VERIFICATION REPORT TEESTA-V HYDRO POWER PROJECT IN SIKKIM BY NHPC LIMITED, INDIA

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Summary:

NHPC Ltd has commissioned the LGAI Technological Center, S.A., herein after called as Applus+ Certification to carry out the 3rd verification of the project "Teesta-V Hydro Power Project in Sikkim by NHPC Limited, India" (VCS ID:766)/24/ with regard to the relevant requirements of VCS Program Guide, v4.3 and VCS standard, version 4.4/9/. The project is located in East district of Sikkim state on the major river system in Teesta in Sikkim. The hydel energy generated from the hydro 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.

The monitoring period covered in the verification is 01-06-2012 to 31-03-2018 (inclusive both days). During the current monitoring period, the project activity has supplied 14,665,380 MWh of electricity, and thus contributing to the GHG reductions of 11,776,268 tCO_2e/3/,/4/,/5/. A risk-based approach has been followed to perform this verification activity. In the course of verification, 06 Corrective Action requests (CAR), 02 Clarification Requests (CLs) and 00 Forward action requests (FARs) were raised and successfully closed. The review of the monitoring report and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews/25/ 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 10"/8/
- the project's monitoring plan is assessed against "ACM0002: Grid-connected electricity generation from renewable sources --- Version 10"/8/

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/, /4/. The main focus of the assessment team is to identify the significant risks for the project implementation and the generation of VCUs.

This project has supplied 14,665,380 MWh of electricity to the grid and achieved 11,776,268 tCO_2e emission reductions during the current monitoring period i.e., 01-06-2012 to 31-03-2018.

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 conclusion.

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1 INTRODUCTION

1.1 Objective

Applus+ Certification has been appointed to perform the verification of the project entitled "Teesta-V Hydro Power Project in Sikkim by NHPC Limited, India" that is managed by NHPC Limited/24/ under VCS Program Guide, v4.3 and VCS standard, version 4.4/9/. 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 assessment 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 10"/8/
- the project's monitoring plan is assessed against "ACM0002: Grid-connected electricity generation from renewable sources --- Version 10"/8/
- 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.1/23/, 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, v4.3 and VCS standard, version 4.4
- CDM Validation and Verification Standard for project activities, version 03.0
- CDM Project Standard for project activities, version 03.0
- 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) and to check whether it is prepared as per the registered PD and registered approved methodology ACM0002: Grid-connected electricity generation from renewable sources --- Version 10/8/.

The MR is reviewed against the criteria stated in Article 12 of the Kyoto Protocol/23/, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board, and guideline v4.3 and VCS standard, version 4.4. and, including the approved baseline and monitoring methodology ACM0002: Grid-connected electricity generation from renewable sources --- Version 10. The verification was based on the requirements in the VCS Program Guide, v4.3 and VCS standard, version 4.4/9/, CDM validation and verification standard for project activities, Version 03.0 and CDM Project Standard for project activities, version 03.0.

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 4.4 requirements (para 3.10, 3.10.2, 4.1.2, 4.1.8)

and Guidelines for Application of materiality in verifications, 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 ((captured under the deviation settlement account statements))/14/. There are no material errors, overestimation of ER, omission or misstatement. The verification team has reviewed all the documents like commissioning certificates/11/, deviation settlement account statements/22/, calibration certificates/15/, 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/24/.

In our opinion the GHG emissions reductions reported for the project activity for the monitoring period 01 June 2012 to 31 March 2018 are fairly stated in the Monitoring Report Version 05 dated 07-08-2023-24/, /25/, /3/, /4/. The GHG emission reductions were calculated correctly based on the approved baseline and monitoring methodology ACM0002, Version 10, and the VCS standard. For more information, please refer to section 4 of this verification report.

1.4 Summary Description of the Project

The Teesta hydro electric project - Stage V is a run of the river scheme connected to the NEWNE grid. Stage V of the Teesta River project has installed a capacity of 510 MW (3×170 MW turbines). The power house is located near Singtam (about 4 km upstream of the confluence of Rongnichu with Teesta). The dependable discharge available throughout the year has been assessed as 60 cumecs and gross head available is 216.73 m; for the installed capacity of 510 MW.

The project consists of concrete gravity dam across river Teesta with a 17.2 km long head race tunnel and an underground power housing three generating units of 170 MW capacity each. The Teesta hydro electric project Stage V is a run of the river scheme and will be producing energy to be absorbed into the Eastern region, part of the NEWNE grid at the time of commissioning of the plant/11/, earlier there were two regional grid distribution systems in India vis-à-vis Southern regional Grid or North East West North Eastern regional grid (NEWNE). These two regional grids are integrated as single Indian Grid. The project consists of 96.45 m high concrete gravity dam across river Teesta with a 17.2 km long head race tunnel and an underground power housing three generating units of 170 MW capacities each. The three tail race tunnels are D-shaped and 155m, 165m, 175m long. The penstock is of vertical pressure shaft type. The energy from the hydropower plant is a cleaner form of energy and displaces electricity that would otherwise generated using fossil fuel sources. The commissioning details of the project are as follows/11/:

Unit No	Project Name	Capacity	Commissioning date
I	Teesta- V Hydro Power project in Sikkim	170 MW	10-04-2008
II		170 MW	25-02-2008
III		170 MW	03-04-2008

The commissioning details/11/ were already verified from the commissioning certificate/11/ during the first verification/21/. The commissioning date/11/ of the first turbine has been considered as 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 PD.
b) VVB has conducted the desk review and remote audit to confirm the implementation status of the project.
c) The commissioning date/11/ 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 PD.
e) There was no increase in emission reduction from estimates made in registered PD, 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.

This is thethird verification for the project, and the monitoring period for the same is 01-06-2012 to 31-03-2018. 14,665,380 MWh of electricity was exported to grid during the monitoring period and the total emission reductions achieved is 11,776,268 tCO_{2e}.

2 VERIFICATION PROCESS

The registered VCS project is undergoing its third 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 /4/ and the ER sheet/6/ 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, v4.3 and VCS standard, version 4.4 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 against the registered PD;
II. Follow-up interviews with project participant; /25/
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 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 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	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 PD, final validation 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/11/, Deviation Settlement Account Statement /14/ etc.

Follow-up interviews

A remote audit was conducted by Applus+ Certification who performed interviews/25/, 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. 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 MR Version 07 submitted by PP on 30-01-2024 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 final verification report and the checklist have to undergo an internal quality control by the technical review committee, i.e., each report has to be finally approved either by the head of the technical review committee or the deputy. In case one of these two persons is part of the assessment team approval can only be given by the other one to avoid any conflict of Interest.

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 (PD/1/, MR/3, /4/, GHG Calculator/5/, validation report/2/, /19/) 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/8/ including applicable tool(s) /8/ and, where applicable, the applied standardized baseline (not applicable to this project activity), paying particular attention to the frequency of measurements/1/, /11/, the quality of metering equipment including calibration requirements/15/, 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/25/ on 26-12-2022 with project stakeholders to confirm selected information and to resolve issues identified in the document review. During the remote audit, the PP representatives of were interviewed.

Sr. No.	Name	Subject	Organization
1	Kumar Manish	Project implementation	Sr. Manager, NHPC
2	Sanjay Kumar Sharma	Plant maintenance and operational data	Sr. Manager Electrical; NHPC
3	Sanjoy Das	Monitoring procedures, electrical maintenance	General Manager, NHPC
4	Abhishek Gangopadhay		Technical advisor, NHPC
5	Abhigna. P	Data monitoring Emission reduction calculation	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/15/ 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/11/ of project activity, 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/22/,

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/15/, 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 4.1.9 of the *VCS standard , version 4.4*,

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

1) The first verification of the project after validation;

2) Verification of project baseline reassessments; and 4 Validation and Verification Requirements 57

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: 01-10-2009 to 31-05-2012. Currently, the project is undergoing 3rd verification. Hence, as per the VERRA guidelines site visit is not mandatory for the 3rd verification of the project activity.

Based on the above, verification team has performed the remote audit and ensured that there is risk to the audit to 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. 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 07 submitted by PP on 30-01-2024 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 validation and verification findings	No. of CL	No. of CAR	No. of FAR
Monitoring report	2	2	0
Description of project activity	0	1	0
Application of selected baseline and monitoring methodology and selected standardized baseline			
Applicability of methodology and standardized baseline	0	0	0

Deviation from methodology	0	0	0
Clarification on applicability of methodology, tool and/or standardized baseline	0	0	0
Project boundary	0	1	0
Establishment and description of baseline scenario	0	0	0
Demonstration of additionality	0	0	0
Emission reductions	0	0	0
sampling plan	0	0	0
Implementation of Monitoring plan	0	2	0
No Net harm assessment	0	0	0
Local stakeholder consultation	0	0	0
Others (monitoring period related)	0	0	0
Total	**02**	**06**	**00**

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

2.5.1 Forward Action Requests

This is the 3rd 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 10 which is as per the registered VCS PD 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

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

Deviation-1
1) The first deviation is concerning the parameter "Quantity of Electricity exported by the project from the grid at interconnection point of the Regional Supply in year y; $EG_{export,y}$"
Reason for change
The deviation has been sought for the 'source document for electricity exported.' In the registered VCS PD, the export values have been mentioned Joint Meter Reading (JMR) / Monthly Special Energy Meter statement (SEM) however in actual the export values are being sourced from

"Deviation Settlement Account document"/22/ " from the Grid Report published by Eastern Load Dispatch Center (ERLDC) for export/import parameter from 01-June-2012. In addition, the document for cross-checks of electricity export has been changed from invoices/14/ to Monthly Generation Reports/13/.
Verification Team Background Assessment
- The VVB has assessed the Single Line Diagram (SLD). - The VVB during the remote audit confirmed through interviews/25/, on-line verification of metering system, calibration records that installed meters were operating under normal conditions. - The monitoring through installed main and check meter happens on line 1 and line 2 which are installed on HT side; thus, determination of the parameter will lead to accurate and conservative of baseline emissions. - During the remote audit, the VVB noted that NHPC declares available Hydel power plant capacity on ERLDC website (http://www.erpc.gov.in) by punching in data on a daily basis. This is called Declared Generation (DG). - ERLDC responds to NHPC's declared DG by punching in Scheduled Capacity of the hydel plant on a daily basis, which is called Scheduled Generation (SG). - The energy-meter jointly installed by ERLDC and NHPC for Teesta-V Hydro Power Project in Sikkim, records and sends the actual daily generation (AG) to ERLDC on a daily basis through SCADA, measuring net sent out energy (net of auxiliary power consumption). - ERLDC (also called Power System Corporation of India POSOCO) publishes a daily generation report on its website mentioning DG, SG, AG and the deviation between AG and SG. - ERPC (Northern Region Power Committee) settles these energy accounts on a weekly basis based on daily generation data published by ERLDC and publishes the weekly "Deviation Settlement Account"/22/ on http://www.erpc.gov.in. This information is considered as the final approved generation data of any power plant and is to be used for billing and payments. - It is assessed that this deviation is applicable from the start date of the current monitoring period i.e. 1st June 2012. - Actual Generation Data published by ERLDC on daily basis is the actual generation. - The VVB has also visited the ERLDC website and confirmed the mechanism by downloading the recent available "Deviation Settlement Account"/22/.
Verification Team Opinion
• The deviation proposed by the PP was accepted by the VVB since the monthly JMR is not available for the project activity. The exported electricity is in turn sourced from "Deviation Settlement Account document"/22/ which are publicly available documents issued by the 'Northern Regional Power Committee," Ministry of power; Government of India entity, as already assessed above. The source was therefore found acceptable. • In addition, the invoices/14/ provided by the PP did not conform the export values. The project being a hydro project the invoices/14/ are based on scheduled energy. The actual energy exported varies from the scheduled amount, this information gets reflected in the "Deviation Settlement Account records"/22/. Therefore, the cross-check document to "Deviation Settlement Account records" /22/ will be generation data. Since NHPC Ltd is a government of India enterprise and the documents contains generation details of all its projects it is fair to assume it a credible source. • Based on the above, assessment team confirm that the deviation does not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario, and the project remains in conformance with the applied methodology. • Lastly, the Deviation is accepted as it will not lead to over-estimation of emission reductions.

Deviation 02

2) In registered VCS PD, in the section 3.2, it is mentioned that "- The meters recording the electricity exported will be calibrated at least once 3 years". However, The Central Electricity Authority (CEA) notification regarding Installation and Operation of meters regulations, 2006, says that meters are required to be tested once in 5 years (refer clause 18 of the guideline). Thus, deviation is requested to change the calibration frequency from 3 years to five years

Reason for change

Application of the correct calibration frequency.

Verification Team Background Assessment

Calibration history from MP#1 to MP#3:
The VVB noted that previous verification has applied the calibration frequency as 03 years, however, the calibration was not performed at the frequency of 03 years, provisions of delayed calibration were applied.

Details of MAIN & CHECK METER for LINE -1

MAIN METER for LINE-1		CHECK METER for LINE-1	
Meter Serial No.	NP–5896–A	Meter Serial No.	NP–5895–A
Model	ER300P	Model	ER300P
Make	L&T	Make	L&T
Accuracy Class	0.2S	Accuracy Class	0.2S
Calibration	13/12/2010	Calibration	08/02/2014
Validity of calibration	12/12/2015	Validity of calibration	07/02/2019
Detail of Meter Change	NP–8716–A (meter changed on 24/12/14, verified based on the email trail issued by Powergrid Rangpo, GIS to the PP)	Detail of Meter Change	No Change

Details of MAIN & CHECK METER for LINE -2

MAIN METER for LINE-2		CHECK METER for LINE-2	
Meter Serial No.	NP–5898–A	Meter Serial No.	NP–5897–A
Model	ER300P	Model	ER300P
Make	L&T	Make	L&T
Calibration	13/12/2010, 08/02/2014	Calibration	08/02/2014
Validity of calibration	*12/12/2015,* 07/02/2019	Validity of calibration	07/02/2019
Detail of Meter Change	No Change	Detail of Meter Change	No Change

Based on the above assessment it was identified that the calibrations follow the requirements of "Central Electricity Authority (Installation and Operation of meters) Regulations 2006".

Provision of calibration based on PPA/10/:
The PPA/10/ snapshots are reproduced as below:

Status for other hydro plants by the same PP:
The VVB reviewed the other hydro power plants to compare if the application of 05 years calibration has been applied following the requirements of "Central Electricity Authority (Installation and Operation of meters) Regulations 2006":

Sr. No.	Title of project	PP	Calibration Frequency
1	Kishanganga Hydroelectric Project (1891)	NHPC Ltd	5 Years
2	Teesta Low Dam Project, Stage-IV (1423)	NHPC Ltd	5 Years
3	Parbati Hydroelectric Project, Stage III (1425)	NHPC Ltd	5 Years

Verification Team Opinion

1. Provision of calibration based on PPA/10/: Provisions of PPA/10/ confirms that there is no specific calibration frequency, however, the PPA/10/ refer to the CEA guidelines for calibration.
2. Status for other hydro plants by the same PP: The same PP has applied the calibration frequency of 05 years follows basis of "Central Electricity Authority (Installation and Operation of meters) Regulations 2006" which is traceable and realistic. Thus, the consideration of 05 years calibration frequency is further corroborated.
3. Based on the above, assessment team confirm that the deviation does not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario, and the project remains in conformance with the applied methodology.

The VVB concludes that calibration frequency of 05 years id following the host country requirements and thus it will not compromise the QA / QC requirements.

Deviation 03

In the registered VCS PD, section 1.15, it has been mentioned that "Emergent Ventures India Pvt Ltd" is another project participant. However, the "Emergent Ventures India Pvt Ltd" was the project consultants for the validation of the project and not the project participant. The project "TEESTA- V HYDRO POWER PROJECT IN SIKKIM" with project ID 766 has only one Project Proponent, i.e., NHPC Limited. The same is presented in the Registration Deed of Representation and previous year's Issuance Deed of Representation on the Verra website[1]. As per section 1.4 of the MR, "Core CarbonX Solutions Private Limited", is the other entity involved since Core CarbonX Solutions Private Limited was appointed as the consulting company (Other entity) for the verification of the project for the period 01-June-2012 to 31-March-2018 by the PP "NHPC Limited" (Contract No: GEMC-511687703033765, dated 29.09.2021 between NHPC Limited and Core CarbonX Solutions Private Limited). Thus, deviation is requested to change the other entity from "Emergent Ventures India Pvt Ltd" to "Core CarbonX Solutions Private Limited".

The deviation does not have any impact on the applicability of the methodology, additionality or appropriateness of the baseline scenario.

Reason for change

Clarifying the name of the other entity involved in the project

Verification Team Background Assessment

Assessment team has reviewed the approved VCS PD and MR. It was noticed that the company name "Emergent Ventures India Pvt Ltd" is included in the VCS PD. However, it's role was not

[1] https://registry.verra.org/app/projectDetail/VCS/766

specified. Based on the local expertise, assessment team is able to confirm that the entity is a consultant involved in the project at the time of validation. Further, it was confirmed that the Project Proponent is NHPC Limited as per the publicly available deed document. Further, during the current monitoring period, the new entity "Core CarbonX Solutions Private Limited" included in section 1.4 of the MR and the same was confirmed based on the provided contract document. Thus, assessment team is able to confirm that the entity ""Emergent Ventures India Pvt Ltd" is not involved in the project and the new entity "Core CarbonX Solutions Private Limited" is involved in the project.
Verification Team Opinion
Based on the above, assessment team confirm that the deviation does not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario, and the project remains in conformance with the applied methodology.

Therefore, the team concludes that there is no other deviations in the project which may affect the applicability of methodology, additionality or the appropriateness of the baseline scenario and the project is in compliance with the applied methodology.

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 Teesta Hydro electric project - Stage V is a run of the river scheme connected to the NEWNE grid. Stage V of the Teesta River project has installed a capacity of 510 MW (3×170 MW turbines). The power house is located near Singtam (about 4 km upstream of the confluence of Rongnichu with Teesta). The dependable discharge available throughout the year has been assessed as 60 cumecs and gross head available is 216.73 m; for the installed capacity of 510 MW.

The project consists of concrete gravity dam across river Teesta with a 17.2 km long head race tunnel and an underground power housing three generating units of 170 MW capacity each. The Teesta HE projects Stage V is a run of the river scheme and will be producing energy to be absorbed into the Eastern region, part of the NEWNE grid at the time of commissioning of the plant/11/, earlier there were two regional grid distribution systems in India vis-à-vis Southern regional Grid or North East West North Eastern regional grid (NEWNE). These two regional grids are integrated as single Indian Grid. The project consists of 96.45 m high concrete gravity dam across river Teesta with a 15 km long head race tunnel and an underground power housing three generating units of 170 MW capacities each. The three tail race tunnels are D-shaped and length of 135 m and 6 m wide. The penstock is of vertical pressure shaft type.

The commissioning details of the project are as follows/11/:

Project Name	Unit No.	Turbine Capacity	Location	Commissioning Date
Teesta-V Hydro Power Project in Sikkim by NHPC Limited, India	i	170 MW	Sikkim	10 April 2008
	ii	170 MW		25 February 2008
	iii	170 MW		03 April 2008

The commissioning details/11/ were verified form the commissioning certificate/11/, the date of commercial operation/11/ has been considered the start date of the project crediting period and also the current monitoring 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 PD.
b) VVB has conducted the desk review of documents and referred to the earlier verification reports (where the site visit was performed) to confirm the implementation status of the project.
c) The commissioning date/11/ of the project activity was found to be accurately and consistently recorded.
d) The monitoring plan in terms of the installed monitoring equipment and monitoring systems in inline with the PD in terms of compiling and analyzing the monitored data and parameters, with the

exceptions to the assessed and validated deviations (process and schedule for obtaining and recording) regarding the to the established monitoring plan,

e) The actual operation of project activity was found to be in compliance with the description provided in registered PD.
f) There was no increase in emission reduction from estimates made in registered PD, 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 any other form of environmental credit, or has become eligible to do so since validation or previous verification (refer the Appendix-5).
i) The project has implemented the activities that result in the SD contributions described in the monitoring report.
j) The audit history table included under the MR is accurately reported.
k) There was no deviation approved during the last verification

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 VCS-PD, section 5. Environmental Impact and corresponding Validation 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/25/, 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. The VVB also confirmed during the interviews/25/ 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 feed back 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. 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 VCS PD and MR.
Findings	CL 02, CAR 05 and CAR 06 was raised on this section and closed successfully. Please refer Appendix 2 for further details.
Conclusion	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 2.0). Formula Used: BEy,electricity - baseline emissions in year y (tCO_2) EGPJ,y – Net electricity supplied to the grid by the project activity during year Y (MWh) EFgrid,CM,y – The grid CO2 emission factor in year y ($t\ CO_2/MWh$) Ex-ante parameters: The baseline emission factors are taken ex-ante in line with the registered VCS PD as well as cross checked with section validation report/2/,/19/ and found correct. Combined margin CO_2 emission factor (EFgrid,CM,y) is equal to 0.803 tCO_2/MWh. The calculation approach was in line with the VCS PD. Values of ex-ante parameters are as follows: $EF_{OM,y}$= 1.008 tCO2/MWh "Tool to calculate the emission factor for an electricity system", version 2.0 as 3-year generation weighted average using data for the years 2005-2006, 2006-2007 & 2007-2008. The data are obtained from "CO2 Baseline Database published by CEA, Version 04, published by the Central Electricity Authority, Ministry of Power, Government of India. Verification team checked the VCS PD and confirms that value reported in MR and ER is correct. $EF_{BM,y}$= 0.597 tCO_2/MWh (Calculated as per "Tool to calculate the emission factor for an electricity system", version 2.0"). The data is obtained from "CO2 Baseline Database for Indian Power Sector", Version 04, published by the Central Electricity Authority, Ministry of Power, Government of India. Verification team checked the VCS PD and confirms that value reported in MR and ER is correct.

	EFy= EFgrid,CM,y= 0.803 tCO_2/MWh The combined margin emissions factor is calculated as follows: EFgrid,CM,y= EFgrid,OM,y* WOM + EFgrid,BM,y* WBM Where: EFgrid,BM,y = Build margin CO_2 emission factor in year y (tCO2/MWh) EFgrid,OM,y = Operating margin CO_2 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 0.803 tCO2/MWh. Verification team checked the VCS PD and confirms that value is correct. EGPJ,y - Total Net Electricity exported to NRPC (MWh): This is calculated value based on monitored data of export, Import and transmission losses. The meter reading of the electricity exported/imported to and from the grid is undertaken with the help of provisions of the "Deviation Settlement Account Document"/22/ in line with applied deviation. The details of meter are provided in Section 4.5 of this report. Meters are calibrated by Electrical Research and Development Association (ERDA) – (Accredited by the National Accreditation Board for Testing and Calibration Laboratories, Govt. of India). as per calibration frequency i.e., once in five years. During the current monitoring, the net electricity supplied to grid by the project activity is 14,665,380 MWh. The same has been verified with the Deviation Settlement Account Document/22/ prepared by NRPC. Also, the monthly Deviation Settlement Account Document/22/ are cross checked and found consistent. PP has considered the actual net electricity supplied by the project activity to grid as per Deviation Settlement Account Document/22/ (MWh) on monthly basis for ER calculations. EGExport - Quantity of Electricity exported by the project to the grid at project site switch yard in year y (MWh) EGImport - Quantity of Electricity imported by the project from the grid at interconnection point of the Regional Supply in year y (MWh) The electricity export and Import has been measured continuously by bi-directional (Trivector) main and check energy meters of accuracy class 0.2s. The readings are recorded every month on Deviation Settlement Account Document/22/ which has been signed by the PP representative and NRPC official. The details of meters are as follows: As per applied methodology ACM0002: Grid-connected electricity generation from renewable sources --- Version 10 and the registered VCS PD, 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 10 and VCS PD Leakage emissions are not considered for the project activity.

Details of MAIN & CHECK METER for LINE -1

MAIN METER for LINE-1		CHECK METER for LINE-1	
Meter Serial No.	NP–5896–A	Meter Serial No.	NP–5895–A
Model	ER300P	Model	ER300P
Make	L&T	Make	L&T
Accuracy Class	0.2S	Accuracy Class	0.2S
Calibration	13/12/2010	Calibration	08/02/2014
Validity of calibration	*12/12/2015*	Validity of calibration	07/02/2019
Detail of Meter Change	NP–8716–A (meter changed on 24/12/2014, verified based on the email trail issued by Powergrid Rangpo, GIS to the PP)	Detail of Meter Change	No Change

Details of MAIN & CHECK METER for LINE -2

MAIN METER for LINE-2		CHECK METER for LINE-2	
Meter Serial No.	NP–5898–A	Meter Serial No.	NP–5897–A
Model	ER300P	Model	ER300P
Make	L&T	Make	L&T
Calibration	13/12/2010, 08/02/2014	Calibration	08/02/2014
Validity of calibration	12/12/2015, 07/02/2019	Validity of calibration	07/02/2019
Detail of Meter Change	No Change	Detail of Meter Change	No Change

There is no delay in the calibration of the installed meters. There was no change or error in the installed main meters (Line1, Line 2), except for meter NP–5896–A which was replaced by NP–8716–A (meter changed on 24-12-2014, verified based on the email trail issued by Powergrid Rangpo, GIS to the PP). All the readings during applied monitoring period were sourced from the main meter except for meter NP–5896–A where the check meter readings were utilized during changeover. The readings from the check meter in case of fault / changeover / malfunction is allowed as per PPA/10/ and documented as part of the registered monitoring plan. Thus, all the data readings are taken from the main meter or check meter and inline with the registered monitoring plan.

During the verification all relevant monitoring parameters (as listed in section 3.3 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, 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 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. Baseline emissions are calculated as follows: BEy = EGPJy X EFgrid,CM,y BEy - baseline emissions in year y (tCO2) EGPJy – Quantity of electricity that has been displaced by the project activity (MWh) EFgrid,CM,y - Combined Margin CO2 emission factor in year y (Where EGPJy= EGPJy,electricity) EGPJy,electricity = 14,665,380 MWh EFgrid,y = 0.803 tCO2/MWh BEy,electrcity = 14,665,380 MWh * 0.803 tCO2/MWh = 11,776,268 tCO2 (rundown) Hence, ERy = BEy – PEy -Ly = 11,776,268 tCO2 – 0 - 0 = 11,776,268 tCO2e Verification team confirms that • The monitoring has been carried out in accordance with the monitoring plan contained in the registered VCS PD and the applicable deviations. • 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 PD. • The quality of external backup evidences was satisfactory (refer section 4.5 below for details) • The manual transfer of the “EGPJ,y” can deemed as accurate after addressing all the errors as identified under CAR 06. • Assessment team confirmed that the GHG emission reductions and removals have been quantified correctly in line with the registered VCS PD. • It is confirmed that overall GHG emission reductions and removals have been quantified correctly in accordance with the project description, deviations and applied methodology (refer closure of all the raised findings).

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 and outlined in the registered PD/01/ and monitoring methodology/07/.
	Monitoring equipment	Tri-vector Energy Meters of 0.2s accuracy class.
	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.
	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 (Based on approved deviation)
	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?	Deviation was applied to inline the calibration frequency with the Central Electricity Authority (Installation and Operation of meters) Regulations 2006 which specifies the calibration frequency as 05 years. Please refer section and deviation request assessments for details.
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Yes, the calibration is conducted by a certified agency/15/.
	Is(are) calibration(s) valid for the whole reporting period?	The parameter is a calculated parameter. The details of the calibration of monitoring equipment's calibration frequency have been provided under the respective parameter section.

	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Yes, the parameter is a calculated parameter. 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 Deviation Settlement Account Document/22/ and the data was found comparable. The value obtained for the parameter is 14,665,380 MWh.
	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 ERLDC website (http://www.erpc.gov.in) by punching in data on a daily basis. This is called Declared Generation (DG). 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/22/ 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 06.	
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/07/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan and avails the reliable source of the external evidence for the determination of GHG emission reductions or removals. The implementation of the information flow from data generation and aggregation, to recording, calculation and final transposition into the monitoring report is as per the registered PD and applied deviation (confirmed by the verification team during audit assessment). The project description also updated the calibration frequency of monitoring equipment to the realistically implementable calibration frequency and approved the same as part of its validation. There was no delay in the calibration of installed meters. The emission reduction calculation for the project activity is estimated based on the electricity generated by the hydropower plant. and result in 11776268 tCO_2e of emission reductions.	

Parameters fixed ex ante - Values were taken from the PD. Refer corresponding assessment under section 4.4 of this report above.

During the remote audit, the team visited the metering locations through the virtual tour using the internet. It was found all the energy meters accuracy class as 0.2s including the replaced meter for the main meter of Feeder 1. ; therefore, there is no change in the accuracy class of the meters. The details of the equipment monitoring electricity exported have been provided below:

Sr. No.	Meter	Meter Identification Number	Meter Model & Make	Accuracy Class	Additional comment
1.	Main meter Feeder 1	NP-5896-A	ER300P & L&T	0.2s	The main meter of Line 1 with the serial number NP-5896-A was replaced with the meter with serial number NP-8716-A with the accuracy class of 0.2S due to the meter being faulty on date 24/12/2014. -
2.	Main meter Feeder 1	NP-8716-A	ER300P & L&T	0.2s	
3.	Check meter Feeder 1	NP-5895-A	ER300P & L&T	0.2s	-
4.	Main meter Feeder 2	NP-5898-A	ER300P & L&T	0.2s	-
5.	Check meter Feeder 2	NP-5897-A	ER300P & L&T	0.2s	-

All the meters were calibrated on 08-02-2014 at the time of installation by the L&T itself. The calibration for these meters is valid for five years i.e. 07-02-2019 and therefore cover the entire monitoring period./115/

Assessment team has reviewed the revised MR and found PP has updated section 3.1 and Appendix II of the MR. It is to be noted, there are main and check meters for each location. Thus, if main meter does not function check meter reading will be taken into consideration. Assessment team has reviewed the energy meters and confirm that all the energy meters are functioning well and were calibrated and the details are provided in Appendix II of the MR. It was found one main meter (S. No: NP-5896-A) was replaced with another meter number (S. No : NP-8716-A) as the old meter (S.No : NP-5896-A) was found faulty. Further, the meter replacement related communication record/26/ indicated that the replacement was completed within one hour. As stated above, during the replacement duration of 1 hour the readings of the check meter were considered. Thus, it is to be noted there is break in the continuous measurement of the energy generation data. Hence, assessment team opines that the provided energy meter data is credible, accurate, verifiable and reliable.

4.6 Non-Permanence Risk Analysis

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

5 VERIFICATION OPINION

Applus+ Certification has been engaged by NHPC Limited to perform the verification of the "Teesta-V Hydro Power Project in Sikkim by NHPC Limited, India." The management of project participant 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 registered VCS PD and the approved methodology ACM0002: Grid-connected electricity generation from renewable sources --- Version 10.

Our verification approach was based on the requirements as defined under the Kyoto Protocol[23], Marrakesh accord, as well as those defined by the CDM Executive Board and VCS standard, version 4.4. 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 registered project document;
- The monitoring plan is as per the applied methodology;
- The monitoring process in Monitoring Report is as per the registered PD and the applied deviation;
- The development and maintenance of records and reporting procedures are in accordance with the Deviation request (for supporting documents) 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 and subsequently validated Deviations.

Monitoring period: From 01 June 2012 to 31 March 2018 (first and last date included).
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)
01-01-2012 to 31-12-2012	*1228265*	*0*	*0*	1228265
01-01-2013-31-12-2013	*1868174*	*0*	*0*	1868174

01-01-2014 to 31-12-2014	*1879336*	*0*	*0*	1879336
01-01-2015 to 31-12-2015	*2099439*	*0*	*0*	2099439
01-01-2016 to 31-12-2016	*2234566*	*0*	*0*	2234566
01-01-2017 to 31-12-2017	*2264214*	*0*	*0*	2264214
01-01-2018 to 31-03-2018	*202274*	*0*	*0*	*202274*
Total	**11776268**	**0**	**0**	**11776268**

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 11,776,268 tCO_2e which is 1.29% lower than the estimated emission reduction 11,930,579 tCO_2e (2,044,442 tCO_2e/ 365 days x 2,130 days) during this monitoring period. The changes are due to seasonal variation in wind flow pattern which is not in control of PP. The project activity is otherwise operated according to its description in registered PD and no changes observed during the monitoring period.

Year	Ex-ante emissions reductions/removals	Achieved emissions reductions/removals	Percent difference	Justification for the difference
01/06/2012 - 31/12/2012	1198659	1228265	+2.5%	Within 10% of estimation
01/01/2013 - 31/12/2013	2044442	1868174	-8.6%	Lower than estimated value
01/01/2014 - 31/12/2014	2044442	1879336	-8%	Lower than estimated value
01/01/2015 - 31/12/2015	2044442	2099439	+2.7%	Within 10% of estimation

01/01/2016 - 31/03/2016	2050043	2234566	+9%	Within 10% of estimation
01/01/2017 - 31/12/2017	2044442	2264214	10.74%	Higher than 10% of estimation, However the PLF is beyond the PP's control
01/01/2018 - 31/03/2018	504109	202274	-0.60%	Too short period for comparison for the power plant.
Total	**11930579**	**11776268**	**-1.29%**	**Lower than estimated value**

APPENDIX I: REFERENCES

<table>
<tr><th>Sr. No.</th><th>Title of Document</th><th>Version</th><th>Date</th></tr>
<tr><td>1.</td><td>Registered VCS PD</td><td>-</td><td>24/12/2009</td></tr>
<tr><td>2.</td><td>VCS Validation Report (Voluntary Carbon Standard 2007.1)</td><td>-</td><td>23/02/2010</td></tr>
<tr><td>3.</td><td>VCS Monitoring Report (Filling Form & Guidelines)</td><td>4.2</td><td>-</td></tr>
<tr><td>4.</td><td>VCS Monitoring Report</td><td>1.0</td><td>21/07/2022</td></tr>
<tr><td>5.</td><td>VCS Monitoring Report
VCS Monitoring Report</td><td>7.0
5.0</td><td>30/01/2024
07/09/2023</td></tr>
<tr><td>6.</td><td>VCS ER spreadsheet (corresponding to the final monitoring report)</td><td></td><td></td></tr>
<tr><td>7.</td><td>VCS website for project information https://registry.verra.org/app/projectDetail/VCS/766</td><td>-</td><td>-</td></tr>
<tr><td>8.</td><td>ACM0002: ‘Grid-connected electricity generation from renewable sources’ Methodology</td><td>10</td><td>-</td></tr>
<tr><td>9.</td><td>VCS standard, version 4.4</td><td>4.4</td><td>-</td></tr>
<tr><td>10.</td><td>Power purchase agreement signed between PP and various states</td><td>-</td><td>-</td></tr>
<tr><td>11.</td><td>Date of commercial operation -01/04/2008
Commissioning certificates for the project activity confirming below schedule
<table>
<tr><th>Unit No.</th><th>Turbine Capacity</th><th>Location</th><th>Commissioning Date</th></tr>
<tr><td>i.</td><td>170 MW</td><td rowspan="3">Sikkim</td><td>10/04/2008</td></tr>
<tr><td>ii.</td><td>170 MW</td><td>25/02/2008</td></tr>
<tr><td>iii.</td><td>170 MW</td><td>03/04/2008</td></tr>
</table></td><td>-</td><td>-</td></tr>
<tr><td>12.</td><td>Weekly Deviation Settlement Account statements for the project activity for the current monitoring period.</td><td>-</td><td>-</td></tr>
<tr><td>13.</td><td>Monthly generation report issued by NHPC Limited.</td><td>-</td><td>-</td></tr>
</table>

14.	Deviation Settlement Account Statement (entered by PP as part of the ER worksheet)	-	-
15.	Calibration certificates for the export meters used in the current monitoring period.	-	Refer Section 4.4 of this report.
16.	CEA database, version 04	-	For the entire monitoring period.
17.	General project information http://www.nhpcindia.com/Default.aspx?id=186&lg=eng&CatId=1&ProjectId=14	-	For the entire monitoring period.
18.	For verification of Deviation Settlement Account. https://cercind.gov.in/2014/regulation/noti132.pdf	-	For the entire monitoring period.
19.	Voluntary Carbon Standard 2007.1 Verification Report	Ver 1.1	For the entire monitoring period.
20.	Central Electricity Regulation Commission Notification No. L-1/132/2013/CERC (http://www.cercind.gov.in/2014/regulation/noti132.pdf)	-	Last accessed on 22/05/2018
21.	Last Issuance	-	-
22.	Monthly Deviation Account statements compared and rectified as pert of the audit process addressing the findings	-	-
23.	Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1	-	-
24.	Verification contract between the Applus+ Certification and the PP for the monitoring period 01-June-2012 to 31-March-2018	-	-
25.	Interviews between the PP and the Assessment Team (Remote, telephonic, video conferencing and email as applicable)	-	-
26.	Email communication on Feeder 1- main meter replacement Pictures of all the energy meters operational at site during the current monitoring period.		Dated 24/12/2014

27.	Contract (No : GEMC-511687703033765) between NHPC Limited and Core CarbonX Solutions Private Limited		Dated 29/09/2021

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 registered VCS PD section 1.15, the contact information is relating to the Chief Engineer R&D Division, NHPC Limited Sector-33, Faridabad 121 003 Haryana, India Fax: +91-129-2277941 However, the stated information differs in section 1.3 of the submitted MR. Clarification is required.				
Project participant response				**Date:** 20/04/2023
The contact information in the section 1.3 of the submitted MR has been revised.				
Documentation provided by project participant				
The revised MR is submitted as Annex 1.				
VVB assessment				Date: 23/04/2023
Received the revised MR and the information is found consistent. Finding is CLOSED.				

CL ID	02	Section no.	3.2.1	Date: 10/04/2023
Description of CL				
1. Confirmation is required whether the existing/ current energy meters were in usage since the time of registration/commissioning date are still utilized for the export of the electricity. 2. Whether the electricity import readings are deducted from the Export readings 3. Furthermore, clarification is required for considering the monthly grid reports (issued by ERLDC), whereas the lower of the electricity generation values out of the two statements (ERLDC and ERPC) were found considered during the last issuance to determine the total energy supplied by the Project activity to the grid.				
Project participant response				**Date:** 20/04/2023

1.	Of the four meters present, one main meter of Line 1 has been replaced due to the meter being faulty in 2014. The rest of the meters are still existing and the calibration certificates of the same have been provided. The meter replacement certificate has been provided for the same.
2.	The readings taken are the net energy generation readings. The import, auxiliary consumption and losses are deducted and then the final values are taken into consideration from the meters.
3.	ERPC (Eastern Region Power Committee) settles the energy accounts on a weekly basis based on daily generation data published by ERLDC and publishes the weekly "Deviation Settlement Account"/22/ on http://www.erpc.gov.in This information is considered as the final approved generation data of any power plant and is to be used for billing and payments. Actual Generation Data published by ERLDC on daily basis is the actual generation. Hence, only data published by ERPC is considered as the final one.

Documentation provided by project participant	
The meter replacement certificate is submitted as Annex 3.	
VVB assessment	**Date**: 23/04/2023
1. Meter replacement trailing mail is found in the submission Annex 3. However, from the submitted document Annex 3 it is clear that the main meter of Line 1 (NP-5896-A) has been changed by (NP-8716) on 24-12-2014. Furthermore, the PP has submitted photographs of the installed meters which clearly shows that meter NP-8716 is installed at the site and operating. FINDING IS CLOSED.	
2. The VVB noted that the ERPC (Eastern Region Power Committee) settles the energy accounts on a weekly basis based on daily generation data published by ERLDC (taking due account of any imports as applicable) and publishes the weekly "Deviation Settlement Account"/22/ on http://www.erpc.gov.in. FIDING IS CLOSED.	
3. Explanation is accepted, The VVB reviewed the process of “Deviation Settlement Account"/22/ and noted that the same is derived based on the plant generation. Thus, further action is not required. FIDING IS CLOSED.	

Table 2. CAR from this verification

CAR ID	01	**Section no.**	1.1	**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. The Title of project activity” “Teesta –V Hydro Power project in Sikkim by NHPC Limited, India” is inconsistently reported throughout MR and shall be updated all over the MR.				
Project participant response				**Date**: 20/04/2023

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 title of the Project activity has been corrected throughout the MR.	
Documentation provided by project participant	
The revised MR is submitted as Annex 1. The revised ER sheet is submitted as Annex 2.	
VVB assessment	**Date**: 23/04/2023
Received the revised MR and found the information consistent. Finding is CLOSED.	

CAR ID	02	**Section no.**	1.11	**Date:** 10/04/2023

Description of CAR

1. The PP 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"

The section 1.11 of MR is not filled by appropriately complying with below requirements.

Requirement	Disclosure under table 1 Sustainable Development Contributions	Description of non-Conformance
Activities implemented during previous monitoring periods shall not be described in this report. Where no activities were implemented during the monitoring period, state as such.	4.4.1 Information and communications technology (ICT) skills- This initiative completed during 2020-21	The activity is beyond applied MP
	6.2.1 Proportion of population using (a) safely managed sanitation services and (b) a hand washing facility with soap and water 2019 (MOU signed on 23.10.2019	
	Indicator: Access to quality affordable and essential healthcare- implemented during COVID-19	
	Indicator: Access to quality affordable and essential healthcare	
	Indicator: Access to quality affordable and essential healthcare	Date of implementation unclear

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**: 20/04/2023
1. The demonstration of contribution to SDGs has been included in the section 1.11 of the revised MR. 2. The SDG activities corresponding to the current monitoring period only have been taken into consideration and the activities taken place beyond the monitoring period have been removed. 3. The evidence of the project's SD contributions has been included in the Appendix III of the revised MR.
Documentation provided by project participant
The revised MR is submitted as Annex 1. The revised ER sheet is submitted as Annex 2.
VVB assessment **Date**: 23/04/2023
Received the revised MR and found the same consistent. Finding is CLOSED.

CAR ID	03	**Section no.**	1.7	**Date**: 10/04/2023
Description of CAR				
Refer section 1.7 of MR, the map location is inconsistent with the registered PD.				
Project participant response				**Date**: 20/04/2023
The map in the section 1.7 of the MR has been corrected and updated in line with the registered VCS PD.				
Documentation provided by project participant				
The revised MR is submitted as Annex 1.				
VVB assessment				**Date**: 23/04/2023
Received the revised submission as Annex 1 and found the map location consistent. Finding is CLOSED.				

CAR ID	04	**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 VISta Program, but is completing a VCS Program verification without also completing a CCB or SD VISta 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:** 20/04/2023
As the Project has not been previously certified to the CCB or SD VISta 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
The revised MR is submitted as Annex 1. The revised ER sheet is submitted as Annex 2.
VVB assessment **Date:** 23/04/2023
The explanation is accepted. Finding is CLOSED.

CAR ID	05	**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" is inconsistent as it stated calibration frequency as once in five years whereas as per VCS PD it is at least once in three years. Furthermore, the last verification was concluded on date 08/02/2014, thus considering the 03 years of calibration frequency the credits can be claimed till the end date of its validity (refer para 366 and 367 of CDM validation and verification standard for project activities, Version 03.0). The Monitoring Report is not clear 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				
Project participant response				**Date:** 20/04/2023
In registered VCS PD, in the section 3.2, it is mentioned that "- The meters recording the electricity exported will be calibrated at least once 3 years". However, The Central Electricity Authority (CEA) notification regarding Installation and Operation of meters regulations, 2006, says that meters are required to be tested once in 5 years (refer clause 18 of the guideline). Thus, the deviation is requested to change the calibration frequency from 3 years to five years. Hence, the calibration done on 08/02/2014 is valid for this monitoring period.				
Documentation provided by project participant				
MR				

VVB assessment	Date: 23/04/2023
Deviation is accepted please refer para 3.3 of this report for detailed assessment. Finding is CLOSED.	

CAR ID	06	Section no.	ER worksheet, MR	Date: 10/04/2023

Description of CAR

Findings in MR and ER worksheet (ER Sheet 766-CCX.xlsx)

a) Inconsistency between MR and Calibration Certificate

1. Energy meter serial numbers are given for 4 meters (NP-5895A, NP-5896, NP-5897, NP-5898) in MR (Appendix II Meter Calibration details, page no.28) whereas in Annex 2 -Calibration Certificate (page no.1) there are 7 Energy meters (NP-5895A, NP-5896A, NP-5897A, NP-5898A, NP-5899A, NP-5900A, NP-5901A), request to update

b) Inconsistency between ER Worksheet (ER Sheet tab) and Annex 2 - Actual Generation

2. Inconsistencies in Actual Generation values between ER Sheet and Annex 1 Generation Data, request to update:

Monitoring Period		Actual Generation (MU) in ER Sheet	Actual Generation in Annex 1 Generation Data
From	To		
01-06-2012	30-06-2012	323.83	294.2
01-08-2012	31-08-2012	341.39	332.8
01-09-2012	30-09-2012	273.7	269.8
01-10-2012	31-10-2012	187.22	185.6
01-11-2012	30-11-2012	42.23	46.1
01-12-2012	31-12-2012	75.85	61.2
01-01-2013	31-01-2013	55.73	50.7
01-02-2013	28-02-2013	46.23	36.8
01-03-2013	31-03-2013	101.06	96.8
01-04-2013	30-04-2013	158.57	156.9
01-05-2013	31-05-2013	314.15	307.3
01-06-2013	30-06-2013	333.68	331.5
01-07-2013	31-07-2013	305.99	295.2

01-08-2013	31-08-2013	365.7	360.6
01-09-2013	30-09-2013	301.07	297.4
01-10-2013	31-10-2013	230.04	227
01-11-2013	30-11-2013	121.13	119.6
01-12-2013	31-12-2013	48.89	46.7
01-01-2014	31-01-2014	3.91	3.8
01-03-2014	31-03-2014	89.7	91
01-04-2014	30-04-2014	153.43	143.6
01-05-2014	31-05-2014	297.55	250.5
01-06-2014	30-06-2014	336.67	330.8
01-07-2014	31-07-2014	361.63	368.7
01-08-2014	31-08-2014	365.91	372.3
01-09-2014	30-09-2014	365.32	372.6
01-10-2014	31-10-2014	198.56	197.8
01-11-2014	30-11-2014	130.36	116.9
01-12-2014	31-12-2014	99.74	92.4
01-01-2015	31-01-2015	80.04	61.7
01-09-2016	30-09-2016	120.1	366.6

Project participant response	**Date**: 20/04/2023

a) The calibration certificates corresponding to the meter numbers given in the MR are updated.
b) The inconsistencies in the energy generation values have been addressed and correct values have been updated.

Documentation provided by project participant
The calibration certificates corresponding to the meter numbers given in the MR are submitted as Annex 3

VVB assessment	**Date**: 23/04/2023

Actual Generation values are now corrected and consistent with Actual Generation in Annex 1 Generation Data. 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	Remote site inspection[2]	Interview(s)	Joint validation and 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) / Technical Expert (TE)	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 out GHG audits in the aforementioned schemes. Mr.

[2] Remote Assessment was performed.

Srikanth Meesa is based at Hyderabad, India. Mr. Srikanth Meesa participate in the project's technical review 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
CO2	Carbon dioxide
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
ERLDC	Eastern 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
VCS PD	VCS Project Description
VCUs	Voluntary Carbon Units
VVB	Validation Verification Body

APPENDIX 5: DECLARATION BY PP

एन एच पी सी NHPC

आज़ादी का अमृत महोत्सव

स्वच्छ भारत
एक कदम स्वच्छता की ओर

एन एच पी सी लिमिटेड
(भारत सरकार का उद्यम)
NHPC Limited
(A Government of India Enterprise)

फोन/Phone : _____

संदर्भ सं./Ref. No. : NH/VCS/EDM/383

दिनांक/Date : 11.05.2023

TO WHOMSOEVER IT MAY CONCERN

This declaration is in reference to the VCS Project activity titled **TEESTA - V HYDRO POWER PROJECT IN SIKKIM BY NHPC LIMITED, INDIA** for the monitoring period of 01-June-2012 to 31-March-2018.

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-2012 to 31-March-2018.

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)
सैक्टर–33, फरीदाबाद / Secto-33, Faridabad

पंजीकृत कार्यालय : एन एच पी सी ऑफिस कॉम्पलैक्स, सैक्टर-33, फरीदाबाद - 121 003, हरियाणा (भारत)
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