VALIDATION REPORT

ACEL BLENDED CEMENT PROJECT AT SANKRAIL GRINDING UNIT IN INDIA

REPORT NO. 2006-1880

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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: Ambuja Cements Eastern Ltd. (ACEL)	Client ref.: Mr. S K Sadhu

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Summary:
Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the "ACEL blended cement project at Sankrail grinding unit" project 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 and the subsequent decisions by the CDM Executive Board. This validation report summarizes the findings of the validation.

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 project design document version-06 of 15 December 2006, meets all relevant UNFCCC requirements for the CDM and correctly applies the approved baseline and monitoring methodology ACM0005 version-03. Hence, DNV requests the registration of the "ACEL blended cement project at Sankrail grinding unit" as a CDM project activity.

Report No.: 2006-1880	Subject Group: Environment	
Report title: ACEL blended cement project at Sankrail grinding unit in India		
Work carried out by: Subhendu Biswas, Soumik Biswas, Santhosh Jayaram		
Work verified by: Chandrashekara Kumaraswamy		
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Abbreviations

ACEL	Ambuja Cements Eastern Limited.
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electrical Authority
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CESC	Calcutta Electricity supply corporation.
CL	Clarification request
CMA	Cement Manufacturer's Association.
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
GACL	Gujarat Ambuja Cements Limited.
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LSHS	Low sulphur Heavy stock.
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
ODA	Official Development Assistance
OPC	Ordinary Portland Cement
PDD	Project Design Document
PIN	Project Information Note
PPC	Portland Pozzolana Cement
PSC	Portland Slag Cement
UNFCCC	United Nations Framework Convention on Climate Change

1 INTRODUCTION

M/s ACEL has commissioned Det Norske Veritas Certification Ltd. (DNV) to validate the "ACEL blended cement project at Sankrail grinding unit" 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 consisted of the following personnel:

Mr Subhendu Biswas	DNV Certification India	Team Leader, CDM validator
Mr Soumik Biswas	DNV Certification India	CDM validator
Mr Santhosh Jayaram	DNV Certification Colombo	Sector expert
Mr Chandrashekara Kumaraswamy	DNV Certification 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 and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0005 version-03. The validation team has, based on the recommendations in the Validation and Verification Manual /10/ 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 project is developed by ACEL at their Sankrail unit and involves optimal utilization of clinker by increasing the percentage blend of flyash in the production of Portland pozzolana cement (PPC) beyond the current market practice in the eastern region of India. This increase in the blend of fly ash will reduce the clinker requirement and thus result in the reduction of fossil fuel used for clinker production to the extent that it is replaced with fly ash. The project also helps in effective utilisation of fly ash; a waste generated from thermal power stations, by

reducing the burden of land filling of fly ash and its associated environmental impacts on ground water and ambient air quality.

The total anticipated emission reduction due to the project activity is expected to be 23 727 tons CO_2 e per annum over the 10 years crediting period.

2 METHODOLOGY

The validation consisted of the following three phases:

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

This validation report summarises the findings of the validation.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual /10/. 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 "ACEL blended cement project at Sankrail grinding unit" 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 project design document for "ACEL blended cement project at Sankrail grinding unit" submitted initially by ACEL and subsequent revisions /1/ along with additional background documents related to the project design and baseline /2/-/14/were assessed as a part of the validation. The final validation report is based on the project design document version 6, dated 15 December 2006.

2.2 Follow-up Interviews

DNV performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review the 21st January 2006. Representatives of ACEL and Agrinergy Ltd. were interviewed. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
ACEL *Mr. S.K.Bandopadhyay, Mr. K. M. Kavadia, Mr. Abhijit Ghosh, Mr. Naveen Soni* ***Agrinergy Ltd.*** *Mr. Robert Taylor, Mr. Ben Atkinson*	➢ Ascertaining that project was taken up as a CDM initiative and that CDM was considered during inception. ➢ Clarifications on establishment of baseline, monitoring plan and emission reduction calculations ➢ Assessment of project additionality ➢ Verification of plant related data for baseline determination. ➢ Assessment of marketing and training efforts of the organisation. ➢ Determination of environmental impacts ➢ Assessment of stakeholder consultation process

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 prior to DNV's positive conclusion on the project design. The corrective action requests and requests for clarification raised by DNV Certification Ltd., presented to the project participants in DNV's draft validation report of 16 June 2006 (rev. 1) were resolved during communications 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.

Since modifications to the project design were necessary to resolve DNV's concerns, the client decided to revise the PDD and resubmitted a new version of the PDD on 15 December 2006. After assessing the revised PDD (version 06) 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

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 validation findings relate to the project design as documented and described in the project design document, version 6 of 15 December 2006.

3.1 Participation Requirements

The project participants are the private entities "Ambuja Cements Eastern Limited" of India and "Agrinergy Limited" of The United Kingdom. India is the host country and the United Kingdom is the Annex-I country involved. The host country India and the Annex-I country The United Kingdom both meet all the requirements for participating in a CDM project. The Ministry of Environment and Forests (MoEF), the DNA of India, has approved the project vide letter of approval dated 21 November 2005. The Department for Environment, Food and Rural affairs, the DNA of the United Kingdom, has approved the project with a letter of approval dated 3 October 2006.

3.2 Project Design

The project activity involves increasing the blend of fly ash in PPC produced at the Sankrail grinding unit of ACEL. This will reduce the clinker percentage in PPC manufactured, thereby reducing the GHG emissions associated with the clinker production. Clinker utilised at Sankrail grinding unit is produced at the Bhatapara unit of ACEL. The project proponent proposes to increase the proportion of fly ash in blended cement production. In the base year, 2003-2004, the clinker percentage in PPC for the unit was 68.7%. During the project implementation, the proportion of fly ash is increased from 27.3% at the time of project initiation in 2003-2004 to 32.0% during the ten year crediting period starting from 01 January 2004. The project defines the eastern region of India as the baseline region for the project. The proposed flyash percentage of the project is confirmed to be beyond the common practice in PPC manufacturing in the region as the baseline clinker percentage for the selected region has been evaluated to be 68.2% at the start of the crediting period. The baseline clinker percentage determination has been verified against the data from the Cement Manufacturer's Association (CMA) and found to be in order. Emissions arising from the consumption of fossil fuel and electricity for clinker manufacture in the calcination phase will thus be reduced.

The technology reflects current good practice, involving installation of dust mitigating systems, along with associated fly ash storage and pneumatic conveying systems. Training on operation, maintenance practices and quality control of the PPC while increasing the blend has been

imparted by the project management. Records of on-the-job training were evidenced by DNV and were found to be adequate.

3.3 Project Baseline

The project applies the approved baseline methodology ACM0005 "Consolidated baseline methodology for increasing the blend in cement production", version 03.

The applied baseline methodology is justified as it has been demonstrated that the project activity ensures:

- That there is no shortage of additives i.e. fly ash for blending in cement, and there is no alternative allocation or use of additional amount of additives used,
- That it excludes export of blended cement, and includes only domestically sold output, and
- Data on other cement manufacturers in the region is available from the CMA of India, which is published annually.

The project participants have chosen region comprising of the states of West Bengal, Jharkand, Orissa and Chattisgarh for the estimation of baseline clinker percentage. Regarding the selection criteria stipulated in ACM0005 for selection of the region, it has been justified that:

i) 95% of the total production of the unit is sold within the region selected, which again is greater than the minimum 75% required for region selection,

ii) The selected region includes 7 plants (as against 5 plants stipulated in ACM0005) with published data for PPC production and

iii) Production from the Sankrail unit is only 6% of the production of the selected region.

The benchmark for the baseline clinker percentage has been calculated in a transparent manner. As stipulated in ACM0005, this has been evaluated to be 68.2% based on "*The production weighted average mass percentage of clinker in the top 20% (in terms of share of additive) of the total production of the blended cement type in the region of the year 2003-2004*". In line with the approved methodology, the project has chosen the option of establishing the baseline clinker percentage *ex ante*, with an annual 2% increase in the additive percentage during the ten year crediting period. The baseline clinker percentage for the project is 68.2% at the start of the crediting period and is established *ex ante* to be 62.35% at the end of 10 years of crediting period. The additive percentage as considered in the project activity is defined as "100% minus (baseline clinker% + constant gypsum %). The project uses 5% gypsum as a constant baseline content over the entire crediting period in the PPC manufacturing and the basis of this assumption is justified via verification of past plant performance records.

It has also been evidenced that the project proponent has and archive of all relevant records for the Sankrail grinding unit and Bhatapara clinkerization plant for the period 2000 to 2006.

The baseline emission factors have been deduced from the equations stated in the approved methodology ACM0005, version 03. The data used for arriving at the baseline emission factor are validated and found to be in order. Published CEA data for the western regional electric grid has been used to estimate the baseline emissions due to grid electricity consumption for calcinations at the Bhatapara unit. The emissions corresponding to the consumption of captive

electricity at the Sankrail grinding unit are accounted for based on the metered amount of electricity consumed at the unit for cement grinding

3.4 Additionality

The additionality of the project has been established using the "Tools for the demonstration and assessment of Additionality" approved by the CDM-EB.

Step 0: preliminary screening based on the starting date of the project activity

The project proponent intends to have the crediting starting prior to the registration of project activity. It has been established that the CDM was considered during the project inception. The following documentation to this effect has been evidenced:

a) E-mails from Zenith Corporate Services Limited to Mr. U. R. Raju dated 10 July 2003 discussing prospects of CDM projects.

b) PIN for the project dated November 2003.

The starting date of the project is taken as November 2003 corresponding to the actual increase in proportion of fly-ash in PPC production as confirmed from the plant records.

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

The alternative scenarios identified for the project activity are:

Alternative 1: Continuation of the existing practice of cement (PPC) production with the current blend level.

Alternative 2: Implementation of the project activity not undertaken as a CDM project activity.

Alternative 3: Continuation of the existing practice of cement (PPC) production with blend level as per the prevailing practice in the "Region" selected for the project.

Beside these three alternatives three other options have been discussed. These are reducing the blend level in PPC, switching to OPC and switching to PSC. While reducing the blend level and switching to OPC are theoretically possible, it is in practice unlikely for a PPC producer to revert back to OPC or reduce the blend level. In addition, both of these two baseline options would have led to higher emissions during determination of baseline emissions. Hence these two options have been discarded. The third option of switching to PSC has also been discarded since there is no availability of blast furnace slag in the vicinity of the plant.

Both the baseline alternatives meet the requirements of the Bureau of Indian standards specification IS:1489 (part 10) for the production of fly ash blended Portland Pozzolana Cement, which specifies that the fly ash percentage must fall between 15-35% for production of PPC.

Step 2: Investment analysis

This step has not been considered.

Step 3: Barrier analysis

The project proponent has demonstrated the additionality of the project by technical barrier and barriers due to market resistance.

Technical barriers: While increasing the fly ash blending in cement, the 1st and 3rd day concrete strengths are found to be lower due to the higher fly ash blend. Since these are key parameters in determining the quality of the cement, increasing the fly ash blending while maintaining the quality of the cement is one of the key barriers in increasing the fly-ash blending. Research has been carried out at the Technical Services Department to allow for an increase in the fly ash blend. Approximately 3,800 samples of concrete and mortar have been analysed as part of the process of increasing the blend.

Market resistance to high fly ash blend cement: Un-burnt carbon content in Indian fly ash is high, thus leading to discolouration of cement, which in turn leads to strong customer dissatisfaction. The high proportion of un-burnt carbon and lower silicate content of fly ash interfere with the air entraining agents in the concrete and has negative impacts on the strength of concrete. This again requires stringent quality control on fly ash purchased from different suppliers and locations. Thus, in India, there is a perception of high fly ash blended cement being of inferior quality to OPC. This perception has also been fuelled by a ban imposed by the central public works department on the use of fly ash in cement used for bridges and other public works construction. There is also a general perception that high fly ash blended cement requires more settling time and has lower strength. This is evident from customer complaints received by the project proponent from some of its customers and the dealers. In some cases concerns are also raised due to the darker colour, greater water requirements and lower corrosion protection of the PPC. Thus, due to these perceptions the marketing of fly ash blended cement of higher proportion faces stiff barriers. Consequently, the increase of fly ash blending in the cement is perceived as risky and might lead to loss of market and credibility of the project proponent. To mitigate this, the project proponent had to undertake significant amount of marketing and training activities with the end-users to assure them of the quality of the PPC. The marketing department had run a series of workshops, seminars and programs for customers on the use of PPC and convincing users that high fly-ash PPC is of an acceptable quality. The marketing department is also in constant contact with cement dealers and are able to call in technical services when dealers have concerns over the use and quality of high fly-ash PPC.

Expenditures incurred for the training of technical services personnel for the period 2003-2006 have been presented. These records demonstrate the increasing amount of investment the organisation spent on training of its personnel. The organisation carried out extensive research at the central GACL research institute located at Ambujanagar. Evidence have been provided to confirm the research works carried out at Ambujanagar and is found to be in order.

Step 4: common practice analysis

The baseline proportion of additive blending in the region has been established from the published CMA data. It has been observed that the benchmark baseline clinker percentage in the region is 68.2%. The baseline clinker percentage for the project plant is 68.7%. Some other cement manufacturers have also taken up projects to increase the fly-ash blending. However, all of these plants have claimed for CDM benefits to increase the additive blending in cement manufacturing.

Step 5: Impact of CDM registration

The revenues from CDM will help ACEL to overcome the barriers to the project activity. The funds from CDM will be diverted to both research and marketing efforts. The research activities will be targeted towards increasing and sustaining the quality of the blended cement. Efforts will

be directed to increasing blends and the marketing efforts will be targeted towards training of consumers and technical personnel on the proper use of the blended cement and to overcome the perception that blended cement is of lower quality than OPC. CDM revenues will support the project proponent's research and marketing efforts in overcoming these market barriers.

In conclusion, it is deemed likely that the project activity is not a business-as-usual scenario and would not have been implemented in the absence of the CDM.

3.5 Monitoring Plan

The project applies the approved monitoring methodology ACM0005, version 03, titled "Consolidated monitoring methodology for increasing the blend in cement production".

The monitoring methodology adopted is applicable and justified as the proposed project activity aims to increase the share of fly ash as additive in the PPC production beyond current practices in the selected eastern region.

The monitoring plan adequately addresses all necessary information for monitoring and reporting of emission reductions due to the project activity.

As per the monitoring plan all critical data are either measured or calculated and parameters such as cement production, coal consumption, fly ash consumption etc., are recorded and archived for a period up to 2 years beyond the crediting period.

The project involves production of PPC at the Sankrail plant of ACEL. The clinker is sourced from the Bhatapara unit. As power for the grinding of clinker and fly-ash is drawn from the diesel and LSHS based captive power generation unit. The baseline emission factor for the self generated electricity are based on the monitored amount of fossil fuel consumed and power generated in the Sankrail unit. The Bhatapara unit consumes electricity from the western regional electrical grid the emission factor of the western regional grid has been established *ex-ante* based on the published data. Part of the power consumed for clinker manufacturing is generated within the Bhatapara unit using a diesel / LSHS based captive power generation unit. The emission factors selected for the grids are respectively 0.75 t CO_2e/MWh for the self generated electricity at Sankrail unit, 0.68 t CO_2e/MWh for the self generated electricity at Bhatapara unit and 0.89 t CO_2e/MWh for the western regional grid electricity.

The monitoring plan provides for monitoring of parameters for monthly determination of emission factor from self generated electricity both at the Bhatapara unit and the Sankrail grinding unit. The lime content of the clinker utilised in the project plant will be analysed at the in-house facility at Bhatapara unit.

The monitoring plan provides for monitoring leakage associated with transportation of additional amount of additives. Parameters that are associated with leakage determination will be cross verified against data from the transporters. Calibration and maintenance of process instrumentation are also as per approved monitoring methodology and are governed by the organisations' established procedures as part of the company's quality management system.

Documentation have been reviewed and revised to cover issues such as internal audit, performance reviews and corrective actions pertaining to the blended cement project.

The monitoring of sustainable development indicators has not been included in the monitoring plan. This is considered acceptable as the DNA of India does not warrant monitoring of such indicators.

3.6 Calculation of GHG Emissions

The calculation of the GHG emissions has been done as per the ACM0005, version 03. All the aspects related to the direct and indirect GHG emissions have been addressed and the calculations are presented in a transparent manner.

Agreement with M/s CESC limited, dated 9 December 2004, ascertaining future availability of fly ash for the project activity was presented and found to be in order. The document also demonstrated that the increased amount of fly-ash utilised in the project is in surplus and not a diversion from any other existing user. Thus discounting of emission reductions due to leakage associated with diversion of additive from existing users is not applicable for the project activity.

The project, on implementation, is expected to result in reductions of an average 23 727 tonnes of CO_2 equivalent per year.

DNV has verified all the factors, sources and resulting calculations based on underlying production data and confirmed the reasonableness of the forecasted emission reductions.

3.7 Environmental Impacts

Indian regulations do not warrant an EIA to be conducted for this type of project. The project proponent has assessed the possible impacts of the project activity on the neighbouring environment and established that since the project involves handling of fly ash, it might be a source of dust pollution due to increased fly-ash handling. Adequate measures have been taken to reduce dust pollution. Dust collection bag filter systems, closed tankers for transportation of the fly ash have been incorporated in the project design to counter the possibility of dust pollution. The

3.8 Comments by Local Stakeholders

The local community, regulatory bodies, fly-ash transporters and the customers have been identified as the stakeholders for the project. The stakeholders' meeting was well publicised and the local media like newspaper was used to invite comments on the project. Meetings have been organised with the masons and the dealers as well to train and assure them to use PPC in the construction work. In general, the project by itself did not receive any adverse comment. However concerns were raised due to the increase in fly ash blending by the masons that have been resolved by subsequent training activities. Concerns were also raised on fly ash dusting on crop lands. It has been confirmed during site visit that adequate dust mitigating measures have been implemented in the project plant.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD of was made publicly available on DNV's climate change website (www.dnv.com/certification/climatechange) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 06 December 2005 to 04 January 2006. No comment was received.

5 VALIDATION OPINION

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the "ACEL blended cement project at Sankrail grinding unit project. The validation was performed 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.

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 host country is India. The United Kingdom has been identified as the Annex-I Country. Both countries meet the participation criteria for CDM and have approved the project and authorized the project participants. The Indian DNA also confirmed that the project assists the country in achieving sustainable development.

The project correctly applies the approved baseline methodology ACM0005, version 03 "Consolidated baseline methodology for increasing the blend in cement production". The baseline has been selected by determining the common prevailing clinker percentage of PPC in other manufacturing plants in the selected region that use similar raw material as the project and which face similar economic, market and technological circumstances.

The project activity will reduce clinker production and associated GHG emissions by displacing clinker with fly ash in the production of pozzolona Portland cement. Emissions arising from the calcination of limestone and fossil-fuel based process energy will be reduced. By increasing percentage of fly ash in the cement production, the project results in reduction of CO_2 emissions that are real, measurable and gives long-term benefits to the mitigation of climate change. An analysis of relevant barriers demonstrates that the proposed project is not a likely baseline scenario and emission reductions are hence additional to any that would occur in its absence.

The total emission reductions from the project are estimated to be on the average 23 727 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.

In summary, it is DNV's opinion that the ACEL blended cement project at Sankrail grinding unit project, as described in the PDD, version 06 of 15 December 2006, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0005, version 03. DNV thus requests the registration of the project as a CDM project activity.

REFERENCES

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

/1/ ACEL: *CDM PDD, version 01 and subsequent revisions (latest revised version 06 dated 15 December 2006)*

/2/ ACEL: *Excise reports of 2003 and 2004 for Bhatapara and Sankrail unit*

/3/ DNA of India: *Letter of Approval dated 21 November 2005.*

/4/ DNA of United Kingdom: *Letter of Approval dated 03 October 2006.*

/5/ ACEL: *Agreement of guaranteed fly-ash supply with CESC limited dated 09 December 2004.*

/6/ ACEL: *Project Information Note dated 20 November 2003*

/7/ ACEL: *Excel calculation spreadsheets for emission factors and emission reductions*

/8/ ACEL: *Consent to operated dated 27 May 2005*

/9/ ACEL: *Customer complaints*

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

/10/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. http://www.vvmanual.info

/11/ ACM0005: *"Consolidated Baseline Methodology for Increasing the Blend in Cement Production", version 3, sectoral scope 04, dated 19 May 2006.*

/12/ CDM Executive Board: *Tool for the demonstration and assessment of additionality. Version 02 of 28 November 2005.*

/13/ CMA: *Executive Summary Cement Industry 2004*

/14/ CEA: *CO_2 database power sector* and *CO_2 database user manual*

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

/15/ ACEL:
- *Mr. Kishore M. Kavadia, General Manager (Environment)*
- *Mr. S. K. Bandopadhyay, General Manager (Prod. And Q.C)*
- *Mr. Abhijit Ghosh, Vice President (Marketing)*
- *Mr. Naveen Soni, Assistant Officer (Safety and Occupational Health)*

/16/ Agrinergy: *Mr. Robert Taylor, Mr. Ben Atkinson*

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APPENDIX A

CDM VALIDATION PROTOCOL

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

Requirement	Reference	Conclusion	Cross Reference / Comment
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		Table 2, Section E.4.1,
2. 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	Table 2, Section A.3
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
4. 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	~~CL 1~~	Status of "Host country approval" from U K needs to be clarified. The ministry of environment and forests (India) and department of environment, food and rural affairs (UK) are included as public entity who are project participants as per table A.3 Details of these project participants are not included in annex-01 of the PDD.
5. 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	Table 2, Section E
6. Reduction in GHG emissions shall 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. 12.5c, CDM Modalities and Procedures §43	OK	Table 2, Section B.2

Requirement	Reference	Conclusion	Cross Reference / Comment
7. 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	OK	The project has not received any public funding from any Annex-I country.
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures §29	OK	The Ministry of Environment and Forests (MoEF) is the DNA of India. The Department of Envionment, Food and Rural Affairs is the DNA of UK.
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities §30/31a	OK	India ratified the Kyoto Protocol on 26 August 2002. UK ratified the Kyoto Protocol on 31 May 2002.
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	OK	The assigned amount for UK is 92% of the 1990 emission level.
11. 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	
12. 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	Table 2, Section G
13. 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	OK	Table 2, Section F

Requirement	Reference	Conclusion	Cross Reference / Comment
14. Baseline and monitoring methodology shall be previously approved by the CDM Executive Board	CDM Modalities and Procedures §37e	OK	Table 2, Section B.1.1 and D.1.1
15. 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, Section D
16. 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	The PDD was made publicly available on www.dnv.com/certification/climatechange and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during the period 06 December 2005 to 04 January 2006. No comments were received.
17. 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 circumstances	CDM Modalities and Procedures §45c,d	OK	Table 2, Section B.2
18. 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	Table 2, Section B.2
19. The project design document shall be in conformance with the UNFCCC CDM-PDD format	CDM Modalities and Procedures Appendix B, EB Decision	OK	

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Conclusion
A. General Description of Project Activity *The project design is assessed.*					
A.1. Project Boundaries *Project Boundaries are the limits and borders defining the GHG emission reduction project.*					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR/I	The project boundary includes the Sankrail Grinding unit, Bhatapara clinkerisation unit, on site power generation units at Sankrail and Bhatapara unit and the regional electrical grids to which the Bhatapara unit is connected. Clarification is requested on which regional grids are considered within the project boundaries since clinkerisation for the project activity occurs in the Bhatapara unit and the grinding at Sankrail unit.	~~CL 2~~	OK
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	/1/	DR/I	All the subsystems involved in the manufacturing of cement are taken care of in the project boundary. The grid supply for the grinding and clinkerisation units needs to be clarified.	~~CL 2~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Conclusion
A.2. Technology to be employed *Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.*					
A.2.1. Does the project design engineering reflect current good practices?	/1/	DR/I	The project involves use of closed dumpers for fly-ash transportation, storage system with bag filters for preventing fugitive emissions and solid feeders of high accuracy. This reflects good engineering design and practice.		OK
A.2.2. 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?	/1/	DR/I	Yes the project uses the latest technology in solid additive handling.		OK
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	/1/	DR/I	The project is envisaged to continue producing blended cement with higher proportion of fly-ash. The project has been undertaken after a great deal of research and the most efficient technologies have been used. Hence it is not likely that the project activity would be substituted within the crediting period.		OK
A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	/1/	DR/I	The project requires specialized training in fly ash handling systems, change in operating conditions and training of end users to communicate the requirements of the changed products.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Conclusion
A.2.5. Does the project make provisions for meeting training and maintenance needs?	/1/	DR/I	The organisation has an in-house research and development centre at Ambujanagar. Training has been provided to the marketing and technical services' personnel through in house training programmes and through the R&D centre. Training provisions have also been made for the end-users and training have been imparted to the masons, contractors and dealers.		OK
A.3. Contribution to Sustainable Development *The project's contribution to sustainable development is assessed.*					
A.3.1. Is the project in line with relevant legislation and plans in the host country?	/1/	DR/I	The project has received the DNA approval from India demonstrating that it fulfils all relevant legislative requirements.		OK
A.3.2. Is the project in line with host-country specific CDM requirements?	/1/	DR/I	India has specific requirements in the areas of sustainable development in order to qualify as a CDM project. These are suitably addressed in the project.		OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/	DR/I	The project contributes to the social, environmental, economic and technological well being of the region and is thus in line with the sustainable development policies of the country.		OK
A.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR/I	The project results in local employment generation, investment in research and development efforts and helps in conservation of natural resourced like coal and limestone.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Conclusion
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 baseline methodology previously approved by the CDM Executive Board?	/1/	DR	The project uses the approved baseline methodology ACM0005 "Consolidated baseline methodology for increasing the blend in cement production", version 03. The date of version 03 as given in the design document does not match with the actual date of revision. The project proponent is requested to modify accordingly.	~~**CAR 1**~~	OK
B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/	DR/I	The baseline methodology is justifiably applicable for the projects as it utilizes fly ash for production of blended cement production which is available in abundance. The project accounts for emission reduction against the domestically sold outputs only and there is adequate data available on other PPC manufacturing units in the region from the CMA.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Conclusion
B.2. Baseline Determination *The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.*					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	/1/	DR/I	The discussion and determination of the baseline is transparent. Two other options have been discussed while determining the baseline. These are continuation of the current scenario and the project activity without the CDM benefits. Two other options of reducing the blend level and switch to PSC from PPC have been discarded since slag from steel industries is not available in the region and reducing the blend level leads to more GHG emissions. Among them the continuation of the present blend ratio has been selected as the baseline. However, the other plants in the "region" selected are not transparently described under the baseline discussion. As per 2003~2004 data available from CMA there are 10 other PPC manufactures in the region. Clarification is requested as to why only 7 are included in the discussion. Calculation details are requested to be furnished in order to asses that the baseline clinker % determination is appropriate and as per data available with CMA.	~~CL 3~~	OK
B.2.2. Has the baseline been determined using	/1/	DR/I	The baseline does not take account any	~~CAR 2~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Conclusion
conservative assumptions where possible?			other GHG than CO_2. Changes in CH_4 and N_2O emissions are considered as negligible and are not taken into account which makes it conservative in nature. However the project proponent is requested to use the published CEA data for the grid emission factors since these will give a more conservative estimate of the emission reductions.		
B.2.3. Has the baseline been established on a project-specific basis?	/1/	DR/I	Yes, the baseline has been established on a project specific basis.		OK
B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR/I	The different baseline scenarios are taken into consideration and evaluated against the national policies and prevailing practices in the cement sector to determine the most probable baseline scenario.		OK
B.2.5. Is the baseline determination compatible with the available data?	/1/	DR/I	The project defines West Bengal, Jharkhand, Orissa and Chattisgarh of the Eastern region of India as the "region" for the project activity. During justification of "region selection" it is argued that the total production of the selection region in the base year 2003~2004 is 7862 890 tonnes. However this does not match with the published CEA data for the same period (2003~2004). The project proponent is requested to update the data as per actual data available from CMA.	~~CAR 3~~	OK
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1/	DR/I	Yes the selected baseline of continuation of the current blend is the most likely baseline scenario and the baseline scenario also leads to the lowest GHG emissions among		Ok

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Conclusion
			the other discussed options.		
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario?	/1/	DR/I	The additionality of the project has been assessed by using the additionality tool. **Step 0:** The project starting date was in November 2003. The project proponent is requested to provide documentation in the PDD regarding the starting date of the project and consideration of CDM during project inception. **Step I:** Two other alternatives of the project activity have been discussed. These are continuation of current scenario and project activity without CDM benefit. Both the situations are in compliance with the local regulations. **Step II:** This step has not been selected. **Step III:** The additionality of the project has been demonstrated by technical barriers and barriers due to market resistance to high fly ash blended cement. *Technical barriers:* While increasing the fly ash blending in cement, the 1st and 3rd day strengths are found to be decreased due to the higher blend. Since these are key parameters in determining the quality of the cement, increasing the fly ash blending while maintaining the quality of the cement is one of the key barriers in increasing the fly-ash blending. *Market resistance to high fly ash blend cement:* In India, there is a perception of high fly ash blended cement being of inferior	~~CL 4~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Conclusion
			quality to OPC. This has also been fuelled by a ban imposed on the use of fly ash for bridges and other public works construction by the central public works department. Also there is a general perception that high fly ash blended cement requires more settling time and has lower strength. This is evident from the customer complaints received by the project proponent from the customers and the dealers. Also in some cases concerns are raised due to the darker colour, greater water requirements and lower corrosion protection of PPC. Thus, due to these perceptions the marketing of fly ash blended cement faces stiff barriers. For these reasons the increase of fly ash blending in cement is risky and might lead to loss of market and credibility of the project proponent. It has been argued that considerable marketing and educational efforts were needed to educate the consumers regarding the changed product. Clarification is requested on the expenses incurred for these activities and the future provision for such activities to sustain the project.	~~CL 5~~	
			The two barriers discussed above prevent the increase of blending of fly ash in cement manufacturing. However the project proponent is requested to clarify why the above mentioned barriers are not applicable to the baseline scenario of continuation of present blend level as well. Also the project	~~CL 6~~	

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Conclusion
			proponent is requested to provide documentation regarding the above barriers in the PDD. **Step 4:** The baseline cement blending in the region can be established from the published CMA data. It has been observed that the benchmark baseline clinker % in the region is 68.2%. The baseline clinker % for the project plant is 68.7%. Some other cement manufacturers have also taken up projects to increase the fly-ash blending. However, all of these plants have claimed for CDM benefits to increase the additive blending. **Step 5:** The revenues from CDM will help ACEL to overcome the barriers to the project activity. The funds from CDM will be diverted to both research and marketing efforts. The research activities will be targeted towards increasing and sustaining the quality of the blended cement with increasing blends and the marketing efforts will be targeted towards the consumers and the technical people to train them on the proper use of the blended cement and to overcome the barrier of the perception of fly ash blended cement being of lower quality than OPC.		
B.2.8. Have the major risks to the baseline been identified?	/1/	DR/I	No risks to the baseline have been envisaged for the project activity.		OK
B.2.9. Is all literature and sources clearly referenced?	/1/	DR	Sources of data used to demonstrate the most likely alternatives to the project are		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Conclusion
			clearly indicated in the design document.		
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 and reasonable?	/1/	DR/I	The starting date of the project is indicated as November 2003, The lifetime of the project is indicated as 20 years which is reasonable as per the market trends.		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/I	The project selects the fixed crediting period of 10 years starting from 01 January 2004.		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 ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).*					
D.1. Monitoring Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
D.1.1. Is the monitoring methodology previously approved by the CDM Executive Board?	/1/	DR/I	The project applies the approved methodology ACM0005, "Consolidated Monitoring Methodology for Increasing the Blend in Cement Production" for the project	~~**CAR 4**~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Conclusion
			activity" version 2. The latest version available at the time of validation is version 03 dated 19 May 2006. The project proponent is requested to update the monitoring plan based on the latest version of the methodology.		
D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified?	/1/	DR/I	Yes, the monitoring methodology is applicable to the project activity.		OK
D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices?	/1/	DR/I	The monitoring methodology provides for the collection and archiving of all relevant data required for monitoring of project emissions and leakage determination. Hence the monitoring methodology reflects good monitoring practice.		OK
D.1.4. Is the discussion and selection of the monitoring methodology transparent?	/1/	DR/I	Yes.		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/	DR/I	All the parameters as detailed in the monitoring methodology ACM0005 version 03 are covered under the project monitoring plan and are adequate for the project. Based on the proportion of blend for the specific crediting year, emissions from the clinkerisation, grinding and additive preparation have been taken care of in the project emissions. The project proponent is requested to provide for the monitoring of	~~CL 7~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Conclusion
			the amount of PPC exported (if any) during the crediting period.		
D.2.2. Are the choices of project GHG indicators reasonable?	/1/	DR/I	CO_2 is the only GHG indicator that needs to be accounted for and it has been taken care of.		OK
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/1/	DR/I	The parameters included in the monitoring plan are adequate to measure the GHG emissions from the project activity.		OK
D.2.4. Will the indicators give opportunity for real measurements of project emissions?	/1/	DR/I	It has been confirmed during the site visit that the parameters included in the monitoring plan are measurable and give opportunity for real measurements of project emissions.		OK
D.2.5. Will the indicators enable comparison of project data and performance over time?	/1/	DR/I	Yes. The project will enable comparison of project data and performance over time.		OK
D.3. Monitoring of Leakage *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/	DR/I	Leakage has been identified for the emissions due to increased transportation of additive from the source to the project activity plant. All data required to establish the same is suitably identified in the project monitoring plan.		OK
D.3.2. Are the choices of leakage indicators reasonable?	/1/	DR/I	The leakage indicators are identified in line with the requirements of the approved methodology ACM0005 which is applicable for this project.		OK
D.3.3. Will it be possible to monitor / measure	/1/	DR/I	Under the monitoring plan, the emission factor of transport fuel (ID 61) has been	~~CL 8~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Conclusion
the specified leakage indicators?			mentioned to be cross verified with the transporters records. Clarification is requested regarding how this data will be collected for cross-verification.		
D.3.4. Will the indicators give opportunity for real measurements of leakage effects?	/1/	DR/I	The project does not discount for any diversion of fly ash from existing users to the project plant due to the project activity. The excess availability of fly ash needs to be demonstrated on project specific basis from the designated supplier of fly ash for the project. Clarification is requested on how the availability of additional amount of fly ash is ascertained.	~~CL 9~~	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/	DR/I	All the parameters as per the approved monitoring methodology ACM0005 have been taken care of in the monitoring plan for the project activity.		OK
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR/I	CO_2 is the only relevant baseline indicator. The baseline indicator is reasonable and adequate to evaluate the baseline emissions.		OK
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/	DR/I	The baseline indicators are all based on available data and actual records of plant operations. Hence it will be possible to measure the baseline indicators.		OK
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/1/	DR/I	The data used in the baseline evaluation are taken from financially audited figures		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Conclusion
			which are also part of the excise related data. This ensures that the data are authentic in nature and helps in real measurement of baseline emissions.		
D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts *It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.*					
D.5.1. Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR/I	Parameters concerning environmental, social and economic impacts are not included in the monitoring plan. These are not mandatory as per the guideline of the Indian DNA.		OK
D.6. Project Management Planning *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.*					
D.6.1. Is the authority and responsibility of project management clearly described?	/1/	DR/I	The unit head at Sankrail is responsible for the management of the project activity.		OK
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	/1/	DR/I	The roles and responsibility of the people entrusted with the monitoring and measurement of project parameters are clearly defined under the quality management system of the organisation.		OK
D.6.3. Are procedures identified for training of monitoring personnel?	/1/	DR/I	Yes.		OK
D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended	/1/	DR/I	No such emergencies are envisaged for the project activity.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Conclusion
emissions?					
D.6.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR/I	Calibration of monitoring equipment is ensured under the QMS structure of the organisation.		OK
D.6.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR/I	Yes.		OK
D.6.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR/I	Yes.		OK
D.6.8. 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/I	Most the data is archived in paper/electronic format which are preserved as per standard procedures of the organisation. The procedure has been checked and found to be adequate.		OK
D.6.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR/I	Yes.		OK
D.6.10. Are procedures identified for review of reported results/data?	/1/	DR/I	Yes.		OK
D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	/1/	DR/I	Yes.		OK
D.6.12. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	/1/	DR/I	Yes.		OK
D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR/I	Yes.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Conclusion
E. Calculation of GHG Emissions by Source *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 ex-ante estimated project GHG emissions focuses on transparency and completeness of calculations.*					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	/1/	DR/I	All the indirect and direct aspects of emissions due to the project activity are suitably addressed for the project.		OK
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	The equation used for estimation of project emission during additive preparation has not been updated as per the latest version -03 of approved methodology ACM0005. The project emissions have been calculated on the basis of the projected PPC production in the future years. It is observed that the PPC production estimates from 2009 onwards have almost doubled. Since no future expansion plan was evident during the site visit, the project proponent is requested to justify the sudden jump in PPC production. Also as seen from the CMA data, the grinding unit exported 1200 T of cement during 2003-2004. The project proponent is requested to exclude the exported amount during calculations of the	~~**CAR 5**~~ ~~CL 10~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Conclusion
			emission reductions as required by the methodology.		
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	/1/	DR	In calculating the project emissions, emissions per tonne of clinker/blended cement are evaluated in the project scenario and compared with the baseline emissions per tonne of clinker/blended cement. If the project emissions are found to be lower then the baseline values then the baseline value is substituted by the project value making the estimate conservative in nature. This ensures that that emission reduction is only due to the change in blend and not for any other energy efficiency measure.		OK
E.1.4. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	/1/	DR	Uncertainties in the form of drop in efficiency of the process, changes in the carbon intensity of the fuel and electricity are suitably accounted for in the project design.		OK
E.1.5. Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	/1/	DR/I	CO_2 is the only relevant GHG and it has been evaluated.		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 and estimated ex-ante.*					
E.2.1. Are potential leakage effects beyond the	/1/	DR/I	The leakage issues have been properly		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Conclusion
chosen project boundaries properly identified?			identified and taken care of in the project. Leakage emissions due to additive transportation and conveying have been considered.		
E.2.2. Have these leakage effects been properly accounted for in calculations?	/1/	DR/I	The leakage affects due to additional additive transportation have been accounted for in the calculations.		OK
E.2.3. Does the methodology for calculating leakage comply with existing good practice?	/1/	DR/I	The leakage calculation is in line with the laid down procedure of ACM0005 and thus reflects good practices of the industry.		OK
E.2.4. Are the calculations documented in a complete and transparent manner?	/1/	DR/I	The calculations provided for leakage are not transparent. Clarification is requested on the source of the data used to calculate the leakage. Also, leakage emissions due to additional conveying of additives have not been accounted for in the calculations. The project proponent is requested to justify the exclusion. Also the project proponent is requested to clarify that the data regarding transportation will be collected from the transporters and the round-trip distance have been accounted for in the calculation.	~~CL 11~~	OK
E.2.5. Have conservative assumptions been used when calculating leakage?	/1/	DR/I	The emission due to transportation of raw material and fuel decreases in the project scenario as compared to the baseline scenario. To keep the leakage calculation on the conservative side the emission reduction due to decreased transport requirement of raw material and fuel has not been accounted for.		OK
E.2.6. Are uncertainties in the leakage estimates properly addressed?	/1/	DR/I	The uncertainties in the leakage estimates result from the different types of vehicle	~~CL 12~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Conclusion
			used for additive transportation and the capacity of each of the vehicle. The project proponent is requested to clarify how this will be addressed in the project activity.		
E.3. Baseline Emissions *The validation of ex-ante estimated baseline GHG emissions focuses on transparency and completeness of calculations.*					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	/1/	DR/I	The baseline emissions are estimated based on the actual plant records for the baseline year 2003~2004 and thus represents the most likely baseline scenario.		OK
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	/1/	DR/I	The baseline emission factor determination is done for the base year 2003~2004. Emission factor due to consumption of grid electricity for BC grinding is evaluated to be 0.0281 tCO_2/ tonne BC for Sankrail grinding unit. As evidenced during site visit there was no grid electricity consumption in Sankrail unit in the base year. Clarification is requested on the baseline emission factor used in the project.	~~**CL 13**~~	OK
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR/I	The grid emission factors are established *ex-ante* for the project activity. The project proponent is requested to use the published emission factor data by CEA in ascertaining the grid emissions.	~~**CAR 2**~~	OK
E.3.4. Have conservative assumptions been used when calculating baseline	/1/	DR/I	Please refer to E.1.2.	~~CL 10~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Conclusion
emissions?					
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	/1/	DR/I	No uncertainties are envisaged in the baseline evaluation as the data are all drawn from reputable publicly available domain and are easily verifiable in nature.		OK
E.3.6. Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	/1/	DR/I	The baseline and project emissions are calculated using the same methodology and algorithm and uses the same weighted average principle making it conservative in nature.		OK
E.4. Emission Reductions *Validation of ex-ante estimated emission reductions*.					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	/1/	DR/I	By replacing clinker with additives in cement manufacturing, the project results in 23 727 t CO_2 emission reductions per year over the 10 years crediting period.		OK
F. Environmental Impacts *Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.*					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/	DR/I	The effects of the project on the neighbouring environment have been adequately assessed.		OK
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/	DR/I	As per the directive of the ministry of environment and forest EIA is not required to be carried out for this project activity.		OK
F.1.3. Will the project create any adverse	/1/	DR/I	The project involves handling of fly ash		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Conclusion
environmental effects?			which may cause dust pollution. Adequate measures have been taken to reduce dust pollution. Dust collection bag filter systems, closed tankers for transportation of the fly ash have been incorporated in the project design to counter the possibility of dust pollution.		
F.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR/I	No significant transboundary impacts for the project are envisaged in the project.		OK
F.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR/I	All potential aspects and their possible impacts on the environment are identified for the project. Suitable abatement techniques and measures are in place as a control of those potential aspects.		OK
F.1.6. Does the project comply with environmental legislation in the host country?	/1/	DR/I	The project has received host country approval vide letter number 4/22/2005-CCC dated 21st November 2005.		OK
G. Stakeholder Comments *The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.*					
G.1.1. Have relevant stakeholders been consulted?	/1/	DR/I	The local community, regulatory / statutory bodies, fly-ash transporters and the customers have been identified as the stakeholders for the project.		OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR/I	The stakeholders' meeting was well publicised and the local media like newspaper was used to invite comments on the project. Meetings have been organised with the masons and the dealers as well.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Conclusion
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	The Indian DNA does not have specific regulations/laws regarding stakeholder consultation.		OK
G.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR/I	Concerns on fly ash dusting on crop lands which were raised during the stakeholder consultation have not been provided in the design document.	~~**CAR 6**~~	OK
G.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR/I	Please refer to G.1.4.	~~CAR 6~~	Ok

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
CAR 1 The project uses the approved baseline methodology ACM0005 "Consolidated baseline methodology for increasing the blend in cement production", version 03. The date of version 03 as given in the design document does not match with the actual date of revision. The project proponent is requested to modify accordingly.	Table II, B.1.1	This has been revised in the latest version of the PDD.	**OK**. The version no. and revision date has been modified in the latest PDD. This CAR 1 is closed.
CAR 2 The project proponent is requested to use the published CEA data for the grid emission factors since these will give a more conservative estimate of the emission reductions.	Table II, B.2.2	The CEA data on grid emission factors have been incorporated while calculating the emission estimates.	**OK.** The emission reduction calculations have been modified based on the published emission factor data from CEA. This CAR 2 is closed.
CAR 3 During justification of "region selection" it is argued that the total production of the selection region in the base year 2003~2004 is 7862 890 tonnes. However this does not match with the published CEA data for the same period (2003~2004). The project proponent is requested to update the data as per actual data available from CMA.	Table II, B.2.5	Total cement production in the region is shown by CMA data to be 16,112,680 tonnes on 2003-4. This is made up as follows: W. Bengal 2744070 Jharkhand 3587810 Chhattisgarh 7297640 Orissa 2483160 **Total 16112680** The above figure in included in the revised PDD (page 9).	**OK**. The PDD has been updated and modified based on the latest report from CMA. The value for the cement production now tallies with the CMA data. This CAR 3 is closed.
CAR 4 The project applies the approved	Table II, D.1.1	This date has been included in the revised PDD	**OK.** The monitoring plan has been modified according to the latest

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
methodology ACM0005, "Consolidated Monitoring Methodology for Increasing the Blend in Cement Production" for the project activity" version 2. The latest version available at the time of validation is version 03 dated 19 May 2006. The project proponent is requested to update the monitoring plan based on the latest version of the methodology.			methodology version. This CAR 4 is closed.
CAR 5 The equation used for estimation of project emissions during additive preparation has not been updated as per the latest version -03 of approved methodology ACM0005.	Table II, E.1.2	This has been rectified in the revised PDD.	**OK.** The revised calculations have been checked and found to be correct. This CAR 5 is closed.
CAR 6 Concerns on fly ash dusting on crop lands which were raised during the stakeholder consultation have not been provided in the design document.	Table II, G.1.4	This is now included in the revised PDD.	**OK.** The concern raised and the subsequent actions taken have been provided in the PDD. Adequate dust collection and dust prevention measures have been incorporated in the PDD. This CAR 6 is closed.
CL 1 Status of "Host country approval" from U K needs to be clarified. The ministry of environment and forests (India) and department of environment, food and rural affairs (UK) are included as public entity who are project participants as per table A.3 Details of these project participants are not included in annex-01 of the PDD.	Table I	The UK letter of approval has now been provided. The DNAs of both the countries have been excluded from the list of project participants.	**OK.** The DNA of UK has approved the project vide a letter of approval dated 03 October 2006. The DNAs of both India and UK have been removed from the list of project participants since none of the Parties are project participants. This CL 1 is closed.
CL 2 Clarification is requested on which regional grids are considered within the project	Table II, A.1.1	This is now clarified. Bhatapara is in the Western. Clinkerisation electricity emissions are	**OK.** The selected grids are appropriate for the project activity. This CL 2 is closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
boundaries since clinkerisation for the project activity occurs in the Bhatapara unit and the grinding at Sankrail unit.		thus calculated using the Western grid. For Sankrail unit the emission factor for self generated electricity is used.	
CL 3 The other plants in the "region" selected are not transparently described under the baseline discussion. As per 2003~2004 data available from CMA there are 10 other PPC manufactures in the region. Clarification is requested as to why only 7 are included in the discussion. Calculation details are requested to be furnished in order to asses that the baseline clinker % determination is appropriate and as per data available with CMA.	Table II, B.2.1	This is now clarified in the revised PDD. There are 12 cement plants in the region which produce PPC. However, 4 of these plants (Chaibasa, Singbhum, Rajgangpur and ACC Bargarh) produce a large volume of slag based cement (77%, 64%, 70% and 70% of total cement production respectively). This means that calculation from CMA data of the clinker content of PPC is unreliable, and the figures given for these 4 plants are outside of regulatory allowed and/or feasible levels. The table in the PDD therefore outlines the other 7 cement plant in the identified Region with the required data, and also shows the percentage of clinker in PPC at each of these cement plants.	**OK.** The exclusion of the 4 plants is acceptable since the data for these five plants are unreliable. Also the Rajgangpur plant has a registered CDM project and hence can be excluded. The ACC Bargarh is now included in the IDCOL Bargarh calculation following a merger. The calculation presented have been checked and found to be correct. This CL 3 is closed.
CL 4 The project proponent is requested to provide documentation in the PDD regarding the starting date of the project and consideration of CDM during project inception.	Table II, B.2.7	Extensive documentation has now been provided. This documentation originates from Gujarat Ambuja Cements Limited (at the time Sankrail was under the control of GACL) and explicitly mentions Sankrail.	**OK.** It has been observed from the documentation presented that CDM was considered for the project during the inception and the starting date of the project was in November 2003.E-mails from the consultants to the client and PIN for the project dated November 2003 has been evidenced. This CL 4 is closed.
CL 5 It has been argued that considerable	Table II, B.2.7	Marketing and Training activities carried out and a forward plan for these has	**OK.** The marketing and training activities carried out and the forward

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
marketing and educational efforts were needed to educate the consumers regarding the changed product. Clarification is requested on the expenses incurred for these activities and the future provision for such activities to sustain the project.		now been provided.	plan for the same have been evidenced. The documents have been made available to the validator for verification. The documents have been checked and it has been verified that substantial marketing and training efforts were necessary for the project. This CL 5 is closed.
CL 6 The two barriers discussed above prevent the increase of blending of fly ash in cement manufacturing. However the project proponent is requested to clarify why the above mentioned barriers are not applicable to the baseline scenario of continuation of present blend level as well. Also the project proponent is requested to provide documentation regarding the above barriers in the PDD.	Table II, B.2.7	The barriers relate specifically to an increase in the blending of fly ash in PPC (i.e. an increase in the content of fly ash). As the baseline scenario is continuation of the current blend level, the baseline scenario will not face these barriers. A technical document is provided as evidence of these barriers. This document shows that as fly ash content increase, strength decreases. In addition, letters of complaint from PPC customers are provided.	**OK.** During the site visit and subsequent interviews later on have provided evidence that the project proponent had to face resistance from the market, specifically the masons and contractors, to increase the blend in PPC. Due to the construction practices followed in India, there is reluctance among the constructors to use PPC in the construction. The complaints from the customers have been evidenced which mentions the apprehension of the customers to use PPC due to higher water requirements and more settling time. It was also evidenced during site visit that the project proponent had to organise extensive trainings to alleviate the concerns of the masons and dealers in using PPC with higher fly ash content. This CL 6 is closed.
CL 7 The project proponent is requested to provide for the monitoring of the amount of PPC exported (if any) during the crediting period.	Table II, D.2.1	For monitoring variable 65 (BCy) the comment is provided: Any volume of PPC exported will be deducted from PPC production to arrive at BCy. Documented evidence of any export	**OK.** The PPC exported will be deducted from the actual PPC production during estimation of CERs. Emission reduction calculation to use the domestic sales figure only. For

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		volumes will be provided in the form of invoices and receipts from the sales office of ACEL.	determination of emission factor during the project period the total amount of blended cement produced will be used. This CL 7 is closed.
CL 8 Under the monitoring plan, the emission factor of transport fuel (ID 61) has been mentioned to be cross verified with the transporters records. Clarification is requested regarding how this data will be collected for cross-verification.	Table II, D.3.3	This cross verification reference has now been removed.	**NOT OK.** This is not acceptable since the fuel consumption, distance travelled and additive carried per trip can only be obtained from the transporters themselves. The project proponents requested to clarify how the above data will be collected from the transporters. This CL 8 is closed.
CL 8 (continued) The project proponents requested to clarify how the above data will be collected from the transporters.	Table II, D.3.3	ID 61 in the monitoring plan is the emission factor of the fuel in KgCO2/Kg of fuel. This is provided by the IPCC and hence is not provided by the transporters and not subject to cross verification. However, ID 59 and ID 60 can be cross verified and this is outlined in the revised PDD.	**OK.** The distance per trip and the fuel consumption will be cross-checked with the transporters data. This CL 8 is closed.
CL 9 The project does not discount for any diversion of fly ash from existing users to the project plant due to the project activity. The excess availability of fly ash needs to be demonstrated on project specific basis from the designated supplier of fly ash for the project. Clarification is requested on how the availability of additional amount of fly ash is ascertained.	Table II, D.3.4	Based on data for fly ash generation of 4 tonnes per day of MW capacity (calculated from http://www.hinduonnet.com/2004/07/05/stories/2004070510230400.htm), the annual fly ash production in W. Bengal is estimated at 10.4 million tonnes (7130 MW * 365 days). The only significant use of fly ash is in PPC. PPC production in W. Bengal is 2003-4 was 6.3 million tonnes. The maximum percentage of fly ash allowed in PPC is	**OK.** The project proponent has entered into an agreement with the fly ash supplier (CESC) whereby the surplus supply of additives has been confirmed. Since CESC is dedicated supplier for the project plant, the agreement with CESC ensures that the additive used in the project will not be diverted from some other use of the fly ash. This CL 9 is closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		35%, which would amount to 2.2 million tonnes of fly ash. This is well below availability, showing that there is a major excess of fly ash availability.	
CL 10 The project emissions have been calculated on the basis of the projected PPC production in the future years. It is observed that the PPC production estimates from 2009 onwards have almost doubled. Since no future expansion plan was evident during the site visit, the project proponent is requested to justify the sudden jump in PPC production. Also as seen from the CMA data, the grinding unit exported 1200 T of cement during 2003-2004. The project proponent is requested to exclude the exported amount during calculations of the emission reductions as required by the methodology.	Table II, E.1.2	The plant has concrete plans to increase capacity. This increase in capacity is reflected in the project emissions. There are no plans to export PPC going forward, hence no need to account for such exports in projections.	**OK.** It has been confirmed that the plant will go in for expansion to increase its capacity to 2 million tonnes per annum by 2009. Exports are being monitored in the revised monitoring plan. This CL 10 is closed.
CL 11 The calculations provided for leakage are not transparent. Clarification is requested on the source of the data used to calculate the leakage. Also, leakage emissions due to additional conveying of additives have not been accounted for in the calculations. The project proponent is requested to justify the exclusion. Also the project proponent is requested to clarify that the data regarding transportation will be collected from the transporters and the round-trip distance have been accounted for in the calculation.	Table II, E.2.4	Leakage calculations have now been outlined fully as per the methodology in the attached spreadsheet. Round-trip distance is taken and it has been highlighted in the monitoring variables section of the PDD that data will be collected from transporters.	**OK.** The leakage calculations have been checked and found to be correct. The round-trip distance has been taken for a conservative estimate of the leakage. This CL 11 is closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
CL 12 The uncertainties in the leakage estimates result from the different types of vehicle used for additive transportation and the capacity of each of the vehicle. The project proponent is requested to clarify how this will be addressed in the project activity.	Table II, E.2.6	This is now explained in Section D.2.4.	**OK.** The uncertainty in estimating the leakage resulting from the different types of vehicle used for additive transportation and the capacity of each of the vehicle has been taken care of by monitoring the quantity of additives conveyed by each vehicle for each trip. This CL 12 is closed.
CL 13 The baseline emission factor determination is done for the base year 2003~2004. Emission factor due to consumption of grid electricity for BC grinding is evaluated to be 0.0281 tCO_2/ tonne BC for Sankrail grinding unit. As evidenced during site visit there was no grid electricity consumption in Sankrail unit in the base year. Clarification is requested on the baseline emission factor used in the project.	Table II, E.3.2	This has been corrected in the revised PDD.	**OK.** Since the Sankrail grinding unit is solely dependent on captive power the eastern regional grid emission factor has been removed from the calculations and the baseline emission factor has been based on the captive power plant emission factor of the Sankrail unit. This CL 13 is closed.

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APPENDIX B

CERTIFICATES OF COMPETENCE

CERTIFICATE OF COMPETENCE

Subhendu Biswas

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:	-	***JI Verifier:***	-
Industry Sector Expert for Sectoral Scope(s):			-

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

Soumik Biswas

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:	-	***JI Verifier:***	-
Industry Sector Expert for Sectoral Scope(s):			-

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Santhosh Jayaram

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:	-	***JI Verifier:***	-
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 4		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

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
ACM0006, 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