82 MW Lau Renun Hydro Power Plant North Sumatra.

TÜV Rheinland (China) Ltd.

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Summary:

South Pole Carbon Asset Management Limited (SP) has commissioned the TÜV Rheinland (China) Ltd. to carry out the verification of the project - "82 MW Lau Renun Hydro Power Plant, North Sumatra" with regard to the relevant requirements of VCS Version 3 Standard/VCSA Rules.

The project activity involves installation and operation of two vertical shaft type Francis turbines with total capacity of 82 MW in stages and starting of commercial generation / export of electricity (to the grid) on and from 14/08/2006 (=Unit 2) and 19/12/2006 (=Unit 1).

The project activity has been implemented as described in the VCS PD /B02/. The total installed capacity of the project activity during the monitoring period was 82 MW consisting of two vertical shaft type Francis turbines (2 X 41 MW).

The project activity is in continuous operation since commissioning of first Renun Hydro Power Plant Unit 2 on 14/08/2006 and is located in Northwestern part of Lake Toba in North Sumatera Province of Indonesia.

The emission reduction for the reported monitoring period is based on net electricity of 562,196 MWh exported to state grid interconnected with the Sumatra grid of Indonesia. The validated ex-ante grid emission factor (=0.743 tCO2e/MWh) /B02/ of Sumatra grid is applied for the calculation of baseline emission and emission reduction of this monitoring period.

The net electricity exported from the project activity is calculated as the difference of the electricity export figures {mentioned in the joint meter reports (JMR)} and the electricity import figures (mentioned in the JMR) derived from the continuously measured export and import electricity (by 2 way tri-vector meters) at the respective metering locations of each of the HTGs which served as dedicated meters from 01/04/2010 to 29/02/2012 period.

The joint meters at the 11 kV side of the sub stations are of tri vector type and are in the custody of PT. PLN (Persero). These continuous meters provide cumulative readings in MWh and were calibrated by PT. PLN as per the national regulation confirming the PPA provision and also subjected to periodic testing. The readings of dedicated meters (mentioned in the JMR) are used for commercial invoicing and also for the emission reduction calculations.

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 Methodology ACM 0002, Ver. 10: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" an approved methodology of UNFCCC CDM program is applied.

A risk based approach has been followed to perform this verification. In the course of the verification eight (08) CAR and one (01) CR were raised and successfully closed out.

The verification is based on documents registered by VCSA, i.e., VCS PD /B02/, monitoring report /P02/ and other supporting documents made available to the verification team by project proponent.

Based on the verification of the registered VCS PD /B02/, MR and other supporting documents, the verification team confirms that:

The verified GHG emission reduction in the reported monitoring period (01/04/2010 to 29/02/2012 period) for given project is 417,704 tCO_2e.

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1 INTRODUCTION

1.1 Objective

The purpose of this verification, by independent checking of objective evidence, is as follows:

- to verify that the project is implemented as described in the VCS registered PD /B02/;
- to confirm that the monitoring system is implemented and fully functional to generate Voluntary Emission Reductions (VERs/VCUs[1]) 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 of this VCS project is based on the VCS PD /B02/, monitoring report and supporting documents made available to the verifier and information collected through performing interviews during the on-site assessment. Furthermore publicly available information was considered as far as available and required.

The TÜV Rheinland (China) Ltd has employed a risk-based approach in the verification, focusing on the identification of significant risks and reliability of project monitoring and generation of emission reductions.

1.3 Level of assurance

The verification report is based on VCS PD /B02/, Validation report /B03/ and Monitoring report (/P01/, /P02/) with supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. The verification opinion is assured provided the credibility of all above.

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 14/08/2006 (=Unit 2) (=VCS starting date) /P11/.

Points no. 2.a(ii) of section 3.1.5 of VCS guidance document “Registration and Issuance Process” dated 08/03/2011 /B06/ requires that “*The approved GHG Program validation or VCS validation shall be completed or contracted before 19 November 2008. In relation to contracts entered into before 19 November 2008, the approved GHG program validation or VCS validation, as the case may be, shall be completed before 19 November 2009 (i.e., at least one or other of the validations shall be completed before 19 November 2009). Proof of contracting of the approved GHG program validation or VCS validation, as the case may be, prior to 19 November 2008 shall be provided in accordance with Section*

[1] As per VCS, Verified Emission Reductions (VERs) are considered to be VCUs only after successful registration in an approved VCU Registry.

3.2.6." This is a VCS registered project and the validation of this project is completed on 16/11/2009 i.e. before 19/11/2009 as per the date of validation statement provided by RINA S.P.A (Validator) to the project proponent /B03/ which is treated as validation completion date. Hence, this project activity fulfils the above VCSA requirement.

The starting date of this project activity is 14/08/2006 /P11/ as per the commissioning certificate of unit 2.

As per the section 3.12.1 "Proof of Title" of VCS Standard under VCS Version 3, the definition of "Proof of Title" and requirements with respect to evidencing proof of "Right of use" the validated documents of Proof of Title i.e. commissioning order /P11/ and purchase order /P11/, are matching with the evidencing proof for Right of Use "a right of use 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 Right of Use with evidencing proof /P11/.

The full capacity i.e. 82 MW (of the project activity) consisting of 2 numbers of HTGs were commissioned on 14/08/2006 (=Unit 2) and 19/12/2006 (=Unit 1) respectively i.e. commissioning date of last hydro electric generator. The project activity is located at Lake Toba, Northern Sumatra Province in Sumatra, Indonesia.

The emission reduction for the reported monitoring period is based on net electricity of 562,196 MWh exported to North Sumatra regional grid interconnected with the Sumatra grid of Indonesia. The validated ex-ante grid emission factor (=0.743 tCO_2e/MWh) /B02/ 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 10). The net electricity exported by the project activity is calculated as the difference of the export and import electricity figures, both of which are registered 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.

2 VALIDATION PROCESS, FINDINGS AND CONCLUSION

2.1 Validation Process

This is a VCS registered project (Project ID - 488), Validated by DOE “RINA S.P.A”. The contract of the DOE with the PP was entered on 07/09/2009 /P10/. The Validation statement was issued on 16/11/2009 /B03/.

2.2 Validation Findings

2.2.1 Gap Validation

Project is a VCS registered project (Project ID - 488), hence the Gap Validation is not applicable.

2.2.2 Methodology Deviations

No methodology deviation is applied to this project activity.

2.2.3 New Project Activity Instances

No new project activity instance is involved for the given project during this monitoring period. Hence this section is not applicable.

2.3 Validation Conclusion

This is a VCS registered project (Project ID - 488), Validated by DOE “RINA S.P.A”. The contract of the DOE with the PP was entered on 07/09/2009 /P10/. The Validation statement was issued on 16-11-2009 /B03/.

3 VERIFICATION PROCESS

3.1 Method and Criteria

The verification consists of the following steps:

- A desk review of the VCS PD /B02/, Validation report /B03/, Monitoring report and supporting documents with the use of the relevant sections of a customised protocol according to the VCS Version 3;
- A desk review of the Monitoring Report and additional supporting documents which were submitted by the client. The relevant sections of the above mentioned customised protocol according to the VCS Version 3 were used;
- Verification audit planning;
- On-Site assessment;
- Background investigation and follow-up interviews with personnel of the project developer; and
- Verification reporting (Draft Verification Report and Final Verification Report).

The criteria of this verification include the relevant rules and steps as set out in the VCS Version 3 and VCSA rules.

3.2 Document Review

The following table outlines the documentation reviewed during the verification:

Documents referred during the course of verification:

Reference	Documents
/P01/	Monitoring Report dated 03/04/2012 for the reporting monitoring period, Version 1.0.
/P02/	Monitoring Report dated 02/11/2012 for the reporting monitoring period, Version 3.0.
/P03/	Emission reduction calculation spread sheet (related to /P01/ and /P02/).
/P04/	1. Joint meter readings covering the monitoring period. 2. Sales electricity receipts issued by the PLN transmission unit. 3. Diesel purchase reports and DG set operation hours logbook.
/P05/	1. All Calibration / testing reports during the reported monitoring period. 2. Competency proof of the calibrating agency.
/P06/	Copy of commissioning reports of two 41 MW Hydro Turbine-Generators (2 X 41 MW = 82 MW).
/P07/	Extract of Power Purchase Agreement (PPA) in particular metering, recording, meter readings, meter inspection, calibration / test and checking and communication.
/P08/	Copies of Standard Operation Procedures for calibration, monitoring, metering and

	emergency preparedness.
/P09/	Training records of O & M team during the reported monitoring period.
/P10/	• Applicable statutory/regulatory/other clearances covering this monitoring period. • Validation Contract between the validating DOE and the PP
/P11/	Proof of title (= Right of use as per definition of VCS version 3 dated 08 March 2011) for the project activity (as per the validated VCS PD). 1. Commissioning order and 2. Purchase order
/P12/	Single line diagram showing the electricity generation and consumption for the project plant and grid interface for electricity export.
/P13/	Snap shots of the following 1. Equipments: Covering the equipment and corresponding nameplates under project boundary (all major equipment and auxiliary drives). 2. All the meters and measuring & testing equipment (including their specifications/nameplates). 3. Fuel handling systems. 4. Fuel storage area.
/P14/	1. Extract of operation and maintenance record of HTGs and DG sets. 2. Records of outage covering HTGs within this monitoring period. 3. Extract of manual of all the major equipment (HTGs, DG sets) and all meters/measuring instruments/devices clearly indicating their specifications/ technical details.
/P15/	Organization chart specific to the project activity.
/P16/	Proof of main meter reading on 1st day and end day of monitoring period i.e. the first and last Joint meter reading report for this monitoring period.
/P17/	VCS version 3 Verification contract dated on 24/08/2011.
/P18/	• Copy of ISO and OHSAS certificates along with VCS project activity management procedures. • Procedure to monitor the implementation of verified carbon standard (VCS) at Lau Renun HEPP unit
/P19/	Sumatra System Grid Code – Metering code, Minister Energy and Mineral Resources Number 37, 2008

Background investigation and assessment documents:

Reference	Documents

Reference	Documents
/B01/	Applied baseline and monitoring methodology for the VCS project activity, i.e., ACM 0002, Version 10.
/B02/	Final VCS PD for the project: "82 MW Lau Renun Hydro Power Plant, North Sumatra"
/B03/	• Validation Report for the project "82 MW Lau Renun Hydro Power Plant, North Sumatra" issued by RINA. • Validation statement was issued on 16/11/2009
/B04/	Monitoring Report for the project "82 MW Lau Renun Hydro Power Plant, North Sumatra" for the monitoring period 01/04/2009 to 31/03/2010.
/B05/	Verification Report for the project "82 MW Lau Renun Hydro Power Plant, North Sumatra" issued by RINA for the monitoring period 01/04/2009 to 31/03/2010.
/B06/	VCS Version 3; Program Guidelines; VCSA Rules; and VCS Guidance Document.
/B07/	CDM Validation and Verification Manual, Version 01.2
/B08/	ISO 14064-2: ISO 14064-3: ISO 14065
/B09/	GHG Protocol for Project accounting Chap 7

Websites used:

Reference	Link	Organisation
/W01/	http://unfccc.cdm.int	United Nations Framework Convention on Climate Change
/W02/	www.v-c-s.org	Voluntary Carbon Standard
/W03/	http://dna-cdm.menlh.go.id/id/database /DNACDM_Grid_Sumatera_JAMALI_2008	Indonesian DNA declaration of emission factor for Sumatra grid

3.3 Interviews

During the on site-visit, a number of persons were interviewed. Date of interview, interviewee are given in the following table.

Reference	Date	Name	Organisation / Function
/I01/	02/07/2012	Mr. Risman Sidauruk	Manager, PT PLN
/I02/	02/07/2012	Mr. Aron Yudho Supriady	Electrical Engineer, PT PLN
/I03/	02/07/2012	Mr. Muhammad Munzir	Turbine Engineer, PT PLN
/I04/	02/07/2012	Ms. Ratna Nawang Sari	Project Manager, South Pole Carbon

			Asset Management Ltd.
/I05/	02/07/2012	Mr. Leonardo Sidabalok	Assistant Project Manager, South Pole Carbon Asset Management Ltd.

3.4 Site Inspections

The DOE contracted by the Project participant South Pole Carbon Asset Management Limited has conducted on-site inspection in order to confirm all physical features of the project activity proposed in the registered VCS PD are in place and that the project participant has operated and correctly monitored all parameters of the project activity as per the registered VCS PD during this monitoring period, the verification team had visited the project site on 02/07/2012. The action items covered during the site visit include, but are not limited to.

- The on-site assessment included an investigation of whether all relevant equipments are installed and works as anticipated in the registered VCS PD.
- Assessment of any permanent changes in the project activity in comparison with the registered VCS PD /B02/.
- The operating staff was interviewed and observed in order to check the risks of inappropriate operation and data collection procedures.
- The on-site visit to check that the data recorded and stored as per the monitoring plan.
- Information flows for generating, aggregating and reporting the selected monitored parameters were reviewed.
- Check monitoring equipments including calibration performance.
- Cross-check the information provided in the MR documentation with other sources (raw data).
- The monitoring practices were checked to comply with the requirements of the Registered VCS-PD and the selected methodology.
- The data aggregation trails were checked via spot sample down to the level of the meter recordings.
- Calculations and assumptions made in determining the GHG data and emission reductions were reviewed.
- 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

3.5 Resolution of Any Material Discrepancy

Material discrepancies identified in the course of the verification are addressed either as CARs, CRs or FARs.

Corrective action requests (CARs) are raised, in case:

(a) Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
(b) Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
(c) Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

Requests for clarification (CRs) are raised, if information is insufficient or not clear enough to determine whether the applicable VCS Version 3 requirements have been met.

4 VERIFICATION FINDINGS

The findings of verification are summarised in table 4-1:

Table 4-1: Summary of CAR, CR and FAR issued

Verification topic (Cp VCS Version 3 Verification Report Template)	No. of CAR	No. of CR	No. of FAR
Project Implementation status (Sec 4.1).	03	----	----
Accuracy of GHG Emission Reduction or Removal Calculations (Sec 4.2).	03	----	----
Quality of Evidence to Determine GHG Emission Reductions or Removals (Sec 4.3).	02	----	----
Management and Operational System (Sec 4.4).	----	01	----
SUM	**08**	**01**	**----**

For an in depth analysis/evaluation of all CARs and CRs can be referred to the below sections from 4.1 to 4.4.

4.1 Project Implementation Status

The project activity involves installation and operation of two vertical shaft type Francis turbines with total capacity of 82 MW in stages and starting of commercial generation / export of electricity (to the grid) on and from 14/08/2006 (=Unit 2) (=VCS starting date) and 19/12/2006 (=Unit 1).

During the monitoring period the project activity has delivered a total of 562,196 MWh of electricity and thus the total baseline emission comes to 417,704 tCO_2e.

It was verified in the course of this verification that the actual project activity was implemented in accordance with the VCS PD. Nevertheless, the following CAR's and CRs are raised and successfully closed.

CAR/CR/FAR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
CAR 01 The MR is inconsistent and incomplete for following sections: 1. First page: The version of the MR and monitoring period report versions are not matching. PP needs to clarify the same. 2. Geo coordinates need to be in decimal format (up to four decimals) (section 1.1 and 1.7 of MR) 3. The date format in the MR should be according to the VCS filling guideline i.e. dd-month-yyyy. **4.** Section 3.3.2 needs to be addressed as per the filling guidelines.	MR	1. The MR has been corrected. 2. Geo coordinates have been provided in the decimal format (section 1.1 and 1.7 of MR). Revision has been accommodated in the revised MR 3. The date format in the MR has been revised to be inline with the VCS filling guideline. 4. Section 3.3.2 of the MR is revised to address the filling guidelines	Entire MR	1. The corrections have been done and found OK 2. The corrections have been done and found OK 3. Date format is corrected and found OK. 4. Revision in the MR found OK w.r.t. MR filling guidelines. Hence CAR is closed.

CAR/CR/FAR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
CAR 02 From the document review during the site visit, it was observed that commissioning date for the first unit is incorrect. Furthermore, PP needs to provide the commissioning certificate for both units installed in the project activity. (Section 1.5 of MR)	MR	Date of commissioning for the first unit has been corrected in the revised MR. The commissioning certificates for both units are provided to DOE.	1.5	Commissioning date is corrected i.e. 19/12/2006 in the MR and found OK. Commissioning certificates were provided to the verification team and the commissioning dates were confirmed from the issued certificates. Hence the CAR is closed.

CAR/CR/FAR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
CAR 03 During the on-site visit, it was observed that main meters installed at the project site are of 0.2s accuracy class. PP needs to correct the same in the revised MR section 3.2 Furthermore, PP needs to fill the tables for both parameters as per the guidelines.	MR	The main accuracy class has been corrected to be 0.2s. Revision is accommodated in the revised MR. The tables in the revised MR (Section 3.2) have been modified to be inline as per guidelines.	3.2	Revision of the MR is found to be appropriate with correct accuracy class of meters along with revision in tables as per the guideline. Hence the CAR is closed.

The reporting /P02/, /P03/ is in line with the requirements of the validated monitoring plan as well as with the applied methodology ACM 0002, Version 10 /B01/. 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 /B02/. 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 /P04-1/ 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 /P04-2/ 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. 36027216 and 36027222. 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 PTL Transmission unit.

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

4.2 Accuracy of GHG Emission Reduction or Removal Calculations

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

The baseline emission reductions are based on the net electricity supplied by the project activity. Leakage is zero as per meth and registered VCS PD /B02/. Therefore the Emission Reduction equals to baseline emission minus project emission.

During this monitoring period maximum consumption value (120 litres) available for one of these months for all the months of this monitoring period and accordingly the project emissions from diesel consumption is calculated /P04/. Since the same is conservative, verification team accepted. Please refer to closure of CAR-06.

The emission factor used for ER calculation is fixed ex-ante as mentioned in the registered VCS PD /B02/ as 0.743 tCO_2/MWh. The net electricity figures used for ER calculation are the net actual electricity figures during the monitoring period based on JMR. The methods of calculating the net exported electricity figure and checking the accuracy of the reported electricity figures in the MR are described in the section 4.1 of this report.

The total net electricity exported during the monitoring period is 562,196 MWh. The baseline emission factor has been fixed ex-ante as 0.743 tCO_2e/MWh based on the Indonesian DNA published data (Page 30 of the registered PD) /B02/. Based on the net electricity supplied and the emission factor the baseline emissions are 417,704 tCO_2e.

Moreover, during the on-site visit document review of calibration reports /P05/, it was found that the main meters at the transaction point were duly calibrated during this monitoring period.

CAR/CR/FAR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
CAR 04 Baseline emission calculations and project emission calculations are not corresponding to the evidences submitted to the verification team. PP needs to correct the same and submit the revised MR and ER sheet.	MR, ER sheet	Corrections have been made in the revised MR and ER sheet. The baseline emission calculation is determined based on the Joint Meter reading (JMR) and project emission is based on the DG set operation logbook.	3.2	Baseline emission calculations and project emission calculations are now corresponding to the evidences submitted with the revised MR and ER sheet. The value of ER has changed from 417,712 tCO_2e to 413,313 tCO_2e. Hence this CAR is closed.

CAR/CR/FAR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
CAR-05 As per the deviation done by the PP, running hours of the DG sets in the Renun HEPP has to be monitored by installing an instrument. However the same needs to be monitored during next verification.	FAR-1	For any new equipment installation, Renun unit has to request a proposal for the equipment installation to the head office. Since the requested new installation is not directly affected the electricity export to the grid, hence head office has not given their approval yet. Running hours of the DG sets is required to calculate the quantity of project emission from the fuel consumption. For the current monitoring period, the fuel consumption is recorded from the DG set operational logbook. The highest value recorded in the logbook is taken and applied for every months in the reported monitoring period, then converted to determine the emission. Since the current approach has given higher PE than the actual condition, it is considered as the most conservative approach rather than the PE calculation based on the operating hours recording.	3.2	DG set operating hours are clearly noted in the log book along with the amount of Diesel that was consumed per month. The same was checked from the purchase receipts of Diesel. As the highest value recorded in the log book has been taken. The same has been applied for every month in the reported monitoring period to determine the project emission. Since this approach gives higher PE than the actual condition, it is considered most conservative hence this CAR is closed.

CAR/CR/FAR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
CAR-06 It is noted that the electricity exported from the plant, Renun HEPP is also metered at substation, Sidikalang and Berastagi. The readings of the same are also recorded in the log book. Since the cross checking of the electricity supplied to the grid from the HEPP is done based on the meter at the substation, this meter needs to be calibrated at a frequency as per the Indonesian regulation or manufacturer whichever is less and the same needs to be checked during the next verification.	FAR-2	As per the registered MP, JMR is the value source and for cross checking mechanism, the sales receipts from Pandan sector who is the recipient party. The sales receipt is based on the jointly measurement by Pandan Sector and exporting unit (Lau Renun Hydro Power Plant). The DOE has verified the exported electricity value from respective JMRs, which are source value for ER calculation and the same was crosschecked with sales receipt issued from Pandan sector office.	3.2	The verification team has checked the registered monitoring plan and as per that JMR are the source for the exported electricity and the for the respective values of the month-wise exported electricity against the sales receipts from the Pandan sector office hence this CAR is closed.

4.3 Quality of Evidence to Determine GHG Emission Reductions or 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.

Dedicated meters are calibrated once every five year according to the national regulation. The Ministry of Energy and Mineral Resource's regulation number 37 dated 27/11/2008 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) /P19/.

During the last verification, South Pole was asked to develop a procedure consisting of monitoring data/parameter, PIC to collect the data and data storage. The same was verified by the verification team during the current verification and found in order. In another FAR, PP was asked to focus on the VCS project and justification on the variation if any on the electricity generation compared to the estimated generation as mentioned in the registered VCS PD. The verification team has checked the ISO procedures where VCS project management was included and it covers all the requirements mentioned in the FAR along with their implementation status hence the verification team confirm the establishment and implementation of such procedures /P18/.

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

S. No.	Meter Number /P04/	Make of meter /P14-3/	Accuracy Class /P05/	Calibration Date /P05/
1.	36027216	ACTARIS SL7000	0.2s	28/07/2005 to 27/07/2010 22/04/2010 to 21/04/2015
2.	36027222	ACTARIS SL7000	0.2s	28/07/2005 to 27/07/2010 22/04/2010 to 21/04/2015

CAR/CR/FAR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
CAR-07 SP will develop a procedure consisting of: a. The monitoring data/parameter b. The PIC to collect the data c. Data storage The same has to be verified in the coming verification.	FAR-3	SP has prepared the VCS Monitoring Procedure and submitted to Renun VCS Monitoring team. The same was submitted to the DOE.	3.2	The verification team has reviewed "Procedure to monitor the implementation of verified carbon standard (VCS) at Lau Renun HEPP unit" /P18/ prepared by SP for monitoring the project activity including all parameters. CAR-07 is closed.

CAR/CR/FAR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
CAR-08 During the next internal audit, PP is requested to focus on the VCS project and justification on the variation if any on the electricity generation compared to the estimated generation as mentioned in the registered VCS PD.	FAR-4	PT. PLN, has adopted ISO 9001, ISO 14001 and OHSAS from head office until sector scope (ISO certifications are given for Lau Renun generation Unit). Since the main business of ISO certificate holders is also the VCS project activity of Lau Renun HEPP, thus the ISO management procedure and requirement for ISO audit also applicable for the VCS project activity. The monitoring and control system for Lau Renun HEPP has being done by the VCS monitoring team. Therefore, a separate internal audit process for the VSC project is not longer necessary to be taken.	3.2	The project site is ISO and OHSAS certified hence "Procedure to monitor the implementation of verified carbon standard (VCS) at Lau Renun HEPP unit" has been implemented and incorporated in the ISO procedures to maintain all records and data handling for the operation of the project activity. Hence internal audits have become regular part of the operation since the plant has implemented ISO procedures hence this has been complied with. CAR-08 is closed.

4.4 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.

CAR/CR/FAR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
CR 01 1. Section 3.3.1 of MR refers to the appointment of VCS manager. PP needs to clarify the same. 2. It has been mentioned that Pt PLN has implemented ISO 9001, 14001 and OHSAS systems in the project activity. PP is requested to provide respective certificates to the verification team.	MR	1. The relevant information in section 3.3.1 has been removed from the revised MR. 2. The respective certificates are provided to the DOE.	3.3.1	Since there was mention of the appointment of VCS manager not a part of registered monitoring plan hence this removal is accepted. Valid certificates for implemented management systems i.e., ISO 9001, 14001 and OHSAS are provided to the verification team. Hence the CR is closed.

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.

5 VERIFICATION CONCLUSION

The scope of the verification relates to the registered VCS PD (project ID-488) submitted to verification team.

The period of the verification covers 01/04/2010 to 29/02/2012 (inclusive of the days).

Conclusions of the verification, including the verified amount of emission reductions for the given period are 417,704 tCO_2e

Reporting period: From 01/04/2010 to 29/02/2012 (Including both days)

The yearly VCUs for this verification period are as follows:

Year	**Emission reduction in the reported monitoring period in tCO_2e**
2010	153,291
2011	218,484
2012	45,930
Total emission reduction in tCO_2e	**417,704**

Verified emission in the above reporting period:

GHG Emission Reductions or Removals	tCO_2e
Baseline Emissions	417,712
Project Emissions	7.17
Leakage	0
Net GHG emission reductions or removals	**417,704**

ANNEXURE 1:

Abbreviations:

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CR	Clarification Request
DOE	Designated Operational Entity
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
ISO	International Standardisation Organisation
JMR	Joint Meter Reading Report
KV	kilo Volt
kW	kilo Watt
kWh	kilo Watt hour
MR	Monitoring Report
MW	Megawatt
MWh	Megawatt Hours
O&M	Operation and Maintenance
PD	Project Design
PP	Project Participant
PPA	Power Purchase Agreement
QA/QC	Quality Assurance / Quality Control
SI	International System of Units
tCO_2	tonnes of Carbon dioxide
UNFCCC	United Nations Framework Convention on Climate Change
VCS PD	Voluntary Carbon Standard Project Description

VCSA	Voluntary Carbon Standard Association
VCU	Voluntary Carbon Unit
VER	Voluntary Emission Reduction