

50 MW Sipansihaporas Hydro Power Plant, North Sumatra



Document Prepared By: KBS Certification Services Pvt. Ltd.

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Prepared By	KBS Certification Services Pvt. Ltd.
Contact	Registered Office: 414-424, Om Shubham Tower, Neelam-Bata Road, N.I.T., Faridabad-121001, Haryana India. Contact us at: Tel.: +91-129-4034513, 4054513, 403513, Fax: +91-129-4035139. Webpage: www.kbsindia.in.
Approved By	Kaushal Goyal, Managing Director
Work Carried Out By	Team Leader: Chetan Swaroop Sharma (TA 1.2) Local Expert: Yenni Sembiring Technical Reviewer: Sanjay Kandari (TA 1.2)

Summary:

KBS Certification Services Pvt. Ltd. has been contracted by, “South Pole Carbon Asset Management Ltd.” to undertake independent 1st periodic verification and certification (**Corresponding to 2nd crediting period**) for the greenhouse gas (GHG) emission reductions reported from ‘50 MW Sipansihaporas Hydro Power Plant, North Sumatra’ for the monitoring period 01/04/2016 to 30/04/2017 in the initial monitoring report version 01 date 25/08/2017, with regard to the relevant requirements of VCS Standard Version 3.7.

The primary objective of the project activity was to harness the hydro energy for generation of renewable electricity and exporting power to the PT. PLN grid, thereby displacing fossil fuel dominated electricity generation of the Sumatra regional grid of Indonesia.

The proposed project activity 50 MW Sipansihaporas Hydro Power Plant, North Sumatra is a new run-of-river type hydro power plant with total installed capacity of the project is 50 MW; it comprises 2 turbines of 33 MW and 17 MW turbines respectively. The project is connected to the grid through an existing 150 kV single circuit transmission lines, which is being operated from Sibolga substations; the length of the new lines from each power station to the substation is 7.8 km and 0.9 km respectively. The project is owned and developed by PT. PLN (Persero), a state-owned electricity company. The project supplies electricity to the connected Sumatra grid which will replace the equivalent electricity supplied by the Indonesian National grid dominated by the fossil fuel-fired power plants.

The project activity has been implemented as described in the VCS PD /19/.

The project area of the Sipansihaporas Hydropower Plant is situated in North Sumatra Province at about 344 km south of Medan city as the capital city of North Sumatra province and 12 km east of Sibolga as the capital city of Tapanuli Tengah district.

The exact location to Sipansihaporas Hydropower Plant:

Power Station	North Latitude	East Longitude
Sipansihaporas #1 power station	1.74058 N	98.86711 E
Sipansihaporas #2 power station	1.72882 N	98.84018 E

The project was validated and registered with reference no. 486 under VCS (Verified Carbon Standard) program. This is the 1st periodic verification (corresponding to the 2nd crediting period) of this project which covers the period from 01/04/2016 to 30/04/2017 (including both the days). The project is verified against the VCS Version 3. The verification is based on the monitoring plan of registered VCS Project Description document (VCS PD) /19/, requirements of VCS (VCS Standard and VCS Program Guide of VCS Version 3) and CDM Validation and Verification Standard for project activities /23/.

The methodology applied for the project to estimate the GHG emission reduction is ACM0002 – “Large-scale Consolidated Methodology: Grid-connected electricity generation from renewable sources”, version 17 /22/.

The verification is based on the VCS PD, proof of title, proof of right, additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and supporting documents made available to the verification team by project proponent.

Monitoring report (MR)/2/, Emission reduction calculation spread sheet (ER sheet)/4/, Project Description document (VCS PD)/19/ and other supporting documents have also been made available to the verification team.

A risk based approach has been followed to perform the verification of the project activity. In the course of verification, 02 Corrective Action Requests (CAR) and 00 Clarification Request (CL) have been raised. All the CARs and CLs have been closed out successfully.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the period 01/04/2016 to 30/04/2017 based on the reported emission reductions in the final monitoring report Version 2.0 dated 14/02/2018 for the same period.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, KBS planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.

As a result of the verification, the verifiers confirm that the GHG emission reduction in the verification period from 01/04/2016 to 30/04/2017, including both the days, is **187,259 tCO₂e**.

KBS confirms the following;

Reporting period: 01/04/2016 to 30/04/2017 (including both the days)

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)
2016 (01/04/2016 to 31/12/2016)	141,893.00	0	0	141,893.00
2017 (01/01/2017 to 30/04/2017)	45,366.00	0	0	45,366.00
Total	187,259.00	0	0	187,259.00

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1 INTRODUCTION

1.1 Objective

KBS has been commissioned by 'South Pole Carbon Asset Management Ltd.' to perform verification of its registered VCS project '50 MW Sipansihaporas Hydro Power Plant, North Sumatra', for the reported GHG emission reductions for the given monitoring period 01/04/2016 to 30/04/2017 (both dates included). The VCS projects must undergo an independent third party verification and certification of emission reductions as the basis for issuance of Verified Carbon Units (VCUs).

The objectives of this verification exercise are, by review of objective evidence, to establish that:

- The project activity has been implemented and operated as per the project description (PD) and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- Monitoring report and other supporting documents are complete;
- The data is recorded and stored as per the monitoring methodology and approved monitoring plan.
- To confirm that the monitoring system is implemented and fully functional to generate Verified Emission Reductions (VERs/VCUs) without any double counting, and
- To establish that the data reported are accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation.

1.2 Scope and Criteria

The verification scope is defined as an independent and objective review of monitoring report, VCS project description (VCS PD), including the monitored data and other relevant documents made available to verifier and information collected through performing interviews during on-site assessment of the project activity.

The project is assessed against the requirements of VCS standard version 3.7 and related rules and guidance. KBS has, based on the recommendations in the latest version of Verified Carbon standard, and employed a rule-based approach (as criteria) in the verification, focusing on the identification of significant reporting rules and the reliability of project monitoring.

The aspects to be covered under the purview of verification are:

- Ensure that the project activity has been implemented and operated as per the registered VCS PD and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place as per the documents provided by the client and on-site visit;
- Ensure that the monitoring report and other supporting documents provided are complete
- Ensure that the practiced monitoring system and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved CDM methodology;
- Evaluate the data recorded and stored are as per the monitoring methodology.

1.3 Level of Assurance

- ☒ Reasonable level of assurance

1.4 Summary Description of the Project

The project activity consists of 2 numbers of Hydro Energy Generators. The starting of commercial generation/ export of electricity by the project activity (to the grid) is on and from 21/02/2002 (=Unit 2) (=VCS starting date) /08/.

Points no. 3 of section 3.8.5 “Renewal of Project Crediting Period” of VCS Standard Version 3.7 21/06/2017 /24/ requires that *“The updated project description shall be validated in accordance with the VCS rules. In addition, the project shall be validated against the (current) scope of the VCS. Such validation report shall be issued after the end of the (previous) project crediting period but within two years after the end of the (previous) project crediting period.”*

This is a VCS registered project and the validation of this project is completed on 31/10/2017 i.e. within 2 years after the end of previous crediting period (1st crediting period: 01-Apr-2006 until 31-Mar-2016) as per the date of validation statement provided by KBS Certification Services Pvt. Ltd. to the project proponent /20/ which is treated as validation completion date. Hence, this project activity fulfils the above VCSA requirement.

The starting date of this project activity is 21 October 2002 /08/ as per the commissioning certificate of unit 2. As per the section 3.11.1 “Project and Program Ownership” of VCS Standard under VCS Version 3.7, requirements with respect to evidencing proof of “Project and Program Ownership” the validated document i.e. commissioning order /08/ is matching with the evidencing proof *“Project ownership arising or granted under statute, regulation or decree by a competent authority.”*, i.e., the right of PP to use the ERs arises due to this project activity provided by PT. PLN (Persero) through commissioning certificate. Hence, it fulfils the definition of Project and Program Ownership with evidencing proof /08/.

As per the registered PDD /19/, proposed project activity '50 MW Sipansihaporas Hydro Power Plant, North Sumatra' is a new run-of-river type hydro power plant which is owned and developed by PT. PLN (Persero), a state-owned electricity company. Further the Sipansihaporas project has the main dam and waterway which is situated in the downstream of the confluence of the three tributaries upstream of the Sipansihaporas River, which are Sarumanggita river, Natolbak river and Bargot river. The water flows from Sipansihaporas River with total catchment area of 196 km² for power station no. 1, and 210 km² for power station no. 2, with a yearly average flow of 28,5 m³ /sec and the total installed capacity of the project is 50 MW, comprised of 2 turbines of 33 MW and 17 MW turbines respectively. The project is connected to the grid through an existing 150 kV single circuit transmission lines, which is being operated from Sibolga substations; the length of the new lines from each power station to the substation is 7.8 km and 0.9 km respectively, which supplies electricity into the Sumatra grid and replaces the equivalent amount of electricity which would have been supplied by the Indonesian National grid, which is mainly dominated by the fossil fuel-fired power plants. Unit 2 was commissioned on 21/10/2002 /08/ and Unit 1 was commissioned on 14/12/2004 /08/. The verification team has cross checked the same by referring the commissioning certificates /08/ during the site visit and found to be appropriate. The verification team confirms that all the components of the project activity as stated in the PD are in place and were in operation. Furthermore, the verification team verified the technology and confirms that the technology is not substituted. It is also confirmed that the commissioning date is same as the actual operational date of the plant. It was also noted that the plant has operated normally throughout the monitored period.

The emission reduction for the reported monitoring period is based on net electricity exported 215,923 MWh to North Sumatra regional grid interconnected with the Sumatra grid of Indonesia. The validated ex-ante grid emission factor (=0.869 tCO₂e/MWh) /19/ of Sumatra grid is applied for the calculation of baseline emission and emission reduction for this monitoring period. The applied CDM methodology is ACM 0002 (version 17). The net electricity exported by the project activity is calculated as the difference of the export and import electricity figures, both of which are recorded in the joint meter reading reports i.e. JMRs. The export / import electricity is measured continuously at the respective single metering locations for the project activity, which served as dedicated meters. There is only one dedicated meter at the 11kV side of the substation for the monitoring of the electricity exported and electricity imported to the grid for the project activity.

The dedicated meters at the 11 kV side of the sub stations are of tri vector type and are in the custody of PT. PLN Transmission Unit. These continuous meters provide cumulative readings in kWh and were calibrated before installation by PT. PLN Transmission as per the Indonesian national regulations and also subjected to periodic checking and testing. The reading of dedicated meters (registered in JMR) is used for commercial invoicing and the given emission reduction calculation.

Project crediting period is from 01/04/2016 to 31/03/2026 (2nd crediting period), hence the monitoring period selected for 1st periodic verification i.e. 01/04/2016 to 30/04/2017 is within the crediting period.

The total emission reduction for the 1st verification period from 01/04/2016 to 30/04/2017 is 187,259 tCO₂e. The emission reduction is calculated conservatively as per the applied methodology.

2 VERIFICATION PROCESS

2.1 Method and Criteria

The verification process was carried out in line with the requirements VCS Version 3. In addition, the verification team followed the guidelines of the CDM Validation and Verification Standard. Standard auditing techniques and KBS's CDM Procedures were also applied during the verification. A risk-based approach was followed to carry out verification and access all the factors and concerns that relate to the issuance of emission reductions from a project activity.

They include:

- Identification of all the sources contributing to the baseline emissions, project emissions and emission reductions.
- Authenticity of the provided data is checked.
- A risk based analysis is carried out to ensure a clear and transparent assessment. The risks involved in this process are mainly with the informational flows and data recording.

KBS follows a risk based verification approach, wherein a desk review of the project documentation is undertaken, which is followed by an onsite visit by the members of verification team. The verification protocol is filled by the verification team that is based on standard auditing practices and VCS requirements. The verification protocol provides transparent means to record the observations by the verification team members and the non-conformities, if any. The verification protocol is an internal document, and available on request.

Duration of Verification:

Verification Contract	17/08/2017
On site verification	26/09/2017
Findings raised	29/09/2017
Draft Verification Report	18/11/2017
Final Verification Report	14/02/2018

2.2 Document Review

A desk review is undertaken, involving but not limited to,

- A review of the data and information presented to verify their completeness;
- A review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures;
- 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 list of document reviewed is included in the Appendix 2: 'References'

2.3 Interviews

The site visit for this verification assessment was undertaken by Chetan Swaroop Sharma (Team Leader and Technical Expert (TA 1.2)). Summary of on-site activities are mentioned below;

Dates	26/09/2017
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Key points discussed	Name of persons interviewed, Designation, Organization
• General aspects of the project • Project equipment operation and technical details • Changes since validation • Monitoring and measurement equipment • Remaining issues from previous verification • Calibration procedures • Quality management system • Involved personnel and responsibilities • Training and practice of the operational personnel • Implementation of the monitoring plan • Monitoring data management • Data uncertainty and residual risks • GHG calculation • Maintenance	Augga Pramukti, Health and Safety, PT. PLN (Persero) Dike Satya L.P, Administration, PT. PLN (Persero) Radiyan P.R, Health and Safety, PT. PLN (Persero) Rachtvatheriandi, Administration, PT. PLN (Persero) Roy Zona Kaban, Operation, PT. PLN (Persero) Fajor, Unit Manager, PLN Sipansihaporas Leonardo Sidabalok, Project Manager, South Pole Carbon Asset Management Limited

2.4 Site Inspections

A site visit is undertaken by members of verification team, involving but not limited to,

- An assessment of the implementation and operation of the project activity as per the registered VCS PD;
- A review of information flows for generating, aggregating and reporting the monitoring parameters;
- Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the approved monitoring plan;
- A cross-check between information provided in the monitoring report and data from other sources such as plant log books, inventories, purchase records or similar data sources;
- A check of the monitoring equipments including calibration performance and observations of monitoring practices against the requirements of the registered VCS PD and the selected methodologies/22/;
- A review of calculations and assumptions made in determining the GHG data and emission reductions;
- 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.

2.5 Resolution of Findings

KBS applies the risk based approach aimed at focusing on high risk issues to the verification results whilst not omitting any part of the mandatory processes. A few discrepancies were found during the verification and the verification report was submitted to the project proponent, indicated under the titles corrective action requests (CARs) and clarification requests (CLs). CARs and CLs require the PP to take relevant actions. Criteria for judging items as CAR or CL are as follows:

Corrective action request (CAR):

- the project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions
- the Verified Carbon Standard's requirements have not been met, or
- there is a risk that emission reductions cannot be monitored or calculated.

Clarification request (CL):

- Information is insufficient or not sufficiently clear to determine whether the applicable VCS requirements have been met.

FARs is to be raised to highlight issues related to project implementation that require review during the first verification of the project activity. FARs does not relate to VCS requirements for registration/issuance.

CARs and CLs are to be resolved or closed out if the PP modifies the project description, rectifies the MR or provides adequate additional explanations or evidence that satisfies the concerns. If this is not completed, the project activity cannot be recommended for issuance under VCS registry.

The monitoring report was revised addressing the CARs & CLs issued by KBS. After reviewing the revised and resubmitted MR/02/; resolving the CARs & CLs raised and outstanding concerns, KBS issues this final verification report and opinion.

02 CAR and 00 CL were found during verification and closed satisfactorily. The list of CARs/CLs raised and the response provided, the means of verification, reasons for their closure and references to correction in the MR are provided in appendix 4 of this report. The revised MR with changes incorporated as per the issues raised were rechecked with the documentary evidences and found to be inline.

2.5.1 Forward Action Requests

No FAR was raised during this monitoring period.

2.6 Eligibility for Validation Activities

KBS has a valid UNFCCC accreditation in the sectoral scope from UNFCCC.

3 VALIDATION FINDINGS

Refer above section.

3.1 Participation under Other GHG Programs

The project is already registered under VCS program. It has been confirmed by the project participant that the VERs will be claimed only from the VCS programme. The same is also mentioned in the section 1.9 of the final MR /02/.

3.2 Methodology Deviations

The verification team confirms that the registered VCS PD complies with the requirements in the applied monitoring methodology ACM0002 – “Large-scale Consolidated Methodology: Grid-connected electricity generation from renewable sources”, version 17. Therefore, no methodology deviations are applied during the monitoring period.

The verification team confirms that no deviations were observed during the current monitoring period.

3.3 Project Description Deviations

There is no project description deviation in the project activity during present monitoring period.

3.4 Grouped Project

The project is not a grouped project. Therefore this section is not applicable.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity involves installation and operation of two vertical shaft type Francis turbines with total capacity of 50 MW in stages and starting of commercial generation / export of electricity (to the grid) on and from 21/10/2002 (=Unit 2) (=VCS starting date) and 14/12/2004 (=Unit 1).

During the monitoring period the project activity has delivered a total of 215,923¹ MWh of electricity and thus the total baseline emission comes to 187,637 tCO₂e.

¹ The value is before the correction factor applied for the delayed calibration.

It was verified in the course of this verification that the actual project activity was implemented in accordance with the VCS PD.

The reporting /02/, /04/ is in line with the requirements of the validated monitoring plan /19/ as well as with the applied methodology ACM 0002, Version 17 /22/. The monitoring plan is also found in accordance with the approved methodology applied by this VCS project activity.

The reporting procedures reflect the requirements of the monitoring plan of VCS PD /19/. The monitoring parameters are recorded as per the monitoring plan. The JMR (Joint Meter Reports) provides the meter readings of export and import electricity in kWh on the day of reading taken jointly mostly once in a month, on the starting day of monthly billing cycle and hence the starting date of billing cycle of the subsequent is the end date of billing cycle of the previous month. The exported electricity and imported electricity for a particular period as reported in the MR are derived from the joint meter readings difference of the current month and previous month with the multiplication of the CT-PT multiplication factor. The net electricity exported from the project activity to the grid at the joint metering point (= commercial metering point) for a given period is calculated based on the difference of exported electricity and imported electricity.

During the course of verification, the resultant net electricity figure of PT PLN statements /15/ was checked by verifying original data registered in JMR and applying the same approach of calculation as explained above and found reproducible. The net electricity figures as reported in the MR and in the statements are found consistent. The same was also cross checked by the verification team against the invoices /05/ raised on a monthly basis by PP to Transmission Unit and found it consistent and correct both in Monitoring report and VER spread sheet. The net electricity figure in the JMR forms the basis of emission reduction calculation.

All the dedicated meters for the project activity are trivector digital Watt-hour type and of serial no. 36027177 and 36027137. The accuracy class of all the dedicated meters is 0.2s. These meters are used to measure the electricity export and import on continuous basis. The Joint meter reading is considered for the calculation electricity supplied by PT PLN Transmission unit.

None of the meters have been changed or reset during the reported monitoring vintage. No abnormality was found in the metering.

All the physical components and project boundary are in conformity with the description in registered VCS PD. On the basis of the on-site visit and the reviewed project documentation, the verification team confirms that the project was implemented and operated as described in the registered VCS PD/19/.

Ownership and other programs:

The PP declared that the project is not registered any other mechanism apart VCS. Thus emission reductions generated by project will be solely claimed by PP and PP has right of use and hence accepted. Net GHG emission reductions or removals generated by this project will not be used for compliance with an emissions trading program or to meet binding limits on GHG emissions as the host country i.e. Indonesia is not a participant in any emission trading programs or nor does it have any binding limits.

PP will not claim the carbon credits under any other GHG emission reduction scheme for the crediting period under VCS and PP has provided declaration on the same during the validation. Hence there is no possibility of double counting. Apart from VCS, it has neither applied nor been rejected under any other GHG program.

From the document review and onsite verification, it is confirmed that all the monitoring parameters were monitored in accordance with the registered monitoring plan /19/ during the monitoring period. Following are the details of monitoring in accordance with the monitoring plan of the registered VCS PD:

Monitored Parameter	Assessment/Observation
Data / Parameter: (as in monitoring plan of the VCS PD):	EG _{PD,y}
Data unit:	kWh (kilo Watt hour)
Description:	Net electricity supplied to the grid by the project activity during the year 'y'
Source of data used:	Source: Joint Meter Reading. Net electricity supplied to the grid by the project activity i.e. export minus import which are monitored by the main meter (i.e. accuracy level 0.2s) and has a function as a bi-directional kWh meter. Also, main meter can calculate the net exports electricity (i.e. export electricity-import electricity) value automatically in the meter itself. The exported and imported electricity is monitored hourly and recorded monthly. The meter Reading has been taken on the 1st day of every month from the main meter and PP has generated invoices on the same reading. Further, there is generation and auxiliary meters are installed at plant, and same meter values will be considered for invoice purpose when main meter is not in operation. According to the monitoring plan of the project activity mentioned in VCS-PD /19/, the energy meters will be calibrated according to the national regulation. The Ministry of Energy and Mineral Resource's regulation number 37 dated 27/11/2008 /16/ on the Grid Code Sumatra Electricity Power System mentioned that the calibration of kWh meter must be done every 5 (five) years, as stated in the Metering Code section, MC 4.1.1 (Test after metering code commissioning, page 138). The Calibration of the main meter is done at once in five years by Laboratorium Kalibrasi - PT. PLN (Persero) Penelitian dan Pengembangan Ketenagalistrikan /07/. The agency has authority for testing and calibration of the metering equipments and the same has been verified during site audit. Also, there is no change in the any main meters of the project activity during present monitoring period.
Means of verification/Comments:	The values in the CER spread sheet /04/ and monitoring report /02/ have been verified from the JMR /15/ which contains the values of export and import electricity.
Cross-check	The values of the calculation sheet have been cross checked with sales electricity receipts /05/.

Remaining Issues from Validation or Previous Verification:

The verification team has reviewed validation report for the 2nd crediting period and found that there is no remaining FAR to be addressed during this monitoring period.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

The value of the emission reductions depends on the net electricity exported by the project activity.

The baseline emissions are based on the net electricity supplied by the project activity. Project emission and Leakage emission are zero as per methodology and registered VCS PD /19/. Therefore the Emission Reduction equals to baseline emission.

The emission factor used for ER calculation is fixed ex-ante as mentioned in the registered VCS PD /19/ as 0.869 tCO₂/MWh. The net electricity figures used for ER calculation are the net actual electricity figures during the monitoring period based on JMR.

The total net electricity exported during the monitoring period is 215,923 MWh. The baseline emission factor has been fixed ex-ante as 0.869 tCO₂e/MWh based on the Indonesian DNA published data (registered PD) /19/. Based on the net electricity supplied and the emission factor the baseline emissions are 187,259 tCO₂e.

Moreover, during the on-site visit document review of calibration reports /07/, it was found that the calibration of the main meter at the transaction point were delay for which maximum correction factor has been applied for the for the whole monitoring period conservatively and hence accepted by the verification team. As the calibration results for the calibration done after the monitoring period is within the accuracy class hence applying the maximum correction factor for the delayed months is conservative and hence accepted. After applying the correction factor, net electricity exported during the monitoring period is 215,490 MWh.

The calibration, accuracy class, make of dedicated meters for the reported monitoring period is summarized below:

S. No.	Meter Number /15/	Make of meter	Accuracy Class /07/	Calibration Date /07/	Calibration result
1	36027177	ACTARIS SL7000	0.2s	14/04/2010 to 14/04/2015 09/01/2018 to 09/01/2023	Within accuracy level Within accuracy level
2	36027137	ACTARIS SL7000	0.2s	14/04/2010 to 14/04/2015 10/01/2018 to 10/01/2023	Within accuracy level Within accuracy level

The verification team has reviewed the emission reduction (ER) spread sheet and checked all the formulae and found they are correct and inline with the monitoring plan of the registered VCS PD and the applied monitoring methodology.

The following are the ex-ante parameters used in the ER calculation which are in compliance with registered VCS PD/19/:

Parameter	Description	Value	Unit
EF _{grid,CM,y}	Grid Emission Factor of Sumatra	0.869	tCO ₂ /MWh

The detailed emission reduction calculation is presented in the ER spread sheet/04/. All the formulae and the calculation procedure were checked by the verification team. It was observed that the emission reduction was determined in a conservative manner.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

Proper data management inclusive of data acquisition and aggregation, data management system is being followed for the project activity.

All records needed for monitoring are archived in line with the requirements of the VCS PD. No significant, lack of evidence and missing data were detected during on-site verification.

It is evident from the monitoring data that the monitoring system ensures for continuous operation. All internal data are subjected to QA/QC measures and has proper procedures for data handling. Project proponents, themselves are conducting the annual maintenance hence responsible for data recording in log sheet and shut down maintenance of the project activity. The personnel from project proponent daily check the data recorded by operators and providing for archiving purpose.

The monitoring personnel at site are well trained and follow reproducible routines. Thus, they are competent to carry out the relevant tasks with sufficient accuracy. All necessary monitored and measured raw data were checked during on-site verification.

The calibration, accuracy class, make of dedicated meters for the reported monitoring period is summarized below:

S. No.	Meter Number /15/	Make of meter	Accuracy Class /07/	Calibration Date /07/	Calibration result
1	36027177	ACTARIS SL7000	0.2s	14/04/2010 to 14/04/2015 09/01/2018 to 09/01/2023	Within accuracy level Within accuracy level
2	36027137	ACTARIS SL7000	0.2s	14/04/2010 to 14/04/2015 10/01/2018 to 10/01/2023	Within accuracy level Within accuracy level

As the calibration of the main meter at the transaction point was delayed hence maximum correction factor has been applied for the for the whole monitoring period conservatively and hence accepted by the verification team.

Management and Operational System:

The allocation of responsibilities is documented in a written form and is followed as described in the VCS PD. Routines for the archiving of data are defined and documented. Calculations are laid down in the monitoring report is in line with VCS PD.

The overall authority of the project site belongs to project proponent. The joint meter readings are noted in presence of officials from plant personnel and the PT PLN Transmission unit mutually.

All internal data are subjected to QA/QC measures. All monitored data are archived in Physical and Electronic form. The data will be kept for the whole crediting period and additional 2 years as given in the VCS PD.

The monitoring report satisfies the calibration procedure followed the calibration/testing frequency for the Main Meter.

4.4 Non-Permanence Risk Analysis

Not Applicable to the project activity

5 SAFEGUARDS

5.1 No Net Harm

The project activity has no potential negative environment and social-economic impacts. Assessment team confirms it based on its on-site visit, document review and local & sectoral expertise.

5.2 Local Stakeholder Consultation

The local stakeholder consultation meeting for the project activity has been conducted on project site on 17/09/2004 and the process was validated during the registration of project activity under VCS. VCS validation report verified to confirm the same. The PP had invited identified stakeholders well in advance. The stakeholder meeting process is described in the section 6 of the registered VCS PD in detail. Further the verification team has interviewed the local stakeholders during the on-site visit for this verification and could not found any negative impact out of the project activity.

6 VERIFICATION CONCLUSION

KBS Certification Services Pvt. Ltd. has been contracted by 'South Pole Carbon Asset Management Ltd.' to undertake independent 1st periodic verification (Corresponding to 2nd crediting period) and certification for the greenhouse gas (GHG) emission reductions reported from "50 MW Sipansihaporas Hydro Power Plant, North Sumatra", for the monitoring period 01/04/2016 to 30/04/2017 (including both the days).

The verification is based on the registered VCS PD and the monitoring report for this project activity. Our verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakech accord, as well as those defined by the CDM Executive Board and the VCS Standard Version 3.7.

The management of the 'PT. PLN (Persero)' and "South Pole Carbon Asset Management Ltd." is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project Final Monitoring Report Version 2.0 and dated 14/02/2018. The calculation and determination of GHG emission reductions from the project is the responsibility of the management of 'PT. PLN (Persero)' and "South Pole Carbon Asset Management Ltd.". The development and maintenance of records and reporting procedures are in accordance with the Monitoring Report Version 2.0 and dated 14/02/2018.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the period 01/04/2016 to 30/04/2017 based on the reported emission reductions in the Final Monitoring Report Version 2.0 dated 14/02/2018 for the same period.

As a result of the verification, the verification team confirms that:

- All operations of the project are implemented and installed as planned and described in the project description.
- The monitoring system is in place and functional.
- The installed equipment essential for generating emission reductions runs reliably.
- The GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, KBS planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.

Verification period: From [01-04-2016] to [30-04-2017]

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)
Year 2016	141,893.00	0	0	141,893.00
Year 2017	45,366.00	0	0	45,366.00
Total	187,259.00	0	0	187,259.00

Location: Faridabad
Date: 14/02/2018



Authorized Signatory: Kaushal Goyal
Designation: Managing Director
KBS Certification Services Pvt. Ltd.

APPENDIX 1: ABBREVIATIONS

Abbreviations	Full texts
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CL	Clarification request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DOE	Designated Operational Entity
EB	Executive Board
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
MP	Monitoring Plan
MR	Monitoring Report
PD	Power Density
PP	Project Participant
QA/QC	Quality Assurance / Quality Control
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCSA	VCS Association
VCS PD	VCS Project Design document
VCU	Verified Carbon Unit

VVB	Validation & Verification Body
VVS	Validation And Verification Standard

APPENDIX 2: REFERENCES

S. No.	Name of document	date
/1/	Draft Monitoring Report	Version 01, dated 25/08/2017
/2/	Final Monitoring Report	Version 2.0, dated 14/02/2018
/3/	Draft ER sheet	Version 01, dated 25/08/2017
/4/	Final ER sheet	Version 2.0, dated 14/02/2018
/5/	Sales electricity receipts issued by the PLN transmission unit covering the monitoring period.	-
/6/	"Tool to calculate the emission factor for an electricity system",	Version 05
/7/	All Calibration / testing reports during the reported monitoring period	-
/8/	Copy of commissioning reports: Commissioning Certificate of Sipansihaporas Hydro Power Plant Unit 2: dated 21/10/ 2002. Commissioning Certificate of Sipansihaporas Hydro Power Plant Unit 1: dated 14/12/ 2004.	-
/9/	Single line electrical diagram of the project activity	-
/10/	Copies of Standard Operation Procedures for calibration, monitoring, metering and emergency preparedness.	-
/11/	Training records of O & M team during the reported monitoring period.	-
/12/	Technical specification of the turbine and generator	-
/13/	Operation and maintenance records of the power plant	-

/14/	Organization chart specific to the project activity	-
/15/	Joint Meter Readings covering the monitoring period	-
/16/	Sumatra System Grid Code – Metering code, Minister Energy and Mineral Resources Number 37	27/11/2008
/17/	Snap shots of the following 1. Equipments: Covering the equipment and corresponding nameplates under project boundary (all major equipments). 2. All the meters and measuring & testing equipment (including their specifications/nameplates).	-
/18/	Extract of Power Purchase Agreement (PPA) in particular metering, recording, meter readings, meter inspection, calibration / test and checking and communication.	-
/19/	Final VCS PD for the project: “50 MW Sipansihaporas Hydro Power Plant, North Sumatra” corresponding to the 2nd crediting period.	Version 03, dated 30/10/2017
/20/	Validation Report for the project “50 MW Sipansihaporas Hydro Power Plant, North Sumatra” issued by KBS Certification Services Pvt. Ltd. version 1.1, dated 31/10/2017 corresponding to the 2nd crediting period. “VCS VALIDATION DEED OF REPRESENTATION” was issued on 01/11/2017.	-
/21/	Document corresponding to 1st crediting period: Registered VCS PD, version 3 dated 10/11/2009. Validation Report for the project issued by RINA dated 18/11/2009.	-
/22/	Large-Scale CDM methodology Approved methodology, ACM0002 “Large-scale Consolidated Methodology: Grid-connected electricity generation from renewable sources”, version 17.0	-
/23/	CDM validation and verification standard for project activities	01.0
/24/	Validation and Verification Manual, v3.2	

	- VCS Program Guide, v3.7 - VCS Standard, v3.7 - Registration & Issuance Process, v3.8	
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APPENDIX 3: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

Personnel Name:		Chetan Swaroop Sharma	
Qualified to work as:			
Team Leader	☒	Technical Expert	☒
Validator/Verifier	☒	Financial Expert	☒
Technical Reviewer	☒	Local Expert (India)	☒
Area(s) of Technical Expertise			
Sectoral Scope	Technical Area		
Energy industries (renewable/non-renewable sources)	TA 1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar		
	TA 1.2: Energy generation from renewable energy sources		
Energy Demand	TA 3.1. Energy demand		
Waste handling and disposal	TA 13.1. Solid waste and wastewater TA 13.2. Manure		
Approved by (Manager C & T)	Sanjay Kandari		
Approval date:	01/05/2017		

Personnel Name:		Yenni Sembiring	
Qualified to work as:			
Team Leader	☐	Technical Expert	☐
Validator/Verifier	☐	Financial Expert	☐
Technical Reviewer	☐	Local Expert (Indonesia)	☒
Area(s) of Technical Expertise			
Sectoral Scope	Technical Area		
Not applicable	Not applicable		
Approved by (Manager C & T)	Gagandeep Kakkar		
Approval date:	31/12/2014		

Personnel Name:		Sanjay Kandari	
Qualified to work as:			
Team Leader	☒	Technical Expert	☒
Validator/Verifier	☒	Financial Expert	☒
Technical Reviewer	☒	Local Expert (India)	☒
Area(s) of Technical Expertise			
Sectoral Scope	Technical Area		
Energy Industries (renewable/non-renewable sources)	TA 1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar		
Energy industries (renewable/non-renewable sources)	TA 1.2: Energy generation from renewable energy sources		
Energy demand	TA 3.1. Energy Demand		
Waste Handling and Disposal	TA 13.1 Waste Handling and Disposal TA 13.2 Manure		
Approved by (Manager C & T)	Akhilesh Joshi		
Approval date:	11/12/2015		

APPENDIX 4: CLARIFICATION REQUESTS, CORRECTIVE ACTION REQUESTS AND FORWARD ACTION REQUESTS

Table 1. Remaining FAR from validation and/or previous verification

No FAR from previous verification

FAR-ID	xx	Section no.		Date: DD/MM/YYYY
Description of FAR				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

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Table 2. CL from this verification

No CL from this verification

CL ID	xx	Section no.		Date: DD/MM/YYYY
Description of CL				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

Table 3. CAR from this verification

CAR ID	01	Section no.	-	Date: 29/09/2017
Description of CAR				
In the section 1.1 of the MR /01/, PP needs to mention the technical details of the installed turbine and the generator under the project activity.				
Project participant response				Date: 31/10/2017
The technical details of the installed turbine and the generator under the project activity have been mentioned in the section 1.1 of the revised MR.				
Documentation provided by project participant				
171031_Sipansihaporas_2nd CP_1st ver_Monitoring Report_v1.1_Isa.docx				
DOE assessment				Date: 16/11/2017
Corrections have been done in the revised MR /02/ and found OK. Verification team has checked the mentioned technical details from the technical description document /12/ and found OK. Hence this CAR is closed.				

CAR ID	02	Section no.	-	Date: 29/09/2017
Description of CAR				
In the section 4.2.1 of the MR /01/, PP needs to justify each source of the project emission as per the applied methodology /22/ and the VCS PD/19/.				
Project participant response				Date: 31/10/2017
Each source of the project emission as per the applied methodology and the VCS PD has been justified in the section 4.2.1 of the revised MR.				
Documentation provided by project participant				
171031_Sipansihaporas_2nd CP_1st ver_Monitoring Report_v1.1_Isa.docx				
DOE assessment				Date: 16/11/2017
Corrections have been done in the revised MR and found OK. Hence this CAR is closed.				

Table 4. FAR from this verification

No FAR raised during this verification.

FAR ID	xx	Section No.		Date: DD/MM/YYYY
Description of FAR				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY