VALIDATION REPORT

RICE HUSK BASED COGENERATION PLANT (5 MW) AT SHIBZADA AJIT SINGH NAGAR DISTRICT, PUNJAB BY M/S NAHAR INDUSTRIAL ENTERPRISES LIMITED PROJECT IN COUNTRY INDIA

REPORT NO. 2006-9123

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DET NORSKE VERITAS

VALIDATION REPORT

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Approved by: Einar Telnes Director	Organisational unit: DNV Certification, International Climate Change Services
Client: Nahar Industrial Enterprises Limited	Client ref.: Mr. S.S. Aich

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Summary:
Det Norske Veritas Certification AS (DNV) has performed a validation of the "*Rice husk based cogeneration plant (5 MW) at Shibzada Ajit Singh Nagar District, Punjab by M/s Nahar Industrial Enterprises Limited"* in India 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.

This validation report summarizes the findings of the validation and also incorporates the responses forwarded for the 'request for review' as recommendations by the Executive Board, (vide its EB34 minutes of meeting point 31 (h)). The validation consisted of the following three phases: i) a desk review of the project design and the baseline and monitoring plan, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

In summary, it is DNV's opinion that the project, as described in the revised project design document of version 02 of 10 February 2007 submitted by the project proponent as a part of the response for request for review (and incorporating the responses forwarded towards the request for review), is eligible as category I.C. meets all relevant UNFCCC requirements for the small scale CDM and correctly applies the approved simplified baseline and monitoring methodology AMS-I.C, version 09. Hence DNV requests the registration of the "*Rice husk based cogeneration plant (5 MW) at Shibzada Ajit Singh Nagar District, Punjab by M/s Nahar Industrial Enterprises Limited"* as a CDM project activity.

Report No.: 2006-9123	Subject Group: Environment
Report title: Rice husk based cogeneration plant (5 MW) at Shibzada Ajit Singh Nagar District, Punjab by M/s Nahar Industrial Enterprises Limited Project in Country India	
Work carried out by: Amit Thusu, Michael Lehmann, Ramesh Ramachandran	
Work verified by: C Kumaraswamy	

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Abbreviations

AFBC	Atmospheric Fluidized Bed Combustion
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH_4	Methane
CL	Clarification request
CM	Combined Margin
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DCS	Distributed Control System
DNV	Det Norske Veritas
DNA	Designated National Authority
FO	Furnace Oil
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
HCA	Host Country Approval
IPCC	Intergovernmental Panel on Climate Change
MoEF	Ministry of Environment and Forest
MP	Monitoring Plan
MT	Metric Tonnes
MW	Mega Watt
NIEL	M/s Nahar Industrial Enterprises Limited
N_2O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
PPCB	Punjab Pollution Control Board
PSEB	Punjab State Electricity Board
TPH	Tonnes per Hour
UNFCCC	United Nations Framework Convention on Climate Change

1 INTRODUCTION

The Nahar Industrial Enterprises Limited (NIEL) has commissioned Det Norske Veritas Certification AS (DNV) to validate the "*Rice Husk based cogeneration plant (5 MW) at Shibzada Ajit Singh Nagar District, Punjab by M/s Nahar Industrial Enterprises Limited*" (hereafter called "the project") in India. This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation team consists of the following personnel:

Mr. Amit Thusu	DNV New Delhi, India	Project manager and GHG auditor
Mr. Ramesh Ramachandran	DNV Chennai, India	CDM validator
Mr. Michael Lehmann	DNV Oslo, Norway	Sector expert
Mr. C. Kumaraswamy	DNV Bangalore, India	Technical reviewer

1.1 Validation 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).

1.2 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.C. version 09 /17/. The validation team has, based on the recommendations in the Validation and Verification Manual /16/ 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.

1.3 Description of Proposed CDM Project

The "*Rice Husk based cogeneration plant (5 MW) at Shibzada Ajit Singh Nagar District, Punjab by M/s Nahar Industrial Enterprises Limited*" proposed by NIEL involves the installation of a new cogeneration plant consisting of a new rice husk based boiler (replacing the existing two fuel oil boilers) and a new power plant (displacing PSEB grid power), adjacent to a existing textile plant. The primary objective of the project activity by NIEL is to reduce GHG emissions through utilization of rice husk for the generation of power and steam for captive consumption, thereby replacing fossil fuel based steam and power generation at the plant. The project activity

is implemented at NIEL manufacturing facility and located in the village Jalalpur, PO Dappar, Near Lalru, SAS Nagar, Mohali District, Punjab, in India.

The project thus leads to the reduction of greenhouse gas (GHG) emissions by displacing fossil fuel based steam and electricity generation with environmentally sustainable resources such as rice husk and thereby contributes towards sustainable development.

Total estimated GHG emission reductions due to the project activity are expected to be on an average of 44 820 tonnes of CO_2 per year during ten years of chosen crediting period.

2 METHODOLOGY

The validation of the project started in September 2006. The validation consists of the following three phases:

i) a desk review of the project design document

ii) follow-up interviews with project stakeholders

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

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual /16/. The protocol shows in transparent manner 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 Figure 1.

The completed validation protocol for the "*Rice Husk based cogeneration plant (5 MW) at Shibzada Ajit Singh Nagar District, Punjab by M/s Nahar Industrial Enterprises Limited*" is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of validation protocol 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) validation protocol 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.

The term Clarification may be used where additional information is needed to fully clarify an issue.

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities			
Requirement	***Reference***	***Conclusion***	***Cross reference***
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.*	*Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.*

Validation Protocol Table 2: Requirement Checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	*Gives reference to documents where the answer to the checklist question or item is found.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question (See below).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 Requests and Requests for Clarification			
Draft report corrective action requests and requests for clarifications	***Ref. to Table 2***	***Summary of project participants' response***	***Final conclusion***
If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	*Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request 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

2.1 Review of Documents

The PDD /1/ submitted by NIEL and additional background documents related to the project design and baseline /2/ were reviewed as a part of validation. The revised PDD submitted by the project proponent as a part of the response to the request for review was also reviewed and incorporated in this report.

2.2 Follow-up Interviews

On 06-07 November 2006, DNV performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of NIEL were interviewed /19//20//21//22//23/. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
NIEL	➢ Approval of Host country (India). ➢ Determination of project additionality, residual life of the existing FO boilers and technical barriers. ➢ Clarifications on establishment of baseline, monitoring plan and emission reduction calculations including leakage and emission factors of northern region grid. ➢ Resources, training needs and procedures for calibration, operation and maintenance. ➢ Environmental consents & approvals

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified for DNV's positive conclusion on the project design. The corrective action requests (CAR) and requests for clarifications (CL) raised by DNV, were presented to the project participant in DNV's draft validation report and were resolved during communication between the client and DNV. To guarantee the transparency of the validation process, the concerns raised and responses given are documented in the validation protocol in Appendix A (Table 3). Since modification to the project design were necessary to resolve DNV's concerns, the client decided to revise the PDD and resubmitted the PDD (version 02) of 10 February 2007. The PDD was again revised to incorporate the responses provided to the request for review and submitted as a part of the project proponent's response. After reviewing the revised PDD, DNV issued this final validation report and opinion.

2.4 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 review was performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

3 VALIDATION FINDINGS

In the following sections the findings of the validation are stated. 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.

3.1 Participation Requirements

The project activity is being proposed as a unilateral project by *Nahar Industrial Enterprises Limited* of India, which is the only project participant. The host country India fulfils the participation requirements and has ratified the Kyoto Protocol. The DNA of India has approved its voluntary participation in the project and has confirmed that project assists in achieving sustainable development /3/.

3.2 Project Design

The *"Rice husk based cogeneration plant (5 MW) at Shibzada Ajit Singh Nagar District, Punjab by M/s Nahar Industrial Enterprises Limited"* project proposed by NIEL involves the installation of a new cogeneration plant consisting of a rice husk based boiler and a new power plant (displacing the PSEB grid power), adjacent to an existing textile plant. The primary objective of the project activity by NIEL is to reduce GHG emissions through utilization of rice husk available in the region for the generation of power and steam for captive consumption, thereby replacing fossil fuel based steam and power generation.

The cogeneration project comprises a new 5 MW condensing cum extraction turbo-generator and a new rice husk fired AFBC boiler (40 TPH, 45 kg/cm^2 and 420º C) that replaces the two existing low-pressure FO fired boilers (12 TPH, 10.5 kg/cm^2 and 140ºC each). The new turbine generator is of extraction cum condensing type with controlled extraction (at 8-8.5 kg/cm$^2_{(a)}$ and gives 22 TPH of steam at a temperature of approximately 270ºC) for the provision of process steam to the textile factory units. The entire power requirements of the textile units and the auxiliary units are met by the power generated from the turbo generator. The project design and engineering reflects good practice. The technology used in the project activity is indigenously available in India and no transfer of technology is envisaged. Auxiliary plant facilities such as rice husk handling unit, ash handling system, air pollution control devices and air and cooling water systems have also been installed. Current plant procedures on training and maintenance also cover requirements for the cogeneration plant.

DNV is able to verify that the net thermal energy output of the project activity determined to be 31.51 MW_{th} is less than the stipulated limit 45 MW_{th}. The project fulfils the conditions under which AMS-I.C. version 9 is applicable. The existing two oil fired boilers have been verified to have a residual life of more than 10 years. Out of the two FO based boilers, one would be kept as a standby whereas the other would be shifted to a stand by arrangement for the new captive power plant inside the NIEL industry premises (the emissions from the same if used would be monitored throughout the crediting period and accounted for as leakage). The project will combust rice husk procured from outside (during normal conditions) and some quantity of coal and FO (if any) during emergencies, e.g. when rice husk availability is insufficient.

The start date of the project activity is 26 June 2001 /9/ and the expected operational lifetime of the project activity is 25 years which is deemed reasonable. The project developer has chosen a fixed crediting period of 10 years starting from the date of registration of the project activity.

Over a 10 year crediting period, starting from the date of registration, the project's expected annual emission reduction forecast will be on an average 44 820 tonnes of CO_2 equivalents (tCO_{2e}).
No public funding is involved in the project, and the validation did not reveal any information that indicates the project to be seen as a diversion of ODA funding.

3.3 Baseline Determination

The project applies one of the approved simplified baseline methodologies proposed for the small scale project activity AMS – I.C (version 9) titled "*Thermal energy for the user*" /17/. The baseline is a combination of emission reductions happening due to avoidance of fossil fuel combustion for generating process steam and renewable energy generated by the project activity. The emission reductions have been arrived at considering the thermal and electrical energy generated by the captive cogeneration plant.
For thermal energy generation using renewable technologies that displace technologies using fossil fuels, the simplified baseline is the fuel consumption of the technologies that would have been used in the absence of the project activity times an emission coefficient of the fossil fuel displaced (furnace oil in the case of the project activity). The emission factor for furnace oil is 77.3667 tCO_2 / TJ based on IPCC data and the same is verified by DNV. The FO boiler efficiency is taken as 100% which is conservative for calculations.
The simplified baseline for the emission reductions occurring due to the electricity generation using renewable fuel is the electricity consumed times a relevant emission factor (of the selected grid). The combined margin emission factor of the northern regional grid of India has been used in this case.
In accordance with AMS-I.C. and I.D., an electricity baseline emission factor has been calculated in accordance with ACM0002 (version 06) as a combined margin emission coefficient, consisting of the combination of a simple operating margin (OM) emission coefficient and a build margin (BM) emission coefficient (see section 3.6). Both the OM and BM emission coefficient will be fixed for the entire crediting period and are determined ex-ante. The electricity system selected to determine the combined margin emission coefficient is the northern regional grid in India. The weighted average of the "operating margin" and the "build margin" emission coefficient for northern regional grid of India has been estimated to be 0.751 tCO_2/MWh /2/. The "operating margin" emission factor has been estimated based on the "simple OM" approach as the low cost / must run plants constitute less than 50% of the generation of northern regional grid. For OM calculation the vintage data for the years 2003~2004, 2004~2005 and 2005~2006 has been used and operating margin emission factor is evaluated to be 0.9436 TCO_2/ MWh, based on the generation weighted average. For the build margin, the 20% most recently installed plants have been accounted for, in terms of electricity generation. The build margin emission factor has been evaluated to be 0.558 TCO_2/MWh. The completeness of the set of power plants as well as the correctness of the reported fuel consumption and electricity generation data has been verified. All data has been sourced from data published by the central electricity authority (CEA).

DNV is able to confirm that the calculated value (0.751 tCO_2/MWh) of emission coefficient for northern regional grid of India has been conservatively calculated as compared to CEA emission coefficient for the same grid (published as 0.76 TCO_2/MWh) (Source: www.cea.nic.inplanningc%20and%20eGovernment%20of%20India%20website.htm) for the baseline emission calculations.

3.4 Additionality

The project activity primarily demonstrates additionality through the existence of the various barriers, viz. prevailing practice, technological and other barriers:

DNV is able to verify that the project had to overcome the following sectoral barriers which act as disincentives:

- The incentive from the CDM was indeed seriously considered by NIEL in their decision to proceed with the project as evident from the Internal memo to the top management /4/(1(a)) (seeking approval for the implementation of the project activity dated 03/11/2000) and the true copy of the abstract on the resolution passed by the board of directors of the company in its meeting held on 11/01/2001
- NIEL is the first plant to plan and implement a biomass cogeneration project in the textile sector in Punjab and is thus the *'first of its kind'* in the textile sector in Punjab. This is evident from the acknowledgement from the *Textile and Spinning Mill Association of Punjab* /5/;
- The existing two FO fired boilers have a considerable amount of residual life (of more than 10 years) left and would not have been replaced otherwise (the given reference indicates the date of manufacture of boilers is in year 1999 and considering the fact that the life of boilers on average is 18-20 years, it purports that the boilers have residual life of more that 10 years as on date) /12/;
- The fabric manufacturing process being a continuous process, any disruption in supply of steam and power leads to production losses due to breakdowns. The perceived technological and operating risk of project activity has in fact lead to events of more frequent plant breakdowns than anticipated (the frequent breakdowns in boiler are due to erosion problems in bank tubes, super heater zone, ID impeller and ash handling conveyor gearboxes as well as NIEL has been facing technical problems in air box, air distribution of air nozzles and distribution plate of the boiler leading to improper fluidization). Since the project is already in operation, the history of such breakdowns leading to loss of production /6/ provided to DNV demonstrates that the breakdowns are more frequent in the project activity than that in the baseline scenario;
- DNV is able to verify that high pressure cogeneration is a new activity for NIEL, for which they do not have any core competency in operating and maintaining the cogeneration plant. In the absence of adequate incentives to venture into initiating such extra efforts for acquiring the requisite technical skills, the project activity would not have been conceived.
- Although, the project is already in operation (as the FO boilers for steam generation were replaced by rice husk fired boilers in 2002 and the 5 MW turbine generator for power generation was commissioned in 2004), it is demonstrated that the project would not have occurred and continued as the project proponent was well aware of CDM benefits at the planning stage /4/ (IOM is provided to DNV: For consideration of CDM prior to the start of project activity) as well as the technological and operational risks /4/ (IOM is provided to DNV: For consideration of risks perceived in operation of rice husk based cogeneration plant prior to the start of project activity) due to the project activity at the planning stage itself. Moreover, DNV is able to verify that the perceived operational risks exists even after the implementation of the

project /6/ (as evidence for history of breakdowns leading to production loss on post project implementation), /7/ (as evidence for existence of operation risks based on communication from technology supplier)

In conclusion, it is deemed likely that the project activity would not have been implemented in the absence of the CDM.

3.5 Monitoring Plan

The project applies the approved small scale monitoring methodology AMS – I.C (Version 09) titled *"Thermal energy for user"/17/.* The monitoring plan adequately addresses all the necessary parameters required for the estimation of emission reductions and all such critical data are either measured or calculated and archived for a period of two years after the crediting period. Details of the data collection and frequency of data recording and associated formats are described and adequate. The monitoring will involve metering the electricity and steam generated. The CO_2 emission reductions due to the project are linked directly to the electricity and steam generated.

The monitoring plan indicates the electricity generated will be continuously monitored and measured through duly calibrated meters for both total generations and auxiliary consumption. The steam flow rate, pressure and temperature of steam supplied to process from biomass or FO (including standby and FO boiler transferred out of project boundary) boilers are continuously monitored by duly calibrated steam flow meter, pressure gauge and temperature indicators, respectively. These records are then collated and emission reduction reports are generated.

Fossil fuels such as coal and FO (if any) if used in the project activity when sufficient biomass residue is not available will also be measured. Quantity of biomass (rice husk) supplied from outside will be measured by duly calibrated weighbridges and crosschecked with transporters receipts /10/. The net calorific values of the rice husk will also be measured. The FO boiler efficiency will also be measured both for standby (to calculate project emissions, if any) and for boiler transferred out of project boundary (to calculate leakage, if any). NIEL shall evaluate whether there is a surplus of biomass in the region every year (ex-post) and any leakage shall be deducted from the emission reductions in accordance with the Board's "General guidance on leakage in biomass project activities (version 2)".

Calibration and maintenance of process instrumentation including electricity and steam meters are governed by established procedures of organisation /13/.

Detailed responsibilities and authorities for project management, monitoring procedures, calibration procedures and QA/QC procedures have been presented and were verified during follow up interviews. The monitoring practices are considered appropriate.

3.6 Calculation of GHG Emissions

The calculation of the GHG emissions has been done as per AMS-I.C. version 09. All the aspects related to the direct and indirect GHG emissions have been addressed and the calculations are presented in a transparent manner.

In order to determine baseline emissions, the net quantity of electricity generation (power consumed by the plant) as a result of the project activity and the baseline grid emission factor of 0.751 TCO_2/MWh (for northern region grid), determined ex-ante (and remain fixed for entire crediting period), has been applied. Baseline emissions for thermal energy component have been

determined considering carbon content of furnace oil as 77.3667 tCO_2 / TJ based on IPCC data and the FO boiler efficiency is taken as 100% which is conservative for calculations.

As confirmed earlier, fossil fuels (coal and FO) will be used during emergency (if required due to non-availability of biomass). The project emissions due to biomass (purchased from outside) transportation are insignificant as compared to the emissions in the baseline due to transport of fossil fuels, which is considered reasonable by DNV and hence not considered.

The leakage, both due to transfer of existing equipment and general leakage for biomass projects /18//15/, has been demonstrated to be zero which is considered reasonable by DNV. However, NIEL will be monitoring and addressing the leakage due to transfer of existing equipment (one of the FO boiler that is transferred as standby to other plant outside the project boundary) as per AMS-I.C. version 09, ex-post throughout the crediting period (if used). DNV has verified that the formula for estimating both types of these leakage emissions has been provided under section E.1.2.2. of the revised PDD (version 02) and found to be appropriate and correct. Also, NIEL shall evaluate whether there is a surplus of biomass in the region every year (ex-post) and any leakage shall be deducted from the emission reductions in accordance with the Board's "General guidance on leakage in biomass project activities (version 2)".

The project is expected to result in average reduction of 44 820 tCO_2 per year during the chosen fixed ten years crediting period. DNV has verified all the factors and calculations and confirm the reasonableness of the forecasted emission reductions.

3.7 Environmental Impacts

As per the MoEF, an EIA is not required for projects costing less than USD 22 Millions, as is the case with the proposed project and the project has evaluated the environmental impacts due to the project activity. No adverse environmental impacts are foreseen. The summary of findings has been addressed in the project design document. Moreover, the systems for the environmental management are developed as NIEL is certified for ISO 14001.

The applicable and valid permits and consents as dictated by the Indian environmental regulations are verified to be in place /11//12//14/.

3.8 Comments by Local Stakeholders

While a formal stakeholder process is not required for this type of project under Indian environmental regulations and EIA, NIEL has identified the elected body of representatives administering the local area, Ministry of Environment & Forest (MoEF), Government of India, PPCB and PSEB as the key stakeholders. The project participant invited comments for local stakeholder consultation process through invitation letters. Meetings and direct consultation with the stakeholders did not reveal any negative comments from local stakeholder process and the same stands verified by DNV.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD (version 01) of 02 September 2006 was made publicly available on DNV's climate change website and Parties, stakeholders and NGOs were through the CDM website (Source:

http://www.dnv.com/certification/climatechange/Projects/ProjectDetails.asp?ProjectId=753) invited to provide comments during a 30 days period from 06 September 2006 to 05 October 2006. No comments were received.

5 VALIDATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a validation of the "Rice husk based cogeneration plant (5 MW) at Shibzada Ajit Singh Nagar District, Punjab by M/s Nahar Industrial Enterprises Limited"project in India. The validation was performed on the basis of UNFCCC criteria for the small scale projects under the Clean Development Mechanism and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

The proposed project is being proposed as a unilateral project by Nahar Industrial Enterprises Limited of Punjab, India. The host country, India, fulfils the participation criteria and approved the project and authorized the project participants (NIEL). The DNA of India confirms that the project assists in achieving sustainable development.

The project correctly applies AMS-I.C. (version 09) "Thermal energy for user."

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The installation and the implementation of a new high pressure biomass fired cogeneration plant, supplying power and steam to the adjacent textile plant (using mainly rice husk supplied from outside sources), displaces fossil fuel based grid power and steam for captive consumption. Hence the project results in reductions of CO_2 emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on the average 44 820 tCO_2e per year over the selected 10 year crediting period. The emission reduction forecast has been checked and it is deemed likely that the state amount is achieved given that the underlying assumptions do not change.

Adequate training and monitoring procedures have been implemented. Detailed responsibilities and authorities for project management, monitoring and reporting and QA/QC procedures have also been addressed.

In summary, it is DNV's opinion that the "Rice husk based cogeneration plant (5 MW) at Shibzada Ajit Singh Nagar District, Punjab by M/s Nahar Industrial Enterprises Limited"project in India, as described in the revised PDD, version 02 of 10 February 2007, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the simplified baseline and monitoring methodology AMS-I.C. (version 09). DNV thus requests the registration of the "Rice husk based cogeneration plant (5 MW) at Shibzada Ajit Singh Nagar District, Punjab by M/s Nahar Industrial Enterprises Limited" as a CDM project activity.

REFERENCES

Documents provided by the project proponent that relate directly to the project:

/1/ Nahar Industrial Enterprises Limited: CDM Simplified PDD for the "*Rice husk based cogeneration plant (5 MW) at Shibzada Ajit Singh Nagar District, Punjab by M/s Nahar Industrial Enterprises Limited*", Version 01 (dated 02 September 2006) and version 02 (dated 10 February 2007). The revised PDD also contains the responses to the request for review submitted by the project proponent.

/2/ Nahar Industrial Enterprises Limited: *Spreadsheets documenting the OM and BM emission coefficient and Emission Reduction calculations (Emission Reduction_NIEL_New.xls).*

/3/ Ministry of Environment and Forests (DNA of India): *Letter of Approval*, F.No.4/12/2006-CCC dated 28-02-2007.

/4/
- Enclosure 1(a): IOM: For consideration of CDM prior to the start of project activity - (Internal memo to the top management (seeking approval for the implementation of the project activity dated 03/11/2000) and the true copy of the abstract on the resolution passed by the board of directors of the company in its meeting held on 11/01/2001
- Enclosure 1(b): IOM: For consideration of risks in operation of rice husk based cogeneration plant prior to the start of project activity.

/5/ Enclosure 2- Letter from *Textile and Spinning Mill Association of Punjab* – for the project being first of its kind in the textile sector.

/6/
- Enclosure 3(a)- Evidence for existence of Technical barrier based on data on breakdown history of the project for year 2004-2006.
- Enclosure 3(b)- Evidence for loss of production due to operational risks based on data on breakdown history of the project for year 2005-2006 indicating loss of production

/7/ Enclosure 4- Technical barrier- Communication with/ from Technology supplier as evidence for existence of operational problems due to Rice husk based cogeneration plant.

/8/ Bureau of Energy Efficiency, India: "*Energy performance Assessment of Cogeneration systems with Steam and Gas turbines.*"

/9/ Document showing the following:
- Purchase order for 40 TPH boiler (Ref. No. : OCM/99-2000 dated 08-01-2000).
- Invoice for 40 TPH boiler (Invoice No. : TTPL/M/24/2001-2002 dated 26-06-2001).
- Purchase order for 5 MW Turbo generator (Ref. : OCML: 2002 dated 12-09-2002).

/10/ Nahar Industrial Enterprises Limited & M/s Paras Enterprises Husk Suppliers: *Rice Husk Receipt Ticket (S.No. 13350 dated 15/11/2006)*

/11/ Nahar Industrial Enterprises Limited & Chief Electrical Inspector, Patiala, Punjab:

Inspection of 5 MW TG Set (Letter No. 6510 dated 05-05-2004).

/12/ Nahar Industrial Enterprises Limited & Punjab Boiler Inspection Department:

- *Certificate for use of Boiler (No. 133):* For Boiler No. PI 3944 (12 TPH/ FO boiler) dated 17-12-2004.
- *Certificate for use of Boiler (No. 131):* For Boiler No. PI 3977 (12 TPH/ FO boiler) dated 17-12-2004.
- *Certificate for use of Boiler (No. 1294):* For Boiler No. PI 4037 (40 TPH/ Rice Husk boiler) dated 21-11-2005.

/13/ Valid Calibration certificate for:

- Meter measuring turbine electricity generation (S.No. 030801/ 144 dated 25-10-2006) and auxiliary (S.No. 03130497 dated 25-10-2006) electricity consumption.
- Weighbridge (30 MT) measuring quantity of rice husk brought to project site (*S.No. 6992 dated 20-07-2006*).

/14/ Nahar Industrial Enterprises Limited:

- *Air Consent* (PTA/APC/ECD/2002/F-208 dated 11-03-2002 valid till 30-04-2015).
- *Water consent* (MHL/WPC/2006/V-01 dated 01-05-2006 valid till 30-04-2007).
- *Hazardous waste authorisation* (HMC/MLI/2006-08/(F-2586)/C-3354 dated 03-09-20006 valid till 02-09-2008).
- *'No Objection Certificate' for setting up a thermal co-generation plant of 40 TPH boiler and power generation capacity* (No PTA-Power Generation-649 dated 15-09-2000)

/15/ TERI: *District Biomass Assessment Study-Patiala (Report No. 2003SF62).*

Background documents related to the design and/or methodologies employed in the design or other reference documents:

/16/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. http://www.vvmanual.info

/17/
- 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 activity categories*. I.C./Version 09: 23 December 2006 & I.D./Version 08: 28 July 2006.
- *Consolidated baseline methodology for grid-connected electricity generation from renewable sources:* ACM0002, version 06.

/18/ Attachment C 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 activity categories- General Guidance on leakage in biomass project activities.* Version 01.

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

/19/ Mr. S.S. Aich (Chief Executive)

/20/ Mr. A.P. Singh (Vice President- Engineering)

/21/ Mr. N.J. Singh (Chief Engineer- Maintainence Plant and Utilities)

/22 Mr. M.D. Sharma (Manager- Power Plant)

/23 Mr. Lokesh Dhawan (Dy. Manager- Power Plant)

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APPENDIX A

VALIDATION PROTOCOL
FOR SMALL-SCALE CDM PROJECT ACTIVITIES

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

Requirement	Reference	Conclusion	Cross Reference/ Comment
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	OK	Table 2, Section E.4.1
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, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	OK	Table 2, Section A.3
The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art. 12.2.	OK	Table 2, Section E.4.1
The project shall have the written approval of voluntary participation from the designated national authority of each party involved	Kyoto Protocol Art. 12.5a, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	~~**CAR 1**~~ **OK**	Clarification of the status of approval by the Indian DNA and letter of participation is awaited.
The emission reductions should be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E.1 to E.4
Reduction in GHG emissions must be additional to any that would occur in 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. 12.5.c, Simplified Modalities and Procedures for Small Scale CDM Project Activities §26	OK	Table 2, Section B.2.1
Potential public funding for the project from Parties in Annex I shall not be a diversion of official development	Decision 17/CP.7	OK	Not applicable as the project is being proposed as unilateral

Requirement	Reference	Conclusion	Cross Reference/ Comment
assistance			project.
Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures § 29	OK	Designated National Authority for host party India has been formed under the Ministry of Environment and Forest. (MoEF)
The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities and Procedures § 30, 31b	Ok	Host country India ratified the Kyoto Protocol on 26 August 2002.
The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	OK	Not applicable as the project is being proposed as unilateral project.
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	Not applicable as the project is being proposed as unilateral project.
The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakesh 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	Table 2, Section A.1
The project design document shall conform with the Small Scale CDM Project Design Document format	Simplified Modalities and Procedures for Small Scale CDM Project Activities, Appendix A	OK	As per SSC-CDM-PDD format version 02.
The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and uses the simplified baseline and monitoring methodology for that project category	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	OK	Table 2, Section A.1.3, B and D.
Comments by local stakeholders are invited, and a summary of these provided	Simplified Modalities and Procedures for Small	OK	Table 2, Section G.

Requirement	Reference	Conclusion	Cross Reference/ Comment
	Scale CDM Project Activities §22b		
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	Table 2, Section F.
Parties, stakeholders and UNFCCC accredited NGOs have been invited to comment on the validation requirements and comments have been made publicly available	Simplified Modalities and Procedures for Small Scale CDM Project Activities §23b,c,d	OK	The PDD was published on http://www.dnv.com/certification/climatechange/Projects/ProjectDetails.asp?ProjectId=753 , and Parties, stakeholders and NGOs were invited through the UNFCCC CDM website to provide comments on the validation requirement during a period of 30 days, commencing 6 September to 5 October 2006 and no comments were received.

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A. **Project Description** The project design is assessed.					
A.1. Small scale project activity It is assess whether the project qualifies as small scale CDM project activity.					
A.1.1. 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?	/1/	DR/I	Yes. The project qualifies as a small scale CDM project type I (Renewable energy projects), category C (Thermal energy for user). The energy output is 31.5 $MW_{Thermal}$ and does not exceed the stipulated upper limit of 45 $MW_{Thermal}$.		OK
A.1.2. The small scale project activity is not a debundled component of a larger project activity?	/1/	DR	The proposed project activity is not a debundled component of a large project activity as the project proponents neither have registered any project activity within the previous 2 years for the same project category nor do they propose to set up another biomass based cogeneration project within 1 km radius of the proposed small-scale project activity.		OK
A.1.3. Does proposed project activity confirm to one of the project categories defined for small scale CDM project activities?	/1/	DR	The project conforms to Type I (Renewable energy projects), category I.C (Thermal energy for user).		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A.2. Project Design Validation of project design focuses on the choice of technology and the design documentation of the project.					
A.2.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR	The project is located in village Jalalpur, near Lalru, district Mohali in Punjab State, India.		OK
A.2.2. Are the project's system (components and facilities used to mitigate GHG's) boundaries clearly defined?	/1/	DR/I	The project boundary extends from the fuel storage to the point of steam and power supply to the plant and thus covers fuel storage, boiler, steam turbine generator, all other accessory equipment and the Northern Region Grid. However, the following in not clear: ▪ The current residual life of the existing two oil fired boilers. ▪ What is done with the existing two oil fired boilers after Cogeneration/ project implementation? ▪ What are the capacity, efficiency and operating parameters (such as temperature and pressure) of all the existing two oil fired boilers and the same may be reflected in the PDD.	~~CL 1~~	OK
A.2.3. Does the project design engineering reflect current good practices?	/1/	DR	Yes. The project design reflects current good practices. The proposed boiler is of modern design with atmospheric fluidised bed with electrostatic precipitator for dust collection and belt conveyors for transportation of the rice husk.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A.2.4. Will the project result in technology transfer to the host country?	/1/	DR	There is no technology transfer envisaged in the project as the same is indigenously available in India.		OK
A.2.5. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period? Does the project make provisions for meeting training and maintenance needs?	/1/	DR	Captive power and cogeneration is a new activity for NIEL and the provisions for meeting initial training and maintenance requirements are addressed in the PDD.		OK
A.3. Contribution to Sustainable Development The project's contribution to sustainable development is assessed					
A.3.1. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	The project will generate secondary and primary employment generation and technological development of the sector. Also, it will reduce the consumption of fossil fuels.		OK
A.3.2. Will the project create any adverse environmental or social effects?	/1/	DR	The project is unlikely to create any adverse environmental or social effects.		OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/	DR/I	Clarification of the status of approval by the Indian DNA and letter of participation is awaited.	~~CAR 1~~	OK
A.3.4. Is the project in line with relevant legislation and plans in the host country?	/1/	DR/I	As per MoEF, an EIA is not required for projects costing less than USD 22 Millions as is the case with the proposed project. The project has obtained "no objection certificate" (consent to operate and establish) from Punjab Pollution Control Board (PPCB), "boiler licence" and "approval from the electrical inspectorate".		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
B. **Project Baseline** The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.					
B.1. Baseline Methodology It is assessed whether the project applies an appropriate baseline methodology.					
B.1.1. Is the selected baseline methodology in line with the baseline methodologies provided for the relevant project category?	/1/	DR	Yes. The project applies one of the simplified baseline methodologies proposed for the small scale project activity category I.C. i.e., for renewable energy that displaces both fossil fuel based grid power and steam to the process. The simplified baseline is the sum of: 1) Fuel consumption of the technologies that would have been used in the absence of the project activity times the emission coefficient of the fossil fuel displaced; and 2) Electricity consumption times the relevant emission factor calculated as described under category I.D., which is MWh produced by the renewable generation unit multiplied by an emission coefficient (measured in TCO_2/MWh)		OK
B.1.2. Is the baseline methodology applicable to the project being considered?	/1/	DR	The emission coefficients have to be calculated in transparent and conservative manner as the average of the 'operating margin (not approximate operating margin)' and the "built margin" (calculated as per ACM0002) or as "the weighed average emissions (in kg CO_2 equ/kWh) of the	~~**CL 2**~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			current generation mix". However, PDD (Version 01, page10, 23, etc) uses the average of the 'approximate operating margin' and the "built margin" (not calculated as per ACM0002 and not justified for its applicability), which requires correction.		
B.2. Baseline Determination It is assessed whether the project activity itself is not a likely baseline scenario and whether the selected baseline represents a likely baseline scenario.					
B.2.1. Is it demonstrated that the project activity itself is not a likely baseline scenario due to the existence of one or more of the following barriers: investment barriers, technology barriers, barriers due to prevailing practice or other barriers?	/1/	DR/I	The PDD demonstrates additionality primarily through the existence of the following barriers: 1) Barriers due to prevailing practice- It is argued that NIEL is the first plant to plan to implement such projects in the textile sector in Punjab which shall be justified. 2) Other barriers- DNV is able to verify that captive power and cogeneration is a new activity for NIEL, for which they do not have any core competency in operating and maintaining the cogeneration plant. 3) The fabric manufacturing process being a continuous process, any disruption in supply of steam and power, would lead to production losses due to breakdowns and NIEL would be incurring huge financial losses. The perceived technological and operating risks of project activity may lead to events of more frequent boiler breakdowns. Since, the project is already	~~CL 3~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			in operation, so history of such breakdowns may be provided to DNV in order to demonstrate that the breakdowns are more frequent in biomass based boiler (leading to higher production losses) than FO based boiler. It remains to be more clearly demonstrated that the project would not have occurred anyway as the project is already in operation (as the FO boilers were replaced by Biomass fired boilers in year 2002 and switch to biomass from FO was carried out in year 2002 for steam generation. Later, 5 MW turbine generator was commissioned in year 2004) for generation of power and steam for plant. So, it is required to be justified as to why the project envisaged CDM funding since the project was already in successful operation for more than 4 years at the time when NIEL submitted CDM project for validation to DNV.		
B.2.2. Is the application of the baseline methodology and the discussion and determination of the chosen baseline transparent and conservative?	/1/	DR	Yes. The baseline scenario is the renewable energy that displaces both fossil fuel based grid power and steam to the process and the application is transparent and conservative.		OK
B.2.3. Are relevant national and/or sectoral policies and circumstances taken into account?	/1/	I	Yes. The national policy favours renewable energy.		OK
B.2.4. Is the baseline selection compatible with the available data?	/1/	DR	The data for is taken from the official sites of the Ministry of Power, CEA, NRLDC and IPCC. The baseline selection and emission reduction calculations are compatible with the available data and correct if it is demonstrated that :	~~**CAR 2**~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			1) Power generation displaced is 90200 KWh/day. 2) The days of operation are 360 days in a year. 3) EF of northern region grid is calculated in line with the latest data/ report from CEA as the CEA reports the combined margin (including imports) to be 0.76 TCO2/MWh for average of years 2002-3, 2003-4 and 2004-5 (Source: www.cea.nic.inplanningc%20and%20eGovernment%20of%20India%20website.htm). However, PDD reports combined margin (including imports) to be 0.89626 TCO2/MWh which requires a justification for not using conservative values. 4) Steam supplied to the process is 8.7 TPH based on data from Jan 2005- Jan 2006. 5) Steam to fuel ratio for fuel oil is 13 for calculation of boiler efficiency. 6) Calorific value (NCV) of diesel used in the transportation (PDD version 02) = 2.83 $x10^{-5}$ TJ/Litre. Thus it still remains to be demonstrated that the estimated average emission reduction forecast due to this CDM activity is 47 025 tCO2/year.		
B.2.5. Does the selected baseline represent the most likely scenario describing what would have occurred in absence of the project activity?	/1/	DR	Refer point B.2.1.	~~CL3~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
C. **Duration of the Project / Crediting Period** It is assessed whether the temporary boundaries of the project are clearly defined.					
C.1.1. Are the project's starting date and operational lifetime clearly defined?	/1/	I	The starting date of the project is 26 June 2001 and an operational life time of 25 years is forecast, which is reasonable and is verified by DNV.		OK
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?	/1/	DR	Yes. A fixed crediting period of ten years starting from the date of registration has been opted for.		OK
D. **Monitoring Plan** The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.					
D.1. Monitoring Methodology It is assessed whether the project applies an appropriate monitoring methodology.					
D.1.1. Is the selected monitoring methodology in line with the monitoring methodologies provided for the relevant project category?	/1/	DR	The monitoring methodology is as per methodology AMS I.C. which applies for this project.		OK
D.1.2. Is the monitoring methodology applicable to the project being considered?	/1/	DR	Yes.		OK
D.1.3. Is the application of the monitoring methodology transparent?	/1/	DR	Yes. The application of monitoring methodology is simple and transparent.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
D.1.4. Will the monitoring methodology give opportunity for real measurements of achieved emission reductions?	/1/	DR	Yes the data are tangible and recorded by calibrated equipments for electricity generation and steam supply to plant and thus will help in giving realistic measurements.		OK
D.2. Monitoring of Project Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.2.1. 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?	/1/		Since the project is a renewable energy based, so there will be no major project emissions. However, no direct emissions have been considered, such as due to use of any other fuel other than rice husk during start up operations (eg., charcoal) of the boiler (particularly during winters when the moisture content of biomass is high). Also, indirect emissions such as due to transportation of rice husk (biomass) to the site have been considered negligible with out measurement which requires clarification.	~~**CL 4**~~	OK
D.2.2. Are the choices of project GHG indicators reasonable?	/1/	DR	Refer to D.2.1.	~~**CL 4**~~	OK
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/1/	DR	The choices of the GHG indicators are reasonable as quantity of coal or any other fuel, if burnt, can be measured.		OK
D.2.4. Will the indicators give opportunity for real measurements of project emissions?	/1/	DR	Yes. The data will be archived in paper and electronic form for two years after the crediting period.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
D.3. Monitoring of Leakage If applicable, it is assessed whether the monitoring plan provides for reliable and complete leakage data over time.					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	I	The leakage has not been considered for the project in the PDD. Since one of the 12 TPH boiler is used as a stand by in the project boundary and other is to be transferred outside the project boundary, so as per AMS I.C, leakage is to be considered. However, this is not reflected in the PDD (version 01) and formula to calculate this leakage may be provided in the PDD. Moreover, for biomass projects (Ref: Attachment C 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 activity categories- General Guidance on leakage in biomass project activities.* Version 01), NIEL shall evaluate if there is a surplus of biomass in the region of the project activity, which is not utilised. If it is demonstrated that the quantity of available biomass in the region, is at least 25% larger than the quantity of biomass that is utilised including the project activity, then this source of leakage can be neglected otherwise this leakage shall be estimated and deducted from the emission reductions.	~~**CAR 3**~~	OK
D.3.2. Are the choices of leakage indicators reasonable?	/1/	DR	Refer to D.3.1.	~~**CAR 3**~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
D.3.3. Will it be possible to monitor / measure the specified leakage indicators?	/1/	DR	Refer to D.3.1.	~~CAR 3~~	OK
D.3.4. Will the indicators give opportunity for real measurements of leakage effects?	/1/	DR	Refer to D.3.1.	~~CAR 3~~	OK
D.4. Monitoring of Baseline Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/		Yes.		OK
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR	The choice of baseline indicators in order to estimate the baseline emissions are adequate and in line with the laid down norms of the approved methodology AMS I.C.		OK
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/	DR	The choices of the GHG indicators are reasonable as quantity of steam and net electricity generated can be measured.		OK
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/1/	DR	Yes. The data will be archived in paper and electronic form for two years after the crediting period.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
D.5. Project Management Planning It is checked that project implementation is properly prepared for and that critical arrangements are addressed.					
D.5.1. Is the authority and responsibility of project management clearly described?	/1/	DR	The authority and responsibility of the monitoring plan is described clearly.		OK
D.5.2. Is the authority and responsibility for registration monitoring measurement and reporting clearly described?	/1/	DR	The responsibility of recording the data and monitoring as per monitoring plan lies with the mechanical and electrical manager.		OK
D.5.3. Are procedures identified for training of monitoring personnel?	/1/	DR	Same as in A.2.5.		OK
D.5.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	Emergencies like fire in fuel storage area can cause unintended emission. The emergency preparedness in such situation is taken care through ISO14001 system implemented already.		OK
D.5.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR	The procedures for calibration of monitoring equipments, record handling, internal audit, performance review, implementing corrective actions management are described in the PDD.		OK
D.5.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR	Same as in D.5.5.		OK
D.5.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR	Same as in D.5.5.		OK
D.5.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	Same as in D.5.5.		OK
D.5.9. Are procedures identified for dealing with	/1/	DR	Considering the nature of the project, uncertainties		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
possible monitoring data adjustments and uncertainties?			are expected to be minimal. Consequently, such procedures are not imperative to the project.		
D.5.10. Are procedures identified for internal audits of GHG project compliance with operational requirements as applicable?	/1/	DR	Same as in D.5.5.		OK
D.5.11. Are procedures identified for project performance reviews?	/1/	DR	Same as in D.5.5.		OK
D.5.12. Are procedures identified for corrective actions?	/1/	DR	Same as in D.5.5.		OK
E. **Calculation of GHG emission** It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.					
E.1. Project GHG Emissions The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.					
E.1.1. Are all aspects related to direct and indirect project emissions captured in the project design?	/1/	DR	Refer to D.2.1.	~~CL 4~~	OK
E.1.2. Have all relevant greenhouse gases and sources been evaluated?	/1/	DR	Yes.		Ok
E.1.3. Do the methodologies for calculating project emissions comply with existing good practice?	/1/	DR	Yes, but applicable in case of exigencies like non-availability of rice husk.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
E.1.4. Are the calculations documented in a complete and transparent manner?	/1/	DR	Yes.		OK
E.1.5. Have conservative assumptions been used?	/1/	DR	Yes.		OK
E.1.6. Are uncertainties in the project emissions estimates properly addressed?	/1/	DR	Uncertainties will be only on account of rice husk. The substitute will be usage of coal, the monitoring of coal is addressed,		OK
E.2. Leakage It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed.					
E.2.1. Are leakage calculation required for the selected project category and if yes, are the relevant leakage effects assessed?	/1/	DR	Refer to D.3.1.	~~CAR 3~~	OK
E.2.2. Are potential leakage effects properly accounted for in the calculations (if applicable)?	/1/	DR	Refer to D.3.1.	~~CAR 3~~	OK
E.2.3. Do the methodologies for calculating leakage comply with existing good practice (if applicable)?	/1/	DR	Refer to D.3.1.	~~CAR 3~~	OK
E.2.4. Are the calculations documented in a complete and transparent manner and (if applicable)?	/1/	DR	Refer to D.3.1.	~~CAR 3~~	OK
E.2.5. Have conservative assumptions been used (if applicable)?	/1/	DR	Refer to D.3.1.	~~CAR 3~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
E.2.6. Are uncertainties in the leakage estimates properly addressed (if applicable)?	/1/	DR	Refer to D.3.1.	~~CAR 3~~	OK
E.3. Baseline GHG Emissions The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.					
E.3.1. Are the baseline emission boundaries clearly defined and do they sufficiently cover sources for baseline emissions?	/1/	DR	Refer to D.2.1.	~~CL 4~~	OK
E.3.2. Are all aspects related to direct and indirect baseline emissions captured in the project design?	/1/	DR	Refer to D.2.1.	~~CL 4~~	OK
E.3.3. Have all relevant greenhouse gases and sources been evaluated?	/1/	DR	Refer to D.2.1.	~~CL 4~~	OK
E.3.4. Do the methodologies for calculating baseline emissions comply with existing good practice?	/1/	DR	Refer to D.2.1.	~~CL 4~~	OK
E.3.5. Are the calculations documented in a complete and transparent manner?	/1/	DR	Refer to D.2.1.	~~CL 4~~	OK
E.3.6. Have conservative assumptions been used?	/1/	DR	Refer to D.2.1.	~~CL 4~~	OK
E.3.7. Are uncertainties in the baseline emissions estimates properly addressed?	/1/	DR	Refer to D.2.1.	~~CL 4~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
E.4. Emission Reductions Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.					
E.4.1. Will the project result in fewer GHG emissions than the baseline case?	/1/	DR	Refer to B.2.4.	~~CAR 3~~	OK
***F.* Environmental Impacts** It is assessed whether environmental impacts of the project are sufficiently addressed.					
F.1.1. Does host country legislation require an analysis of the environmental impacts of the project activity?	/1/	DR/I	Refer to A.3.4.		OK
F.1.2. Does the project comply with environmental legislation in the host country?	/1/	I	Refer to A.3.4.		OK
F.1.3. Will the project create any adverse environmental effects?	/1/	DR, I	The environmental effects are restricted to suspended particulate matter, nitrogen oxides and sulphur dioxide apart for generation of fly ash. An ESP has been envisaged and the project is designed to adhere to the stipulations as per the PPCB. Ash collected is expected to be used as landfill.		OK
F.1.4. Have environmental impacts been identified and addressed in the PDD?	/1/	DR, I	The environmental impacts of the project are sufficiently assessed.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
G. **Comments by Local Stakeholder** Validation of the local stakeholder consultation process.					
G.1.1. Have relevant stakeholders been consulted?	/1/	DR, I	Yes, the relevant stakeholders had been consulted which include: ▪ Local stakeholders, ▪ PPCB, ▪ Industry associates, ▪ Equipment suppliers.		OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR, I	The process of inviting comments from local stakeholders has been clearly described in the PDD.		OK
G.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?	/1/	DR, I	Since, the project activity is not required to have EIA, the stake holder's consultation process is not required as per host country legislations / laws.		OK
G.1.4. Is a summary of the comments received provided?	/1/	DR	No adverse comments have been received from local stakeholders.		OK
G.1.5. Has due account been taken of any comments received?	/1/	DR	As in G.1.4		OK

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
CAR 1: Clarification of the status of approval by the Indian DNA and letter of participation is awaited.	Table 1, A.3.3.	The DNA had earlier given the host country approval to the said project on 14th June 2006 vide F.No. 4/12/2006-CCC. During the course of validation, the Government of Punjab has changed the district boundary in which the project activity is located i.e. Village Jalalpur, PO Dappar, Near Lalru from Patiala to SAS (Shibzada Ajit Singh Nagar) Nagar (Mohali). In lieu of the same, reissuance of HCA has been requested from DNA incorporating the changed district name in the HCA title. Please find attached the revised HCA letter vide F.No. 4/12/2006-CCC dated 28 February 2007.	OK. The HCA from India has been provided. The CAR is therefore closed.
CAR 2: The baseline selection and emission reduction calculations are compatible with the available data and correct if it is demonstrated that : 1) Power generation displaced is 90200 kWh/day. 2) The days of operation are 360 days in a year. 3) EF of northern region grid is calculated in line with the latest data/ report from CEA as the CEA reports the combined margin	B.2.4.	The emission reduction calculations have been revised with the latest available data. Following changes have been made in the revised PDD and the data to support this is attached: 1) Net Power generation displaced is 86 858 kWh/day in accordance with available data from January 2005 to December 2005. 2) The days of operation have been revised to be 350 days in a year as 16 days on average are needed for plant maintenance in a year.	OK. The complimentary information provided sufficiently addresses DNV's request for corrective action. It has been that the PDD uses conservative values (0.76 TCO_{2e} /MWh) for the emission factors of the northern regional grid of India (as per CEA). DNV is able to confirm that the average emission reductions are correctly and conservatively estimated at 44 820 tCO2/ year

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
(including imports) to be 0.76 TCO2/MWh for average of years 2002-3, 2003-4 and 2004-5 (Source: www.cea.nic.inplanningc%20and%20eGovernment%20of%20India%20website.htm). However, PDD reports combined margin (including imports) to be 0.89626 TCO_2/MWh which requires a justification for not using conservative values. 4) Steam supplied to the process is 8.7 TPH based on data from Jan 2005- Jan 2006. 5) What is the FO boiler efficiency used in the Calculations? 6) Calorific value (NCV) of Diesel used in the transportation (PDD version 02) = 2.83 $x10^{-5}$ TJ/Litre. Thus it still remains to be demonstrated that the estimated average emission reduction forecast due to this CDM activity is 47 025 TCO2/year.		3) Combined margin emission factor has been recalculated as per CEA data and the new emission factor is 0.751 tCO_2 / MWh which is inline with the final CEA baseline emission factor for Northern region grid. The baseline information along with references has been revised in Annex 3 of the revised PDD. 4) The steam supplied to process was wrongly mentioned as 8.7 TPH, a typographical error. The same has been revised to 12.2 TPH (Total steam generations were 30 TPH which is less than the installed capacity of 40 TPH) in accordance with January 2005 to December 2005 data from log books. The data to support the same has been shown to DNV. 5) Steam to fuel ratio is not being used in the revised PDD to calculate efficiency of the boiler. Efficiency of FO boilers is assumed as 100% for conservativeness of emission reduction calculations. The efficiency will be monitored through out the crediting period. 6) The NCV of diesel used in calculation of transportation emissions has been referred from	and the revised PDD (Version 02) reflects the same correctly. The CAR is closed

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		NATCOM report. Thus the estimated average emission reduction forecast due to this CDM project activity (as per the above changes) is reduced and has been revised as 44 820 tCO_{2e}/year. The revised excel sheet for emission reduction calculations, EF of Grid, and other process data is provided to DNV.	
CAR 3: The leakage has not been considered for the project in the PDD. Since one of the 12 TPH boiler is used as a stand by in the project boundary and other is to be transferred outside the project boundary, so as per AMS I.C, leakage is to be considered. However, this is not reflected in the PDD (Version 01) and formula to calculate this leakage may be provided in the PDD. Moreover, for biomass projects (Ref: Attachment C 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 activity categories- General Guidance on leakage in biomass project activities.* Version 01), NIEL	D.3.1-4, E.2.1-6, E.4.1.	Out of the two existing FO fired boilers, one would be kept as standby for the project activity and the other one would be kept as standby to a new power plant being installed in the NIEL industry premises, the emissions from the same (if used) would be monitored throughout the crediting period and accounted for as leakage. The formula for estimating these emissions has been provided under section E.1.2.2. of the revised PDD. Evaluation of surplus biomass availability in the region: The below data has been referred from *District Biomass Assessment Study* -	OK. The complimentary information provided for treatment of leakages is accepted and verified by DNV. CAR is closed

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
shall evaluate if there is a surplus of biomass in the region of the project activity, which is not utilised. If it is demonstrated that the quantity of available biomass in the region, is at least 25% larger than the quantity of biomass that is utilised including the project activity, then this source of leakage can be neglected otherwise this leakage shall be estimated and deducted from the emission reductions.		*Patiala,* T E R I Report No. 2003SF62. Total Quantity of paddy husk generated in Patiala* = 136255 MT/yr Net Quantity of surplus paddy husk available in patiala = 134552 MT/yr Project activity requirement = 65712.5 MT/yr Net quantity of surplus pady husk availability considering the project activity = 68839.5 MT/yr From the above, it is to be noted that the total quantity of available biomass in the region is about 50.53 % larger than quantity of biomass that is utilized. Hence the source of leakage shall be neglected. The same has now been reflected in the PDD.	
CL 1: The project boundary extends from the fuel storage to the point of steam and power supply to the plant and thus covers fuel storage, boiler, steam turbine generator, all other accessory equipment and the northern regional grid.	A.2.2.	▪ The two oil fired boilers have a considerable amount of residual life left and would not have been replaced anyway. The following table depicts the year of manufacture of the existing two oil fired boilers:	OK. The provided response sufficiently addresses DNV's request for clarification and the same stands verified by DNV. CL is closed

* District Biomass Assessment Study - Patiala, T E R I Report No. 2003SF62

<table>
<tr><th>Draft report corrective action requests and requests for clarification</th><th>Ref. to Table 2</th><th>Summary of project participants' response</th><th>Final conclusion</th></tr>
<tr><td>However, the following in not clear:
▪ The current residual life of the existing two oil fired boilers.
▪ What is done with the existing two oil fired boilers after cogeneration/ project implementation?
▪ What are the capacity, efficiency and operating parameters (such as temperature and pressure) of all the existing two oil fired boilers and the same may be reflected in the PDD.</td><td></td><td><table><tr><td>Boiler Number</td><td>Year of manufacture</td></tr><tr><td>P13944</td><td>1999</td></tr><tr><td>P13977</td><td>1999</td></tr></table>The evidence for the same is the certificate for the use of a boiler issued by Punjab Boiler Inspection Department. The reference document has been provided to DNV. Generally the boilers have an estimated lifetime of 18-20 years from the date of manufacture (documentary evidence for the same has been shown to DNV). So the current residual life (approximately) of the existing two boilers is till the year 2019 and more than the crediting period.
▪ From the two existing oil fired boilers, one would be kept as standby for the project activity and the other one would be kept as standby to a new power plant being installed in the NIEL industry premises, the emissions from the same (if used) would be monitored throughout the crediting period and accounted for as leakage. The formula for estimating these emissions has been provided under section E.1.2.2. of the PDD.</td><td></td></tr>
</table>

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		▪ The capacity of the existing two FO boilers is 12 TPH each with operating parameters 10.5 kg/ cm^2 and 140ºC. The same has been updated in the PDD under section A.2.	
CL 2: The emission coefficients have to be calculated in transparent and conservative manner (as required by AMS. I.C, version 09) as the average of the 'operating margin (not approximate operating margin)' and the "built margin" (calculated as per ACM0002) or as "the weighed average emissions (in Kg CO_2 equ/KWh) of the current generation mix". However, PDD (Version 01, page10, 23, etc) uses the average of the 'approximate operating margin' and the "built margin" (not calculated as per ACM0002 and not justified for its applicability), which requires correction.	B.1.2.	The PDD has been revised and the explanation of choosing the combined margin approach (as per ACM0002) has been provided in the revised PDD under section B.2.	OK. The provided response sufficiently address DNV's request for clarification. The revised PDD has been verified. CL is closed
CL 3: The PDD demonstrates additionality primarily through the existence of the following barriers: 1) Barriers due to prevailing practice- It is argued that NIEL is the first plant to plan to implement such projects in the textile sector in Punjab which calls for evidence. 2) The fabric manufacturing process being a continuous process, any disruption in	B.2.1., B.2.5.	1) Please find attached the letter by The Textile and Spinning Mill Association of Punjab as the evidence for NIEL project activity being the first of its kind in the textile sector in Punjab (Refer Enclosure 2). 2) Nahar Industrial Enterprises Limited (NIEL) manufactures fabrics and electrical energy along with steam forms an essential input for fabric	OK. The information provided has been verified and accepted and DNV confirms that the project is additional. CL is closed.

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
supply of steam and power, would lead to production losses due to breakdowns and NIEL would be incurring huge financial losses. The perceived technological and operating risk of project activity has in fact lead to events of more frequent boiler breakdowns. Since, the project is already in operation, so history of such breakdowns may be provided to DNV in order to demonstrate that the breakdowns are more frequent in Biomass based boiler (leading to higher production losses) than FO based boiler. 3) It remains to be more clearly demonstrated that the project would not have occurred anyway as the project is already in operation (as the FO boilers were replaced by Biomass fired boilers in year 2002 and Switch to biomass from FO was carried out in year 2002 for steam generation. Later, 5 MW turbine generator was commissioned in year 2004) for generation of power and steam for plant. So, it is required to be justified as to why the project envisages CDM funding since the project is already in operation since year 2002.		manufacturing process. Any disruption in supply of electrical energy and steam would affect the production processes and subsequently lead to production losses and higher rejections. In the baseline scenario, FO based boiler was used for catering to steam requirement of the plant. It is to be emphasized here that there were no breakdowns in FO based boiler. But since the inception of the rice husk based boiler cogeneration system (project activity), there had been frequent breakdowns in the boiler leading to corresponding production losses. The frequent breakdowns in boiler are due to erosion problems in bank tubes, superheater zone, ID impeller and ash handling conveyor gearboxes as well as NIEL has been facing technical problems in air box, air distribution of air nozzles and distribution plate of the boiler leading to improper fluidization. After implementation of the project, the project proponent has been facing heavy production losses due to increased downtime without power and steam caused by frequent breakdown of the cogeneration plant equipment. In forthcoming years, it is expected	

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		that the breakdown trend of the rice husk boiler would increase and the financial losses incurred due to production losses would increase. The breakdown details leading to production loss are documented in the log books of the respective department at the NIEL. These are being made available to the DNV as evidence in Enclosure 3 (a& b). 3) The project proponent was well aware of CDM benefits (Enclosure 1 (a): Letter: For consideration of CDM prior to the start of project activity) as well as technological and operational risks (Enclosure 1 (b) & Enclosure 4- Technical barrier- communication from/with technology supplier) due to the project activity at the planning stage itself and the CDM revenue envisaged from the project would offset the financial losses faced due to implementation and operation of the project. Hence it clearly purports that the sustainability of the project activity requires CDM funding. However, as the CDM Registration process was not well developed around year 2002 as no project had realised the actual CERs and this was infact a risk for the additional investiment to be incurred towards	

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		consulting, DoE and registration fee. Owing to this, the project proponent postponed the start of the CDM registration process of this project in order to finalise the registration of their group's first CDM project "3.5 MW Rice Husk based Cogeneration Project at Nahar Spinning Mills Ltd.", which was registered on 11/12/ 2005. That is why, it is only after registration of their first CDM project, the project proponent wanted to take initiatives on further CDM registration of this project.	
CL 4: The following clarifications are requested: - No direct emissions have been considered, such as due to use of any other fuel other than rice husk during start up operations (eg., charcoal) of the boiler (particularly during winters when the moisture content of biomass is high). - Also, indirect emissions such as due to transportation of rice husk (biomass) to the site have been considered negligible with out measurement which requires clarification.	D.2.1, D.2.2., E.1.1., E.3.1-7.	During startup some charcoal is used which is in the range of 300-400 kg per annum. The project emissions corresponding to this amount of fossil fuel are insignificant i.e., 0.88 T CO_2/ annum and hence neglected. Indirect emissions due to transportation of biomass have now been addressed and reflected in the PDD. The indirect emissions from the transportation have been estimated to be 431 tCO_2 / annum. Since similar quantum of emissions would have occurred in the baseline also, due to the transport of coal for the grid	OK. The complimentary information provided is accepted. CL is closed

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		connected power plants and FO for the onsite DG sets. Also as per attachment C to appendix B of Indicative simplified baseline and monitoring methodology for selected small-scale CDM project activity categories (Point No.12, Page-3), as these emissions are less than 10 %, these can therefore be neglected in the context of SSC project activities. Much larger emissions would have occurred in the baseline scenario due to disposal of ash from coal based power plants in the grid. Furthermore these emissions would have been less than 1%, so as per attachment C to appendix B of Indicative simplified baseline and monitoring methodology for selected small-scale CDM project activity categories (Point No.12, Page-3), as these emissions are less than 10 %, these can therefore be neglected in the context of SSC project activities.	

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APPENDIX B

CERTIFICATES OF COMPETENCE

CERTIFICATE OF COMPETENCE

Amit Thusu

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	--	***JI Validator:***	--
CDM Verifier:	--	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	--		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

Ramesh Ramachandran

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	--
CDM Verifier:	Yes	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 4, 5, 13		
Technical Reviewer for (group of) methodologies:			
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	Yes		

Høvik, 22 December 2006

Einar Telnes
Director, International Climate Change Servicer

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Kumaraswamy Chandrashekara

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	--
CDM Verifier:	Yes	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 4 & 5		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	*AM0021*	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	Yes	*AM0023*	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	*AM0024*	Yes
ACM0004	Yes	*AM0027*	Yes
AM0018, VERSION 01, AM0007, AM0015, AM0036, AM0042	Yes	*AM0028, AM0034*	Yes
ACM0007	Yes	*AM0030*	Yes
ACM0008	Yes	*AM0031*	Yes
ACM0009, AM0008, AMS-III.B	Yes	*AM0032*	Yes
AM0006, AM0016, AMS-III.D	Yes	*AM0035*	Yes
AM0009, AM0037	Yes	*AM0038*	Yes
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	Yes	*AM0041*	Yes
AM0014	Yes	*AM0034*	Yes
AM0017	Yes	*AMS-II.A-F*	Yes
AM0018	Yes	*AMS-III.A*	Yes
AM0020	Yes	*AMS-III.E, AMS-III.F*	Yes

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Michael Lehmann

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	Yes
CDM Verifier:	Yes	***JI Verifier:***	Yes
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1,2,3 & 9		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	*AM0021*	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	Yes	*AM0023*	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	*AM0024*	Yes
ACM0004	Yes	*AM0027*	Yes
AMS-I.C. VERSION 09, AM0007, AM0015, AM0036, AM0042	Yes	*AM0028, AM0034*	Yes
ACM0007	Yes	*AM0030*	Yes
ACM0008	Yes	*AM0031*	Yes
ACM0009, AM0008, AMS-III.B	Yes	*AM0032*	Yes
AM0006, AM0016, AMS-III.D	Yes	*AM0035*	Yes
AM0009, AM0037	Yes	*AM0038*	Yes
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	Yes	*AM0041*	Yes
AM0014	Yes	*AM0034*	Yes
AM0017	Yes	*AMS-II.A-F*	Yes
AM0018	Yes	*AMS-III.A*	Yes
AM0020	Yes	*AMS-III.E, AMS-III.F*	Yes

Høvik, 6 November 2006

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