VERIFICATION/CERTIFICATION REPORT

Final

"210 MW Musi hydro power plant, Bengkulu"
in
Indonesia

Monitoring period: 01/04/2009 to 31/03/2010
(both days are included)

Report N° 2009-IQ-133-ME

Revision N° 1.1

VERIFICATION/CERTIFICATION REPORT

Project Title:	Country:	Estimated VERs (tCO_2e):
210 MW Musi hydro power plant, Bengkulu	Indonesia	847,020 annual average
CDM Registration Reference N° (if any)	**Monitoring period:** 01/04/2009 to 31/03/2010	**Certified VERs (tCO_2e):** 568,898
Client: South Pole Carbon Asset Management Limited	**Client contact:** Mrs. Ikke Martha Prasetyaning	
Report No.: 2009-IQ-133-ME	**Revision:** 1.1	**Date of this report:** 08/09/2011
Approved by (Final Report – DCI Director approval): Roberto Cavanna		**Date of approval:** 08/09/2011

Methodology

Number:	Version:	Title:	Scale	SS(s):
ACM0002	10 of 28/05/2009	Consolidated baseline methodology for grid-connected electricity generation from renewable sources	01	Large

RINA Services S.p.A. (RINA), commissioned by South Pole Carbon Asset Management Limited, has verified the greenhouse gas emission reductions reported for the project activity "210 MW Musi hydro power plant, Bengkulu" in Indonesia, for the period 01/04/2009 to 31/03/2010, with regard to the relevant requirements for CDM and VCS activities. The verification shall ensure that reported emission reductions are complete and accurate in accordance with applicable VCS/CDM requirements in order to be certified.

The project was validated by RINA SpA (validation report N° 2009-IQ-ME-132 issued on 16/11/2009) and it was registered on 24/08/2010.

The GHG emission reductions were calculated on the basis of the approved methodology ACM0002, version 10, consolidated baseline methodology for grid-connected electricity generation from renewable sources of 28/05/2009 and the monitoring plan included in the registered Project Description Document, version 3.1 of 23/08/2011.

In conclusion, it is RINA's opinion that the project activity "210 MW Musi hydro power plant, Bengkulu", in "Indonesia", as described in the Monitoring Report version 4 of 23/08/2011, meets all relevant requirements for VCS/CDM activities and all relevant host Party criteria and correctly applies the baseline and monitoring methodology "ACM0002", "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 10 of 28/05/2009. Hence RINA is able to certify that the emission reductions from the project during the monitoring period 01/04/2009 to 31/03/2010 amount to 568,898 tCO_{2e}.

Work carried out by:

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- ☐ Strictly confidential
- ☐ Unrestricted distribution

Work verified by (Final Report – CRT person responsible approval)

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Keywords:

Climate Change, Kyoto Protocol, Voluntary Carbon Standard, Verification

Abbreviations

BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM M&P	Modalities and Procedures CDM
CER(s)	Certified Emission Reduction(s)
CH_4	Methane
CL	Clarification Request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CRT	Coordination and Technical Control Staff
DCI	Certification Division of RINA Services Spa
DG	Diesel Generator
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
ER	Emission Reductions
FAR	Forward Action Request
GHG(s)	Greenhouse gas(es)
HEPP	Hydro Electric Power Plant
IPCC	Intergovernmental Panel on Climate Change
KW	Kilo Watt
KWh	Kilo Watt hour
MCH	Main Control House
MoV	Means of Verification
MR	Monitoring Report
MW	Mega Watt
MWh	Mega Watt hour
NCV	Net Calorific Value
NPA	Nilai Perolehan Air
PE	Project Emission
PLN	Perusahaan Listrik Negara
PLTA	Pembangkit Listrik Tenaga Air
PP(s)	Project proponent(s)
Ref.	Document Reference
RINA	RINA Services Spa
SBKL	Sektor Bengkulu
SCADA	Supervisory Control And Data Acquisition
SOP	Standard Operational Procedure
SS(s)	Sectoral Scope(s)
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Voluntary Carbon Standard
VCS PD	Voluntary Carbon Standard - Project Description

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VVM	Validation and Verification Manual
VCS PD	Voluntary Carbon Standard - Project Description

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VERIFICATION/CERTIFICATION REPORT

1 INTRODUCTION

South Pole Carbon Asset Management Limited has commissioned RINA to carry out the verification and certification of emission reductions reported for the registered “210 MW Musi hydro power plant, Bengkulu” project in Indonesia, for the period 01/04/2009 to 31/03/2010.

This report summarizes the findings of the verification of the project, performed on the basis of UNFCCC criteria for CDM and VCS, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

The objective of the verification is to have an independent review ex post determination by a Designated Operational Entity (DOE) of the monitored reductions in GHG emissions that have occurred as a result of the registered VCS project activity during a defined monitoring period. Certification is the written assurance by the DOE that, during a specific time period, a proposed VCS project activity achieved the reductions in anthropogenic emissions by sources of GHGs as verified.

The objective of this verification/certification was to verify and certify emission reductions, reported for the “210 MW Musi hydro power plant, Bengkulu” project in Indonesia for the period 01/04/2009 to 31/03/2010.

1.2 Scope

The verification scope is:

- to verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan;
- to evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement;
- To verify that reported GHG emission data is sufficiently supported by evidence.

Verification shall ensure that reported emission reductions are complete and accurate in accordance with applicable UNFCCC criteria for CDM and VCS in order to be certified.

UNFCCC criteria for CDM refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.

The VCS criteria refer to VCS 2007.1 Standard and VCS Programme Guidelines.

Verification is not meant to provide any consultancy towards the project proponents. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the monitoring.

Level of Assurance

The level of assurance of verification report is reasonable which is based on documents and evidences submitted to the verification team. The same was verified by the verification team and based on the review along with the opinion of technical expert, the assurance is found reasonable.

2 METHODOLOGY

Verification was conducted using RINA procedures in line with the requirements specified in the VCS Requirements, CDM M&P, the latest version of the CDM Validation and Verification Manual, and relevant decisions of the COP/MOP and the CDM EB and applying standard auditing techniques.

The verification consisted of the following three phases:

- Desk review;

- On-site assessment:
- The resolution of outstanding issues and the issuance of the final verification report and certification.

The following sections outline each step in more detail.

2.1 Desk Review

The monitoring report, version 1 of 27/04/2010, version 2 of 24/02/2011, version 3 of 15/07/2011 and latest version 4 of 23/08/2011 **/02/**, the emission reduction calculations provided in the form of a spreadsheet titled "110718_Musi_ER Calculation_DVR_vintage breakdown_im" submitted on 23/08/2011, were assessed as part of the verification. In addition the Project Design Document (VCS PD) **/01/** in particular the baseline estimations and the monitoring plan, the validation report dated 16/11/2009 **/08/** for the project were reviewed.

The following table lists the documentation that was reviewed during the verification.

/01/	South Pole Carbon Asset Management Ltd.: VCS-PD for project activity "210 MW Musi hydro power plant, Bengkulu" in Indonesia, version 3.1 of 23/08/2011 and version 3 of 09/11/2009
/02/	South Pole Carbon Asset Management Ltd.: Monitoring report for project activity "210 MW Musi hydro power plant, Bengkulu" in Indonesia, version 4 of 23/08/2011, version 3 of 15/07/2011, version 2 of 24/02/2011 and version 1 of 27/04/2010 related to the monitoring period 01/04/2009 to 31/03/2010.
/03/	Voluntary Carbon Standard 2007.1 of 18/11/2008: Specification for the project-level quantification, monitoring and reporting as well as validation and verification of greenhouse gas emission reductions or removals.
/04/	Voluntary Carbon Standard Program Guidelines 2007.1 of 18/11/2008
/05/	CDM Executive Board: Validation and Verification Manual, version 01.2 of 30/07/2010
/06/	CDM Executive Board: Baseline and monitoring methodology " ACM0002", "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 10 of 28/05/2009
/07/	South Pole Carbon Asset Management Ltd.: Emission reduction calculation sheet titled "110718_Musi_ER Calculation_DVR_vintage breakdown_im" submitted on 23/08/2011
/08/	RINA SpA: Validation report no. 2009 IQ ME 132 for the project "210 MW Musi hydro power plant, Bengkulu" dated 16/11/2009
/09/	CDM Executive Board: "Tool to calculate project or leakage CO_2 emissions from fossil fuel consumption", version 02 dated 02/08/2008
/10/	Department of Energy, Indonesia: Copy of commissioning certificate dated 19/07/2006
/11/	Sector Pembankitan Bengkulu, Musi HEPP, PT PLN (PERSERO): Copy of monthly electricity transfer protocol report from 01/04/2009 to 31/03/2010.
/12/	Balai Pengelolaan Laboratorium Kemetrologian : Calibration certificates dated 28/07/2005 for the meters with meter no. 36027156, 36027159, 36027158, 36049453, 36050371, 36049455
/13/	Laboratorium Kalibrasi: A copy of calibration certificates dated 04/08/2010 for the meters with meter no. 36027156, 36027159, 36027158
/14/	PT.PLN : Copies of Standard Operation Procedures to develop Musi HEPP Monthly electricity transfer protocol report Report, for calibration of meters and Line charging dated 02/07/2007
/15/	Ministery of Energy and Mineral Resources, Indonesian Government: Copy of regulation for calibration of meters (document no. 37 YEAR 2008) dated 27/11/ 2008
/16/	PT.PLN: SOP on Electricity Energy Transfer to the Sumatera Grid (Prosedur Tetap Transfer Tenaga Listrik)
/17/	Musi HEPP : Copies of the training certificates received for the employees for taking part in the training conducted by the PP for period 01/04/2009 to 31/03/2010 .
/18/	South Pole Carbon Asset Management Ltd.: Deviation proposal for the project submitted on

	23/08/2011.
/19/	National Committee on Clean Development Mechanism: Web link for the emission factor of DNA for Sumatera grid in the year 2008 http://pasarkarbon.dnpi.go.id/web/index.php/komnasmpb/read/14/emission-factors-for-sumatera-and-jamali-grid-2008.html in Indonesian language last retrieved on 26/08/2011 http://pasarkarbon.dnpi.go.id/web/index.php/dnacdm/read/14/emission-factors-for-sumatera-and-jamali-grid-2008.html in English Language last retreived on 26/08/2011
/20a/	Pemerintah Propinsi Bengkulu: Bengkulu Province Regional regulation number : 42 Year 2001
/20b/	Gubernur Bengkulu: Bengkulu Province Regional regulation number : 14 Year 2002, First Amendment
/21/	Gubernur Bengkulu: Bengkulu Goernor Decree, number 385 year 2003
/22/	Dinas Pendapatan Daerah propinsi Bengkulu: Water Tax receipt from January 2009 to December 2010
/23/	Dinas Pendapatan Daerah propinsi Bengkulu: Statement letter dated 25/01/2011 regarding collection and utilization of ground water and surface water at PT. PLN (Persero) generation unit Musi HEPP.
/24/	Cummins Engineering company Ltd.: Engine Performance data for the DG set in MCH dated 09/09/1996
/25/	PT.PLN: Operational hours for the DG sets at Musi HEPP for the period 01/04/2009 to 31/03/2010
/26/	South Pole Carbon Asset Management Ltd.: Invitation letter to PT. PLN dated 02/03/2010 for the training to be conducted
/27/	PT.PLN: Reply letter dated 05/04/2010 for the training to be conducted by South Pole Carbon Asset Management Ltd.
/28/	South Pole Carbon Asset Management Ltd.: Power point presentation used for training the employees of Musi HEPP
/29/	PT.PLN: List of persons attended the training conducted by South Pole Carbon Asset Management Ltd. dated 20/05/2010
/30/	PT.PLN: Minutes of VCS review meeting conducted on 20/05/2010
/31/	PT.PLN: Attendance list dated 20/05/2010 indicating the list of persons attended the review meeting
/32/	PT.PLN: Details of the results for the internal audit conducted at site on 28/06/2010 and 29/06/2010
/33/	VCS project database : web link that routes to the page in which this project is registered https://vcsprojectdatabase1.apx.com/mymodule/ProjectDoc/EditProjectDoc.asp?id1=487 in English language last retrieved on 24/08/2011.
/34/	Musi HEPP: Technical details of the DG sets in MCH, intake dam and re regulating dam as mentioned in the standard operation and maintenance manual
/35/	GMI USA: Technical specification for the DG sets in intake dam and re regulating dam
/36/	PT.PLN: Daily operational log book maintained by PP at site for the period 01/04/2009 to 31/03/2010
/37/	PT.PLN: Excel sheet maintaining the summary of daily operational hour of Musi HEPP site for the period 04/2009 to 03/2010

/38/	DNA, Indonesia: Emission factor calculation sheet for the Sumatra grid for the year 2008, prepared in the month of 12/2008.
/39/	IPCC: IPCC guidelines for National Greenhouse Gas Inventories: Workbook volume 2 chapter 1 Table 1.2 published in the year 2006.
/40/	PT.Pertamina (Persero): Density of diesel for the month 06/2007.
/41/	PT PLN: Monthly Sumatra Grid Evaluation Operation Report "Evaluasi Operasi Sistem Tenaga Listrik Sumatra" for the month starting from 01/04/2009 to 31/03/2010
/42/	CDM Executive Board: "Tool to calculate emission factor for an electricity system", version 01.1, dated 29/07/2008.

2.2 On-site assessment

On 17/05/2010 and 18/05/2010, RINA, visited the project site at Bengkulu province about 30 km northeast of Bengkulu city, the capital of province. During the on-site assessment of the project RINA assessed the implementation and operation of the proposed project activity, reviewed the information flows for generating, aggregating and reporting the monitoring parameters, interviewed key personnel of the plant to confirm the operational and data collection procedures, cross-checked between information provided in the monitoring report and data plant, checked the monitoring equipment including calibration performance, reviewed calculations and assumptions made in determining the GHG data and emission reductions, checked the quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

The key personnel interviewed and the main topics of the interviews are summarized in the table below.

	Date	Name and Role	Organization	Topic
/a/	17/05/2010	Mr. Heri Priambodo – Plant Manager	PT.PLN Persero Bengkulu Sector (PLN SBKL)	Project description, management review and internal audit
/b/	17/05/2010	Mr. Shodiqin - Assistant Manager for Operation & Maintenance	PT PLN Persero Bengkulu Sector (PLN SBKL)	Data monitoring, recording, archiving of data, maintenance of machines.
/c/	17/05/2010	Mr. Feri Setiawan E - Assistant Engineer for Operational	PT PLN Persero Bengkulu Sector (PLN SBKL)	Data monitoring, recording, archiving of data, maintenance of machines.
/d/	17/05/2010	Mr. Asep Saefudin - Environment and Safety Engineer	PT PLN Persero Bengkulu Sector (PLN SBKL)	Data monitoring, recording, archiving of data, maintenance of machines.
/e/	17/05/2010	Ms. Elly Marliana - Assistant Engineering for Performance	PT PLN Persero Bengkulu Sector (PLN SBKL)	Data monitoring, recording, archiving of data, maintenance of machines.
/f/	17/05/2010 and 18/05/2010	Mrs. Ikke Martha - Assistant project manager	South Pole Carbon Asset Management Limited	Monitoring report, ER calculation.

2.3 Resolution of outstanding issues

The objective of this phase of the verification is to resolve any outstanding issues which need to be clarified for RINA's positive conclusion on the monitoring report and emission reductions.

To guarantee transparency a verification protocol has been customized for the project. The protocol shows in a transparent manner the requirements, means of verification and the results from verifying the identified criteria.

The verification protocol consists of four tables; the different columns in these tables are described in the figure below (see Figure 1). The completed verification protocol is enclosed in Appendix A to this report.

A corrective action request (CAR) is raised if one of the following occurs:

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

A clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A forward action request (FAR) is raised during verification for actions if the monitoring and reporting require attention and/or adjustment for the next monitoring period.

CARs, CLs and FARs identified are included in the verification protocol in Appendix A of this report.

Figure 1 Verification protocol tables

Verification Protocol, Table 1 - Requirement checklist					
Checklist Question	Ref.	MoV	Comments	Draft Conclusion	Final Conclusion
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organized in seven different sections.	Makes reference to documents where the answer to the checklist question or item is found.	Explain how conformance with the checklist question is investigated. Examples are document review (DR), interview or any other follow-up actions (I), cross checking (CC) with available information relating to projects, (N/A) means not applicable.	The discussion on how the conclusion is arrived at and the conclusion on the compliance with checklist question so far.	OK is used if the information and evidence provided is adequate to demonstrate compliance with CDM requirements. For CAR, CL and FAR see the definitions above.	OK is used if the information and evidence provided is adequate to demonstrate compliance with CDM requirements.

Verification Protocol, Table 2 - Resolution of Corrective Action Requests and Clarification			
Corrective action requests and/or clarification requests	Reference to Table 1	Response by project proponents	Verification conclusion
The CAR and/or CLs raised in table 1 are repeated here.	Reference to the checklist question number in Table 1 where the CAR or CL is explained.	The responses given by the project proponents to address the CARs and/or CLs.	The verification team's assessment and final conclusion of the CARs and/or CLs.

Verification Protocol, Table 3 - Forward Action Requests		
Forward action request	Reference to Table 1	Response by project proponents Verification conclusion
The FAR raised in table 1 is repeated here.	Reference to the checklist question number in Table 1 where the FAR is explained.	Response by the project proponents on how forward action request will be addressed.

2.4 Internal quality control

All the deviations of the verification report before being submitted to the client were subjected to an independent internal technical review to confirm that all verification activities had been completed according to the pertinent RINA instructions.

The technical review was performed by a technical reviewer(s) qualified in accordance with RINA's qualification scheme for VCS and CDM validation and verification.

2.5 Verification team and the technical reviewer(s)

The verification team and the technical reviewers consist of the following personnel:

Role	Last Name	First Name	Country
Team Leader CDM/VCS	Menon	Rekha	India
Technical Expert VCS	Kumar	Ashok	India
Observer	Cavanna	Barbara	Italy
Observer	Perne Narayanan	Sreeraj	India
Technical Reviewer	Valoroso	Rita	Italy

3 VERIFICATION FINDINGS

The findings of the verification related to the monitoring period from 01/04/2009 to 31/03/2010 as documented and described in the monitoring report version 4 of 23/08/2011 **/02/** are stated in the following sections.

The verification requirements, the means of verification and the results from verifying the identified criteria are documented in more detail in the verification protocol in Appendix A.

3.1 Description of the project activity

The main information of the project is summarized in the table below.

Project Proponent(s)	South Pole Carbon Asset Management Limited		
Project Title	210 MW Musi hydro power plant, Bengkulu		
Location of the project	Bengkulu Province, Indonesia		
Methodology(ies)	"ACM0002 ", "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 10 of 28/05/2009 **/06/**		
Sectoral Scope(s)	01	RINA's Technical Area(s)	1.2 – Energy generation from renewable energy sources
Registered PD	Revision 03 of 09/11/2009 /01/		
Date of registration	24/08/2010	VCS Registration ID	487
Revised monitoring plan	Revision 3.1 of 23/08/2011		
Starting date of the crediting period	01/08/2006		
Project's crediting period	01/08/2006 to 31/07/2016		
Monitoring period	01/04/2009 to 31/03/2010		
Project	https://vcsprojectdatabase1.apx.com/mymodule/ProjectDoc/EditProjectDoc.asp?i		

documentation link	d1=487

The project activity belongs to project group, which involves the installation of three turbines with a unit capacity of 70 MW, resulting in a total capacity of 210 MW which is then coupled to generators. The purpose of the project activity is to generate clean electricity from renewable hydro power source and export to the regional grid, thereby leading to the reduction of GHG emissions by displacing the equivalent amount of electricity which would have been generated predominantly from fossil fuel fired power projects connected to the grid.

3.2 Remaining issues (FARs) from previous validation or verification

Based on the review of validation report **/08/**, FAR 1 was raised during the validation. The FAR states that the metering devices involved in this project activity needs to be calibrated once in a year. Furthermore, the PP was requested to establish procedures to identify defective meters and also to clarify how emission reduction would be accounted in such cases. . PP had closed the same during the validation stating that the calibration for the main meter and check meters would be conducted once in every year and a detailed procedure on identification of defective meters and to take note on the emergency and uncertainties involved in the generation readings would be included in the SOP. However, during the site visit, it was noted that the initial calibration of the main meters were done on 28/07/2005 and the subsequent calibration was performed on 27/07/2010 and the certificate for the same was issued on 04/08/2010 **/12//13/**. Accordingly RINA raised a CAR on the same. However PP had gone for a deviation which stated that as per the Indonesian regulation, the Ministry of Energy and Mineral's resource regulation Number 37 year 2008 dated November 27, 2008 on the Grid Code Sumatra Electricity Power System, the calibration of kWh meter must be done once every 5 (five) years (stated in the Metering Code section, MC 4.1.1. Verification team has checked the said regulation **/15/** and confirmed that the justification provided by PP was appropriate. Hence the proposed deviation was accepted and the CAR was closed accordingly. Further, PP has also included a detailed procedure both in the monitoring report and the SOP for identification of meter faults and the action that would be taken on occurrence of the same **/14/**. Verification team has checked the SOP and monitoring report and found that the method prescribed is appropriate and conservative. Hence the issues raised in the FAR is taken into account appropriately and successfully closed.

3.3 Project implementation

As per the registered PD, version 03 dated 09/11/2009 and the final PD after deviation in monitoring plan, version 3.1 dated 23/08/2011 **/01/**, the project activity involves installation of three vertical shaft type Francis turbines with an unit capacity of 70 MW each. The water is taken from the Musi river through the intake dam and is fed to the turbines through high pressure pipeline and this falling water rotates the turbines, which drive the generators coupled to the turbines and produce electricity. The generator converts the mechanical energy generated from the turbines into electricity. This electricity is then transmitted to the Sumatra grid through Pekalongan PLN main station with a 150 KV transmission line. All the turbines were commissioned on 19/07/2006 **/10/**, which was much ahead of the validation of the project activity, dated 16/11/2009 **/08/**. The verification team has cross checked the same by referring the commissioning certificates **/10/** 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 registered 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.

The project is fully implemented according to the description presented in the registered PD. The verifier confirms, through the visual inspection that all physical features of the VCS project activity including data collecting systems and storage have been implemented in accordance with the PD, version 3.1, dated 23/08/2011 **/01/**. The project activity is completely operational and the same has been confirmed on-site.

3.4 Methodology for determining Emission Reductions.

According to the applied methodology "ACM0002", "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 10 of 28/05/2009 **/06/**, the emission reductions have been calculated based on the following formula:

$ER_y = BE_y - PE_y - LE_y$

Where,

ER_y : Emission reductions in year y (tCO_2e/yr)

BE_y : Baseline emissions in year y (tCO_2e/yr)

PE_y : Project emissions in year y (tCO_2e/yr)

LE_y : Leakage Emissions in year y(tCO_2e/yr)

Baseline emissions are calculated as follows:

$BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$

Where,

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

$EF_{grid,CM,y}$: Combined margin CO_2 emission factor for grid connected power generation in year y (tCO_2/MWh)

The representatives of both Musi HEPP and transmission unit record the main meter readings on a monthly basis and a report is prepared based on this readings. This report is named as the monthly electricity transfer protocol report and is signed by the representatives of Musi HEPP and the transmission department **/11/**. The value of $EG_{PJ,y}$ is taken from this report and amounts to 765,677MWh/yr for the period from 01/04/2009 to 31/03/2010. The verification team has checked the monthly electricity transfer protocol reports for each month of the said period and confirmed that the value mentioned above is in line with the monthly electricity transfer protocol reports **/11/**.

The combined margin emission factor was fixed ex ante and was calculated based on "tool to calculate emission factor for an electricity system", version 01.1, dated 29/07/2008 **/42/**. The value fixed ex ante is 0.743 (tCO_2/MWh) **/01/**.

Project emissions were calculated as follows:

$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$

Where,

$PE_{FF,y}$: Project emissions from fossil fuel consumption in year y (tCO_2/yr)

$PE_{GP,y}$: Project emissions from the operation of geothermal power plants due to the release of non-condensable gases in year y (tCO_2/yr)

$PE_{HP,y}$: Project emissions from water reservoirs (tCO_2/yr)

Since the project activity is not a geothermal project activity and the project is implemented as a run off river project without any construction of a new reservoir/implemented in an existing reservoir, project emission is accounted only due to usage of fossil fuels.

Project emission from fossil fuel consumption was calculated based on "the tool to calculate project or leakage CO_2 emissions from fossil fuel combustion", version 02 dated 02/08/2008 **/09/**, which is listed as follows:

$PE_{FF,y} = PE_{FC,j,CO2}$

$PE_{FC,j,CO2} = \Sigma FC_{i,j,y} \times COEF_{i,y}$

Where,

$PE_{FC,j,CO2}$: CO_2 emissions from fossil fuel combustion in process j during year y (tCO_2/y)

$FC_{i,j,y}$: Quantity of fuel type i combusted in process j during the year y (ton/y)

$COEF_{i,y}$: CO_2 emission coefficient of fossil fuel type i in year y (tCO_2/ton)

i : Fuel types combusted in process j during year y

As per the registered PD, version 3 dated 09/11/2009 **/01/**, the fuel consumption in DG sets has to be calculated based on the installed static graduated level gauges and the fuel injection tanks. However, during onsite visit , it was noted that no such instruments were installed in the DG sets. Hence a CAR was raised for the same. To resolve the issue, PP further requested for a deviation in monitoring plan of the registered PD. Accordingly the maximum running hours of the DG sets would be considered to calculate the diesel consumption based on the following equation. $FC_{diesel\ fuel\ (ton)}$ = maximum running hours (hour/day) * number of day for each month (day) *fuel consumption (litre/hour)*fuel density (ton/litre)

For conservative approach, maximum running hours of the DG sets (24hrs * 365 days) at 100% load are considered for calculating the diesel fuel consumption.. Verification team has checked the calculations and confirmed to be appropriate and conservative.

$COEF_{i,y}$ is calculated using option B. Option B calculates the $COEF_{i,y}$ based on the net calorific value and the CO_2 emission factor of fuel type i, as follows:

$$COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i}$$

Where,

$NCV_{i,y}$: Weighted average net calorific value of fuel type i in year (GJ/kg)

$EF_{CO2,i}$: Weighted average CO_2 emission factor of fuel type i in year y (tCO_2/GJ)

Noted that three DG sets are in operation located at MCH, intake and reregulating dam and the maximum amount of fuel that can be consumed by these sets at 100% load are 154 l/hr, 34 l/hr and 22.8 l/hr . The verification cross checked the same with the technical specifications provided by the technological provider and found to be appropriate **/24//34//35/**. Thus, the maximum amount of fuel that can be consumed by the DG sets for this monitoring period is calculated as 1,504.99 tonnes and the emissions due to the usage of the same comes to 4,795,34 tCO_2/yr which is 0.8429 % of emission reduction **/07/**. Since the value is less than 1%, as per the methodology applied, this emission is neglected. Verification team has checked the calculation and found appropriate.

Leakage emissions: As per the methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, version 10 of 28/05/2009 **/06/**, no leakage emission is considered.

The value of EG_y for this monitoring year is 765,677MWh **/01//07/** and EF_y is 0.743tCO_2/MWh, which would result in CERs of 568,898tCO_2e for this monitoring period01/04/2009 to 31/03/2010.

3.4.1 Compliance of the monitoring plan with the monitoring methodology

As per the applied methodology, ACM0002, “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, version 10 of 28/05/2009 **/06/**, monitoring shall consist of metering the net electricity supplied to the grid by the project activity during the year y and project emissions from fossil fuel consumption in year y. As per the monitoring plan of the registered PD, version 3 dated 09/11/2009 **/01**/, the parameters monitored are the net electricity supplied to the grid by the project activity during the year y and amount of diesel fuel used in the hydro power plant during the year y. Thus, the monitoring plan included in the registered PD is in accordance with the applied methodology. However, it was indicated in the registered PD that all the meters will be calibrated once in a year and the quantity of electricity exported to the grid can be cross checked with the sales receipts/invoice. It was also indicated in the registered PD that the fuel consumption in DG sets would be calculated based on the static graduated level gauges installed and the fuel injection tanks. Verification team during the site visit found that none of these were followed at site. Hence a CAR was

raised for the same **/CAR 1/ /CAR 3/ /CL 3/**. To close the same, PP had gone for the following deviations in the monitoring plan of the registered PD **/18/**.

1. The calibration of KWh meters would be conducted once in five years.

PP has confirmed that the calibration of energy meters will be done once in 5 years, instead of once in a year, which is as per the Indonesian regulation, the Ministry of Energy and Mineral's resource regulation Number 37 year 2008 dated 27/11/2008. Verification team checked the said regulation **/15/** and confirmed that the justification provided by PP was appropriate. Hence accepted the same.

2. The electricity exported to the grid as recorded in the monthly electricity transfer protocol would be cross checked with the water tax receipt issued by Dinas Pendapatan Daerah Propinsi Bengkulu (Bengkulu Province Tax Office).

PP has submitted the following documents:

- Bengkulu province regional regulation number 42: year 2001 **/20a/**
- Its first amendment, number 14: year 2002 **/20b/**
- Bengkulu Governor Decree, number 385 year 2003 **/21/**

The first two documents are pertaining to collection and Utilization of ground water and surface water tax and the third document is pertaining to the water recovery value (NPA) used by state-owned enterprises, regional-owned enterprises for public service, oil and gas mining. As per this regulation, PP is required to pay tax to the government for the utilization of water. The tax is calculated based on NPA- Nilai Perolehan Air (Water Recovery Value). This value is generally based on volume of water consumed. However for PT.PLN, it is calculated based on KWh (unit for electricity exported to grid). The same was also made transparent in the above mentioned regulations. Moreover a letter was also provided by the tax authority stating that for PT. PLN, NPA is Rp.50/- for 1KWh **/23/**. Hence verification team confirmed that the tax is paid based on the electricity exported to grid. PP makes the tax payment based on the amount of electricity exported to grid and tax authority provides the receipts for the same. PP has used this document in order to cross check the electricity exported to the grid by the plant. Verification team has accepted the same as the tax receipt is provided by a third party.

3. Considering the maximum running hours of DG sets and then calculating the diesel fuel consumption based on full load

The PP will be considering the maximum running hours of the DG sets and the diesel consumption will be calculated based on the following equation.

$FC_{diesel\ fuel\ (ton)}$ = maximum running hours (hour/day) * number of day for each month (day) *fuel consumption (litre/hour)*fuel density (ton/litre)

For conservative approach, maximum running hours of the DG sets (24hrs * 365 days) at 100% load are considered for calculating the diesel fuel consumption. The verification team has accepted the same as the approach is most conservative.

4. Web link for Grid Emission Factor of Sumatera

As the web link provided in the registered VCS PD is no longer available, new web link has been provided by PP for the grid emission factor. Verification team has checked the same and confirmed that the new link routes to the DNA of Indonesia; National Committee on Clean Development Mechanism. It clearly states that the emission factor for Sumatera grid for the year 2008 is 0.743tCO_2e/MWh. The same has been mentioned in the registered VCS PD, version 3 of 09/11/2009 and final VCS PD version 3.1 of 23/08/2011. PP has used this value for calculating the emission reduction in this monitoring period and is hence accepted.

The deviation proposed is pertaining to this current monitoring period and for next monitoring period, the procedures will remain the same as indicated in the registered VCS PD, version 3 of 09/11/2009.

3.4.2 Compliance of monitoring with monitoring plan

As per the PD, version 3.1 dated 23/08/2011, validation report dated 16/11/2009 and the monitoring report, version 4 of 23/08/2011 **/01//02//08/,** the project activity involves the following monitoring key parameters.

3.4.2.1 Data fixed ex-ante

DATA/PARAMETER	Source of data	Reported value for the project period	Assessment/Observation
Grid emission factor of Sumatra ($EF_{grid,CM,y}$)	DNA of Indonesia http://pasarkarbon.dnpi.go.id/web/index.php/komnasmpb/read/14/emission-factors-for-sumatera-and-jamali-grid-2008.html	0.743 tCO_2/MWh	The verification team has verified the value with the excel sheet provided by DNA of Indonesia for the year 2008 and with the value in the link provided by DNA of Indonesia; National Committee on Clean Development Mechanism for the year 2008 **/19//38/** and registered PD **/01/** and found to be correct and consistent. Hence accepted.
Net caloric value of diesel fuel ($NCV_{i,y}$)	2006 IPCC Guidelines for National Greenhouse Gas Inventories: Workbook volume 2 chapter 1 Table 1.2	0.043 GJ/kg (1 GJ/kg = 1 TJ/ton)	Verification team has checked the 2006 IPCC guidelines for National Greenhouse Gas Inventories: Workbook volume 2 chapter 1 Table 1.2 **/39/** and the registered PD **/01/** and found to be correct and consistent. Hence accepted.
Density of diesel fuel (P_i)	Pertamina diesel fuel specification	0.815 kg/litre or 815 kg/m^3	Verification team has checked the report provided by PT.Pertamina (Persero) in the month of June 2007 **/40/** and the registered PD **/01/** and found to be correct and consistent. Hence accepted.
Weight average CO_2 emission factor of diesel fuel in year 'y' ($EF_{CO2,i,y}$)	2006 IPCC Guidelines for National Greenhouse Gas Inventories: Workbook volume 2 chapter 1 Table 1.4	74.1 tCO_2/TJ	Verification team has checked the 2006 IPCC guidelines and the registered PD **/01/** and found to be correct and consistent. Hence accepted.

3.4.2.2 Monitored data

<table>
<tr><td>DATA/PARAMETER</td><td>EG_y</td></tr>
<tr><td>Data Unit</td><td>kWh</td></tr>
<tr><td>Description</td><td>Electricity supplied to the grid by the project activity during the year y</td></tr>
<tr><td>Source of data to be used</td><td>Monthly electricity generation/protocol report “Berita Acara tentang Penyerahan dan Penerimaan kWh Penyaluran”/11/. This is also referred as Joint meter reading.</td></tr>
<tr><td>Value data for the monitoring period</td><td>765,677
This is the sum of net export as measured from meters installed for all the three units (unit 1, unit 2 and unit 3).</td></tr>
<tr><td>Measuring frequency</td><td>Continuously by digital watt hour meter installed in the main control house</td></tr>
<tr><td>Reporting frequency and recording procedure</td><td>The reporting frequency is monthly and recording frequency is hourly for each of the unit, which is in accordance with the monitoring plan and monitoring methodology.</td></tr>
<tr><td>Type of monitoring equipment</td><td>The monitoring equipments used are digital watt hour meter as seen at site. All meters are of accuracy class 0.2s and the same was confirmed by the verification team during site visit and by cross checking with the calibration certificates dated 28/07/2005 and 04/08/2010 /12//13/. Further details of the meters are as follows.
<table>
<tr><th>Meter No.</th><th>Type</th><th>Factory</th><th>Purpose</th></tr>
<tr><td>36027156</td><td>SL 7000</td><td>Actaris</td><td>Main meter - to monitor the net electricity exported to the grid from unit 1</td></tr>
<tr><td>36049453</td><td>SL 7000</td><td>Actaris</td><td>Production meter - to monitor the electricity generated from unit 1. It is also used as cross check meter for the main meter of unit 1.</td></tr>
<tr><td>36027159</td><td>SL 7000</td><td>Actaris</td><td>Main meter - to monitor the net electricity exported to the grid from unit 2</td></tr>
<tr><td>36050371</td><td>SL 7000</td><td>Actaris</td><td>Production meter - to monitor the electricity generated from unit 2. It is also used as cross check meter for the main meter of unit 2.</td></tr>
<tr><td>36027158</td><td>SL 7000</td><td>Actaris</td><td>Main meter - to monitor the net electricity exported</td></tr>
</table>
</td></tr>
</table>

	<table><tr><td></td><td></td><td></td><td>to the grid from unit 3</td></tr><tr><td>36049455</td><td>SL 7000</td><td>Actaris</td><td>Production meter - to monitor the electricity generated from unit 2. It is also used as cross check meter for the main meter of unit 3.</td></tr></table> As per the montoring report, version 4 dated 23/08/2011 **/02/** and the monitoring plan of the final VCS PD **/01/**, the energy meters of each unit measures the export and import of the electricity generated. The representatives of both Musi HEPP and transmission unit takes the meter readings on a monthly basis and this reading is cross checked with the water tax receipts received from the Bengkulu Province Tax Office. Verification team during the site visit checked the same and confirm that the same procedure is followed at site.
Is accuracy of the monitoring equipment as stated in the PD?	As per the registered VCS PD version 3 dated 09/11/2009 **/01/**, the accuracy class of main and check meters installed at plant is of accuracy class 0.2s. Verification team has checked the same during the site visit and confirmed that the accuracy class of main meter and that of check meters also called as production meters is 0.2s. Hence verification team confirms that accuracy of the meters installed at site are as stated in the registered VCS PD, version 3 dated 09/11/2009 and final VCS PD, version 3.1 of 23/08/2011. The same was also confirmed by cross verifying the calibration certificates dated 28/07/2005 and 04/08/2010 **/12//13/**.
Calibration frequency/interval	As per the registered PD, calibration should have been done annually. However during the site visit, verification team found that, calibration was not done as per the requirement. Hence a CAR was raised. So, PP had gone for a deviation of the monitoring plan in the registered PD. As per that, PP claimed that, calibration frequency will be performed once in five years, which is as per the Indonesian regulation, the Ministry of Energy and Mineral's resource regulation Number 37 year 2008 dated 27/11/2008 on the Grid Code Sumatra Electricity Power System (stated in the Metering Code section, MC 4.1.1. Verification team has checked the said regulation **/15/** and confirmed that the justification provided by PP was appropriate. Hence accepted and the CAR was closed. PP had conducted the calibration on 28/07/2005 and is thus valid till 28/07/2010 which covers the present monitoring period. However PP had conducted the subsequent calibration of meters to confirm that the meters are working without any error. Calibration certificates dated 04/08/2010 confirmed that all the three meters are working properly within the permissible limit. The same was verified and confirmed by the verification team by cross checking the old and latest calibration certificates **/12//13/**.
Is the calibration interval in line with the monitoring plan of the PD?	The calibration interval is once in five years and is inline with the revised monitoring plan of the registered PD, version 3.1 dated 23/08/2011.
How were the values in the monitoring report verified	As per the registered VCS PD, the electricity export should have been cross checked with the sales receipt/invoices. However during site

and cross-checked?	visit, verification team was unable to find such procedures. Hence a CAR was raised on the same. However, the PP had gone for a deviation in the monitoring plan of the registered PD, version 3 dated 09/11/2009. As per that, the electricity exported to the grid would be cross checked with the water tax receipts received from the Bengkulu Province Tax Office. PP has submitted the following documents: • Bengkulu province regional regulation number 42: year 2001 **/20a/** • Its first amendment, number 14: year 2002 **/20b/** • Bengkulu Governor Decree, number 385 year 2003 **/21/** The first two documents are pertaining to collection and Utilization of ground water and surface water tax and the third document is pertaining to the water recovery value (NPA) used by state-owned enterprises, regional-owned enterprises for public service, oil and gas mining. As per this regulation, PP is required to pay tax to the government for the utilization of water. The tax is calculated based on NPA- Nilai Perolehan Air (Water Recovery Value). This value is generally based on volume of water consumed. However for PT.PLN, it is calculated based on KWh (unit for electricity). The same is transparent on the above mentioned regulations. Moreover a letter was also provided by the tax authority stating that for PT. PLN, NPA is Rp.50/- for 1KWh **/23/**. Hence verification team confirmed that the tax is paid based on the electricity exported to grid. Once PP makes the tax payment based on the electricity exported to grid and tax authority provides the receipts for the same. PP has used this document in order to cross check the electricity exported to the grid by the plant. Verification team has accepted the same as the tax receipt is provided by a third party. Thus the electricity generation is cross checked with the water tax receipts received from Dinas Pendapatan Daerah Propinsi Bengkulu (Bengkulu Province Tax Office) **/22/**. Verification team has checked both the documents and confirmed that the amount of electricity exported from the HEPP to the grid as shown in the monthly electricity protocol is correct. Hence verification team confirms that the values considered for the emission reduction calculation are accurate and in line with the said document. However it was noted by the verification team that value mentioned in the tax receipt for the month of 10/2009 is not consistent with the monthly electricity protocol report. Further it was also noted that electricity export reading specified in the water tax receipt is on higher side. Thus, to be on conservative side PP has considered the value from the monthly electricity protocol report in ER calculations. Since the approach chosen is conservative, verification team accepted the same.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions?	Electricity generation data is monitored on continuous basis using the digital watt hour meters of each unit and the plant personnel takes the monthly reading of each meters in the presence of officials from the transmission department. A monthly electricity transfer protocol is prepared by PP based on this reading. The emission reduction calculation is based on this document and hence this ensures the correct value of electricity generation taken for the emission reductions calculation. Verification team has checked all the monthly electricity transfer protocol report **/11/** and confirms that the values considered for the emission reduction calculation are accurate and in line with the said document. These readings were also cross checked from the check meters located in the power station. PP is also maintaining the log book on a daily basis **/36/**. The readings are also stored in a computer based on SCADA system. Hence there are no possibilities

	of manual errors to be occurred during the transposition between data sets. The same was confirmed and checked by the Verification team during the site visit.
If only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	All the data necessary for the emission reduction calculation were available for the whole monitoring period.

VERIFICATION/CERTIFICATION REPORT

DATA/PARAMETER	$FC_{i,y}$
Data Unit	ton
Description	Amount of diesel fuel used in the hydropower plant operation during the year y
Source of data to be used	Calculated - Project Owner - Maximum running hours of the diesel generators in monthly basis
Value data for the monitoring period	1504.99
Measuring frequency	As and when DG sets are used . However monitored continuously.
Reporting frequency and recording procedure	Monthly
Type of monitoring equipment	As per the registered PD, version 3 dates 09/11/2009 **/01/**, fuel consumption in DG sets has to be calculated based on the static graduated level gauges installed and the fuel injection tanks. Verification team during the site visit was unable to find any of such instruments installed in the DG sets. Hence a CAR was raised for the same. PP further requested for a deviation in monitoring plan of the registered PD. As per that, the PP will consider the maximum running hours of DG sets and the diesel consumption will be calculated based on the following equation. $FC_{diesel\ fuel\ (ton)}$ = maximum running hours (hour/day) * number of day for each month (day) *fuel consumption (litre/hour)*fuel density (ton/litre) For conservative approach, maximum running hours of the DG sets (24hrs * 365 days) at 100% load are considered for calculating the diesel fuel consumption The verification team has accepted the same as the approach is most conservative. However the deviation proposed is pertaining only to this current monitoring period and for next monitoring period, the procedures will remain the same as indicated in the registered VCS PD, version 3 of 09/11/2009.
Is accuracy of the monitoring equipment as stated in the PD?	Not applicable for this monitoring period
Calibration frequency/interval	Not applicable for this monitoring period
Is the calibration interval in line with the monitoring plan of the PD?	Not applicable for this monitoring period
How were the values in the monitoring report verified and cross-checked?	Since the diesel consumed was calculated based on 100% load the value taken is most conservative. Hence further cross check was not done for this particular monitoring period.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions?	PP maintains a log book for monitoring the running hours of the DG sets. However as documents was only partially available, PP has calculated the fuel consumption based on maximum running hours. This is then multiplied with the fuel consumption factor (considering that DG sets works at 100% load) and fuel density. Verification team has accepted the same as it is a conservative approach.
If only partial data are available because activity levels or non-activity	Please refer above.

parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	

3.4.3 Accuracy of emission reduction calculations

The emission reduction calculations provided in the spreadsheet titled "110718_Musi_ER Calculation_DVR_vintage breakdown_im" submitted on 23/08/2011 **/07/** have been verified to be correct and in line with the final monitoring report, version 4 of 23/08/2011 **/02/**.The emission reductions from the project for the monitoring period 01/04/2009 to 31/03/2010 as reported in the monitoring report version 4 of 23/08/2011 **/02/** is equivalent to 568,898 tCO_{2e}. The reported emission reductions are 32.8% lower than the estimated emission reduction of 847,020 tCO_{2e} for the period as per the registered PD **/01/**. Verification team has checked the registered VCS PD **/01/**, the monthly electricity transfer protocol report **/11/** for the current monitoring year and confirmed that the expected annual power generation was 1,140,000 MWh whereas the achieved generation is 765,677 MWh with a capacity factor of 41.62%.PP had submitted the operation log book maintained at site for the period 01/04/2009 to 31/03/2010 **/36/** which clearly indicated that the turbines where not working throughout the year and generator operational hour range from 30% to 57% **/37/**. Further PP had submitted the monthly Sumatra Grid Evaluation Operation Report "Evaluasi Operasi Sistem Tenaga Listrik Sumatra" prepared by PT PLN **/41/**. This is a summary report issued by PT PLN (Persero) P3B / Load Dispatcher Division report and consists of a comparison of monthly electricity generation with the same month of previous year. It also has details like the expected generation and actual generation. Report clearly indicates that the generation in Musi HEPP in this current monitoring period (01/04/2009 to 31/03/2010) is less compared to previous year of each month. The verification team had checked both documents and confirmed that the generation was less compared to previous year and all the three turbines were not working for 24 hours. It was also confirmed that there was no major shut down/maintenance for this HEPP. Hence the verification team concluded that the generation was lower than the expected as per the registered PDD as the water flow rate is lower during this monitoring period.

The data presented in the monitoring report, version 4 of 23/08/2011 **/02/** were assessed by reviewing in detail the project documentation, collection of monitored data, observation of established monitoring and reporting practices and assessment of the reliability of monitoring equipment. Sufficient evidence was presented and verified by RINA for the reported emission reductions as listed in the above Section 3.4.2.2.

3.4.4 Management system and quality control

The verification team has done the site visit on 17/05/2010 and 18/05/2010 and cross-checked the procedures being followed at site in monitoring and calculating the electricity generation which is exported to the grid. The team confirmed that PP follows the procedures as mentioned in the registered PDD **/01/**. Further, the PP has their own standard operation procedures calibration of equipments, preparation of Electricity Transfer Monthly Protocol Report, electricity transfer and line charging **/14//16/**. PP strictly follows these procedures and the same was confirmed by the verification team during the site visit. Further, the team has verified the monthly electricity transfer protocol report for the period from 01/04/2009 to 31/03/2010 **/11/**, water tax receipts **/22/** and confirmed that the net electricity exported from the Renun HEPP is same as the quantity received at substation. Verification team has also checked the documents pertaining to internal audit **/32/,** minutes of management review meeting **/30/** and confirmed that no NCs / observations was raised with respect to the project. It was also noticed that the internal audit does not concentrate on the requirements of VCS project to be met by the PP. Hence a FAR **/FAR2/** was raised on the same. PP had confirmed that from the next verification period onwards, PP through their internal audit team will check whether all of the monitoring and data management are done as per the VCS requirement.

All data are being archived in the log books and is maintained at plant. A monitoring team has been established in the Musi hydro power plant for this project activity, which is headed by a VCS manager. The verification team has confirmed the same during the site visit. All these documents will be archived up to two years after the end of the crediting period or last issuance of this project activity whichever comes later.

As per the registered VCS PD, version 3 dated 09/11/2009 **/01/**, a formal set of monitoring procedures has been established prior to the implementation of project activity that includes the details of the organization, control and steps required for certain key monitoring system features including VCS staff training, VCS data and record keeping arrangements, data collection, VCS data quality control and quality assurance, equipment maintenance, equipment calibration and equipment failure. These procedures will be agreed and signed by PT. PLN (Persero) and South Pole Carbon Asset Management Ltd. However during the site visit the verification team found that there were no such procedures prepared and PP is following their own standard procedures. Hence PP has confirmed that South Pole Carbon Asset Management Ltd. will develop a procedure consisting of (a) The monitoring data/parameter (b) The PIC to collect the data (c) Data storage and FAR **/FAR 1/** was raised to verify the same in next verification.

4 VERIFICATION AND CERTIFICATION OPINION

RINA Service Spa (RINA) has performed verification of the emission reductions reported for the project activity "210 MW Musi hydro power plant, Bengkulu" in Indonesia, for the period 01/04/2009 to 31/03/2010, with regard to the relevant requirements for CDM and VCS activities.

The project proponents of the "210 MW Musi hydro power plant, Bengkulu" project is responsible for:

- the preparation of greenhouses gas emissions data and the reported greenhouse gas emission reductions from the project on the basis set out in the monitoring plan contained in the project description version 3.1 of 23/08/2011
- the development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of greenhouse gas emission reductions of the project

It is the responsibility of RINA to express an independent verification opinion about the project's conformity with the requirements of paragraph 62 of the CDM modalities and procedures and on the reported greenhouse gas emission reductions from the project.

Based on documented evidence and corroborated by an on-site assessment RINA can confirm that:

- the project has been implemented and operated as per the registered VCS-PD, version3 dated 09/11/2009 and final VCS PD with revised monitoring plan, version 3.1 of 23/08/2011 ;
- the monitoring report and other supporting documents provided are complete and verifiable and in accordance with the applicable CDM and VCS requirements;
- the monitoring is in place as per the applied baseline and monitoring methodology;
- the monitoring complies with the monitoring plan in the final VCS-PD, version 3.1 of 23/08/2011;
- the monitoring plan in the final VCS PD, version 3.1 of 23/08/2011 is as per the applied baseline and monitoring methodology.

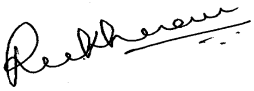
It is RINA's opinion that the GHG emission reduction stated in the monitoring report version 4 of 23/08/2011 for the "210 MW Musi hydro power plant, Bengkulu" project in Indonesia for the period 01/04/2009 to 31/03/2010 are fairly stated. The GHG emission reductions were calculated correctly on the basis of the approved monitoring methodology "ACM0002", "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 10 of 28/05/2009 and the monitoring plan contained in the registered.

Reporting period: 01/04/2009 to 31/12/2009:
Verified emissions in the above reporting period:
Project Emissions: 0 tCO_2 equivalents
Baseline emissions: 421,938 tCO_2 equivalents
Emission reductions: 421,938 tCO_2 equivalents

Reporting period: 01/01/2010 to 31/03/2010:
Verified emissions in the above reporting period:
Project Emissions: 0 tCO_2 equivalents
Baseline emissions: 146,960 tCO_2 equivalents
Emission reductions: 146,960 tCO_2 equivalents

VERIFICATION/CERTIFICATION REPORT

Mumbai, 08/09/2011



Rekha Menon
CDM/VCS Team Leader
RINA India Private Limited

Genova, 08/09/2011

Paolo Teramo
Authorized officer signing for the DOE
RINA Services S.p.A.

APPENDIX A

VERIFICATION PROTOCOL

Table-1Requirement Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
1. Remaining issues, any material discrepancy, from previous validation					
1.1.1. Has the project documentation been reviewed (i.e. registered VCS PD, monitoring plan, validation report and previous verification reports, if any)?	/1//2//3/	DR	Yes. The project documents VCS PD dated 09/11/2009, version 03, final validation report dated 18/11/2009 and Monitoring report dated 27/04/2010, version 01 of project activity (monitoring period from 01/04/2009 to 31/03/2010) has been reviewed and found to be complete and verifiable and in accordance with the VCS requirements. Since this is the first verification for this project activity, no other previous verification reports are available. However during the site visit and interaction with PP, it is noted that site visit for validation was completed on 07/08/2009 and final validation report was submitted on 16/11/2009. But the registration of VCS PD dated 09/11/2009, version 03 is still under process.	~~**CL 1**~~	**OK**
1.1.2. Are there findings and remaining issues from the previous validation/determination stage or from previous Verification reports (if any) of the project?	/1//2//3/	DR	The Validation report of the project activity was reviewed to find out any Forward Action Request (FAR). It was evident from the Validation report that a FAR was raised during the validation time regarding the calibration frequency and inclusion of detailed procedure in SOP in order to identify meter faults and to take care the emergency and uncertainties involved in the generation readings. Subsequently the same was closed by the PP by providing the justification that calibration for the meters will be conducted once in a year and SOP with detailed procedures will be submitted at the time of verification. However verification found that calibration is done only once in five years. Hence PP is requested to justify on the same.	~~**CAR 1**~~	**OK**
1.1.3. If yes, can they be considered solved or be closed?	/1//2//3/	DR	Not applicable		**OK**
2. Project implementation					
2.1.1. Does implementation of the project comply with the	/1//2//3	DR/I	As per the VCS-PD dated 09 November 2009,	~~**CAR 2**~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
project activities described in the registered VCS PD?	/		version 03 the project activity was commissioned on 19 July 2006, which was much before validation of the project activity, dated 07 August 2009. The verification team has also cross checked the same by referring the commissioning certificates during the site visit and found appropriate. Hence, verification team confirms that the PP has operated the VCS project activity as per the registered VCS-PD. However, the monitoring report states that project has been commissioned and commercialized since July 2006. PP is requested to mention the exact commissioning date and the actual operation of the VCS project activity As per the VCS-PD, the crediting period starts from 1 August 2006. However, the crediting period in the monitoring report starts from 01 April 2009. The PP is requested to justify on not claiming the emission reductions for first two years.		
3. Monitoring					
3.1. Monitoring Methodology					
3.1.1. Is the monitoring methodology implemented as described in the VCS PD?	/1//2//3//5/	DR	Yes. The methodology used in the project activity is approved consolidated methodology ACM0002 version 10 of EB 47. The same was mentioned in the final VCS PD and in the monitoring report submitted by the PP. The descriptions of all the monitoring parameters mentioned in the monitoring report are not in line with the final VCS PD. Also the sources of data required for monitoring the parameter electricity supplied by the project activity to the grid is not clear.	~~**CL 2**~~	**OK**
3.1.2. Have all the relevant GHG sources, to be monitored as per the VCS PD, effectively been monitored?	/1//2//3//9//12//14/	DR/I	As per the VCS PD if main meter fails, production meter which is located at generation site of each power generation unit will be used as cross-check meters, measuring the quantity of electricity exported from the project to the Sumatera grid. The	~~**CAR 3**~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			same was also verified by the verification team during the site visit and found to be in line. However monitoring report is not transparent on procedure followed to monitor electricity supplied by the project activity to the grid. As per the PD, validation report and the monitoring report, the project activity involves the following monitoring key parameters. 1. Electricity supplied to the grid. 2. Amount of diesel consumption in hydropower plant. It is noted that an Electricity Transfer Protocol Report is signed by the official representatives of Musi hydro power plant which is the generating unit and PT PLN transmission unit. During the site visit the verification team verified Electricity Transfer Protocol Report for the period of 01 April 2009 to 31 March 2010 and found satisfactory. Further the verification team also tried to cross check the same with sales electricity receipts. However it was noted that there are no such procedure of raising invoice, which is inconsistent with what is mentioned in the PD and the validation report. Verification team had also verified the monthly operational report that shows the total electricity received by the substation in the particular month from the Musi hydro power plant prepared by the Pekalongan substation, in order to cross verify the electricity exported to grid and found that the values in the operational report and the monthly electricity transfer protocol report are not matching. PP is also requested to submit the copies of operational reports. PP had submitted the copy of the logbook maintained for diesel generator set operation. However it is found that as per the document submitted, fuel consumption is calculated by		

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			multiplying the fuel consumption with a factor. PP is requested to provide the source for the factor selected.		
3.1.3. Are all the data and parameters, used for the GHG calculation and required by the VCS approved monitoring methodology and by the monitoring plan, monitored?	/1//2//3//5/	DR	Yes. PP is monitoring all the parameters used for GHG calculation as per the VCS approved methodology and as mentioned in the monitoring plan. The parameters monitored are electricity supplied by the project activity to the grid, amount of diesel fuel used in hydro power plant operation during the year y		**OK**
3.1.4. Are all the data and parameters monitored according to the unit measures, source of data and frequency of measurements required by the VCS approved monitoring methodology and by the monitoring plan?	/1//2//3/	DR/I	Units of all the data and parameters measured, sources of data and frequency of data measured are provided in the monitoring report and is consistent with the final VCS PD and final validation report. Further verification team also verified the same during the site visit and found that the units of all data and parameters monitored are same as mentioned in monitoring report, final VCS PD and final validation report.		**OK**
3.1.5. Are the measurement procedures (if any) implemented according to the VCS approved monitoring methodology and monitoring plan?	/1//2//3//12/	DR	The measurement of electricity generation is conducted on a continuous basis, where monthly data is recorded and continuous total electricity measurement is available. However the monitoring procedure is not clear on the recording and reporting frequency of net electricity supplied to the grid. Quantity of diesel fuel used in diesel generator sets are measured with the help of static graduated level gauges on the fuel injection tanks of the diesel generator set and a log book is maintained by the PP to monitor the same. PP is requested to submit the purchase receipts of diesel oil.	~~**CL 3**~~	**OK**
3.2. Monitoring equipment					
3.2.1. Is the monitoring equipment used for the data/parameters collected calibrated in a regular way?	/1//2//3//10/	DR/I	The PP has provided the copies of calibration certificates dated 28 July, 2005 for main meters installed for the three units (serial numbers:	~~**CAR 1**~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			36027156 for unit 1, 36027159 for unit 2 and 36027158 for unit 3) in Musi hydro power plant. The next due is on 28 July, 2010 which implies that no calibration is required for these meters in this crediting period (01 April 2009 to 31 March 2010). However as per the final VCS PD, calibration of meters has to be done yearly. PP is requested to justify on the same. PP is also requested to submit the colored scanned copy of original calibration certificates. During the site visit the verification team has found the following, which needs clarification: • Manufacturing year mentioned in the calibration certificate for all meters (Meter No: 36027156, 36027159 and 36027158 respectively) are 2004 and that mentioned in the meters are 2005. • No calibration certificates submitted for check meters and the meter that measures the own consumption of the plant with serial number 35008966.		
3.2.2. Is the measurement equipment calibrated according to current good practice?	/1//2//3//13/	DR	Calibration is done once in five years as per the regulation in Indonesia. PP had provided a copy of the regulation passed by the Indonesian Government dated 27 November, 2008. Verification team has verified and found appropriate. However it was mentioned in the final VCS PD that the calibration will be done annually. So PP is requested to clarify.	~~**CAR 1**~~	**OK**
4. Emission Reduction Calculations (accuracy, correctness)					
4.1. Accuracy of Emission Reduction Calculations					
4.1.1. Are the formulas and connections used for the Emission Reduction Calculations correctly applied in the spreadsheet?	/1//2//3//4//5/	DR/I	PP has correctly applied all the formulas as per the approved consolidated methodology ACM0002 version 10 of EB 47 for calculating the emission reduction and is in line with the final VCS PD.		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			Baseline emissions are calculated as follows: $BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$ Where, BE_y = Baseline emission during the period y , $EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project activity in year y, and $EF_{grid,CM,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year y. Project emissions are calculated as follows : $PE_{FC,j,CO2} = \Sigma FC_{i,j,y} \times COEF_{i,y}$ Where, $PE_{FC,j,CO2}$ =CO_2 emissions from fossil fuel combustion in process j during year y, $FC_{i,j,y}$ =Quantity of fuel type i combusted in process j during the year y, $COEF_{i,y}$ =CO_2 emission coefficient of fossil fuel type i in year y and i = Fuel types combusted in process j during year y As per the methodology ACM0002, version 10 no leakage emissions are considered. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, and transport). These emissions sources are neglected. The parameters like $EG_{PJ,y}$, $FC_{i,j,y}$ are monitored as per the methodology and is found in line. $EF_{grid,CM,y}$ is fixed ex-ante and is taken from the data published by the Indonesian DNA for the year 2008 which was the latest available data at the time of submission of PDD. The value selected is 0.743tCO_2e/MWh. Verification team has verified the same with the emission factor calculation sheet prepared by the Indonesian DNA provided by the PP and found		

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			appropriate. COEFi,y is calculated as per the tool to calculate project or leakage CO_2 emissions from fossil fuel combustion. The factors like NCV and weighted average CO_2 emission factor for diesel oil are fixed ex-ante and is taken from IPCC published in 2006. Verification team has verified all the formulas and default values used in the monitoring report and the emission reduction calculation sheet and compared with the methodology and the VCS PD and found appropriate and in line.		
4.1.2. Are the conversions correctly implemented?	/1//2//3/	DR	Yes, the conversions have been correctly implemented. The only conversion involved in this project activity is the conversion of KWh to MWh and has been done correctly.		**OK**
4.1.3. Are the aggregations correctly implemented?	/1//2//3//16/	DR	Yes. The electricity readings are taken on a daily basis in log books and the same is aggregated monthly. Verification team has verified these documents and found to be in place.		**OK**
4.1.4. Are the factors used in line with the monitoring plan and VCS approved methodology?	/1//2//3//4//5/	DR	Yes. The factors used in this project activity in order to calculate the emission reductions are in line with the methodology. However it is mentioned in the monitoring report that baseline emissions are calculated from gas projection. PP is requested to elaborate. Value of baseline emission mentioned in the section 4.3.2 of monitoring report is 764,146 tCO_2e which is contradicting with the emission reduction spread sheet. PP is requested to clarify.	**~~CL 4~~**	**OK**
4.1.5. Could manual errors occur during the transposition between data sets?	/1//2//3//9//16/	DR/I	The monthly electricity reports are made in the presence of officials from grid as well as from PP. These readings are taken from main meter located in main control house which acts as the transaction point. These readings will be cross checked from check meters located in the power station. PP is also maintaining the log book on a daily basis. The readings are also stored in a computer based on SCADA system. Hence there are no possibilities of	**~~CL 5~~**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			manual errors to be occurred during the transposition between data sets. However these details are not transparent in the monitoring report.		
4.1.6. Is there a risk of uncertainty in the calculations due to technological limitations (i.e. use of particular equipment such as meters)?	/1//2//3//10/	DR/I	Refer section 3.2.1	~~CAR 1~~	OK
4.1.7. Are all the measurements conducted with calibrated measurement equipment?	/1//2//3//10/	DR/I	Refer section 3.2.1	~~CAR 1~~	OK
4.1.8. Are there sources lacking data or using default data?	/1//2//3//12/	DR	No, the parameters monitored are electricity supplied to grid and diesel fuel consumption in the DG sets. These are monitored in the main meter and level gauges respectively. Parameters fixed ex-ante are emission factor for the electricity supplied to grid which is taken from Indonesian DNA published grid emission factor for Sumatra, NCV, density and Weighted average CO2 emission factor of diesel oil which are taken from 2006 IPCC guidelines for National Green house gas Inventories .		OK
4.1.9. Are there additional data from other sources (for example, from non-routine or exceptional events)?	/1//2//3//9//12/	DR	No, all the data are from available sources. (main meters, Electricity Transfer Protocol Report and logbook of diesel generator set operational data)		OK
4.1.10. Are the key physical process parameters that are critical for the determination of GHG emissions (e.g. meters, sampling methods) identified?	/3//4//12/	DR	PP has calculated the project emissions from the combustion of diesel in DG sets. There are no other GHG emissions involved in this project activity.		OK
4.2. Quality of Evidence to Determine Emission Reductions					
4.2.1. Is the evidence collected enough to support the Emission Reduction results?	/1//2//3//4//9/	DR/I	Emission reductions are calculated on the basis of monthly electricity transfer protocol report signed by both the parties of grid as well as the PP. Verification team has verified the copies of these protocols with the original copies and found that these protocols where signed by the officials from transmission department representing the grid and officials from generation department representing the Musi hydro power plant and is appropriate. However it was mentioned in the final VCS PD that these readings can be cross verified with the sales	~~CAR 3~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			electricity receipts. Verification team was not able to find these documents during the site visit and also came to know that there are no such procedures followed in the plant. PP has to justify on the same. It is also noted that the PP has deducted an amount of 0.2% from the actual monitored values mentioned in the monthly electricity report. The same is not mentioned in the registered PDD. Hence it is not clear on why PP has done this data adjustment and on what basis it has been done. The emission reduction value mentioned in the final VCS PD is 847,020 tCO_2e. Whereas the value mentioned in the monitoring report is 567,754 tCO_2e. PP is requested to explain why this difference has occurred.		
4.2.2. Is the evidence of appropriate quality?	/9/	DR/I	Yes. Verification team has verified the original copies of monthly electricity transfer protocol report signed by the grid officials and officials from PP and is found appropriate. Refer section 4.2.1	~~**CAR 3**~~	**OK**
4.2.3. Is the evidence collected reliable?	/1//2//3//4//9/	DR/I	Refer section 4.2.1 and 4.2.2.	~~**CAR 3**~~	**OK**
5. Management and Operational System					
5.1.1. Is a GHG information management system implemented, including location and retention of stored data?	/1//2//3/	DR/I	As per the VCS PD, a monitoring team has been established in the Musi hydro power plant for this project activity which is headed by a VCS manager. He has the overall responsibility for the monitoring system on this project. Whereas monitoring report says that the sector manager is responsible for overall monitoring system on this project. PP is requested to clarify on the same. As per the VCS PD a formal set of monitoring procedures has been established prior to the implementation of project activity that includes the details of the organization, control and steps required for certain key monitoring system features including VCS staff training, VCS data and record	~~**CL 6**~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			keeping arrangements, data collection, VCS data quality control and quality assurance, equipment maintenance, equipment calibration and equipment failure. These procedures will be agreed and signed by PT PLN (Persero) and South Pole Carbon Asset Management Ltd. However during the site visit the verification team found that there were no such procedures prepared and PP is following their own standard procedures. PP is requested to justify on the same.		
5.1.2. Is there a monitoring report that includes all the monitoring data, calculations, estimations, conversion factors and other standard factors?	/1//2//3 //5/	DR	Yes. The monitoring report includes all the monitoring data, calculations, estimations, conversion factors and other standard factors. The monitored data are the electricity supplied by the project activity to grid and the amount of diesel fuel used in the hydro power plant operation during year y. The calculations and formulas used to calculate the baseline emission, project emission and emission reduction are as per the methodology and VCS PD. Baseline emissions are calculated as the product of the net electricity supplied to the grid by this project activity and combined margin CO_2 emission factor for the grid connected power generation in year y. project emissions are the emission caused due to the consumption of fossil fuel in year y. as per the methodology, leakage is found to be zero. Hence the emission reduction will be the difference between the baseline emission and the project emission. The only factors used are combined margin CO_2 emission factor for the grid connected power generation in year y which is taken from data published by DNA of Indonesia from the year 2008 and CO_2 emission coefficient of fossil fuel type i in year y which is calculated based on net calorific value and CO2 emission factors of fuel type i. Net calorific value and CO2 emission factors of fuel type I are taken from IPCC 2006 values.		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
5.1.3. Are the QA/QC procedures for the monitored data/parameters implemented according to the monitoring methodology?	/1//2//3/	DR/I	The QA/QC procedures for the monitored data/ parameters implemented are as per the monitoring methodology. The accuracy of the data collections and management are ensured by internal audits. The document relevant for the same has been verified by the verification team during the site visit and found satisfactory. External audit was also conducted in this plant for ISO 9001:2008. PP had also received the certificate for the same which was also verified by the verification team during the site visit and is satisfactory. PP is requested to submit a copy of the report submitted by the auditor of the internal and external audit. However, the monitoring report is not very much clear on how the internal audit will be conducted and its frequency. PP is also requested to mention whether any NC's was raised in the internal/external audits and if raised what are the steps taken to close those issues.	~~**CL 7**~~	**OK**
5.1.4. Are the procedures to collect, record and report all the data for the calculation of emission reductions correctly implemented?	/1/	DR	The monitoring report is not transparent on the procedures followed to collect, record and report the data required for calculation of emission reductions.	~~**CAR 4**~~	**OK**
5.1.5. Is there a correctly and efficiently implemented procedure to ensure the appropriateness, accuracy, consistency and completeness of the data?	/1/	DR	The monitoring report is not transparent on the procedures implemented to ensure the appropriateness, accuracy, consistency and completeness of the data.	~~**CAR 4**~~	**OK**
5.1.6. Is there a correctly and efficiently implemented procedure for internal audits and non-conformance handling?	/1//11/	DR/I	Yes. PP is conducting the internal audits as per the Standard Operational Procedure (SOP) prepared by the company. Verification team has cross verified the SOP and found that the PP is following all the procedures as mentioned in the SOP. However monitoring report does not talks about the same.	~~**CL 8**~~	**OK**
5.1.7. Is the management review frequency defined?	/1/	DR	The monitoring report doesn't address management review frequency. Please provide the copy of the same.	~~**CL 9**~~	**OK**
5.1.8. Is the management review undertaken according to the frequency established?	/1/	DR	Refer section 5.1.7	~~**CL 9**~~	**OK**
5.1.9. Is a procedure in place and implemented to take into	/1/	DR	Yes. PP has identified specific procedures that have	~~**CL 10**~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
account the collection, recording and reporting of additional data of other sources coming from non-routine or exceptional events?			to be followed during any uncertainties or unexceptional events such as main or cross check meter failure. However monitoring report is not transparent on the same.		
5.1.10. Is the role of each person involved in the GHG data management process defined in the procedures?	/1//11/	DR	PP has an SOP which specifies the roles, responsibilities and competence required for each person involved in GHG data management process. Verification team has verified the SOP and found that PP is following the same without any failure.		**OK**
5.1.11. Are the defined competence and responsibilities correctly applied?	/1//11/	DR	Refer section 5.1.10		**OK**
5.1.12. Are the personnel competencies for each aspect of the GHG determination process suitable?	/1//11/	DR	Refer section 5.1.10		**OK**
5.1.13. Do the procedures guarantee the quality and correctness of the calculated emission reductions, identifying and reducing to a minimum the risk of mistakes (e.g. manual errors, meters, internal reporting, sampling methods…) and uncertainty?	/1//2//3//9//16/	DR	Refer section 4.1.5	~~**CL 5**~~	**OK**
5.1.14. Have data protection measures for databases/spreadsheets/internal reporting been implemented?	/1//2//3/	DR/I	As per the VCS PD, at the end of each month all the monitoring data needs to be filed electronically. These files also need to have CD back-up and/ or print out. All written documentation such as maps, drawings, EIA and the feasibility report should be stored and be available until two years after the end of the crediting period. During the site visit, verification team has found that PP is storing all the records both electronically and in the form of hard copy and is available at any time until two years after the end of the crediting period.		**OK**
5.1.15. Has the IT System used for GHG monitoring and reporting been tested and documented?	/1//2//3/	DR/I	Refer section 5.1.14		**OK**
6. Grouped projects					
6.1.1. Has a proper sample of sites been verified according to the IAF Guide to ISO/IEC Guide 66:1999?	/1/	DR	The project is not grouped project. Hence sampling is not required.		**OK**
6.1.2. Is there just one central GHG Information System	/1/	DR	Not applicable		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
and controls associated with the project and its monitoring?					

TABLE 2

Draft report clarifications and corrective action requests	Ref. to table 1	Summary of project proponents' response	Verification team conclusion
CAR 1 PP is requested address the following issues and submit the revised monitoring report accordingly. **1.** It was evident from the final validation report that a FAR was raised during the validation time regarding the calibration frequency and inclusion of detailed procedure in SOP in order to identify meter faults and to take care the emergency and uncertainties involved in the generation readings. Subsequently the same was closed by the PP by providing the justification that calibration for the meters will be conducted once in a year and SOP with detailed procedures will be submitted at the time of verification. However verification found that calibration is done only once in five years. Hence PP is requested to justify on the same. PP has provided the copies of calibration certificates dated 28 July, 2005 for main meters installed for the three units (serial numbers: 36027156 for unit 1, 36027159 for unit 2 and 36027158 for unit 3) in Musi hydro power plant. The next due is on 28 July, 2010 which implies that no calibration is required for these meters in this crediting period (01 April 2009 to 31 March 2010). However as per the final VCS PD, calibration of meters has to be done yearly. PP is requested to justify on the same. PP is also requested to submit the colored	1.1.2, 3.2.1, 3.2.2, 4.1.6	1. The Musi HEPP as part of the PT. PLN (Persero), a state-own electricity enterprise has to follow the national regulation. From the Ministry of Energy and Mineral's resource regulation Number 37 year 2008 dated November 27, 2008 on the Grid Code Sumatera Electricity Power System, the calibration of kWh meter must be done once every 5 (five) years (stated in the Metering Code section, MC 4.1.1). A deviation for Monitoring Report proposal has been submitted to RINA to address this issue and has been accepted. kWh meters calibration period following national regulation is once every five years (Musi HEPP deviation proposal), instead of yearly calibration. Copy of original calibration certificate has been submitted to DOE, there is no colored scanned copy available.	1. As per the deviation proposal, calibration frequency has been changed from once in a year to once in five year based on the Indonesian regulation. Verification team has checked the regulation pertaining to calibration and found appropriate. Hence accepted. 2. As per the deviation proposal, calibration frequency has been changed from once in a year to once in five year based on the Indonesian regulation. Verification team has checked the regulation pertaining to calibration and found appropriate. The copies of original calibration certificates dated 27/07/2010 has also been submitted by PP. Verification team has checked the same and found that all those meters are working without any fault. Hence accepted. Since all the issues are closed, CAR 1 is

scanned copy of original calibration certificates			closed.
CAR 2 1. During the site visit the verification team has found the following, which needs clarification: • Manufacturing year mentioned in the calibration certificate for all meters (Meter No: 36027156, 36027159 and 36027158 respectively) are 2004 and that mentioned in the meters are 2005. 2. No calibration certificates submitted for check meters and the meter that measures the own consumption of the plant with serial number 35008966	2.1.1	1. It was a typo error for the manufacture year shown on the first calibration certificates, correct manufacturing year was 2005. Validity and accuracy are not affected by the typo, those calibration certificates are correctly applicable to Musi HEPP kWh meters (not for other meters). The certificates administrative correction 5 years after issued won't be possible. Under the registered VCS PD, the main meters listed for the three main meters with serial number 36027156, 36027159, 36027158. All certificates for those meters have been submitted during the verification site visit. Calibration certificates for 3 check meters and own consumption meter being submitted to DOE. The calibration test results showed all meters have been working correctly since first time installation, there was no meter adjustment required for any of those meters during calibration test. 2nd respond for point #1: The difficulty would occur to obtaining administrative correction for a certificate that had been issued 5 years in the past. The meter was calibrated by external entity, BPLK Purwakarta (while their responsible person was replaced in past years), and they found difficulties to track back old 5 years records. They were not willing to do such administrative correction now. Due to different entitlement of staff, their new person would need another work of re-checking the meter (on-site). Currently PLN works with another third party, and no longer work with BPLK Purwakarta.	1. PP is requested to explain the reason for the difficulty in obtaining the administrative correction. 2. PP has submitted the calibration certificates for the own consumption meter and the cross check meters. Verification team has checked the same and confirmed that all the meters are working correctly without any error. Hence accepted. Since the first issue is not closed, CAR 2 is still open. **2nd response for point #1** PP has submitted the new calibration certificates for the meters 36027156, 36027159 and 36027158 dated 04/08/2010. Verification team compared the old calibration certificate with the new one and confirmed that the authority for calibrating the meters has been changed by PP. Further it was also noted that the meter numbers and accuracy class in the old and new calibration certificates are same as seen at site. Hence the justification provided by PP is accepted.

		But as per explained above, apart from this administrative correction, the calibration result was correct for Musi HEPP.	Since all issues are closed, CAR 2 is also closed.
CAR 3 PP is requested to submit the revised monitoring report by addressing the following issues. 1. Monitoring report is not transparent on procedure followed to monitor electricity supplied by the project activity to the grid. 2. The verification team tried to cross check the electricity exported by the project activity to the grid with sales electricity receipts. However it was noted that there are no such procedure of raising invoice, which is inconsistent with what is mentioned in the PD and the validation report. PP is requested to justify.	3.1.2, 4.2.1, 4.2.2, 4.2.3	1. Procedure to monitor electricity supplied by the project activity to grid has been made transparent in Monitoring Report section 3 (page 4 -10). Specifically, on the revised Monitoring Report section 3.2 we have made clear that the meters meet the relevant local standards at the time of installation and calibrated as required. "Electricity meters have met the relevant local standards at the time of installation. Before the installation of the meters, they were calibrated by the manufacturer on July 28, 2005 (at Balai Pengelolaan Laboratorium Kemetrologian). The meters installed by the project developer according to the manufacturer's standard (ACTARIS). Records of the meter (type, make, model and calibration documentation) is shown in the Table 1 below" – Monitoring Report section 3.2 page 5. 2. The QA/QC procedure to cross-check the electricity transfer to the grid has been revised by VCS-PD Deviation proposal. Under the Deviation proposal, the electricity exported by the project activity to the grid was to be cross-checked with the Water Tax receipt issued by Bengkulu Province Tax Office (local government). This procedure has been working properly (for main meter cross-check). 2nd respond for point #2: Musi HEPP has followed the SOP to develop the	1. As per the procedure followed at site, on a predetermined day of every month, representatives from both the transmission unit and production unit together note the electricity export and import readings from main meter installed at main control house and a monthly electricity transfer protocol is prepared by the PP based on this reading. This is then verified and signed by both the parties. PP has incorporated the same in the revised monitoring report. Verification team has checked the same and found to be in line and consistent with what mentioned in the registered PD. Hence accepted. 2. As per the registered VCS PD and the methodology applied, electricity exported by the project activity to the grid has to be cross checked with sales electricity receipts. Since PP doesn't have such kind of procedures, PP had submitted a proposal for deviation. As per the proposal, the electricity exported by the project activity to the grid was to be cross-checked with the Water

		Monthly Electricity Protocol Report as per the general procedure on 'Prosedur Transfer Tenaga Listrik antara PT PLN (Persero) Pembangkitan Sumbagut, PT PLN (Persero) Pembangkitan Sumbagsel dengan PT PLN (Persero) P3B Sumatera' and detail on 'Prosedur pembuatan BA Pengiriman Energi Listrik PLTA Musi' or 'Procedure to develop Musi HEPP Monthly Electricity Protocol Report'.. As per explained on the statement letter from Bengkulu Province Tax Office, there is a crosscheck process to verify the accuracy of net electricity supplied to the grid amount reported to the Tax Office. Both Monthly Protocol Report and Water Tax Payment Receipt are valid and signed by the authority Different value between Musi Monthly Electricity Protocol Report and Tax Receipt for October 2009 was due to an administrative error from the Tax Office (in which PLN was actually paying higher amount of tax than its actual value). The problem was unidentified until this VCS verification (two years after the error occurred). The tax paid was therefore difficult to correct and redeem.	Tax receipt issued by Bengkulu Province Tax Office (local government). Hence PP has submitted the following: • Bengkulu province regional regulation number 42: year 2001. • Its first amendment, number 14: year 2002 • Bengkulu Governor Decree, number 385 year 2003. The first two documents are pertaining to collection and Utilization of ground water and surface water tax and the third document is pertaining to the water recovery value (NPA) used by state-owned enterprises, regional-owned enterprises for public service, oil and gas mining. As per this regulation, PP is required to pay tax to the government for the utilization of water. The tax is calculated based on NPA- Nilai Perolehan Air (Water Recovery Value). This value is generally based on volume of water consumed. However for PT.PLN, it is calculated based on KWh (unit for electricity). The same is transparent on the above mentioned regulations. Moreover a letter was also provided by the tax authority stating that for PT. PLN, NPA is Rp.50/- for 1KWh. Further PP needs to fill a form named as SPTPD which clearly indicates the volume of water used. However for PT. PLN, instead of volume of water used, electricity exported to grid is mentioned which

			is approved by tax authority. Once the SPTPD form is filled by PP, tax authority comes to the plant and cross checks the value of electricity mentioned in the form with the monthly electricity transfer protocol report. The same procedure is evident on the letter provided by tax authority. Hence verification team confirmed that the tax is paid based on the electricity exported to grid. Once it is confirmed that the value is correct, PP makes the tax payment and tax authority provides the receipts for the same. PP has used this document in order to cross check the electricity exported to the grid by the plant. Verification team has accepted the same as the tax receipt is provided by a third party. However it is noted that value mentioned in the tax receipt for the month of October is not matching with the monthly electricity transfer protocol report report for the same month. PP is requested to clarify. **2nd response for point #2** Verification team has checked the water tax payment receipt and the monthly electricity transfer protocol report report for the month of October 2009 and confirmed that the value on the water tax receipt is on higher side. Further PP has considered the value in the monthly electricity transfer protocol report report for the calculation of ER. Hence the approach is conservative and thus the justification provided by PP is accepted. 3. Justification provided by PP is

			acceptable. PP has submitted the water tax receipts for the year 2009 and 2010. Verification team has checked the same and is found appropriate. Hence accepted.
3. PP is requested to submit the copies of operational reports prepared by the Pekalongan substation.		3. During the site visit verification, the operational report of the transmission sub-station was shown instead of the sales electricity receipt. However, currently with the deviation proposal, water tax receipt was to be used as the cross-check data (the transmission sub-station operational report would no longer be required). The water tax receipts have been submitted to DOE (previously during the deviation process, files : Musi watertax complete form 2009, Musi watertax complete form 2010).	
4. PP had submitted the copy of the logbook maintained for diesel generator set operation. However it is found that as per the document submitted, fuel consumption is calculated by multiplying the fuel consumption with a factor. PP is requested to provide the source for the factor selected.		4. The source of the selected factor have been submitted to DOE (previously during the deviation process, files : Technical data diesel generator @MCH, Technical data for diesel generator @ intake and RRD).	4. PP has provided the source for the factor selected. The factors are taken from the specification provided by the technology provider and is based on 100% load so as to be conservative. Verification team has checked the same and confirmed that the values taken by the PP are appropriate and conservative. Hence accepted.
5. It is also noted that the PP has deducted an amount of 0.2% from the actual monitored values mentioned in the monthly electricity report. The same is not mentioned in the registered PDD. Hence it is not clear on why PP has done this data adjustment and on what basis it has been done.		5. The deduction of 0.2% during initial verification process was being made to conclude the calibration interval issue being longer than required. However, after the approval of our deviation proposal for the same (calibration interval following host country regulation), the ER calculation has revised to the actual value without deduction.	5. PP has revised the monitoring report and ER sheet accordingly. It is noted that PP has included the actual monitoring values of electricity exported to gird mentioned in the monthly electricity report for the calculation of baseline emission without deducting 0.2%. In the initial monitoring report, PP had deducted an amount of 0.2% from the actual monitored values of electricity exported to grid. This was done as there was a delay in calibration for the meters and hence followed ”Guidelines for assessing compliance with the calibration frequency requirements”, EB 52, annex 60, version 01. As per the registered VCS PD, meters had to be calibrated once in a year. However PP had gone for a

6. The emission reduction value mentioned in the final VCS PD is 847,020 tCO_2e. Whereas the value mentioned in the monitoring report is 567,754 tCO_2e. PP is requested to explain why this difference has occurred.		6. The emission reduction value mentioned in the VCS PD is calculated from the expected annual electricity generation under the maximum annual production hours. The emission reduction value mentioned in the Monitoring Report calculated based on monthly actual electricity production. The value is lower because the power plant is not 100% operated due to the low water flowrate condition. 2nd response for point #6: The power plant was not 100% operational due to the low flow rate conditions, as typically occurred in hydro power plant. Musi HEPP operates according to actual load and resources condition, as determined by powerplant operation team. The Capacity Factor of a hydro turbine typically depends on the water availability. With low water availability, Musi HEPP need to collect enough water on its collecting pond (reservoir) before operating each turbine. Due to different turbine operation hours, in total the Musi HEPP couldn't operate with maximum operation hours (8760 hours per year) .	deviation on the same and proposed to conduct calibration once in five year. Verification team accepted the same as this was proposed based on the Indonesian regulation. Hence PP has made necessary corrections in the MR and ER sheet and is accepted. 6. Verification team has checked the registered VCS PD, the monthly electricity transfer protocol report for the current monitoring year and confirms that the expected annual power generation was 1,140,000MWh whereas the achieved generation is 765,677.373MWh with a capacity factor of 41.62%. Further it is mentioned that power plant was not 100% operational due to the low flow rate conditions. PP is requested to provide supporting evidence for the same. Since point number 2 and 6 are not closed, CAR 3 is still open. **2nd response for point #6** PP has submitted the monthly operational report from April 2009 to March 2010 which consists of the daily operational hours of all the three turbines commissioned at site. It was understood that the operational working hour of these turbines were less than 60% throughout the monitoring period. Hence the justification provided by the PP is accepted. Since both the issues are closed, CAR 3

		The 1st supporting document is the Monthly Sumatera Grid Evaluation Operation Report "Evaluasi Operasi Sistem Tenaga Listrik Sumatera". This document is a summary report issued by PT PLN (Persero) P3B / Load Dispatcher Division. Clearly stated from this report, the monthly net electricity production 2009-2010 for Musi HEPP compare to the same month from the previous year (2008) having *negative growth* for most of the month (December 2009 – March 2010), so that Musi production is much below its capacity. The 2nd supporting document is the 'Musi HEPP turbine daily operational report'. From this operational report, we developed the summary sheet of the Operational Hour. The summary sheet clearly showed that the Generator Operational Hour range from 30% to 57%. Therefore its actual capacity is rather low. With current operation hours less than 60% of maximum hours for each month in average, generation of 765,677.373 MWh is reasonable.	is also closed.
CAR 4 PP is requested submit the revised monitoring report by addressing the following issues. • The monitoring report is not transparent on the procedures followed to collect, record and report the data required for calculation of emission reductions.	5.1.4, 5.1.5	1. Monitoring report has been revised (section 3.4 - page 8 to 9) "VCS data collection and record keeping arrangements" to be transparent and consistent with VCS PD.	**1.** Monitoring report has been revised accordingly and is now transparent on the procedures followed to collect, record and report the data required for calculation of emission reductions. As per the procedure followed at site, on a predetermined day, representatives from both the transmission unit and production unit together notes the reading from main meter and a monthly electricity transfer protocol is prepared by the PP based on this reading. This is then verified and signed by both the parties. The value of electricity

• The monitoring report is not transparent on the procedures implemented to ensure the appropriateness, accuracy, consistency and completeness of the data.		2. Monitoring report has been revised (section 3.2-3.3; page 4-8) to be transparent and consistent with VCS PD, specifically on page 7-8 “Stand meter reading”, page 8 “Meter failure”.	exported to grid by the HEPP for calculating the baseline emission is taken from this monthly electricity transfer protocol. PP has incorporated the same in the revised monitoring report. Verification team has checked the same and found to be in line and consistent with what mentioned in the registered PD. 2. The revised monitoring report is now transparent on the procedures implemented to ensure the appropriateness, accuracy, consistency and completeness of the data. The monthly electricity reports are made in the presence of official representatives of Musi hydro power plant which are the generating unit and PT PLN, the transmission unit. These readings are taken from main meter located in main control house which acts as the transaction point. These readings will be cross checked from check meters located in the power station. PP is also maintaining the log book on a daily basis. The readings are also stored in a computer based on SCADA system, which also serves as a backup. Hence there are no possibilities of manual errors to be occurred during the transposition between data sets. Since all the issues are closed, CAR 4 is also closed.
CL 1 PP is requested to provide the following	1.1.1	1. 210 MW Musi Hydro Power Plant, Bengkulu has registered on MARKIT registry. Please go to this link for	Verification team has checked the web link provided by the PP and confirmed

clarification and submit the revised monitoring report accordingly. Submission of the VCS PD dated 09/11/2009, version 03 to registration is still under process. Supporting documents of the same needs to be provided for verification.		detail: **https://vcsprojectdatabase1.apx.com/mymodule/ProjectDoc/EditProjectDoc.asp?id1=487**	that the project has been registered under VCS standard with ID 488 and uploaded in the registry on 24/08/2010. Hence accepted. CL 1 is closed.
CL 2 PP is requested to provide the following clarification and submit the revised monitoring report accordingly. 1. The descriptions of all the monitoring parameters mentioned in the monitoring report are not in line with the final VCS PD. Also the sources of data required for monitoring the parameter electricity supplied by the project activity to the grid is not clear.	3.1.1	1. Monitoring report has been revised (section 3.3; page 5-8) to be transparent and consistent with VCS PD. Description provided with graphs and tables.	PP has revised the monitoring report accordingly. The descriptions of all the monitoring parameters mentioned in the revised monitoring report are now in line with the registered VCS PD. The source of data required for monitoring the parameter electricity supplied by the project activity to the grid is also clear. Hence CL 2 is closed.
CL 3 PP is requested to provide the following clarification and submit the revised monitoring report accordingly. 1. Monitoring procedure is not clear on the recording and reporting frequency of net electricity supplied to the grid.	3.1.5	1. Monitoring report has been revised to be transparent and consistent with VCS PD, Table 1 - page 6, "The electricity generation's data used for monitoring is the monthly electricity generation report delivered to grid signed by both parties of generation department and transmission department (Joint Meter Reading)" **2nd response to point #1:** *a. on the electricity transfer procedure* The metering of net electricity supplied to the grid procedure as explain on the Monitoring Report is following the 'Prosedur pembuatan BA Pengiriman Energi Listrik PLTA Musi' or 'Procedure to develop Musi HEPP Monthly Electricity Protocol Report' The SOP 'Prosedur Transfer Tenaga Listrik antara PT PLN (Persero) Pembagkitan Sumbagut, PT PLN	1. Revised monitoring report is now clear on the recording and reporting frequency of net electricity supplied to the grid. As per the procedure followed at site, on a predetermined day of every month, representatives from both the transmission unit and production unit together note the electricity export and import readings from main meter installed at main control house and a monthly electricity transfer protocol is prepared by the PP based on this reading. This is then verified and signed by both the parties. PP has incorporated the same in the revised monitoring report. Verification team

		(Persero) Pembangkitan Sumbagsel dengan PT PLN (Persero) P3B Sumatera' is a general procedure for all Generation Unit located in South and North Sumatera. As a general procedure it doesn't really show the normal procedure occured in the Musi HEPP Generation Unit. SOP page 8 shown 4 points (point a, b, c and d), which are not continuing steps. The point c is an additional activity by special requirement (one party allowed to read the stand meter on other party side if there is request from the stand meter owner). The steps shown in the revised Monitoring Report page 8 (also described on the registered VCS PD page 34), is the detail procedure taken from the 'Prosedur pembuatan BA Pengiriman Energi Listrik PLTA Musi' or 'Procedure to develop Musi HEPP Monthly Electricity Protocol Report' *b. on different title of documents stated in Monitoring Report Appendix 2* The title of "Prosedur tetap transfer tenaga listrik antara PT PLN (Persero) Pembangkitan Sumbagut, PT PLN (Persero) Pembangkitan Sumbagsel dengan PT PLN (Persero) P3B Sumatera" has been revised *c. on incomplete title of documents stated in Monitoring Report page 6* Table 1, column #4 'Source of Data as required in section 3.3 of PD' "BAP transfer listrik" was revised into "Berita Acara tentang Penyerahan dan Penerimaan kWh Penyaluran"	has checked the same and found to be in line and consistent with what mentioned in the registered PD. However revised monitoring report also states that the metering of net electricity supplied to the grid is done by following the SOP "Prosedur tetap transfer tenaga listrik antara PT PLN (Persero) Pembangkitan Sumbagut, PT PLN (Persero) Pembangkitan Sumbagsel dengan PT PLN (Persero) P3B Sumatera". Moreoever it is noted that the procedure mentioned in the revised monitoring report is not matching with the steps indicated in the SOP submitted by PP. Also the title of this SOP is contradicting with the title mentioned in Appendix 2 of this monitoring report. PP is requested to clarify. **2nd response for the point # 1** PP is having a general procedure for monitoring the electricity transfer named as "Prosedur Tetap Transfer Tenaga Listrik antara PT.PLN Pembangkitan Sumbagut, PT. PLN Pembangkitan Sumbagsel dengan PT. PLN (P3B) Sumatera". However Musi HEPP is having a detailed procedure for monitoring the same which is titled " Prosedur pembuatan BA (Berita Acara) Pengiriman Energi Listrik PLTA Musi". The procedure mentioned in the revised monitoring report is now consistent with this SOP. Title of the SOP mentioned is also consistent within the revised monitoring report. Hence accepted.

2. PP is requested to submit the purchase receipts of diesel oil.		2. Following the approved deviation proposal, the diesel oil usage was calculated from the diesel engine running hours, therefore no need to provide the documents. 2nd response to point #2: The proposed deviation was agreed to replace the diesel fuel consumption measurement method. The running hours of emergency diesel generator set has been recorded with a meter long before the Deviation process. This is the reason why we proposed the new measurement method from running hours. The running hours recording had been submitted to DOE during deviation process, and used for current monitoring period. Previously, it was said that the fuel usage (in litre) is resulted from static graduated level gauges on the fuel injection tanks. After deviation, Fuel consumption is calculated from the monitored running hours on monthly operation report of the diesel generators, converted to litres using the diesel oil consumption per hour, from engine manufacturer datasheet on 100% load. Then, liters shall be converted to tonnes using fuel specific density or scientifically proven fuel densities. **3rd response for point#2:** a. Accuracy of the diesel oil usage value by manual monitoring of the diesel generator operational hour:	2. Justification provided by PP is accepted as PP has requested for a deviation for monitoring the diesel consumption in the plant. As per the deviation request, diesel consumption in the DG sets at plant will be calculated based on the running hours of the DG sets. PP confirmed that the running hours of the DG sets will be monitored henceforth. Hence verification team has raised a FAR on the same. However PP is requested to clarify on whether the meter used in monitoring the running hours of DG sets is installed or if it is not installed, a tentative time period in which the meter will be installed. Further PP has submitted necessary documents and calculated the diesel consumption. Verification team has checked the same and confirms that the value is correct and conservative. Hence accepted. Since both the issues are not closed, CL 3 is open. **2nd response for point # 2** Verification team had noticed during the site visit that PP monitors the running hours of DG sets. However it was done manually. Hence PP is requested to clarify the accuracy of the value. Also the monitoring report is not clear on the cross checking method of the fuel consumption by the DG sets. Since the issues are not closed, this CL is also not closed. **3rd response for point # 2**

		The operational hour of emergency diesel generator set is manually recorded and reported in monthly basis. For conservativeness purpose, we used the maximum running hours of diesel generator in a day (24 hours per day) for each and every months of this monitoring period. The calculation will also use fuel consumption at 100% load. For the next verification process PP will monitor the operational hour by the monitoring plan as per registered VCS PD. b. Cross-checking method on the fuel consumption by the DG sets: No cross-checking method required as most conservative figures are considered.	Justification provided by PP is accepted as the calculation is done considering that the DG sets are running throughout the year at maximum load. Hence the approach taken by the PP is most conservative. Verification team has checked the calculations and found to be appropriate. Further as the deviation is pertaining only for this monitoring period, no FAR is raised. Since all the issues are closed, CL 3 is also closed.
CL 4 PP is requested to provide the following clarification and submit the revised monitoring report accordingly. 1. It is mentioned in the monitoring report that baseline emissions are calculated from gas projection. 2. Value of baseline emission mentioned in the section 4.3.2 of monitoring report is 764,146 tCO2e which is contradicting with the emission reduction spread sheet.	4.1.4	1. It was a typo error. Monitoring report has been revised accordingly (section 4.1.1 - page 10, deleted the sentence “Baseline emissions calculated from gas projection refer to equation (1)”). 2. It was a typo error. Monitoring report has been revised accordingly, BE is 568,898 tCO_2e (section 4.3.2 - page 13). 2nd response to point #2: - Section 2.4 has been revised accordingly (Monitoring Report page 4). The current monitoring period is “the fourth monitoring period”. - The table 2 of Section 3.3 has been revised accordingly with ER sheet (Monitoring Report page 7, table 2, row #3 “density value”)	1. PP has made relevant changes in the monitoring report and is appropriate. Hence accepted. 2. PP has revised the monitoring report accordingly. The value of baseline emission mentioned in the revised monitoring report is now consistent with the emission reduction spread sheet. Hence accepted. However verification team has noted the following: • Section 2.1 of the revised monitoring report states that the current monitoring period is the fourth monitoring period whereas section 2.4 of the revised monitoring report states that it is the first monitoring period. Kindly clarify. • Unit mentioned for the grid

			emission factor and density of diesel fuel in table 2 under section 3.3 of the revised monitoring report is not matching with ER sheet. Since the second issue is not closed, CL 4 is not closed. **2nd response for point #2** • PP has revised the monitoring report accordingly and is now consistent within the report on the monitoring report. • PP has revised the monitoring report accordingly and now the unit and value of grid emission factor and density of diesel fuel in table 2 under section 3.3 is in line with ER sheet. Since all the issues are closed, CL 4 is also closed.
CL 5 PP is requested submit the revised monitoring report by addressing the following issue. The monthly electricity reports are made in the presence of officials from grid as well as from PP. These readings are taken from main meter located in main control house which acts as the transaction point. These readings will be cross checked from check meters located in the power station. PP is also maintaining the log book on a daily basis. The readings are also stored in a computer based on SCADA system. Hence there are no possibilities of manual errors to be occurred during the transposition between data sets. However these details are not transparent in the monitoring report.	4.1.5, 5.1.13	1. Monitoring has been revised (section 3.4 page 9) to be transparent and in line with the VCS PD **"**As explained on the 1st paragraph of section 3.2… …occurred during the transposition between data sets."	PP has included the necessary details in the revised monitoring report and is appropriate. Hence accepted. CL 5 is closed.
CL 6	**5.1.1**		

PP is requested to provide the following clarification and submit the revised monitoring report accordingly 1. As per the VCS PD, a monitoring team has been established in the Musi hydro power plant for this project activity which is headed by a VCS manager. He has the overall responsibility for the monitoring system on this project. Whereas monitoring report says that the sector manager is responsible for overall monitoring system on this project. PP is requested to clarify on the same.		1. The correct title is the 'VCS Manager'. Monitoring report has been revised accordingly (section 3.4 - page 8).	1. PP has revised the monitoring report accordingly and is now consistent with the registered VCS PD. Hence accepted.
2. As per the VCS PD a formal set of monitoring procedures has been established prior to the implementation of project activity that includes the details of the organization, control and steps required for certain key monitoring system features including VCS staff training, VCS data and record keeping arrangements, data collection, VCS data quality control and quality assurance, equipment maintenance, equipment calibration and equipment failure. These procedures will be agreed and signed by PT PLN (Persero) and South Pole Carbon Asset Management Ltd. However during the site visit the verification team found that there were no such procedures prepared and PP is following their own standard procedures. PP is requested to justify on the same.		2. As this is a VCS project, PP has been following their owned procedurals (for previous period, prior to VCS-PD validation and registration). Description on Monitoring Report (section 3.4 – page 8) "South Pole has organized one time monitoring training… …found in the SOP monitoring plan." Procedures SOP monitoring plan to be applied on the next monitoring period, consist of : a. The monitoring data/parameter b. The PIC to collect the data c. Data storage The Monitoring Training document is attached	2. PP has their own standard operation procedures for operation of plant, calibration of equipments, preparation of Electricity Transfer Monthly Protocol Report, electricity transfer and emergency response. PP strictly follows these procedures and the same was confirmed by the verification team during the site visit. Hence the argument provided by PP is accepted. However a FAR is raised to verify the procedure developed by SP that has to be followed henceforth by the PP. Moreover South Pole has already provided training for all the VCS team members at the project site. The verification team has cross checked the supporting documents for the same such as the attendance sheet, invitation letter sent by South Pole to PP, PP's reply, the training material and hereby confirms that a proper training was given to PP

			focusing on the monitoring procedures as required for this project as per the VCS requirements. Since all the issues are closed, CL 6 is also closed.
CL 7 PP is requested to provide the following clarification and submit the revised monitoring report accordingly 1. PP is requested to submit a copy of the report submitted by the auditor of the internal and external audit. 2. The monitoring report is not very much clear on how the internal audit will be conducted and its frequency.	**5.1.3**	1. The audit result is attached. However the audit result was not VCS Project related. The audit result is described on Monitoring Report section 3.4 pg. 8 and Appendix 3 pg. 18 2. As per discussion with the PP, the internal audit routine is conducted for following activities: a.Quality Management System Documentation b. Quality Standard, Document Control c. Recording control d. Generator Operation e. Generator Maintenance f. Generator Failure Control, Precaution and Repair The internal audit process is not included the data collecting and metering check on the agenda. The data collecting process is always participating witness from other party and done monthly (following the procedure). The operator also attract the data daily and will notice if there is meter failure and report it to his supervisor by the applied procedure.	1. PP has submitted the report for the internal audit conducted on 28/06/2010 and 29/06/2010. It is noted that PT PLN conducts internal audit for Bengkulu sector which also covers Musi HEPP. It was also confirmed during site visit that external audits were also conducted in the plant. However details regarding the same are not transparent in the revised monitoring report. Further it was noted that internal audit is not focusing on the VCS project. Hence verification team has raised a FAR to include the same as a point during next internal audit. 2. Still the revised monitoring report is not transparent on the frequency of internal audit conducted. Verification team was also not able to understand the last paragraph mentioned by PP in their response for this point. **2nd response for the point#2** PP has included the frequency of internal audit in the revised monitoring report. The last point also has been rephrased and is acceptable.

3. PP is also requested to mention whether any NC's was raised in the internal/external audits and if raised what are the steps taken to close those issues.		2nd response to point #2: The general internal audit frequency has been added on the Revised Monitoring Report section 3.4, Page 9 (conducted annually). There was a typo error for the last paragraph in the previous answer to point 2 above (not 'attract' but 'extract'). The correct sentence is 'the operator also extract the data daily and will notice if there is meter failure and report it to his supervisor by the applied procedure. 3. There is no NC's was raised. The audit result was in the form "suggestion for improvement" 3rd response for the point#1 **Details regarding Internal and External Audit conducted on the project site** Additional paragraph regarding the Internal and External Audit has been added to the revised Monitoring Report section 3.4 page 9 'Monitoring management and operational system'.	3. Justification provided by PP is accepted. However kindly refer point number 1 of this CL. Since the first issue is not addressed by the PP, this CL is not closed. 3rd response for the point#1 PP has included the details regarding the external audit in the revised monitoring report and is acceptable. Since all issues are closed, CL 7 is also closed.
CL 8 PP is requested to provide the following clarification and submit the revised monitoring report accordingly 1. PP is conducting the internal audits as per the Standard Operational Procedure (SOP) prepared by the company. Verification team has cross verified the SOP and found that the PP is following all the procedures as mentioned in the SOP. However monitoring report does not talks about the same.	**5.1.6**	1. The Monitoring Report section 3.4 page 9-10 was revised as above – please refer to CL 7.	Monitoring report has been revised accordingly and is now transparent on the internal audits conducted at site. Hence this CL is closed.
CL 9	**5.1.7,**	1. Monitoring report has been revised accordingly	Justification provided by the PP is

PP is requested to provide the following clarification and submit the revised monitoring report accordingly The monitoring report doesn't address management review frequency. Please provide the copy of the same.	**5.1.8**	(section 6 - page 16), To evaluate the monitoring report for each monitoring period, the VCS Team (PT PLN (Persero) Generation Sector Bengkulu) held a management review once for every monitoring period at end of the monitoring period. Since this is the first verification process ever conducted on Musi HEPP, the management review took place on May 20, 2010 or after the Verification site visit. The meeting discussed some points such as calibration certificate, kWh meter recording and many more (complete management review result attached).	accepted. PP has submitted the minutes of the management review meeting conducted on 20/05/2010 and the attendance sheet. Verification team has checked the same and found to be appropriate. The details regarding the management review meeting conducted and its frequency is also transparent on the revised monitoring report. Hence accepted. CL 9 is closed.
CL 10 PP is requested to provide the following clarification and submit the revised monitoring report accordingly PP has identified specific procedures that have to be followed during any uncertainties or unexceptional events such as main or cross check meter failure. However monitoring report is not transparent on the same.	**5.1.9**	1. Monitoring report has been revised accordingly. (refer to section 3.5.2 page 10 "Monitoring equipment malfunctions")	PP has certain Standard Operational Procedures (SOP) that has to be followed during equipment maintenance, calibration and failure of meters. PP follows these procedures as and when required and the same was confirmed by the verification team during site visit. PP has revised the monitoring report accordingly and is now transparent on the procedures to be followed during any uncertainties or unexceptional events such as main or cross check meter failure. It was also checked by the verification team during the site visit that there was no metering device break down or malfunction reported during the respective monitoring period. Hence CL 10 is closed.

TABLE 3 FORWARD ACTION REQUEST

Forward action request	Reference to Table 2	Response by project proponents Verification Conclusion
FAR 1 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.	CL 6	Respond: SP will develop a procedure consisting of : a. The monitoring data/parameter b. The PIC to collect the data c. Data storage The VCS Procedure will be made available on the next verification process. PP will follow the procedure prepare by SP parallel with their own procedural. **Verification Conclusion:** Verification team has accepted the response provided by the PP. Further for the upcoming verifications, the procedures prepared by South Pole Carbon Asset management Ltd. has to be checked by the verification team and confirm that all the above mentioned points are included in the procedures prepared and PP is following the same parallel to their own SOPs.
FAR 2 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.	CL 7	Respond: At this moment, no issue related to the VCS project audited on the last internal audit process. For the next verification period onward, PP through their internal audit team will check whether all of the monitoring and data management are done as per the VCS requirement on their internal audit. The audit team will also audit the electricity generation and supply to the Sumatera Grid and make a comparison evaluation between actual and estimated electricity generation. **Verification Conclusion:** Verification team has accepted the response provided by PP as no issues related to VCS project was included in the last internal audit. For the upcoming verifications, verification team needs to verify and confirm that the internal audit team has checked whether all of the monitoring and data management are done as per the VCS requirement and whether the audit team had done a comparison evaluation between actual and estimated electricity generation.