Voluntary Carbon Standard 2007

Validation Report

19 November 2007

Validation Report: 2009 IQ ME 132

Name of Verification company:	**Date of the issue:**
RINA SpA	16 November, 2009
Report Title:	**Approved by:**
"210 MW Musi Hydro Power Plant, Bengkulu" in Indonesia	Certification and Services Division Director Roberto Cavanna
Client:	**Project Title:**
Pt. PLN (Persero)	"210 MW Musi Hydro Power Plant, Bengkulu"

Summary:	
RINA is performing a validation of the VCS(2007.1) project activity "210 MW Musi Hydro Power Plant, Bengkulu" on the basis of the Voluntary Carbon Standard 2007.1 (VCS 2007.1), the VCS Program Guidelines 2007.1 as well as criteria to provide for consistent project operations, monitoring and reporting. The validation consists of the following three phases: i) a desk review of the project design documents, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion. Eight (08) Corrective Action Requests (CAR's), One(01) Forward Action Request (FAR) and Eight (08) requests for Clarification (CL's) were identified. Upon the satisfactory resolution of these CAR's and CL's presented in this report, it is the validation team's opinion that the project is likely to meet the relevant Voluntary Carbon Standard 2007.1 (VCS 2007.1) requirements and RINA recommends the project for registration.	
Work carried out by:	**Number of pages:**
Reghu Kumar Raghavan Nair, Team Leader Shivraj Sharma, Validator Sreeraj P N, Observer	98

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Appendix A: Validation Protocol

Abbreviation

ADB	Asian Development Bank
BM	Built Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism,
CL	Clarification Request
CM	Combined Margin
CO_2EF_i	Carbon dioxide Coefficient
DNA	Designated National Authority
DOE	Designated Operational Entity
FAR	Forward Action Request
GHG	Green house gas
GPS	Global positioning system
GWh	Giga Watt Hour
IDR	Indonesian Rupiah
IRR	Internal Rate of Return
kW	Kilo Watt
MEP	Monthly Electricity Protocol
MoV	Means of verification
MW	Mega Watt
MWh	Mega Watt Hour
NCV	Net Calorific Value
OM	Operating Margin
PLN	Perusahaan Listrik Negara
PP	Project Proponent
PPA	Power Purchase Agreement
PD	Project Design
QA/QC	Quality Assurance/Quality Control
RINA	Registro Italiano Navale
UNFCCC	United Nations Framework Conventions on Climate Changes
USD	United States Dollar
VCS	Voluntary Carbon Standard
VCUs	Voluntary Carbon Units
WACC	Weighted Average Cost of Capital

1 Introduction

The client has commissioned RINA to perform a validation of the **Error! Reference source not found.**. This report summarizes the findings of the validation of the project, performed on the basis of Voluntary Carbon Standard-Specification for the project level quantification, monitoring and reporting as well as validation and verification of green house gas emission reductions or removals, Voluntary Carbon Standard program guidelines (VCS 2007.1), the subsequent decisions by the VCS board and the Host country criteria.

The validation was performed by the following team:

Role/Qualification	Last Name	First Name	Country
Team leader	Raghavan Nair	Reghu Kumar	India
VCS validator	Sharma	Shivraj	India
Observer	Narayanan	Sreeraj	India

The draft validation report, including the initial validation findings, underwent a technical review before being submitted to the project participants. The technical review was performed by Rekha Menon qualified in accordance with RINA's qualification scheme for VCS validation and verification.

1.1 Objective

The purpose of a validation is to have an independent third party to assess the VCS project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant VCS and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all GHG projects in accordance with VCS program requirements and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of Voluntary Carbon Units (VCUs).

1.2 Scope and Criteria

The validation scope is defined as an independent and objective review of the VCS PD. The VCS PD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, Voluntary Carbon Standard program guidelines (VCS 2007.1), the CDM modalities and procedures as agreed

in the Marrakech Accords and the approved baseline and monitoring methodology (ACM0002, i.e. "Consolidated methodology for grid-connected electricity generation from renewable resources" – Version 10, EB 47 (valid from 11 June 2009 onwards)/4/. The validation team has, based on the recommendations in the Validation and Verification Manual /8/employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of VCUs.

The validation is not meant to provide any consulting towards the project participants. However, stated Clarifications and/or Corrective Actions Requests may have provided input for improvement of the project design.

1.3 VCS project Description

The project is a 210 MW capacity, grid connected, run off river type hydro electric power generating unit. It is located in Bengkulu Province about 30 km northeast of Bengkulu city, the capital of the Province. It involves the inter-basin transfer of water from the Musi river in Rejang Lebong Regency to the Simpangaur river in North Bengkulu Regency through a 7.5 km long waterway and has an underground powerhouse.

The main objective of the project activity is to generate electricity by harnessing the hydrological resources of the Musi river and supply it to the Sumatra grid through the Pekalongan PLN main station, with a 150 kV transmission line. This in turn reduces the power supplied to the grid using fossil fuels that results in GHG emission to the atmosphere. Hence this project activity reduces the GHG emissions.

The validation team has verified the documents like contract agreements between the supplier of turbine and generator and Pt.PLN and commissioning certificates of the units to confirm the ownership of Pt.PLN (Persero) for the project activity/10/.

The project has three units with 70 MW capacity each. Start date of the project is 19 July 2006 as per the commissioning certificate of all three units./9/ the validation team accepted this start date as this is the actual and officially certified date from which the project activity began reducing or removing GHG emissions. The project is expected to reduce CO_2 emissions to the extent of 8,47,020 tCO_2e/year over the fixed crediting period of 10 years with an expected operational life time of the project is 30 years as the same was evidenced by the documents provided to the validation team./10/

1.4 Level of assurance

The level of assurance of validation report is reasonable which is based on documents and evidences submitted to the validation team. The same were verified by the validation team and based on review of them along with opinion of experts, the assurance is found reasonable.

2 Methodology

The validation consists of the following three phases:

i) A desk review of the project design documentation

ii) Follow-up interviews with project stakeholders

iii) The resolution of outstanding issues and the issuance of the final validation report and opinion.

In order to ensure transparency, a validation protocol was customized for the project, according to the Validation and Verification Manual /8/. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organizes, details and clarifies the requirements a VCS project is expected to meet;
- It ensures a transparent validation process where the Validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of two tables. The different columns in these tables are described in Figure 1.

The completed validation protocol is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfillment of validation protocol criteria or where a risk to the fulfillment of project objectives is identified. Corrective Action Requests (CAR) are issued, where:

- mistakes have been made with a direct influence on project results;
- validation protocol requirements have not been met; or
- There is a risk that the project would not be accepted as a VCS project or that emission reductions will not be certified.

The validation team may also use the term Clarification Request (CL), where:

- Additional information is needed to fully clarify an issue.

The validation team may also use the term Forward Action Request (FAR), where

- During the validation the highlight issues related to project implementation that requires review during first verification of the project activity.

Validation Protocol Table 1: Requirement checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The checklist is organized in eight different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	*Gives reference to documents where the answer to the checklist question or item is found.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided* ***(OK),*** *or a* ***Corrective Action Request (CAR)*** *due to non-compliance with the checklist question (See below).* ***Clarification*** *is used when the validation team has identified a need for further clarification.*

Validation Protocol Table 2: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action requests	***Ref. to checklist question in table 2***	***Summary of project owner response***	***Validation conclusion***
If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	*Reference to the checklist question number in Table 1, where the Corrective Action Request or Clarification Request is explained.*	*The responses given by the Client or other project participants during the communications with the validation team should be summarized in this section.*	*This section should summaries the validation team's responses and final conclusions. The conclusions should also be included in Table 1, under "Final Conclusion".*

Figure 1 Validation protocol tables

2.1 Review of Document

The VCS PD of version 03 dated 9th November 2009 submitted by Pt. PLN (Persero) /1/ and additional background documents (/2/ to /40/) related to the project design and baseline were assessed by RINA.

2.2 Follow-up Interviews

On 14th and 15th September 2009, RINA performed the site visit and conducted interviews with project stakeholders (/41/ to /52/) to confirm selected information and to resolve issues identified in the document review. Representatives of Pt. PLN (Persero) and South Pole

Carbon Asset Management Ltd. were interviewed. The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization(s)	Interview topics
Pt.PLN(Persero) and South Pole Carbon Asset Management Ltd.	• Clarifications on establishment of baseline, monitoring plan and emission reduction calculations • Resources, training needs and procedures for operation and maintenance • Monitoring Plan / Records (backups) • Maintenance program (calibration) • Project boundaries • Baseline and project emissions • Emissions reductions calculations

2.3 Resolution of any material discrepancy

The objective of this phase of the validation is to resolve any outstanding issues, which needs to be clarified for RINA's positive conclusion on the project design.

The initial validation of the Project resulted in Eight (08) Corrective Action Requests, Nine (09) Clarification Requests and One (01) Forward Action Request. Project participants were invited to respond to RINA's Clarification and Corrective Action Requests and include their response in Table 2 of the validation protocol, in Appendix A to which the project participant replied and resolved successfully

To guarantee the transparency of the validation process, the concerns raised are summarized in chapter 3 below and documented in more detail in the validation protocol in Appendix A.

3 Validation Findings

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol appendix A.

3.1 Project Design

The "210 MW Musi Hydro Power Plant, Bengkulu" project by Pt.PLN (Persero) is a run-off river hydro electric power

plant which utilizes the hydrological resources of Musi river in order to generate electricity and supply to Sumatra grid which otherwise would have been generated through power plants connected to the grid that are mostly fossil fuel based. The project envisages the installation of three turbines of capacity 70 MW each./9/ The annual energy generation is estimated to be 1,140 GWh. /10/

The water is taken from the Musi River through the intake dam and is fed to the turbine through the high pressure pipeline and it is then coupled to a generator thereby producing electricity. The water is then discharged to the Simpangaur River through the tail race.

The power plant consists of three units that include three turbines and generators of 70 MW capacity each. All the turbines are of vertical shaft type Francis turbine manufactured by VA Tech Hydro which has a rated output 73.6 MW and rated speed of 500rpm./10/*/13/* Generators are manufactured by Mitsubishi with a continuous rated output of 84.5 MVA and rated speed of 500rpm./37/ The machineries were physically verified by the validation team during the site visit. The project supplies electricity to the Sumatra grid through Pekalongan PLN main station with a 150 kV transmission line respectively.

The expected operational life time of the project activity is 30 years/10/ and the start date of the project activity is 19 July 2006 as per the commissioning certificate of all the units. A fixed crediting period of 10 years has been chosen starting from 01 August 2006.

The proposed project is not a grouped project and has not participated in any other emission trading program nor applied for any other environmental credits, which has been verified during the validation/18/ and since the project has not applied for any other environmental credits, it is not rejected under other GHG programme.

The proposed project has been validated against all the requirements of VCS 2007.1 and is found eligible under the VCS.

3.2 Baseline

The project applies the approved consolidated baseline methodology ACM0002 (version 10),"Consolidated baseline methodology for grid connected electricity generation from renewable sources"/4/.

This methodology is applicable for this project activity as:

- The project activity is a new run of river type hydro power plant which is connected to a grid. The same was verified during the site visit by the validation team and through assessment of land agreement with department of forest /14/
- No capacity additions, retrofits or replacements involved in this project activity. The same was verified through the loan sanction letter /38/, contract agreement for turbines & generators /4//39/ and through approved EIA copy /11//29/ and found appropriate.
- The project activity is not a reservoir based hydro power plant. Power density of the plant is 820 W/m2 which is greater than 4 W/m2 /4//10/
- This project activity is a new hydro power plant wherein no retrofit, replacement or capacity measures are applicable. The same was verified during the site visit and subsequent assessment of land agreement /14/, approved EIA /11//29/, feasibility study report /10/, project completion report /12/ and commissioning certificate /9/.

The baseline selected is "Electricity delivered to the grid by the project activity that would otherwise have been generated by the operation of grid-connected power plants and by the addition of new generation sources". The combined margin emission factor is used here and is calculated as per the tool to calculate emission factor for an electricity system, version 2. The emission factor for the year 2008 is 0.743tCO_2/MWh as provided by the Indonesian DNA which was verified from the official declaration issued by the State Ministry of Environment on 19 January 2009 /34/, the same has been verified by the validation team and found acceptable. It is selected as it is the most recent data available at the time of submission of PD to the DOE. The grid emission factor has been calculated as the combined margin with the operating margin being calculated ex-ante using a 3 year generation weighted average based on the most recent data available at the time of submission of the PD to the DOE for validation. The data values for the years 2005, 2006 and 2007 are used for calculating the operating margin emission factor and the build margin is based on the power plant capacity addition that comprise 20% of the system generation that have been built recently. The operating margin has been arrived at 0.906tCO2e/MWh and the build margin at 0.581tCO2e/MWh and the combined margin emission factor has been confirmed to 0.743tCO2e/MWh and is fixed ex-ante for the crediting period. RINA has verified all the relevant documents and

calculations and found it as appropriate and correct./19//34/

Additionality

PP has attempted to establish additionality of the project activity as per "Tool for the demonstration and assessment of additionality" (Version 5.2, EB 39) ***/10/***

Step 1: Identification of alternatives to the project activity consistent with current laws and regulations

As per the guidance provided in the Validation and Verification Manual ***/10/*** and approved consolidated methodology ***/10/***, the baseline is defined in the methodology itself as electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, and as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system", Version 02 ***/10/***

Due to this consideration as per Validation and Verification Manual, Para 103 no further analysis is required on alternatives for alternatives for the proposed project activity.

Step 2: Investment Analysis:

Sub-step 2a: Determine the appropriate analysis method

The project activity will generate financial benefits other than VCS-Related income as it is selling the electricity to the grid. Hence the first option of the simple cost analysis method is not applicable.

The project activity doesn't have other comparable sources for the power generation as alternatives hence the PP chose the benchmark analysis.

Sub-step 2b: Option III – Application of Benchmark Analysis

As per the argument made by the PP, the application of benchmark depends upon the likelihood of the development and further operation of the project. The benchmark will be determined by comparing the project IRR with benchmark rates available to a local investor. These could be provided by local banks, or investment bonds in the host country or it could be internally calculated, based on accepted models.

The following reviews were carried out during the assessment

a) Determining the appropriate analysis method

The project developer has chosen to apply the benchmark analysis method and has identified Project IRR as the most suitable financial indicator. Since the project developer is demonstrating the financial unattractiveness of the project, project IRR is appropriate as it is often used by the project developers to make a decision on investing in the project. Besides, the project will generate revenue from the sale of electricity /10//10/ /32/.

Therefore project IRR can be accepted as the most suitable analysis method for this project activity.

b) Determining the suitability of the benchmark applied for the type of financial indicator presented

As per the additionality tool, the financial viability of the project may be demonstrated by comparing the project IRR against the benchmarks available for this type of financial indicators. The most accepted benchmarks are Investment bond rates, Government bond rates or benchmarks computed using internal and external data. One such bench mark may be computed through the Weighted Average Cost of Capital (WACC).

The project developer has chosen to use WACC as the benchmark for the project. The project is partly financed by debt and partly by equity. of The debt component is a loan from the Asian Development Bank with an interest rate of 6.63% US Dollars (USD) /10/ and the equity component is funded the government Indonesia in form of an APBN (Anggaran Pendapatan dan Belanja Negara) or government's budget.

To arrive at the correct WACC, the following steps are followed:

Determining the cost of debt

The revenue and costs of operation are in Indonesian Rupiah (IDR) and the investment cost as well as the funding is in USD hence the project is exposed to currency risk arising from the fluctuation of the IDR and USD. The project developer has therefore converted the interest rate on the USD loan into its equivalent IDR using the Interest rate Parity method.

Interest rate parity plays an essential role in foreign exchange markets, linking interest rates, spot exchange rates and foreign exchange rates. Interest rate parity follows the theory that the interest rate differential between two countries is equal to the gap between the forward exchange rate and the spot exchange rate. In fact, the interest rate parity assumes that the actions of investors trigger corresponding changes in the

exchange rates as well. We therefore consider it appropriate to use this method to determine the equivalent IDR rate.

This comprises:

Determine the 1-year IDR/USD Future Spot Rate using Fisher1. This is calculated using the spot IDR/USD exchange rate in 1992 and applying the US and Indonesian inflation rates for 1993. The future spot rate thus calculated is IDR 2250.28. The formula used is

$$S_{t+1} = S_t \times \frac{1+\inf_{IDR}}{1+\inf_{USD}}$$

Parameters	Description	Value	Base
St	IDR/USD Spot Rate	2112.46	USD/IDR exchange rate in 1993
St+1	1-year IDR/USD Future Spot Rate	2250.28	Calculated
infIDR	IDR inflation rate	9.69%	IDR Inflation Rate in 1993[1]
InfUSD	USD inflation rate	2.97%	US inflation rate in 1994[2]

Using the future spot rate as calculated above, the PP has calculated the cost of debt using Fisher 2. The equivalent interest rate calculated thus is 13.59%. The formula used is

$$S_{t+1} = S_t \times \frac{1+CD_{IDR}}{1+CD_{USD}}$$

Parameters	Description	Value	Base
S_t	IDR/USD Spot Rate	2112.46	USD/IDR exchange rate in 1993
S_{t+1}	1-year IDR/USD	2250.28	Calculated

[1] International Monetary Fund, 2008 World Economic Outlook, http://www.indexmundi.com/indonesia/ inflation_rate_ (consumer_prices).html

[2] http://www.indexmundi.com/united_states/inflation_rate_%28consumer_prices%29.html

	Future Spot Rate		
inf_{IDR}	IDR inflation rate	9.69%	IDR Inflation Rate in 1993[3]
Inf_{USD}	USD inflation rate	2.97%	US inflation rate in 1994
Cd_{USD}	USD cost of debt	6.63%	Loan interest and capital payment disbursement
Cd_{IDR}	IDR equivalent cost of debt	13.59%	Calculated

Determining the cost of equity

In determining the cost of equity, the project participant had two methods to choose from:

The Capital Asset Pricing model which is the most commonly used model to determine expected rate of return from a project. However the model assumes a certain level of maturity in the domestic market. The Indonesian market in 1993 was still very immature and developing hence the market return for 1993 was unavailable.

The Ashwath Damodaran Model */10/* based on country risk premiums. The project proponent has chosen to use this model to compute the cost of equity.

Parameter	**Value**	**Source**
Risk free rate	6.52%	30-year US Treasury Bill, Average rate for 1993
Beta	0.83	Lowest beta for electricity generation, distribution, and transmission, integrated in 2003 – 2008; according to Prof. Damodaran.
Equity market risk + country risk	13.33%	Total risk premium Indonesia average 1992 – 1996, calculated using Interest Rate Parity

[3] International Monetary Fund, 2008 World Economic Outlook, http://www.indexmundi.com/indonesia/ inflation_rate_ (consumer_prices).html

		Fisher model based on inflation during the period 1992-1996 and 2000 – 2005 and total risk premium Indonesia during the period 2000-2005.
Expected Cost of Equity	17.57%	Calculated. Cost for investing in Equity

The country risk premium for 1992-96 is unavailable and the Project proponent has calculated the equity risk and country risk premium for 1992-96 by applying the interest parity model to the average risk premium for 2000-05. The average inflation rate for 2000-05 is 8.39% and for 1992-96 it is 8.43%. The difference between the two is insubstantial and hence it is assumed that the economic conditions prevalent between the two periods are similar. In the absence of other verifiable economic data, the validation team has accepted this point. The interest parity model has then been applied to arrive at the rate of 13.33%.

Determining the Weighted Average cost of capital (WACC)

WACC is defined as the weighted average of the costs of the different components of financing used by the firm. The expected cost of equity is 17.57% and the cost of Debt is 13.59%.Together with a tax rate of 30%, the WACC is works out to 12.75%.

The tax rate of 30% has been verified by us against a tax report by the Deloitte Tax team.

After assessing the financial calculation ***/10/*** submitted by the PP along with the loan sanction letter ***/10/*** and contract agreement with equipment suppliers ***/10/***, the benchmark was found to be appropriate for this project activity.

c) Parameters and assumptions used and verification of the parameters and assumptions against third party documents:

Three important parameters that are used to compute the cash flow are,

- Project cost :This comprises:
  - Direct works
  - Land costs

- Engineering services
- Administration costs
- Contingency costs

These costs have been verified against the Completion Report prepared in June 1993 by P.T. Indra Karia in association with Nippon Koei Co Ltd. ***/10/***

- Financing levels and costs

The project has been partly funded by a debt from the Asian Development Bank (ADB) ***/10/***. The loan is denominated in US Dollars. The terms of the loan as shown below has been extracted from the Completion Report prepared by P.T. Indra Karia in association with Nippon Koei Co Ltd are as below

Rate of interest- 6.63%

Construction period – 7 years

Term of the loan – 25 years

- Estimation of profits and incomes: This comprises
  - Gross electricity revenue
  - Operating and management expenses
  - Depreciation.
  - Tax costs
  - Gross Electricity revenue

This is comprises electricity tariff and the estimated annual electricity generation. The Electricity tariff is obtained from the official transfer price document. The project proponent has calculated the average annual increase in tariff to be 0.028% based on the average annual increase for the period 1990-1994. The Annual generation is derived from the detailed design document – 1993 prepared by Nippon Koei Co Ltd, Tokyo Japan.

Operating and management expenses

Operating and management expenses are in line with the Completion Report. The Project proponent has assumed an annual increase of 5% of operating costs which is conservative given the inflation levels.

Depreciation

Depreciation has been calculated on a straight line basis over 30 years. The project is expected to have a life of 30 years. The plant and machinery are expected to have a residual value of 5% of the cost.

d) Assessment of correctness of computation:

All costs have been verified against the completion report prepared by Indra Karya in association with Nippon Koei & Co in 1993. The validation team has also verified and found correct the formula used in the financial analysis. The total project IRR based on the above numbers is 5.77%.

e) Sensitivity analysis:

A sensitivity analysis that supports the robustness of the conclusion arrived at by varying the critical assumption has been carried out. The project developer has identified the following parameters as the most critical parameters:

1. electricity tariff;
2. electricity generation
3. total investment
4. operational cost.

The following table shows the changes required to the critical assumptions so that the IRR can cross the benchmark of 12.75%:

Scenario	% change	IRR
Increase in electricity tariff or electricity generation	125 %	12.75%
Reduction in investment costs	57%	12.75%
Reduction in O&M Costs	100 %	7.21%

Financial results of the project without carbon finance.

- Increase in Tariff/ Electricity Generation:

Based on the tariff increases over the period 1990-94, it seems highly unlikely that the tariff will increase beyond 10% per annum. Similarly based on the performance of the plant, since 2000, it is not likely to increase by 125% from the base case as cited above.

- Reduction in investment costs

Most of the costs of the project has already been incurred hence there is not likely to be any material change in the investment costs incurred.

- Reduction in operational costs

Even if operation and maintenance cost were reduced by 100%, the calculated project IRR would still be under the benchmark. All operations will incur a certain amount of operation costs therefore to envisage a reduction of 100% in operational costs is not practical.

Other financial issues:

The DOE has reviewed the financial statements of PLN ***/10/*** for the period 1999 to 2002 and have noted the following:

1. The company has been suffering from operating losses since 1999. The operating loss for 2002 was IDR 8,152 billion.
2. There has been a sharp increase in the values of the fixed assets held in 2002 on account of a revaluation exercise. This is unrealized profit
3. The rate of return on net average asset has been negative throughout this period.

The validation team also examined the report prepared by the Asian Development bank (the lender) /10/ in July 2003 and noted the following:

1. PLN has been unable to meet the covenant requirements stated in the loan documents.
2. The financial position of PLN has been affected on account of the Asian financial crisis.
3. The Government's reluctance to increase tariffs has affected PLN's ability to meet its covenants.
4. PLN has over the last few years developed good internal controls which will help its financial position in the long run.

Step 4: Common Practice Analysis

As per the government data, the potential for hydro power in Indonesia is 75000 MW wherein only 3200 MW has been utilized ***/10/***. These figures include project activities developed by captive generation by private entities and by the project proponent.

For this project activity, Southern Sumatra has been taken as the region where in four hydro projects are being implemented.

Sub-step 4a: Analyze other activities similar to the proposed activity:

At the time of this project activity, there were four such hydro power project existed in Southern Sumatra grid region.

Out of 630,100 kW installed capacity these hydro power plants consisted of 97,460 kW capacity which is around 15.47 % of the total capacity.

Sub-step 4a: Analyze other activities similar to the proposed activity:

There are four hydro power plant located in the southern Sumatra region which are mentioned in the table below:

Hydro Power Plant in Southern Sumatra	**Total Installed capacity (MW)**	**Year of commissioning**
Tes I hydro power plant	1.3	1958
Tes II hydro power plant	17.6	1991
PLTA MJAU	68	1983
PLTA BAGM (Ebara)	10.5	1976

As it can be observed from these figures that none of the project activity has the same capacity as the project activity hence they can't be compared.

Hence considering all arguments above and subsequent verification of all relevant evidences supporting these arguments, it was concluded that the project is additional and VCS revenue enable PLN to improve the financial viability of this project activity.

3.3 Monitoring Plan

The project activity essentially consists of generating power from hydro potential, a renewable resource, and feeding it to the Southern Sumatra grid. The installed capacity of the project is 210 MW. The project qualifies for consideration as large scale project activity and therefore, baseline and monitoring methodology ACM 0002, version 10 is applicable for the project. Accordingly, the methodology requirement of "Metering the Electricity Generated" is in place for the project activity.

Monitoring plan consists of parameters required for monitoring during the crediting period for estimation of emission reduction. Such parameters are,

- Electricity supplied to the grid
- Amount of Diesel used in the project activity

Measurement of electricity supplied is done using Actaris type meters and the same is also being recorded

continuously. As the meters are installed at the switchyard near to the generation point the Transmission and Distribution losses are negligible. Metering is done separately for the net electricity exported to the grid accounting for the captive consumption. Electricity exported to the grid can be verified by the readings of a check meter. The meters installed are of standard quality and the calibration of the meters is governed by recommendations from equipment manufacturer. However the same will be carried out annually. Meters for monitoring of energy generated, consumed and exported to grid are of 0.2s accuracy class to ensure accurate efficient measurement. Monthly readings of power exported to the grid are jointly signed through Monthly Electricity Protocol (MEP) by the official representatives of PLN Musi generating unit and PLN transmission unit that may be counter verified by monthly invoices raised.

As discussed in the section 3.4 of the report, the project emission through the usage of Diesel based Generator Set comes to less than 1% of the total emission of reduction. However, the PP has chosen to monitor the amount of fuel used to ensure transparency and conservative approach which is found acceptable. Recording of the same will be done through the log book which will be maintained throughout the crediting period and two years after the end of the crediting period.

The emission factor is based on the data published by Indonesian DNA and is applied on an ex-ante basis and fixed for the crediting period. All data, including the Emission Factor data of grid emissions, will be archived in paper and electronic format until two years further to the crediting period.

The project design employs SCADA based microprocessor ensuring high accuracy monitoring and control equipment that will measure, record, monitor and control various key parameters like energy generation by the project.

The VCS monitoring team comprising of experienced personnel and led by a VCS Manager is responsible for monitoring, recording and reporting the monitored data. The manager will ensure training of required to personnel to ensure effective monitoring. A standard set of procedures have been developed which will enable the monitoring team to ensure effectiveness of the monitoring. The effectiveness of the corrective action also will be monitored and reports submitted for review.

As per the monitoring plan in order to ensure quality assurance on effectiveness adjustment will be made in the event of: any seal securing the metering system is broken, the system fails to register, or the measurement result is found (upon testing) to vary more than the

allowable error from the standard meter used in the test. In case of failure of the main meter, production meter and own consumption meter which are also located at generation site, will be used as cross-check meters, measuring the quantity of electricity exported from the project. The difference between electricity produced and consumed on-site shall be valid for claiming carbon credits. In the special case of total failure of all meters no credits will be claimed during such period. This approach is conservative and hence accepted.

3.4 Calculation of GHG Emissions

The calculation of the GHG emissions is done as per the approved baseline and monitoring methodology ACM0002 version 10. Emission reduction is calculated by subtracting the project emission and leakage from the baseline emission.

Baseline emission is calculated as the product of net electricity supplied to the grid that is 1.140 GW (from feasibility study report) and the combined margin emission factor of the grid which is calculated as per the tool to calculate emission factor of an electricity system, version 2, EB 50. As discussed in the section 3.2, CM emission factor for Sumatra grid is selected as 0.743tCO_2e/MWh.

According to the approved consolidated methodology ACM 0002, Version 10, emission due to leakage is not applicable for this project activity.

The project activity is a run-off river hydro power plant. A diesel generator is used as a backup in this project activity. The maximum quantity of diesel consumed is found to 345 litres in a year. The value for the Diesel consumption has been taken from the plant record and it was verified during the site visit by the validation team. The value of 345 litres has been taken out of the highest consumption value for the year (2008) which is conservative /11//21/. The emission calculated due to this is found to be approximately 1.00t CO2/year. Since the value is too small(less than 1% of the total emission reduction) compared to the baseline emission, this is neglected. Hence the project emission is taken to be Zero. However, the PP will monitor the amount of Diesel consumed annually which is appropriate and conservative.

The project is expected to result in an emission reduction of 8,47,020 tCO_2 e/year. The calculations and assumptions have been verified and found to be correct. In summary, the GHG calculations are complete and transparent, and the data accuracy has been verified.

3.5 Environmental Impact

As per the decree of the Ministry of Environment No. 17/2001, all hydroelectric power plants with a dam height of ≥ 15 meters, or flooded area of ≥ 200 ha or installed capacity of ≥ 50 MW need to undertake an Environmental Impact Assessment (EIA). Since the installed capacity of this project is 210 MW, an EIA was conducted./11/ RINA had checked the copy of the same and was found appropriate. Certain impacts that may affect the environment during the pre construction phase, construction phase and operation phase were found and the mitigation measures were suggested and defined. Project also supports the sustainable development. With all these mitigation measures and contribution to the sustainable development, project has a positive impact on the local and global environment.

3.6 Comments by stakeholders

A stakeholder consultation meeting was held on May 6, 2003. The persons who attended the meeting included the village chief and those who live nearby the hydro power plant. RINA has checked the report on stakeholder consultation meeting prepared by the PP which includes attendance list and minutes of meeting. The validation team is of the opinion that there was fair representation and opportunity given to the stakeholders and also noticed that no negative comments were received from the stakeholders during the meeting./17/

4 Validation conclusion

RINA has performed the validation of the "210 MW Musi Hydro Power Plant, Bengkulu" at Bengkulu, Indonesia, on the basis of Voluntary Carbon Standard program guidelines (VCS 2007.1), the subsequent decisions by the VCS Board and the Host Country criteria as well as criteria given to provide for consistent project operations, monitoring and reporting.

The project activity involves hydro power as a source of energy to generate and clean electricity clean heat energy. The project activity exports clean electricity, produced from the renewable energy source (Hydro Source) to the national grid, thus reduces greenhouse gas emissions by displacing fossil-fuel electricity from the grid.

In the course of the draft validation 1 FAR, 8 CAR and 9 CL were raised and the same were closed upon appropriate justification/explanation and correction by the project proponent. The review of the project description and additional documents related to baseline and monitoring methodology, subsequent background investigation, follow-

up interviews and review of comments by parties, local stakeholders, and consultant has provided RINA with sufficient evidence to validate the fulfillment of stated criteria.

As per VCS standard 2007.1, the project is not a grouped project activity and aims to reduce 847,020 tCO_2e per year with 10 years crediting period. The emission reductions achieved due to the project activity are real, measurable and give long term benefits and that are additional to what would have occurred in the absence of project.

The validation has confirmed that the project correctly applies the baseline and monitoring methodology as per approved consolidated methodology ACM 0002, i.e. "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 10, dated 28/05/2009. The determination of baseline was elaborate, transparent and sufficiently supported with facts. The selected baseline scenario is reasonable and appropriate for the chosen crediting period. Moreover, an analysis of barriers facing the project demonstrates that project is not a likely baseline scenario and hence additional.

The monitoring plan is complying with requirement of the methodology. The monitoring plan includes all relevant parameters. Responsibilities and authorities for project management, monitoring and QA/QC procedures have also been stated in the final version of VCS PD (version 3, dated 10th November, 2009). A local stakeholder consultation has been carried out by the project participant.

In detail, RINA's opinion can be summarized as follows:

1. The project meets all relevant VCS 2007.1 requirements and all relevant host country criteria (Indonesia)
2. It correctly applies approved consolidated methodology ACM 0002 – "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 10, dated 28/05/2009.
3. The project additionality is sufficiently justified in VCS PD.
4. Monitoring plan is transparent and adequate.
5. Calculations of project emission reductions are carried out in transparent manner. The calculated emission reductions are 847,020 tCO_2e per year for 10 years crediting period.

Hence, RINA recommends and requests the registration of "210 MW Musi Hydro Power Plant, Bengkulu" as a VCS project activity.

5 References

Category 1 Documents:

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

/1/	VCS PD of "210 MW Musi Hydro Power Plant, Bengkulu", version 01, dated 13 July 2009 and version 03, dated 9 November 2009.
/2/	Emission Reduction Calculation sheet
/3/	IRR calculation sheets
/4/	"CDM Executive Board: ACM0002 "Consolidated methodology for grid connected electricity generation from renewable sources" – Version 10, EB 47 (dated 11 July 2009 onwards).
/5/	"Tool for demonstration and assessment of additionality", version 05.2
/6/	"Tool to calculate emission factor for an electricity system", version 02
/7/	"Tool to calculate project or leakage CO2 emissions from fossil fuel consumption", version 02
/8/	Clean Development Mechanism Validation and Verification Manual, Version 01, Annex-3, EB-44. http://cdm.unfccc.int/EB/044/eb44_repan03.pdf
/9/	Copy of Commissioning certificates for all the three units provided by the Department of Energy dated 19 July 2006
/10/	Copy of Project Report on Engineering services for Detailed Design prepared by P.T. Indra Karya in association with Nippon Koei Co. Ltd. In June 1993.
/11/	Copy of Environment Impact Assessment
/12/	Copy of Project Completion Report Executive Summary prepared by P.T. Indra Karya in association with Nippon Koei Co. Ltd. and P.T. Indra Karya, Indonesia in August 2006.
/13/	Report on Country plans and policies for developing and implementing renewable energy programs in Indonesia.
/14/	Copy of Land Deed Agreement
/15/	Copy of Ministerial Decree for grid connection 2007
/16/	Copy of list of employees who had undergone training
/17/	Copy of minutes of meeting of stake holder consultation along with the photographs of the meeting and the comments received.
/18/	Copy of undertaking letter provided by the PP dated 16 September 2009.
/19/	Copy of emission factor calculation sheet for the Sumatra grid for the year 2008 prepared by the DNA.
/20/	Report on Indonesian power sector by EU

/21/	Copy for the diesel consumption in the plant from 2006 to 2009.
/22/	Foot note document
/23/	Paper published on Global Finance
/24/	A textbook on Security Analysis for Investment and Corporate Finance by Aswath Damodaran.
/25/	A text book on Valuation
/26/	Evidence for the Indonesian Inflation rate.
/27/	A book on Banking Disintermediation and its Implication for Monetary policy: The case of Indonesia.
/28/	Literature on Estimating Equity Risk Premiums by Aswath Damodaran
/29/	Report on Impact Evaluation Study by ADB
/30/	Calibration certificates for the meters used.
/31/	Document for O&M
/32/	Document for the transfer price of electricity for the years 1990 to 1994
/33/	Document in support of GPS coordinates
/34/	Letter provided by the State Ministry of Environment, Government of Indonesia for the emission factor in Sumatra grid dated 19 January 2009
/35/	Copy of monthly electricity protocol from 1 January 2007 to 31 December 2008.
/36/	Copies of Standard Operation Procedures for calibration, monitoring, metering and emergency preparedness.
/37/	Copy of Technical Specifications of the turbine and generator.
/38/	Copy of ADB loan sanction letter
/39/	Copy of Contract Agreement between the supplier of turbine and generator and Pt.PLN(Persero)
/40/	Copy of PLN annual report of year 2002.

Persons interviewed:

List persons interviewed during the validation, or persons contributed with other information that are not included in the documents listed above.

/41/	Mr. Heri Pirambodo, Operations In charge, PT PLN
/42/	Mr. Pandi, Electrical Engineer, PT PLN
/43/	Mr. Shobivin, Mechanical Engineer, PT PLN
/44/	Mr. K. Andriyanto, Turbine Operator, PT PLN
/45/	Mr. M. Hasan, Assistant Engineer, PT PLN
/46/	Mr. Asep, Assistant Engineer, PT PLN
/47/	Mr. Rika Rahrja, Trainee, PT PLN
/48/	Mr. Dinda Almaryah, Assistant Engineer, PT PLN
/49/	Ms. Risa Augustina, Trainee, PT PLN
/50/	Mr. Henricus Hutabarat, CDM Development Manager - Indonesia, South Pole Carbon Asset Management Ltd
/51/	Mr. Peter Handana, CDM Development Manager - Indonesia, South Pole Carbon Asset Management Ltd
/52/	Mr. Paul Butarbutar, Country Director - Indonesia, South Pole Carbon Asset Management Ltd

APPENDIX A

VCS 2007.1 VALIDATION PROTOCOL

This document contains a generic Validation Protocol for VCS projects, which must be seen in conjunction with the Validation and Verification Manual and the Validation Report Template. The entries in the protocol should be adjusted and amended as appropriate to prepare for the validation of a particular project.

This validation protocol serves the following purposes:

- *It organizes, details and clarifies the requirements a VCS project is expected to meet; and*
- *It ensures a transparent validation process by inducing the Validator to document how a particular requirement has been validated and which conclusions have been reached;*

This protocol contains two tables with generic requirements for validation projects. Table 1 consists of a checklist with validation questions. The checklist questions may not be applicable for all investors, and should not be viewed as mandatory for all projects. Where a finding is issued, a corrective action request or clarification request are stated. The resolution and final conclusions of these requests should be described in Table 2 of this protocol.

Before this generic validation protocol can be applied to validate a specific project, the Validator must review and adjust/amend the protocol to make it applicable to individual project characteristics and circumstances as well as individual investor criteria. The application of the validator's professional judgment and technical expertise should ensure that checklist amendments cover all necessary specific project requirements that have impact on project performance and acceptance of the project. Given the above, the checklist part of the protocol is neither exhaustive nor prescriptive.

Requirement Checklist

Table 1

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
1. General Description of Project Activity. *The project design is assessed.*					
1.1. Title of the project activity.					
1.1.1. Is the title of the project activity, version number and date of document (VCS PD) clearly mentioned?	/1/	DR/I	The title of the project is "210 MW Musi Hydro Power Plant, Bengkulu", version 01. However the date of VCS PD mentioned in the first page and under section 1.1 is different. Kindly clarify.	~~CL 1~~	**OK**
1.2. Type/Category of the project.					
1.2.1. Is the project category part of a VCS Board approved GHG Program?	/1/	DR/I	Project is categorized under sectoral scope 1, Energy Industries (renewable/ non renewable resources)		**OK**
1.2.2. Is the project activity a grouped project?	/1/	DR/I	The project activity is not a grouped project. However project participant has to remove the term debundled from the PD.	~~CL 1~~	**OK**
1.3. Estimated amount of emission reductions over the crediting period including project size.					
1.3.1. Is the project a micro project, project or a mega project? • *micro projects: under 5,000 tCO_2e per year;* • *projects: 5,000 - 1,000,000 $tCO2_2e$ per year; and* • *mega projects: greater than 1,000,000 $tCO2_2e$ per year*	/1/	DR/I	The project generates an average emission reduction of 5,19,055 tCO_2e per year and hence comes under the category projects.		**OK**
1.3.2. Are the total and annual estimated emission reductions defined?	/1/	DR/I	Yes. The project is expected to reduce an amount of 5,19,055 tCO_2e per year		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
1.4. A brief description of the project.					
1.4.1. Has the project been properly described?	/1/ /9/ /10/ /20/	DR/I	The project activity is a run-of river type hydro power plant in Bengkulu province in Indonesia. It utilizes the hydrological resources of Musi river to generate zero emission electricity, The total capacity of the project is 210MW which is generated with the help of three 70MW Francis turbines which can work under a rated head of 396.0m and a rated speed is 500rpm. The electricity generated is delivered to the Sumatra grid. However PP needs to change the operation date of the three units. It has to be the date mentioned in the commissioning certificate. PP is also requested to provide the evidence for the statement "the potential capacity of the hydro resources in Indonesia is 75000MW of which only 4,200 MW has so far been used to generate electricity". PP needs to clarify the statement that the project causes no negative impact on the surrounding environment since it is implemented in an existing reservoir. But in the site visit, no reservoirs were seen. Also clarify how the project supports technology transfer from other regions or even other countries.	~~**CL 1**~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
1.5. Project location including geographic and physical information allowing the unique identification and delineation of the specific extent of the project					
1.5.1. Is the location of the project activity clearly defined, including details of the physical location and information that allows its unique identification and delineation of the specific extent of the project? *GPS -boundaries- coordinates included?*	/1/ /14/ /33/	DR/I	Project activity is located in Bengkulu province, Sumatra, Indonesia. Its exact location is $3^0$34'South and $102^0$30'East. However the GPS mentioned in the EIA was different from this value. Kindly incorporate the exact value. Land agreement of the project site from the forestry department from the year 2004 has to be submitted by the PP.	~~CL 1~~	**OK**
1.6. Project activity and crediting period Start dates.					
1.6.1. Is the project start date (*the date the project activity began reducing or removing GHG emissions*) correctly mentioned?	/1/ /9/	DR/I	Project start date mentioned in the PD is 24/05/2006 which is as per the commissioning inspection certificate. But as per the VCS guidelines, it should be the date in which actual emission reduction has started. So starting date of the project should be as per the commissioning certificate of the generators. PP needs to revise the same. PP to submit the commissioning certificate for the turbines and generators for verification.	~~CAR 1~~	**OK**
1.6.2. Is the project crediting period start date (*the date on which the first monitoring period commences*) correctly mentioned?	/1/	DR/I	Project crediting period also changes according to start date. PP needs to revise the crediting period start date appropriately.	~~CAR 1~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
The earliest Project Crediting Period Start Date under the VCS 2007.1 shall be 28 March 2006 for non-AFOLU projects and 1 January 2002 for AFOLU projects.					
1.6.3. Is the project crediting period clearly mentioned? *For non-AFOLU projects and ALM projects focusing exclusively on emissions reductions of N_2O, CH_4 and/or fossil-derived CO_2, a maximum of 10 years which may be renewed at most two times. For AFOLU projects other than such ALM projects, a minimum of 20 years up to a maximum of 100 years.*	/1/	DR/I	See section 1.6.2	~~CAR 1~~	**OK**
1.7. Conditions prior to project initiation.					
1.7.1. Are the conditions prior to the initiation of the project clearly mentioned?	/1/	DR/I	No. Even though the project is a new activity, PP should mention the condition prior to the project activity.	~~CL 1~~	**OK**
1.8. A description of how the project will achieve GHG emission reductions and/or removal enhancements.					
1.8.1. Is it explained how the project activity reduces GHG emissions, i.e. technology, measures?	/1/	DR/I	Yes. Project uses the run-of river for generating electricity which otherwise would have generated through power plants connected to the Sumatra grid.		**OK**
1.9. Project technologies, products, services and the expected level of activity.					
1.9.1. Is the technical description of the project clearly stated?	/1/ /9/ /10/	DR/I	Yes. The technical description of the project is clearly mentioned. However the PP is requested to clarify the following issues :		

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
	/16/		• Capacity is mentioned as 210 MW (70 MW x 3). But from the site visit, it was evident that the capacity was not the same. Instead it was 73.6 MW x 3 = 220.8 MW. • Water head mentioned in the first paragraph of this section is contradicting with the value mentioned the table A.1.9.1. • Kindly provide evidence for the claim that project will use state of art technology with credible documents. Also PP needs to provide the documented proof for the following statements: • Essential equipment has to be procured from another country. • Training provided to the employees prior to the project commissioning. • Annual energy output is expected at 1,140 GWh with a gross head of 404m by diverting water of 42.3m^3/sec.	~~CAR 1~~ ~~CL 1~~	**OK**
1.9.2. Are the products, services and expected level of activity clearly mentioned?	/1/	DR/I	Yes. The products, services and expected level of activity are mentioned.		**OK**
1.9.3. Does the project involve transfer of technology?	/1/	DR/I	PP needs to mention whether the project involves transfer of technology	~~CL 1~~	**OK**
1.9.4. Is the technology used environmentally safe and sound?	/1/ /11/	DR/I	PP needs describe whether the technology used is environmentally safe and sound.	~~CL 1~~	**OK**
1.9.5. Does the project require extensive initial	/1/	DR/I	PP has mentioned that they have provided	~~CL 1~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
training and maintenance efforts in order to be carried out as scheduled during the project period?	/16/		training prior to the project commissioning. They must provide the documents for justifying the same.		
1.10. Compliance with relevant local laws and regulations related to the project.					
1.10.1. Does the project comply with laws and regulations of the Host Country?	/1/ /11/ /14/	DR/I	Project complies with all laws and regulations of the Host country. However PP needs to submit the documentary evidence for the same and also mention in the PD, the laws and regulations that the project comply.	~~CL 1~~	**OK**
1.11. Identification of risks that may substantially affect the project's GHG emission reductions or removal enhancements.					
1.11.1. Are the risks that may affect the project's GHG emission reductions or removal enhancements been identified?	/1/	DR/I	PP has to mention the risks that may affect the project's GHG emission reductions or removal enhancements.	~~CL 1~~	**OK**
1.12. Demonstration to confirm that the project was not implemented to create GHG emissions primarily for the purpose of subsequent removal or destruction.					
1.12.1. Does the project clearly state that it was not implemented to create GHG emissions primarily for the purpose of subsequent removal or destruction?	/1/	DR/I	PP needs to justify that why this section is not applicable for this project.	~~CL 1~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
1.13. Demonstration to confirm that the project has not created another form of environmental credit *(for example renewable energy certificates)*					
1.13.1. Has the project created any form of environmental credit?	/1/	DR/I	The project has not created any form of environmental credits.		**OK**
1.13.2. Has supporting documents been provided to prove the above statement?	/1/ /18/	DR/I	PP has provided an undertaking letter marked to the registry stating that they will not go for any other form of environmental credits other than VCS. The same was verified by RINA and found satisfactory.		**OK**
1.14. Project rejected under other GHG programs *(if applicable)*.					
1.14.1. Has this project being rejected by other GHG programs due to procedural or eligibility requirements?	/1/	DR/I	PP needs to justify that why this section is not applicable for this project.	~~**CL 1**~~	**OK**
1.14.1.1. If it was rejected, it is mentioned the reason for the rejection in the VCS PD? *Such information shall not be deemed commercially sensitive information.*	/1/	DR/I	See Section 1.14.1	~~**CL 1**~~	**OK**
1.14.1.2. Was (were) the actual rejection document(s) provided to the VCS Program Validator/Verifier?	/1/	DR/I	See Section 1.14.1	~~**CL 1**~~	**OK**
1.14.1.3. Is the project validated against the VCS2007.1 program requirements?	/1/	DR/I	Yes. The project is validated against VCS 2007.1 program requirements.		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
1.15. Project proponents' roles and responsibilities, including contact information of the project proponent(s), other participants.					
1.15.1. Are the roles and responsibilities of the project proponent and other participants incorporated?	/1/	DR/I	The roles and responsibilities of the project proponent and other participants have to be mentioned in this section.	~~CL 1~~	**OK**
1.15.2. Does the contact information of the project proponent and other participants mentioned?	/1/	DR/I	Yes. The contact information of the project proponent and other participants mentioned. However PP has to clearly mention whether the parties involved in this project are public or private entity.	~~CL 1~~	**OK**
1.16. Any information relevant for the eligibility of the project and qualification of emission reductions or removal enhancements, including legislative, technical, economical, sectoral, social, environmental, geographic, site-specific and temporal information.					
1.16.1. Does the VCS PD provides any information regarding the eligibility and qualification of emission reductions or removal enhancements, including legislative, technical economical, sectoral, social, environmental , geographic, site-specific and temporal information?	/1/	DR/I	PP needs to justify why this section is not applicable for this project activity.	~~CL 1~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
1.17. List of commercially sensitive information *(if applicable)*.					
1.17.1. Has the project proponent listed any commercially sensitive information that has been excluded from the public version of VCS PD which will be displayed on the VCS project database?	/1/	DR/I	PP needs to justify why this section is not applicable for this project activity.	~~CL 1~~	**OK**
2. Project Baseline Application (methodologies). *The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.*					
2.1. Baseline Methodology. *It is assessed whether the project applies an appropriate baseline methodology (number, title and version). Explanation of methodology choices.*					
2.1.1. Is the selected methodology previously approved by the VCS Registry and in line with the relevant project category? *(Correctly quoted and interpreted?)*	/1/ /4/	DR/I	Methodology used in this project activity is ACM0002"Consolidated methodology for grid connected electricity generation from renewable sources", version 10 which is approved by the VCS registry.		**OK**
2.1.2. Is the methodology applicable to the project being considered?	/1/	DR/I	Yes. The methodology is applicable to the project activity.		**OK**
2.1.3. Does the project provide information on methodology deviations or methodology	/1/	DR/I	PP needs to provide information/reference on methodology deviations/methodology revisions	~~CL 2~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
revisions?					
2.1.4. Are other methodologies or tools drawn up by the approved methodology mentioned? *(Correctly quoted and interpreted?)*	/1/	DR/I	Yes. However PP needs to mention the version number for all the tools used in this project activity.	~~CL 2~~	**OK**
2.2. Justification of the choice of the methodology and why it is applicable to the project activity.					
2.2.1. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/	DR/I	The project activity is a run-of river type hydro power plant that does not involve capacity additions, retrofits or replacement and is connected with a regional power grid, the Sumatra grid. It is neither a biomass fired power plant nor involves switching of fossil fuel. Hence the methodology used in this project is applicable to this project activity. However PP has mentioned that this project is implemented in an existing reservoir. During the site visit, it was evident that no reservoirs exist and is a run-off river project. Kindly clarify.	~~CL 2~~	**OK**
2.3. Identifying GHG sources, sinks and / or reservoirs for the baseline scenario and for the project.					
2.3.1. Has the GHG sources, sinks and / or reservoirs identified for the baseline scenario and for the project?	/1/	DR/I	Yes, the GHG sources, sinks and reservoirs have been identified for the baseline scenario and for the project.		**OK**
2.3.2. Has the justification for the emission in	/1/	DR/I	Kindly bring in more clarity for the	~~CAR 2~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
baseline scenario and the project done correctly?			justification why CH4 is excluded.		
2.4. Description of how baseline scenario is identified and description of the identified baseline scenario. *The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.*					
2.4.1. Is the application of the methodology and the discussion and determination of the chosen baseline scenario transparent?	/1/ /4/	DR/I	Yes. The methodology selected is ACM0002 which is applicable for this project. Baseline selected is also in accordance with the methodology. Baseline is Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid connected power plants and by the addition of new generation sources.		**OK**
2.4.2. Has the baseline been determined using conservative assumptions where possible? *(confirm that any procedure contained in the methodology to identify the most reasonable baseline scenario, has been correctly applied)*	/1/	DR/I	The selected baseline is the only applicable baseline for this project.		**OK**
2.4.3. Has the baseline been established on a project-specific basis?	/1/	DR/I	Yes. The baseline is established on a project specific basis.		**OK**
2.4.4. Is the baseline determination compatible with the available data?	/1/	DR/I	PP is requested to submit the electricity generation data which includes electricity generated in the plant, supplied to the grid and	~~**CL 2**~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			own consumption.		
2.4.5. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1/	DR/I	There is only one possible baseline scenario for this project activity.		**OK**
2.4.6. Have the major risks to the baseline been identified? (*Are uncertainties in the GHG emission estimates properly addressed in the documentation?*)	/1/	DR/I	Kindly mention the major risks identified for the baseline.	~~CL 2~~	**OK**
2.4.7. Is all literature and sources clearly referenced?	/1/ /5/ /6/	DR/I	Kindly provide all literatures and sources referenced.	~~CL 2~~	**OK**
2.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered VCS project activity (*Assessment and demonstration of additionality*).					
2.5.1. Does the VCS PD follow all the steps required in the methodology to determine the additionality? (*Is an approved additionality tool required / used? - Note: the guidance in the methodology shall supersede the tool*)	/1/ /5/	DR/I	PP has attempted to establish additionality of the project activity as per "Tool for the demonstration and assessment of additionality" (Version 5.2, EB 39) The PP needs to consider the guidance provided by the approved consolidated methodology – ACM 0002, Version 10 for demonstration and assessment of additionality. Project activity additionality is emphasized on investment barrier. Step 1: Identification of alternatives to the	~~CAR 3~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			project activity consistent with current laws and regulations Sub-step 1a: Defining Alternatives Alternative 1: The proposed project activity without being registered as VCS project activity This alternative would be financially unattractive option which is discussed further in detail later in step 2. This alternative has not been considered as the plausible baseline scenario. Alternative 2: Continuation of the current practice The electricity generated through existing generation mix. Alternative 3: Construction of a fossil fuel fired power plant with same installed capacity or same annual power output. Fossil fuel powered power plants are common practice in Indonesia. The government is encouraging sue of natural gas and coal for power generation. Government is planning to develop 10,000 MW power plants fired through coal in Indonesia. Sub-step 1b: Consistency with mandatory laws and regulations: For the first alternative, there are no laws or		

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			regulations compelling the PP to develop hydro electric projects in Indonesia. Similarly alternatives 2 & 3 also are in line with applicable mandatory laws and regulations. The laws are encouraging project developers to invest in fossil-fired power plants making the third alternative viable option. Step 2: Investment Analysis: Sub-step 2a: Determine the appropriate analysis method The project activity will generate financial benefits other than VCS-Related income as it is selling the electricity to the grid. Hence the first option of the analysis method is not applicable. The project activity doesn't have other comparable sources for the power generation as alternatives hence the PP chose to implement benchmark analysis. The PP is requested to justify why they have not discussed the third alternative with supportive evidences.	~~CL 3~~	
			Sub-step 2b: Option III – Application of	~~CL 3~~	

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			Benchmark Analysis The comparison between the continuation of purchase or grid electricity generation mix with returns from the project activity PP needs to provide the investment comparison for the continuation of purchase and grid electricity generation mix with returns from the project activity. The comparison will be based on comparing the project IRR (without carbon) with benchmark rates available to a local investor which obtained from local banks or investment bonds in the host country or it could be internally calculated. PP to justify why they have not considered lending rates from local banks as the benchmark. The risk free rates and premium risk are obtained from other countries which need to be justified with supporting evidences. When the PP is a government company based in the host country – Indonesia, who is into the power generation sector, PP needs to demonstrate consideration of calculating country risk. The premium risk is provided for the country which is not specific to the project activity;	~~CL 3~~	

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			kindly justify the application of the same for this project activity. PP to justify the appropriateness of the project type / industrial sector when calculating for beta value hence they need to correct the same in the financial calculation/WACC sheet provided to the DOE. PP needs to clarify whether the beta value chosen represents raw/unlevered or levered value. PP need to provide sources for chosen values for insurance, operation and maintenance, equity amount, operational life time of the project activity, fair value for the project at the end of the operational life time. As per the guidance provided in the tool for demonstration and assessment of additionality version 5.2, guidance point no. 6, the PP needs to use input values for all investment analysis should be valid and applicable at the time of the investment decision taken. Further, the tariff considered for the financial analysis is not appropriate to the project. PP should also justify if the PLF considered is in line with the guidance given by EB 48 for reporting PLF The loan was procured from Asian	~~CL 3~~ ~~CAR 3~~	

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			Development Bank (ADB) in the USD denomination currency at the interest rate of 4.26 %. PP is requested to provide loan agreement papers to the DOE for verification. The benchmark is calculated as per weighted average cost of capital (WACC) which comes to 13.51 %. The returns from the proposed project activity comes to 8.48 % which less than the selected benchmark. The PP is requested to provide justification on selection and the appropriateness of the chosen benchmark as per the EB guidance on investment analysis along with supporting documents. The PP is also requested to provide clarification on the pre-tax/ post-tax returns comparison with the benchmark. The PP is requested to provide the use of this arrangement consistently in their investment decisions for last three years which is in line with guidance provided on investment analysis by EB. PP to substantiate all arguments made under the performance of PLN with supportive evidences for all assumptions/ data provided	~~CL 3~~ ~~CL 3~~	

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			Sub-step 2c: calculation and comparison of financial indicators: PP is requested to clarify on the use of other financial indicator – Net Present Value (NPV) for the project activity.	~~CL 3~~	
			Sub-step 2d: Sensitivity Analysis: Sensitivity analysis has been performed to check the robustness of the financial model employed for this proposed project activity. The project viability has been evaluated increase and decrease of 10 % of Electricity tariff, total investment and operational cost. The PP is requested to carry out the sensitivity analysis till it reaches the breakeven point and explain the likelihood of the achieving the same with supporting evidences.	~~CL 3~~	
			With 10 % increase in the tariff, the IRR reaches to 9.42 % which is still less than benchmark Tariff is unlikely to increase more than 10 % which can be witness from the historical data hence further increase in the tariff is not possible. The PP is requested to provide historical tariff structure for verification.	~~CL 3~~	
			Step 4: Common Practice Analysis		

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			Sub-step 4a:Analyze other activities similar to the proposed activity: As per the government data, the potential for hydro power plant is 75000 MW wherein only 4200 MW has been utilized. PP is requested to provide the evidence for potential and installed capacities for Hydro Power plants in Indonesia. The project activity is located in Bengkulu province hence the PP has considered the same province for common practice analysis. The PP needs to conduct the common practice analysis for the relevant regional grid (for entire Sumatra region) and present findings on the same. Sub-step 4b: Discuss any similar options that are occurring: The common practice analysis is not complete and has not included the sub-step 4b as per "Tool for the demonstration and assessment of additionality" (Version 5.2, EB 39)	~~CL 3~~ ~~CAR 3~~ ~~CAR 3~~	
2.5.2. Does the project demonstrate to be additional?	/1/	DR, I	Refer to 2.5.1	~~CAR 3~~ ~~CL 3~~	**OK**
2.5.3. Is a complete list of barriers developed that	/1/	DR, I	Refer to 2.5.1	~~CAR 3~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
prevents the project activity to occur in step 2 of the implementation barriers?				~~CL 3~~	
2.5.4. Is the discussion on the additionality clear and have all assumptions been conservative, supported by transparent and documented evidence for all steps?	/1/	DR, I	Refer to 2.5.1	~~CAR 3~~ ~~CL 3~~	**OK**
2.5.5. Is it appropriately explained how the approval of the project activity will help to overcome the identified barriers?	/1/	DR, I	Refer to 2.5.1	~~CAR 3~~ ~~CL 3~~	**OK**
3. Monitoring					
3.1. Monitoring Methodology. **1.** *It is assessed whether the project applies an appropriate monitoring methodology (number, title and version). Explanation of methodology choices.*					
3.1.1. Is the selected methodology approved under the VCS Program and in line with the relevant project category?	/1/	DR/I	Yes the monitoring methodology is approved by the CDM Methodology panel which is applicable for this project activity.		**OK**
3.1.2. Have the methodological choices correctly explained?	/1/	DR/I	Yes, methodological choices have been explained correctly.		**OK**
3.1.3. Is the monitoring methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/	DR/I	The approved methodology of ACM0002 is chosen and applicable to the proposed project due to the following reasons: ▫ The project activity is the installation of an accumulation reservoir hydroelectric power plant; The PP needs to clarify whether this	~~CAR 4~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			project activity involves reservoir or not with supporting evidences. ▫ The proposed project is not an activity that involves switching from fossil fuels to renewable energy at the site of the project activity, ▫ It is implemented in a new reservoir, and the power density of the project activity, as per definitions given in the project emissions section, is greater than 4 W/m2. The PP needs to clarify whether this project activity involves reservoir or not with supporting evidences. It is connected with a regional power grid, the Sumatra grid; the Sumatra grid is clearly identified and information on the		
3.2. Monitoring. ***(Monitoring procedures content)***					
3.2.1. Is the purpose of monitoring properly specified?	/1/	DR/I	Yes, it is to present the reliable and complete data. To also ensure that all actual data would be collected and archived in proper way.		**OK**
3.2.2. Types of data and information to be reported, including units of measurement, are mentioned?	/1/	DR/I	Yes, parameters to be monitored are mentioned below: ▫ Net electricity generated in MWh Units for electricity exported to the grid needs to be in KWh ▫ Electricity imported from the Sumatra grid	~~**CL 4**~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			in MWh Units for electricity exported to the grid needs to be in KWh ▫ Amount of diesel fuel used in metric tonnes or liters This data of Diesel usage need not to be monitored if it is justified that the emission due to diesel usage is less than 1% of the total emission reductions.		
3.2.3. Is the origin of the data identified?	/1/	DR/I	The data of the origin for electricity generation is given which is not mentioned in the parameters required for monitoring. The PP needs to incorporate the origin of the data for parameters those require monitoring.	~~CAR 4~~	**OK**
3.2.4. Is monitoring, including estimation, modeling, measurement or calculations approaches, properly specified?	/1/	DR/I	The PP will make and collect the data based on field data. Statement that "Monitoring data will be made" is not justified and acceptable.	~~CL 4~~	**OK**
3.2.5. Monitoring times and periods, considering the needs of the intended users, are properly defined?	/1/	DR/I	Monitoring of electricity generation, export, and import, steam delivered, steam fraction, and diesel used will be made daily, monthly or quarterly with regular yearly reports dependent on the monitoring plan for each data parameter for the entire crediting period. The PP needs to clarify how the monitoring of parameters like electricity generation, steam delivered, steam fraction is relevant for this	~~CAR 4~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			project. PP needs to also include recording procedures of these monitored parameters in the PD.		
3.2.6. Are the monitoring roles and responsibilities defined?	/1/	DR/I	Yes, PP together will be responsible for collecting all monitoring data and information. However, PP needs to have team structure wherein roles and responsibilities to each team members are defined.	~~CL 4~~	**OK**
3.2.7. Information management systems, including the location and retention of stored data, were identified?	/1/	DR/I	PP needs to identify information management systems, including the location and retention of stored data and incorporate the same in the PD.	~~CAR 4~~	**OK**
3.3. Monitoring parameters.					
3.3.1. Are the parameters to be monitored properly addressed and identified?	/1/	DR/I	During the site visit it was found that the two types of meters were installed 1) Analog meters 2) Tri-vector meters PP needs to incorporate types of meters, locations of installed meters, QA/QC procedures in section 3.3 of the PD PP needs to the list of parameters those are required to be monitored and re-work on the section 3.3 of the PD Grid Emission factor needs to be calculated separately for the different years 2006, 2007, 2009 etc.	~~CAR 4~~	**OK**
3.4. Description of the monitoring plan.					
3.4.1. Is the authority and responsibility of project	/1/	DR/I	VCS manager will head the team (VCS		**OK**

Checklist Question		Ref.	MoV*	Comments	Draft Concl.	Final Concl.
	management clearly described?			Monitoring team) to handle day to day activity, reporting, recording.		
3.4.2.	Are procedures identified for training of monitoring personnel?	/1/	DR/I	PP will identify procedures for training of monitoring personnel.		**OK**
3.4.3.	Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR/I	PP needs to identify procedures for emergency preparedness for cases where emergencies can cause unintended emissions	~~**CL 4**~~	**OK**
3.4.4.	Does the monitoring plan reflect good monitoring and reporting practices?	/1/	DR/I	Monitoring plan consists of procedures on monitoring equipments installation, data recording, and data management. PLN is ISO certified for quality management systems hence relevant standard operating procedures for operation of plant, calibration requirements and emergency related procedures were found. However, during the site visit, calibration certificates were not made available. Kindly provide the same Procedures for archiving of the recorded data needs to be included in the monitoring plan. The monitoring plan appears futuristic which needs to be changed and made realistic with sufficient evidences to confirm the same. Procedures on data apportioning for the joint meter reading not matching with the crediting period state date is not evident in PD	~~**CL 4**~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			Procedures to identify if meters are functioning ok or faulty in between calibrations and procedures on action to be taken when such readings recorded with faulty meter are found. What is the permissible deviation between the main meter and check meter, to identify the faulty meter There is a mention of annex 4 which is not included in the PD, kindly clarify. Frequency for calibration is mentioned as "generally every year". The PP needs to be specific for such requirements in the monitoring plan. The PP needs to conduct calibration for all metering devices every year and archive the data. PP need to establish procedures to identify the meter faults and to take care the emergency and uncertainties involved in the generation readings in such a case.	~~**FAR 1**~~	
3.4.5. Is the discussion and selection of all required monitoring parameters and / or data variables (for example, project emissions, project electricity generation, baseline grid / captive power emission factor) of the monitoring plan	/1/	DR/I	Refer to 3.2.3, 3.2.5, 3.2.7 and 3.3.1	~~**CAR 4**~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
according to the approved / applied methodology transparent?					
3.4.6. Is the monitoring methodology previously approved by the VCS Registry?	/1/	DR/I	Yes. Monitoring methodology is previously approved by the VCS Registry		**OK**
3.4.7. Is the monitoring methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/	DR/I	Yes. The monitoring methodology is the one deemed most applicable for this project and is the appropriateness justified.		**OK**
3.4.8. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/	DR/I	Refer to 3.2.3, 3.2.5, 3.2.7, 3.3.1 and 3.4.5	**~~CAR 4~~ ~~CL 4~~**	**OK**
3.4.9. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR/I	According to the methodology, leakage from related emission sources does not need to be considered.		**OK**
4. GHG emission reductions. *Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.*					
4.1. Methodology choice.					
4.1.1. Have the project, baseline and leakage emissions and emission reductions been properly explained and determined using the same appropriate methodology and conservative assumptions?	/1/ /5/ /6/ /7/ /34/	DR/I	Project, baseline and leakage emissions and emission reductions been properly explained and determined using the same appropriate methodology and conservative assumptions. Kindly provide the exact location for the reference of NCV of fuel.	**~~CL 5~~**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			Under baseline emission, the third term $EG_{grid,CM,y}$ in the table is not there in the equation. Kindly change. Kindly mention the tool used to calculate the emission factor of grid. Under step 4, it is mentioned that table is provided in Annex-3 .However it is not there in the VCS PD. However the PP is required to justify whether the selected value for emission factor of the grid is in line with the procedures mentioned in the tool.	~~CAR 5~~	
4.1.2. Does the proposed project clearly state which equations for the calculation of emission reductions are used, as given by the approved / applied methodology?	/1/ /4/	DR/I	Yes. The proposed project clearly state which equations for the calculation of emission reductions are used, as given by the approved / applied methodology.		**OK**
4.1.3. Are the demonstration / justification for the choice of the chosen scenario (for example, in ACM0006) or case, option / method (for example in ACM0002) adequate and sufficient?	/1/ /4/	DR/I	Yes. Demonstration/justification for the chosen scenario is adequate and sufficient.		**OK**
4.1.4. Are the demonstration / justification for the chosen default values adequate and sufficient?	/1/ /5/ /6/ /7/ /34/	DR/I	See section 4.1.1	~~CL 5~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
4.2. Quantifying GHG emissions for the baseline scenario.					
4.2.1. Have the baseline GHG emissions been properly explained and determined using the same appropriate methodology and conservative assumptions?	/1/ /4/	DR/I	The baseline GHG emission has to be clearly explained. The explanation for the terms used in the equation should be clear and specific. The crediting period year mentioned in this section is different from the one mentioned in section 1.3. Kindly clarify. Also the crediting period has to be changed appropriately with the changed start date.	~~CAR 6~~	**OK**
4.2.2. Are the demonstration / justification for the chosen default values adequate and sufficient?	/1/ /21/ /34/	DR/I	Grid emission factor provided by the Indonesia DNA is for the year 2008. PP needs to provide justification for using the same value for the calculation of emission in the years 2006 and 2007. Also provide the electricity generation data, electricity supplied to the grid, own consumption from the starting date of the project activity. PP also needs to demonstrate that emission produced due to the diesel consumption is less than 1% of the total emission.	~~CAR 6~~	**OK**
4.2.3. Does the proposed project clearly state which equations for the calculation of baseline emission are used, as given by the approved / applied methodology?	/1/ /4/	DR/I	Yes. The PP has used the correct equations for the calculation of baseline emission and is as per the approved / applied methodology.		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
4.2.4. Is the calculation of the expected baseline emissions transparent, conservative, accurate, and documented and as per the approved / applied methodology (equations) of the project activity?	/1/ /21/ /34/	DR/I	See section 4.2.2	~~CAR 6~~	**OK**
4.3. Quantifying GHG emissions for the project.					
4.3.1. Have the project GHG emissions been properly explained and determined using the same appropriate methodology and conservative assumptions?	/1/ /4/	DR/I	PP needs to mention the GHG emissions / removals of the project in this section.	~~**CAR 7**~~	**OK**
4.3.2. Are the demonstration / justification for the chosen default values adequate and sufficient?	/1/ /4/	DR/I	See section 4.3.1	~~**CAR 7**~~	**OK**
4.3.3. Does the proposed project clearly state which equations for the calculation of project emission are used, as given by the approved / applied methodology?	/1/ /4/	DR/I	See section 4.3.1	~~**CAR 7**~~	**OK**
4.3.4. Is the calculation of the project emissions transparent, conservative, accurate, and documented and as per the approved / applied methodology (equations) of the project activity?	/1/ /4/	DR/I	See section 4.3.1	~~**CAR 7**~~	**OK**
4.4. Quantifying GHG emission reductions for the project. *(between a **baseline scenario** and the project)*					
4.4.1. Have the project GHG emission reductions	/1/	DR/I	PP needs to provide the calculation	~~**CAR 8**~~	**OK**

	Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
	been properly explained and determined using the same appropriate methodology and conservative assumptions?	/2/		transparently. There is a contradiction between the values mentioned for emission reduction in this section and in the section 4.2. Also the values mentioned in the table is different from that mentioned in the sentence just above the table. Kindly change. The crediting period date need to be changed as discussed in section 1.6.2		
4.4.2.	Does the proposed project clearly state which equations for the calculation of project emission reductions are used, as given by the approved / applied methodology?	/1/ /4/	DR/I	Yes. The equations used for the calculation of the project emission reductions are applicable to this project as per the approved / applied methodology.		**OK**
4.4.3.	Is the calculation of the project emission reductions transparent, conservative, accurate, and documented and as per the approved / applied methodology (equations) of the project activity?	/1/	DR/I	The project emission reduction values are not accurate. It differs in all the sections. Also the document for the electricity generation, own consumption and supply to the grid has to be provided.	**~~CAR 8~~**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
5. Environmental impacts. ***<u>If required by the host party</u>,*** *documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the Validator/Verifier.*					
5.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/ /11/	DR/I	As per the Decree of the Ministry of Environment, all hydroelectric power plants with a dam height of >= 15m or flooded area of >=200ha or installed capacity of >=50 MW needs to conduct an EIA. Since the project has an installed capacity of 210 MW, an EIA has been conducted by the client. PP is requested to submit the copy of the same for verification.	~~CL 6~~	**OK**
5.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/ /11/	DR/I	See section 5.1	~~CL 6~~	**OK**
5.3. Will the project create any adverse environmental effects?	/1/ /11/	DR/I	Project is expected to have an overall positive impact on the local and global environment. All the environmental impacts have been identified during the EIA and mitigation measures also have been taken. Hence project does not create any adverse environmental impacts. However The measures taken for the social responsibility is not transparent in the PD.	~~CL 6~~	**OK**
5.4. Are transboundary environmental impacts	/1/	DR/I	There are no adverse transboundary		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
considered in the analysis?			environmental impacts for this project activity.		
5.5. Have identified environmental impacts been addressed in the project document?	/1/ /11/	DR/I	See section 5.3		**OK**
5.6. Does the project comply with the environmental legislation in the host country?	/1/	DR/I	Yes. Project complies with environmental legislation in the host country.		**OK**
6. Stakeholder's comments. *The Validator/Verifier should ensure that stakeholders' comments have been invited and that due account has been taken of any comments received.*					
6.1. If a stakeholder consultation process is required by regulations / laws in the host country, has the stakeholders' consultation process been carried out in accordance with such regulations / laws?	/1/ /17/	DR/I	Stakeholder consultation is not mandatory according to the regulations/ law in the host country. However relevant stakeholder was identified and meeting was conducted on May 6, 2003. RINA has verified the document for the same and found satisfactory. However it is mentioned in the PD that stakeholder meeting was held to inform regarding the project rather than consultation. PP is required to justify on the same. Also kindly clarify whether the project is a capacity up gradation project which is a complete contradictory to all the discussions that was done above.	~~CL 7~~	**OK**
6.2. Have relevant stakeholders been consulted / invited for comments?	/1/ /17/	DR/I	Yes. Relevant stake holders been identified and were invited for the meeting. However The date of meeting, mode of invitation for	~~CL 7~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			stakeholder consultation, persons invited, persons present for the stakeholder consultation, contact details and summary of comments received are not transparent in PD .Kindly provide evidences for all the above		
6.3. Was the stakeholders' consultation process conducted, within a reasonable time for comments submission, in an open and transparent manner to facilitate comments and properly described?	/1/ /17/	DR/I	Refer to 6.2.	~~CL 7~~	**OK**
6.4. Are the stakeholders who made comments identified (addresses provided / available)?	/1/ /17/	DR/I	Refer to 6.2.	~~CL 7~~	**OK**
6.5. The summary of the stakeholders' comments received is provided / available?	/1/ /17/	DR/I	Refer to 6.2.	~~CL 7~~	**OK**
6.6. Has due account been taken of any stakeholders' comments received?	/1/ /17/	DR/I	Refer to 6.2.	~~CL 7~~	**OK**
7. Schedule					
7.1. Has the chronological plan for the date of initiating project activities, date of terminating the project, frequency of monitoring and reporting and the project period, including relevant project activities in each step of GHG project cycle mentioned?	/1/ /9/ /10/	DR/I	Refer to 1.6.1. Also provide the schedule in detail and correct appropriately with change in start date mentioned. Documented evidence for the operational life time of the project has to be submitted.	~~CL 8~~	**OK**
8. Ownership					
8.1. Proof of Title.					
8.1.1. Has they provided a legislative right or a right	/1/	DR/I	PP has submitted the commissioning order and		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
under local common law for the proof of title? or Has they submitted any evidence for proving the ownership of the plant, equipment and / or process generating the reductions / removals? or Does a contractual arrangement with the owner of the plant, equipment or process that grants all reductions / removals to the proponent shown?	/9/		purchase order for the proving the proof of title. RINA has verified the same and found to be satisfactory		
8.2. Projects that reduce GHG emissions from activities that participate in an emissions trading program *(if applicable)*.					
8.2.1. Does the project that reduce GHG emissions from activities participate in an emission trading program or take place in a jurisdiction or sector in which binding limits are established on GHG emissions?	/1/	DR/I	Not applicable		**OK**
8.2.1.1. Has the project proponent provided any evidence to prove that the reductions or removals generated by the project have or will not be used in the program or jurisdiction for the purpose of demonstrating compliance?	/1/	DR/I	See section 8.2.1		**OK**
8.2.1.1.1. Has letter from the Program operator or DNA that emission allowances (or other GHG credits used in the program) equivalent to the reductions / removals generated by the project have been	/1/	DR/I	See section 8.2.1		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
cancelled from the program or national cap as applicable been submitted?					
8.2.1.1.2. Has purchase and cancellation of GHG allowances equivalent to the reductions /removals generated by the project related to the program or national cap done?	/1/	DR/I	See section 8.2.1		**OK**

Table 2 Resolution of Corrective Action and Clarification Requests, and FARs

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
FAR 1 Frequency for calibration is mentioned as "generally every year". The PP needs to be specific for such requirements in the monitoring plan. The PP needs to conduct calibration for all metering devices every year and archive the data. PP need to establish procedures to identify the meter faults and to take care the emergency and uncertainties involved in the generation readings in such a case.	3.4.4	Procedure for monitoring plan will be established prior to verification. Calibration will be conducted on yearly basis in accordance with methodology. This procedure has been edited in the PD at monitoring table parameter in sec 3.3 and is included in the monitoring procedure. SOP for emergency and uncertainties are available and have been shown and submitted to DOE during validation. Uncertainty has been incorporated in the Electricity meter SOP section 6.2. Detailed procedure will be defined prior to verification Filename: 06 Musi_SOP_Electricity Meter	The PP needs to provide evidence at the time of verification on procedures for monitoring plan has been taken. The PP needs to incorporate the same in the PD. The same has been incorporated in the revised PD and found acceptable. However, the same shall be verified during the verification. Hence FAR 1 is closed.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
CAR 1 • Project start date mentioned in the PD is 24/05/2006 which is as per the commissioning inspection certificate. But as per the VCS guidelines, it should be the date in which actual emission reduction has started. So starting date of the project should be as per the commissioning certificate of the generators. PP needs to revise the same. PP to submit the commissioning certificate for the turbines and generators for verification. • Project crediting period also changes according to start date. PP needs to revise the crediting period start date appropriately. • Capacity is mentioned as 210 MW (70 MW x 3). But from the site visit, it was evident that the capacity was not the same. Instead it was 73.6 MW x 3 = 220.8 MW.	1.6.1,1.6.2, 1.6.3,1.9.1	Project start date has been revised in PD to 19 July 2006 according to commissioning certificate. Commissioning certificate has been revealed and submitted to DOE during the validation site visit Project crediting period has been revised in PD to 1 August 2006 Capacity 210 MW (3 x 70 MW) stated in PD is based on the FS, detail engineering design, which all had been displayed and submitted to DOE. 73.6 MW is stated on the generator plate on-site and in the completion report 2006 section 1.3 page 6. Filename: 13 Musi Final FS Engineering Detail 1993	Project start date is revised and is in consistent with the commissioning certificates submitted by the PP hence the same is accepted. Crediting period start date is also revised as per the starting date and found acceptable. The Feasibility report was prepared keeping the potential in focus however, the actual plant size got reduced to 210 MW. The explanation is clear and realistic considering the projected design and implemented design. The CAR 1 is closed

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
CAR 2 Kindly bring in more clarity for the justification why CH4 is excluded.	2.3.2	The project activity is a run-off hydro power plant whereas according to ACM 0002 that the CH4 is excluded. Further clarification is added in PD.	The project activity is a run of river which has been verified during the site visit, hence the justification provided is found acceptable. CAR 2 is closed.
CAR 3 The PP needs to consider the guidance provided by the approved consolidated methodology – ACM 0002, Version 10 for demonstration and assessment of additionality. As per the guidance provided in the tool for demonstration and assessment of additionality version 5.2, guidance point no. 6, the PP needs to use input values for all investment analysis should be valid and applicable at the time of the investment decision taken. Further, the tariff considered for the financial analysis is not appropriate to the project. PP should also justify if the PLF considered is in line with the guidance given by EB 48 for reporting PLF The PP needs to conduct the common practice analysis for the relevant regional	2.5.1, 2.5.2, 2.5.3, 2.5.4,2.5.5	Input values for Investment analysis have been revised in accordance with the prevailing parameters during the time the investment decision was made. Such information is taken from Project Report dated July 1993. Project Report has been shown and submitted to DOE during Validation site visit. Tariff used in Investment analysis is revised according to the issued tariff information by PLN Palembang sector as headquarter for Southern Sumatra sector. The tariff used is the internal transfer-pricing tariff for Hydro Power Plant delivered to Southern Sumatra grid. The actual internal transfer pricing evidence has been shown and submitted to DOE. The tariff information for year 1990 to 1994 has been sent to DOE by email.	PP has taken the values as per the feasibility study report that is in line with guidance provided by the additionality tool. The tariff has been taken as per the actual internal transfer pricing. It has been considered for the year 2002 using average escalation which is realistic.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
grid (for entire Sumatra region) and present findings on the same. The common practice analysis is not complete and has not included the sub-step 4b as per "Tool for the demonstration and assessment of additionality" (Version 5.2, EB 39)		The tariff is taken from feasibility study. The 1991 average tariff, as mentioned in the Musi FS, is used as the base tariff for tariff calculation in 2002 using the average escalation of actual internal transfer prices during the period of 1990 – 1994. The actual internal transfer price reflects the real price escalation of electricity tariff. PLF is already in line with EB guidance. The value of PLF (61.97%) is calculated based on values available in the Project report 1993. All section in PD pertinent to the PLF number has been revised accordingly. The PLF determination is calculated by dividing the expected annual electricity production, as per FS, through the maximum annual electricity production as per generator specifications. The maximum annual electricity production is calculated by multiplying the installed capacity with 8760 hours.	As per mentioned above. The PLF has been calculated as per the values provided in the FS. FS is carried out by Nippon Koei Company Limited in association with P. T. Indra karya in 1983-84 with financial assistance form IBRT which is a third party and they have derived the PLF of the project activity as per the expected annual generation with maximum annual generation which is in line with requirement.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
		For the common practice analysis, the appropriate regional grid is supposed to be Southern Sumatra grid since at time of investment decision (1994) the region was not yet connected to the whole Sumatra grid. Whole Sumatra grid was interconnected in July 2007. The grid interconnection between North and South Sumatra in 2007 is stated on: Energy and Mineral Resources Ministerial Decree no: 2682 K/21/MEM/2008, highlighted on page 12. File: Ministerial Decree for Grid connection 2007 For sub step 4b. More elaboration and explanation is added in PD in section 2.5.	The reference document mentioning the said merger between South and North Sumatra Grids in July 2007 has been provided. More details have been provided as per the sub step 4. b of tool for demonstration & assessment of additionality. The correction has been incorporated in the revised PD and found acceptable. CAR 3 is closed.
CAR 4 The PP needs to clarify whether this project activity involves reservoir or not with supporting evidences. The data of the origin for electricity generation is given which is not mentioned in the parameters required for monitoring.	3.1.3, 3.2.3, 3.2.4, 3.2.5, 3.2.7, 3.3.1, 3.4.5, 3.4.5	The project activity is a run off river hydro power plant. This mentioned in Project Report 1993, detail engineering design and project completion report 2006. All such documents was revealed and submitted to DOE during Validation site visit. PD also has been revised	The same has been verified during the site visit and found acceptable.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
The PP needs to incorporate the origin of the data for parameters those require monitoring.		accordingly in sec 2.2 page 9. The run off river hydro power plant is now clearly stated in section 3.1.	
The PP needs to clarify how the monitoring of parameters like electricity generation, steam delivered, steam fraction is relevant for this project. PP needs to also include recording procedures of these monitored parameters in the PD.		Electricity Generation (EG) data used for monitoring is the monthly EG report delivered to grid signed by both parties of Generation department and Transmission department. The monitoring parameter in PD is revised accordingly in section 3.4.	The electricity generation data has been incorporated in the monitoring plan and is important for ex-ante emission reduction calculation & investment analysis. The same has been incorporated in the section 3.4 of the revised PD and found acceptable.
PP needs to identify information management systems, including the location and retention of stored data and incorporate the same in the PD. PP needs to incorporate types of meters, locations of installed meters, QA/QC procedures in section 3.3 of the PD		Electric generation is relevant to the calculation of ER during vintage year, investment analysis. Other parameters like steam delivered and steam fraction is not relevant, and has been omitted. PD has also been revised accordingly	The correction has been incorporated in the revised PD and found acceptable.
PP needs to the list of parameters those are required to be monitored and re-work on the section 3.3 of the PD Grid Emission factor needs to be calculated separately for the different years 2006, 2007 2009 etc.		Recording procedures of the monitoring parameters has been edited with more clarity in PD section 3.4 description of monitoring plan	The correction has been incorporated in the revised PD and found acceptable.
The PP needs to use latest version of "Tool to calculate the emission factor for an electricity system"		Information management systems, including the location and retention of stored data are explained in PD but the information has been added with further	The correction has been incorporated in the revised PD and found acceptable.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
		clarification	
		Type of meters, locations of installed meters, QA/QC procedures have been identified and incorporated in PD section 3.3	The correction has been incorporated in the revised PD and found acceptable.
		Data of parameters to be monitored has been put in the table in section 3.3	The correction has been incorporated in the revised PD and found acceptable.
		As per tool " Tool to calculate the emission factor for an electricity system"" EB 50 Annex 14, page 15 the most recent DNA approved emission factor 2008 is applied during the whole crediting period: "For the first crediting period, calculate the build margin emission factor ex ante based on the most recent information available on units already built for sample group m at the time of CDM-PDD submission to the DOE for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE."	The Indonesian DNA approved emission factor has been provided to the DOE and found acceptable. The calculation of emission factor has been done as per the tool to calculate the emission factor for an electricity system which is in line with the requirement. CAR 4 is closed.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
CAR 5 PP is required to justify whether the selected value for emission factor of the grid is in line with the procedures mentioned in the tool.	4.1.1	EF Calculation provided by the Indonesian DNA is in line with the procedures mentioned in the tool, the calculation spreadsheet has been submitted along with the resolution of CAR CL.	Refer to CAR 4. CAR 5 is closed.
CAR 6 • The baseline GHG emission has to be clearly explained. The explanation for the terms used in the equation should be clear and specific. • The crediting period year mentioned in this section is different from the one mentioned in section 1.3. Kindly clarify. Also the crediting period has to be changed appropriately with the changed start date. • PP needs to provide justification for using the same value for the calculation of emission in the years 2006 and 2007. • Also provide the electricity generation data, electricity supplied to the grid, own consumption from the starting date of the project activity. • PP also needs to demonstrate that emission produced due to the diesel	4.2.1,4.2.2, 4.2.4	All formulas for the calculation of baseline emission and their explanation have been revised and clearly explained The explanation for the terms used in the equation is now clear and specific. This has been incorporated in the PD. Crediting period year has been revised in PD. Design values have been used to estimate the emission reductions. Therefore 2006, 2007 and 2008 values are the same. Such values will be replaced in the monitoring report through actual measured ex-post values. EF has been calculated based on values explained in the CAR 4 response.	Formulas for the calculation of baseline emission have been mentioned along with their explanation and found acceptable. Crediting period selected is found appropriate. It is found ok since design values have been considered which is in line with the requirement. The use of such values has been conservative and it doesn't affect the ER calculation in negative way.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
consumption is less than 1% of the total emission.		The repeated part in this section is deleted.	All the details have been found correct.
		Data EG supplied to grid and for own consumption have been shown and submitted to DOE in form of Monthly EG report delivered to grid signed by both Generation department and Transmission department during validation site visit. However, for ex-ante ER calculation design values have been used.	Data for electricity supplied to the grid and captive consumption has been provided for verification and the same was cross checked with joint meter reading.
		Demonstration of PE has been explained and added in PD. Calculation Spreadsheet of PE has been submitted to DOE.	Detail of PE has been incorporated in the PD.
		Annex 3 has been removed from the PD. For grid emission factor calculation, please refer to the excel sheet of Updating Baseline EF Sumatera 2008. Final. Paragraph under step 4 is rephrased.	Under step 4, PP mentioned that a table is provided in Annex 3 which was included sue to typo error which has been removed from the revised PD. Provide the source of $EF_{grid,CM,y}$ The source of $EF_{grid,CM,y}$ is provided. The validation has cross verified the same and found to be appropriate.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
		The Musi units have started to produce electricity in February 2006 but commissioning certificate is issued by 3rd party on 19 July 2006. So for conservativeness, 1 August 2006 is used as start date of crediting period. The emission reduction calculation sheet has been revised so the all units of parameters and figures in the excel sheet and PD are the same.	All documents have been submitted by the PP. As per the submitted document, it is clear that electricity is supplied to the grid from February 2006 onwards and the PP has got the commissioning certificate on 19th July 2006. However for conservativeness the PP has chosen 1st August 2006 as start date which is acceptable. The figures for consumption of diesel oil mentioned in the PD, excel sheet and supporting document are matching and they are verified by means of comparison. CAR 6 is closed.
CAR 7 PP needs to mention the GHG emissions / removals of the project in this section.	4.3.1,4.3.2, 4.3.3,4.3.4	GHG emission removals have been clearly explained in PD in section 4.3. All data pertinent to the calculation such as EG delivered to grid, EG for own consumption and official EF 2008 have been shown to DOE during validation site visit. EF calculation and formula have been in line with the approved methodology.	From the revised PD, it is clear that emission reduction calculation method is as per the approved consolidated methodology and found ok.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
		Calculation spreadsheet for ER and PE has been revised and has been submitted to DOE.	Section 4.2, consists of baseline emissions and section 4.3 discusses project emissions. The PE calculations have been done for diesel consumption which may be used during start up of the turbine and is coming less than 1% of the total emission reduction hence may be neglected. CAR 7 is closed.
CAR 8 PP needs to provide the calculation transparently. There is a contradiction between the values mentioned for emission reduction in this section and in the section 4.2. Also the values mentioned in the table is different from that mentioned in the sentence just above the table. . The crediting period date need to be changed as discussed in section 1.6.2. The project emission reduction values are not accurate. It differs in all the sections. Also the document for the electricity generation, own consumption and supply to the grid has to be provided.	4.4.1,4.4.3	Emission Reduction values have been revised in PD. The crediting period date has been revised as discussed in section 1.6.2 Project emission reduction values have been revised in all relevant section in PD. Document for EG delivered, own consumption and supply to grid have been displayed and submitted to DOE during Validation site visit.	Baseline emission calculations values have been found consistent in all sections. For project emission refer CAR 7. Crediting period date is also revised as per the project start date. CAR 8 is closed.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
CL 1 The date of VCS PD mentioned in the first page and under section 1.1 is different. Kindly clarify. Project participant has to remove the term debundled from the PD. PP needs to change the operation date of the three units. It has to be the date mentioned in the commissioning certificate. PP is also requested to provide the evidence for the statement "the potential capacity of the hydro resources in Indonesia is 75000MW of which only 4,200 MW has so far been used to generate electricity". PP needs to clarify the statement that the project causes no negative impact on the surrounding environment since it is implemented in an existing reservoir. But in the site visit, no reservoirs were seen. Also clarify how the project supports technology transfer from other regions or even other countries. GPS mentioned in the EIA was different from the value mentioned in the PD. Kindly incorporate the exact value.	1.1.1,1.2.2, 1.4.1,1.5.1, 1.7.1,1.9.1, 1.9.3,1.9.4, 1.9.5,1.10.1 ,1.11.1,1.12 .1,1.14.1,1. 14.1.1,1.14. 1.2,1.15.1,1 .15.2,1.16.1 ,1.17.1	Date has been revised and in consistent each page. PD has been revised stating the project is not a group project activity. The type of the project has been identified as sectoral scope 1 (renewable/non-renewable sources) applying methodology UNFCCC ACM0002 version 10 EB 47. Same has been incorporated in section 1.2 of the PD. Operation date has been revised in PD in accordance to the commissioning certificate. Emission reduction start date has been revised to 1 August 2006 The evidence regarding the statement of potential hydro resources has been submitted. The statement in PD has been revised according to the referred reference.	Date of the VCS PD mentioned is now consistent in both sections. The same is reflected in the revised PD and found ok. Operation date has been revised as per the commissioning certificate which is verified and found acceptable. The evidence provided for the potential hydro resources in Indonesia is provided and verified. The statement has been revised in the PD and found acceptable.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
Land agreement of the project site from the forestry department from the year 2004 has to be submitted by the PP. Even though the project is a new activity, PP should mention the condition prior to the project activity. • Water head mentioned in the first paragraph of this section is contradicting with the value mentioned the table A.1.9.1. • Kindly provide evidence for the claim that the project will use state of art technology with credible documents. Also PP needs to provide the documented proof for the following statements: • Essential equipment has to be procured from another country. • Training provided to the employees prior to the project commissioning. Annual energy output is expected at 1,140 GWh with a gross head of 404m by diverting water of 42.3m^3/sec. PP needs to mention whether the project involves transfer of technology. PP needs describe whether the technology used is environmentally safe and sound. PP has mentioned that they have provided		Statement in 1.16, has been removed from the PD, as no this project is a run-of-river hydro power plant. If environmental risks would exist in the project they would be assessed in the EIA and measures will be defined. EIA shows the negative and positive impacts of the project activity. For the negative impacts, necessary monitoring and management measurements need to be taken has been described un the EIA. The monitoring and management of such impacts are submitted to the local environmental agency (BPLHD) in regular basis. The necessary monitoring and management measurements documents are submitted to DOE. Various training has been conducted prior to the commissioning of the project and during the operation as part of the technology transfer. List of training of the training conducted has been submitted to DOE. There is no technology transfer take place in this project. The statement has been	The approved EIA report was provided and verified. The PP has included these points in the revised PD and found acceptable. Training documents have been provided and verified by the DOE. The same was found acceptable. Justification is acceptable.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
training prior to the project commissioning. They must provide the documents for justifying the same. Project comply with all laws and regulations of the Host country. However PP needs to submit the documentary evidence for the same and also mention in the PD, the laws and regulations that the project comply. PP has to mention the risks that may affect the project's GHG emission reductions or removal enhancements. PP needs to justify that the project was not implemented to create GHG emissions primarily for the purpose of subsequent removal or destruction. PP has to mention that whether this project being rejected by other GHG programs due to procedural or eligibility requirements. The roles and responsibilities of the project proponent and other participants has to be mentioned in this section. PP has to clearly mention whether the parties involved in this projects are public or private entity. PP has to mention whether VCS PD provides any information regarding the eligibility and qualification of emission		removed in PD section 1.16. The project activity is run off river hydro power plant, this statement has been revised accordingly in PD section 2.2 page 9. Exact location mentioned in EIA has been also incorporated in PD. Translated copy of relevant section from EIA is submitted to DOE. From the EIA document, the coordinate used for the location of regulating dam is 3° 37' 6.59" S, 102° 27' 25.87" E. File:Musi GPS coordinates+translation Permit to build power plant dated 2004 issued by Forestry department has been revealed and submitted to DOE during The Validation site visit. The extended permit after 2004 to 2009 cannot be found since all documents were handed over from project team to unit team. But he budget for extending the 2009 license	The correction has been incorporated in the revised PD and found acceptable. PP has provided the relevant sections of EIA and the location has been verified which is provided in the revised PD. GPS coordinates mentioned in the revised PD is transparent with supporting evidences. Initial Construction permit was verified during the site visit and the application for the extension of the same has been submitted by the PP.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
reductions or removal enhancements, including legislative, technical economical, sectoral, social, environmental , geographic, site-specific and temporal information. Has the project proponent listed any commercially sensitive information that has been excluded from the public version of VCS PD which will be displayed on the VCS project database.		is on process. Filename: Musi Land Permit Extension 2009 Water head information uses the gross water head mentioned in detail engineering design. The gross water head already considers the losses due to pipeline friction. Such information has been revised accordingly in responding to this CL. The operational hour of the plant is derived from the designed electricity generation data provided in Musi FS Project Report 1993. Please see explanation above on the justification on the water head. Statement the project will use state of art technology has been changed in PD to the project will use proven technology Equipment procurement document was in form of contract document between PLN	Validation team has cross verified with the detail design report. The net water head is less than gross head considering losses due to pipeline friction, which is acceptable. Source of the operational hour of the plant is mentioned as per the feasibility study which is 5428 hours. The same has been verified by the validation team The same was verified by the team during site visit and found ok.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
		and supplier of the essential equipment (turbine and generator). Such document has been shown and submitted to DOE during Validation site visit. Copy of contract documents is once more submitted to DOE. Various training has been conducted prior to the commissioning of the project and during the operation as part of the technology transfer. List of training of the training conducted has been submitted to DOE.	All the said documents have been submitted and verified by the validation team. The correction has been incorporated in the revised PD and found acceptable.
		Annual energy output at 1,140 GWh, gross head of 404.4 m and diverting water of 42.3 m^3/sec are based on Detail engineering design and project report 1993. Values do not need to be justified as taken from the actual project report 1993	The explanation has been cross verified from the detail engineering report and project completion report.
		PP proved that by EIA approval, the project activity (which includes as well all project's components) is environmentally safe and sound. If environmental risks would exist in the	Hydro power plant is environmentally sound practice since it does not create any emission resulting from the fossil fuel burning. The approved EIA has been provided and

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
		project they would be assessed in the EIA and measures will be defined. The evaluation of the project activity is submitted to the DOE. Project activity is complying with all law and regulations as it has been described in EIA. EIA has been shown and submitted to DOE during Validation site visit. The proper justification has been provided in the PD. Major risks involved to project activity are rephrased in PD. PP did not create the project primarily on the purpose of GHG emission removal but instead to provide electricity. Please refer to section 1.12 of the PD. For the EIA approval, all documents, including the construction permit have to be submitted to the Ministry of Environment. At the current time construction permit cannot be found.	verified. This is ok. PP has mentioned the major risks involved in the project and the same has been included in the revised PD. The correction has been incorporated in the revised PD and found acceptable. Initial Construction permit was verified during the site visit and the application for the extension of the same has been

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
			submitted by the PP.
		This project has never been submitted to other GHG programs.	
		The section is numbered in the PD.	
		The roles and responsibilities of the project proponent and other participants have been mentioned in this section.	The correction has been incorporated in the revised PD and found acceptable.
		Parties involved in this project have been clearly explained and stated in PD. PLN acts as Public entity with role as Project owner and South Pole Carbon Asset Mangement, Ltd as Private entity with role as Carbon Credit Buyer.	The roles and responsibilities of the PP and other participants have been mentioned in the revised PD and is found acceptable. Parties involved in this project is also clearly explained in the revised PD and found acceptable.
		VCS PD provides information regarding the eligibility and qualification of emission reductions, including legislative, technical economical, sectoral, social, environmental , geographic, site-specific and temporal information.	The correction has been incorporated in the revised PD and found acceptable.
		The project proponent has no commercially sensitive information that has been excluded from the public	The correction has been incorporated in the revised PD and found acceptable.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
		version of VCS PD which will be displayed on the VCS project database.	CL 1 is closed.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
CL 2 PP needs to provide information/reference on methodology deviations/methodology revisions. PP needs to mention the version number for all the tools used in this project activity. PP has mentioned that this project is implemented in an existing reservoir. During the site visit, it was evident that no reservoirs exist and is a run-off river project. Kindly clarify. PP is requested to submit the electricity generation data which includes electricity generated in the plant, supplied to the grid and own consumption. Kindly mention the major risks identified for the baseline. Kindly provide all literatures and sources referenced.	2.1.3,2.1.4, 2.2.1,2.4.4, 2.4.6,2.4.7	Information regarding deviation/ revision of the methodology has been provided in section 2.1 of the PD The version number for all tools used in the PD has been incorporated. The project activity is a run off river hydro power plant. This mentioned in Project Report 1993, detail engineering design and project completion report 2006. Data EG supplied to grid and for own consumption have been shown and submitted to DOE in form of Monthly EG report delivered to grid signed by both Generation department and Transmission department during validation site visit. Major risks involved to project activity are explained in PD. They are 1) Water supply 2) Natural disaster 3) Unexpected major machine breakdown List of all literature and sources referenced in PD has been provided to the DOE. Please see List of Footnotes.	There is no such deviation taking place in the project activity regarding methodology, hence it is accepted. The same has been reflected in the PD and is acceptable. Project activity is a run off river hydro power plant. RINA has verified the same during the site visit. Also the supporting docs have been submitted by the PP.RINA had checked all the documents and found satisfactory. Justification provided is acceptable. The correction has been incorporated in the revised PD and found acceptable. All literatures and sources referenced are included in the revised PD. Hence this CL 2 is closed.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
CL 3 The PP is requested to justify why they have not discussed the third alternative with supportive evidences. PP needs to provide the investment comparison for the continuation of purchase and grid electricity generation mix with returns from the project activity. PP needs to justify why they have not considered lending rates from local banks as the benchmark. The risk free rates and premium risk are obtained from other countries, which need to be justified with supporting evidences. When the PP is a government company based in the host country – Indonesia, who is into the power generation sector, PP needs to demonstrate consideration of calculating country risk. The premium risk is provided for the country which is not specific to the project	2.5.1, 2.5.2, 2.5.3, 2.5.4,2.5.5	The investment comparison is not needed since the particular area is only suitable for building Hydro Power Plant. Since this is a new grid connected power plant, according to methodology ACM 0002 ver 10 "The baseline is defined in the methodology as „Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system". Therefore according to the Validation and Verification manual, no further analysis is required for other alternatives. According to the methodology and Validation and Verification manual, list of alternatives has been removed from PD. No further analysis is required for other alternatives. If applying the ""Tool for the demonstration and assessment of additionality" under ACM002, PP only needs to identify that there is at least one credible and feasible alternative that	As per the guidance provided in the approved consolidated methodology and in the Validation and Verification Manual on the baseline selection, the same can be accepted.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
activity; kindly justify the application of the same for this project activity. PP to justify the appropriateness of the project type / industrial sector considered when calculating for beta value hence they need to correct the same in the financial calculation/WACC sheet provided to the DOE. PP needs to clarify whether the beta value chosen represents raw/unlevered or levered value. PP need to provide sources for chosen values for insurance, operation and maintenance, equity amount, operational life time of the project activity, fair value for the project at the end of the operational life time. PP is requested to provide loan agreement papers to the DOE for verification.		would be financially more attractive then the project activity. Therefore no other project alternatives need to be elaborated. Pease see paragraph (4) of the tool. WACC calculation is chosen as the appropriate benchmark since the capital employed in financing the project consists of Loan and Government's equity. This hydro project needs loan from the foreign institution not only to complement the government's equity to finance the project, to reduce the investment risk, and to increase the economic attractiveness of the project. The cost of equity is industry and country specific calculated and therefore reflects the investment of the underlying project activity. Evidence and article supporting WACC calculation has been shown, explained and submitted to DOE during Validation site visit. Further explanation can be found in the PD section 2.5	In Indonesia, the financial condition of entire country has not been as healthy as it has been verified through various sources submitted by the PP. In such conditions, the sector specific risk could not be established. However, the PP has come up with risk associated with the project have been calculated through country rick. PP has also taken the lowest beta value from energy sector which is conservative and hence accepted.
The PP is requested to provide justification on selection and the appropriateness of the chosen benchmark as per the EB guidance		The risk free rate and country premium risk are used to calculate the cost of	Refer to the explanation mentioned above

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
on investment analysis along with supporting documents. The PP is also requested to provide clarification on the pre-tax/ post-tax returns comparison with the benchmark. The PP is requested to provide the use of this arrangement consistently in their investment decisions for last three years which is in line with guidance provided on investment analysis by EB. PP to substantiate all arguments made under the performance of PLN with supportive evidences for all assumptions/ data provided PP is requested to clarify on the use of other financial indicator – Net Present Value (NPV) for the project activity. The PP is requested to carry out the sensitivity analysis till it reaches the breakeven point and explain the likelihood of the achieving the same with supporting evidences. The PP is requested to provide historical tariff structure for verification.		equity to achieve the WACC calculation. Biography of Damodaran has been removed in PD in section 2.5 step 2 investment analysis. The cost of equity method chosen is the method issued by Prof Damodaran from Stern NYU. Brief description of such person is explained in PD. This method employs US risk free rate and US market return as the base minimum expected return for equity investor when investing in US country and then added by specific country risk where the project is built. The method has been explained in PD along with reference supporting it. The risk free rates and premium risk justification have been also explained in PD section additionality. According to Damodaran cost of equity method (references are pointed out in PD) The risk free rate and premium risk are used USD value as the baseline rate return for equity investor anywhere in the world.	Biography of Dr. Damodaran is not relevant in the discussion for additionality, which has been removed from the revised PD. Refer to the explanation mentioned above

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
PP is requested to provide the evidence for potential and installed capacities for Hydro Power plants in Indonesia.		USD rate value is chosen by the method since US is considered the most mature market for capital market sector and banking sector. These values are then adjusted by specific designated country in which the project is built, then is further adjusted specifically for the particular project by multiplying beta taken for particular sector Country risk data is not calculated; instead it is taken from related references. The justification and references have been noted and explained in PD. Country risk will reflect the economic risks for particular country affected by various risks for investing in such country. Regardless private or government entity, risks such as inflation, consumer confidence, political stability, currency, domestic economic strength etc will reflect on stability of index capital market value (Damodaran uses the standard deviation of equity market value and bond value to find country risk adjustment)	Refer to the explanation mentioned above

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
		Beta has been revised in benchmark calculation by using only electricity generation industry beta. The lowest Beta value since existence of database has been used for the WACC calculation to follow conservativeness.	PP has calculated beta value considering similar type of industries i.e. Electricity Generation. The beta value has been taken from the year where the same has been the lowest which is conservative and in line with the requirement. This is acceptable
		Premium risk in calculation is adjusted by beta taken from specific industry sector (electricity generation, transmission, and distribution) thus the risk is justified to specific industry	Refer to the explanation mentioned above.
		Beta used is calculated by average taken from beta several related industry sector, they are electric generation, transmission and distribution sectors. Beta used represent levered beta since the project is mostly financed by Loan. Beta values, formula of this type cost of equity by Damodaran are adhered in the cash flow spreadsheet calculation along with reference footnotes.	The correction has been incorporated in the revised PD and found acceptable.
		Source parameters for operation amount,	

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
		operation life time, time of the project activity, fair value for the project are based on the project report 1993 where such document has been shown and submitted to DOE during validation site visit. Investment analysis has been revised according to the project report 1993 as well as the values in PD pertinent to the investment analysis. About insurance reference, since the evidence supporting cash flow is just an expert opinion thus this parameter has been omitted from the cash flow. Evidence stating the financial condition was poor is taken from ADB report. This supporting document has been submitted to DOE. The loan sanction letter is submitted to the DOE. Filename: Musi ADB Loan Agreement Evidence to show information about the loan financing the project activity has been shown in form of Completion Report 2006 in which containing the	Operation amount has been taken conservatively. In order to be more conservative, the PP has chosen to not include the insurance cost.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
		information about value of loan, tenor, interest charge, payment schedule and total investment value. Such document has been shown and submitted to DOE during validation visit. Please refer to explanation in CL 3 regarding the appropriateness of the chosen benchmark. Benchmark calculated is post tax value, and such number is compared with posttax IRR of the project. The clarification has been explained in PD. Arguments about poor financial performance of PLN have been supported by relevant document which are ADB's impact evaluation report and PLN's annual report. Such documents have been submitted to DOE Please see explanation above. PLN Annual Report has been provided to DOE. Annual can be downloaded Filename: FN23 Annual Report PLN	Copy of loan sanction letter has been provided and verified by the DOE. The appropriateness of the chosen benchmark to the project activity is discussed transparently in the PD section 2.5. Since the PP planned to obtained loan from foreign bank and the equity from the government, the most appropriate bench mark would be WACC to assess the viability of the project. It is found conservative and hence accepted

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
		2002 Financial parameter NPV has been removed from PD. PD uses IRR as indicator of project feasibility. The sensitivity analysis has been revised in PD as the parameters like tariff, PLF, investment cost and operation cost have all been varied to achieve benchmark value. Likelihood of achieving break even point has been discussed in the PD. In addition to the realistic variation of sensitive parameters by +\-10% another analysis has been performed where parameters hit the benchmark as comparison. At least +\- 10% variation of parameters is proposed by a guidance of the UNFCCC. Historical tariff information issued by PLN Palembang headquarter has been submitted to DOE	The correction has been incorporated in the revised PD and found acceptable. RINA has received ADB report stating the financial condition was poor for Pt PLN. IT is acceptable The correction has been incorporated in the revised PD and found acceptable. The same has been submitted to the DOE for verification. PP has conducted the sensitivity analysis as per the guidance provided in Tool for demonstration assessment of additionality point no. 17 in the annex, which is found acceptable and in line with

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
		Evidence for potential and installed capacities for Hydro Power Plant has been submitted to DOE.	the requirement. The correction has been incorporated in the revised PD and found acceptable. Evidence for potential and installed capacities for Hydro Power Plant has been submitted to RINA and was found correct. CL 3 is closed.
CL 4 Units for electricity exported to the grid needs to be in KWh This data of Diesel usage need not to be monitored if it is justified that the emission due to diesel usage is less than 1% of the total emission reductions. Statement that "Monitoring data will be made" is not justified and acceptable. PP needs to have team structure wherein roles and responsibilities to each team members are defined. PP needs to identify procedures for emergency preparedness for cases where emergencies can cause unintended emissions. During the site visit, calibration certificates	3.2.2,3.2.4, 3.2.6, 3.4.3, 3.4.4, 3.4.6	Units for electricity exported to the grid has been revised in PD Justification for the diesel usage less than 1% of the total emission reductions has been added in PD Statement that "Monitoring data will be made" has been revised to " Monitoring data has been made" Organization structure for monitoring team has been submitted to DOE. It adopts the current structure with some adjustment to be integrated with Monitoring SOP.	The correction has been incorporated in the revised PD and found acceptable. The correction has been incorporated in the revised PD and found acceptable. The correction has been incorporated in the revised PD and found acceptable. The correction has been incorporated in the revised PD and found acceptable.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
were not made available. Kindly provide the same			
Procedures for archiving of the recorded data needs to be included in the monitoring plan. The monitoring plan appears futuristic which needs to be changed and made realistic with sufficient evidences to confirm the same.		Procedures for emergency preparedness for cases where emergencies can cause unintended emissions, have been shown and submitted to DOE during Validation site visit	The correction has been incorporated in the revised PD and found acceptable.
Procedures on data apportioning for the joint meter reading not matching with the crediting period state date is not evident in PD		Calibration certificates valid from 2006 to 2010 for the main meter has been shown and submitted to DOE during validation site visit but the comparison meter's calibration was not yet available. This calibration has been submitted.	The correction has been incorporated in the revised PD and found acceptable.
Procedures to identify if meters are functioning ok or faulty in between calibrations and procedures on actions to be taken when such readings recorded with faulty meter are found. What is the permissible deviation between the main meter and check meter, to identify the faulty meter		Procedures to identify if meters are functioning ok or faulty in between calibrations and procedures on actions to be taken when such readings recorded with faulty meter are found have been described in the PD.	Procedures regarding identification of faulty meters and to undertake the action to account the same has been explained in the revised Pd and found acceptable.
There is a mention of annex 4 which is not included in the PD, kindly clarify.		SOP on electricity transfer between South Sumatra is sent to the DOE. However exact procedure in terms of acceptable uncertainty will be defined in the SOP prior to verification.	SOP on electricity transfer between south Sumatra has been provided and verified.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
		Filename: 06 Musi_SOP_Electricity Meter Information about permissible deviation has been added to PD in section 3.3. Exact procedure in terms of acceptable uncertainty will be defined in the SOP prior to verification.	Inclusion of permissible deviation has been done in the revised PD under section 3.3 which was found acceptable. CL 4 is closed.
CL 5 Provide the exact location for the reference of NCV of fuel. Under baseline emission, the third term $EG_{grid,CM,y}$ in the table is not there in the equation. Kindly change. Kindly mention the tool used to calculate the emission factor of grid. Under step 4, it is mentioned that table is provided in Annex-3.However it is not there in the VCS PD.	4.1.1,4.1.4	Exact location NCV has been revised in PD sec 3.3. The calculation as per methodology is explained in section 4.1 Baseline emission has been revised The method used from the Tool to calculate the emission factor of grid has been determined and explained in the PD. The table has been provided in annex 1	PP has explained the calculations of emissions and emission reductions in detail. Detail on NCV has been also provided in the revised PD. The revised calculation on baseline emission was found in line with the requirement and guidance of approved methodology. PD is revised and is found acceptable. CL 5 is closed.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
CL 6 PP is requested to submit the copy of EIA for verification The measures taken for the social responsibility is not transparent in the PD.	5.1,5.2,5.3	EIA copy has been shown and submitted during Validation site visit. Relevant section of the EIA is submitted to DOE. File: Musi_EIA_Monitoring&Management The measures taken for the social responsibility is now mentioned in the revised PD.	A reference from EIA for this query has been submitted by the client and RINA has verified the same. Explanation on the social benefits resulting due to the project has been included in the revised PD. CL 6 is closed.
CL 7 It is mentioned in the PD that stakeholder meeting was held to inform regarding the project rather than consultation. PP is required to justify on the same. Also kindly clarify whether the project is a capacity up gradation project which is a complete contradictory to all the discussions that was done above. The date of meeting, mode of invitation for stakeholder consultation, persons invited, persons present for the stakeholder consultation, contact details and summary of comments received are not transparent in PD. Kindly provide evidences for all the	6.1,6.2,6.3, 6.4,6.5,6.6	Proves for stakeholder consultation have been shown and submitted during Validation site visit. The documents of the attendant list of the stakeholder consultation and the result of the discussion in the EIA are submitted to the DOE. Statement of capacity upgrade project is removed because as explained in section 1 and 2 that Musi HEPP is a Greenfield project and not a capacity-upgrade project.	RINA has checked the documents during the site visit. PP has submitted the copy of attendee list and result of the discussion. This is found acceptable. The project activity has been implemented as green field project and it is not a capacity up-gradation project. The same has been verified from the contract agreement and found acceptable.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
above.		Evidences for the stakeholder consultation and other information have been shown and submitted to DOE during Validation site visit.	The same has been included in the revised PD and found acceptable. CL 7 is closed.
CL 8 Provide the schedule in detail and correct appropriately with change in start date mentioned. Documented evidence for the operational life time of the project has to be submitted.	7.1	Start date project has been revised in PD. Statement of two units has been revised to three units. Evidence for the operational lifetime stated in Musi FS Project Report 1993 and completion report 2006. These documents have been revealed and submitted to DOE during validation site visit. Operational lifetime as per FS is 50 years. However the generator turbine has a technical lifetime of 25 years. A major overhaul is needed after this operation period. Commonly 30 years are assumed as technical lifetime for hydropower projects as proposed by the DOE. Section 7 has been revised to 30 years as well as the IRR calculation period.	Start date has been revised as per the third unit and found acceptable. Operational lifetime of the HPP is mentioned as 30 years which is correct and conservative. CL 8 is closed.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project proponents' response	Validation team conclusion
Additional CL found after submitting the revised PD. **CL9** In the revised PD it is mentioned that ER calculation for the year 2006 to 2008 is based on historical and actual data. However these values are contradicting with the documents provided by the PP.	1.3	For ex ante calculation, ER calculation is based on expected annual electricity generation mentioned in FS. The statement of ER calculation for the year 2006 to 2008 has been revised in the PD.	Refer to CAR 4 and CAR 6, CL 9 is closed.