VALIDATION REPORT

"PFC Emission Reductions at ALBRAS, Alumínio Brasileiro S.A." in Brazil

REPORT NO. 2007-1189

REVISION NO. 01C

VALIDATION REPORT

DET NORSKE VERITAS
DNV CERTIFICATION AS

Veritasveien 1
N-1322 Høvik
Norway
http://www.dnv.com

Date of first issue: 2007-08-03	Project No.: 28624550
Approved by: Mari Grooss Viddal	Organisational unit: DNV Certification, International Climate Change Services
Client: ALBRAS – Alumínio Brasileiro S.A.	Client ref.: Eduardo Macedo

Project Name: "PFC Emission Reductions at ALBRAS, Alumínio Brasileiro S.A."
Country: Brazil
Methodology: AM0030
Version:01
GHG reducing Measure/Technology:"PFC emission reductions from anode effect mitigation at primary aluminium smelting facilities"
ER estimate: 802 862 over 10-years
Size
☒ Large Scale
☐ Small Scale
Validation Phases:
☒ Desk Review
☒ Follow up interviews
☒ Resolution of outstanding issues
Validation Status
☒ Corrective Actions Requested
☒ Clarifications Requested
☒ Full Approval and submission for registration
☐ Rejected

This validation report summarizes the findings of the validation. The only changes made to this version of the validation report compared to the validation report rev. 01 dated 06 November 2007 referred to in the letter of approval of the DNA of Brazil are linked to the status of issuance of the letter of approval by the DNA of Brazil.

In summary, it is DNV's opinion that the "PFC Emission Reductions at ALBRAS, Alumínio Brasileiro S.A." in Brazil, as described in the PDD of 08 September 2008, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology AM0030 (version 01). DNV thus requests the registration of the project as a CDM project activity.

Report No.:	Date of this revision:	Rev. No.
2007-1189	2008-09-08	01C

Report title:
"PFC Emission Reductions at ALBRAS, Alumínio Brasileiro S.A." in Brazil

Work carried out by:
Luis Filipe Tavares, Andrea Leiroz, Jan Van Evercooren

Work verified by:
Ole Andreas Flagstad (acting), Michael Lehmann

Key words:

☒ No distribution without permission from the Client or responsible organisational unit

☐ Limited distribution

☐ Unrestricted distribution

Abbreviations

ALBRAS	Alumínio Brasileiro S.A.
ALUNORTE	Alumina do Norte do Brasil S.A
AEF	Anode Effect Frequency
AED	Anode Effect Duration
AEO	Anode Effect over-voltage
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
Eletrobras	Brazilian Public Electric Company
FTIR	Fourier Transform Infrared
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
N_2O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
PFC	Perfluorocarbon
SEMA	Secretaria de Estado de Meio Ambiente (Environment State Secretary)
SECTAM	Secretaria Executiva de Ciência Tecnologia e Meio Ambiente (Executive Secretary for Science, Technology and Environment)
UNFCCC	United Nations Framework Convention on Climate Change

VALIDATION REPORT

TABLE OF CONTENTS

VALIDATION REPORT

1 EXECUTIVE SUMMARY – VALIDATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a validation of the "PFC Emission Reductions at ALBRAS, Alumínio Brasileiro S.A." project, located in the municipalities of Barcarena; Pará State, in Brazil. The validation was performed on the basis of UNFCCC criteria for CDM project activities and relevant Brazilian criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The project participant is ALBRAS – Alumínio Brasileiro S.A. of Brazil. The host Party Brazil meets all relevant participation requirements and has provided written approval of voluntary participation in the project.

The objective of project is to implement a preventive algorithm in order to reduce the frequency and duration of anode effect at ALBRAS – Alumínio Brasileiro S.A..

By saving electricity, the project is in line with the current sustainable development priorities of Brazil, confirmed by Brazilian DNA.

The project applies the approved baseline and monitoring methodology AM0030, i.e. "PFC emission reductions from anode effect mitigation at primary aluminium smelting facilities" (version 01). The baseline methodology has been applied using the 2006 IPCC guidelines instead of the 1996 guidelines as stated in the methodology. This is considered correct as the methodology states that the most recent recommendations from IPCC shall be used. The assumptions made for the selected baseline scenario are sound. It is sufficiently demonstrated that the project is not a likely baseline scenario and that emission reductions attributable to the project are additional to any that would occur in the absence of the project activity.

The monitoring methodology has been correctly applied. The monitoring plan sufficiently specifies the monitoring requirements of the main project indicators.

By reduction of the frequency and duration of the anode effect, the project results in reductions of PCF emissions that are real, measurable and give long-term benefits to the mitigation of climate change. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions.

Local stakeholders, such as the Municipal Government, the state and municipal agencies, the Brazilian forum of NGOs, neighbouring communities and the office of the attorney general, were invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA. No negative comment was received.

In summary, it is DNV's opinion that the "PFC Emission Reductions at ALBRAS, Alumínio Brasileiro S.A." project, as described in the revised project design document of 08 September 2008, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology AM0030(version 01). Hence, DNV will request the registration of the "PFC Emission Reductions at ALBRAS, Alumínio Brasileiro S.A." project as CDM project activity.

2 INTRODUCTION

ALBRAS – Alumínio Brasileiro S.A. (ALBRAS) has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the "PFC Emission Reductions at ALBRAS, Alumínio Brasileiro S.A." project, located in the municipalities of Barcarena; Pará State in Brazil (hereafter called "the project"). This report summarizes the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.

The only changes made to this version of the validation report compared to the validation report rev. 01 dated 06 November 2007 referred to in the letter of approval of the DNA of Brazil are linked to the status of issuance of the letter of approval by the DNA of Brazil

2.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology AM0030 (version 01). The validation team has, based on the recommendations in the Validation and Verification Manual, 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.

3 METHODOLOGY

The validation consisted of the following three phases:

I a desk review of the project design documents

II follow-up interviews with project stakeholders

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

The following sections outline each step in more detail.

3.1 Desk Review of the Project Design Documentation

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

/1/ MGM International: Project Design Document for the "PFC Emission Reductions at ALBRAS, Alumínio Brasileiro S.A." Version 1 (29 June 2007);

/2/ MGM International: Project Design Document for the "PFC Emission Reductions at ALBRAS, Alumínio Brasileiro S.A.". Version 02 of 10 September 2007.

/3/ MGM International: Project Design Document for the "PFC Emission Reductions at ALBRAS, Alumínio Brasileiro S.A.". Version 03 of 08 September 2008.

/4/ Spreadsheet ALBRAS Economic Analyses 10 September 2007

/5/ Spreadsheet ALBRAS emission reductions 10 September 2007

/6/ Spreadsheet ALBRAS MVP 21 June 2007

/7/ J.Mark & Associates: Calculation of IPCC Tier 3b PCF Calculation Coefficients form Measurement of PCF Emissions at ALBRAS. 7 July 2007;

/8/ José Eduardo Macedo Blasques: 180kA Booster Cells Operation at ALBRAS, TMS The Mineral, Metals & Materials Society, 2006;

/9/ MGM International's proposal to develop CDM project at ALBRAS issued on November 2004

/10/ ALBRAS web site http://www.ALBRAS.net/en/

/11/ Alunorte web site http://www.alunorte.net/

/12/ IAI PCF 2005 inventory http://www.world-aluminium.org/cache/fl0000136.pdf

/13/ Aluminium price at London Metal Exchange http://www.lme.co.uk/aluminium.asp

/14/ Evidence CDM consideration: MGM Proposal for CDM services issue in November 2004 to Albras

/15/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. http://www.vvmanual.info

/16/ CDM Executive Board: "PFC emission reductions from anode effect mitigation at primary aluminium smelting facilities" (AM0030). version 01

/17/ CDM Executive Board: Tool for the demonstration and assessment of additionality. Version 03

/18/ US EPA Protocol for Measurement of Tetrafluorommethane and Hexafluoroethane Emissions from Primary Aluminium Production – March 2003. http://www.epa.gov/highgwp/aluminum-pfc/pdf/TMSProtocol_02_06.pdf

/19/ 2006 IPCC Guidelines for national greenhouse gas inventories

/20/ Comissão Interministerial de Mudança Global do Clima (DNA of Brazil): *Letter of Approval*. 15 May 2008

Main changes between the PDD version published for the 30 days stakeholder commenting period and the version submitted for registration:

- The updated PDD gives a more detailed and complete picture of the starting date and the consideration of CDM,
- The PDD gives a clearer description of the different steps in the additionality tool
- The PDD includes updated numbers for some parameters of the financial analysis.
- Clarification about project activity starting date.

3.2 Follow-up Interviews with Project Stakeholders

	Date	Name	Organization	Topic
/21/	2007-08-14	Eduardo Macedo	Abras	• AEF, AED, AEO monitoring • Slope coefficient of PFC emission at ALBRAS • Environment impacts & their control • Environment licenses compliance • Local Stakeholders consultation process • Quality procedures.
/22/	2007-08-14	Guilherme Epifânio da Mota		
/23/	2007-08-14	Roberto Kenji Fujimoto	MGM	

3.3 Resolution of Outstanding Issues

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

- It organizes, 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.

VALIDATION REPORT

The validation protocol consists of three tables. The different columns in these tables are described in the figure below. The completed validation protocol for the "PFC Emission Reductions at ALBRAS, Alumínio Brasileiro S.A." project is enclosed in Appendix A to this report.

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

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

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

VALIDATION REPORT

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

Validation Protocol Table 2: Requirement checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the large-scale PDD template, version 03 - in effect as of: 28 July 2006. Each section is then further sub-divided.	*Gives reference to documents where the answer to the checklist question or item is found.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided (**OK**), or a c**orrective action request (CAR)** due to non-compliance with the checklist question (See below). A request for clarification (CL) is used when the validation team has identified a need for further clarification.*

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

Figure 1 Validation protocol tables

3.4 Internal Quality Control

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

3.5 Validation Team

Role/Qualification	Last Name	First Name	Country
Team leader/CDM Auditor	Tavares	Luis Filipe	Brazil
CDM Auditor	Leiroz	Andrea	Brazil
Sector expert	Van Evercooren	Jan	Belgium
Technical reviewer (acting)	Flagstad	Ole Andreas	Norway
Technical reviewer	Lehmann	Michael	Norway

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

4 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.
The final validation findings relate to the project design as documented and described in the revised project design documentation of 08 September 2008.

4.1 Participation Requirements

The project participant is ALBRAS – Alumínio Brasileiro S.A. of Brazil. The host Party Brazil meets all relevant participation requirements and has provided written approval of voluntary participation in the project, also confirming the project's contribution to sustainable development.

4.2 Project Design

The objective of the "PFC Emission Reductions at ALBRAS, Alumínio Brasileiro S.A." project is to reduce PFC emissions, tetrafluoromethane (CF4) and hexafluoroethane (C2F6), in the aluminium smelting facility of ALBRAS through the implementation of an Anode Effect Early Detection Algorithm, which reduces the anode effect frequency and thus the emissions of PFC. The project involves the improvement of the automatic control system in 960 pots of the aluminium smelting facility. The technology of these pots is Center Work Prebake with Point Feeder system (PFPB).

Until 2005 ALBRAS implemented several improvements in order to increase the production to 460 000 ton aluminium/year with the current of 170 kA from line 1 and 180 kA from lines 2, 3 and 4 /8/ and to reduce the anode effect from 0.9 anode effects (AE)/pot per day to 0.21 AE/pot per day. This level was stable from March 2004 to March 2005.

This improvement includes the feed operation in the smelter pots on two ranges: underfeed and overfeed compared with the theoretical range of alumina feeding considering the current of 4.25 V and the characteristics of the pots. The alumina feeding was in normal operation underfeed, which resulted in a decrease of alumina solved in the pot and in a correspondent increase of electrical resistance. The computer system identifies a tendency of electrical resistance up and above the level of 8.0 V where the anode effects occur, and changes the feeding rate to overfeed in order to avoid the occurrence of the anode effect in the respective pot. This technology reaches the level mentioned of 0.21 AE/pot per day.

However, ALBRAS wanted to reduce this effect further. To achieve this, ALBRAS developed the "Anode Effect Early Detection Algorithm" which identifies several conditions, during the rate overfeeds, when the height of anodes is changing and the previous computer control was not able to avoid the anode effect.

The project activity involves the following two stages:

1) Installation of an Anode Effect Early Detection Algorithm: This system is based on the pot resistance behaviour. There is a specific pot resistance variation pattern, which is indicative that an anode effect is going to occur in the pot. The system detects the pattern and sends a message to the pot operator before the occurrence of the anode effect. The pot operator must attend the cell and eliminate any cause of anode effect before its occurrence.

This is a new procedure that was developed by the technical team of ALBRAS, in order to reduce the anode effect frequency, and thus, the PFC emissions.

2) Installation of a new feeding algorithm that will be integrated to the Anode Effect Early Detection Algorithm mentioned above: The Anode Effect Early Detection Algorithm will be complemented by the new feeding algorithm presently under development, which will allow an additional reduction of anode effect frequency, and thus, of PFC emissions. Through this new algorithm, the frequency of alumina feeding will be increased in order to overfeed the pot as soon as the anode effect pattern is detected. This will give the pot operator time enough to detect and eliminate anode effect causes.

The starting date of the project activity was 01 May 2005 with respect the Presentation and implementation of first phase of the PCF Albras Project. Nonetheless the start of project activity happened in 2005, the submission for validation only happened in June 2007 mainly due the approval of AM0030 (version 01) and subsequent PDD preparation.

The expected operational lifetime of the project is more than 20 years. A fixed 10-years crediting period has been selected starting on 15 August 2008 or registering date.

The new feeding algorithms integrated to Anode Effect Early Detection Algorithm was to be implemented during 2007 and the goal is to obtain a reduction to less than 0.1 AE/potday.

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

4.3 Baseline Determination

The project applies the approved baseline methodology AM0030 - “PFC emission reductions from anode effect mitigation at primary aluminium smelting facilities” (version 01) /16/. The project applies the 2006 IPCC Guidelines /21/. This follows up on EB 26, paragraph 68 that states 2006 IPCC guidelines are be considered the latest version after 24 October 2006. AM0030 also states that the latest version of the IPCC guidelines shall be used.

The project fulfils the conditions under which AM0030 (version 01) is applicable considering that ALBRAS operates smelting lines using center work pre-bake cell (CWPB) with point feeder system (FPB), ALBRAS started-up on 1985, historical date is available for more than three years before, the number of 960 existent pots are not foreseen to increase and the historical figures (verified by assessing the computer operational control center) demostrate the operational stability, mainly with respect to anode effectd during the period of March 2004 to March 2005 when ALBRAS reached a level 0.21 AE/pot per day. This stability could be used to increase the aluminium production by increasing the electric current (until 182.5 kA) as shown through pilot tests carried out by ALBRAS.

The baseline scenario was identified based on the procedure for "*Identification of baseline scenario*" described in the approved methodology AM0030 (version 01) and the *Tool for the demonstration and assessment of additionality*, as referred to in AM0030 (version 01).

The methodology application first involves an identification of possible baseline scenarios, and eliminating those that would not qualify. As a result the only feasible baseline is a continuation of the *status quo*, which meets current regulations. Therefore the continuation of the current situation can be selected as the baseline scenario.

4.4 Additionality

In accordance with AM0030 (version 01), the additionality of the project is demonstrated through the *Tool for the demonstration and assessment of additionality* /17/, which includes the following steps:

The starting date of the CDM project activity was 01 May 2005. This was prior to the project requesting validation and DNV has thus assessed evidence that demonstrates that the CDM was seriously considered in the decision to implement the project, through the proposal issued in November 2004 by MGM International /14/, a developer of CDM projects worldwide, to develop CDM project at ALBRAS confirms that ALBRAS took into account the CDM before implementation of project.

As a consequence of the communications with MGM International, ALBRAS proposed to reduce non-scheduled anode effect frequency during the year 2005. ALBRAS' motivation was the reduction of PFC emissions under the CDM rather than to achieve performance improvements, since ALBRAS could continue operating with the anode effect conditions reached in March 2004. When AM0030 (version 01) was approved on May 2006 ALBRAS start the additional development as a CDM project activity.

Step 1 - Identification of baseline scenario candidates:

The possible baseline scenarios are:

a) The proposed project activity not undertaken as a CDM
b) Anode effect mitigation though control measures and quality measures, and
c) No implementation of any anode effect mitigation measures.

As explained in the PDD and verified during the site visit, ALBRAS had achieved high level of anode effect stability control due to the several improvements to the equipment and operation control. Also the quality of the raw material is already very high given the quality control of the supplier, Alunorte /11/, a neighbour to ALBRAS and the world largest alumina producer. Hence, no further alumina quality improvements are likely to occur. Finally, Brazilian Legislation does not include any regulation on PCF emissions and it is not foreseen that such regulation will be adopted in the future..

In conclusion, only alternative "a" and "c" above can be considered as realistic and credible baseline options. For the assessment of additionality, the alternative "a" is split on two cases: Case 1 corresponds to the implementation of the project activity with electricity saving(0.17%) from reduction of the anode effect, Case 2 corresponds to the implementation of the project activity by increasing the aluminium production (802 tonnes Al) and electricity saving (0.17%). The scenario "c" is analyzed as Case 3 corresponding to an increase in the aluminium production as in Case 2 (800 ton Al) but by only increasing the electric current /4/ and no implementation of any anode effect mitigation.

Step 2 - Investment analysis:

An investment analysis, using the approach 2b/2c of *Tool for the demonstration and assessment of additionality* /17/ namely an investment/financial comparison analysis is presented to demonstrate that the Case 3 is more attractive compared to Case 1 and 2. The

argumentation considers that the project NPV (before tax) of Case 3 is US$ 7 100 971, while the Case 2 has a NPV of US$ 6 632 934 and Case 1 has a NPV of US$ 2 583 598.

The results of the NPV analysis were presented to DNV /4/.It considered the investment for developing the algorithm, the cost of electricity established by the contract with the electricity supplier and the aluminium price according London Metal Exchange /13/, on August 2007 reaching US$ 2 500/ton Al. The NPV analysis shows that case 3 is the most economically attractive option.

A sensitive analysis has been done decreasing the aluminium price and increasing the electricity price. The sensitivity analysis demonstrates that even with changing the aluminium or electricity price case 3 still is more financially attractive than case 1 and 2.

Step 3 - Barrier analysis:

a) *Barriers due to business strategy*. During the last years, ALBRAS had developed several improvements for increasing the production through the increase of electric current, the main economic issue, and also develop the control of anode effect through monitoring of electrical resistance on the pots, reaching the level of 0.21 AE/pot per day. This level is the 20th level in the IAI PFPB ranking /12/ and represents a good level compared with the average AE frequency of 0.27 AE/pot per day determined based on data from 109 smelters corresponding to 65% production of all smelters of the world. Due to this, the main objective of ALBRAS would be to increase the electrical current capacity in order to improve the aluminium production. The development of the "Anode Effect Early Detection Algorithm" does not reduce the electricity consumption significantly (0.17%) and do not result in a significant increase of aluminium production.

b) *Prevailing practice barriers*. DNV could confirm that a project activity of this type with the implementation of an "Anode Effect Early Detection Algorithm" is not currently operational in Brazil.

Step 4 - Common practice analysis:

DNV was able to confirm that the anode effect mitigation as developed as "Anode Effect Early Detection Algorithm" is not common practice in Brazil. The similar project at Aluar in Argentina was implemented and proposed as CDM project activity.

Given the above, it is sufficiently demonstrated that the project is not a likely baseline scenario and that emission reductions form the project can be considered additional.

4.5 Monitoring

The project applies the approved monitoring methodology AM0030 - "PFC emission reductions from anode effect mitigation at primary aluminium smelting facilities" (version 01) /16/.

The monitoring plan for emissions reduction occurring within the project boundary is based on monitoring the amount of aluminium produced, the anode effect frequency (AEF) and duration (AED) and the project slope coefficient. The table "*B.7.1 Data and parameters monitored*" of the PDD does present all the parameters that need to be monitored.

4.5.1 Parameters determined ex-ante

Baseline emissions due to the mitigation of anode effect in the aluminium smelting pots of ALBRAS are calculated considering the anode effect frequency and anode effect duration for the period of 01 March 2004 to 31 March 2005, when ALBRAS reached stability related to anode effect mitigation. These figures were treated statistically as established by AM0030 (version 01) considering a 95% confidence interval (applying a Student's t-distribution). The results are an average AEF of 0.208 AE/pot per day with confidence interval of 0.204 – 0.213 and an average AED of 4.641 sec with a confidence interval of 4.581 – 4.700.

The baseline emission calculation considers the slope coefficient calculated based on measurements carried out in May 2006 through a Fourier Transform Infrared (FTIR) methodology. The slope coefficient was calculated according the US EPA Protocol for PCF monitoring /18/ and the 2006 IPCC Tier 3b PCF Calculation Coefficients form Measurement of PCF /7/. The measurements were carried out on 104 cells in ALBRAS's pot line 4 under two different conditions: operating the current anode effect mitigation system (baseline) and operating with the Anode Effect Early Detection Algorithm (project activity). The slope coefficient measurement with the current anode effect mitigation system (baseline) for CF4 resulted in 0.040 (kg CF_4/ton Al)/(AE min/cel per day) and with the weight ratio of C_2F_6 to CF_4 measured to be 0.071, the slope coefficient for C_2F_6 is 0.00284 (kg C_2F_6 /ton AL)/AE min/cel per day).

AM0030 (version 01) established that there is an uncertainty of +/- 15%. Baseline emissions calculation consider - 15% and project emissions consider + 15% of the slope measurement. Thus, the values obtained are:

- Baseline emissions: 0.034 (kg CF4/ton Al)/(AE min/cel per day) and 0.00241 (kg C_2F_6 /ton Al)/AE min/cel per day);
- Project emissions: 0.055 (kg CF4/ton Al)/(AE min/cel per day) and 0.00502 (kg C_2F_6 /ton Al)/AE min/cel per day).

4.5.2 Parameters monitored ex-post

The AEF and AED will be monitored on line by the Control System of ALBRAS, which have capacity to storage all operation parameters and treat the figures according statistical approach considering 95% confidence interval (Student's t-distribution). For the ex-ante estimation of the project emissions, ALBRAS considers a value of 0.05 for AEF and 3.0 for AED based on the results of a pilot test.

The slope coefficient will be measured at every 3 years or less, and the results treated according the US EPA Protocol for PCF monitoring /18/ and Calculation of IPCC Tier 3b PCF Calculation Coefficients form Measurement of PCF /7/, including calibration of FTIR equipment using certificated standard PFC gas. The slope coefficient measurements carried out in May 2006 with the Anode Effect Early Detection Algorithm (project activity) of CF4 resulted in 0.048 (kg CF_4/ton Al)/(AE min/cel day) and with a weight ratio of C_2F_6 to CF_4 measured to be 0,091, the slope coefficient for C_2F_6 results in 0.00437 (kg C_2F_6 /ton AL)/AE min/cel day). These results were used in the ex-ante estimation of project emissions. However, actual measurements will be carried out ex-post and actual project emissions will be determined based on the ex-post measurement results. Until an updated measurement is taken the project emissions will be calculated based on the ex-ante values, this is conservative and deemed reasonable.

Details of the data to be collected, calibration of measurement instruments, and the frequency of data recording, format and storage location are described. The recording frequency and storage of the data seems appropriate for the project.

4.5.3 Management system and quality assurance

ALBRAS – Alumínio Brasileiro S.A. is responsible for the management of project and monitoring and reporting as well as for training of staff in the appropriate monitoring, measurement and reporting techniques including Spreadsheet ALBRAS MVP /5/.

The monitoring plan is straightforward and the established QA/QC procedures will be included on Quality Environment and Safety Management Systems, certified as ISO 9001, ISO 14001 and OHSAS 18001.

4.6 Estimate of GHG Emissions

The calculations were considered conservative and accurate. DNV was able to confirm that if the project will be implemented as described; the project is likely to achieve the emission reductions stated in the PDD.

4.7 Environmental Impacts

ALBRAS has been granted an Environmental Operation License Nº 450/2006 issued on May 2006 by SEMA/SECTAM and requested to renew on 28/12/2006. This license includes a number of conditions and restrictions. The compliance with these conditions and restrictions were verified during the follow up interview with ALBRAS. The project will result in less emission of PCF and has only positive environmental impacts.

During the first verification, the renewal of the Operational Environmental License should be checked.

4.8 Comments by Local Stakeholders

Local stakeholders, such as the Municipal Government, the state and municipal agencies, the Brazilian forum of NGOs, neighbouring communities and the office of the attorney general, were invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA and as verified by copies sent to DNV. Three comments were received by the President of Barcarena Chamber, the Executive Secretary of the Municipal Environmental Agency and the Abaetetuba Archbishop. All comments were supporting the project and adequately addressed by project participants.

4.9 Comments by Parties, Stakeholders and NGOs

The PDD of 29 June 2007 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 July 2007 to 05 August 2007. No comments were received.

APPENDIX A

CDM VALIDATION PROTOCOL

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

Requirement	Reference	Conclusion
About Parties		
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	No participating Annex I Party is yet identified.
2. 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
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	OK
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	Table 2, Section A.3 OK. DNA of Brazil: Letter of Approval. 15 May 2008
5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK - The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Brazil.
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK - The Brazilian designated national authority for the CDM is the Comissão Interministerial de Mudança Global do Clima.
7. The host Party and the participating Annex I Party shall be a Party to the	CDM Modalities §30/31a	OK - Brazil has ratified the Kyoto

Requirement	Reference	Conclusion
Kyoto Protocol.		Protocol on 23 August 2002.
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK - No participating Annex I Party is yet identified.
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	OK - No participating Annex I Party is yet identified.
About additionality		
10. Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	OK - Table 2, Section B.3.1
About forecast emission reductions and environmental impacts		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK - Table 2, Section B.4 to B.7
For large-scale projects only		
12. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK.- Table 2, Section D.
About stakeholder involvement		
13. 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 E.

Requirement	Reference	Conclusion
14. 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 of 29 June 2007 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 July 2007 to 05 August 2007. No comments were received.
Other		
15. The 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
16. 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.
17. 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.
18. The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK - The project design document conforms to version 03.1 of the CDM-PDD.
19. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	OK.

Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A. General Description of Project Activity *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 boundaries (geographical) clearly defined?	/1/	DR	The "PFC Emission Reductions at ALBRAS, Alumínio Brasileiro S.A." is constituted by ALBRAS aluminium smelter located in the Barcarena municipality, Pará State. However, the identification in section A.3 is different from Annex 1. DNV request a clarification on this.	~~CL 1~~	OK
A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/	DR	The project boundary is the site where ALBRAS are located and involves the improvement of the automatic control system in 960 pots of its aluminium smelting facility.		OK
A.2. Participation Requirements *Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.*					
A.2.1. Which Parties and project participants are participating in the project?	/1/	DR	The project participant is ALBRAS – Alumínio Brasileiro S.A. of Brazil. The host Party Brazil meets all relevant participation		OK

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			requirements.		
A.2.2. Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party?	/1/	DR	The Brazilian DNA confirmed that the project assists in achieving sustainable development.		OK
A.2.3. Do all participating Parties fulfil the participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority	/1/	DR	Yes, Brazil fulfil all requirements		OK
A.2.4. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.	/1/	DR	The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Brazil.		OK
A.3. 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.3.1. Does the project design engineering reflect current good practices?	/1/	DR	The project design engineering reflects good practice.		OK
A. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used	/1/	DR	The technology of these pots is Center Work Prebake with Point Feeder system (PFPB). Until 2005, ALBRAS implemented several		OK

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
technologies in the host country?			improvement in order to increase the production as to 460.000 ton Aluminium/year with the current of 170 kA on line 1 and 180 kA on lines 2.3 and 4 /8/ and reduce the anode effect from 0.9 AE/potday to 0.21 AE/pot per day, when was verified a stable level from March 2004 to March 2005. This technology reach the level mentioned of 0.21 AE/pot per day. ALBRAS want to reduce this effect, which happens during overfeed condition, and due not foreseen operational conditions. To achieve this, ALBRAS developed the "Anode Effect Early Detection Algorithm"		
A.3.2. Does the project make provisions for meeting training and maintenance needs?	/1/	DR	Yes - The "Anode Effect Early Detection Algorithm" was developed by own technical expertise and the system is upload on ALBRAS Control Center.		OK
A.4. Contribution to Sustainable Development *The project's contribution to sustainable development is assessed.*					
A.4.1. Has the host country confirmed that the project assists it in achieving sustainable development?	/1/	DR	The project is in line with current sustainable development priorities in Brazil and was confirmed by Brazilian DNA.		OK
A.4.2. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	The project is according the ALBRAS's Sustainability Policy which have several initiatives to improve the life quality of own employees and regional communities as		OK

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			could be evidenced on ALBRAS website http://www.ALBRAS.net/en/.		
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. Does the project apply an approved methodology and the correct version thereof?	/1/	DR	Yes - The project applies the approved baseline methodology AM0030 - "PFC emission reductions from anode effect mitigation at primary aluminium smelting facilities" (version 01) /16/,		OK
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?	/1/	DR	Yes - The project fulfils the conditions under which AM0030 (version 01) is applicable considering that ALBRAS operate smelting lines using center work pre-bake cell (CWPB) with point feeder system (FPB), ALBRAS started operation in 1985, historical date is available more than three years, the number of 960 existent pots are not foreseen to increase and historical figures evidence operational stability.		OK
B.2. Baseline Scenario Determination *The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and*					

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.					
B.2.1. What is the baseline scenario?	/1/	DR	In accordance with AM0030 (version 01), the baseline was defined during operational stability during the period of March 2004 and March 2005 when the ALBRAS reach 0.21 AE/potday. This stability could be used to increase the Aluminium production by the increasing of electric current (until 182.5 kA) as evidenced on pilot tests carried out by ALBRAS. The emission coefficient calculations were transparently presented in spreadsheets submitted to and verified by DNV. As a result the only feasible baseline is a continuation of the *status quo*, which meets current regulations. Therefore, the continuation of the current situation can be selected as the baseline scenario. However, the identification of the baseline scenario is not clearly described in the section B.4 of the PDD. According to the methodology AM0030 (version 01), the project developer needs to use correctly the steps 1 and 2. Step 1 should contain a clear and brief description of each alternative scenario. DNV requests clarifications on these alternatives. In step 2, the project developer should use the steps 2		OK

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			and/or 3 of the latest approved version of the *Tool for the demonstration and assessment of additionality* to assess which of the alternatives selected in step1 should be excluded from further consideration. The use of the Tool should be clearly described in section B.4 of the PDD. DNV requests the correct use of the Tool steps.	~~CL 2~~	
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/	DR	*Step 1 - Identification of baseline scenario candidates:* The possible baseline scenarios are: a) The proposed project activity not undertaken as a CDM b) Plausible and credible anode effect mitigation though control measures and quality measures, and *c)* No implementation of any anode effect mitigation measures. As explained in the PDD and verified during the site visit, the ALBRAS had achieved high level of AE stability control due to several improvements of equipment and operation control. Also the quality of raw material is very high considering the quality control of the supplier, Alunorte /11/, which is a neighbour to ALBRAS and the world largest alumina producer. No further quality		

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			improvement are likely to be achieved. There is no Brazilian regulation on PCF emissions established or foreseen. In conclusion, only alternative “a” and “c” could be considered as realistic and credible options, and in order to be clear on analyses, the alternative “a” is split on two cases: Case 1 correspond the implementation of project activity with electricity savings from the reduction of the anode effect (0.17%), Case 2 correspond to the implementation of thje project activity with increase the aluminium production (802 ton Al) with the electricity saved (0.17%). The scenario “c” is analysed as Case 3 corresponding to no implementation of any anode effect mitigation and increase the aluminium production to same amount as in Case 2 (800 ton Al) only by increasing the electric current /4/. The amount of aluminium of Case 2 is different of Case 3. DNV request correction of that.	~~CAR 1~~	OK
B.2.3. Has the baseline scenario been determined according to the methodology?	/1/	DR	The baseline emission calculations are according to AM0030 (version 01). It is calculated considering the anode effect frequency and anode effect duration for the period of 01 March 2004 to 31 March 2005, when ALBRAS reach stability in the anode		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			effect mitigation. These figures were treated statistically as established by AM0030 (version 01) considering a 95% confidence interval (applying a Student's t-distribution). The baseline emission consider also the slope coefficient measured in July 2006 through FTIR methodology. The slope coefficient was calculated according the US EPA Protocol for PCF monitoring /18/ and Calculation of IPCC Tier 3b PCF Calculation Coefficients form Measurement of PCF /7/. The measurements were carrying out from 104 cells in ALBRAS's pot line 4 with two conditions: operating the current anode effect mitigation system (baseline) and operating with the Anode Effect Early Detection Algorithm (project activity). The CF4 slope coefficient measurement with the the current anode effect mitigation system resulted in 0.040 (kg CF4/ton Al)/(AE min/cel per day). With a weight ratio of C_2F_6 to CF4 measured to be 0,071 the C_2F_6 slope coefficient is 0.00284 (kg C_2F_6 /ton AL)/AE min/cel per day). As the AM0030 (version 01) established to Tier 3 an uncertainty of +/- 15%, the baseline emissions calculation consider - 15% and the project emission consider + 15% of the lope		

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			measurement. And the values results: Baseline emissions: 0.034 (kg CF4/ton Al)/(AE min/cel prt day) and 0.00241 (kg C2F6 /ton Al)/AE min/cel per day);		
B.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/1/	DR	See B.2.3		OK
B.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR	As verified on Brazilian Legislation, there is no regulation on PCF emissions established and not foreseen		OK
B.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR	Yes		OK
B.2.7. Have the major risks to the baseline been identified?	/1/	DR	The baseline was established considering the anode effect frequency and anode effect duration for the period of 01 March 2004 to 31 March 2005, when ALBRAS reached stability in anode effect mitigation. These assumptions could be considered representative and significant.		OK
B.3. Additionality Determination *The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.*					
B.3.1. Is the project additionality assessed according to	/1/	DR	Yes, In accordance with AM0030 (version 01),		OK

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
the methodology?			the additionality of the project is demonstrated through the *Tool for the demonstration and assessment of additionality* /17/, which includes the following steps:		
B.3.2. Are all assumptions stated in a transparent and conservative manner?	/1/	DR	Yes		OK
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	*Step 2 - Investment analysis:* An investment analysis, using the approach 2b/2c of *Tool for the demonstration and assessment of additionality* /17/ namely an investment/financial comparison analysis is presented to demonstrate that the Case 3 is more attractive compared whit Case 1 and 2. The argumentation considers that the project NPV (before tax) of Case 3 US$ 7,100,971, the Case 2 has NPV of US$6,632,934 and Case 1 has the NPV of US$ 2,583,598, however the investment of US$ 100,000 of system installation cost was not described. DNV request clarification of that. The results of the NPV analyses were presented to DNV /4/ and evidenced the result considering the electricity price establish by contract with the electricity supplier and an aluminium price according to the London Metal Exchange /13/. However, the price on August 2007 reached only US$ 2,500/ton Al. DNV request clarification of what date was considered. A sensitive analysis was carrying on but not	~~CL 3~~ ~~CL 4~~	OK

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			described in the spreadsheet. DNV request to include this in the spreadsheet. *Step 3 - Barrier analysis::* a) *Barriers due to business strategy*. During the last years, ALBRAS had developed several improvements on increasing the production through the increase of electric current, the main economic issue, and also develop the control of anode effect through monitoring of electrical resistance on the pots, reaching the level of 0.21 AE/potday, the 20th level on IAI PFPB ranking /12/, a good level compared with the AE frequency average of 0.27 from 109 smelters corresponding 65% production of all smelters of the world. Due this, the main objective of ALBRAS would be increase the electrical current capacity in order to improve the aluminium production, once the efforts on development of the "Anode Effect Early Detection Algorithm" don't avoid significant electricity (0,17%) and don't represent significant increase of aluminium production. DNV has been able to confirm the appropriateness of the analysis.	~~CL 5~~	

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			b) *Prevailing practice barriers*. DNV could confirm that a project activity of this type as "Anode Effect Early Detection Algorithm" is not currently operational in Brazil. *Step 4 - Common practice analysis:* DNV was able to confirm that the anode effect mitigation as developed as "Anode Effect Early Detection Algorithm" is not common practice in Brazil. The similar project of Aluar on Argentina was implemented under CDM scheme. Given the above other barriers the project faces, it is sufficiently demonstrated that the project is not a likely baseline scenario, and emission reductions form the project can be considered additional		
B.3.4. If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?	/1/	DR	The starting date of the CDM project activity is 01 May 2005. The intention to develop incremental improvement under CDM project was defined after ALBRAS reached stability with an AE frequency of 0.21 AE/pot per day in March 2005 and when the AM0030 (version 01) was approved in May 2006. However the documental evidence was not available yet. DNV request clarification about that.	~~CL 6~~	OK

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.4. Calculation of GHG Emission Reductions – Project emissions *It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	Yes, on PDD and on ALBRAS emission reduction spreadsheet.		OK
B.4.2. Have conservative assumptions been used when calculating the project emissions?	/1/	DR	As the AM0030 (version 01) established for Tier 3 an uncertainty of +/- 15%.The project emission consider + 15% of the slope measurement. And the values results: Project emissions: 0.055 (kg CF_4/ton Al)/(AE min/cel per day) and 0.00502 (kg C_2F_6 /ton Al)/AE min/cel per day)		OK
B.4.3. Are uncertainties in the project emission estimates properly addressed?	/1/	DR	According to the results obtained from the pilot test (10 prototypes of retrofitted cells are running in Line 3) ALBRAS expects to reach an Anode Effect Frequency of 0.05 anode effects per cell per day and an Anode Effect Duration of 3 minutes after the complete implementation of the project activity. However, the statistic and the conservative approach was not evidenced. DNV request more information about that.	~~CL 7~~	OK

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.5. Calculation of GHG Emission Reductions – Baseline emissions *It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
B.5.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	Yes, on PDD and on ALBRAS emission reduction spreadsheet. Baseline emissions due to mitigation of anode effect in the aluminium smelting pots of ALBRAS are calculated considering the anode effect frequency and anode effect duration for the period of 01 March 2004 to 31 March 2005, when ALBRAS reach stability in anode effect mitigation. These figures were treated statistically as established by AM0030 (version 01) considering 95% confidence interval (applying a Student's t-distribution) and the results was an average AEF of 0.208 with confidence interval 0.204 – 0.213 and an average of 4.641 sec AED with confidence interval 4.581 – 4.700. The baseline emission consider also the slope coefficient measured in May 2006 through FTIR methodology, and was calculated according the US EPA Protocol for PCF monitoring /18/ and Calculation of IPCC Tier		OK

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			3b PCF Calculation Coefficients form Measurement of PCF /7/. The measurements were carrying out in 104 cells in ALBRAS's pot line 4 with two conditions: operating the current anode effect mitigation system (baseline) and operating with the Anode Effect Early Detection Algorithm (project activity). The CF_4 slope coefficient measurement with the current anode effect mitigation system (baseline) resulted in 0.040 (kg CF_4/ton Al)/(AE min/cel per day). With a weight ratio of C_2F_6 to CF_4 measured to be 0,071, the C_2F_6 slope coefficient result in 0.00284 (kg C_2F_6/ton AL)/AE min/cel per day). The CF_4 slope coefficient measurements with the Anode Effect Early Detection Algorithm (project activity). resulted in0.048 (kg CF_4/ton Al)/(AE min/cel per day). With a weight ratio of C_2F_6 to CF_4 measured to be 0.091, the C_2F_6 slope coefficient results in 0.00437 (kg C_2F_6/ton AL)/AE min/cel per day),		
B.5.2. Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	As the AM0030 (version 01) established for Tier 3 an uncertainty of +/- 15%. The baseline emissions calculation consider -15% and the project emission consider + 15% of the slope measurement. Hence, the following values result:		OK

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			Baseline emissions: 0.034 (kg CF4/ton Al)/(AE min/cel per day) and 0.00241 (kg C2F6 /ton Al)/AE min/cel day).		
B.5.3. Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	The Baseline emissions pre tonne of aluminium produced according formula (1) of AM0030 (version 01) was considered in the baseline calculations as 0.235 (t CO_2/tAl). However, in the table 8 section B.6.2 of PDD, this figure was mentioned as 0.65(t CO_2/tAl), the value of IAI Survey for PFPB technology. DNV request a correction of this.	~~CL 8~~	OK
B.6. Calculation of GHG Emission Reductions – Leakage *It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
B.6.1. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	No leakage is expected to occur in this type of projects.		OK
B.6.2. Have conservative assumptions been used when calculating the leakage emissions?	/1/	DR	See B.6.2		OK
B.6.3. Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR	See B.6.2		OK

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.7. Emission Reductions *The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.*					
B.7.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	/1/	DR	The project is expected to reduce CO_2 emissions to the extent of 802 862 tCO2e during the fixed 10-years crediting period (80 286 tCO2e/year on average).		OK
B.8. Monitoring Methodology *It is assessed whether the project applies an appropriate monitoring methodology.*					
B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	The project applies the approved monitoring methodology AM0030 - "PFC emission reductions from anode effect mitigation at primary aluminium smelting facilities" (version 01) /16/. The monitoring plan for emissions a reduction occurring within the project boundary is based on monitoring the amount of the aluminium produced, the anode effect frequency (AEF), the anode effect duration (AED) and the project slope coefficient. The table "*B.7.1 Data and parameters monitored*" of the PDD does not present all the parameters that need to be monitored. According to the methodology, the current efficiency needs to be monitored.	~~CL 9~~	OK

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.8.2. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/	DR	Details of the data to be collected, calibration of measurement instruments, and the frequency of data recording, format and storage location are described. The recording frequency and storage of the data seems appropriate for the project.		OK
B.9. Monitoring of Project Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
B.9.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/	DR	The AEF and AED will be monitored on line by the control system of ALBRAS, which have capacity to storage all operation parameters and treat the figures according statistical approach considering 95% confidence interval (Student's t-distribution). The slope coefficient will be measured at least each 3 years, and the results treated according the US EPA Protocol for PCF monitoring /18/ and Calculation of IPCC Tier 3b PCF Calculation Coefficients form Measurement of PCF /7/, including calibration of FTIR equipment using certificated standard PFC gas		OK
B.9.2. Are the choices of project GHG indicators reasonable and conservative?	/1/	DR	Yes.		OK
B.9.3. Is the measurement method clearly stated for each	/1/	DR	See B.9.1		OK

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
GHG value to be monitored and deemed appropriate?					
B.9.4. Is the measurement equipment described and deemed appropriate?	/1/	DR	See B.9.1		OK
B.9.5. Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR	See B.9.1		OK
B.9.6. Is the measurement *interval* identified and deemed appropriate?	/1/	DR	See B.9.1		OK
B.9.7. Is the *registration, monitoring, measurement* and *reporting* procedure defined?	/1/	DR	The monitoring plan is straightforward and the established QA/QC procedures will be included on Quality Environment and Safety Management Systems, certified as ISO 9001, ISO 14001 and OHSAS 18001		OK
B.9.8. Are procedures identified for *maintenance* of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR	See B.9.7		OK
B.9.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	See B.9.7		OK

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.10. Monitoring of Baseline Emissions *It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.*					
B.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR	The aluminium production will monitored by production control system and the AEF, AED and slope will be considered fixed according measurements carried out on anode effect stable period of ALBRAS from 01 March 2004 to 31 March 2005.		OK
B.10.2. Are the choices of baseline GHG indicators reasonable and conservative?	/1/	DR	Yes		OK
B.10.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/1/	DR	See B.10.1		OK
B.10.4. Is the measurement *equipment* described and deemed appropriate?	/1/	DR	See B.10.1		OK
B.10.5. Is the measurement *accuracy* addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR	See B.10.1		OK
B.10.6. Is the measurement *interval* for baseline data identified and deemed appropriate?	/1/	DR	See B.10.1		OK
B.10.7. Is the registration, *monitoring*, *measurement* and *reporting* procedure defined?	/1/	DR	See B.10.1		OK

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.10.8. Are procedures identified for *maintenance* of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR	See B.10.1		OK
B.10.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	See B.10.1		OK
B.11. Monitoring of Leakage *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.*					
B.11.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR	No leakage is expected to occur in this type of projects.		OK
B.11.2. Are the choices of project leakage indicators reasonable and conservative?	/1/	DR	See B.6.2		OK
B.11.3. Is the measurement method clearly stated for each leakage value to be monitored and deemed appropriate?	/1/	DR	See B.6.2		OK
B.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts *It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over*					

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
time.					
B.12.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/	DR	Neither AM0030 (version 01) nor Resolution 1 of the Brazilian DNA requires the monitoring of social or environmental indicators.		OK
B.12.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	See B.12.1		OK
B.12.3. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/	DR	See B.12.1		OK
B.13. Project Management Planning *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.*					
B.13.1. Is the authority and responsibility of overall project management clearly described?	/1/	DR	The monitoring plan is straightforward and the established QA/QC procedures will be included on Quality Environment and Safety Management Systems, certified as ISO 9001, ISO 14001 and OHSAS 18001.		OK
B.13.2. Are procedures identified for training of monitoring personnel?	/1/	DR	ALBRAS – Alumínio Brasileiro S.A. is responsible for the project management and monitoring and reporting as well as for training of staff in the appropriate		OK

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			monitoring, measurement and reporting techniques including Spreadsheet ALBRAS MVP		
B.13.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	Not applicable		OK
B.13.4. Are procedures identified for review of reported results/data?	/1/	DR	See B.13.1		OK
B.13.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR	See B.13.1		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 evidenced?	/1/	DR	The project starting date is 01 May 2005 with an expected lifetime of 20 years.		OK
C.1.2. Is the start of the crediting period clearly defined and reasonable?	/1/	DR	A fixed 10-years crediting period was selected, starting on 1 January 2008. However, in order to comply with the Brazilian DNA and CDM requirements, this starting date is considered not adequate, DNV request to adjust it.	~~CL 10~~	OK
D. Environmental Impacts					

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.					
D.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/	DR	ALBRAS has been granted an Environmental Operation License Nº 450/2006 issued on May 2006 by SEMA/SECTAM and requested to renew on 28/12/2006. This license includes a number of conditions and restrictions. The compliance with this conditions and restrictions were verified during the follow up interview with ALBRAS. The project will result on less emission of PCF and only positive impact will result of its implementation		OK
D.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/	DR	See D.1.1		OK
D.1.3. Will the project create any adverse environmental effects?	/1/	DR	See D.1.1		OK
D.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR	See D.1.1		OK
D.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR	See D.1.1		OK

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
D.1.6. Does the project comply with environmental legislation in the host country?	/1/	DR	See D.1.1		OK
E. Stakeholder Comments *The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.*					
E.1.1. Have relevant stakeholders been consulted?	/1/	DR	Local stakeholders, such as the Municipal Government, the state and municipal agencies, the Brazilian forum of NGOs, neighboring communities and the office of the attorney general, were invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA and as verified by copies sent to DNV. Three comments were received: President of Barcarena Chamber, Executive Secretary of the Municipal Environmental Agency and Abaetetuba Archbishop. All comments were supporting the project and adequately addressed by project participants.		OK
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	See E.1.1		OK
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR	See E.1.1		OK

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
E.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR	See E.1.1		OK
E.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR	See E.1.1		

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

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CAR 1 Case 1 corresponds to the implementation of project activity with electricity save from the reduction of anode effect (0.17%), Case 2 corresponds to the implementation of project activity with increase the aluminium production (802 ton Al) with the electricity saved (0.17%). The scenario "c" is analyzed as Case 3 corresponding to no implementation of any anode effect mitigation and increase the aluminium production on same amount of Case 2 (800 ton Al) only by increasing the electric current. The amount of aluminium of Case 2 is different of Case 3. DNV requests a correction of that.	B.2.1	This was corrected in the PDD and spreadsheet. There was a misunderstanding of formulas.	The reviewed PDD and the spreadsheet "ALBRAS Economic Analysis 10Set07cer0" were corrected. Therefore this CAR is closed.
CL 1 The "PFC Emission Reductions at ALBRAS, Alumínio Brasileiro S.A." is constituted by ALBRAS aluminium smelter located in the Barcarena municipality, Pará State. However the identification in section A.3 is different from Annex 1. DNV request a correction of this.	A.1.1	It was adjusted in the PDD, Table 1 page 3.	The PDD was corrected. Therefore this CL is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CL 2 The identification of the baseline scenario is not clearly described in the section B.4 of the PDD. According to the methodology AM0030 (version 01), the project developer needs to use correctly the steps 1 and 2. Step 1 should contain a clear and brief description of each alternative scenario. DNV requests clarifications on these alternatives. In step 2, the project developer should use the steps 2 and/or 3 of the latest approved version of the Tool for the demonstration and assessment of additionality to assess which of the alternatives selected in step1 should be excluded from further consideration. The use of the Tool should be clearly described in the section B.4 of the PDD. DNV requests the correct use of the Tool steps.	B.2.1	The methodology AM0030 was followed. Step 1 of the determination of the baseline requests: "Identify all realistic and credible baseline scenario candidates". From the scenarios proposed by the methodology, alternative 2 is discarded due to not be considered as a "realistic and credible baseline scenario candidate", by which Step 2 of the determination of the baseline (item B4 of the PDD) should have scenarios 1 and 3 analyzed. In this Step 2, Steps 2 and 3 of the Additionality Tool shall be applied. ALBRAS did exactly this, justifying in item B.5 that alternative 1 is not economically attractive. However, Step 3 from the Additionality Tool presents technological barriers. This is the realistic and credible baseline scenario.	The additional clarification identify the tracking of applicable scenarios and steps, and the argumentation is considered adequate. Therefore this CL is closed.
CL 3 The investment of US$ 100 000 of system installation cost was not described. DNV	B.3.3	A new worksheet was shown on the ALBRAS_Economic Analysis_10Sep07, where it is	The spreadsheet "ALBRAS Economic Analysis 10Set07cer0" could evidence each investment of US$ 289.561 which

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
requests clarification of that.		representing an investment values and sensitivity analysis. The US$ 100,000 investment shall be attributed to global costs of Research and Development.	is considered adequate on Brazilian labor price. Therefore this CL is closed.
CL 4 The results of the NPV analyses were presented to considering the electricity price establish by the contract with electricity supplier and the aluminium price according London Metal Exchange. However, the price on August 2007 reached only US$ 2,500/ton Al. DNV requests clarification of what date was considered.	B.3.3	US$ 2800,00 was the conservative price presented taking into account the fluctuation of the increasing cost of the aluminium tonne. This adopted value was of the last month before the local stakeholder process, that is, July 2007. These considered spreadsheets are on Annex 01.	The choice of aluminium price can be considered justified. Also considering the price of US$2,300 of December 2005, the project is still additional. Therefore this CL is closed.
CL 5 A sensitive analysis was carrying on but not described in the spreadsheet. DNV requests to include this.	B.3.3	The sensitivity analysis is inserted on ALBRAS_Economic Analysis_10Sep07cer0.	Detailed sensitive analyses included in the spreadsheet “ALBRAS Economic Analysis 10Set07cer0” is acceptable and could evidence that the project is still additional with changes in the aluminium and electricity price. Therefore this CL is closed.
CL 6 The starting date of the CDM project activity is 01 May 2005. The intention to develop incremental improvement under CDM project was defined after ALBRAS reach the stability in AE frequency of 0.21 AE/pot per day in March 2005 and when the AM0030 (version	B.3.4	Project’s starting date was May 2005. However, ALBRAS has knowledge on the CDM issues since 2002, upon invitation to attend a World Bank’s program on project possibilities. From this date on, despite uncertainties arisen during this period, ALBRAS provided	The complementary evidence of a MGM proposal to develop CDM project at ALBRAS issued on November 2004 and others evidences demonstrates that ALBRAS took into account the CDM before implementation of project. Therefore this CL is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
01) was approved on May 2006. However the documental evidence was not available yet. DNV requests clarification about that.		an experimental team for development and summary of data from the new monitoring and control software. At October 2004 MGM International, a developer of CDM projects worldwide, encouraged ALBRAS with a proposal of the current methodology and the Aluar project. So after 2 years of research, ALBRAS implemented definitively the project at the end May 2005. Despite incentives of the Aluar project, ALBRAS has sought to develop a different project, which would improve its environmental quality. Annex 02 presents the invitation letters of the World Bank's program and contacts with MGM as incentive to Aluar project.	
CL 7 According to the results obtained from the pilot test (10 prototypes of retrofitted cells are running in Line 3) ALBRAS expects to reach an anode effect frequency of 0.05 anode effects per cell per day and an anode effect duration of 3 minutes after the complete implementation of the project activity. However, DNV requests more information	B.4.3	Since 2007 2nd quarter, ALBRAS has been carrying out a test with the new feeding algorithm in a group of standard cells (not retrofitted) in order to evaluate its effectiveness. However, so far test results have been spoiled by increased power shutdown frequency caused by problems in the power supplier grid. It is well known that	Considering the complementary information received, the anode effect frequency of 0.05 anode effects per cell per day and an anode effect duration of 3 minutes is likely to be achieved. Therefore this CL is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
about that.		power failures increase the Anode Effect frequency during the restart due to overcooling of the cells. The Anode Effect frequency of 0,05 AE/cell.day has been estimated based on the number of anode effects foreseen and identified by the early Anode Effect prevention algorithm, but the operators did not have time enough to remove the causes and avoid the occurrence of the anode effect. Considering the period from January to July 2007, 14403 of this kind of Anode Effect occurred in ALBRAS potlines. This number corresponds to an Anode Effect frequency of 0,07 AE/cell.day that would be avoided by the new feeding algorithm. Considering the present Anode Effect frequency of 0,12 AE/cell.day, it has been set as target 0,05 AE/cell.day after new feeding algorithm implementation.	
CL 8 The Baseline emissions pre tonne of aluminium produced according formula (1) of AM0030 (version 01) was considered in the baseline calculations as 0.235 (t CO_2/tAl).	B.5.3	The value of 0.235 was considered, as pointed out by the Validator. An explanation regarding this value is yet showed in the PDD (table 8, item B.6.2, page 28), where the baseline parameter	The reviewed PDD consider the figure according to the definition of AM0030 (version 01) and consider the tCO2e/tAl according the slope measured at

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
However, in the table 8 section B.6.2 of PDD, this figure was mentioned as 0.65(t CO_2/tAl), the value of IAI Survey for PFPB technology. DNV requests a correction of this.		requested by AM0030 was taken into account as well. "As shown above, the baseline emissions per tonne of aluminium produced is lower than the IAI average value of "PFC emission per tonne of Aluminium Produced"	ALBRAS. Therefore this CL is closed.
CL 9 The monitoring plan for emissions a reduction occurring within the project boundary is based on monitoring the amount of the aluminium produced, the anode effect frequency (AEF), the duration (AED) and the project slope coefficient. The table "B.7.1 Data and parameters monitored" of the PDD does not present all the parameters that need to be monitored. According to the methodology, the current efficiency needs to be monitored.	B.8.1	According to USEPA and IAI (2003), Protocol for Measurement of Tetrafluoromethane and Hexafluoroethane from Primary Aluminium Production. U.S. EPA Climate Protection Partnerships Division, Washington, DC (see Annex 03 page from 10 to 11) it is not necessary the efficiency value of the current when applying the Slope method for emissions calculations. Use of this data is only for the calculation of emissions by the OverVoltage method. For the case of the ALBRAS project, these data do not need to me measured.	Considering the mentioned "Protocol" and the instrumentation available at ALBRAS, the monitoring plan can only consider the the parameter mentioned, because the over voltage from 4 to over 8 V can identify the anode effect. Therefore this CL is closed.
CL 10 A fixed 10-years crediting period was selected, starting on 01 January 2008. However, in order to comply with the Brazilian DNA and CDM requirements, this	C.1.2	It was adjusted in the PDD at C.2.2.1 page 38 and all points of new emission reductions.	The PDD adjusted the crediting starting date for 15 August 2008 and the emissions reduction estimation. Therefore this Cl is closed

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
starting date is not considered adequate and DNV request to adjust it.			

APPENDIX B

CERTIFICATES OF COMPETENCE

CERTIFICATE OF COMPETENCE

Andrea Leiroz

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

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

Høvik, 18 July 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Luis Filipe Tavares

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

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	--
CDM Verifier:	Yes	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 9 & 13		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

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:	Yes		
CDM Validator:	--	***JI Validator:***	--
CDM Verifier:	--	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 9		

Høvik, 5 February 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Ole Andreas Flagstad

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

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

Høvik, 5 February 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Michael Lehmann

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

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	--
CDM Verifier:	Yes	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1, 2, 3		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	*AM0027*	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes	*AM0030*	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	*AM0031*	Yes
ACM0004, ACM0012	Yes	*AM0032*	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	*AM0035*	Yes
ACM0007	Yes	*AM0038*	Yes
ACM0008	Yes	*AM0041*	Yes
ACM0009, AM0008, AMS-III.B	Yes	*AM0034*	Yes
AM0006, AM0016, AMS-III.D, ACM0010	Yes	*AM0043*	
AM0009, AM0037	Yes	*AM0046*	
AM0013, AM0022, AM0025, AM0039, AMS-III.H, AMS-III.I	Yes	*AM0047*	
AM0014	Yes	*AMS-II.A-F, AM0044*	Yes
AM0017	Yes	*AMS-III.A*	Yes
AM0018	Yes	*AMS-III.E, AMS-III.F*	Yes
AM0020	Yes		
AM0021, AM0028, AM0034, AM0051	Yes		
AM0023	Yes		
AM0024	Yes		

Høvik, 5 February 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director