which is conservative.
Meter Number	NR-3245-A, NR-3247-A, NR-3258-A, NR-3288-A, NR-3291-A, NR-3325-A																	
Date of calibration	05/10/2015 17/11/2015																	
Validity (years)	05																	
Date of Validity	04/10/2020																	
Date of calibration	13/09/2023 - NR-3247-A 15/09/2023 - 3258-A, 3288-A, 16/09/2023 - NR-3245-A, NR-3291-A, NR-3325-A																	
Delay in calibration	05/10/2020 to 31/03/2021																	
Factor for delayed calibration	(1-0.2%)																	
Assessment	The VVB verified and confirmed that the PP has applied appropriate error factor for the entire monitoring period, which is conservative.																	
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Yes, the calibration is conducted by a certified agency/ ^{13/} .																

	Is(are) calibration(s) valid for the whole reporting period?	No, there is delay in calibration. The PP has applied appropriate error factor for the same.
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Yes, the details of the calibration of monitoring equipment's calibration frequency have been provided under the respective parameter heads.
	How were the values in the monitoring report verified?	The monthly reported data was cross-checked, with the Weekly Deviation Settlement Account Statement/ ^{10/} and the data was found comparable. The value obtained for the parameter is 1,728,176.9194 MWh (after application of provisions of delayed calibration).
	If applicable, has the reported data been cross-checked with other available data?	The monthly reported data is issued by the NHPC declares available Hydel power plant capacity on NRPC website (http://nrpc.gov.in/) by punching in data on a daily basis. Thus, reported data can be cross checked by visiting the website.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	The data management system is transparent and reliable. The values are manually transferred from the Deviation Settlement Account Document/ ^{10/} and calibrations are performed periodically.
	In case project participants have temporarily not monitored the parameter, has either i). a deviation been approved by the CDM EB or ii). has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	No such issues.
Findings	CAR 05.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology/^{06/}. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The implementation of the project is as per the registered Joint Project Description & Monitoring Report/^{1/} which was confirmed by the verification team. The emission reduction calculation for the project activity is estimated based on the electricity generated by the hydropower plant. and result in 1,728,176.9194 tCO₂e of emission reductions.	

Parameters fixed ex ante

Values were taken from the Joint Project Description & Monitoring Report/^{1/}. Refer corresponding assessment under section 4.4 of this report above.

Calibration

During the remote audit, the team visited the metering locations through the virtual tour using the internet. It was found that a few energy meters were found replaced during the current monitoring period; However, there is no change in the accuracy class of the meters. The details of the equipment monitoring electricity exported have been provided below:

Meter locati on ID no.	Ma ke	Meter Number	Accura cy Class	Install ed On	Date of testing/calibration ¹	Date of calibratio n	Due date of calibratio n	Result
KG-01	Elst er	NR-3292-A	0.2s	Feb-2018	17/11/2015	16/09/2023	15/09/2025	Error is within the limits.
KG-02	Elst er	NR-3314-A	0.2s	Feb-2018	17/11/2015	16/09/2023	15/09/2025	
KG-03	Elst er	NR-3504-A	0.2s	Feb-2018	17/12/2015	13/09/2023	12/09/2025	
KG-04	Elst er	NR-3236-A	0.2s	Feb-2018	05/10/2015	Not available		
	Sch nei der	WR-2169-A ²		Jun-2022	13/06/2022	13/09/2023	12/09/2025	
KG-05	Elst er	NR-3241-A	0.2s	Feb-2018	05/10/2015	13/09/2023	12/09/2025	
KG-06	Elst er	NR-3243-A	0.2s	Feb-2018	05/10/2015	13/09/2023	12/09/2025	
KG-07	Elst er	NR-3245-A	0.2s	Feb-2018	05/10/2015	Not available		
	Sch nei der	WR-2167-A ³		Mar-2022	05/03/2022	13/09/2023	12/09/2025	
KG-08	Elst er	NR-3247-A	0.2s	Feb-2018	05/10/2015	13/09/2023	12/09/2025	
KG-09	Elst er	NR-3258-A	0.2s	Feb-2018	05/10/2015	15/09/2023	14/09/2025	
KG-10	Elst er	NR-3288-A	0.2s	Feb-2018	17/11/2015	15/09/2023	14/09/2025	
KG-11	Elst er	NR-3291-A	0.2s	Feb-2018	17/11/2015	NA	NA	
		NR-3493-A ⁴		Feb-2020	15/02/2020	15/09/2023	14/09/2025	
KG-12	Elst er	NR-3325-A	0.2s	Oct-2018	17/11/2015	16/09/2023	15/09/2025	

¹ According to No. 502/70/CEA/DP&D In exercise of the powers conferred by sub-section (1) of section 55 and clause (e) of section 73 read with sub-section (2) of section 177 of Electricity Act, 2003 "Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006" and subsequent amendments clause 18 (1), (2) and (3), para number 18 of Calibration and periodical testing of meters need to be calibrated at least once in five years. Hence, the calibration is valid till 04/10/2020.

The PP has applied an error factor factoring the maximum permissible error as per the accuracy class of the meters for the entire monitoring period. The approach is in accordance with the CDM VVS V03/²⁴/ therefore the approach was accepted.

4.6 Non-Permanence Risk Analysis

This is not relevant for this project as it is not a AFOLU project.

² The meter number NR-3236-A was replaced with the meter WR-2169-A on 13/06/2022 since that meter was faulty.

³ The meter number NR-3245-A was replaced with the meter WR-2167-A on 05/03/2022 since that meter was faulty.

⁴ The meter number NR-3291-A was replaced with the meter NR-3493-A on 15/02/2020 since that meter was faulty.

5 VERIFICATION OPINION

Applus+ Certification has been engaged by NHPC Limited to perform the verification of the “Kishanganga Hydroelectric Project.” The management of project proponent/owner is responsible for the preparation of the GHG emissions data and the reported/estimated GHG emissions reductions on the basis set out within the project’s Monitoring Plan in the Joint Project Description & Monitoring Report^{1/} and MR and the approved methodology ACM0002: Grid-connected electricity generation from renewable sources -- Version 19^{6/}.

Our Verification approach was based on the requirements as defined under the Kyoto Protocol^{21/}, Marrakesh accord, as well as those defined by the CDM Executive Board and VCS standard, version 4.5^{7/}. Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. The verification can confirm that:

- The project is operated as planned and described in the project document;
- The monitoring plan is as per the applied methodology;
- The monitoring process in Monitoring Report is as per the approved joint PD&MR;
- The development and maintenance of records and reporting procedures and monitoring plan (QA/QC);
- The installed equipment being essential for generating emission reduction runs reliably; and is calibrated appropriately except delayed calibration is addressed in line with para 366 (a) of the “CDM validation and verification standard for project activities, Version 03”;
- The monitoring system is in place and generates GHG emission reductions data;
- The GHG emission reductions are calculated without material misstatements.
- A reasonable level of assurance was achieved during the verification.
- No limitation observed for the present verification
- Project has been implemented in accordance with the project description

Monitoring period: From 01-06-2019 to 31-03-2021 (first and last date included).

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

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2019 (01-Jun-2019 – 31-Dec-2019)	515,891	0-	0-	515,891
2020 (01-Jan-2020 - 31-Dec-2020)	889,198	0-	0-	889,198
2021 (01-Jan-2021- 31-Mar-2021)	172,038	0-	0-	172,038
Total	1,577,127	0-	0-	1,577,127

The quantified emission reduction calculation for the monitoring period is correct and justified. Assessment team also compared actual VCUs with the estimated VCUs and found that the actual VCUs is 1,577,127 tCO₂e which is 45.04% lower than the estimated emission reduction 2,869,522 tCO₂e (2,869,522 tCO₂e/ 365 days x 670 days) during this monitoring period. The changes are due to seasonal variation in the water availability which is not in control of PP. The project activity is otherwise operated according to its description in registered Joint Project Description & Monitoring Report^{1/} and no changes observed during the monitoring period.

Year	Ex-ante Emissions Reductions/Removals	Achieved Emissions Reductions/Removals	Percent Difference	Justification for the difference
2019 (01-Jun-2019 – 31-Dec-2019)	916,534	515,891	-43.71	Lower than estimated value
2020 (01-Jan-2020– 31-Dec-2020)	1,567,530	889,198	-43.27	Lower than estimated value
2021 (01-Jan-2021– 31-Mar-2021)	385,458	172,038	-55.37	Lower than estimated value
Total	2,869,522	1,577,127	-45.04%	As the source of energy generation is water, the availability is not in the control of PP. The non-availability of water is a major reason for the difference in ex-ante emission reductions and the achieved emission reductions. Unit1, Unit2, and Unit3 had major breakdown during the monitoring period. The details of the same have been given in the appendix I under the title “Breakdown Details of the Project”.

APPENDIX 1: REFERENCES

Sr. No.	Title of Document	Version	Date																
1.	Registered Joint Project Description & Monitoring Report	-	26-06-2019																
2.	VCS Joint Validation & Verification Report	-	04-07-2019																
3.	VCS Monitoring Report (after 1 st round of VERRA review)	5.2	17-05-2024																
	VCS Monitoring Report	5.0	28-02-2024																
	VCS Monitoring Report	1.0	01-11-2022																
4.	VCS ER spreadsheet (corresponding to the final monitoring report)	05.0	28-02-2024																
5.	VCS website for project information https://registry.verra.org/app/projectDetail/VCS/1891	-	-																
6.	ACM0002: 'Grid-connected electricity generation from renewable sources' Methodology	19	-																
7.	VCS standard 4.5	4.5	-																
	VCS Program Guide 4.4	4.4	-																
8.	Power purchase agreement signed by PP with state electricity authority	-	12-04-2005																
9.	Commissioning certificates for the project activity confirming below schedule: <table border="1"> <tr> <th>Unit No.</th><th>Turbine Capacity</th><th>Location</th><th>Commissioning Date</th></tr> <tr> <td>I</td><td>110 MW</td><td>Bandipora;</td><td>13-03-2018</td></tr> <tr> <td>II</td><td>110 MW</td><td>Jammu &</td><td>21-03-2018</td></tr> <tr> <td>III</td><td>110 MW</td><td>Kashmir</td><td>30-03-2018</td></tr> </table>	Unit No.	Turbine Capacity	Location	Commissioning Date	I	110 MW	Bandipora;	13-03-2018	II	110 MW	Jammu &	21-03-2018	III	110 MW	Kashmir	30-03-2018	-	-
Unit No.	Turbine Capacity	Location	Commissioning Date																
I	110 MW	Bandipora;	13-03-2018																
II	110 MW	Jammu &	21-03-2018																
III	110 MW	Kashmir	30-03-2018																
10.	Weekly Deviation Settlement Account statements for the project activity for the current monitoring period.	-	01-06-2019 to 31-03-2021																
11.	CDM Project Standard for project activities	3.0	-																
12.	Invoices raised by the project activity for the current monitoring period	-	01-06-2019 to 31-03-2021																
13.	Calibration certificates for current monitoring period for all the energy meters. The details are provided in Appendix -5.	-	01-06-2019 to 31-03-2021																

14.	CEA database	14.0	For the entire monitoring period.
15.	For verification of Deviation Settlement Account. https://cercind.gov.in/2014/regulation/noti132.pdf	-	For the entire monitoring period.
16.	Voluntary Carbon Standard 2007.1 Validation Report	-	For the entire monitoring period.
17.	Central Electricity Regulation Commission Notification No. L-1/132/2013/CERC (http://www.cercind.gov.in/2014/regulation/noti132.pdf)	-	-
18.	Central Electricity Authority (Installation and Operation of Meters) Regulations Notified on 17/03/2006 <u>No. 502/70/CEA/DP&D</u> Amendments Notified on 26/06/2010 <u>No. 502/6/2009/DP&D/D-I</u>	-	-
19.	Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1	-	-
20.	Verification contract between the LGAI and the PP for the monitoring period 01-06-2019 to 31-03-2021	-	-
21.	CDM Validation and Verification Standard (VVS)	3.0	-

APPENDIX 2: VERIFICATION FINDINGS

Table 1. CL from this verification

CL ID	01	Section no.	1.3	Date: 10/04/2023
Description of CL				
As per the approved VCS joint PD&MR section 1.3, the contact information is relating to the DGM (Environment) R&D Division, NHPC Limited Sector-33, Faridabad 121 003 Haryana, India +91-129-2271297 However, the stated information differs in section 1.3 of the submitted MR. Clarification is required.				
Project participant response				Date: 17/04/2023
The contact information in the section 1.3 of the submitted MR has been revised.				
Documentation provided by project participant				
<i>The revised MR has been submitted as Annex 1.</i>				
DOE assessment				Date: 03/05/2023
Received the revised MR and found the contact information consistent. Finding is CLOSED.				

Table 2. CAR from this verification

CAR ID	01	Section no.	1.1 & 1.6	Date: 10/04/2023
Description of CAR				
1. Telephone no, email and website information is not provided in the title page. Refer the MR template V 4.2. 2. The section 1.1 of MR does not include the tabular details of the audit history of the project. Refer requirement from monitoring template which is stated as below: “Using the table below, include the audit history of the project. For the project validation, state the validation date in the Period column. This table should include all monitoring periods, including the period of this monitoring report.” 3.In section 1.6 of MR, information about renewal of crediting period and its type is missing.				
Project participant response				Date: 17/04/2023
1. The telephone number, email and website information has been provided in the title page. 2. The section 1.1 of the MR has been revised and the tabular details of the Audit history of the Project has been included. 3. The section 1.6 has been revised and the crediting type has been included.				
Documentation provided by project participant				

MR	
DOE assessment	Date: 03/05/2023
1. The telephone number, email and website information is found consistent in the submitted revised MR. 2. The section 1.1 of the revised MR contains the Audit history of the Project. 3. Crediting type has been included in the revised MR. Finding is CLOSED.	

CAR ID	02	Section no.	1.11	Date: 10/04/2023
Description of CAR				
1. The project proponent shall demonstrate that a project contributes to at least three SDGs by the end of the first monitoring period, and in each subsequent monitoring period. Refer: "Project requirement para 3.17: Sustainable Development Contributions" 2. The evidence of the project's SD contributions are also not provided as appendices to submitted MR. Furthermore, the PP is required to submit the SDG contribution following the Sustainable Development Contribution Reports.				
Project participant response				Date: 17/04/2023
1. The demonstration of contribution to SDGs has been included in the section 1.11 of the revised MR. 2. The evidence of the project's SD contributions has been included in the Appendix III of the revised MR.				
Documentation provided by project participant				
MR				
DOE assessment				Date: 03/05/2023
1. The contribution of SDG's is found in Section 1.11 of the revised MR. 2. The evidence of the project's SD contributions is found in Appendix III of the revised MR. Finding is CLOSED.				

CAR ID	03	Section no.	2	Date: 10/04/2023
Description of CAR				
Refer section 2 of MR, as per the latest VCS Standard version 4.4, para 3.18.1, requirement is produced as below.				

Note – Where a project has previously certified to the CCB or SD VSta Program, but is completing a VCS Program verification without also completing a CCB or SD VSta Program verification for the same verification period, the project proponent shall demonstrate conformance with the requirements set out in this Section 3.18. Compliance is missing.

As per para 3.18.4 of the latest version of the VCS standard, “

The project proponent shall establish mechanisms for ongoing communication with local stakeholders to allow stakeholders to raise concerns about potential negative impacts during project implementation”. Hence, PP is required to update section 2.2 of the MR.

Project participant response

Date: 17/04/2023

As the Project has not been previously certified to the CCB or SD VSta Program verification, the conformance to section 3.18 of the VCS Standard version 4.4 is not applicable to the Project.

The PP has established mechanisms for ongoing communication with local stakeholders, and the same has been updated in the section in the revised MR.

Documentation provided by project participant

DOE assessment

Date: 03/05/2023

Explanation is accepted. Finding is CLOSED.

CAR ID	04	Section no.	4.2	Date:	10/04/2023
Description of CAR					
The statement under section 4.2 of MR under row “QA/QC procedures to be applied” states calibration frequency as once in five years. Furthermore, the last verification was concluded on date 15/10/2105, thus considering the 05 years of calibration frequency, the credits can be claimed till the end date of its validity (refer to para 366 and 367 of CDM validation and verification standard for project activities, Version 03.0). The Monitoring Report is unclear how the delayed calibration provisions have been applied in line with para 366 and 367 of CDM validation and verification standard for project activities, Version 03.0. Furthermore, the calibration certificate to cover remaining monitoring period (after end of validity of applied calibration period) is requested.					
Project participant response					Date:
					17/04/2023

The energy meters were tested in 2015, and the Project started its operation in 2018. Hence, considering the start date of the Project, the meter calibration is due in 2023.

As the energy meter is under the custody of Power Grid Corporation of India Limited (PGCIL), the calibrations have to be done by PGCIL, and the frequency of conducting calibrations is under the control of PGCIL. Thus, the calibration is being done as per the schedule planned by PGCIL. Thus, calibration is not done once every five years.

As per the validation and verification standard, if the calibration is delayed, the following conservative approach needs to be followed: “Applying the maximum permissible error of the energy meter to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration, if the results of the delayed calibration do not show any errors in the measuring equipment, or if the error is smaller than the maximum permissible error.”

As the % error within the limits of Maximum Permissible Error (MPE) +/- 0.2% thus, MPE of -0.2% has been applied to measured ERs, i.e., difference between baseline emission of energy generated $((100\% - 1\%) \times (EGy) \times EF)$ has resulted in 1,577,127 tCO_{2e} GHG emission reductions or net anthropogenic GHG removals.

Documentation provided by project participant

Revised MR and ER sheet

DOE assessment

Date: 27/12/2023

Verification team has reviewed the revised MR and ER sheet and found the calibration delay is applied as per the guidelines and provided calculations are assessed as correct.

Hence, the Finding is closed.

CAR ID	05	Section no.	ER Worksheet and MR	Date: 10/04/2023
Description of CAR				
Findings in MR and ER Worksheet (ER Sheet – 1891.xlsx) from Annex 1-Generation Data and Annex 2-Calibration certificate				
1. Inconsistencies in MR between Appendix II: Meter Calibration Details				
a) Meter location (KG-09) – the Meter Serial Number has written “05295743758” whereas in Annex 2 – Kishanganga_Test Report, the number is “05295743”				
b) Date of testing column, Meter location (KG-01) – “15/10/2015” is inconsistent with “17/12/2015” which has present in Annex 2 – Kishanganga_Test Report (page no.1)				
c) Date of testing column, Meter location (KG-02) – “15/10/2015” is inconsistent with “17/11/2015” which has present in Annex 2 – Kishanganga_Test Report				

- d) Date of testing column,
Meter location (KG-03) – “15/10/2015” is inconsistent with “17/11/2015” which has present in Annex 2 – Kishanganga_Test Report
- e) Date of testing column,
Meter location (KG-04) – “15/10/2015” is inconsistent with “17/11/2015” which has present in Annex 2 – Kishanganga_Test Report
- f) Date of testing column,
Meter location (KG-05) – “15/10/2015” is inconsistent with “17/11/2015” which has present in Annex 2 – Kishanganga_Test Report
- g) Date of testing column,
Meter location (KG-06) – “15/10/2015” is inconsistent with “17/11/2015” which has present in Annex 2 – Kishanganga_Test Report

2. Inconsistencies in ER between Annex 1- Generation data

- a) D24 to D28 cell of June 19 (2019 tab) of ER Sheet for date

Date	Generation (LU) in ER	Generation (LU) in Annex 1
19-06-2019	46.6725	47.16840
20-06-2019	43.40528	42.93840
21-06-2019	54.32235	55.58208
22-06-2019	54.9075	55.53936
23-06-2019	72.5375	73.02264

- b) K33 cell of March 2021 (2021 tab) of ER Sheet for date

28-03-2021	44.7672	44.79720
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Project participant response

Date: 17/04/2023

- The inconsistencies of the dates in the calibration details of the meters have been corrected and updated in the revised MR.
- The inconsistencies in the generated data for the months of June 2019 and March 2021 have been corrected, and the overall emission reduction values have also been updated in the revised MR.

Documentation provided by project participant

- Revised MR has been submitted as Annex 1
- Revised ER sheet has been submitted as Annex 2

DOE assessment

Date: 03/05/2023

- Received the revised MR and found the Meter Calibration Details consistent with Appendix II.
- D24 to D28 cell of June 19 (2019 tab) of ER Sheet are found consistent with Annex 1.
 - K33 cell of March 2021 (2021 tab) of ER Sheet is found consistent with Annex 1.

Finding is CLOSED.

APPENDIX 3: COMPETENCY STATEMENT

Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g., name of central or other office of VVB or outsourced entity)	Involvement in			
						Desk review	On-site inspection ⁵	Interview(s)	Verification findings
1.	Lead Auditor/Technical Expert	EI	Meesa	Srikanth	Applus+ Certification	Yes	Yes	Yes	Yes

Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g., name of central or other office of VVB or outsourced entity)
1.	Technical reviewer (TR)	EI	Shen	Simon	Applus+ Certification
2.	Approver	IR	Calle de Miguel	Agustin	Applus+ Certification

Short CVs of the Team:

Mr. Srikanth Meesa is a climate change professional with more than 17 years of experience in the fields of climate change, GHG auditing, carbon footprint assessments, water and energy audits, scope-3 emissions, net zero strategies, sustainability & ESG sectors and water and wastewater treatment sectors. He has completed his masters in Environmental Engineering & Management from I.I.T Delhi and Bachelors in Civil Engineering from Osmania University. Furthermore, he has extensive experience i.e., more than 14 years on the auditing of CDM, VERRA, GS, JCM projects of various sectoral scopes across the world. He has worked with reputed certification bodies such as TUV NORD, DNVGL, TUV SUD and LR. He also has consulting experience on sustainability reports & road-maps, stakeholder consultation and LCA studies while working at Thinkstep (Now called Sphera). Currently, he is associated with Global Green Solutionz and empanelled with Applus+ Certification to carry

⁵ Remote Assessment was performed.

out GHG audits in the aforementioned schemes. Mr. Srikanth Meesa is based at Hyderabad, India. Mr. Srikanth Meesa participate in the project's audit team.

Mr. Simon Shen: Mr. Simon Shen (Master's Degree in Thermal Energy Engineering, Bachelor's Degree in Environmental Engineering) is an Auditor appointed by Applus+ LGAI for the GHG project assessment, auditing, and technical review. He has more than 6 years of work experience in CDM/GS4GG/VCS project assessment and review with Applus+, apart from the years of experience working as GHG Auditor and ISO 9001/14001 in TUV SUD for 3.5 years before he joined Applus+. Mr. Simon Shen has extensive experience also as former Applus+ Shanghai CDM Technical Manager. Mr. Simon Shen is based in Shanghai, China.

APPENDIX 4: ABBREVIATIONS

Abbreviations	Full Texts
BEF	Baseline Emission Factor
BM	Build Margin
CAR	Corrective Action Request
CL	Clarification Request
CO ₂	Carbon dioxide
DOE	Designated Operational Entity
DSA	Deviation Settlement Account
ERDA	Electrical Research and Development Association
FAR	Forward Action Request
GHG	Green House Gas
MR	Monitoring Report
MW	Megawatt
MWh	Megawatt-hour
NHPC	National Hydroelectric Power Corporation
NRLDC	Northern Regional Load Despatch Centre
NRPC	Northern Region Power Committee
NEWNE	Northern Eastern Western North-Eastern
PD	Project Description
PGCL	Power Grid Corporation Limited
PP	Project Proponent

PPA	Power Purchase Agreement
QA/QC	Quality Assurance and Quality Control
SEM	Special Energy Meter
tCO_{2e}	tonnes of Carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Voluntary Carbon Standard
VCSA	Voluntary Carbon Standard Association
VCUs	Voluntary Carbon Units

APPENDIX 5: CALIBRATION DETAILS

Meter location ID no.	Make	Meter Number	Accuracy Class	Installed On	Date of testing/calibration ⁶	Date of calibration	Due date of calibration	Result
KG-01	Elster	NR-3292-A	0.2s	Feb-2018	17/11/2015	16/09/2023	15/09/2025	Error is within the limits.
KG-02	Elster	NR-3314-A	0.2s	Feb-2018	17/11/2015	16/09/2023	15/09/2025	
KG-03	Elster	NR-3504-A	0.2s	Feb-2018	17/12/2015	13/09/2023	12/09/2025	
KG-04	Elster	NR-3236-A	0.2s	Feb-2018	05/10/2015	Not available		
	Schneider	WR-2169-A ⁷		Jun-2022	13/06/2022	13/09/2023	12/09/2025	
KG-05	Elster	NR-3241-A	0.2s	Feb-2018	05/10/2015	13/09/2023	12/09/2025	
KG-06	Elster	NR-3243-A	0.2s	Feb-2018	05/10/2015	13/09/2023	12/09/2025	
KG-07	Elster	NR-3245-A	0.2s	Feb-2018	05/10/2015	Not available		
	Schneider	WR-2167-A ⁸		Mar-2022	05/03/2022	13/09/2023	12/09/2025	
KG-08	Elster	NR-3247-A	0.2s	Feb-2018	05/10/2015	13/09/2023	12/09/2025	
KG-09	Elster	NR-3258-A	0.2s	Feb-2018	05/10/2015	15/09/2023	14/09/2025	
KG-10	Elster	NR-3288-A	0.2s	Feb-2018	17/11/2015	15/09/2023	14/09/2025	
KG-11	Elster	NR-3291-A	0.2s	Feb-2018	17/11/2015	NA	NA	
		NR-3493-A ⁹		Feb-2020	15/02/2020	15/09/2023	14/09/2025	
KG-12	Elster	NR-3325-A	0.2s	Oct-2018	17/11/2015	16/09/2023	15/09/2025	

⁶ According to No. 502/70/CEA/DP&D In exercise of the powers conferred by sub-section (1) of section 55 and clause (e) of section 73 read with sub-section (2) of section 177 of Electricity Act, 2003 "Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006" and subsequent amendments clause 18 (1), (2) and (3), para number 18 of Calibration and periodical testing of meters need to be calibrated at least once in five years. Hence, the calibration is valid till 04/10/2020.

⁷ The meter number NR-3236-A was replaced with the meter WR-2169-A on 13/06/2022 since that meter was faulty.

⁸ The meter number NR-3245-A was replaced with the meter WR-2167-A on 05/03/2022 since that meter was faulty.

⁹ The meter number NR-3291-A was replaced with the meter NR-3493-A on 15/02/2020 since that meter was faulty.

APPENDIX 6: DECLARATION BY PP



एन एच पी सी लिमिटेड
(भारत सरकार का उद्यम)

NHPC Limited
(A Government of India Enterprise)

फोन/Phone : _____

संदर्भ सं./Ref. No. : NH/EDM/VCS/387

दिनांक/Date : 11.05.2023

TO WHOMSOEVER IT MAY CONCERN

This declaration is in reference to the VCS Project activity titled **KISHANGANGA HYDROELECTRIC PROJECT** for the monitoring period of 01-June-2019 to 31-March-2021.

In line to the above-mentioned details, **NHPC Limited**, hereby declares that we are not going to claim same GHG emission reductions of the project from different GHG programs for the current monitoring period of 01-June-2019 to 31-March-2021.

The project activity has not been rejected by any other GHG program.

The project activity has not created any form of environmental credits for the given monitoring period other than voluntary emission reductions.

Project ownership and the right to use as per the VCS compliance rest with NHPC Limited.

Also, it is to be noted that, NHPC Limited would not use net GHG emission reductions by this project for compliance with emission trading program to meet binding limits on GHG emissions.

For NHPC Limited,

Name: - 
(Avinash Kumar)

Designation: - **महाप्रबंधक (पर्यावरण)**
General Manager (Environment)
एन एच पी सी लिमिटेड / NHPC Limited
(भारत सरकार का उद्यम / A Govt. of India Enterprise)
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