VALIDATION REPORT

MYSORE CEMENTS LIMITED PORTLAND SLAG CEMENT PROJECT IN INDIA

REPORT NO. 2006-9006

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DET NORSKE VERITAS

VALIDATION REPORT

Date of first issue: 2006-03-24	Project No.: 46069006.
Approved by: Einar Telnes Director	Organisational unit: DNV Certification, International Climate Change Services
Client: Mysore Cements Ltd	Client ref.: Mr. B.K.Kumar, Executive Vice President

Summary:

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the "Mysore Cements Limited Portland Slag Cement 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 of 25th September 2006, meets all relevant UNFCCC requirements for the CDM and correctly applies the approved baseline and monitoring methodology *AM0005 version 3*. Hence, DNV requests the registration of the "Mysore Cements Limited Portland Slag Cement project" as CDM project activity.

Report No.: 2006-9006	Subject Group: Environment	
Report title: Mysore Cements Limited Portland Slag Cement Project in India		
Work carried out by: Praveen Nagaraje Urs Santosh Jayaram		
Work verified by: C Kumaraswamy		
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Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH_4	Methane
CL	Clarification request
CMA	Cement Manufacturer's Association
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MCL	Mysore Cements Limited
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
N_2O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OPC	Ordinary Portland Cement
PDD	Project Design Document
PSC	Portland Slag Cement
UNFCCC	United Nations Framework Convention on Climate Change

1 INTRODUCTION

Mysore Cements Ltd has commissioned Det Norske Veritas Certification Ltd. (DNV) to validate the "Mysore Cements Limited Portland Slag Cement project" (hereafter called "the project") in India. This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation team consists of the following personnel:

Mr Praveen Urs	DNV Certification, Bangalore	Team Leader, GHG auditor
Santosh Jayaram	DNV Certification Colombo	Sector expert
Mr C Kumaraswamy	DNV Certification, Bangalore	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 AM0005, version 3. The validation team has, based on the recommendations in the Validation and Verification Manual /3/ employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

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

1.3 Description of Proposed CDM Project

The project proposed by Mysore Cements Limited for registration as a CDM project involves the increase in share of slag in the production of Portland slag cement (PSC) at Mysore Cements Limited (MCL), Ammasandra, in the Tumkur district of Karnataka. The project activity not only reduces clinker use in the PSC production but also the associated greenhouse gas (GHG) emissions with clinker production, thereby lowering the CO_2 emissions per ton of cement production. The proportion of blending of additive in PSC production is beyond the current

market practice in the southern region of India, which is taken as the baseline region for the project.

The total anticipated emission reduction due to the project is around 35 806 tonnes CO2 equivalents (tCO_2e) per annum.

2 METHODOLOGY

The validation consists 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.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual /3/. 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 "Mysore Cements Limited Portland Slag Cement" project is enclosed in Appendix A to this report.

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

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

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

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities			
Requirement	***Reference***	***Conclusion***	***Cross reference***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**), a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements or a request for **Clarification (CL)** where further clarifications are needed.*	*Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.*

Validation Protocol Table 2: Requirement Checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	*Gives reference to documents where the answer to the checklist question or item is found.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question (See below).A request for **Clarification (CL)** is used when the validation team has identified a need for further clarification.*

Validation Protocol Table 3: Resolution of Corrective Action Requests and Requests for Clarification			
Draft report corrective action requests and requests for clarifications	***Ref. to Table 2***	***Summary of project participants' response***	***Final conclusion***
If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	*Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.*	*The responses given by the project participants during the communications with the validation team should be summarised in this section.*	*This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".*

Figure 1 Validation protocol tables

2.1 Review of Documents

The PDD /1/ for the "Mysore Cements Limited Portland Slag Cement" project (version 01 dated 16th August 2005, version 02 dated 14th November 2005 and the final version 03 dated 25th September 2006) submitted by Mysore Cements Limited and additional background documents related to the project design and baseline were reviewed as a part of validation.

2.2 Follow-up Interviews

On 21st February 2006, DNV performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of Company Mysore Cements Ltd were interviewed. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
Mysore Cements Limited	- Determination of the project additionality and ascertaining that CDM was considered during the project inception - Establishment of the baseline for the project - Adequacy of the monitoring plan - Stakeholder consultation process - Review of the monitoring and verification procedure of the organisation and management structure of the organisation for the project activity - Environmental permits of the plant - Verification of the findings of the desk review

2.3 Resolution of Clarification and Corrective Action Requests

The issues identified in DNV's draft validation report dated 24th March 2006 (version 01) were resolved to DNV's satisfaction during communications between Mysore Cements Limited and DNV.

Since modification to the project design were necessary to resolve DNV's concerns, Mysore Cements Ltd decided to revise the PDD and eventually submitted version 03 of the PDD dated 25th September 2006. After assessing the revised PDD, DNV issued this final validation report.

To guarantee the transparency of the validation process the concerns raised and their response provided by Mysore Cements Ltd is documented in the validation protocol in Appendix A of this report.

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 final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation (version 03 dated 25th September 2006)

3.1 Participation Requirements

The only project participant is Mysore Cements Ltd. The DNA of India approved the project on 17th January 2005. India has ratified the Kyoto Protocol and established a DNA and thus meets the requirements to participate in the CDM. No participating Annex I Party has yet been identified.

No public funding has been used for the project activity.

The project is expected to contribute to socio-economic development of the surrounding area through increased generation of employment for transportation of additional amount of slag and improvement of infrastructure facilities for transportation. In the absence of the project activity, the slag would have been dumped in designated landfill sites and the cement would have been manufactured from the traditional clinker and gypsum. Reduction in clinker percentage reduces the demand for limestone consumption, which further reduces the demand for mining. This reduces GHGs emissions into the atmosphere associated with the production of clinker, apart from reducing specific energy consumption for cement production. The DNA of India has provided confirmation that the project assists in achieving sustainable development.

3.2 Project Design

The objective of the proposed project activity is to develop Portland slag cement (PSC) grades with high slag content in order to replace clinker in the manufacturing of PSC. The project activity involves increasing the share of slag in the Portland slag cement (PSC) production at Mysore Cements Limited (MCL), at Ammasandra in Karnataka. This reduces clinker use in the PSC production and the associated greenhouse gas (GHG) emissions from clinker production, besides lowering CO_2 emissions per ton of cement production.

In the baseline year 2000 the actual proportion of clinker and slag in PSC was 60.92% and 39.07% respectively. Due to the project implementation the proportion of clinker decreased to 60.15% during the first year of the project activity in 2001 and will be further reduced to 53.26% during the subsequent years of the chosen ten years crediting period starting on 1st January 2001. This is confirmed to be beyond the common practice in PSC manufacturing in the region. The baseline clinker percentage for the southern region is evaluated to be 61.69% at the start of the crediting period. The baseline clinker percentage determination is verified against the data from the Cement Manufacturer's Association (CMA) and found to be in order. Emissions arising from the use of fossil fuel for clinker manufacture, calcination of limestone and consumption of electrical energy for clinker manufacturing and cement grinding will thus be reduced.

The technology has been indigenously developed by MCL and the project activity provides for additional hoppers, feeders, conveyors and cement grinding aid.

The project proponent has chosen a fixed crediting period of 10 years with the starting date of the crediting period as 1 January 2001.

3.3 Project Baseline

The project applies the approved baseline methodology ACM0005, version 03 dated 19th May 2006, titled "Consolidated baseline methodology for increasing the blend in cement production".

The baseline methodology is applicable as it has been demonstrated for the project activity that:

- There is no shortage of slag (additives) for blending in cement, and there is no alternative allocation or use of additional amount of additives used in the project plant;
- There is no export of blended cement, and the output of the project activity plant is only sold domestically;
- Data on other cement manufacturers in the region is available from the CMA of India which is published annually.

The project participants have defined the region as states comprising Karnataka, Kerala, Pondicherry, Tamil Nadu, Maharashtra and Goa including the Gulbarga cluster, Yerraguntla cluster, Nalgonda Cluster and Chandrapur Cluster as the *geographic region* for the estimation of baseline clinker percentage. As per the selection criteria stipulated in ACM0005, for selection of the "region", it has been justified that,

- Only domestically sold output is considered and any export of cement produced by the project is excluded from emission reduction calculations.
- The region selected includes 6 plants, including MCL which produce PSC (as against minimum of 5 plants stipulated in ACM0005) with published data for PSC production and
- Production in the region during the baseline year 2000 is 79 times the project plants' output (As compared to minimum four times stipulated in ACM005).

The benchmark for the baseline clinker percentage has been calculated in a transparent manner. As stipulated in ACM0005, this has been evaluated to be 61.69% based on "*The average (weighted by production) mass percentage of clinker for the 5 highest blend cement brands for the relevant cement type in the region*". In line with the approved methodology, the project chooses 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 additive % as considered in the project activity is defined as "100% minus (baseline clinker percentage + constant gypsum percentage).

3.4 Additionality

The additionality of the project has been established using the "Tools for the demonstration and assessment of additionality". The project activity primarily demonstrates the additionality through the barriers of investment, technology and other barriers such as market acceptability.

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 the project activity. The following documentation to demonstrate that CDM benefits were considered during the project inception has been presented and found to be in order:

- The Managing Director's report dated 24th Jan 2000, to the Board of Directors meeting held at Kolkata on the 31st Jan 2000. The Organisation's intention to receive CDM benefits from the project is detailed in this report.
- The invoices provided as Annex III for modification of the existing chrome boltless liners as a part of the project.

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: Implementation of the project activity without the CDM revenues.

Alternative 2: Continuation of the existing practice of PSC production.

Alternative 3: Implementation of PSC production practice, as in other manufacturing plants in the region, using similar input/raw materials, and facing similar economic, market and technical circumstances.

All scenarios meet the requirement of the Bureau of Indian standards specification IS: 455 (Amendment number 05) "Specification for Portland slag cement manufacturing", which specifies that the slag percentage must fall between 25% and 70% for production of PSC.

Step 2: Investment analysis

This step has not been considered.

Step 3: Barrier analysis

It has been demonstrated the project activity results in additional investments. The excessive wear and tear of grinding media, liner plates etc, due to abrasive nature of slag, have made modification and replacement of grate plate and liner plate for middle diaphragm a requisite, thereby increasing the investment and manufacturing cost. The project activity has also entailed additional costs associated with research and development, marketing promotion and brand building. The argument that requirements of additional investment, increase of manufacturing costs and resistance from distribution channels, have proven to be prohibitive for MCL to undertake the project activity is considered reasonable. This in the light of the fact that, with increased percentage of slag, the market share of MC PSC has been demonstrated to have decreased, thus leading to a loss, during the year 2001-2002, immediately after implementation.

The project has also faced technological barriers. It is demonstrated that the operation and maintenance of ball mills in slag cement plants is difficult as the slag is abrasive and hard to grind. Moreover, with increased percentage of slag addition in the PSC the wear rate inside the ball mill further increases, which in turn requires the lining material of the ball mills to be replaced frequently. MCL therefore had to resort to modified high chrome boltless liner plates that reduce wear rate of lining plates and improves grinding.

Availability of granulated slag of proper quality for PSC manufacturing has been identified as another barrier to the project activity. In addition, the quality of slag generated varies depending on the input of raw materials, which is a prerequisite based on the steel plant customer needs. As a result, it is found that as the quality of slag varies, causing the quality of slag cement produced also to be affected. Slag being harder to grind, requires more power for grinding, thereby affecting the rate of production of cement which is lower as compared to OPC. This is considered as a prohibitive barrier as it has direct implication on productivity and O&M costs.

Poor customer knowledge regarding PSC with higher slag content has also been discussed as one of the major barriers to the project as it discourages manufacturers to produce and promote PSC with higher slag content. Compared to the conventionally accepted ordinary Portland cement (OPC), PSC with a higher amount of slag content requires longer curing and setting time. It has been presented that the grey white colour PSC has also created doubts in the market place due to the colour variations between PSC and OPC. Moreover, government agencies like NHAI, central public works department and corporations do not accept the use of blended cements. This has lead to unnecessary doubts in the minds of other users about the quality & performance of PSC. It has been demonstrated that this barrier required MCL to overcome the same through dedicated meetings and trainings, marketing and brand building. The organisation had to thereby invest in marketing, training and awareness programmes facilities in order to overcome this barrier.

Step 4: Common practice analysis

Amongst the 43 cement manufacturing plant in the region, there are only 6 cement plants, including MCL, which manufacture PSC. In addition, the shares of additives in the blended cements have not increased substantially as comparable to the MCL PSC share of additives in all the plants. Considering the technical and utilization uncertainties, it is apparent that it was not a common practice at the time of project conceptualisation to implement PSC manufacturing with high proportion of slag.

Step 5: Impact of CDM registration

CDM revenues will support the project proponent's research and marketing efforts in overcoming the technical barriers and market barriers. The availability of the CDM revenues will also help the organisation to further invest in the research and development efforts and also help in anthropogenic GHG emission reduction.

3.5 Monitoring Plan

The project applies the approved monitoring methodology ACM0005 "Consolidated baseline 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 additive slag in the production of PSC beyond current practices in the region defined.

The monitoring plan adequately addresses all necessary information for monitoring and reporting of emission reductions due to the project activity. All critical data are either measured or calculated and parameters like PSC production, slag consumption, energy consumption for

clinkerisation, grinding and additive preparation etc., are recorded and archived for a period up to 2 years after the crediting period.

The baseline emission factor has been calculated as a combined margin (CM), consisting of the combination of simple operating margin (OM) and build margin (BM) factors, as per ACM0002 and as required by ACM0005. These have been determined ex ante and verified to be 0.996 tCO_2/MWh for the southern Indian grid. The "operating margin" emission factor has been estimated as 1147 t CO_2/GWh, based on the "simple OM" approach as low cost / must run plants constitute less than 50% of the generation of the southern regional grid. For the BM calculation, the 20% of the most recently installed plants have been accounted for in terms of electricity generation. The build margin emission factor has been determined to be 845 t CO_2/GWh.

The monitoring plan also provides for monitoring of leakage, such as emissions caused by transportation of additives-slag.

The MCL Director is vested with the authority and responsibility of the project management, while the eight member CDM team appointed by the Director is responsible for the registration, monitoring, measurement and reporting of the project activity. Calibration and maintenance of process instrumentation are also as per approved monitoring methodology, ACM0005 and are governed by the organisations' established procedures which are a part of the company's quality management system.

3.6 Calculation of GHG Emissions

The calculation of the GHG emissions has been done as per 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.

DNV has verified all the factors, sources and resulting calculations based on underlying production data and confirmed the reasonableness of the forecasted emission reductions. In the project activity the additive (slag) is transported from the supplier locations to the project plant by road. Leakage due to emissions associated with transportation of additional amount of slag is estimated.

The project, if implemented as planned, is expected to result in reductions of an average of 35 806 tonnes of CO_2 equivalent per year.

3.7 Environmental Impacts

Indian environmental regulations do not warrant an Environment Impact Assessment (EIA) for this type of project. MCL has however undertaken and completed the process of an "environmental audit". The audit report was made available to DNV. No adverse environmental impacts are foreseen due to the project activity. MCL has also obtained relevant air and water consents from the respective state pollution control boards for project plant.

3.8 Comments by Local Stakeholders

While a formal stakeholder process is not required for this type of project under Indian Environmental Regulations, MCL has identified employees, education centres and local communities around the plant as the key stakeholders. The meeting was held on 24th October

2005. Invitations and public notices were used to invite the stakeholders for consultation and meeting and provide their comments on the project.

Interactions with the stakeholders were presented and it has been confirmed that no adverse comments were received from the local community and employees, statutory and regulatory bodies.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD (version 02 dated 14th November 2005) 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 22nd November 2005 to 21st December 2005.

No comment was received.

5 VALIDATION OPINION

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the "Mysore Cements Limited Portland Slag Cement" project in India. 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 which is currently the only project participant. The host Party India meets the relevant participation requirements for the CDM and has approved its voluntary participation in the project. The DNA of India has also confirmed that the project assists in achieving sustainable development..

The project activity will reduce clinker production and associated GHG emissions by displacing clinker with slag in the production of Portland slag cement. Emissions arising from the calcination of limestone and fossil-fuel based process energy will be reduced. By increasing the percentage of slag 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 project correctly applies AM0005 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 PSC in other manufacturing plants in the selected region that use similar raw material as the project and which face similar economic, market and technical circumstances. It is justified that the proposed project activity itself is not a likely baseline scenario.

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

The total emission reductions from the project are estimated to be on the average 35 806 tCO_2e per year over the selected 10 year fixed crediting period. The emission reduction forecast has been checked and is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

Adequate training and monitoring procedures have been implemented.

In summary, it is DNV's opinion that the "Mysore Cements Limited Portland Slag Cement" project, as described in the PDD, version 03 of 25th September 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. Given that the project is implemented as described, the estimate for the anticipated emission reductions stated in the project design document is reasonable and likely to be achieved. 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/ Mysore Cements Limited: CDM-PDD for the "Mysore Cements Limited Portland Slag Cement project", Version 03 dated 25th September 2006 and its earlier versions.

/2/ Indian DNA: Letter of approval dated 17th January 2006.

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

/3/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. http://www.vvmanual.info

/4/ ACM0005, *"Consolidated baseline methodology for increasing the blend in cement production"* Version 03 dated 19th May 2006.

/5/ IPCC: *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*. 2000

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

/6/ Mysore Cements Limited:

- B.K Kumar, Executive Vice President,
- Dr Suju George, Care Sustainability.

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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	Annex I party has not been identified yet.	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	OK	A letter of approval from the Indian DNA dated 17 January 2005 has been obtained
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
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	No public funding is involved in the project activity
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures §29	OK	India: The National Clean Development Mechanism (CDM) Authority

Requirement	Reference	Conclusion	Cross Reference / Comment
			Ministry of Environment and Forests
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities §30/31a	OK	India has ratified the Kyoto protocol on 26 August 2002.
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	OK	The project has been proposed as an unilateral project
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	The project has been proposed as an unilateral project
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
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 has been published on DNV's Climate Change website. Parties, stakeholders and NGOs were invited to provide comments on the validation requirement through the UNFCCC CDM website during a period of 30 days from 22 November 2005 to 21 December 2005. No comments were received

Requirement	Reference	Conclusion	Cross Reference / Comment
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 Concl
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 activity is located in Ammasandra Taluk, Turvekre District, in Karnataka state.		OK
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	/1/	DR, I	The project system boundaries include the cement production plant, onsite power generation and power generation in the grid.		OK
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 objective of the proposed project activity is to increase the share of slag in the Portland Slag Cement (PSC) production by reducing the clinker usage. The project does not involve any major changes with regard to the manufacturing technology and reflects current good practices.		OK
A.2.2. Does the project use state of the art technology or would the technology result in a significantly	/1/	DR	The technology for PSC was indigenously developed by MCL. It will enable utilisation		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
better performance than any commonly used technologies in the host country?			of slag beyond the current average blend levels in India.		
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	/1/	DR	It is unlikely that the project technology will be substituted by other more efficient technologies within the projects 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	Since there are no major changes in the production technology, extensive initial training might not be required. It has also been confirmed that on the job training has been provided by MCL.		OK
A.2.5. Does the project make provisions for meeting training and maintenance needs?	/1/	DR	As in A.2.4		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 proposed project is a voluntary initiative by MCL. There are no regulatory requirements related to blended cements in India, except IS 455 amendment 5, which stipulates that the slag content in the cement can vary between 25% and 70%. The project otherwise complies with all the rules and regulations of the host country.		OK
A.3.2. Is the project in line with host-country specific CDM requirements?	/1/	DR, I	Yes. The host country approval has been obtained (Letter of approval dated 17 January 2006 from the DNA of India is available).		OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/	DR, I	The letter of approval from the DNA of India indicates that the project contributes in achieving sustainable development.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	Yes, the project will create other benefits such as creating additional employment opportunities, contributing to reduced energy requirements, limestone conservation and reducing problems associated with the disposal of slag.		OK
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 applies approved consolidated baseline methodology ACM0005, version 3 - "Consolidated methodology for increasing the blend in cement production".		OK
B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/	DR	Yes, the chosen baseline methodology is applicable to the proposed project activity as the project aims to increase the share of additive slag in the production of PSC beyond current practices in India. It has been demonstrated that the project activity: • Ensures sufficient supply of slag and the project activity will not lead to other PSC producers to reduce their slag blend rate.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			• All the cement produced is sold in the domestic market. • Has obtained all adequate databases on cement types in the market from the Cement Manufacturing Association of India.		
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	The benchmark for baseline emissions has been estimated based on the lowest values of the three options stipulated in ACM0005. The lowest value among them has been determined to be: - Based on the production weighted average mass percentage of clinker for the 5 highest blend cement brands for the relevant cement type in the region. However, it needs to be demonstrated with evidence that MCL unit supplies more than 97.5% of the total production in the region.	~~CL 1~~	OK
B.2.2. Has the baseline been determined using conservative assumptions where possible?	/1/	DR	Instead of the national market the project proponents have chosen the regional markets, based on the criteria stipulated in the ACM0005. However, by choosing the southern region,	~~CL 2~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			it is observed that one of the requirements of ACM0005 for selection of the region – *includes at least 5 other plants with the required published data*- is not being fulfilled as the southern region includes only two PSC manufacturers.		
B.2.3. Has the baseline been established on a project-specific basis?	/1/	DR	The baseline has been determined taking into view all the policies / legislations related to cement manufacturing and by mapping all cement manufactures producing PSC type of blended cement only.		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	As per the methodology the baseline is selected by determining the common prevailing clinker percentage of PSC in other manufacturing plants in the selected region who use similar raw material as the project and face similar economic, market and technical circumstances.		OK
B.2.5. Is the baseline determination compatible with the available data?	/1/	DR	Yes. The baseline has been determined based on data published by the Cement Manufacturers Association of India (CMA).		OK
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1/	DR	In the absence of the project activity, it is likely that the existing practice of cement production would have continued.		OK
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario?	/1/	DR	Yes, the project additionality has been demonstrated through the use of the latest tool for additionality: Step 0: The start date of the project activity is Jan 31st 2000. Step 1: 3 alternatives to the proposed project activity have been identified and all of them are consistent with the current laws	~~CL 3~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			and regulations. Step 3: Barrier analysis: Investment barriers: The project activity has entailed investment in modification and replacement of grate plate and liner plate for middle diaphragm. It has also incurred cost associated with R & D, marketing promotional and brand building. With increase in percentage of slag, it has been claimed that the market share of MCL PSC has decreased which has resulted in sales loss. Market acceptability barriers: It has been presented that the perception that the low early strength of the PSC and grey white colour of the cement make it less acceptable in the market. The government agencies like NHAI, State Govt Organisation and many others do not accept the use of blended cements. Technological barriers: It has been argued that maintaining the quality of the cement and maintenance of the unit represents a major technical barrier to implementation of the project activity, as slag is harder to grind Step 4: It has been demonstrated that prevailing practice in the southern region is manufacture of either OPC or PPC. Apart from MCL there is only one other plant in the region manufacturing PSC. Step 5: The carbon credits received from		

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			the CDM project activity will help remove market barriers restricting increased slag content in blended cement and invest in further R&D efforts. In our opinion, it remains to be more clearly demonstrated that project activity is additional, in the absence of: 1) Evidence of project implementation in March 2000 – shall be provided. 2) Evidence of considering CDM incentives at the start of the project activity shall be provided 3) Step 3: claims for the following shall be substantiated: a) investment in modification and replacement of grate plate and liner plate for middle diaphragm, for the project activity. b) With increase in percentage of slag, the market share of MCL PSC has decreased which has resulted in sales loss. c) It is also evident that slag constituting 31.5% is the composition in the baseline scenario at the start of project activity. d) Government agencies like NHAI, UP State Bridge Corporation Ltd and many others do not accept the use of blended cements.		
B.2.8. Have the major risks to the baseline been identified?	/1/	DR	No risks to the baseline have been identified.		OK
B.2.9. Is all literature and sources clearly referenced?	/1/	DR	Yes, CMA, CEA and IPCC data has been		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			considered.		
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	The project start date is 31st Jan 2000 and the operational lifetime of the project is determined as 20 years.		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	A fixed crediting period of 10 years has been chosen with the starting date as 1 January 2001.		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	The monitoring methodology is per the approved methodology ACM0005 for "Consolidated methodology for increasing the blend in cement production".		OK
D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified?	/1/	DR	Yes, the chosen monitoring methodology is applicable to the proposed project activity		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			as the project aims to increase the share of additive slag in the production of PSC. It has been demonstrated that the project activity: • Ensures sufficient supply of slag and the project activity will not lead to other PSC producers to reduce their slag blend rate. • All the cement produced is sold in the domestic market. • Has obtained all adequate databases on cement types in the market from the Cement Manufacturing Association of India.		
D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices?	/1/	DR	Yes. All relevant data as stipulated in the approved monitoring methodology have been sufficiently addressed in the PDD		OK
D.1.4. Is the discussion and selection of the monitoring methodology transparent?	/1/	DR	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	All relevant data necessary for the estimation or measuring the GHG emissions within the project boundary have been included in the monitoring plan.		OK
D.2.2. Are the choices of project GHG indicators reasonable?	/1/	DR	Project emissions per tonne of blended cement, (t CO_2 / t of BC) have been chosen		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			as GHG indicator.		
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/1/	DR	Yes. It will be possible to monitor the specified project GHG indicators.		OK
D.2.4. Will the indicators give opportunity for real measurements of project emissions?	/1/	DR	The parameters to be monitored to evaluate the emissions due to the project activities are measurable.		OK
D.2.5. Will the indicators enable comparison of project data and performance over time?	/1/	DR	Yes.		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	Leakage emissions for transport of additives have been adequately addressed.		OK
D.3.2. Are the choices of leakage indicators reasonable?	/1/	DR	The leakages are identified for emissions related to transport of additive which increases due to the project activity.		OK
D.3.3. Will it be possible to monitor / measure the specified leakage indicators?	/1/	DR	Yes as the units is manufacturing only PSC.		OK
D.3.4. Will the indicators give opportunity for real measurements of leakage effects?	/1/	DR	Yes		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	/1/	DR	Yes, the baseline indicators have been chosen in line with the ACM0005. Captive power and grid power have also		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
during the crediting period?			been considered in the baseline.		
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR	Yes. The baseline is evaluated ex-post for each crediting year and the emission due to calcinations, clinker generation both due to consumption of grid electricity and captive generation and grinding /preparation of additive is taken care of.		OK
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/	DR	The baseline indicators are all based on available data and actual records of plant operations.		OK
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/1/		Yes		OK
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	The monitoring of sustainable development indicators has not been included in the monitoring plan. This is considered acceptable as the DNA of India considers that the project contributes to sustainable development and do not call for monitoring them.		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	/1/	DR	Director has been vested with the authority		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
management clearly described?			and responsibility of project management.		
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	/1/	DR	The eight member CDM team appointed by the Director is responsible for the registration, monitoring, measurement and reporting of the project.		OK
D.6.3. Are procedures identified for training of monitoring personnel?	/1/	DR	Procedures exist as part of the quality management systems of the company. Company is certified to ISO 9001 systems.		OK
D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	As in D.6.3		OK
D.6.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR	As in D.6.3		OK
D.6.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR	As in D.6.3		OK
D.6.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR	As in D.6.3		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	Most the data is archived in electronic format which are preserved as per standard procedures laid down by 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	Procedures exist as part of the quality management systems of the company. Company is certified to ISO 9001 systems.		OK
D.6.10. Are procedures identified for review of reported results/data?	/1/	DR	As in D.6.3		OK
D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	/1/	DR	As in D.6.3		OK
D.6.12. Are procedures identified for project	/1/	DR	As in D.6.3		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
performance reviews before data is submitted for verification, internally or externally?					
D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR	As in D.6.3		OK
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	All relevant direct and indirect GHG emissions have been captured in the project design.		OK
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	Yes, the calculations are transparent.		OK
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	/1/	DR	Yes		OK
E.1.4. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	/1/	DR	No major uncertainties are foreseen.		OK
E.1.5. Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	/1/	DR	Yes. Mainly CO2.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
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 chosen project boundaries properly identified?	/1/	DR	Yes Potential leakage effects are related to transportation of slag to plant site are identified. • Updates in ACM 0005 (Version 02 dated 28 November 2005) with changes to leakage related calculations (Equations 2 and 2.1 of the methodology) needs to be incorporated into the PDD in section D.2.3.2 and Section E.2. • Corresponding figures of 'Estimation of leakage' and 'Estimation of emissions reductions' in section E.6 will need to be rechecked. This may also mean a change in estimated emissions reductions figures for all locations given in A.4.4.1	~~CL 4~~	OK
E.2.2. Have these leakage effects been properly accounted for in calculations?	/1/	DR	Pending E.2.1 of above	~~CL 4~~	OK
E.2.3. Does the methodology for calculating leakage comply with existing good practice?	/1/	DR	Pending E.2.1 of above	~~CL 4~~	OK
E.2.4. Are the calculations documented in a complete and transparent manner?	/1/	DR	Pending E.2.1 of above	~~CL 4~~	OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
E.2.5. Have conservative assumptions been used when calculating leakage?	/1/	DR	Pending E.2.1 of above	~~CL 4~~	OK
E.2.6. Are uncertainties in the leakage estimates properly addressed?	/1/	DR	Pending E.2.1 of above	~~CL 4~~	OK
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	Yes		OK
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	/1/	DR	The baseline takes into account all the possible sources of emissions and is in line with the approved baseline methodology ACM0005 which is applicable for this project.		OK
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	Yes		OK
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	/1/	DR	Yes		OK
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	/1/	DR	No uncertainties are foreseen.		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	Yes		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
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	Yes, the project is expected to reduce 35807 tCO2e per year resulting in total emission reductions of 358067 $tCO_{2..}$		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 □alidators.*					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/	DR	No adverse environmental impacts are expected to occur as the project activity represents an increase in existing percentage of slag in the cement production.		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	EIA is not required for this type of project activity.		OK
F.1.3. Will the project create any adverse environmental effects?	/1/	DR	No adverse environmental impacts are expected to occur. The reduction in clinker percentage per ton of cement produced reduces adverse environmental impact related to calcinations of limestone, slag disposal and conserve natural resources like limestone and coal.		OK
F.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR	No significant transboundary impacts are expected to occur due to the project activity.		OK
F.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR	No adverse environmental impacts are expected to occur. An environmental audit has been conducted in 2000 evidencing no major environmental impacts.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
F.1.6. Does the project comply with environmental legislation in the host country?	/1/	DR, I	Project complies with all the environmental legislation in India. All valid environmental permits such as air consent and water consent were evidenced.		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	Key stakeholders consulted for the project activity have been the employees, members of the local panchayat body and senior citizens around the plant. The meeting was held on 24 October 2005.		OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	Invitations and public notices were used to invite comments from the local stakeholders.		OK
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR	Not required for change in the percentage of additives in PSC.		OK
G.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR	Yes. No negative comments were received.		OK
G.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR	Not required as no adverse comments were received.		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
CL 1: It needs to be demonstrated with evidence that MCL unit supplies more than 97.5% of the total production in Karnataka and Kerala state. Also the determination of percent clinker based on CMA data shall also be demonstrated.	B.2.1	a) MCL supplies more than 97.5% of the total production to Karnataka and Kerala State. In response to CL2, we have changed the definition of the region and MCL supplies more than 97.5% of the total production in this region too (See Annex I). b) The benchmarking spreadsheet attached demonstrates the determination of percent of clinker based on CMA data. Wherever, the plants data on percentage of clinker is available in public domain (from the individual PPs project design documents or plant record) such data is taken into account.	Market share of PSC dispatch has been provided and demonstrated that MCL supplies more than 97.5% of the total production in the region. Benchmarking spread sheet provided has been verified. CL 1 is closed.
CL 2: By choosing the southern region, it is observed that one of the requirements of ACM0005 for selection of the region - *includes at least 5 other plants with the required published data*- is not being fulfilled as the southern region includes only two PSC manufacturers	B.2.2	MCL is located in the state of Karnataka. The plant caters their cement to Karnataka state and adjoining state market and clusters. The key parameters affecting the percentage of additive blending vary widely in cement manufacturing units across India depending on the local scenarios. Therefore, the region has been redefined; it considers plants that are located in the state of Karnataka, adjoining states and adjoining clusters. Out of 43 plants in the region only 6 (including project proponent) plants are producing PSC. This fulfils the ACM 0005 criteria for selection of the region. The required change is incorporated in the PDD.	The project participants have now re-defined the region as states comprising Karnataka, Kerala, Pondicherry, Tamil Nadu, Maharashtra and Goa including the Gulbarga cluster, Yerraguntla cluster, Nalgonda Cluster and Chandrapur Cluster as the *geographic region* for the estimation of baseline clinker percentage. Accordingly six plants produce PSC.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
The data source for all values used while defining the region and the benchmark selection needs to be provided.	B.2.2.	Data Source: Clinker Data : Section :Performance of Cement Plant Regionwise-statewise (1999-2000).Cement statistics 2000; Published by Cement Manufacturers Association Cement Data:, Varietywise Cement Production, Regionwise-statewise (1999-2000), Cement statistics 2000; Published by Cement Manufacturers Association	Data sources provided have been verified and accepted. CL 2 is closed.
CL 3: In our opinion, it remains to be more clearly demonstrated that project activity is additional, in the absence of: a) Evidence of project implementation in March-April 2000 – shall be provided. b) Evidence of considering CDM incentives at the start of the project activity shall be provided c) Step 3: claims for the following shall be substantiated: I. investment in modification and replacement of grate plate and liner plate for middle diaphragm, for the project activity II. With increase in percentage of slag, the market share of MCL PSC has decreased which has resulted in sales loss III. Slag levels prevailing in the market and PSC manufactured in MCL is at a level that	B.2.7	a) The documentation proof on project implementation is submitted as Annex III. b) Evidence of considering CDM incentive at the start of the project activity is attached as Annex II. c) I. the documentation proof for the same is submitted as annex III. II. the documentation proof for the same is submitted as Annex I. III. There are 43 cement manufacturing plans in the selected region. Out of 43 plants (including MCL), only 6 manufacture PSC. In addition, the share of additives in other plants blended cements have not increased substantially as comparable to the MCL PSC share of additives. The increase in share of slag in the PSC as a result of the project activity takes the PSC to a level that exceeds common practice	a) Documents with the equipment suppliers for high chrome bolt liners in the year 2000 has been evidenced. b) The Managing Director's report dated 24th Jan 2000, to the Board of Directors meeting held at Kolkata on the 31st Jan 2000 has been provided. The Organisation's intention to receive CDM benefits from the project is detailed therein c) i. Documents related to the modification placed on AIA Engineering limited have been verified. ii. The market share of MCL PSC data provided has been verified and accepted.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
represents a "first of its kind blended cement having more than 50 percentage additives" within the region. It is also evident that slag constituting 31.5% is the composition in the baseline scenario at the start of project activity. IV. Government agencies like NHAI, UP State Bridge Corporation Ltd and many others do not accept the use of blended cements		in the relevant region. However due to revision in the geographical region of the project activity and enlargement of the geographical region the project activity no more qualifies for the "first of its kind blended cement having more than 50 percentage additives" category. The slag percentage in the baseline scenario has been changed to 39.31%. The same is incorporated in the revised PDD. IV. Documentary proof from state agencies and private parties is submitted as annex IV.	iii.Complimentary information provided has been accepted. Revised PDD has been verified. iv. Evidences provided have been verified. CL 3 is closed.
CL 4: a) Updates in ACM 0005 (Version 02 dated 28 November 2005) with changes to leakage related calculations (Equations 2 and 2.1 of the methodology) needs to be incorporated into the PDD in section D.2.3.2 and Section E.2. b) Corresponding figures of 'Estimation of leakage' and 'Estimation of emissions reductions' in section E.6 will need to be rechecked. This may also mean a change in estimated emissions reductions figures for all locations given in A.4.4.1	E.2.1	a) The new version of methodology is adopted and relevant changes are incorporated in relevant section of the PDD. b) The emission reduction figure has been revised after the change in percentage of baseline slag percentage. The required changes are incorporated in the PDD.	Revised PDD has been verified and clarifications sought have been appropriately addressed. CL 4 is closed.
CL 5: a) The section D.2.3.2 states that the "Additional amounts of slag used are surplus slag available in the region. Therefore leakage due to the diversion of		a) and b) Mysore Cement sources slag from JSW Steel Ltd which is one of the big plant in the state of Karnataka. It also sources	Complimentary information provided is accepted. Data sources have been verified. CL 5 is closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
additives from existing use is not considered." The slag available is surplus needs to be substantiated, else a the project emissions reductions will be reduced by a factor (alpha) =x tones of additives in yr y / total additional additives used in yr y. b) Similarly, the applicability of the project is defined by proving "There is no shortage of additives related to the lack of blending materials." Project participants should demonstrate that there is no alternative allocation or use for the additional amount of additives used in the project activity.		slag from Visvesvarya Iron and Steel Limited and Kalyani Steels Ltd. JSW Steel installed capacity during the year 1999-2000 was 0.8 MTPA and currently the installed capacity is 3.8 MTPA. It is expected to increase steel production to nine million tonnes by 2009-10. Other players like South West Iron Steel Ltd, Kiloskar Ferrous Industries Ltd, Ispat Industries Ltd, Surana Industries Ltd and BMM Ispat Ltd are executing major projects in the region. During the last three years 100 sponge iron plants were also sanctioned in the region. JSW Steel Ltd source states that "for each tonne of steel produced in the steel manufacturing process about 350 kg of slag and 400 kg of granulated slag are produced." The region defined in the PDD produced 0.7 million tonnes of slag cement during the year 1999-2000 and currently it produces 3.7 Million tonnes of slag cement. As a conservative estimation this requires 2 million tonnes of slag (50-60 % slag) for the production of 3.7 million tonnes of slag cement. JSW Steel only produces slag ranges between 1.2 -1.4 Million tonnes. Order bordering states to Karnataka are also having Steel Manufacturing units that produce slag from its production process. In 2005, about 30 million tonnes of iron	

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		ore was extracted from the Bellary-Raichur-Koppal (Karnataka state) triangle making it one of the key producers of high grade iron ore. (To produce one tonne of virgin steel 1500kg of iron ore is required). This gives an estimated production of 20 million tonnes of Steel from the iron ore. The same amount of steel manufactured would produce 7 to 8 million tonnes of slag. Steel majors flock Karnataka with Rs 30,600 crore plans, Business standard, dt 25/09/2006. (http://ia.rediff.com/money/2006/sep/25steel.htm) 2 www.jsw.in (data on JSW installed capacity)Source: http://www.jsw.in/JSW%20Steel/JSW_Annual%20Report_2005-06Delux.pdf	

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