VALIDATION REPORT

TRANSALLOYS MANGANESE ALLOY SMELTER ENERGY EFFICIENCY PROJECT IN SOUTH AFRICA

REPORT NO. 2007-0068

REVISION NO. 02

DET NORSKE VERITAS

VALIDATION REPORT

Date of first issue: 2007-01-15	Project No.: 45010114
Approved by: Einar Telnes Director	Organisational unit: DNV Certification, International Climate Change Services
Client: EcoSecurities Ltd.	Client ref.: Arnaud Viel

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Summary:
Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the "Transalloys Manganese Alloy Smelter Energy Efficiency Project" in South Africa 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 documents, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.
As requested by the CDM Executive Board (EB33 report, paragraph 64 c) of 27 July 2007) the validation report of 5 March 2007 was modified to be corresponding to the revised PDD submitted by the project participant in response to the request for review.

In summary, it is DNV's opinion that the "Transalloys Manganese Alloy Smelter Energy Efficiency Project" in South Africa as described in the revised PDD of 02 March 2007 version 6 meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology AM0038 Version 01 dated 29 September 2006.
Hence, DNV will request the registration of the "Transalloys Manganese Alloy Smelter Energy Efficiency Project" as a CDM project activity.

Report No.: 2007-0068	Subject Group: Environment
Report title: Transalloys Manganese Alloy Smelter Energy Efficiency Project in South Africa	
Work carried out by: Soumik Biswas, Mr Jan Van Evercoren, Michael Lehmann, Trine Kopperud	
Work verified by: Einar Telnes	

Date of this revision:	Rev. No.:	Number of pages:
2007-08-29	02	15

Indexing terms

Key words	Service Area
Climate Change Kyoto Protocol Validation Clean Development Mechanism	Verification
	Market Sector
	Process Industry

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Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH_4	Methane
CL	Clarification request
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
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
N_2O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PCD	Pitch Centre Diameter
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change

1 INTRODUCTION

EcoSecurities Ltd. has commissioned Det Norske Veritas Certification Ltd. (DNV) to perform a validation of the "Transalloys Manganese Alloy Smelter Energy Efficiency Project" in South Africa. 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 Soumik Biswas	DNV Certification India	CDM Validator
Mrs Trine Kopperud	DNV Certification Norway	GHG Auditor
Mr Jan Van Evercoren	DNV Certification Belgium	Sector Expert
Mr Michael Lehmann	DNV Certification Norway	CDM Validator
Mr. Einar Telnes	DNV Certification Norway	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 AM0038. The validation team has, based on the recommendations in the Validation and Verification Manual /14/ 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 "Transalloys Manganese Alloy Smelter Energy Efficiency Project", developed by Highveld Steel and Vanadium Corporation, is an industrial energy efficiency project that will reduce the electricity consumption in the production of silicomanganese (SiMn) alloy (a key component in steel making) at its Witbank facility in South Africa. The project involves a retrofit of current furnaces with new design of electric arc furnaces, electrode assemblies and new control and peripheral systems. The target is to reduce the specific electricity consumption of the alloy production by approximately 10-20% to between 4.5-4 MWh per tonne of alloy produced. This

will result in a reduction of the specific electricity consumption at approximately 0.4 MWh/ton. The project will thus displace electricity from the South African grid, which is mostly generated from coal combustion. The amounts of coal and coke used as reductants and paste (mostly made of carbon) used as electrodes in the submerged electric arc furnaces in the alloy production are not expected to be affected by the project. The project comprises 5 furnaces with a step-wise implementation over 5 years. The technology is now implemented in 3 of the 5 furnaces. The annual GHG emission reduction is estimated to be 55 044 tonnes of CO_2e on average over the chosen 10 year crediting period.

2 METHODOLOGY

The validation consists of the following three phases:

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

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual /14/. 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 "Transalloys Manganese Alloy Smelter Energy Efficiency 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 (CARs) 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 version 03 dated 3 November /1/ and PDD version 05 dated 02 March 2007 /2/ submitted by EcoSecurities and additional background documents related to the project design and baseline /2/-/19/ were reviewed as a part of the validation.

Moreover, the revised PDD of 2 March 2007, version 6, submitted by the project participant in response to the request for review of the project, was assessed.

2.2 Follow-up Interviews

12 December 2006 DNV performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of Transalloys Division of the Highveld Steel and Vanadium Corporation Ltd. and EcoSecurities were interviewed. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
Transalloys Division of the Highveld Steel and Vanadium Corporation Ltd. Ecosecurities Group Plc	➢ Project background information ➢ Technology used for the project ➢ Ex-ante monitoring and baseline determination ➢ Project additionality ➢ Monitoring plan ➢ Emission reduction calculation ➢ Project approval status ➢ Local stakeholder consultation process

2.3 Resolution of Clarification and Corrective Action Requests.

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

The corrective action requests and requests for clarification identified by DNV Certification Ltd., and presented to the project participants in DNV's draft validation report of 15 January 2007 were resolved during communications between Ecosecurities and DNV. Since modifications to the project design were necessary to resolve DNV's concerns, Ecosecurities decided to revise the PDD and resubmitted the revised PDD version 5 dated 2 March 2007. Following the request for review the PDD of 2 March 2007 was modified and a new version 6 was issued.

To guarantee the transparency of the validation process, the concerns raised and responses given are documented in the validation protocol in table 3 of the validation protocol in Appendix A to this report.

2.4 Internal Quality Control

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

3 VALIDATION FINDINGS

In the following sections the tentative findings of the validation are stated. The validation findings for each validation subject are presented as follows:

1) The findings from the desk review of the original project design documents and the findings from interviews during the follow up visit are summarised. A more detailed record of these findings can be found in the Validation Protocol in Appendix A.
2) Where DNV had identified issues that need clarification or that represented a risk to the fulfilment of the project objectives, a clarification or corrective action request are stated, where applicable, in the following sections and are further documented in the Validation Protocol in Appendix A. The validation of the project resulted in six (6) corrective action requests and three (3) clarification requests.

The final validation findings relate to the project design as documented and described in the CDM PDD for the "Transalloys Manganese Alloy Smelter Energy Efficiency Project", Version 6, 02 March 2007 /3/.

3.1 Participation Requirements

The project participants are Highveld Steel and Vanadium Corporation Limited and EcoSecurities Group Plc. The participating Parties are South Africa as the host Party and the United Kingdom of Great Britain and Northern Ireland as the Annex I Party. Both Parties meet the requirements to participate in the CDM.

The letters of approval of the Designated National Authorities (DNA) of South Africa and the United Kingdom, including a confirmation by the DNA of South Africa that the project assists in achieving sustainable development, are still to be issued. Written approval of both DNAs is awaited and needs be obtained prior to a final validation report being issued

3.2 Project Design

The project is a retrofit of current furnaces with new design of electric arc furnaces, electrode assemblies, and associated control and peripheral systems.

The nature of the project is to reduce the specific electricity consumption of alloy production by 10-20% to achieve an approximately reduction of 0.4 MWh in the specific electricity consumption per tonne of alloy produced. The project will thus displace electricity from the South African grid, in which electricity is mostly produced from combustion of coal. The project has no significant adverse environmental effects.

The project activity started 1 October 2004 and has a planned implementation time over 5 years. An operational lifetime of the project is supposed to be at least twenty (20) years and the project participants chose a fixed crediting period of ten (10) years starting on 1 October 2004.

The expected annual project emission reduction are estimated to be 55 044 tonnes of CO_2e on average over the crediting period.

3.3 Baseline Determination

The project applies the baseline methodology, AM0038 "Methodology for improved electrical energy efficiency of an existing submerged electric arc furnace used for the production of SiMn", version 01, dated 29 September 2006 /15/.

The approved methodology is applicable to the project as this project fulfils the following conditions:

- Submerged electrical arc furnaces are used for production of silicomanganese (SiMn) both in the project case and baseline;
- The electricity consumed, both in the project case and the baseline, by the submerged electric arc furnace is sourced from the grid and not by onsite generation.
- The geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available;
- The quality of the raw material and SiMn produced is not affected by the project activity and remains unchanged;
- The local regulations/programs do not cap the level of grid electricity that can be procured by the SiMn production facility where the project activity is implemented;
- Data for at least three years preceding the implementing the project activity is available to estimate the baseline emission;
- Emission reduction credits shall be claimed only until the end of the lifetime of the equipment;
- The project activity does not result in increase of production capacity of the SiMn production facility, where the project is implemented, during the crediting period.

It should be mentioned that the methodology AM0038 was development on the basis of this project.

The baseline scenario was identified according to the step-wise approach as defined in AM0038. This includes the project scenario from the viewpoints of technical feasibility, regulatory requirements, prohibiting barriers as well as economical attractiveness.

Step 1: Identify technically feasible options to increase energy efficiency within the project boundary:

The methodology firstly involves an identification of technically feasible options to increase energy efficiency within the project boundary. For each furnace the following alternatives were considered:

- Complete replacement of furnace;
- Continued use of installed furnace technology;
- The project activity, installation of new-build design, not implemented as a CDM project;
- All other plausible and credible alternatives to the project activity that provide energy efficiency improvement to the furnace which are technically feasible to implement with comparable quality, properties and application areas.

Different technology providers were considered by the project proponent. However, no alternative project activities were identified.

Step 2. Identify baseline alternatives that do not comply with legal or regulatory requirements:

All the above scenarios comply with legal and regulatory requirements.

Step 3: Eliminate baseline alternatives that face prohibitive barriers

The project proponent has attempted to eliminate the scenarios that faced prohibitive barriers. The following main barriers are identified:

- Low electricity price in South Africa and hence no incentives for electrical efficiency projects,
- High investment costs for the technology,
- Technology risk, and
- Lack of prevailing practice.

Implementing a complete replacement of a furnace with ancillary equipments is facing a barrier due to high levels of investment and at the same time a lack of incentives for electricity savings due to the low electricity price.

The barrier of high investment cost for project activity, installation of new-build design, not implemented as a CDM project, was illustrated by presenting a financial analysis for the two furnaces already implemented. This analysis shows that the project activity implemented without carbon credits is not attractive based on the two years operational experience.

However as a consequence of request for review, a new investment analysis according to step 4 of AM0038, has been carried out /11/.

Step 4: Compare economic attractiveness of the remaining alternatives

The NPV of the two remaining alternatives: Continued use of installed furnace technology and the project activity, installation of a new build design, not implemented as a CDM project has been compared including a sensitivity analysis. All parameters and assumptions for the five furnaces are defined in the revised PDD /3/. The NPV and IRR of each furnace and the related sensitivity analysis is clearly presented. It shows a negative NPV for all furnaces in the base case and the sensitivity analysis shows relatively low NPV's even for a combination of favourable scenarios.

An analysis made by DNV reveals that the main issue for this project is to eliminate the technical barriers. This can be shown by setting the production rate at historical rates (thus eliminating the effect of revenue from sales), keeping the actual observed values for maintenance savings, using the same discount rate of 12% and insert the electricity saving target of 0.4 MWh/t SiMn. The IRR (10 years) is then in the range of 9% to 19%. With reference to the achieved efficiency as observed during the site visit, it is however clear that a more realistic target for electricity saving would be 0.1 MWh/t SiMn; the NPV will then be negative for all furnaces and the IRR will be in the range 3-8%.

Consequently, the only feasible baseline scenario is determined to be the continuation of the current situation.

The grid analysis values are presented and the values for the operating margin (OM), build margin (BM) and combined margin (CM) is verified as follows /7/:

EF	tCO2/MWh
OM	1.195
BM	1.248
CM	1.221

Detailed information about the sources and assumptions made to arrive at the above values are explained in Annex 3 of the PDD. The electricity generation data are taken from national electricity regulator (NER), electricity supply statistics for 2002, 2003 and 2004. For the Eskom plants, which represent 96% of South Africa, generation detailed information for fossil fuel consumption was not available and thus aggregated fuel consumption have been used for coal, and rated efficiency (from Eskom's annual reports) has been used for gas. A conservative approach has been applied for the fuel consumption for municipal and private plants by assuming a slightly lower value of 0.5 t coal/MWh compared to 0.53-0.54 t coal/MWh for the Eskom plants.

For build margin the five latest build Eskom plants have been used (representing more electrical generation than the latest 20%) since the commissioning date of other plants was not available. Since Eskom plants represent 96% of the generation and the remaining 4% is 94-97% coal based, this approach seems appropriate and also conservative. The Eskom build margin coal plants are assumed to be equally efficient as the 2004 average Eskom coal plants. Build margin plants should usually be more efficient than average plants, however in South Africa the build margin plants are old inefficient coal plants that has been put back online (from 2005) and thus the 2004 average is most likely below the actual 2005 build margin figure.

3.4 Additionality

To demonstrate additionality, the project applies the step-wise approach defined in AM0038, which refers to the latest version of the "Tool for the demonstration and assessment of additionality" /15/.

The assessment of additionality comprises three steps:

Step 1: Investment & sensitivity analysis.

It has been demonstrated from calculation of net present value (NPV) and internal rate of return (IRR) that the project activity undertaken without the CDM credits is economically less attractive than the most plausible baseline scenario being the continued use of existing furnace technology. The investment analysis is based on the achieved performance after implementation of the new technology in furnace # 5 and # 7 and includes data collected for 14 and 27 months operation respectively. The average achieved performance was used to calculate NPV's and IRR's for 10 years operation. For both furnaces the NPV is negative. The economic attractiveness of the project activity is depending on its ability to deliver the expected performance and the corresponding savings from reduced energy use, lower repair cost and increased availability. As the technology barriers still remain the financial attractiveness is highly uncertain even with the revenue from sale of CER's. A discount rate of 12% and a CER value of 10 €/CER was used in this analysis.

The project participants have as a consequence of the request for review made available to DNV a new financial analysis comprising all furnaces and a sensitivity analysis (see 3.3 Step 4). The new analysis is partly based on actual financial data from the results of furnace #5 and #7, and partly on expected performance of the technology and data from reliable sources. DNV has investigated the new analysis and found it to be consistent to the analysis presented earlier when using the same input data to the analysis thus arriving at the same conclusion as above.

Step 2: Common practice analysis

To date there has been no identifiable example or similar project in South Africa or the wider sub-Sahara region of a project approach that retrofits the new technology into an existing infrastructure as demonstrated in this project activity. It was also clear from the interviews and check of electricity consumption per ton of SiMn achieved to date that technology risks still remain.

Step 3: Impact of CDM registration

Although the project activity still faces barriers, it is expected that the impact of the CDM registration will alleviate and diminish some of the barriers and thus encourage the project developer to pursue the project activity.

The project is therefore not a likely baseline scenario and that emission reductions are additional to what would have happened in the project's absence.

The following step is not mandated by AM0038 and has been deleted from version 03 of the "Tool for the demonstration and assessment of additionality"; however, the project proponent

has used this step as per version 02 of the "Tool for the demonstration and assessment of additionality" to demonstrate that CDM was considered before the starting date of the project activity.

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

The project started construction in July 2004 which falls between 1 January 2000 and the date of the registration of the first CDM project activity (18 November 2004). Following the attendance to a workshop held at Standard Bank in Johannesburg 23 July 2003, the project proponent confirmed in August 2003 to Ecosecurities the interest to progress to identify CDM project activities. Documents proving the consideration of CDM as a means to implement the project have been provided /11/.

3.5 Monitoring Plan

The project applies the approved methodology AM0038 "Methodology for improved electrical energy efficiency of an existing submerged electric furnace used for the production of SiMn", version 01, dated 29 September 2006.

The monitoring plan takes into account baseline emissions and project emissions, considering the quality control and quality assurance for data monitoring. The baseline offsite and onsite emission factors are determined from 7 years historical data for the annual grid electricity consumption, quantity of silisium manganese production, coal, coke and paste consumption. The emission factor applied for the coke used as reductant is calculated on a project specific basis, while a default value (taken from the latest IPCC guidelines 2006) is used for the emission factors for the coal reductant. The emission factor for the paste is calculated from the data given by the supplier together with a default value of carbon content of volatiles (C_v) of 0.8. The grid electricity factor is estimated according to ACM002.

Details of all required monitoring parameters, the frequency of data recording and format are clearly described. The format for data archiving seems appropriate for the project.

Transalloy holds an ISO 9001 certificate /5/ and an ISO 14001 certificate /6/. The authority and responsibility for registration, monitoring, measurement and reporting are clearly described.

Specific procedures for CDM monitoring, GHG internal auditing and reporting will be agreed between Transalloys and EcoSecurities and incorporated into the existing quality assurance system.

3.6 Calculation of GHG Emissions

The project emissions result from onsite consumption of coal, reductants, electrode paste and electricity. All these have been considered in the project emission calculations.

The assumption made for GHG emissions is arising from a target to meet industrial standard for electricity use per tonne of SiMn product rather than an estimation based on the technology potential. The industrial standard for the industry is given to be 4.1-4.2 MWh/tonne SiMn produced. The target was originally set to 4-4.5 MWh/tonne SiMn (10-20% below the existing electricity consumption). However, after up to two years operating experience for two of the

furnaces the target has been reduced to 0.4 MWh/tonne SiMn. The emission reduction estimation has been adjusted accordingly to reflect this experience.

The overall uncertainty for the onsite emissions has been assessed in line with the European Commission guidelines on monitoring and reporting of GHG emissions in iron and steel production for one of the furnaces. An uncertainty of 9.0 % has been determined *ex-ante* based on an uncertainty analysis for furnace # 7. This value of uncertainty will be used for all furnaces. The uncertainty will be taking into account, during the whole crediting period, by discounting the onsite emissions reductions by 9%.

No leakages are envisaged for this project activity.

3.7 Environmental Impacts

The project is a retrofit of the existing production facilities and it is not expected to have any significant negative environmental impacts. Being a retrofit with none expected changes the project is not subject to an Environmental Impact Assessment (EIA). Ref. /12/

3.8 Comments by Local Stakeholders

A local stakeholder's consultation process has been conducted. A meeting was held at Transalloys plant on the 27 October 2006. A copy of the ad to publicise the event, the list of persons invited, the actual attendance list (17 attendances) and a photo taken during the meeting are provided in the PDD.

No comments were received specifically to the project.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD of 03 November 2006 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 07 November 2006 to 06 December 2006.

No comments were received.

5 VALIDATION OPINION

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the "Transalloys Manganese Alloy Smelter Energy Efficiency Project" in South Africa on the basis of UNFCCC criteria for the CDM, 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 the Republic of South Africa and the Annex I country is United Kingdom of Great Britain and Northern Ireland. Both countries fulfil the participation criteria and have approved the project and authorised the project participants. The DNA from the Republic of South Africa confirmed that the project assists in achieving sustainable development.

The project correctly applies AM0038 "Methodology for improved electrical energy efficiency of an existing submerged electric arc furnace used for the production of SiMn", version 01, dated 29 September 2006. The determination of the baseline is transparent and sufficiently supported with facts. The selected baseline scenario, i.e. the continuation of the current situation, where there will be no installation of technology for energy efficiency is reasonable for the fixed 10 year crediting period.

By retrofitting the current furnaces with new design the project activity results in reduction of the specific electricity consumption per tonne of alloy produced. The project will displace electricity from the South African grid, in which electricity is mostly produced from coal (~90%). The project thus has a potential of CO_2 emissions reductions which are measurable and give long-term benefits to the mitigation of climate change. The project still faces a number of barriers however it is clear that the impact of the CDM registration will alleviate and diminish these barriers and the emission reductions are hence additional to any that would occur in the absence of the project activity.

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

The total emission reductions from the project are estimated to be on the average 55 044 tonnes of CO_2e per year over the selected fixed 10 year 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.

As requested by the Executive Board (EB33 report, paragraph 64 c) of 27 July 2007) the validation report of 5 March 2007 was modified to be corresponding to the revised PDD of 2 March 2007 version 6 submitted by the project participant in response to the request for review.

In summary, it is DNV's opinion that the "Transalloys Manganese Alloy Smelter Energy Efficiency Project" in the Republic of South Africa, as described in the PDD of 02 March 2007 version 6, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology AM0038, version 1. 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/ EcoSecurities Group Plc: CDM PDD for the "Transalloys Manganese Alloy Smelter Energy Efficiency Project", Version 3, 03 November 2006

/2/ EcoSecurities Group Plc: CDM PDD for the "Transalloys Manganese Alloy Smelter Energy Efficiency Project", Version 5, 02 March 2007

/3/ EcoSecurities Group Plc: CDM PDD for the "Transalloys Manganese Alloy Smelter Energy Efficiency Project", Version 6, 2 March 2007

/4/ Letter of Approval from host country South Africa, Department of minerals and Energy, 17 Nov 2006

/5/ Letter of Approval from United Kingdom of Great Britain and Northern Ireland, Department for Environment, Food and Rural Affairs, 22 March 2007

/6/ Certificate ISO 9001:2000. Validity 29 May 2009

/7/ Certificate ISO 14001:2004. Validity 30 June 2009

/8/ Excel spreadsheet: Electricity Gird Analysis

/9/ Excel spreadsheets: Calculation of emission reduction and financial information

/10/ Excel spreadsheet: Transalloy Capital Payback Evaluation Schedule Dec.06

/11/ Excel spreadsheet: Transalloy financial analysis v02 26 June 2007

/12/ Excel spreadsheet: Analysis FixC and Volatiles in coke v01 020207

/13/ Copy of emails regarding consideration of CDM for the project activity

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

/14/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. http://www.vvmanual.info

/15/ AM0038 "Methodology for improved electrical energy efficiency of an existing submerged electric arc furnace used for the production of SiMn", version 01, dated 29 September 2006.

/16/ ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 06, dated 19 May 2006.

/17/ CDM EB, "Tool for the demonstration and assessment of additionality". Version 03

/18/ Environmental Impact Management. Department of Environmental Affairs and Tourism. Guideline document. EIA Regulations – Implementation of section 21, 22 and 26 of the environment conservation act.

/19/ DBSA Annual reports: 2003/2004 and 2005/2006

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

/19/ Transalloys/Highveld:

- Lou Jacobs, Production Manager Transalloy Division
- Eben Barnardo, Unit Manager Client Services and Finished Products
- Jacques Nell, Finance Manager
- Marius Herselman, Project Manager

/20/ Ecosecurities Group Plc.:

- Arnaud Viel, CDM Project Manager
- Steve Abrahams, Monitoring Manager

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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	~~CAR 1~~ OK	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	~~CAR 2~~ 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.	~~CAR 1~~ 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	~~CAR 2~~ OK	The written approvals from the DNAs of UK and South Africa are to be submitted to the validator.
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	~~CAR 3~~ 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	The project does not receive any public funding.
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures §29	OK	Department of Minerals and Energy is the DNA of South

Requirement	Reference	Conclusion	Cross Reference / Comment
			Africa. The Department of Environment, 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	South Africa has accepted the Kyoto Protocol on 31 July 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
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	

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 sector 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	Yes, the project is situated in the Transalloys division of Highveld Steel and Vanadium Corporation Limited at its Witbank facility in the Gauteng province of South Africa.		OK
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	/1/	DR	The project boundary comprises the 5 submerged electric arc furnaces (#1, 3,5,6,& 7) in which the energy efficiency measures have been implemented and the South African national electrical grid to which the project activity is connected.		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	The project activity involves the implementation of energy efficiency measures in the five furnaces of Transalloys. The retrofitting involves the		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			changing of the PCD of the electrodes and the off-take systems along with subsequent modification of the furnace roof design. For furnace #3, the furnace has been converted from a rotating furnace to a stationary furnace and the electrode paste feeding system has been changed. The project design hence reflects innovative and energy efficient practices.		
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	Yes, the project activity is expected to result in better performance than the existing technologies.		OK
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	/1/	DR	The project technology is not likely to be substituted by other efficient practices at least within the first 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	The project requires initial training and maintenance efforts to work as presumed.		OK
A.2.5. Does the project make provisions for meeting training and maintenance needs?	/1/	DR/I	Transalloy holds an ISO 9001 Certificate, valid until 29 May 2009. A CDM monitoring manual will be prepared by project developer.		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/ /7/	DR	The project will not result in any changes in off-gases or any new emissions. Transalloy has a valid certificate for ISO 14001:2004 valid until 30 June 2009. Legislation is in place for dust emissions and bag filters shall		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			operate in average at 99.8% uptime. A new permit will be required in case of any increase in production capacity.		
A.3.2. Is the project in line with host-country specific CDM requirements?	/1/	DR	This will be confirmed after the LoA from the DNA of South Africa is received.		OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/	DR	Refer to A.3.2		OK
A.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	The project activity will reduce the electricity consumption of the facility thereby reducing the electricity demand placed on the South African national electrical grid.		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	Yes, the project applies the approved baseline methodology AM0038, version 01, Methodology for improved energy efficiency of an existing submerged electric arc furnace used for the production of SiMn.		OK
B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/	DR	Yes		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
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/ /3/ /11/	DR	Yes, the discussion and determination of the baseline is transparent. Three alternatives have been discussed – i. maintaining status quo ii. project without CDM benefits iii. complete replacement of the furnace by new installation Among these the alternative of maintaining status quo has been selected as the baseline. The baseline scenario has been identified by using step1 to step 4 as described in AM0038. All assumptions made are clearly described and excel sheets of financial and sensitivity analyses were provided for analysis.		OK
B.2.2. Has the baseline been determined using conservative assumptions where possible?	/1/	DR	Yes, the baseline has been determined based on actual monitored data for 7 years prior to project implementation.		OK
B.2.3. Has the baseline been established on a project-specific basis?	/1/	DR	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 sector policies, macro-economic trends and political aspirations?	/1/	DR	Clarifications are needed from the electrical authorities regarding if there was any restrictions on the use of electrical power at the current consumption level in 2003-2004.	~~CL 1~~ ~~CL 2~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			The project proponent is requested to provide evidence that there are no policies related to energy efficiency for SiMn producers in South Africa.		
B.2.5. Is the baseline determination compatible with the available data?	/1/	DR I	Yes, the baseline determination is compatible with available data. Monitored data for 7 years prior to project implementation has been used to establish the baseline.		OK
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1/ /3/	DR	Continued use of existing furnaces is selected as the baseline scenario. The project proponent is asked to update financial calculations and Table 7 of the PDD (See B.2.7) See B.2.1	~~CAR 3~~	OK
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario?	/1/ /3/	DR I	The project proponent has assessed the additionality of the project as per the guidance provided in AM0028. The project is eligible for retro credits since it was initiated in October 2004 and evidence of consideration of CDM prior to project implementation is available. The baseline scenario has been identified as maintenance of status quo since the other two options – project without CDM benefits and replacement of the existing furnace with new installation both face prohibitive barriers. It is to be noted that points 3 and 4 in section B.4 is also applicable to the baseline scenario. The project proponent is requested to provide documentary evidence of the project being	~~CAR 3~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			first-of-its-kind. Also the project proponent is requested to provide third party opinion related to the technological risk involved in the project. The project proponent is also requested to provide an IRR analysis to conclude upon the most economically attractive option as per step 1 of the additionality assessment mentioned in the methodology. During the site visit DNV investigated that retrofitting of the other two furnaces had to be put on hold due to the difficulties in implementing the project activity. The project proponent informed that the technology has not been used in other retrofits prior to this project (hence first- of-its-kind). Pyromet technology has been used in a new furnace in FeCr furnace (implemented in 2003). The optimised pitch design as used in the project is not used and is regarded as a business secret. The new technology allows the pitch to be adjusted under operation. Normally the pitch is set at design level. 22 July 2003 Financial Director of Highveld Vanadium and Steel attended an information meeting regarding CDM opportunities arranged by SCMB. Tenders to technology providers of technology (Demag, Pyromet and Bateman) were sent out autumn 2003. The project was internally approved for implementation in Furnace # 7		

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			in January 2004 (IRR=19%) requirement for approval being > 10.5% at the time of approval). The contract between Transalloy and the technology provider was signed 11 February 2004 with a guarantee given for increased availability of the furnace of 97% (prior to project 86%). A contract for "Developing the Carbon Mitigation Potential of Higveld Vanadium & Steel's CDM project Transalloy Energy Efficiency" was singed by Highveld Vanadium & Steel 23 August 2004 and by Ecosecurities 2004/12/12. Implementation of new technology in Furnace #7 was ready in 2004/10. The project proponent is requested to provide more evidence that the incentive from CDM was seriously considered in the decision to proceed with the activity in January 2004 as the contract for developing the project as CDM project was only signed in August 2004. At the time of approval of the project for the first furnace # 7 the market was expected to grow according to predictions in the steel market. However the market for SiMn declined in 2005 due to China's export of SiMn into the global market place. The market recovered in 2006. Internal approval of Furnace #5 was 20 May 2004. The original project plan did not cover all furnaces. The other two furnaces 6 and 8		

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			are put on hold since the target for electricity reduction is not achieved in furnace 5 and 7. Transalllloy is awaiting results from implemented technology in furnace 5 and 7 in order to start-up the project to include furnace 6 and 8.		
B.2.8. Have the major risks to the baseline been identified?	/1/	DR	Since the baseline has been established on monitored data for 7 years prior to project implementation, there are no risks to the baseline.		OK
B.2.9. Is all literature and sources clearly referenced?	/1/	DR	Yes, all literature and sources are clearly referenced.		OK
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 has been identified as 01 October 2004. The lifetime of the project is 20 years. The project proponent is requested to provide documentation of the starting date and justify the lifetime of the project activity.		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	The project selects a fixed crediting period of 10 years starting from 01 October 2004.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
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	Yes, the project applies the approved monitoring methodology AM0038, version 01, Methodology for improved energy efficiency of an existing submerged electric arc furnace used for the production of SiMn.		OK
D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified?	/1/	DR	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	Since the monitoring methodology is already approved by the CDM EB, it takes into account all sources of emissions in the baseline and project scenario and hence reflects good monitoring practice.		OK
D.1.4. Is the discussion and selection of the monitoring methodology transparent?	/1/	DR	Yes.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
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.	/1/	DR I	The monitoring plan provides for the collection of all relevant data as stipulated in AM0038. The visit confirmed that the quantity of coal and coke was .measured from hopper weight as per the methodology. The project proponent uses a weigh feeder to measure it.		OK
D.2.2. Are the choices of project GHG indicators reasonable?	/1/	DR	CO_2 is the only GHG indicator which is to be accounted for.		OK
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/1/	DR	Yes.		OK
D.2.4. Will the indicators give opportunity for real measurements of project emissions?	/1/	DR	Yes.		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 I	No leakages are envisaged for this project activity. Increased use of ore, increased production of slag and increased emissions can be regarded as leakages. It was seen at the visit from production log books that there was no increased use of ore (it shall		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			be noted that the project target for energy efficiency is not reached at present). A bag filter with 99.6% efficiency is installed hence no increased emissions are anticipated. The project do not produced any increase slag; rather the opposite will be the effect when the project target is achieved.		
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	The monitoring plan provides for the collection and archiving of all data necessary for estimating the baseline emissions and is as per the requirements of AM0038.		OK
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR	CO_2 is the only GHG indicator required for estimating the baseline emissions.		OK
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/	DR	Yes.		OK
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/1/	DR	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	/1/	DR	Monitoring of sustainable development indicators are not required by the South		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
environmental, social and economic impacts?			African DNA.		
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	Yes, the authority and responsibility of project management has been clearly defined. The responsibility, authority and supervisory roles have been defined clearly.		OK
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	/1/	DR	Yes.		OK
D.6.3. Are procedures identified for training of monitoring personnel?	/1/ /6/	DR I	Transalloy holds an ISO 9001 certificate It remains to be clarified if training procedure are incorporated into the existing quality assurance procedures. Procedures required for the project monitoring and emergency will be prepared by project developer EcoSecurities.	~~CL 3~~	OK
D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	See D6.3	~~CL 3~~	OK
D.6.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR	See D6.3	~~CL 3~~	OK
D.6.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR	See D6.3	~~CL 3~~	OK
D.6.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR	See D6.3	~~CL 3~~	OK
D.6.8. Are procedures identified for day-to-day records handling (including what records to keep,	/1/	DR	Data required for calculation of baseline was found in production log books at the	~~CL 3~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
storage area of records and how to process performance documentation)			visit. The data was reviewed and found to be consistent to the baseline data given in PDD B.6.2. The procedure in place for registration in production log books will be applicable also for the project. Ref. D6.3.		
D.6.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR	See D6.3	~~CL 3~~	OK
D.6.10. Are procedures identified for review of reported results/data?	/1/	DR	See D6.3	~~CL 3~~	OK
D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	/1/	DR	See D6.3	~~CL 3~~	OK
D.6.12. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	/1/	DR	No. The procedure for project performance reviews will be prepared and into the existing quality assurance system.	~~CL 3~~	OK
D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR	See D6.3 CDM project procedures to be incorporated into the existing quality assurance system.	~~CL 3~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
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	The project emissions result from onsite consumption of coal, reductants, electrode paste and electricity. All these have been considered in the project emission calculations.		OK
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	Yes, the GHG calculations are documented in a complete and transparent manner.		OK
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	/1/	DR	The project proponent is requested to clarify the basis of the reduction of electricity consumption by 0.6 MWh/t of SiMn. The project proponent is also requested to provide the actual reductions in electricity consumptions from the monitored data for furnace 7 and 5 which are in operation already and, if required, modify the project emission calculations accordingly. The basis for the energy reduction is the difference between the normal electricity efficiency at Transalloy prior to	~~**CAR 1**~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			implementation of the project and the industry standard of 4.2 MWh/t SiMn. Actual data for energy efficiency of furnace 5 and 7 was reviewed at the visit based on data from production log books. The energy efficiency achieved so far is not in accordance with the target set at the start of the project. The project emission calculations should be adjusted based on the experience achieved so far and the estimated GHG emission reduction should be adjusted accordantly.		
E.1.4. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	/1/	DR	The uncertainty in the project GHG emission estimates result from the uncertainty of the actual reduction of electricity consumption in the project activity. However, since the electricity consumption will be monitored during the project period, this uncertainty is likely to be taken care of during calculation of emission reductions ex-post. The project proponent is also requested to clarify how the uncertainty estimates provided in the PDD have been incorporated in the emission reduction calculations.	~~CAR 4~~	OK
E.1.5. Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	/1/	DR	CO_2 is the only relevant GHG and this has been accounted for.		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 I	Calculation of leakage is not applicable. See D.3.1		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 I	The site visit confirmed that actual monitored data have been used in determining the baseline emissions. However, the figure for $EF_{b,\ total}$ in table 9 of the PDD has been calculated wrongly. The project proponent is requested to modify. The monitored data used for determination of baseline emissions were checked at the visit and found to be correct. The figure EFb is a spread sheet calculation error.	~~CAR 5~~	OK
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	/1/	DR	Yes the baseline boundaries are clearly defined and it includes the five furnaces and the South African national electrical grid.		OK
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	Yes, the GHG calculations are documented in a transparent manner.		OK
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	/1/	DR	The baseline electricity emission factor has been calculated by the combined margin	~~CAR 6~~	OK:

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			approach as per ACM0002 based on data from 2002. 2003 and 2004. The OM has been calculated by the simple OM method and the BM calculation includes the plants whose generation sum up to 20 % of total generation of 2004. However, all the power plants included in the sheet 'Power stn info NER July01-july02' are not included in the grid analysis. The project proponent is requested to justify. The BM has not been calculated as per ACM0002. The calculation did not use the plant specific fuel consumption as required by ACM0002. Rather an average of the OM emission factor has been used. This deviates from the methodology. Please justify or modify suitably. The project proponent has used all Eskom power plants in the calculation of OM, since it was not possible to get the data for the non Eskom power plants. However Eskom power generation is 99.6 % of the total power generation (2004 data). The fuel consumption data was not available for all power plants. The project proponent have used Eskom aggregated value for fuel consumption and allocated to the plants according to the capacity level. However, the following needs to be included in PDD: - Assumptions used and justification for excluding power plants in OM which data is not available.		

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			- Justification for the exclusion of power plants which year of commission is not known from calculation of BM. Justification that the average efficiency factor is conservative for the power plants used for BM.		
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	/1/	DR	Refer to E 1.4	~~CAR 4~~	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
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	The target for improved energy efficiency is not achieved after an implementation time of up to 2 years. The explanation is given to be the reduced "availability" of the furnace which means there have been obstacles in production which results in increased energy consumption. The technology potential of reduced electricity utilisation is therefore camouflaged by this fact.	~~CAR 1~~	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	/1/	DR	The environmental impacts of the project		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
the project activity been sufficiently described?			activity have been described in the PDD. The project is not likely to have any negative environmental impacts.		
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/ /18/	DR I	The project is seen as a retrofit/modification project with no negative effects on the environment. The project does not require an EIA.		OK
F.1.3. Will the project create any adverse environmental effects?	/1/	DR	The project is not likely to create any adverse environmental impacts		OK
F.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR	There are no transboundary impacts due to the project activity.		OK
F.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR	The project is not likely to have any adverse environmental impacts.		OK
F.1.6. Does the project comply with environmental legislation in the host country?	/1/	DR	See A.3.1	ł	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	Representatives of the local environmental groups, municipal council, engineering firm, the electricity supply company, the local newspaper and the company management have been invited to comment on the project during the stakeholder consultation.		OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	Comments from the stakeholders have been invited through a meeting on 27 October 2006. The participants in the meeting have been invited individually to attend the meeting.		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
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	A stakeholder consultation is not mandated by the DNA of South Africa.		OK
G.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR	Yes, a summary of the comments received have been provided.		OK
G.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR	The project activity did not receive any adverse comment and hence no action was necessary.		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 estimated GHG emissions reduction is not achieved during an implementation time of up to 2 years. A written explanation and updated estimations of GHG emission reduction is to be provided. The PDD is to be updated accordingly.	Table-1, Req. 1,3, E.4.1 E.1.3	The explanation of the difficulties has been detailed in section B.4>Step 3>Illustration and conclusion (p15): "This underperformance is due to both technical elements (see point 5 and 6 above) and market conditions (see points 3 and 4 above). On the technical side, some problems are independent of the project (change in raw material supplies, planned shutdown which had to be reversed, etc) but a lot of them are directly linked to the installation of the newly design furnaces (see the design problems described in point 5. above)." and in section B.4>Step 3>5. Technology risks (p14): "Two years of operation of the new furnaces have confirmed these risks: a number of components have failed (in particular: "jumper pipes", dust covers, pressure rings, bellows, locking pipes, downpipes, slipping devices, rubber hoses and feed chutes) and these "design problems" as well as other unrelated operational problems have largely deteriorated the financial viability of the projects (see illustration below)." New emission reduction estimates have been made based on a reduction in electricity use of 0.4MWh/t SiMn instead of the previous 0.6MWh/t	OK The emission reduction is revised and reflects better the potential of the project activity based on the experience gained from operation of the new technology in two furnaces as per date of validation. CAR closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		SiMn. The consequence is a decreased forecast of emission reductions and the PDD has been updated accordingly	
CAR 2 The project has not yet obtained the written approval from the DNA's of UK and South Africa. The written approvals from the DNA's of UK and South Africa are to be submitted to the validator.	Table-1, Req. 2, 4 A.3.2, 3.3	Written approval of both DNAs is being collected by project participants but is subject to a final draft validation report being available.	OK Written approval of both DNAs has been received. CAR closed.
CAR 3 The project proponent is requested to provide an IRR analysis to conclude upon the most economically attractive option as per step 1 of the additionality assessment mentioned in the methodology and update financial calculations and Table 7 of the PDD. The project proponent is requested to provide more evidence that the incentive from CDM was seriously considered in the decision to proceed with the activity. Ref. "Tool for demonstration and assessment of additionality" Step 0.	B.2.6, B2.7	<u>IRR analysis:</u> A NPV and IRR calculation has been integrated in table 7 p15 of the PDD for furnaces 5 and 7. This is based on the Payback evaluation schedule made by Transalloys for both projects, updated as of December 2006, which is now included in annex 9 It shows that: • On the one hand, NPVs and IRRs based on 'expected' results are extremely high because these calculations were based on excessively optimistic forecast for the projects. • On the other hand, NPVs and IRRs based on actual results are negative, because of the technical difficulties that the project has faced, which make it financially very risky. Payback is far from being reached after 1 to 2 years of actual operation because of project underperformance. This analysis makes it difficult to conclude on additionality based on pure financial numbers, and this is why the project participants decided to	OK Financial analysis based on achieved performance after two years shows that the economic attractiveness of the project activity is uncertain and that the project activity undertaken as a CDM project still faces barriers. As a consequence of a request for review a new investment analyses for all 5 furnaces including sensitivity analyses according to step 4 in AM0038 have been received and was reviewed by DNV. It shows a negative NPV for all furnaces in the base case and the sensitivity analysis shows relatively low NPV's even for a combination of favourable scenarios.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		perform a qualitative analysis of the barriers faced by the project and not a financial analysis, in order to conclude on the most economically attractive option. It should be noted that such an approach is allowed by AM0038, as the baseline selection method is to perform a Barrier analysis first (step 3) and a Financial analysis (step 4) only for the remaining alternatives. As the only remaining alternative after step 3 is "Continued use of current furnace technology", there is no need to perform step 4. See the end of section B.4 of the PDD where modifications have been made to take into account the CAR more in detail. <u>Consideration of CDM:</u> Five documents proving the consideration of CDM have been included in attachment A of the PDD (see the list of attachments in annex 6 and their reference in section B.5>Step 0), including evidence dating back to August 2003 when Highveld confirmed their interest to go ahead with the CDM project	It is clear that the impact of the CDM registration will alleviate and diminish the financial barrier of the project activity. Evidence is provided to show that the incentive from CDM was considered in the decision to proceed with the project activity. CAR closed.
CAR 4 The project proponent is requested to clarify the uncertainty estimate provided in the PDD and also clarify how uncertainties have been incorporated in the emission reduction calculations. The PDD should be updated	E.1.4	Project participants have explained extensively how uncertainty should be taken into account according to the EC monitoring guidelines. The analysis is included in annex 8 and the explanation in pages 35-37. It would not include any discounting of emission reductions.	OK The overall uncertainty of the onsite emissions has been estimated for furnace # 7 to be 9.0%. The uncertainty will be taken into account by

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
accordingly.		However, project participants have been asked to use the uncertainty figure to correct the emissions, and therefore on-site emission reductions will be discounted by the uncertainty. The uncertainty has been re-calculated and clarified in tables 11 and 12 of the PDD.	discounting the on-site emission reductions by 9.0% (as determined *ex ante*) during the whole crediting period for all furnaces. CAR closed.
CAR 5 The project proponent is requested to update the emission reduction calculation in revised PDD with the correct value of EFb.	E.3.1	There was a mistake in the calculation of EFb total based on EFbonsite and EFboffiste. This has been corrected (see table 9 of the PDD) and emission reduction calculations updated accordingly	OK The calculation has been corrected. CAR closed.
CAR 6 The project proponent is requested to include assumptions used and justify the exclusion of power plants which data is not available in the calculation of OM. The exclusion of power plants which year of commission is not known from calculation of BM shall also be justified. It shall also be justified that the average efficiency factor is conservative for the power plants used for BM. The PDD shall be updated accordingly.	E.3.4	All sources of data and assumptions have been detailed further in annex 3. In response to the specific points raised in CAR6: • Only must run/low cost power plants have been excluded from OM calculation, according to the Simple operating margin calculation method specified in ACM0002 • Power plants which year of commission is not known can be excluded as o they represent only 4% of total generation o out of this 4%, 94 to 97% are coal-based (same as most of Eskom build margin plants) • Build margin plants would usually be more efficient than average plants because they are more recent. However, the situation in South	OK The assumptions and justifications made are clearly described in the updated PDD. CAR closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		Africa is particular as build margin plants are in fact big, old, inefficient coal-fired power plants that had been shut down decades ago and are being put back online (see PDD section B.6 > 1.1.3 > STEP 2). This process started in 2005 and therefore the 2004 average figure (which has been used and does not include those old plants) is very likely to be below the actual 2005 build margin figure (which is not available), thus ensuring the conservativeness of the EF_{BM} used.	
CL1 The project proponent is requested to make available a confirmation from the electrical authorities that there was no restriction/cap on the use of power at the current consumption level in 2003- 2004.	B.1.2	A confirmation from Eskom has been obtained by Transalloys. It is included in annex 6 of the PDD and referenced in section B.2.	OK Confirmation is received. No restriction was set by Eskom on the amount that could be procured by the project proponent from the National Grid in the period 2003-2004. CL closed.
CL 2 The project proponent is requested to provide evidence that there are no policies related to energy efficiency for SiMn producers in South Africa.	B.2.4	South Africa energy efficiency strategy has a two page programme for the Industry and mining sector (Department of Minerals and Energy (2005) Energy Efficiency Strategy of the Republic of South Africa, section 5.1 pages 28-29, available from http://www.dme.gov.za/pdfs/energy/efficiency/ee_strategy_05.pdf). This has little concrete measures other than formulating standards for boiler efficiency, electric	OK CL closed.

		motors and thermal insulation (which are not affected by the project) and promoting energy audits, energy management best practice and ESOPs.	
CL3 Procedures for monitoring, emergency, internal GHG audits, performance review, review of results before submission and corrective actions in order to provide for more accurate future monitoring and reporting to be prepared by project proponent and incorporated into existing Quality assurance system.	D.6.3- D.6.13	"Specific procedures for CDM monitoring, GHG internal auditing and reporting will be agreed between Transalloys and EcoSecurities and incorporated into the existing Quality assurance system." (included in section B.7.2 of the PDD)	OK CL closed.

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APPENDIX B

CERTIFICATES OF COMPETENCE

CERTIFICATE OF COMPETENCE

Michael Lehmann

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

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	Yes
CDM Verifier:	Yes	***JI Verifier:***	Yes
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1,2,3 & 9		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	*AM0021*	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	Yes	*AM0023*	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	*AM0024*	Yes
ACM0004	Yes	*AM0027*	Yes
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 Servicer

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Einar Telnes

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

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	Yes
CDM Verifier:	Yes	***JI Verifier:***	Yes
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1,2,3 & 9		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	*AM0021*	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	Yes	*AM0023*	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	*AM0024*	Yes
ACM0004	Yes	*AM0027*	Yes
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 Michael Lehmann

Director, International Climate Change Services *Technical Director*

CERTIFICATE OF COMPETENCE

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):		-	
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	-	*AM0021*	-
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	-	*AM0023*	-
ACM003, ACM0005, AM0033, AM0040	-	*AM0024*	-
ACM0004	-	*AM0027*	-
ACM0006, AM0007, AM0015, AM0036, AM0042	-	*AM0028, AM0034*	-
ACM0007	-	*AM0030*	-
ACM0008	-	*AM0031*	-
ACM0009, AM0008, AMS-III.B	-	*AM0032*	-
AM0006, AM0016, AMS-III.D	-	*AM0035*	-
AM0009, AM0037	-	*AM0038*	-
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	-	*AM0041*	-
AM0014	-	*AM0034*	-
AM0017	-	*AMS-II.A-F*	-
AM0018	-	*AMS-III.A*	-
AM0020	-	*AMS-III.E, AMS-III.F*	-

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Servicer

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Jan Van Evercooren

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

GHG Auditor:	-		
CDM Validator:	-	***JI Validator:***	-
CDM Verifier:	-	***JI Verifier:***	-
Industry Sector Expert for Sectoral Scope(s):		-	
Technical Reviewer for (group of) methodologies: Sectoral scope 9			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	-	*AM0021*	-
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	-	*AM0023*	-
ACM003, ACM0005, AM0033, AM0040	-	*AM0024*	-
ACM0004	-	*AM0027*	-
ACM0006, AM0007, AM0015, AM0036, AM0042	-	*AM0028, AM0034*	-
ACM0007	-	*AM0030*	-
ACM0008	-	*AM0031*	-
ACM0009, AM0008, AMS-III.B	-	*AM0032*	-
AM0006, AM0016, AMS-III.D	-	*AM0035*	-
AM0009, AM0037	-	*AM0038*	-
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	-	*AM0041*	-
AM0014	-	*AM0034*	-
AM0017	-	*AMS-II.A-F*	-
AM0018	-	*AMS-III.A*	-
AM0020	-	*AMS-III.E, AMS-III.F*	-

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Servicer

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Trine Kopperud

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

GHG Auditor:	Yes		
CDM Validator:		***JI Validator:***	
CDM Verifier:		***JI Verifier:***	
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 5 & 9		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	-	*AM0021*	-
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	-	*AM0023*	-
ACM003, ACM0005, AM0033, AM0040	-	*AM0024*	-
ACM0004	-	*AM0027*	-
ACM0006, AM0007, AM0015, AM0036, AM0042	-	*AM0028, AM0034*	-
ACM0007	-	*AM0030*	-
ACM0008	-	*AM0031*	-
ACM0009, AM0008, AMS-III.B	-	*AM0032*	-
AM0006, AM0016, AMS-III.D	-	*AM0035*	-
AM0009, AM0037	-	*AM0038*	-
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	-	*AM0041*	-
AM0014	-	*AM0034*	-
AM0017	-	*AMS-II.A-F*	-
AM0018	-	*AMS-III.A*	-
AM0020	-	*AMS-III.E, AMS-III.F*	-

Høvik, 6. November 2006

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