



VALIDATION REPORT

*“1.725 MW Mini Hydel Scheme
on Nagavali River, Andhra
Pradesh” Project*
in
India

REPORT NO. 2008-1026

REVISION NO. 03

DET NORSKE VERITAS



VALIDATION REPORT

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CERTIFICATION AS

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Approved by: Hendrik W. Brinks Technical Director for CDM	Organisational unit: Climate Change Service
Client: M/s Sardar Power Limited	Client ref.: Mr. Movva Srinivas

Project Name: 1.725 MW Mini Hydel Scheme on Nagavali River, Andhra Pradesh

Country: India

Methodology: AMS-I.D

Version: 13

GHG reducing Measure/Technology: Grid connected mini hydro power plant.

ER estimate: 5 559 tCO₂ per year or 55 590 tCO₂ over 10 years of crediting period.

Size

☐ Large Scale

☒ Small Scale

Validation Phases:

☒ Desk Review

☒ Follow up interviews

☒ Resolution of outstanding issues

Validation Status

☐ Corrective Actions Requested

☐ Clarifications Requested

☒ Full Approval and submission for registration

☐ Rejected

In summary, it is DNV's opinion that the *1.725 MW Mini Hydel Scheme on Nagavali River, Andhra Pradesh* in India, as described in the PDD, of version 3 dated 01 June 2009, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology AMS-I.D, version 13. DNV thus requests the registration of the project as a CDM project activity.

Report No.: 2008-1026	Date of this revision: 02-06-2009	Rev. No. 03
Report title: 1.725 MW Mini Hydel Scheme on Nagavali River, Andhra Pradesh in India		
Work carried out by: Sharmistha Shome (GHG Auditor-Trainee), Astakala Vidyacharan		
Work verified by: Venkata Raman Kakaraparthi (Draft Report), Kumaraswamy Chandrashekara (Final Report).		

Key words:

Climate Change

Kyoto Protocol

Validation

Clean Development Mechanism

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VALIDATION REPORT

Abbreviations

APTRANSCO	Andhra Pradesh Transmission Corporation Limited
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electrical Authority
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DG	Diesel Generator
DNV	Det Norske Veritas
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
KWh	Kilo Watt hour
MW	Mega Watts
MNES	Ministry of Non-conventional energy sources
MoEF	Ministry of Environment and Forest
MP	Monitoring Plan
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
PPA	Power Purchase agreement
UNFCCC	United Nations Framework Convention on Climate Change



VALIDATION REPORT

TABLE OF CONTENTS

1	EXECUTIVE SUMMARY – VALIDATION OPINION	3
2	INTRODUCTION.....	4
2.1	Objective	4
2.2	Scope	4
3	METHODOLOGY.....	5
3.1	Desk Review of the Project Design Documentation	5
3.2	Follow-up Interviews with Project Stakeholders	6
3.3	Resolution of Outstanding Issues	7
3.4	Internal Quality Control	9
3.5	Validation Team	9
4	VALIDATION FINDINGS	10
4.1	Participation Requirements	10
4.2	Project Design	10
4.3	Baseline Determination	11
4.4	Additionality	11
4.5	Monitoring	15
4.6	Estimate of GHG Emissions	15
4.7	Environmental Impacts	16
4.8	Comments by Local Stakeholders	16
4.9	Comments by Parties, Stakeholders and NGOs	17

Appendix A: Validation Protocol

Appendix B: Certificates of Competence



VALIDATION REPORT

1 EXECUTIVE SUMMARY – VALIDATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a validation of the “1.725MW Mini Hydel Scheme on Nagavali River, Andhra Pradesh”, on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.

The project participant is Sardar Power Limited. The host Party India meets all participation requirements and the DNA of India has approved the project activity. The DNA of India has confirmed that the project assists in achieving sustainable development and has accorded the approval for the project on 17 March 2008.

Having an installed capacity of less than 15 MW, the project is eligible as type I small-scale CDM project activity. It has also been demonstrated that the project is not a de-bundled component of a large scale project. The validation has confirmed that the project is eligible as category I.D small-scale CDM project activity and correctly applies the simplified baseline and monitoring methodology AMS-I.D, version 13. The determination of the baseline is well elaborated, transparent and sufficiently supported with facts. The selected baseline scenario is reasonable for the selected 10 year crediting period. Moreover, an analysis of the barriers facing the project demonstrates that project is not a likely baseline scenario.

The validation did not reveal any information indicating that the project can be seen as a diversion of ODA funding towards India.

The project results in the reduction of GHG emissions those are real, measurable and give long-term benefits and that are additional to what would have occurred in the absence of the project. The annual emission reductions from the project are estimated to be on the average 5 559 tCO₂e over the selected 10 year fixed crediting period. The emission reduction forecast has been checked and is deemed likely that the stated amount is achieved given that the underlying assumptions do not change. Adequate training and monitoring procedures have been implemented.

The monitoring plan makes sufficient provision for monitoring relevant project and baseline emission indicators. Responsibilities and authorities for project management, monitoring and reporting and QA/QC procedures have also been addressed.

A local stakeholder consultation process has been carried out by the project participant. DNV published the PDD on the DNV Climate Change web site and comments by Parties, stakeholders and UNFCCC accredited NGOs were invited through the CDM web site. No comments were received during this period.

In summary, it is DNV’s opinion that the project, as described in the project design document of 23 December 2008, meets all relevant UNFCCC requirements for the CDM, is eligible as category I.D small-scale CDM project activity and correctly applies the approved simplified baseline and monitoring methodology AMS-I.D version 13. Hence, DNV requests the registration of the “1.725 MW Mini Hydel Scheme on Nagavali River, Andhra Pradesh” project as a CDM project activity.



VALIDATION REPORT

2 INTRODUCTION

Sardar Power Limited has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the “1.725 MW Mini Hydel Scheme on Nagavali River, Andhra Pradesh” project in India (hereafter called “the project”). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, the simplified modalities and procedures for small-scale CDM project activities and the subsequent decisions by the CDM Executive Board.

2.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC 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 CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, the simplified modalities and procedures for small-scale CDM project activities and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology AMS-I.D, version 13 /4/. The validation team has, based on the recommendations in the Validation and Verification Manual /3/ employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.



VALIDATION REPORT

3 METHODOLOGY

The validation consisted of the following three phases:

- I a desk review of the project design documents
- II follow-up interviews with project stakeholders
- III the resolution of outstanding issues and the issuance of the final validation report and opinion.

The following sections outline each step in more detail.

3.1 Desk Review of the Project Design Documentation

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

- /1/ CDM-SSC-PDD of “1.725 MW Mini Hydel Scheme on Nagavali River, Andhra Pradesh, India, version 01, dated 12 March 2008, version 02, dated 23 December 2008, and version 03, dated 01 June 2009
- /2/ Letter of Approval from DNA of India, dated 17 March 2008
- /3/ CDM EB 44: *Validation and Verification Manual*.
- /4/ CDM Executive Board AMS-I.D, version 13 *Grid connected renewable electricity generation*
- /5/ CDM Carbon Dioxide Baseline Data base, version 3, 15 December 2007 (www.cea.nic.in)
- /6/ Detailed Project Report, May 2006, by Elen & Lite Consultancy Services, Hyderabad
- /7/ Purchase order and technical specifications of the Electro Mechanical equipments by Boving Fouress Limited, dated 10 January 2007.
- /8/ Loan sanction letter from Andhra Bank (A Govt. of India undertaking), dated 23 September 2006.
- /9/ Power Purchase Agreement between M/s Sadar Power Limited and Transmission Corporation of Andhra Pradesh Limited, dated 6 December 2003
- /10/ Andhra Pradesh Electricity Regulatory Commission, tariff order for Non conventional energy based power projects, dated 7 July 2004
- /11/ No Objection Certificate from Irrigation & CAD Department, Government of Andhra Pradesh, dated 11 August 2003.
- /12/ Purchase Order for Blasting of hard rock/HDR, Vyshnavi Construction, dated 16 November 2006.
- /13/ Agreement between Non Conventional Energy Development Corporation of Andhra Pradesh and M/s Sadar Power Limited, dated 11 November 2003.



VALIDATION REPORT

- /14/ Proceedings and permission by Non Conventional Energy Development Corporation of Andhra Pradesh for setting up of 1.725 MW project in phase I, dated 3 May 2007
- /15/ No Objection Certificate and clearance for pollution from Andhra Pradesh Pollution Control Board, dated 4 September 2008
- /16/ Minutes of the Board of Directors meeting for CDM revenue consideration, dated 9 June 2006
- /17/ No Objection Certificate from the Gram Panchayat, dated 8 May 2000
- /18/ Detailed Financial analysis.
- /19/ Income Tax Act 1961, sourced from Income Tax Department, Ministry of Finance.
<http://law.incometaxindia.gov.in/TaxmannDit/DisplayPage/dpage1.aspx>
- /20/ India's inflation rates sourced from Finance Minister of India site,
<http://financeminister.gov.in/>
- /21/ Economic Watch, Indian Economy Overview
<http://www.economywatch.com/indianeconomy/india-inflation.html>
- /22/ Promotional Policies by Ministry of Non conventional Energy Sources
http://mnes.nic.in/annualreport/2001_2002_English/ch5_pg5.htm
- /23/ Water Resource Information System, Govt. of Andhra Pradesh
<http://irrigation.cgg.gov.in/html/demoFuncs.html>
- /24/ Commissioning certificate, dated 17 July 2008
- /25/ Chartered Accountant, Jeetendra Kulkarni, certificate for project cost, dated 17 December 2008
- /26/ CDM India Designated National Authority.
<http://cdmindia.nic.in/cdmindia/projectList.jsp?n=y&off=91>
- /27/ Work order for construction of power house and allied structures, placed on Sri Saravana Constructions dated 30 January 2007

3.2 Follow-up Interviews with Project Stakeholders

On 28 April 2008 DNV performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. The interview was carried out at the project site. The interviews were carried out by A. Vidyacharan (qualified validator for the technical area) of DNV India. Representatives of the project proponent and the consultant Zenith Energy were interviewed. The main topics of the interviews are summarized below.



VALIDATION REPORT

	Date	Name	Organization	Topic
/28/	2008-04-28	Mr. Movva Srinivas	Sardar Power	<ul style="list-style-type: none">➤ Determination of project additionality and ascertaining that CDM was considered during the project conceptualization.➤ Clarifications on establishment of baseline, monitoring plan and emission reduction calculations.➤ Resources, training needs and procedures for operation and maintenance. Monitoring methodology
		Mr. Siddharth	Zenith Energy	

3.3 Resolution of Outstanding Issues

The objective of this phase of the validation is to resolve any outstanding issues which need be clarified prior to DNV’s positive conclusion on the project design. In order to ensure transparency a validation protocol was customised for the project. The protocol shows in a transparent manner the criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM 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 three tables. The different columns in these tables are described in the figure below. The completed validation protocol for the “1.725 MW Mini Hydel Scheme on Nagavali River, Andhra Pradesh” project is enclosed in Appendix A to this report.

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

- i) mistakes have been made with a direct influence on project results;
- ii) CDM and/or methodology specific requirements have not been met; or
- iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

A request for clarification (CL) may be used where additional information is needed to fully clarify an issue.



VALIDATION REPORT

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities				
Requirement	Reference	Conclusion		
The requirements the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided (OK), a Corrective Action Request (CAR) of risk or non-compliance with stated requirements or a request for Clarification (CL) where further clarifications are needed.		

Validation Protocol Table 2: Requirement checklist				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the large-scale PDD template, version 03 - in effect as of: 28 July 2006. Each section is then further sub-divided.	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). A request for clarification (CL) is used when the validation team has identified a need for further clarification.

Validation Protocol Table 3: 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 CAR or a CL, these should be listed in this section.	Reference to the checklist question number in Table 2 where the CAR or CL is explained.	The responses given by the project participants during the communications with the validation team should be summarised in this section.	This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".

Figure 1: Validation protocol tables



VALIDATION REPORT

3.4 Internal Quality Control

The draft validation report including the initial validation findings underwent a technical review before being submitted to the project participants. The final validation report underwent another technical review before requesting registration of the project activity. The technical reviews were performed by a technical reviewer qualified in accordance with DNV’s qualification scheme for CDM validation and verification.

3.5 Validation Team

<i>Role/Qualification</i>	<i>Last Name</i>	<i>First Name</i>	<i>Country</i>	<i>Type of involvement</i>					
				Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	Expert input
CDM validator / technical team leader	Astakala	Vidyacharan	India		Yes		Yes		
GHG auditor (Trainee)	Shome	Sharmistha	India	Yes		Yes			
Technical reviewers (Draft report)	Kakaraparthi	Venkata Raman	India					Yes	
Technical reviewers (Final report)	Chandrashekara	Kumaraswamy	India					Yes	

The qualification of each individual validation team member is detailed in Appendix B to this report.



VALIDATION REPORT

4 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 in Appendix A.

The final validation findings relate to the project design document version 3 dated 01 June 2009.

4.1 Participation Requirements

The project activity is being proposed as a unilateral project developed by Sardar Power Limited. The host Party India fulfils the participation requirements, having ratified the Kyoto Protocol on the 26 August 2002 and established National Clean Development Mechanism Authority, Ministry of Environment and Forests (MoEF) as its DNA. Ministry of Environment and Forests (MoEF) has approved the project on 17 March 2008 /2/ and provided confirmation that the project assists in achieving sustainable development. The issuance of Letter of Approval by DNA of India for the proposed project activity has been further verified by DNV from the Ministry of Environment and Forest, India DNA's website /26/.

The project is owned by Sardar Power Limited and the validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards India.

4.2 Project Design

The proposed project is a run of the river 1.725 MW hydro power project located at Vizianagaram district of Andhra Pradesh in India and will be connected to the Andhra Pradesh Transmission Corporation Limited grid, which forms a part of the southern regional grid of India. The project is constructed on Nagavati River, 8 km downstream of Thotapalli reservoir. The project will depend on the surplus water from the Thatopalli reservoir.

The technology used in the project is available in India and no transfer of technology is envisaged. Proposed project is expected to have an annual gross generation of 6.57 GWh at a plant load factor (PLF) of 43.47% and will export a net amount of 6.50 GWh to the southern regional grid through the Andhra Pradesh Transmission Corporation Limited grid. The estimated plant load factor has been verified against the Detailed Project Report, May 2006, by Elen & Lite Consultancy Services, Hyderabad /6/.

The capacity of the generators at 1.725 MW has been verified from the technical specification sheet of the machine /7/. The project will result in an estimated reduction of 55 590 t CO₂e over its entire crediting period of 10 years. The added advantage of the project will be in terms of additional jobs generated and the environmental well being. The technology applied is deemed current good practice and is not expected to be replaced within the crediting period.

The project start date of the project activity is the date of purchase order for blasting hard rocks during excavation of power house and intake, dated 16 November 2006 /12/. The expected operational lifetime of the project is 25 years and a fixed crediting period of 10 years has been chosen with the starting date of the first crediting period as 1 April 2009 or from the date of registration of the project activity whichever is later.



VALIDATION REPORT

4.3 Baseline Determination

In view of the fact that the project capacity is less than 15 MW, the project is eligible as type I small-scale CDM project activity and can apply a simplified baseline methodology. The project applies the baseline methodology stipulated for category I.D of the “simplified modalities and procedure for small scale CDM project activity” The simplified baseline methodology AMS-I.D, version 13 is applicable for grid connected renewable electricity generation projects. The application of AMS-I.D, version 13 is justified as:

- The project generates electricity using hydro resource and it displaces the grid electricity. Power Purchase Agreement, dated 6 December 2003 /9/, signed between M/s Sadar Power Limited and Transmission Corporation of Andhra Pradesh Limited, has been provided and verified by DNV.
- The project activity is a run of the river power plant with a total installed capacity of 1.725 MW. This has been verified from the electro mechanical specifications provided by the technology supplier /7/ and during the site visit.

As the project activity supplies electricity to the Andhra Pradesh Transmission Corporation Limited (APTRANSCO) grid which forms a part of the southern regional electricity grid, the baseline for this project activity is a function of the generation mix of the southern regional grid. The selection of the southern regional grid as the grid system boundary for the project activity is in line with the recent EB guidance for large countries such as India.

The project system boundary includes the power plant from diversion weir to transmission system till the evacuation point. The project activity includes one number of 1.5 MW generator, with 15% continuous overload, vertical full Kaplan turbine, thereby amounting to 1.725 MW of capacity./7/. The spatial boundary of the project includes the southern regional grid. The selected sources and gases are justified for the project activity.

	GHGs involved	Description
Baseline emissions	CO ₂	Emissions equivalent to the amount of net electricity supplied by the project activity that would otherwise be generated by APTRANCO, which is a part of southern grid.
Project emissions	CO ₂	Emissions from diesel consumption in diesel generator set during emergency
Leakage	NA	NA

4.4 Additionality

The additionality of the project activity has been demonstrated as per the Attachment A to Appendix B of simplified modalities and procedures for small-scale CDM project activities. The project activity primarily demonstrates additionality through investment analysis and other barrier.

4.4.1 CDM consideration and continued action to secure CDM status:

The project start date is the date of purchase order for blasting hard rocks during excavation of power house and intake, dated 16 November 2006 /12/, which is the earliest of any real action and financial investment, and thus before the start of the



VALIDATION REPORT

validation of the project activity. The electromechanical equipment was ordered 10 January 2007.

The start date of the project activity is the date of earliest action among all activities which involved major investments in the project implementation. This has been confirmed after verification of the following documents related to major investments.

- Purchase Order for blasting of hard rock/HDR, placed on Vyshnavi Construction, dated 16 November 2006. /12/
- Purchase order and technical specifications of the electromechanical equipments on Boving Fouress Limited, dated 10 January 2007 /7/.
- Work order for construction of power house and allied structures, placed on Sri Saravana Constructions dated 30 January 2007 /27/.

CDM was seriously considered in the decision to proceed with the project activity in compliance with EB41 annex 46, which was confirmed through:

- The CDM revenue consideration for the project activity has been verified from the Detailed Project Report, May 2006, by Elen & Lite Consultancy Services, Hyderabad /6/. The IRR of the project activity without considering CDM revenues is lower compared to the interest rate of the term loan (for the debt component of the investment), making the project financially unviable and necessitating CDM revenues.
- Early consideration of CDM is evidenced by Board of Directors resolution, dated 9 June 2006 /16/.
- The proponent has signed the purchase order for Blasting of hard rock/HDR with Vyshnavi Construction on 16 November 2006 /12/, which is considered as the start date of the project activity.

The assessment that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation is summarized below:

- Though the initial agreement for the execution of the project activity with an installed capacity of 3 MW was signed with Non Conventional Energy Development Corporation of Andhra Pradesh, on the 11 November 2003 /13/, the proceedings and permission by Non Conventional Energy Development Corporation of Andhra Pradesh for setting up of 1.725 MW project in phase I has been obtained on 3 May 2007 /14/.
- Agreement with M/s Zenith Energy for the development of CDM project dated 20 April 2007.
- The proponent has applied for Letter of Approval (LoA) from DNA of India on 7 November 2007 and the LoA was issued on 17 March 2008 /2/
- The project design document, dated 12 March 2008, was published for the global stakeholder consultation on 14 March 2008.
- The project activity has been commissioned on 17 July 2008 /24/

The above chronology of events, Detailed Project Report (DPR) and the minutes of board meeting and the fact that the project capacity was downsized to 1.725 MW from the sanctioned capacity of 3 MW due to reduction in the tariff from the original PPA (based on MNES guidance) to a revised renewable tariff order with reduced tariff, demonstrate that a) CDM was considered for the project activity and b) CDM revenues were decisive for the project activity to go ahead.

4.4.2 Investment analysis: Choice of approach:



VALIDATION REPORT

Since the project activity generates revenue without CDM and the alternative to the project does not involve investments, a benchmark analysis was selected.

4.4.3 Investment analysis: Benchmark selection:

A project-IRR of 10.5% has been chosen as the benchmark, which is the cost of debt considered in the Detailed Project Report, dated May 2006, by Elen & Lite Consultancy Services, Hyderabad /6/. DNV was able to verify the benchmark of 10.5% from the loan sanction letter from Andhra Bank, dated 23 September 2006 /8/.

4.4.4 Investment analysis: Input parameters:

The investment analysis has been performed for 20 years considering annual operational costs /6/, taxes and incentives, total investments /8/ and revenue from the power generation /9/ /10/. DNV was able to verify the financial inputs considered in the IRR analysis, such as total project cost, annual operational costs etc from DPR /6/. The tariff has been verified from the power purchase agreement /9/ and tariff order for Non-conventional energy based power projects by Andhra Pradesh Electricity Regulatory Commission, dated 7 July 2004 /10/ and valid for 10 years of operation.

The project activity is a grid connected renewable energy project and all the electricity generated is exported to the connected APTRANSCO grid. The tariff structure for the project activity has been verified from the Power Purchase Agreement /9/ executed by the project proponent with the APTRANSCO (Transmission Corporation Andhra Pradesh Limited) dated 6 December 2003. According to the agreement, the tariff payable per kWh of energy exported will be as per the directions of Andhra Pradesh state Electricity Commission order /10/ which is available at the time of investment decision /16/. The applicable tariff according to the power purchase agreement at the time of investment decision, as verified from APERC tariff order is INR 2.69/kWh with systematic reduction each year.

The estimated plant load factor of 43.47% in the Detailed Project Report /6/ is based on 16 years past data on daily discharge by the regulator from 1989 to 2005. The total project cost of Rs 92.94 million has been verified against the term loan sanction letter from Andhra Bank, dated 23 September 2006 /8/. The operation and maintenance cost of 1.5% of the project cost with 5% yearly escalation has been verified from the Detailed Project Report /6/. This has been further verified from the tariff order for Non-conventional energy based power projects by Andhra Pradesh Electricity Regulatory Commission, dated 7 July 2004 /10/. All the taxes and incentives are confirmed to be applied correctly and as per the Indian Income Tax Act /19/. Straight line depreciation has been calculated in line with the prevailing national regulation and industrial practice.

4.4.5 Investment analysis: Calculation and conclusion:

Based on data from the Detailed Project Report, dated May 2006, by Elen & Lite Consultancy Services, Hyderabad /6/, tariff order for Non-conventional energy based power projects by Andhra Pradesh Electricity Regulatory Commission, dated 7 July 2004 /10/ and the plant load factor as verified from the Detailed Project Report /6/, the project IRR without CDM has been calculated to be 6.04% /18/, which is lower than the applied benchmark of 10.5%. The IRR calculations were provided in a spreadsheet. The calculation was verified by DNV and has been found to be correct.

4.4.6 Investment analysis: Sensitivity analysis:



VALIDATION REPORT

A sensitivity analysis has been performed in order to check the robustness of the financial analysis for reasonable variations in parameters contributing more than 20% to the costs or revenues. The values were varied till the benchmark was reached and the likelihood for that to happen was assessed. No significant positive correlations between the parameters are anticipated.

a) Project cost: The IRR touches the benchmark if the project cost decreases by 24.19% /18/. Due to the raising inflation rates verified from Indian Economy Overview by Economic Watch /21/ and India's inflation rates sourced from the official website of the Finance Minister of India (<http://financeminister.gov.in>) /20/, the decrease in materials cost is very unlikely. Moreover, As the project activity has already been commissioned on 17 July 2008 /24/, the actual investment cost was verified at INR 93.28 million from the Chartered Accountant certificate, dated 17 December 2008 /25/, which is higher than the estimated cost Rs 92.94 million in the Detailed Project Report /6/ and IRR analysis. Thus, this is deemed impossible.

b) Plant load factor: With the plant load factor increased to 100% of the generation capacity the project IRR only improves to 8.47%. The low IRR is due to the restriction on plant load factor at 35%, above which an incentive of only INR 0.25/kWh has been fixed by the tariff order by Andhra Pradesh Electricity Regulatory Commission, dated 7 July 2004 /10/. A plant load factor of 43.47% considered in the Detailed Project Report /6/ has been assessed on basis of 16 years past data on daily discharge by the regulator, from 1989 to 2005. Further, with the increase in the regulator area, as verified from Water Resource Information System, Govt. of Andhra Pradesh /23/, there is likelihood of decrease in the daily discharge of water. Thus, increase in plant load factor is deemed impossible.

c) Tariff: The project IRR improves to the applied benchmark if the tariff increases by 31.95% /18/. However, it has been verified from the Power Purchase Agreement /9/ that the tariff structure, fixed by Andhra Pradesh Electricity Regulatory Commission /17/, is fixed for 10 years for the proposed project activity. Thereafter, the tariff structure would depend on the order and recommendation from Andhra Pradesh Electricity Regulatory Commission. Thus, increase of tariff by 31.95 % is deemed unlikely.

d) Operation and maintenance cost: It has been demonstrated that if the operation and maintenance cost is removed, the project IRR still only improves to 8.33% /18/. Hence, reduced operation and maintenance costs can not improve the IRR above the benchmark.

4.4.7 Barrier analysis

It has been addressed and verified from the Water Resource Information System, Govt. of Andhra Pradesh /23/ that due to the deterioration of the existing Thotapalli regulator, the Government of Andhra Pradesh is constructing a new regulator, up stream to the existing old regulator. The new regulator is envisaged to increase the existing ayacut facilities from existing 64 000 acres to 120 000 acres. This will result in decrease in the discharge of water to the project plant power house. Further, it has also been verified from the No Objection Certificate from Irrigation & CAD Department, Government of Andhra Pradesh, 11 August 2003 /11/, under special conditions, that the discharge of water will be completely under the regulation of irrigation department, depending on the irrigation needs and not on the project activity energy production needs. Further, it has also been verified from the No Objection Certificate from Irrigation & CAD Department/11/ that the project proponent is liable to pay any royalties taxes, cess levies imposed by government or consequent statutory authority for utilization of water for generation of power and approval by Government time to time or introduction of water tariff fixed by Department of Irrigation in the future.



VALIDATION REPORT

Hence, it is DNV's opinion that the proposed project activity encounters barrier due to low return on investment and hydrological risk

4.5 Monitoring

The project applies the approved monitoring methodology AMS-I.D, Version 13 - "Grid connected renewable electricity generation" for Type I – Renewable Energy Projects, according to Appendix B of the "Simplified modalities and procedures for small-scale CDM project activities" - Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activities. Given that the emission factor is calculated *ex-ante* and according to the monitoring methodology AMS-I.D, version 13, the data to be monitored are the net electricity supplied and imported from the grid by the project. The diesel consumption in the diesel generator set during emergency will also be monitored.

The net electricity supplied to the grid will be monitored by main meter and check meter. The recorded data will be cross checked against the sale receipts. Diesel consumption will be monitored by dip stick/ level gauge or store issues and cross checked against the fuel purchase receipt. The operating hours and the quantity of diesel consumption will be recorded

The monitoring plan is in accordance with the monitoring methodology and will give opportunity for real measurements of achieved emission reductions.

4.5.1 Parameters determined ex-ante

Data available at the time of validation are as follows:

- CO₂ emission factor of the western regional grid, combined margin value, taken from CEA published data 2006-2007.
- Oxidation factor of coal is considered as 1 as per IPCC 2006 default value.

DNV has verified the value used against the sources and concluded that the data used are appropriate and conservative. This has been further described in section 4.6 of the report.

4.5.2 Parameters monitored ex-post

The parameters that will be monitored *ex-post* are:

- The total electricity generated by the project activity,
- The auxiliary electricity utilized by the project activity within the project boundary
- The net electricity delivered to the APTRANCO.
- Amount of diesel consumed by the project activity during emergency.
- CO₂ emission coefficient factor of diesel, sourced from IPCC default value.

4.5.3 Management system and quality assurance

Electricity meters of 0.2S class accuracy will be used. Maintenance and calibration of electricity meters will be calibrated as per the national regulation.

Board of Directors of the company is responsible for registration, monitoring, measurement, reporting and reviewing of the data and overall project management. Internal audit for the proposed CDM project will be carried out quarterly.

4.6 Estimate of GHG Emissions

The calculations and formulae as addressed in the approved baseline and monitoring methodology AMS-I.D, version 13, have been applied. All aspects related to the direct



VALIDATION REPORT

and indirect GHG emissions as relevant to the project activity have been addressed and are presented in a transparent manner, in line with the approved methodology.

Baseline emission: The combined margin emission coefficient for the southern grid of India is 0.854 tCO₂e/MWh, has been sourced from Central Electricity Authority data /5/. The Central Electricity Authority, Ministry of Power, Government of India /5/ has published a database of carbon dioxide emission factors from the power sector in India based on detailed authenticated information obtained from all operating power stations in the country. This database /5/ i.e. the CO₂ baseline database provides information about the OM and BM factors of all the regional electricity grids in India. DNV confirms that the database is an official publication of the Government of India for the purpose of CDM baselines and the OM in the CEA database is calculated *ex ante* using the simple OM approach based on the generation-weighted average emissions per electricity unit of all fossil-fuelled generating sources serving the system over a three year period of 2004-2005, 2005-2006 and 2006-2007 /5/. BM is calculated *ex ante* based on 20% most recent capacity additions in the grid based on net generation as described in ACM0002. Actual calorific values of coal and lignite have been used.

DNV was able to verify the value of combined margin from the Central Electricity Authority published data, 2007 /5/.

The GHG emission reduction due to the project activity has been calculated as the product of net electricity supplied to the grid and the combined margin grid emission factor. The net electricity supplied to the grid will be measured by the main electricity meter and cross checked against check meter. The amount of net electricity supplied to the grid will be verified against the sales receipt from the grid company.

The baseline emission estimate can be replicated using the data and parameter values referenced to in the PDD. The data sources mentioned have been verified by DNV.

Project emission: Fossil fuel consumption in the diesel generator set, during emergency, has been incorporated as the project emission and shall be monitored and calculated.

Leakage: It has been addressed and verified by DNV that no transfer of equipment has taken place in the project activity, thus leakage is not involved in the project activity as per the methodology.

4.7 Environmental Impacts

The total investment cost of the project activity is less than INR.1000 million, thus no environmental impact assessment study is required as per Indian regulation. Further, the proposed project being a mini hydro power plant and does not involve submergence of land or rehabilitation, no adverse impact on the environment is envisaged from the project activity. The proposed project activity contributes to generation of green power and is expected to benefit the economic development of a backward region. Thus, the project activity is expected to have only beneficial impacts and no adverse impacts are foreseen. All the statutory clearances /9//11//13//14//15/ has been provided and verified by DNV.

4.8 Comments by Local Stakeholders

The local stakeholders identified by the project proponent are Department of revenue, Department of Irrigation, Andhra Pradesh Transmission Corporation Limiter, Non conventional Energy Development Corporation of Andhra Pradesh Ltd. and local village panchayat.

The clearances from pollution control board /15/, irrigation department /11/ and Non conventional Energy Development Corporation of Andhra Pradesh Ltd /13//14/ has



VALIDATION REPORT

been verified by DNV. The NOC from the village Panchayat, dated 8 May 2000 /17/ has been verified by DNV.

4.9 Comments by Parties, Stakeholders and NGOs

The PDD of 12 March 2008 was made publicly available on DNV's climate change website

(www.dnv.com/focus/climate_change/Projects/ProjectDetails.asp?ProjectId=1764) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 14 March 2008 to 12 April 2008.

No comments were received



VALIDATION REPORT

APPENDIX A

CDM VALIDATION PROTOCOL



Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities

Requirement	Reference	Conclusion
About Parties		
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	The project is being developed as a unilateral project.
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	OK
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	OK
5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	NA, no Annex I party is identified.
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK



Requirement	Reference	Conclusion
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	OK
About additionality		
10. Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	CAR-2
About forecast emission reductions and environmental impacts		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK
For large-scale projects only		
12. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	NA
About small-scale project activities (if applicable)		
13. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakech Accords and shall not be a debundled component of a larger project activity.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	OK



Requirement	Reference	Conclusion
14. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and use the simplified baseline and monitoring methodology for that project category.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	OK
15. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	OK
About stakeholder involvement		
16. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	OK
17. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	OK. PDD has been published in UNFCCC site from 13 March 2008 to 12 April 2008 for global stakeholder comments. No comments were reported.
Other		
18. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
19. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and	CDM Modalities and Procedures §45c,d	OK



Requirement	Reference	Conclusion
circumstances.		
20. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK
21. The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK
22. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	OK

**Table 2 Requirements Checklist**

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
A. General Description of Project Activity <i>The project design is assessed.</i>					
A.1. Project Boundaries <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>					
A.1.1. Are the project's spatial boundaries (geographical) clearly defined?	PDD	DR/I	Yes, the project is located at Survey No. 136 near Naguru village on Nagavali river, 8 Kms downstream of Thotapalli regulator. The geographical coordinates of the project site are 83° 31'32" longitude and 18°44'20" latitude.		OK
A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	PDD	DR/I	The project system boundary includes the power plant from diversion weir to transmission system till the evacuation point. The plant consists of a synchronous generator of capacity 1.725 MW coupled with a vertical full Kaplan turbine. The spatial boundary of the project includes the Southern regional grid.		OK
A.2. Participation Requirements <i>Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project</i>					



CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
<i>Participant.</i>					
A.2.1. Which Parties and project participants are participating in the project?	PDD	DR/I	India is the host country and Sardar Power Limited is the project participants. No Annex I country is identified.		OK
A.2.2. Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party?	PDD	DR/I	Host country India has provided the letter of approval in addition to the authorization to the project participant.		OK
A.2.3. Do all participating Parties fulfil the participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority	PDD	DR/I	India fulfils the participation requirements, having ratified the Kyoto Protocol on the 26 August 2002 and has established a DNA - National Clean development Mechanism Authority, Ministry of Environment and Forests (MoEF). The voluntary participation in the project is confirmed against the letter of approval from the DNA.		OK
A.2.4. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.	PDD	DR/I	It has been confirmed that no ODA is available for the project from any Annex-I country.		OK
A.3. Technology to be employed <i>Validation of project technology focuses on the project engineering, choice of technology and competence/</i>					



CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
<i>maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i>					
A.3.1. Does the project design engineering reflect current good practices?	PDD	DR/I	The technology employed in the project reflects current good practice. The design head of the project plant is 5.4 m and vertical Kaplan hydro turbine is used. The technical specifications, governor and transformer safety panels needs to be provided for verification along with DPR and Hydrology data.	CL 4	OK
A.3.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	PDD	DR/I	The project uses current good practice technology. The project technology is available in India.		OK
A.3.3. Does the project make provisions for meeting training and maintenance needs?	PDD	DR/I	Training procedure has been formalized and will be provided in the site. Maintenance procedure has been formalized and will be done as per the industrial standards.		OK
A.4. Contribution to Sustainable Development <i>The project's contribution to sustainable development is assessed.</i>					
A.4.1. Has the host country confirmed that the project assists it in achieving sustainable development?	PDD	DR/I	The letter of approval from the DNA confirming that the project assists in		OK



CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			achieving sustainable development		
A.4.2. Will the project create other environmental or social benefits than GHG emission reductions?	PDD	DR/I	The project activity will create employment opportunities during construction and also operation phases. The proposed project will encourage environmentally safe and sound technology in mini hydro power sector.		OK
A.5. Small scale project activity <i>It is assessed whether the project qualifies as small-scale CDM project activity</i>					
A.5.1. Does the project qualify as a small scale CDM project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM?	PDD	DR/I	The Project activity comprises of a 1.725MW power generation unit using renewable energy (hydropower) as source of fuel. The power generated will be supplied to the regional grid. This project qualifies as Type I, Category D of the small scale CDM projects and as the generation capacity is below the stipulated limit of 15MW.		OK
A.5.2. Is the small scale project activity not a debundled component of a larger project activity?	PDD	DR/I	Project proponent is not involved with any other CDM project activity in the same category and within 1 km of project boundary in last 2 years; hence the project is not a de-bundled component of a larger project activity.		OK
B. Project Baseline <i>The validation of the project baseline establishes whether</i>					

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
<i>the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
B.1. Baseline Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1. Does the project apply an approved methodology and the correct version thereof?	PDD	DR/I	Yes the project confirms to the Category type I D, version 13 for small scale CDM projects. The project is a grid connected renewable electricity generation unit (hydro).		OK
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?	PDD	DR/I	The applicability conditions of the methodology are fulfilled. The project is a grid connected 1.725 MW small hydro power unit (renewable). The geographical and system boundary of relevant electricity grid-Southern regional grid can be clearly identified.		OK
B.2. Baseline Scenario Determination <i>The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.</i>					
B.2.1. What is the baseline scenario?	PDD	DR/I	The baseline scenario is that the equivalent power will be generated by southern grid.		OK



CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	PDD	DR/I	No alternate scenario analysis is done. The same is not required as per the methodology.		OK
B.2.3. Has the baseline scenario been determined according to the methodology?	PDD	DR/I	Yes, the baseline scenario has been determined as per the methodology.		OK
B.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	PDD	DR/I	Yes, the baseline scenario is arrived based on conservative assumptions.		OK
B.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	PDD	DR/I	Yes, national and sectoral policies have been taken into consideration for selecting the baseline scenario.		OK
B.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	PDD	DR/I	Yes, the baseline determination is compatible with available data and literature.		OK
B.2.7. Have the major risks to the baseline been identified?	PDD	DR/I	There are no major risks perceived to the proposed baseline.		OK
B.3. Additionality Determination <i>The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.</i>					
B.3.1. Is the project additionality assessed according to	PDD	DR/I	As per the Attachment A to Appendix B, the		OK



CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
the methodology?			<p>project has been analysed in light of investment barrier, prevailing practice barrier and other barriers</p> <p>1) Investment barrier: It is stated that the total investment cost of the proposed project is Rs93.10 million. It has been argued that as the cost works out to be Rs53.97 million per MW and proponent has encountered constraints in getting finance for the project.</p> <p>However it needs to provide the evidence for the total investment cost for the project.</p> <p>Constraints in getting financed needs to be demonstrated with supporting evidence.</p> <p>Detailed project report of the proposed project needs to be provided.</p> <p>Detail IRR analysis of the proposed project needs to be provided with all supporting evidences on assumptions made. PLF of the proposed project needs to be demonstrated with the hydrological data of the region.</p> <p>Sensitivity analysis for the IRR of the proposed project also needs to be provided. at the level where the IRR of the proposed project meets the benchmark IRR and justify</p>	CL-2	



CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			<p>the unlikelihood of such variation.</p> <p>Prevailing practice barrier: The PPA was signed on 2003. The contribution of mini hydel to total installed capacity of the state is 0.8%. Further, it has been argued that small hydro contributes for 2% of the total installed capacity of southern grid.</p> <p>PPA needs to be provided. This needs to be clarified if the PPA was signed before the preparation of DPR of the proposed project.</p> <p>This remains to be justified as to how the total installed capacity of the southern grid or state can be compared with mini hydro capacity.</p> <p>It has also been stated that the PPA was signed for 3MW. Reason for the reduction in the capacity of the project needs to be clarified.</p> <p>The total chronology of the key events related to the proposed project needs to be clarified. The approval from the village panchayat was taken in 2000 and all other statutory clearance was taken by 2003. The delay in the starting of the project activity needs to be justified.</p>	CL-3	



CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			<p>It needs to clarify and demonstrated if the proponent has encountered any barrier due to the present generation mix of the grid.</p> <p>Other barrier: The proposed project operates on the surplus water from the Thotapalli reservoir and as the capacity of the reservoir is increased, the proposed project encounters barrier due to the supply of water. Further, as per the NOC from the Government of Andhra Pradesh, 18 August 2004, the water supply will be controlled by the irrigation department and proponent cannot claim for any loss in regards.</p> <p>The NOC GOAP on control on water supply needs to be provided and the above arguments need to be demonstrated with evidence.</p> <p>It has been addressed that while preparing the DPR of the project, Rs.3.48/kWh was envisaged as per Appellate Tribunal. State Regulatory Commission has fixed the tariff at Rs.2.69/kWh with 5 paisa reduction every subsequent year for 10 years.</p> <p>This needs to be demonstrated with supporting evidence. Further, PP needs to</p>	CL-4	



CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			clarify if the tariff is fixed at Rs.3.48/kWh.		
B.3.2. Are all assumptions stated in a transparent and conservative manner?	PDD	DR/I	Refer to B.3.1	CL2 CL3 CL4	OK
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?	PDD	DR/I	Refer to B.3.1	CL2 CL3 CL4	OK
B.3.4. If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?	PDD	DR/I	Starting date of the project activity is stated to be 16 November 2006, which is the date for purchase order for blasting hard rocks during excavation of power house and intake. Proof for the same needs to be provided. Proof/evidence for CDM consideration prior to the project needs to be furnished. Clarification on the cause of delay for the project proponents to approach a DOE is to be provided.	CL5	OK
B.4. Calculation of GHG Emission Reductions – Project emissions <i>It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and</i>					



CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
<i>values – where applicable – is justified.</i>					
B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	PDD	DR/I	Proposed project being a mini hydro power project, project emission is not applicable. However, if the DG set is used for the emergency purpose, the same will be monitored and deducted from the total emission reduction units.		OK
B.4.2. Have conservative assumptions been used when calculating the project emissions?	PDD	DR/I	Emission factor for the diesel is taken from IPCC 2006 default value.		OK
B.4.3. Are uncertainties in the project emission estimates properly addressed?	PDD	DR/I	Yes.		OK
B.5. Calculation of GHG Emission Reductions – Baseline emissions <i>It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.5.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	PDD	DR/I	Baseline emissions have been estimated as the product of electricity generated in the project activity per year and grid emission factor of the southern regional grid, which have been obtained from the official website of the Central Electricity authority (CEA) The installed capacity of project plant is		OK



CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			1.725 MW and the plant is expected to export an average of 6.50 GWh electricity to the grid per year at an plant load factor of 43.48%.		
B.5.2. Have conservative assumptions been used when calculating the baseline emissions?	PDD	DR/I	<p>Yes. The chosen baseline is in accordance with the baseline methodology AMS ID. Simple OM emission factor published by CEA are calculated based on the three years data 2003-04, 2004-05, 2005-06 and BM is calculated based on 20% most recent capacity additions in the grid based on net generation The chosen baseline is transparent and the choice of emission factor of the current generation mix used for estimation of emission coefficient is conservative.</p> <p>It is clearly mentioned in the PDD that, the baseline estimation will consider an ex-ante emission factor throughout the crediting period. Hence, monitoring of OM and BM is not required.</p>		OK
B.5.3. Are uncertainties in the baseline emission estimates properly addressed?	PDD	DR/I	Refer to B.5.1		OK
B.6. Calculation of GHG Emission Reductions – Leakage <i>It is assessed whether leakage emissions are stated</i>					



CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
<i>according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.6.1. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	PDD	DR/I	No transfer of equipment is taking place. Leakage is not accounted for.		OK
B.6.2. Have conservative assumptions been used when calculating the leakage emissions?	PDD	DR/I	NA.		OK
B.6.3. Are uncertainties in the leakage emission estimates properly addressed?	PDD	DR/I	NA		OK
B.7. Emission Reductions <i>The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.</i>					
B.7.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	PDD	DR/I	The project activity on implementation is stated to result in emission reduction of 5,555 tCO ₂ e annually through out the 10 year fixed crediting period. Net electricity exported to the grid will be measured monthly.		OK
B.8. Monitoring Methodology <i>It is assessed whether the project applies an appropriate monitoring methodology.</i>					



CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	PDD	DR/I	Yes.		OK
B.8.2. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	PDD	DR/I	Yes		OK
B.9. Monitoring of Project Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
B.9.1. 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?	PDD	DR/I	It is claimed that the amount of diesel consumed in the DG set during emergency will be monitored by weigh bridge meter. The data recorded will be cross checked from the fuel purchase receipts. However there is no evidence was found during site visit on plan of installation of weigh bridge at the project site. This requires a clarification.	CL-6	OK
B.9.2. Are the choices of project GHG indicators reasonable and conservative?	PDD	DR/I	Yes. The emission factor for the diesel is taken from IPCC default value as not country specific value is available.		OK



CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
B.9.3. Is the measurement method clearly stated for each GHG value to be monitored and deemed appropriate?	PDD	DR/I	Yes.		OK
B.9.4. Is the measurement equipment described and deemed appropriate?	PDD	DR/I	It is claimed that Weigh bridge meter will be used for measuring the quantity of diesel consumed. The weigh will be calibrated and maintained as per the industrial standard. However, as the diesel will be measured in tonnes, the density of the diesel and NCV of the diesel used needs to be addressed as a part of monitoring plan	CL7	OK
B.9.5. Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	PDD	DR/I	Refer to B.9.4		
B.9.6. Is the measurement <i>interval</i> identified and deemed appropriate?	PDD	DR/I	The operating hours and the amount of diesel consumed will be recorded. The data will be cross checked against fuel receipts.		OK
B.9.7. Is the <i>registration, monitoring, measurement and reporting</i> procedure defined?	PDD	DR/I	Yes.		OK
B.9.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	PDD	DR/I	Yes.		OK



CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
B.9.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	PDD	DR/I	As the project is mini hydro power plant, project emission is not anticipated. However, diesel consumption during emergency will be measured and recorded. The data will be cross checked against fuel purchase receipts.		
B.10. Monitoring of Baseline Emissions <i>It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.</i>					
B.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	PDD	DR/I	For baseline calculations, net electricity supplied to grid by the project activity will be measured using main and check meters. Same will be documented. Gross electricity generated by the project and auxiliary consumption will be monitored and is done by metering the electricity. The power generated is recorded by meters and same will be documented. All the data will be measured monthly and aggregated annually.		OK
B.10.2. Are the choices of baseline GHG indicators reasonable and conservative?	PDD	DR/I	Yes.		OK
B.10.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate?	PDD	DR/I	Refer to B.10.1		OK



CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
B.10.4. Is the measurement <i>equipment</i> described and deemed appropriate?	PDD	DR/I	Electricity meters will be used.		OK
B.10.5. Is the measurement <i>accuracy</i> addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	PDD	DR/I	The meters will be calibrated as per the industrial standards. The accuracy level of the meters needs to be addressed.	CL8	OK
B.10.6. Is the measurement <i>interval</i> for baseline data identified and deemed appropriate?	PDD	DR/I	The data will be measured monthly and aggregated annually.		OK
B.10.7. Is the registration, <i>monitoring</i> , <i>measurement</i> and <i>reporting</i> procedure defined?	PDD	DR/I	BoD is the authority for registration, monitoring, measurement, reporting and reviewing the data.		OK
B.10.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	PDD	DR/I	Refer to B.10.5	CL8	OK
B.10.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	PDD	DR/I	Yes, data will be measured monthly and aggregated annually.		OK
B.11. Monitoring of Leakage <i>It is assessed whether the monitoring plan provides</i>					



CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
<i>for reliable and complete leakage data over time.</i>					
B.11.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	PDD	DR/I	Leakage is not accounted for as no transfer of equipments is taking place.		OK
B.11.2. Are the choices of project leakage indicators reasonable and conservative?	PDD	DR/I	NA		OK
B.11.3. Is the measurement method clearly stated for each leakage value to be monitored and deemed appropriate?	PDD	DR/I	NA		OK
B.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts <i>It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>					
B.12.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	PDD	DR/I	The DNA of India does not warrant monitoring of sustainable development indicators.		OK
B.12.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	PDD	DR/I	NA		OK



CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
B.12.3. Are the sustainable development indicators in line with stated national priorities in the Host Country?	PDD	DR/I	Project activity is in line with social, economical, environmental and technological well being.		OK
B.13. Project Management Planning <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
B.13.1. Is the authority and responsibility of overall project management clearly described?	PDD	DR/I	Board of Directors is the overall authority for project management.		OK
B.13.2. Are procedures identified for training of monitoring personnel?	PDD	DR/I	<p>The equipment suppliers will provide training to the plant operators. This needs to be supported with necessary evidence.</p> <p>The training for the monitoring personnel will be provided and necessary formats will be provided for monitoring independently.</p>		OK
B.13.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	PDD	DR/I	No GHG emission related to project is expected to occur.		OK
B.13.4. Are procedures identified for review of reported results/data?	PDD	DR/I	All the results and data will be reviewed by BoD.		OK
B.13.5. Are procedures identified for corrective actions in order to provide for more accurate future	PDD	DR/I	Internal audit will be conducted and the report will be reviewed by Board of		OK



CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
monitoring and reporting?			Directors.		
C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
C.1.1. Are the project's starting date and operational lifetime clearly defined and evidenced?	PDD	DR/I	Starting date of the project activity is stated to be 16 November 2006, which is the date for purchase order for blasting hard rocks during excavation of power house and intake. Proof for the same needs to be provided. The operational life time of the project is 25 years. Proof/evidence for CDM consideration prior to the project needs to be furnished. Clarification on the cause of delay for the project proponents to approach a DOE is to be provided.	CL5	OK
C.1.2. Is the start of the crediting period clearly defined and reasonable?	PDD	DR/I	Starting date of the crediting period is defined as 1 September 2008. However it will be from date of registration or from the date of commissioning, which ever is later.		OK
D. Environmental Impacts <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					



CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
D.1. For Small-scale projects					
D.1.1. Does host country legislation require an analysis of the environmental impacts of the project activity?	PDD	DR/I	No, since the project cost is less than INR 1000 million, it is not required to carry out EIA for the project.		OK
D.1.2. Does the project comply with environmental legislation in the host country?	PDD	DR/I	All statutory clearances like Pollution clearance and MoUs need to be provided.	CL-9	OK
D.1.3. Will the project create any adverse environmental effects?	PDD	DR/I	The project being a run of river project, does not involve submergence of land and rehabilitation. No adverse environmental effect is envisaged from the project activity.		OK
D.1.4. Have environmental impacts been identified and addressed in the PDD?	PDD	DR/I	No adverse environmental effect is envisaged from the project activity.		OK
E. Stakeholder Comments <i>The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.</i>					
E.1.1. Have relevant stakeholders been consulted?	PDD	DR/I	The identified stake holders are Department of revenue, Department of Irrigation, Andhra Pradesh Transmission Corporation Limiter, Non conventional Energy Development Corporation of Andhra Pradesh Ltd. and local village panchayat. Details on like minutes of meeting and		OK



CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			location of stake holder consultation conducted, needs to be furnished for verification. Project proponent needs to specify the media used for inviting local stakeholder's consultation. Proof for the same needs to be provided. It has been indicated that no negative comments were received. This needs to be demonstrated with supporting proof.	CL10	
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	PDD	DR/I	Project proponent needs to specify the media used for inviting local stake holders comments. Proof for the same needs to be provided.	CL10	OK
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	PDD	DR/I	Not specifically required for small hydro project under Indian legislation.		OK
E.1.4. Is a summary of the stakeholder comments received provided?	PDD	DR/I	No negative comments were received. Proof for the same needs to be provided.	CL10	OK
E.1.5. Has due account been taken of any stakeholder comments received?	PDD	DR/I	Not accounted for, as no negative comments were received.		OK

**Table 3 Resolution of Corrective Action and Clarification Requests**

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>CAR 1</p> <p>As the barrier due to tariff has already being included indirectly in the IRR analysis, the proponent is requested to justify how the same acts as an additional barrier.</p>	B.3.1	<p>Necessary changes have been made in the PDD.</p>	<p>The PDD has been revised and same has been deleted.</p> <p>OK. CAR 1 is closed.</p>
<p>CL 1</p> <p>The technical specifications, governor and transformer safety panels needs to be provided for verification along with DPR and Hydrology data.</p> <p>As per the technical specification and DPR, the installed capacity of the plant is 1.5 MW. This needs to be clarified inline with the mentioned installed capacity in the PDD.</p>	A.3.1	<p>Technical specifications of the Electro Mechanical Equipment etc., is enclosed. Also enclosed DPR which includes Hydrology data.</p> <p>PP Response:</p> <p>The order for E&M equipment with Boving Fouress Limited is made for 1500 kW with 15% continuous overload (Page 7 of Specification) which gives a capacity of 1725 kW. The specification for E&M equipment from Boving Fouress is already furnished to the DOE for verification. Therefore, installed capacity has been changed to 1.725 MW for which necessary permission</p>	<p>The technical specifications of the electro mechanical equipments, provided by the supplier, Boving Fouress Limited, has been verified by DNV.</p> <p>The clearance and the statutory license have been taken for 1.725 MW, which is including the continuous overload. The clearance from NEDCAP has been verified by DNV.</p> <p>OK. CL 1 is closed.</p>



Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		was obtained from NEDCAP, the state nodal agency.	



Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>CL 2</p> <p>However it needs to provide the evidence for the total investment cost for the project.</p> <p>Constraints in getting financed needs to be demonstrated with supporting evidence.</p> <p>Detailed project report of the proposed project needs to be provided.</p> <p>Detail IRR analysis of the proposed project needs to be provided with all supporting evidences on assumptions made. PLF of the proposed project needs to be demonstrated with the hydrological data of the region.</p> <p>Sensitivity analysis for the IRR of the proposed project also needs to be provided at the level where the IRR of the proposed project meets the benchmark IRR and justify the unlikelihood of such variation.</p>	B.3.1	<p>1. The total investment envisaged for the project activity is Rs.93.10 millions as evidenced in the DPR. We also furnish supporting loan sanction letter to confirm that the investment on the project is properly estimated.</p> <p>2. Constraints in getting finance: Initially there was reluctance from bankers to fund the project due to high cost as well as tariff uncertainty. All these developments are informal discussions and therefore necessary corrections are incorporated in the PDD.</p> <p>3. Detailed project report enclosed.</p> <p>4. Soft copy of IRR analysis which includes the sources for assumptions considered, is attached. The documents referred for the assumptions will be sent by courier.</p>	<p>The detailed IRR analysis has been provided and verified by DNV. The benchmark has been selected to the cost of debt and has been verified against the bank loan letter. The financial indicators have been cross checked against the DPR and other national sources. The depreciation and salvage has been taken as per the Indian income tax law, 1961. The depreciation of the land has been considered to be 0 and the IRR analysis has been done as per the same. The total investment cost has been verified from tern loan sanction letter by Andhra Bank. The project IRR, as per the DPR, without CDM, is 5.94%. The IRR analysis provided for project activity shows an IRR of 6.04%, as the investment cost assumed in the DPR is Rs93.1 million whereas, in the detailed financial analysis the investment cost has been taken as per the tern loan letter of Rs92.9 million and a book value depreciation has been calculated considering selvage value of 5% and</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>CL 2 continues:</p> <p>The total cost of the project provided in the DPR is Rs93 million which is little higher than the cost of project considered in the loan sanction letter. The PP is requested to rectify the same.</p> <p>A SLM depreciation of 3.4% has been considered. The PP is requested to clarify the basis of taking depreciation of 3.4% and as per which guideline?</p> <p>The salvage value needs to be clarified as the</p>		<p>5. PLF is estimated based on power generation. The DPR consists of a separate chapter on hydrology at Section 3 which has given the basis for estimation of power generation. The hydrology data is based on daily record of discharges let out from the Thotapally regulator into the Nagavali river for a period of 16 years (1989-90 to 2004-05) and the data is maintained by AP Irrigation authorities.</p> <p>PP Response:</p> <p>The financial analysis have been revised based on project cost of Rs.92.9 million and necessary changes made in the PDD.</p> <p>PP Response:</p> <p>As per Income Tax Act, 1961 SLM depreciation for hydro units is 3.4% and scanned copy of relevant portion of the Act is furnished for verification.</p> <p>PP Response:</p>	<p>100% for cost of land, as per the prevailing industrial practice. Thus, there has been an increase of 0.1% in the project IRR.</p> <p>Sensitivity analysis has been done for the project cost, tariff, PLF and O&M cost up to the variation where it touches the benchmark. The proponent has adequately demonstrated the likelihood of achieving the benchmark.</p> <p>The total investment cost of Rs.92.9 million has been cross checked from the term loan sanction letter by Andhra Bank.</p> <p>OK. CL 2 is closed.</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>same has been taken as 5% of the total project cost; where as the depreciation of the land is considered to be 0.</p> <p>Detailed project report, prepared by Elen & Lite consultancy services, Hyderabad, has been provided and verified by DNV. The PP is requested to include the date of DPR preparation in the chronology of the evident provided in the PDD.</p> <p>Sensitivity analysis for the project cost and generation has been provided. PP is requested to clarify if the tariff is fixed for the project life time and provide the sensitivity analysis up to the benchmark for the tariff and O&M cost.</p>		<p>Considering that depreciation of land is 0, investment analysis is revised.</p> <p>PP Response: Incorporated date of DPR in the PDD</p> <p>PP Response: The investment analysis for the above parameters is furnished and necessary changes incorporated in the PDD.</p>	



Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>CL 3</p> <p>PPA needs to be provided. This needs to be clarified if the PPA was signed before the preparation of DPR of the proposed project. This remains to be justified as to how the total installed capacity of the southern grid or state can be compared with mini hydro capacity.</p> <p>It has also been stated that the PPA was signed for 3 MW. Reason for the reduction in the capacity of the project needs to be clarified.</p>	B.3.1	<p>The Power Purchase Agreement executed with APTRANSCO is enclosed. The PPA is executed on 6th December, 2003. The DPR for 1.5 MW is prepared in May, 2006.</p> <p>Reasons for reduction in capacity:</p> <p>NEDCAP has sanctioned a license to set up a 3 MW mini hydro power project. In 2004 govt. of Andhra Pradesh has started construction of new irrigation project upstream of the proposed mini Hydel power project. Due to the construction of the new regulator the discharges for the proposed project will be reduced. Due to the uncertainty of discharges the PP has decided to implement in the first phase 1.5MW and after observation of discharges in the first phase it was proposed to implement the balance capacity of 1.5MW. This way the promoter being a first</p>	<p>The PPA has been provided and verified by DNV. It has been stated that as per MNES, the project would have received tariff of Rs.3.49 per kWh, the actual tariff received by the PP is less than it. The actual tariff has been verified from the PPA. The anticipated tariff of Rs 3.49 per kWh has been verified from the promotional policies by Ministry of Non Conventional Energy Source.</p> <p>The cause for the reduction in the capacity has been adequately addressed. The present applicable tariff has been verified from the APERC tariff order, dated 7 August 2004.</p> <p>The total chronologies of the events are included in the PDD, along with the cause of delay and the CDM consideration has been established.</p> <p>The prevailing practice barrier has been deleted from the revised PDD.</p> <p>The likely decrease in the discharge of water for the project activity needs to be</p>



Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>The total chronology of the key events related to the proposed project needs to be clarified. The approval from the village panchayat was taken in 2000 and all other statutory clearance was taken by 2003. The delay in the starting of the project activity needs to be justified.</p>		<p>generation entrepreneur would be able to meet the requirement of equity contribution for the project. It may be noted that actual capacity installed is 1.725 MW which is well below licensed sanction of 3 MW.</p> <p>Chronology of events is incorporated in the PDD under Sec.B.5.</p> <p>The delay in implementation of project is mainly because the PP could not take any risk without sanction of financial assistance and the same was obtained in September, 2006. Only thereafter he has immediately commenced the project implementation.</p> <p>The delay caused in getting the financial sanction is due to the tariff fixation by APERC. The PP has executed PPA with APTRANSCO in December, 2003 and the tariff applicable for the project activity at that time was Rs.3.48 per</p>	<p>demonstrated.</p> <p>This has been verified from Water Resource Information System, Govt. of Andhra Pradesh.</p> <p>OK. CL 3 is closed.</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>It needs to clarify and demonstrated if the proponent has encountered any barrier due to the present generation mix of the grid.</p>		<p>kWh which is valid upto 31-03-2004. Thereafter APERC has revised the tariff to Rs.2.69 per kWh.</p> <p>The PP was establishing the fact that setting up of small hydro projects was not a common practice in the State of Andhra Pradesh as only less than 1% of the installed capacity in the state is realised through small hydro projects. This proves the fact that prevailing practice in setting up of thermal power stations and not small hydro projects as these projects depend on monsoons for water flow and power generation. Since the project is located in the State of Andhra Pradesh, comparison with Southern grid was found not in the context and necessary corrections are incorporated in the PDD.</p> <p>Any barrier due to present generation mix: The barrier is basically the prevailing practice in the State.:Over 99% of the installed capacity in the</p>	

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		<p>State is realized from sources other than small hydro which indicates that setting up of small hydro in the state is not the common practice as these project depend on monsoons for power generation whose occurrence is not certain unlike fossil fuel based power projects. Since other barriers are more significant, this barrier has been deleted from the PDD. Necessary corrections are incorporated in the PDD.</p> <p>The PDD has been revised and the additionality of the project activity has been demonstrated with the investment analysis and other barrier. Prevailing practice and the barrier due to the same has been deleted from the revised PDD.</p> <p>Response:</p> <p>Taking into consideration of tariff as per MNES guidelines i.e., Rs.2.25/- per kWh w.e.f. 1994-95 as base year for the first 10 years, the tariff works out to Rs.3.49/kWh for the year 2003-04. The extract from the annual report of MNES</p>	



Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>CL 3 continues: The PP is requested to demonstrate or provide the source of tariff of 3.46/kWh.</p> <p>The existing capacity is 64 000 acres and the same is likely to be extended to 120 000 acres. The proponent is requested to clarify and revise the same.</p>		<p>indicating the above is attached.</p> <p>PP Response: Evidence by way of link is furnished: Water Resource Information System, Govt. of Andhra Pradesh http://irrigation.cgg.gov.in/html/demoFunks.html under link “ongoing” “major”</p> <p>PP Response: Necessary change made in the PDD.</p>	
<p>CL 4</p> <p>The NOC GOAP on control on water supply needs to be provided and the above arguments need to be demonstrated with evidence.</p> <p>It has been addressed that while preparing the DPR of the project, Rs.3.48/kWh was envisaged as per Appellate Tribunal. State Regulatory Commission has fixed the tariff at Rs.2.69/kWh with 5 paise reduction every subsequent year for 10 years.</p> <p>This needs to be demonstrated with supporting evidence. Further, PP needs to clarify if the tariff is fixed at Rs.3.48/kWh.</p>	B.3.1	<p>Copy of NOC from Government which stipulates various conditions on water utilization is enclosed. These conditions prove beyond doubt that, power generation from the project activity is solely at the control of the Government.</p> <p>Since APERC is the final authority, the tariff determined by them is considered for evaluation. These developments are well known even at the time of project planning stage.</p>	<p>NOC from the irrigation and CAD department, dated 11 August 2003, has been provided. The special conditions prescribed in the NOC have been verified by DNV.</p> <p>The tariff has been considered as per the APERC tariff order. The PDD has been revised accordingly.</p> <p>OK. CL 4 is closed.</p>



Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>CL 5</p> <p>Starting date of the project activity is stated to be 16 November 2006, which is the date for purchase order for blasting hard rocks during excavation of power house and intake. Proof for the same needs to be provided.</p> <p>Proof/evidence for CDM consideration prior to the project needs to be furnished.</p> <p>Clarification on the cause of delay for the project proponents to approach a DOE is to be provided.</p> <p>Minutes of the BoD meeting for the CDM revenue consideration needs to be provided.</p>	B.3.4	<p>Copy of the purchase order is provided for verification.</p> <p>Extract of minutes of the board of directors as evidence of consideration of CDM revenue is provided for verification.</p> <p>The project activity commenced only after sanction of term loan in September, 2006 and immediately thereafter a CDM consultant was appointed. Since the project capacity in the first phase was increased from 1.5MW to 1.725 MW, we got the clearance from NEDCAP only in May, 2007 . As soon as PDD was ready the PP took steps to present for Host Country Approval and after ensuring that the proposal would be considered favourably, we have appointed the DOE for validation in February, 2008.</p>	<p>The purchase order for blasting hard rocks during excavation of power house and intake, dated 16 November 2006, has been provided and verified by DNV.</p> <p>The minutes of the board meeting, dated 20 June 2006, has been provided and verified by DNV. The Board has taken decision for the CDM considering the uncertainty in hydrology and the tariff regulation, where the generation is capped, up to which the full tariff can be claimed.</p> <p>OK. CL 5 is closed.</p>
<p>CL 6</p> <p>It is claimed that the amount of diesel</p>	B.9.1	<p>Since there is no requirement of Weigh Bridge necessary corrections have been</p>	<p>The quantity of fossil fuel combusted for the project activity has been included in</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
consumed in the DG set during emergency will be monitored by weigh bridge meter. The data recorded will be cross checked from the fuel purchase receipts. However there is no evidence was found during site visit on plan of installation of weigh bridge at the project site. This requires a clarification.		incorporated in the PDD	the monitoring plan. The monitoirng plan incorporates the measurement of diesel consumption. The emission factor of diesel has been included in the monitoring plan, so as ot account for any revision on the IPCC default value. OK. CL 6 is closed.
<p>CL 7</p> <p>It is claimed that Weigh bridge meter will be used for measuring the quantity of diesel consumed. The weigh will be calibrated and maintained as per the industrial standard.</p> <p>However, as the diesel will be measured in tonnes, the density of the diesel and NCV of the diesel used needs to be addressed as a part of monitoring plan</p> <p>The procedure of measuring the fossil fuel quantity needs to be clarified and documented in the PDD.</p>	B.9.4	<p>Necessary corrections have been incorporated in the PDD.</p> <p>PP Response: Incorporated in the PDD.</p>	<p>The measurement procedure for the diesel consumption has been addressed in the PDD.</p> <p>OK. CL 7 is closed.</p>



Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>CL 8</p> <p>The meters will be calibrated as per the industrial standards.</p> <p>The accuracy level of the meters needs to be addressed.</p> <p>The emission reduction needs to be calculated on the net electricity supplied to the grid. E_{Gy} needs to the net electricity supplied to the grid. Same needs to be corrected in the PDD, section B.7.1.</p>	B.10.5	<p>The PP will install main meters of static type 0.2 class accuracy at the interconnection point and APTRANSCO install check meters of static type at the same point and of the same accuracy</p>	<p>The meters will be calibrated as per the industrial standard.</p> <p>The emission reduction will be calculated on the basis of the net electricity supplied to the grid. The monitoring plan has been revised to clearly state the same.</p> <p>OK. CL 8 is closed.</p>
<p>CL 9</p> <p>All statutory clearances like Pollution clearance and MoUs need to be provided.</p>	D.1.2	<p>Hard copies of clearances are furnished.</p>	<p>Clearance from the Irrigation department, power purchase agreement and clearance from Non conventional Energy Development Corporation of Andhra Pradesh Ltd, dated 3 May 2007 has been provided and verified by DNV.</p> <p>Clearance from Andhra Pradesh Pollution Control Board, dated 4 September 2008 has been provided and verified by DNV.</p> <p>OK. CL 9 is closed.</p>



Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>CL 10</p> <p>Details on like minutes of meeting and location of stake holder consultation conducted, needs to be furnished for verification.</p> <p>Project proponent needs to specify the media used for inviting local stakeholder's consultation. Proof for the same needs to be provided.</p> <p>It has been indicated that no negative comments were received. This needs to be demonstrated with supporting proof.</p>	E.1.1	<p>The project activity is a very small project of 1.725 MWs. It is a run of the rive project with no negative impact on the local environment or local population. Therefore stakeholder consultation is made by approaching each and every stakeholder and obtained their permission for starting of the project activity. The stakeholders identified for the project activity are:</p> <ol style="list-style-type: none"> 1. NEDCAP 2. AP Trans 3. Govt. of AP 4. Local village Panchayat <p>All the stakeholder have after careful examination of the project activity have given permission to take up the project. The most important clearance is from village Panchayat which is the representative of the people of the village where the project activity is proposed. The village panchayat have also examined the proposal and provided their clearance as there is no</p>	<p>NoC from the village Panchayat, dated 8 May 2000 has been provided and verified by DNV.</p> <p>OK. CL 10 is closed.</p>



Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		impact from the project activity to the local environment.	

APPENDIX B

CERTIFICATES OF COMPETENCE



CERTIFICATE OF COMPETENCE

Vidyacharan Astakala

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-9-8-i1-CDMJ1-i1)

GHG Auditor:	Yes				
Technical Area	CDM Validator	CDM Verifier	Sector Expert	Methodology Expert	Technical Reviewer
<i>Landfill gas</i>					
<i>Renewables</i>					
<i>Hydro power</i>	Jan 2009	Jan 2009			
<i>Wind power</i>					
<i>Other renewable</i>					
<i>Biomass</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Grid connection of isolated system</i>					
<i>Cement</i>					
<i>Waste-heat / waste-gas recovery</i>					
<i>Efficiency of thermal power plants</i>					
<i>Coal mine methane</i>					
<i>Fuel switch</i>					
<i>Manure management</i>					
<i>Waste / wastewater treatment</i>					
<i>Energy efficiency</i>					
<i>N₂O</i>					
<i>HFCs</i>					
<i>Flare reduction</i>					
<i>PFCs</i>					
<i>Charcoal</i>					
<i>CO₂ recovery</i>					
<i>Transport</i>					
<i>Non-renewable biomass</i>					
<i>Biofuel</i>					
<i>Pipeline leakage reduction</i>					
<i>SF₆</i>					

Høvik, 9 January 2009

Michael Lehmann

Michael Lehmann

Technical Director, Climate Change Services



CERTIFICATE OF COMPETENCE

Raman Venkata Kakaraparthi

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-9-8-i1-CDMJ1-i1)

GHG Auditor:	Yes				
Technical Area	CDM Validator	CDM Verifier	Sector Expert	Methodology Expert	Technical Reviewer
Landfill gas	Jan 2009				
Hydro power	Jan 2009				
Renewables	Jan 2009	Jan 2009		Jan 2009	Jan 2009
Wind power					
Other renewable					
Biomass	Jan 2009				
Grid connection of isolated system					
Cement					
Waste-heat / waste-gas recovery	Jan 2009	Jan 2009	Jan 2009		
Efficiency of thermal power plants			Jan 2009		
Coal mine methane					
Fuel switch			Jan 2009		
Manure management					
Waste / wastewater treatment	Jan 2009				
Energy efficiency	Jan 2009	Jan 2009	Jan 2009		
N ₂ O					
HFCs	Jan 2009	Jan 2009			
Flare reduction					
PFCs					
Charcoal					
CO ₂ recovery			Jan 2009		
Transport					
Non-renewable biomass					
Biofuel					
Pipeline leakage reduction					
SF ₆					

Høvik, 9 January 2009

Michael Lehmann

Michael Lehmann

Technical Director, Climate Change Service



CERTIFICATE OF COMPETENCE

Kumaraswamy Chandrashekara

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-9-8-i1-CDMJ1-i1)

GHG Auditor:	Yes				
Technical Area	CDM Validator	CDM Verifier	Sector Expert	Methodology Expert	Technical Reviewer
<i>Landfill gas</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Hydro power</i>	Jan 2009	Jan 2009			
<i>Renewables</i>					
<i>Wind power</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Other renewable</i>	Jan 2009	Jan 2009			
<i>Biomass</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Grid connection of isolated system</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Cement</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Waste-heat / waste-gas recovery</i>	Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
<i>Efficiency of thermal power plants</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Coal mine methane</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Fuel switch</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Manure management</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Waste / wastewater treatment</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Energy efficiency</i>	Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
<i>N₂O</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>HFCs</i>	Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
<i>Flare reduction</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>PFCs</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Charcoal</i>	Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
<i>CO₂ recovery</i>	Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
<i>Transport</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Non-renewable biomass</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Biofuel</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Pipeline leakage reduction</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>SF₆</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009

Høvik, 9 January 2009

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