VERIFICATION REPORT

CTF CONSULTING LLC
(SUBSIDIARY OF CARBON TRADE & FINANCE SICAR S.A.)

“REDUCTION
OF PFC EMISSIONS
FROM RUSAL KRASNOYARSK ALUMINIUM
SMELTER JI PROJECT ”

BUREAU VERITAS CERTIFICATION

REPORT NO. RUSSIA/0048-2/2010, VERSION 1

Verification Report on JI project
"Reduction of PFC emissions
from RUSAL Krasnoyarsk Aluminium Smelter JI Project"

VERIFICATION REPORT

Date of first issue: 05/07/2010	Organizational unit: Bureau Veritas Certification Holding SAS
Client: CTF Consulting LLC	Client ref.: Mr. K. Myachin

Summary:

Bureau Veritas Certification has been commissioned by CTF Consulting LLC (subsidiary of Carbon Trade & Finance SICAR S.A.) to carry out, under JI track 1 procedure, the initial and 1st periodic verification of GHG emission reduction by the JI project "Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter" (sectoral scope 09), based on UNFCCC criteria for the JI, as well as criteria given to ensure consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the JI rules and modalities and the subsequent decisions by the JI Supervisory Committee, as well as the host country criteria.

The purpose of this project is to reduce emissions of perfluorocarbons (PFCs) through the reduction of anode effect frequency (AEF) and anode effect duration (AED), by implementing a number of organizational and technical measures at the 24 potrooms of RUSAL Krasnoyarsk Aluminium Smelter (KrAZ), located in the city of Krasnoyarsk, Russian Federation. Twenty one of these potrooms use vertical stud Søderberg process with point feeders (PFVSS), the remaining – prebake anode process with point feeders (PFPB). The project is limited to CF_4 and C_2F_6 emissions.

The verification covers the period from January 1st 2008 to December 31st 2009.The verification is carried out as a combined Initial and 1st Periodic Verification. A risk-based approach has been followed to perform the verification. In the course of verification, 11 Corrective Action Requests (CAR), 3 CL (Clarification Request) were raised and successfully closed during the 1st Periodic Verification. 6 Forward Action Request (FAR) were left open till the next Periodic Verification.

The verification is based on the Monitoring Report (covers January 1st 2008 – December 31st 2009), the Monitoring Plan as set out in the determined PDD, Version 3.0 dated 27 October 2008, with insignificant deviations (improvements), justified by the project owners, and supporting documents made available to Bureau Veritas Certification by the project participant.

As a result of the Initial Verification, the Bureau Veritas Certification confirms that all organizational and technical measures at the 24 potrooms of RUSAL Krasnoyarsk Aluminium Smelter (KrAZ), implemented in the project boundary as planned and described in the PDD at 2233 electrolytic cells of PFVSS and PFBP technology. The potrooms run reliably, measuring equipment is calibrated appropriately, the monitoring system is in place and functional. The project is continuously generating emission reductions.

As a result of the 1st Periodic Verification, the Bureau Veritas Certification confirms that the GHG emission reductions are calculated without material misstatement in conservative and appropriate manner. Bureau Veritas Certification herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as of 464,520 tones CO_2-eq.

Report No.: RUSSIA/0048-2/2010	Subject Group: JI	
Project title: "Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter JI Project"		
Work carried out by: Vera Skitina – Team Leader, Lead Verifier		
Work reviewed by: Leonid Yaskin – Internal Technical Reviewer		
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Indexing terms: *Climate Change, JI, Emission Reductions, Verification, Kyoto Protocol*

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Abbreviations

AIE	Accredited Independent Entity
BVC	Bureau Veritas Certification
C	Carbon
CAR	Corrective Action Request
CL	Clarification Request
CO_2	Carbon Dioxide
CTF	CTF Consulting, LLC (subsidiary of Carbon Trade & Finance SICAR S.A.)
DR	Document Review
EIA	Environmental Impact Assessment
EMS	Environmental Management System
ERU	Emission Reduction Unit
FAR	Forward Action Request
GHG	Green House Gas(es)
JI	Joint Implementation
JISC	Joint Implementation Supervisory Committee
I	Interview
IETA	International Emissions Trading Association
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MR	Monitoring Report
JSC	Joint Stock Company
PCF	Prototype Carbon Fund (World Bank Carbon Finance Unit)
PDD	Project Design Document
PP	Project Participant
tCO_2-e	tonnes CO_2 equivalent
UNFCCC	United Nations Framework Convention for Climate Change
VR	Verification Report

1 INTRODUCTION

CTF Consulting, LLC has commissioned Bureau Veritas Certification to carry out the initial and 1st periodic verification of GHG emission reduction by the JI project “Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter” (hereafter referred ‘the project’). CTF Consulting, LLC (hereafter referred ‘CTF’) being Monitoring Report co-developer (together with UC RUSAL) coordinated the monitoring and verification processes on behalf of the OJSC “RUSAL Krasnoyarsk” (legal name of Krasnoyarsk Aluminium Smelter (KrAZ).

This report summarizes the findings of the verification of the project, performed based on UNFCCC criteria, as well as criteria given to ensure consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the JI rules and modalities and the subsequent decisions by the JI Supervisory Committee, as well as the host country criteria.

The verifier has reviewed the GHG data collected for the period from January 1st 2008 to December 31st 2009.

1.1 Objective

The purpose of this verification is a combined initial and 1st verification.

The objective of the initial verification is to verify that the project is implemented as planned and described in the PDD, to confirm that the monitoring system is in place and fully functional, and to assure that the project will generate verifiable emission reductions.

The objective of the periodic verification is the review and ex post determination by the AIE of the GHG emission reductions. It includes the verification of the data given in the monitoring report by checking the monitoring records and the emissions reduction calculation.

1.2 Scope

The verification of this project is based on the Project Design Document Version 3.0 dated 27 October 2008, the Monitoring Report (covers the period of January 1st 2008 – December 31st 2009), the monitoring plan set out in the PDD, supporting documents made available to Bureau Veritas Certification, and information obtained through the on-site interviews and on-site assessment. The documents and information are reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

Bureau Veritas Certification, based on the recommendations in the Validation and Verification Manual (IETA/PCF), has employed a risk-based approach in the verification, focusing on the identification and reporting of significant risks and on reliability of project monitoring and generation of Emission Reductions Units (ERU).

The verification is not meant to provide any consulting towards the Client. However, stated requests for forward actions and corrective actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.

1.3 GHG Project Description

The project is aimed at reduction emissions of perfluorocarbons (PFCs) through the reduction of anode effect frequency (AEF) and anode effect duration (AED), by implementing a number of organizational and technical measures at the 24 potrooms of RUSAL Krasnoyarsk Aluminium Smelter (KrAZ), located in the city of Krasnoyarsk, Russian Federation. Twenty one of these potrooms use vertical stud Søderberg process with point feeders (PFVSS), the remaining – prebake anode process with point feeders (PFPB). The project is limited to CF4 and C2F6 emissions.

The project has been realized at 21 potrooms with VSS pots (1878 pots) and at 3 potrooms with the point feeders prebaked anodes technology (PFPB) (279 pots). During the project implementation point feeders (PF) has been installed at all VSS potrooms till the end of 2007.

The project also covers pots newly installed within the frameworks of the smelter modernization project (total 76 pots are added to existing 1878 ones; in potrooms 9 to 23, installation of 4 additional pots was made in each room. In potroom 1 and 4, 8 additional pots in each are installed). Including new pots into the project boundary is explained by the fact that their installation is implied by the baseline scenario, and the implementation of individual measures aimed at reduction of AEF for the new VSS pots separately without considering the existing pots in the corresponding potrooms will be inappropriate and even impossible, because there are groups of pots serviced by a team of pot operators. And otherwise, excluding them from the activities aimed at reducing AEF is also inappropriate for the same reason.

Therefore in the project boundary are 2233 electrolytic cells of PFVSS and PFBP technology.

Improvement project being implemented from the beginning of 2006, which aims to:
1. Reduce AEF (as a JI Project);
2. Improve current efficiency;
3. Reduce out-of-operation time due to pot relining;
4. Increase production through additional improvements (not those listed in 2 and 3);

This project became possible due to Automated Alumina Point Feeder System, which was implemented as a part of the Joint Smelter Modernization project designed to increase production, eliminate Anode Plant and Casting House bottlenecks and reduce smelter's environmental impact.

The Modernization Project includes:
- Installation of 19 new dry scrubbers for removal of fluorides from the reduction plant gas emissions, which will reduce environmental impact.

- Extension of 15 (9 through 23) potrooms and installation of 4 additional pots in each potroom.
- Merger of the first and second, third and fourth potrooms into a single potline, extension of potrooms #1 and #4 by 40 meters and installation of additional 8 pots in each.
- Raising potline current to 174 kA.
- Installation of automated alumina point feeders on all VSS pots.
- Modernization and further development of automatic electrolysis process control systems.

The modernization project was launched in 2004. Its completion was finished in 2008.

In accordance with PDD the electrolytic cells for production of high-purity aluminium (74 pots in potroom 25) are outside the project boundary because these pots have been designed for aluminium refinement by three-layer method instead of its initial generation. During such electrolysis the anode is situated underneath in the layer of the metal and PFCs are not evolved due to the absence of anode effects.

The project is additional and one of the substantiations is that using the existing capacity of 2233 electrolytic cells of PFVSS and PFBP technology for aliminium production (the project boundary), the enterprise can reduce a significant part of its PFC emissions, on a purely voluntary basis.

Estimated reduction of GHG emissions should be about 1.165.116 tCO_2e in the period of 2008-2012. It will lead to additional carbon financing from ERU sales.

Project has generated 169 731 tones CO2eq of emission reduction units (ERU) in 2008 that is slightly less than estimated in PDD (189 390 tones CO2eq). The cause of nonconformity is the technological issues with prebaked technology and use of point feeders that led to missing of the target for frequency of anode effects. However, that deviation was somehow compensated by better performance of PFVSS technology.

Analyzing the reasons for AEF deviations connected to prebaked technology OJSC "RUSAL Krasnoyarsk" had implemented some corrective actions during 2008 that gave a comprehensive effect in 2009. For example, the smelter has developed and implemented the techniques for technological treatment of the cells partially without anode effect. Besides, the duration of anode effects has been decreased significantly throughout the smelter. As a result the actual ERUs amount in 2009 (294 789 tones CO2eq) has exceeded the value estimated in the PDD (207 445 tones CO2eq).

For period from 1st of January 2008 to 31st of December 2009 there have been generated 464 520 tons of CO2eq of Emission Reduction Units.

Gaseous emissions are covered by permits to ensure that the Maximum Permissible Concentration of any given substance (MPC) is not exceeded. The enterprise has the official "Permit for emission of pollutants to the atmosphere", which does not include PFC emissions, which are not regulated in the Russian Federation, and there is no other strict reinforcement which requires their reduction.

The decision to proceed with the project was made taking into account the possibility of deriving revenues from selling the achieved reductions of GHG emissions. The project does not bring any other benefits to the enterprise and therefore there are no other incentives for its implementation.

This project is the first of its kind, a breakthrough in the area of AEF reduction in the Russian aluminium industry. Without Kyoto Protocol's Joint Implementation mechanism UC RUSAL would not have had incentives to implement this project since it does not bring any significant benefits apart from reduction of PFC emissions.

2 METHODOLOGY

The verification of the project consisted of the following activities:

- On-site assessment and interviews held on 09/04/2010 at UC «RUSAL», Moscow and 13/04/2010 at OJSC "RUSAL Krasnoyarsk";
- Publication of the 1st Monitoring Report on the BV site;
- Desk review of the 1st Monitoring Report and supporting documents;
- Preparation of the draft Initial Verification Protocol v.1 (Appendix A, Table 1);
- Preparation of the draft First Periodic Verification Protocol v.1 (Appendix A, Tables 2-5);
- Following communications with the project participant by phone and mails;
- Resolution of requests for corrective and forward actions;
- Preparation of the Verification Report v.1; issued on 05/07/2010;
- Internal Technical Review of the Verification Report v.1.

2.1 Verification Protocol

According to the Validation and Verification Manual (IETA/PCF) a verification protocol is used as part of the verification. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from verifying the identified criteria. The verification protocol serves the following purposes:

- It organizes, details and clarifies the requirements the study is expected to meet; and
- It ensures a transparent verification process where the verifier will document how a particular requirement has been verified and the result of the verification.

The verification protocol (IETA/PCF) consists of five tables. Table 1 relates to Initial Verification, Tables 2-5 to Periodic Verification. Different columns in these tables are described in Figure 1.

The completed verification protocol is enclosed in Appendix A to this report. Tables 3 and 4 are combined in one Table 3/4. Table 5 summarizes the verification findings.

The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification procedures.

Initial Verification Protocol Table 1			
Objective	**Reference**	**Comments**	**Conclusion (CARs/FARs)**
The requirements the project must meet.	Gives reference to where the requirement is found.	Description of circumstances and further comments on the conclusion.	This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) of risk or non-compliance of the stated requirements. Forward Action Request (FAR) indicates essential risks for further periodic verifications.

Periodic Verification Protocol Table 2: Data Management System/Controls		
Identification of potential reporting risk	**Identification, assessment and testing of management controls**	**Areas of residual risks**
The project operator’s data management system/controls are assessed to identify reporting risks and to assess the data management system’s/control’s ability to mitigate reporting risks. The GHG data management system/controls are assessed against the expectations detailed in the table.	A score is assigned as follows: • Full - all best-practice expectations are implemented. • Partial - a proportion of the best practice expectations is implemented • Limited - this should be given if little or none of the system component is in place.	Description of circumstances and further commendation to the conclusion. This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) of risk or non compliance with stated requirements. The corrective action requests are numbered and presented to the client in the verification report. The Initial Verification has additional Forward Action Requests (FAR). FAR indicates essential risks for further periodic verifications.

Periodic Verification Protocol Table 3: GHG calculation procedures and management control testing		
Identification of potential reporting risk	**Identification, assessment and testing of management controls**	**Areas of residual risks**
Identify and list potential reporting risks based on an assessment of the emission factor calculation procedures, i.e. • the calculation methods; • raw data collection and sources of supporting documentation; • reports/databases/information systems from which data is obtained. Identify key source data. Examples of source data include metering records, process monitors, operational logs, laboratory/analytical data, accounting records, utility data and vendor data. Check appropriate calibration and maintenance of equipment, and assess the likely accuracy of data supplied. Focus on those risks that impact the accuracy, completeness and consistency of the reported data. Risks are weakness in the GHG calculation systems and may include: • manual transfer of data/manual	Identify the key controls for each area with potential reporting risks. Assess the adequacy of the key controls and eventually test that the key controls are actually in operation. Internal controls include (not exhaustive): • Understanding of responsibilities and roles • Reporting, reviewing and formal management approval of data; • Procedures for ensuring data completeness, conformance with reporting guidelines, maintenance of data trails etc; • Controls to ensure the arithmetical accuracy of the GHG data generated and accounting records e.g. internal audits, and checking/ review procedures; • Controls over the computer information systems; • Review processes for identification and understanding of key process parameters and implementation of calibration maintenance regimes;	Identify areas of residual risks, i.e. areas of potential reporting risks where there are no adequate management controls to mitigate potential reporting risks Areas where data accuracy, completeness and consistency could be improved are highlighted.

calculations; • unclear origins of data; • accuracy due to technological limitations; • lack of appropriate data protection measures? For example, protected calculation cells in spreadsheets and/or password restrictions.	• Comparing and analysing the GHG data with previous periods, targets and benchmarks. When testing the specific internal controls, the following questions are considered: 1. Is the control designed properly to ensure that it would either prevent or detect and correct any significant misstatements? 2. To what extent have the internal controls been implemented according to their design; 3. To what extent have the internal controls (if existing) functioned properly (policies and procedures have been followed) throughout the period? 4. How does management assess the internal control as reliable?	

Periodic Verification Protocol Table 4: Detailed audit testing of residual risk areas and random testing		
Areas of residual risks	**Additional verification testing performed**	**Conclusions and Areas Requiring Improvement (including Forward Action Requests)**
List the residual areas of risks (Table 2 where detailed audit testing is necessary. In addition, other material areas may be selected for detailed audit testing.	The additional verification testing performed is described. Testing may include: 1. Sample cross checking of manual transfers of data 2. Recalculation 3. Spreadsheet ‘walk throughs’ to check links and equations 4. Inspection of calibration and maintenance records for key equipment • Check sampling analysis results • Discussions with process engineers who have detailed knowledge of process uncertainty/error bands.	Having investigated the residual risks, the conclusions should be noted here. Errors and uncertainties should be highlighted. Errors and uncertainty can be due to a number of reasons: • Calculation errors. These may be due to inaccurate manual transposition, use of inappropriate emission factors or assumptions etc. • Lack of clarity in the monitoring plan. This could lead to inconsistent approaches to calculations or scope of reported data. • Technological limitations. There may be inherent uncertainties (error bands) associated with the methods used to measure emissions e.g. use of particular equipment such as meters. • Lack of source data. Data for some sources may not be cost effective or practical to collect. This may result in the use of default data which has been derived based on certain assumptions/conditions and which will therefore have varying applicability in different situations. The second two categories are explored with the site personnel, based on their knowledge and experience of the processes. High risk process parameters or source data (i.e. those with a significant influence on the reported data, such as meters) are reviewed for these uncertainties.

Periodic Verification Protocol Table 5: Resolution of Corrective Action and Clarification Requests			
Report clarifications and corrective action requests	**Ref. to checklist question in tables 2/3**	**Summary of project owner response**	**Verification conclusion**
If the conclusions from the Verification are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	Reference to the checklist question number in Tables 2, 3 and 4 where the Corrective Action Request or Clarification Request is explained.	The responses given by the Client or other project participants during the communications with the verification team should be summarized in this section.	This section should summarize the verification team's responses and final conclusions. The conclusions should also be included in Tables 2, 3 and 4, under "Final Conclusion".

Figure 1 IETA/PCF Verification Protocol tables

2.2 Review of Documents

The preliminary and final Monitoring Reports and supporting documentation submitted by the project participants as well as additional background documents related to the project design and baseline, i.e. country Law, Kyoto Protocol, JI implementation guidelines, Project Design Document were reviewed.

The verification findings presented in this Verification Report v.1 relate to the project as described in the PDD Version 3.0 dated 28 October 2008, and the Monitoring Report for the period of January 1st 2008 - December 31st 2009, Version 1.0 dated 15 March 2010 and 2.1 dated 30 June 2010 as a response to CARs issued after the site visit.

2.3 Follow-up Interviews

In the frame of Initial Verification, Bureau Veritas Certification verifier conducted a visit to the project site on 09/04/2010 at UC «RUSAL» Moscow and 13/04/2010 at OJSC "RUSAL Krasnoyarsk". On-site interviews with the project participant and inspection of the project and monitoring equipment were conducted to collect information needed for the verification of emission reduction. Representatives of UC «RUSAL», OJSC "RUSAL Krasnoyarsk" and CTF Consulting, LLC were interviewed (see the list of interviewees in Section 6). The main topics of the interviews are summarized in Table 1.

Table 1. Interview topics

Interviewed organization	Date	Interview and/or inspected topics
UC «RUSAL», Moscow, OJSC “RUSAL Krasnoyarsk” CTF Consulting, LLC	09/04/2010; 13/04/2010	➢ Status of project equipment ➢ Monitoring plan ➢ Deviations from the monitoring plan ➢ Requirements to competence ➢ Roles and responsibilities for data collection ➢ Training to monitoring procedures ➢ Data to be collected ➢ Measurement equipment (inspection, characteristics, status) ➢ Data logging ➢ Data archiving ➢ Data reporting ➢ Use of calculation tool ➢ Emission calculations ➢ Baseline emission factor ➢ Monitoring report verification and validation ➢ QC and QA procedures ➢ IT management ➢ EMS

2.4 Resolution of Clarification, Corrective and Forward Action Requests

The objective of this phase of the verification is to raise the requests for corrective actions, and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the GHG emission calculation.

Findings established during the verification can either be seen as a non-fulfillment of criteria ensuring the proper implementation of the project or where a risk to deliver high quality ERUs is identified.

Corrective Action Requests (CAR) are issued, where:
i) there is a clear deviation concerning the implementation of the project as defined in the PDD;
ii) requirements set by the Methodological Procedure or qualifications in a verification opinion have not been met; or
iii) there is a risk that the project would not be able to deliver high quality ERUs.

Forward Action Requests (FAR) are issued, where:
iv) the actual status requires a special focus on this item for the next consecutive verification, or
v) an adjustment of the Methodological Procedure is recommended.

Clarification Request (CL) are issued, where:
vi) additional information is needed to fully clarify an issue.

To guarantee the transparency of the verification process, the concerns raised are documented in more detail in the Appendix A Verification Protocol.

3 VERIFICATION FINDINGS

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

1) Where Bureau Veritas Certification had identified issues that needed clarification or that represented a risk to the fulfillment of the project objectives, a Corrective Action Request or Forward Action Request, respectively, have been issued. Corrective Action Requests and Forward Action Requests are referred, where applicable, in the following sections and are further documented in the Initial Verification Protocol (Appendix A, Table 1) and the First Periodic Verification Protocol (Appendix A, Table 2-5).

The verification of the project resulted in 11 Corrective Action Requests, 3 Clarification Requests, and 6 Forward Action Requests.

2) In the context of Forward Action Requests, risks have been identified, which may endanger the delivery of high quality ERUs in the future, i.e. by deviations from standard procedures as defined by the Monitoring Methodology. As a consequence, such aspects should receive a special focus during the next consecutive verification. A FAR may originate from lack of data sustaining claimed emission reductions. Forward Action Requests are understood as recommendation for future project monitoring; they are stated, where applicable, in the following sections and are further documented in the Initial Verification Protocol, Appendix A (Table 1).

6 Forward Action Request (FAR 01-06) are left open till the next Periodic Verification.

3) The final verification team conclusions for verification subject are presented.

Requests for actions and clarifications from the Initial and 1st Periodic verification are summarized in Appendix A Table 5. Verification trials during the Periodic Verification are listed in Appendix A Table 3/4 Column "Additional verification testing performed".

The verification findings relate to the project operation as documented and described in the Monitoring Report.

3.1 Initial Verification Findings

3.1.1 Remaining issues, CAR's, FAR's, CL's from previous verification

CAR 01 (pending approval by Host Party) from Determination Report remained open.

Please refer to the verifier's Note:

"JISC Glossary of JI terms/Version 01 defines the following:
(b) At least one written project approval by a Party involved in the JI project, other than the host Party(ies), should be provided to the AIE and made available to the secretariat by the AIE when submitting the first verification report for publication in accordance with paragraph 38 of the JI guidelines, at the latest.

So far there is no clarity as to how the above JISC requirement will be fulfilled under Track 1.

3.1.2 Project Implementation

On the day of audit, the all the 24 potrooms of RUSAL Krasnoyarsk Aluminium Smelter (KrAZ) were operational. During the monitoring period, no changes were made to the operational equipment.

The starting date of the crediting period did not change and remained the 1st January 2008.

The Monitoring System is in place and operational. Monitoring of GHG emission reductions was carried out as per the Monitoring Plan with minor deviations, which are described and justified by the project participant, in line with the Decision 17/CP.7 Annex H Clause 57 and Guidance on criteria for baseline setting and monitoring Version 02 para 40, in MR Section B.5. To improve transparency of the monitoring plan a parameter was added with data variable "Average weight of 1 cm of liquid metal in pot", which is applied for estimation of mass of liquid aluminium in progress. The verifier found these deviations appropriate to the project conditions.

Outstanding issues related to the Project Implementation, PP's response and BV Certification's conclusion are summarized in Appendix A Table 5 (refer to CAR 02 - CAR 07 and CL 01 - CL 03).

3.1.3 Internal and External Data

The collected data (measured, estimated, and calculated) are presented in MR Sections B.1 and B.2, and Excel file with calculations.

Internal data to be monitored throughout the crediting period are:

- MP is overall production of electrolytic aluminium for Baseline and Project , t
- AEFp is the actual average frequency of anode effects, times/ pot-day;
- AEDp is the actual average duration of anode effects, minutes ;
- S_{CF4} is the Tier 3 Slope coefficient for CF4 measured in accordance to last version of Protocol for Measurement of Tetrafluoromethane (CF4) and Hexafluoroethane (C2F6) Emissions from Primary Aluminium Production, US EPA and IAI, (kg of PFC/ tonne of aluminium)/(number of minutes of anode effect/ pot per day);
- Weight fraction of C_2F_6/CF_4 is the Tier 3 Slope coefficient for CF4 measured in accordance to last version of Protocol for Measurement of Tetrafluoromethane (CF_4) and Hexafluoroethane (C_2F_6) Emissions from Primary Aluminium Production, US EPA and IAI, Unit fraction;
- Average weight of 1 cm of metal in the pot, kg. The method is based on estimation of the difference between mass fraction of the copper and aluminium during 24 hours, measurement if the level of metal in pot and following calculation by formula. The parameter is used for estimation of amount of liquid aluminium in process.

Default data used are: the taken ex-ante Tier 3 Slope coefficient for CF4 measured in accordance to last version of Protocol for Measurement of Tetrafluoromethane (CF4) and Hexafluoroethane (C2F6) Emissions from Primary Aluminium Production, US EPA and IAI; and Weight fraction of C2F6/CF4.

The project uses A JI specific approach for calculation of baseline and project line emissions based on the 3-rd version of the methodology "The Aluminium Sector Greenhouse Gas Protocol" (Addendum to the WRI/WBCSD Greenhouse Gas Protocol) 2006, which has been approved and included in 2006 IPCC Guidelines for National Greenhouse Gas Inventories. According to the IPCC methods, PFCs emissions are influenced by four parameters, which depend on the specific aluminium production: overall production of electrolytic aluminium, frequency and duration of anode effects and slope coefficient for CF4 and C2F6 emissions.

The verifier checked the appropriateness of default and measured internal data, the state of monitoring equipment, the calibration procedures, data control, and assessed the qualification of personnel.

Outstanding issues related to Internal and External Data are summarized in Appendix A Table 5 (refer to CAR 08, CAR 09).

3.1.4 Environmental Indicators

Monitoring of environmental impacts of GPP is carried out in accordance with environmental legislation requirements, as envisaged in the PDD Monitoring Plan. The existing environmental management system ensures monitoring of air pollution. Information on air emissions reductions is outlined in MR Section B.3.

No outstanding issues are summarized related to Environmental Indicators.

3.1.5 Management and Operational System

The company management and operational system for GHG emission monitoring and reporting is based on certified integrated management system in accordance to ISO 9001, 14001 и OHSAS 18001. All equipment related to electrolysis production and the project is covered by calibration procedures of plant. The equipment of JSC "RUSAL VAMI" used for PFC measurements is calibrated in accordance to technical requirements for measurement equipment maintenance.

Outstanding issues related to Management and Operation System, PP's responses and BV Certification's conclusions are summarized in Appendix A Table 5 (refer to FAR 01- FAR 06).

FAR 01, FAR 03, FAR 04 and FAR 06 are left open till the next Monitoring Report.

3.2 Periodic Verification Findings

The project has been realized at 21 potrooms with VSS pots (1878 pots) and at 3 potrooms with the point feeders prebaked anodes technology (PFPB) (279 pots). During the project implementation point feeders (PF) has been installed at all VSS potrooms till the end of 2007.

The project also covers pots newly installed within the frameworks of the smelter modernization project (total 76 pots are added to existing 1878 ones; in potrooms 9 to 23, installation of 4 additional pots was made in each room. In potroom 1 and 4, 8 additional pots in each are installed). Including new pots into the project boundary is explained by the fact that their installation is implied by the baseline scenario, and the implementation of individual measures aimed at reduction of AEF for the new VSS pots separately without considering the existing pots in the corresponding potrooms will be inappropriate and even impossible, because there are groups of pots serviced by a team of pot operators. And otherwise, excluding them from the activities aimed at reducing AEF is also inappropriate for the same reason.

Therefore in the project boundary are 2233 electrolytic cells of PFVSS and PFBP technology.

In accordance with PDD the electrolytic cells for production of high-purity aluminium (74 pots in potroom 25) are outside the project boundary because these pots have been designed for aluminium refinement by three-layer method instead of its initial generation. During such electrolysis the anode is situated underneath in the layer of the metal and PFCs are not evolved due to the absence of anode effects.

It does not impact environment in air, soil, and water. Therefore, the monitoring plan does not specify any specific environmental or social indicators to be monitored for the success of the project activity. All routine environmental measures taken at OJSC "RUSAL Krasnoyarsk" ensure fulfillment of local legal requirements. Social impact of the project is not identified. This is beyond JI mechanism.

3.2.1 Completeness of Monitoring

The realized monitoring of the project is complete, effective and reliable and overall in accordance with monitoring plan contained in the determined PDD. The deviations from the monitoring plan are duly addressed in the Monitoring Report Section B.5. To improve transparency the monitoring plan a parameter was added with data variable "Average weight of 1 cm of liquid metal in pot", which is applied for estimation of mass of liquid aluminium in progress. The verifier found these deviations appropriate to the project conditions.

The relevant emission sources are duly covered by the monitoring plan. The boundaries of the project are defined correctly and transparently.

All pertinent parameters were monitored and determined as prescribed. The collected data were stored during the whole monitoring period (10 years in fact).

The monitoring methodologies and sustaining records were sufficient to enable verification of emission reductions. During the verification process, no significant lacks of evidence were detected. The data gathering and reporting procedures, which were described in the MR and examined during the on-site visit, were found appropriate to reflect the ones defined by the original monitoring plan.

Outstanding issues related to Completeness of Monitoring, PP's responses and BV Certification's conclusions are summarized in Appendix A Table 5 (refer to CAR 10, CAR 11, FAR 01 and FAR 05 from the Initial Monitoring Report).

FAR 01 is left open till the next Monitoring Report.

3.2.2 Accuracy of Emission Reductions Calculation

The project uses a JI specific approach for calculation of baseline and project line emissions based on the 3-rd version of the methodology "The Aluminium Sector Greenhouse Gas Protocol" (Addendum to the WRI/WBCSD Greenhouse Gas Protocol) 2006, which has been approved and included in 2006 IPCC Guidelines for National Greenhouse Gas Inventories. According to the IPCC methods, PFCs emissions are influenced by four parameters, which depend on the specific aluminium production: overall production of electrolytic aluminium, frequency and duration of anode effects and slope coefficient for CF_4 and C_2F_6 emissions.

All used data was of a high quality to assure accurate calculation. It is evidenced that the whole monitoring system was fully operational during the entire monitoring period. The calibration results ensure the correct functionality of all the relevant measuring equipment. The verifier received access to all relevant documentation needed to verify the emission reduction calculation. All used information was traceable and appropriately archived.

The verifier confirms that emission reduction calculations have been performed according to the monitoring plan and to the own calculation methodology reported in the MR in accordance with the PDD. The verifier checked the transfer of monitored data sets to spreadsheets used by PP, correctness of the formulae versus the PDD, programming of formulae and connections, as well as calculations of emission reductions. No inaccuracies in calculations were detected by the verifier. The calculation excel tool was checked by the verifier and no flaws were found.

No outstanding issues related to the accuracy of emission reduction calculation were identified.

3.2.3 Quality of Evidence to Determine Emission Reductions

The evidences that were obtained by the verification team in order to provide confidence in the provided emission reduction calculation, such as:

- The company management and operational system for GHG emission monitoring and reporting is based on certified integrated management system in accordance to ISO 9001, 14001 и OHSAS 18001
- Maintained and calibrated measuring equipment
- The present-day metrological control
- Automatic data acquisition system
- Reliable IT
- Procedures for protection and back up of electronic and paper data
- QC and QA procedures
- Clear allocation of responsibilities and authorities
- Competence and commitments of personnel
- Use of excel spreadsheets
- Implementation of data traceability
- Checking of transfer of formulas and algorithms into excel
- Review for adequacy of any excel spreadsheet
- Verification of data handling by Senior Managers
- Checks for consistency and adequacy of calculations and data in the final MR
- Validation of the MR by the OJSC “RUSAL Krasnoyarsk” top manager E.V.Nikitin
- Appropriate archiving system
- Reliable OJSC “RUSAL Krasnoyarsk” production data for reduction of PFC emission process

are observed as consistent and to high quality. All used parameters were of sufficient and appropriate quality to assure an accurate monitoring.

3.2.4 Management System and Quality Assurance

To ensure quality of project operation and monitoring a certified integrated management system in accordance to ISO 9001, 14001 и OHSAS 18001 is used.

FAR 01, FAR 03 and FAR 06 were issued to ensure more efficient Management and Operation System for GHG emission reduction monitoring. It will be developed and maintained as an Annex to the existing Environmental Corporate Standard, as discussed at the site visit, as a part of the Initial Verification in Section 3.1.5 above.

Outstanding issues related to Conformance with monitoring methodology, PP’s responses and BV Certification’s conclusions are summarized in Appendix A Table 5 (refer to CAR 10, CAR 11, FAR 01 - FAR 06 from the Initial Monitoring Report).

FAR 01, FAR 03 and FAR 04 and FAR 06 are left open till the next monitoring.

4 PROJECT SCORECARD

Risk Areas		Conclusions			Summary of findings and comments
		Baseline Emissions	Project Emissions	Calculated Emission Reductions	
Completeness	Source coverage/ boundary definition	✓	✓	✓	All relevant sources are covered by the monitoring plan and the boundaries of the project are defined correctly and transparently.
Accuracy	Physical Measurement and Analysis	✓	✓	✓	State-of-the-art technology is applied in an appropriate manner. Appropriate back-up solutions are provided.
	Data calculations	✓	✓	✓	Emission reductions are calculated correctly.
	Data management & reporting	✓	✓	✓	Data management and reporting were found to be satisfying. Potential for improvement are indicated by open FAR 01, FAR 03, FAR 04, FAR 06
Consistency	Changes in the project	✓	✓	✓	Results are consistent with underlying raw data.

5 VERIFICATION STATEMENT

Bureau Veritas Certification was commissioned by CTF Consulting, LLC (subsidiary of Carbon Trade & Finance SICAR S.A.) to carry out, under JI track 1 procedure, the initial and 1st periodic verification of the JI project “Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter JI Project” (sectoral scope 09), based on UNFCCC criteria for the JI, as well as criteria given to ensue consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the JI rules and modalities and the subsequent decisions by the JI Supervisory Committee, as well as the host country criteria. The verification covers the period from January 1st 2008 to December 31st 2009.

The purpose of this project is to reduce emissions of perfluorocarbons (PFCs) through the reduction of anode effect frequency (AEF) and anode effect duration (AED), by implementing a number of organizational and technical measures at the 24 potrooms of RUSAL Krasnoyarsk Aluminium Smelter (KrAZ), located in the city of Krasnoyarsk, Russian Federation. Twenty one of these potrooms use vertical stud Søderberg process with point feeders (PFVSS), the remaining – prebake anode process with point feeders (PFPB). The project is limited to CF_4 and C_2F_6 emissions.

The verification is carried out as a combined initial and 1st periodic verification. A risk-based approach has been followed to perform the verification. In the course of verification, 11 Corrective Action Requests (CAR), 3 Clarification Requests (CL), and 6 Forward Action Requests (FAR) were raised. The CAR's and CL's were successfully closed. Six FAR's are left pending until the next periodic monitoring (FAR 01, FAR 02, FAR 03, FAR 04, FAR 05, and FAR 06).

The verification is based on the Monitoring Report (covers January 1st 2008 – December 31st 2009), the Monitoring Plan as set out in the determined PDD Version 3.0 dated 28 October 2008, with insignificant deviations related to the management and reporting structure. The supporting documents were made available to Bureau Veritas Certification by the project participant. The deviations from the monitoring plan are duly addressed in the Monitoring Report.

As a result of the Initial Verification, the Bureau Veritas Certification confirms that all organizational and technical measures at the 24 potrooms of RUSAL Krasnoyarsk Aluminium Smelter (KrAZ) are implemented within the project boundary as planned and described in the PDD at 2233 electrolytic cells of PFVSS and PFBP technology. The potrooms run reliably, measuring equipment is calibrated appropriately, the monitoring system is in place and functional. The project is continuously generating emission reductions.

As a result of the 1st Periodic Verification, the Bureau Veritas Certification confirms that the GHG emission reductions are calculated without material misstatement in conservative and appropriate manner.

Bureau Veritas Certification herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as of 464,520 tCO_2-e.

Bureau Veritas Certification

Vera Skitina - Lead Verifier

05/07/2010

6 REFERENCES

Reviewed documents available before the audit on site

1	Monitoring Report and Excel Spreadsheet Version 2.1 dated 30/06/2010 “Reduction of PFC emission from RUSAL Krasnoyarsk Aluminium Smelter” for monitoring period 01.01.2008 – 31.12.2009.
2	PDD “Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter” ” Version 3.0 dated 27/10/2008.
3	Excel spreadsheet with calculation of emission reduction. Provided by MR Developer.
4	Production data of RUSAL Krasnoyarsk Aluminium Smelter for 2008, 2009 in form of IAI PFC001

Documents obtained at the site on 13/04/2010 and 09/04/2010

5	2008-2009 Statistic reporting (air)
6	RUSAL Krasnoyarsk design guidelines for Maximum permissible Discharge (MPD)
7	Copies of Air pollution sources list from Design guidelines for MPD
8	A copy of Hazard Discharges Permit, #180 for 2010.
9	Rusal approval document of MPD design guidelines.
10	Estimation procedure for Quantity and composition of hazards discharged into air
11	2005-2009 Monitoring reports (sanitary-hygienic zone, work space)
12	Hazards discharge charts for 2005-2009
13	AER (2005-2009) charts.
14	Ecological reporting guidelines
15	Labs certification
16	Ecological production control program
17	Sanitary production control program
18	Rostehnadzor inspection report
19	Technical reports, 2008, 2009 (production, flow etc)
20	Raw material inventory technique
21	Work regulations for engineers (master)
22	Regulations for calculation of Technical and economic indicators
23	Regulations for service and repairs between RUSAL Krasnoyarsk and RIC
24	Operation standard for Automatic alumina feeders
25	VSS operations manual
26	PFPB operations manual
27	Technical process manual (level management)

28	Technical process manual (smelter feeding through Automatic Alumina feeder)
29	Technical and economical indicators, dec. 2009
30	2005-2009 Monitoring reports (sanitary-hygienic zone, work space)

Persons interviewed on 13-14/04/2010 and 09/04/2010:

1	I.Rebrik - UC RUSAL , Environmental department director
2	M.Krasov - UC RUSAL, Environmental department manager
3	V.Goloschapov - UC RUSAL, Manager of Department of Aluminium Processing Devision
4	A.Gavva – CTF Consulting, LLC (CTF), Lead Specialist
5	K.Myachin - CTF Consulting, LLC (CTF), Carbon Projects Manager
6	E.Nagrelli - RUSAL Krasnoyarsk Aluminium Smelter, Environmental and Quality Director
7	E.Kuznetsov - RUSAL Krasnoyarsk Aluminium Smelter, Head of Metrology Department
8	G.Botvich - RUSAL Krasnoyarsk Aluminium Smelter, Head of Environmental department
9	M.Korobkov - RUSAL Krasnoyarsk Aluminium Smelter, manager, coordinator of the JI proect
10	E.Kuryanov - RUSAL Krasnoyarsk Aluminium Smelter, Director of electrolysis production
11	O.Zhigulov - RUSAL Krasnoyarsk Aluminium Smelter, Senior Foreman of potroom #8 of electrolysis production
12	V.Shunyaev – "REO", subsidiary of RUSAL Krasnoyarsk Aluminium Smelter, Foreman Automative Production System Monitoring
13	S.Maksimov - RUSAL Krasnoyarsk Aluminium Smelter, Foreman of potroom #7 of electrolysis production
14	S.Elmanova - RUSAL Krasnoyarsk Aluminium Smelter, dispatch operator of Central Dispatch Office
15	A.Kyrtchenov – RUSAL Krasnoyarsk Aluminium Smelter, Foreman of potrooms #5 and 6 of electrolysis production
16	E.Gostevskaya - RUSAL Krasnoyarsk Aluminium Smelter, Quality Control Department controller
17	V.Egorov - RUSAL Krasnoyarsk Aluminium Smelter, production foreman of Automotive Production System Monitoring Shop
18	K.Nikandrov – RUSAL Krasnoyarsk Aluminium Smelter, Head of Automotive Production System Monitoring Department, Technological Center
19	S.Lyukaev - RUSAL Krasnoyarsk Aluminium Smelter, Quality Control Department manager
20	V.Grigorjeva - RUSAL Krasnoyarsk Aluminium Smelter, Quality Control Department manager
21	V.Baryshnikov - RUSAL Krasnoyarsk Aluminium Smelter, Sanitary and Industrial Laboratory manager

22	T.Mashkantseva - RUSAL Krasnoyarsk Aluminium Smelter, Sanitary and Industrial Laboratory Specialist
23	L.Tretiakova - RUSAL Krasnoyarsk Aluminium Smelter, manager of Group of Planning and Analysis of Electrolysis Production

7 DISCLAIMER

This report contains the results of the determination of whether the ensuing reductions of anthropogenic emissions by sources reported by the project participant meet the relevant requirements of Article 6 of the Kyoto Protocol and the JI guidelines. The used procedure complies with paragraphs 23, 36, 37 of JI guidelines with a reservation that the project approval by the host Party involved is pending. Based on this verification, Bureau Veritas Certification Holding SAS issues, under the contractual arrangements with CTF, an expert opinion on the emission reductions as envisaged by the RF Government Decree # 843 of 28/10/2009 “About measures on realization of Article 6 of Kyoto Protocol to United Nation Framework Convention on Climate Change”.

APPENDIX A: COMPANY JI PROJECT INITIAL VERIFICATION PROTOCOL

Table 1 Initial Verification Protocol

Objective	**Reference**	**Comments**	**Conclusion (CARs/FARs)**
1. Opening Session			
1.1. Introduction to audits	N/A	The Initial Verification and 1st Periodic Verification audit was carried out on the project site on 09.04.10 in United Company RUSAL" (Moscow) and 13-14/03/10 on JSC "RUSAL Krasnoyarsk" (legal name of Krasnoyarsk Aluminium Smelter (KrAZ)). Prior to the audit, the questionnaire (verification protocols forms) and the audit programme were provided to the client. The opening meeting and interviews were performed in Head Office of UC RUSAL followed by interviews with persons concerned and inspection of project implementation on the site. The 24 potrooms of RUSAL Krasnoyarsk Aluminium Smelter (KrAZ), located in the city of Krasnoyarsk, Russian Federation was visited, and technological and metering equipment was inspected. Participants of the opening meeting and interviews were: - V.Skitina - Bureau Veritas Certification Lead Verifier; - I.Rebrik - UC RUSAL , Environmental department director; - M.Krasov - UC RUSAL, Environmental department manager; - V.Goloschapov - UC RUSAL, Manager of Department of Aluminium Processing Division; - A.Gavva – CTF Consulting, LLC (CTF), Lead Specialist; - K.Myachin - CTF Consulting, LLC (CTF), Carbon Projects Manager; - E.Nagrelli - RUSAL Krasnoyarsk Aluminium Smelter, Environmental and	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		Quality Director; - E.Kuznetsov - RUSAL Krasnoyarsk Aluminium Smelter, Head of Metrology Department; - G.Botvich - RUSAL Krasnoyarsk Aluminium Smelter, Head of Environmental department. - M.Korobkov - RUSAL Krasnoyarsk Aluminium Smelter, manager, coordinator of the JI proect; - E.Kuryanov - RUSAL Krasnoyarsk Aluminium Smelter, Director of electrolysis production; - O.Zhigulov - RUSAL Krasnoyarsk Aluminium Smelter, Senior Foreman of potroom #8 of electrolysis production; - V.Shunyaev – “REO”, subsidiary of RUSAL Krasnoyarsk Aluminium Smelter, Foreman Automative Production System Monitoring; - S.Maksimov - RUSAL Krasnoyarsk Aluminium Smelter, Foreman of potroom #7 of electrolysis production; - S.Elmanova - RUSAL Krasnoyarsk Aluminium Smelter, dispatch operator of Central Dispatch Office; - A.Kyrtchenov – RUSAL Krasnoyarsk Aluminium Smelter, Foreman of potroom #5 and 6 of electrolysis production; - E.Gostevskaya - RUSAL Krasnoyarsk Aluminium Smelter, Quality Control Department controller; - V.Egorov - RUSAL Krasnoyarsk Aluminium Smelter, production foreman of Automotive Production System Monitoring Shop; - K.Nikandrov – RUSAL Krasnoyarsk Aluminium Smelter, Head of Automotive Production System Monitoring Department, Technological Center; - S.Lyukaev - RUSAL Krasnoyarsk Aluminium Smelter, Quality Control Department manager;	

Objective	Reference	Comments	Conclusion (CARs/FARs)
		- V.Grigorjeva - RUSAL Krasnoyarsk Aluminium Smelter, Quality Control Department manager; - V.Baryshnikov - RUSAL Krasnoyarsk Aluminium Smelter, Sanitary and Industrial Laboratory manager; - T.Mashkantseva - RUSAL Krasnoyarsk Aluminium Smelter, Sanitary and Industrial Laboratory Specialist. - L.Tretiakova - RUSAL Krasnoyarsk Aluminium Smelter, manager of Group of Planning and Analysis of Electrolysis Production	
1.2. Clarification of access to data archives, records, plans, drawings etc.	N/A	The verifier received copies of all requested data, records, plans, procedures, instructions, documentation and reports.	OK
1.3. Contractors for equipment and installation works *Who has installed the equipment? Who was contracted for planning etc.?*		Since the project aims to reduce emissions of PFCs through the reduction of anode effect frequency (AEF), by implementing a number of organizational and technical measures, no additional equipment and installation works required. The supplier of pot equipment (including point feeders) is RUS-Engineering Co. LLC. Pots are replaced and installed during their relining; the annual pot relining schedule is approved by the Management Company. Auxiliary equipment is replaced during planned and preventive maintenance, regular inspections and execution of emergency requests, i.e. troubleshooting.	OK
1.4. Actual status of installation works *Project installation should be finished at time of initial verification in so far as the*		The purpose of this project is to reduce emissions of PFCs through the reduction of anode effect frequency (AEF), by implementing a number of organizational and technical measures at the 24 potrooms included specifically for that purpose in the RUSAL Krasnoyarsk Aluminium Smelter's Operational Efficiency Improvement project being implemented from the	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
project should be ready to generate emission reductions afterwards.		beginning of 2006, which aims to: 1. Reduce AEF (as a JI Project); 2. Improve current efficiency; 3. Reduce out-of-operation time due to pot relining; 4. Increase production through additional improvements (not those listed in 2 and 3) Project was commissioned at /28/: 21 potrooms with vertical stud Søderberg process with point feeders (PFVSS) (1878 pots) and at 3 potrooms with the point feeders prebaked anodes technology (PFPB) (279 pots). During the project implementation point feeders (PF) has been installed at all VSS potrooms till the end of 2007. The project also covers pots newly installed within the frameworks of the smelter modernization project (total 76 pots are added to existing 1878 ones; in potrooms 9 to 23, installation of 4 additional pots was made in each room. In potroom 1 and 4, 8 additional pots in each are installed). Recording of production data in Form of PFC001 (IAI) in the crediting period from 1 January 2008 till 31 of December 2009 is available as from /31, 32/: However a request has to be responded. **CL 01.** Please clarify in MR the real status of implementation schedule so to ensure the statement in PDD Section A.4.2:” Although, the main AEF improvements were gained in 2006-2007, the work to achieve further reductions of PFC emissions will continue until 2015. Thus, the proposed JI project goes beyond the RUSAL Krasnoyarsk Aluminium Smelter's Operational Efficiency Improvement project.”	
2. Open issues indicated in validation report			

Objective	Reference	Comments	Conclusion (CARs/FARs)
2.1. Missing steps to final approval *Especially in projects which are not yet registered at JISC, there might be some outstanding issues which should have been indicated by the validation report*	/2/	The project did not receive the host Party's approval. By now, the project owner has not obtained the Letter of Approval in Russia.	CAR 01 in [2]
3. Implementation of the project *This part is covering the essential checks during the on-site inspection at the project's site, which is indispensably for an initial verification*			
3.1. Physical components *Check the installation of all required facilities and equipment as described by the PDD.*	/1,2/	Please see also the comments in Section 1.4 above. The project aims to reduce frequency of anode effects leading to PFCs emissions. This reduction may be achieved by technical means or by operational activities. The introduction of automated alumina feed system is one of the technical means and is considered as the baseline scenario. The AEF reduction within the scope of this project is expected to be achieved by the introduction of operational improvements. The main operational improvements are made in the following AEF sensitive areas: - alumina properties (e.g. moisture content); - thermal balance; - automatic process control system algorithms; - electrolysis process technology, electrolysis process practices and	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		procedures, personnel training, analysis of pot operating parameters. Thus, no additional physical equipment of RUSAL Krasnoyarsk Aluminium Smelter's is to be installed and so was not inspected on site. It is observed to be in conformity with the description in PDD. The Reduction Area has the following number of installed pots: 1954 pots applying the Soederberg technology and 279 pots with prebaked anodes. There are no other pots not included in the Project.	
3.2. Project boundaries *Check whether the project boundaries are still in compliance with the ones indicated by the PDD.*	/1,2/	The project boundaries comprise CF4 and C2F6 emissions produced as a result of anode effects in VSS pots (1878 pots) with the prebaked anodes technology in potrooms 7, 8 and 26 (279 pots). The project also covers pots newly installed within the frameworks of the smelter modernization project (total 76 pots are added to existing 1878 ones; in potrooms 9 to 23, installation of 4 additional pots was made in each room. In potroom 1 and 4, 8 additional pots in each are installed). The project also covers pots newly installed within the frameworks of the smelter modernization project (total 76 pots are added to existing 1878 ones; in potrooms 9 to 23, installation of 4 additional pots was made in each room. In potroom 1 and 4, 8 additional pots in each are installed). Including new pots into the project boundary is explained by the fact that their installation is implied by the baseline scenario, and the implementation of individual measures aimed at reduction of AEF for the new VSS pots separately without considering the existing pots in the corresponding potrooms will be inappropriate and even impossible, because there are groups of pots serviced by a team of pot operators. And otherwise, excluding them from the activities aimed at reducing AEF is also inappropriate for the same reason. Therefore in the project boundary are 2233 electrolytic cells of PFVSS and	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		PFBP technology. This is in line with PDD Section B.3. However a request has to be responded. **CAR 01.** Please include in MR the justification of exclusion from the project boundary pots for aluminium refining (74 pots for production of high purity aluminium (HPA).	
3.3. Emission reduction achieved *Compare the value of emission reduction achieved with that estimated in PDD and explain the difference if any*	/1,2/	Estimated amount of emission reductions in the period from 1 January 2008 – 31 December 2009 is 396.835 tCO2e whereas the amount achieved is 464.520 tCO2e. The causes for the deviation are reasonably explained in MR Section A.3.	OK
3.4. Monitoring and metering systems *Check whether the required metering systems have been installed. The meters have to comply with appropriate quality standards applicable for the used technology.*	/8,11,12,14-15,19-26,28/	The metering system is installed and it was inspected on site. It is in compliance with national law and power industry regulations. Collection of all key parameters required for verification of both project and baseline PFC emissions is performed according to RUSAL Krasnoyarsk Aluminium Smelter existing practice of measurement and recording of technical and economical indicators, environmental impact assessment. Each potrooms is equipped with appropriate metering systems for weighting of ladles applying the scales “Scalex-1000” by the quality control department personnel according to the “Areal-type scales “Scalex-1000” User’s Manual. The scales are included into the “List of measuring tools subject to control”, and annually checked according to “Measuring tools check-up schedule” by the specialists of the Federal State Facility “Krasnoyarskiy TsSM” with issuing calibration certificates. Permissible maximum accuracy is ±20 kg within the range of 5,000 to 20,000 kg. (GOST 8.453-82 Scales for statistical weighting. Methods and means of verification).	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		Amount (mass) of liquid aluminium in pots is determined monthly according to valid standards: instruction I 10.03-2002 “Methodology of accounting of the stock of raw materials, goods and metal in progress in electrolysis potrooms” and “Standard methodology for inventory of working remains and goods-in-progress at smelters of OJSC “Russian Aluminium”. The estimation method is as follows: the amount of liquid aluminium is estimated by multiplying the average metal level (height) in a pot by the average weight of 1 cm of metal and the number of operating pots. The metal level is measured using the tools as per Instructions I 8-21-2001 “Procedure for measurements in top-worked pots”. The metal level is measured using a ruler as per Process Regulations 449.01.01.10 “Control of metal and bath levels”, Operational Standard 211.010.2008 (“Measurement of metal and bath levels”). Overall production of electrolytic aluminium per potroom (MP) for reporting period (month) is defined by addition of weight of raw aluminium determined by weighting of ladles with metal taken from potroom and weight of aluminium in progress (AIP) that consists of liquid aluminium being in pots at the end of the month, and small amount of solid aluminium. These separation and methods for estimation are prescribed in “Regulation for estimation of cost-performance characteristics of electrolytic production at the smelters of aluminium division of RUSAL company”. Average anode effect frequency by potrooms per year, times/pot per day and anode effect duration by potrooms per year, min/ pot per day is measured by the aluminum electrolysis process automatic control system (ACS) SAAT-1. The responsibilities and work sequence of ACS operator is outlined in “SAAT-1 Operator’s Manual”.	

Objective	Reference	Comments	Conclusion (CARs/FARs)
		One of the functions of the process control system is to control anode effects on the voltage measure channel on the anode and cathode (Ua-k) section. The operational voltage on the pot is 4.5 Volts in average. When it raises above 9 Volts the system fixes a start of anode effect and generate the corresponding sound and light information for the potroom staff shift. The average voltage of anode effect is 45 Volts in average. When the voltage drops down to 3.5 Volts (which happens after anode effect quenching measures have taken effect) the system fixes the duration of anode effect and it is counted as quenched. Thereby the information on frequency and duration of each anode effect is stored at the smelter. According to the data accumulated during the operation of the automated process control system, the percentage of lost information about anode effect duration and frequency after the introduction of the automated control system is approximately 2%; therefore, data uncertainty is low and conditioned by the channel accuracy and the operability of the automated process control system. The accuracy of the main channel is ±0.2%.	
		Slope coefficients (kg of CF_4 per tonne of aluminium multiplied by the number of minutes of anode effect / pot per day) and weight fraction C2F6/CF4 have been obtained during PFC measurements, carried out by Mr. Jerry Marks (IAI consultant) in September 2007.	
		Using IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, Section 6.3.2, http://www.ipcc-nggip.iges.or.jp/public/gp/pdf/6_Uncertainty.pdf) for estimating uncertainty, the overall combined uncertainty from all sources is expected to be ± 12% of the actual value. All measuring equipment complies with national law and regulations.	

Objective	Reference	Comments	Conclusion (CARs/FARs)
		However a request has to be responded. **CAR 02.** Please eliminate differences in the approach to monitor Overall production of electrolytic aluminium per year by potrooms, tonnes (MP) in MR Section B.1 (exel spreadsheets), PDD Section D.2 and Production Data Form PFC001. The latter states that MP is calculated by means of adding up the metal weight, which is determined by weighting of ladles with metal taken from potrooms, without determining the weight of liquid aluminium in potrooms as metal in progress. **CAR 03.** It is tracked down at the site visit that the weight of liquid aluminium in potrooms as metal in progress is determining on a monthly base. Please correct the MR Section B.1, Cl.2, which states that it is determined quarterly. **CL 02.** Please clarify in MR if a gauge, used for Quantity of liquid metal in the potroom determination, is included into the “List of measuring tools subject to control”, and annually checked? What is a permissible maximum accuracy for it?	
3.5. Data uncertainty *How will data uncertainty be determined for later calculations of emission reductions? Is this in compliance with monitoring and metering equipment?*	/1, 2/	It is shown in MR Section B.1 that uncertainty of the proposed monitoring system is within best industry practice. A special requirement for data uncertainty was not defined in the PDD. The main sources of uncertainty during continuous measuring are: - spectrometer calibration uncertainty, - the effectiveness of the analytical method in calculating the CF4 and C2F6 concentrations from the measured spectrum, - the measurement of the flow rate of exhaust gases in the collection ducts.	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		The verifier observes this estimation as reasonable. Besides, CL 02 has to be responded.	
3.6. Calibration and quality assurance *Check how monitoring and metering systems are subject to calibration and quality assurance routines* *a) with installation* *b) during future operation*	/8,11,12,14-15,19-26,28/	The measurements are carried out by metering equipment calibrated in accordance with the Federal Law №102 "About Unity of Measurements". During the audit, the status of calibration of all used measuring devices was checked and found proper. Responsibility for maintenance of metering equipment is established, documented in the MR in Section B.2 and communicated /29/. The balance consists of the following main components: - A receptacle installed in the foundation pit designed for load acceptance and transmission to weight metering strain gauges. - A weight measuring unit installed in the weighing room and connected via special cables to the strain gauges, the monitor, and the CPU control keyboard. The CPU converts electrical signals from the strain gauges (mV) to weight units (kg) and transfers the data on load weight to the PC via the RS-232 interface. The Scalex-1000 balance is included in the "List of instrumentation for calibration" and annually examined according to the "Instrumentation examination schedule" by specialists of the Federal State Enterprise 'Krasnoyarsk Standardisation & Metrology Centre' who issue a calibration certificate. The measurement channel of the automated control system SAAT-1 is regularly calibrated as per the "Calibration schedule". The measurement channel is calibrated as per the method "Methodical Guidlines. Measurement	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		and Automated Control Systems for the Aluminium Reduction Process. Calibration Method". Calibration is carried out by contractor specialists as per the Regulations "Calibration of instrumentation". The structure of the automated process control system SAAT-1 is hierarchical including two levels. The upper level is based on a SUN server station (host). The work stations of the control room operator and the senior supervisor are connected to the server station via Ethernet 10Base-T network designed to provide service and maintenance personnel with information. The data exchange between the host and the controllers of pot control boxes (low-level controllers) is provided by a data concentrator. The data concentrator and the operator's work station are located in the potroom control room. The principle of pot control is based on generation of control actions on pot actuators via mathematical processing of reduction process data and logical processing of status signals from controls/actuators. However a request has to be responded. **CAR 04.** Please include in the MR the obligatory frequency of calibration performed on the process control system to control anode effects on the voltage measure channel on the anode and cathode (Ua-k) section. Besides, CL 02 has to be responded.	
3.7. Data acquisition and data processing systems *Check the eligibility of used systems.*	/8,11,12,14-15,19-26,28/	Please refer to 3.4 above. **CAR 05.** Monitored data of all key parameters required for determining of both project and baseline perfluorocarbon emissions are kept for five years as per MR Section B.1 and PDD Section D.2. The approach does not meet the requirements of Guidance for users of the JI PDD form version 04, Section D: "Please note that the data monitored and required for determination are to	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		keep for two years after the last transfer of ERUs for the project” [2].	
3.8. Reporting procedures *Check how reports with relevance for the later determination of emission reductions will be generated*	/17, 20, 22,23-27/	Data reporting procedures and responsibilities of the managers concerned are described in the document “Regulations RIK-FL-RG-41-01 “, “Process documentation management in aluminium production”. Two departments are directly involved in monitoring: Environmental Department and Electrolytic Production Directorate of OJSC “RUSAL Krasnoyarsk”. (Refer to list of Persons interviewed (numbers 1-5).	OK
3.8. Documented instructions *Check whether the personnel performing tasks with sensitivity for the monitoring of emission reductions have access and knowledge of documented instructions, forming a part of the project’s management system.*	/22-26/	Instructions for the responsible managers which are documented in the Responsibility Structure (MR, Section B.2) are well mastered and closely followed, as was observed during interviews. (Refer to list of persons interviewed).	OK
3.9. Qualification and training *Check whether the personnel performing tasks with sensitivity for the monitoring of emission reductions has the appropriate competences, capabilities and qualifications to ensure the required data quality.*	/19/	The smelter has the Personnel Training & Development Unit responsible for training and knowledge examinations in the form of testing. The personnel of RUSAL VAMI, staff of electrolytic production Directorate of OJSC “RUSAL Krasnoyarsk”, manager of Environmental Department of UC RUSAL is in charge of monitoring and reporting of GHG emission reduction. All they have appropriate competences, capabilities and qualifications to ensure the required data quality. (Refer to list of persons interviewed). Periodic training is a part of production operations at the smelter and maintenance routine in framework of production duties.	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		There are annual knowledge examinations and learning of operational standards of the personnel concerned.	
3.10. Responsibilities *Check whether all tasks required to gather data and prepare a monitoring report with the necessary quality have been allocated to responsible employees.*	/19,22-26/	Responsibilities of the involved managers are generally well defined and documented in the Corporate Standard 2.02-2009 “Development, coordination, and approval of operational instructions”, Standard 2.08-2009 “Development, coordination, and approval of job descriptions”.	OK
3.11. Troubleshooting procedures *Check whether there are possibilities of redundant data monitoring in case of having problems with the used monitoring equipment. Such procedures may reduce risks for the buyers of emission reductions (e.g. the Client)*	/20-21/	Data troubleshooting procedures are described in: - “Regulation of relationships between the Krasnoyarsk Branch of RUS-Engineering Co. LLC and RUSAL Krasnoyarsk” in the process of planning and execution of equipment repairs; - Process Regulations 449.01.00.14 “Reduction process control at RUSAL Krasnoyarsk upon restriction of electricity supply to 880 MW (by 50%)”; - Process Regulations 449.01.00.15 “Reduction process control at RUSAL Krasnoyarsk upon restriction of electricity supply to 440 MW (reduction by 25%)”; - Process Regulations 449.01.00.16 “Reduction process control at RUSAL Krasnoyarsk upon interruption of electricity supply (0 MW)”.	OK
4. Internal Data *Identifying the internal GHG data sources and ways in which the data have been collected, calculated, processed,*			

Objective	Reference	Comments	Conclusion (CARs/FARs)
aggregated and stored should be part of initial verification to assess accuracy and reliability of the internal GHG data.			
4.1. Type and sources of internal data *Acquire information on type and source of internal GHG data, which is used in calculations of emission reductions. E.g.." continuous direct measurements", "site-specific correlations", "periodic direct measurements", "use of models" and/or "use of default emissions factors".*	/1,8/	Internal data to be monitored throughout the crediting period are: - Overall production of electrolytic aluminium for Baseline and Project; - Actual average frequency of anode effects; - Actual average duration of anode effects; - Average weight of 1 cm of metal in the pot. Default parameters are: - the ex-anteTier 3 Slope coefficient for CF_4 measured in accordance to last version of Protocol for Measurement of Tetrafluoromethane (CF4) and Hexafluoroethane (C2F6) Emissions from Primary Aluminium Production, US EPA and IAI; - Weight fraction of C_2F_6/CF_4	OK
4.2. Data collection *How is data collected and processed? What are the means of quantifying emissions from the different data sources?*	/12,17,20,22,27/	Overall production of electrolytic aluminium per year by potrooms is calculated by means of adding up the metal weight, which is determined by weighting of ladles with metal taken from potrooms, and determining the weight of liquid aluminium in potrooms as metal in progress. Data on Overall production of electrolytic aluminium for Baseline and Project line (MP) are reported monthly. Actual average frequency of anode effects, Actual average duration of anode	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		effects, and Weight fraction of C_2F_6/CF_4 are measured. Data on Tier 3 Slope coefficient for CF4 are measured in accordance to last version of Protocol for Measurement of Tetrafluoromethane (CF4) and Hexafluoroethane (C2F6) Emissions from Primary Aluminium Production, US EPA and IAI. The applied value of Slope coefficients have been obtained during PFC measurements, carried out by Mr. Jerry Marks (IAI consultant) in September 2007. As established in MR and PDD, they are to be measured periodically every three years, selectively for different potrooms, excluding potrooms without alumina point feeders or once changing pot type/considerable change in technology. Collected data are manually transferred to yearly excel spreadsheets which form yearly data reports. The processing of the data is performed according to the Monitoring Plan and described in 1st MR, Section B.2. However, requests have to be responded. **CAR 06.** Overall production of electrolytic aluminium for Baseline and Project line (*MP*) is measured monthly as per MR Section B.1 and PDD Section D.1.1.1 and D.1.1.3. As a matter of fact it is calculated by means of adding up the metal weight, which is measured of ladles with metal taken from potrooms on the scales “Scalex-1000”, and summarizing the weight of liquid aluminium in potrooms as metal in progress (so called “work-in-progress aluminium or WIP”). But the later one is determined quarterly (refer to PDD Annex 2, p.56). Please provide the description of the approach of *MP* monitoring with regard to the existed production practice. **CAR 07.** Please provide in MR the applied Default Data used for GHG	

Objective	Reference	Comments	Conclusion (CARs/FARs)
		emission calculations.	
4.3. Quality assurance *Does internal data collection underlie sufficient quality assurance routines?*	/20,22/	The key monitoring parameters are recorded automatically using the automated process control system.	OK
4.4. Significance and reporting risks *Assess the significance and reporting risks related to the different internal data sources. Potential reporting risks may be related to the calculation methods, accuracy of data sources and data collection and/or the information systems from which data is obtained. The significance of and risks associated with the data source indicate the level of verification effort required at a later stage.*	/20,22,25,26/	Risks might be human errors done during manual data recording and transfer of measured data to the excel spread sheet. Owing to control by independent persons, as described above, the risks are minimized. There are no residual risks since the automated process control system is regularly inspected, instruments are calibrated, etc. However, requests have to be responded. **CAR 08.** For the *quantity of liquid aluminium in pots* (WIP) determined quarterly with the “Techniques for determining liquid aluminium in pots” according to instruction I 10.03-02 “Techniques for inventory accounting of raw materials, materials, metal in progress in potrooms”, a data of *Average weight of one centimeter of liquid metal* (calculated on a yearly base) is used. Please provide the assessment of the significance and reporting risks related to the *average weight of one centimeter of liquid metal* determination. Refer to MR Section B.1, p.6 and PDD Section D.2. Please explicitly explain the sample of 10% pots as appropriate to use the data in calculations of WIP. **CAR 09.** The data of *Average weight of one centimeter of liquid metal* (calculated on a yearly base) are not considered as the data that should be monitored for the project activity. PDD Section D.1 and D.2 also lacks of the information requested. **CL 03.** Please clarify why in excel spreadsheets with production data of	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		RUSAL Krasnoyarsk Aluminium Smelter for 2008, 2009 in form of IAI PFC001/7/ it is stated that Tier 3, specified in 2006 IPCC guidelines are not applicable, since PDD Section B.1, p.14 reads: “… to calculate emissions before the end of 2007, the three above mentioned slope coefficients were used. For the surveyed period 2008-2012, only two coefficients for the PFVSS and PFPB technologies were used. “Given the similarity of technology of the manual fed VSS cells, the point fed VSS cells across the Krasnoyarsk location, I recommend adopting the newly measured IPCC Tier 3 coefficients for CF4 Slope and for weight ratio of C2F6/CF4 for calculation of PFC emissions at the Krasnoyarsk site for potlines operating with similar technology to those measured and reported here”, - Mr. Jerry Marks (IAI consultant).” Section D.1 PDD states that these values of the determined by Mr. Jerry Marks (IAI consultant) in September 2007 slope coefficients based on Tier 3 approach of measuring were applied in GHG’s calculations.	
5. External Data *Especially for data of baseline emissions there might be the necessity to include external data sources. The access to such data and a proof of data quality should be part of initial verification. If it is deemed to be necessary, an entity delivering such data should be audited.*			
5.1. Type and sources of external data *Acquire information on type and*	/1,2/	There are no external data in the monitoring plan, applied to GHG emission reduction calculation.	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
source of external data, which is used in calculations of emission reductions.			
5.2. Access to external data *How is data transferred? How can reproducibility of data set be ensured?*	N/A	Not applicable.	OK
5.3. Quality assurance *Does external data underlie any quality assurance routines?*	/1,8/	No QA routines are explicitly underlined. Refer to 5.3 above.	OK
5.4. Data uncertainty *Is it possible to assess the data uncertainty of external data? Are such routines included in reporting procedures?*	N/A	Gradients for 2008-2010 were obtained during the measurements of PFC emissions made by Mr. Jerry Marks (IAI Consultant) in September 2007. According to the data acquired by Mr. Jerry Marks and represented in the PFC Measurement Report, the main sources of data uncertainty during the continuous measurements are as follows: - calibration error by the spectrometer; - efficiency of the analytical method during the calculation of CF_4 and C_2F_6 concentrations on the basis of the measured spectrum; - measurement of exhaust fume flow rates in collection pipelines. The uncertainty of gradient estimation is ±12%.	OK
5.5. Emergency procedures *Are there any procedures, which will be applicable if there is no access to relevant external data?*	N/A	N/A	OK

Objective	**Reference**	**Comments**	**Conclusion (CARs/FARs)**
6. Environmental and Social Indicators *A Monitoring Plan may comprise environmental and/or social indicators, which could be necessary to monitor for the success of the project activity.*			
6.1. Implementation of measures *A project activity may demand for the installation of measures (e.g. filtering systems or compensation areas), which are exceeding the local legal requirements. A check of the implementation or realization of such measures should be part of the initial verification.*	/1,2/	MR Section B.3 states that the project participants do not expect any negative environmental impact resulting from implementation of activities within the frameworks of this project, and the Russian governmental bodies do not require any surveys regarding environmental impact of the project.	OK
6.2. Monitoring equipment *Check where necessary whether the required metering systems have been installed. The meters have to comply with appropriate quality standards applicable for the used technology.*	N/A	Not applicable. Refer to 6.1 above	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
6.3. Quality assurance procedures *What quality assurance procedures will be applied for such data?*	N/A	Not applicable. Refer to 6.1 above	
6.4. External data *Check the quality, reproducibility and uncertainty of external data.*	N/A	Not applicable. Refer to 6.1 above	
7. Management and Operational System *In order to ensure a successful operation of a Client project and the credibility and verifiability of the ERs achieved, the project must have a well-defined management and operational system.*			
7.1. Documentation *The system should be documented by manuals and instructions for all procedures and routines with relevance to the quality of emission reductions. The accessibility of such documentations to persons working on the project has to be*	/1,25 /	The First Periodic Monitoring was conducted based on the Regulations RIK-FL-RG-41-01 “Process documentation management in aluminium production”, and the Responsibility Structure as well as the PDD Monitoring Plan, and numerous instructions for personal as regards control of measured data and calibration of measuring devices as a part of the Smelter operation routine. However, request has to be responded. **FAR 01.** Based on the first experience of monitoring, RUSAL Krasnoyarsk Aluminium Smelter (KrAZ) may wish to issue a separate Manual of the Monitoring Management System though the present managerial set up is	Pending

Objective	Reference	Comments	Conclusion (CARs/FARs)
secured.		observed by the verifier as appropriate enough.	
7.2. Qualification and training *The system should describe the requirements on qualification and the need of training programs for all persons working on the emission reduction project. Performed training programs and certificates should be archived by the system.*	/19,23-26/	Smelter Standard 2.01-2008 “Arranging and holding of vocational training for workers”, Smelter Standard 2.05-2008 “Training of managers and specialists”. Please also refer to 3. 9 and 7.1 above.	OK
7.3. Allocation of responsibilities *The allocation of responsibilities should be documented in written manner.*	/19,23-26/	Please refer to 3.10 and 7.1 above. However, request has to be responded. **FAR 02.** Based on the first experience of monitoring, RUSAL Krasnoyarsk Aluminium Smelter (KrAZ) may wish to issue a formal order to formalize the status of a JI working group responsible for the JI Project Monitoring Management System, in particular to appoint a JI coordinator to ensure the alignment with the existed managerial set up.	Pending
7.4. Emergency procedures *The system should contain procedures, which provide emergency concepts in case of unexpected problems with data access and/or data quality.*	N/A	Process Regulations 449.01.00.14 “Reduction process control at RUSAL Krasnoyarsk upon restriction of electricity supply to 880 MW (by 50%)”. Process Regulations 449.01.00.15 “Reduction process control at RUSAL Krasnoyarsk upon restriction of electricity supply to 440 MW (reduction by 25%)”. Process Regulations 449.01.00.16 “Reduction process control at RUSAL	Pending

Objective	Reference	Comments	Conclusion (CARs/FARs)
		Krasnoyarsk upon interruption of electricity supply (0 MW)”. However, request has to be responded. **FAR 03**. Please develop a procedure, which provides emergency concepts in case of unexpected problems with data gathering and/or data quality.	
7.5. Data archiving *The system should provide routines for the archiving of all data, which is required for verifying the project’s performance in the context of consecutive verifications.*	/1/	Partly requirements for data archiving are defined in the Regulation “Maintenance of work stations”and 1st MR. **FAR 04.** Based on the first experience of monitoring, RUSAL Krasnoyarsk Aluminium Smelter (KrAZ) may wish to issue a formal procedure for data archiving as partialy defined in the MR. Besides, FAR 03 should be taken into account.	Pending
7.6. Monitoring report *The system includes procedures for the calculation of emission reductions and the preparation of the monitoring report.*	/1/	Procedures for the calculation of emission reductions and the preparation of the monitoring report are partly defined in the 1st MR. Preparation a monitoring report and calculations of emission reduction are carried out at the beginning of each next year of the credit period by the Environmental Department of UC RUSAL on the basis of the Annual Report in the PFC0001 format for IAI (in its turn developed on the basis of the Annual Technical Report of RUSAL Krasnoyarsk). UC RUSAL gets certain consulting assistance from “CTFConsulting” LLC being a subsidiary of Carbon Trade & Finance SICAR S.A. (buyer of ERU’s under the Project). **FAR 05.** Based on the first experience of monitoring, RUSAL Krasnoyarsk Aluminium Smelter (KrAZ) may wish to issue a formal procedure for the calculation of emission reductions and the preparation of the monitoring report in particular respect to internal verification and validation of data and	Pending

Objective	Reference	Comments	Conclusion (CARs/FARs)
		responsibilities assigned for that. The extended and comprehensive Responsibility Structure of the MR is observed and discussed on the site visit. Conclusion is pending also a response to FAR 01, FAR 02, FAR 03, FAR 04.	
7.7. Internal audits and management review *The system includes internal control procedures, which allow the identification and solution of problems at an early stage.*		**FAR 06.** Based on the first experience of monitoring, RUSAL Krasnoyarsk Aluminium Smelter (KrAZ) may wish to issue a formal procedure for the internal control procedures (Internal audits and management review), which allow the identification and solution of problems at an early stage of calculation of emission reductions and the preparation of the monitoring report.	Pending

Table 2 GHG calculation procedures and management control testing & Detailed audit and random testing of residual risk areas

Expectations for GHG data management system/controls	Scores	Verifiers Comments (including *Forward Action Requests*)
A. Defined organisational Responsibility Structure, responsibilities and competencies		
A.1. Position and roles Position and role of each person in the GHG data management process is clearly defined and implemented, from raw data generation to submission of the final data. Accountability of senior management must also be demonstrated.	Full	Data reporting procedures and responsibilities of the managers concerned are established by the existed job descriptions and procedures, applied during routine production management at OJSC "RUSAL Krasnoyarsk". The respective personnel of OJSC RUSAL VAMI, staff of Electrolysis Production Department of OJSC "RUSAL Krasnoyarsk", manager of Environmental Department of UC RUSAL is in charge of monitoring and reporting of GHG emission reduction. All they have appropriate competences, capabilities and qualifications to ensure the required data quality. (Refer to list of persons interviewed). The Responsibility Structure, presented in the 1st Monitoring Report (further MR) Version 2.1 dated 30 June 2010 for the monitoring period from 01/01/2008 to 31/12/2009, clearly defines the scope of application, types of primary data, responsibilities of each person for and requirements to data collection, recording, storage, protection, transfer, consolidation, processing, and reporting (refer to MR, Section B.2). MR reflects most provisions of the Responsibility Structure.
A.2. Responsibilities Specific monitoring and reporting tasks and	Full	General and specific monitoring and reporting tasks and responsibilities of relevant managers are specified the existed job descriptions and procedures,

responsibilities are included in job descriptions or special instructions for employees.		applied during routine production management at OJSC "RUSAL Krasnoyarsk" and in MR, Section B.2). Additionally specific monitoring and reporting tasks and responsibilities of relevant managers are specified for: (a) measurement and backup of data on the weight of electrolytic aluminium produced (ladles with metal and aluminium in the pots): - "Regulations for calculation of key performance indicators of reduction area at the assets of the Aluminium Division"; - Reduction area manager's Job Description; - "Provision on units" (Reduction Area Planning and Analysis Group); - "Provision on Centralized Measurement Group"; (b) preparation by RUSAL Krasnoyarsk of monthly and annual reports on the monitoring parameters: - "Provision on units"(Group of Planning and Analysis of Electrolysis Production); - Planning and Analysis Group manager's Job Description; - Planning and Analysis Group experts' Job Description; (c) preparation by UC RUSAL of reports as per PFC001 form for the International Aluminium Institute: - a senior potline supervisor's Job description; - Job description of a manager and experts of the planning and analysis group; - Job description of a reduction area manager of the Temperature Parameters Monitoring Area; - Job description of a head of the Temperature Parameters Monitoring Area of the Directorate of Reduction Area.
A.3. Competencies needed	Full	The competencies for each step of the GHG monitoring process have been

Competencies needed for each aspect of the GHG determination process are analysed. Personnel competencies are assessed and training programme implemented as required.		checked. Knowledge of the GHG operational monitoring process is available. The Responsibility Structure was prepared by the plant managers who themselves are in charge of monitoring and reporting tasks. Hence there was no need of special training. Corporate Standards STP 2.01-2008 "Organization and Carrying out of Professional Training of Workers" and STP 2.05-2008 "Training of Managers and Experts" have covered all the requirements to competencies of the personnel in charge of monitoring and reporting of GHG emission reduction and needed for each aspect of the GHG determination process.
B. Conformance with monitoring methodology		
B.1. Reporting procedures Reporting procedures should reflect the monitoring methodology content. Where deviations from the monitoring plan occur, the impact of this on the data is estimated and the reasons justified.	Full	Data reporting procedures and responsibilities of the managers concerned are described in the Responsibility Structure (refer to MR, Section B.2). The Smelter prepares monthly reports for UC RUSAL with data as per PFC001 form for the International Aluminium Institute, used for GHG emission reduction calculation. There are no deviations from the monitoring plan observed since the monitoring parameters are being measured during the significant period within the scope of the production indicators gathering and storing system functioning at Krasnoyarsk Aluminium Smelter and are playing an important role in the management reporting system. The production volume of electrolytic aluminium and the frequency and duration of anode effects are measured by the personnel of the Department of Electrolysis Production of RUSAL Krasnoyarsk within the scope of production responsibilities. Up to September 2010 new measurements of perfluorocarbon emissions are not required for the determination of a slope factors. Reporting procedures fully reflect the monitoring methodology content. Conclusion is pending a response to CAR 02 in INV.
B.2. Necessary Changes Necessary changes to the monitoring	Full	There are no deviations from the monitoring plan observed since the monitoring parameters are being measured during the significant period within the scope of

methodology are identified and changes are integrated in local procedures as necessary.		the production indicators gathering and storing system functioning at Krasnoyarsk Aluminium Smelter and are playing an important role in the management reporting system. Conclusion is pending a response to CAR 02 in INV.
C. Application of GHG determination methods		
C.1. Methods used There are documented description of the methods used to determine GHG emissions and justification for the chosen methods. If applicable, procedures for capturing emissions from non-routine or exceptional events are in place and implemented.	Full	The project closely follows the CDM Methodology AM0009 Version 03.2. The equations used to determine GHG emissions are properly documented in MR and formalized in terms of the excel spreadsheet /4/ which is observed the verifier as transparent and correct. The methods specified by the PDD, version 3.0 dated 27 October 2008, are applied for the calculation of GHG emissions at the design and initial conditions. PDD includes the methods of calculation of GHG emissions based on the 3rd version of the methods of the Protocol on Reduction of Atmospheric Greenhouse Gas Emissions in Aluminium Industry (appendix to the Protocol on Reduction of Atmospheric Greenhouse Gas Emissions by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD) 2006, which has been approved and included to the Guidelines for Compilation of National Greenhouse Gas Inventory of the Intergovernmental Panel on Climate Change in 2006 (IPCC guidelines, 2006). According to the applied from IPCC methods, the perfluorocarbon emissions are influenced by four parameters of aluminium production: total production volume of electrolytic aluminium, frequency and duration of anode effects and slope factor for CF4 and C2F6 emissions. The slope factors of level 3 used for the calculation of perfluorocarbon emissions were measured by Jerry Marks – a consultant of the International Aluminium Institute in September 2007, and are valid, in accordance with his recommendations, during a three-year period before and after the measurement (i.e. they can be used for the calculation of perfluorocarbon emissions starting

		from the beginning of the project and up to September 2010). New measurements are to be performed before September 2010. The slope factors used for all vertical stud Soderberg pots with automatic alumina point feeders are the same. The slope factors are also the same for all prebaked anode cells with automatic alumina point feeders. Thus, there are two values of slope factors (one per each technology). If the automated alumina point feeders are being idle for more than 3 days per year, the factual factors will be used at each potroom applying the Soderberg technology for the pots of the above technology (VSS) without automated alumina point feeders. In the event of a similar situation in potrooms of PFPB technology, the emission factors of Tier 2 level will be used, see the IPCC Guidelines for SWPB technology (cells with prebaked anodes and a beam crust breaker, with no automated alumina point feeders installed), which are absent at KrAZ, but can serve as an example if the cells with prebaked anodes operate with automated alumina point feeders disabled. Conclusion is pending a response to CAR 07 in INV.
C.2. Information/process flow An information/process flow diagram, describing the entire process from raw data to reported totals is developed.	Full	MR, Section B.2 contains accounting, registration and storage requirements for the data, which monitored during the monitoring period. **CAR 10.** Please include the process flow scheme in the MR.
C.3. Data transfer Where data is transferred between or within systems/spreadsheets, the method of transfer (automatic/manual) is highlighted – automatic links/updates are implemented where possible. All assumptions and the references to original data sources are documented. Manual transfer has occurred.	Full	The data on the frequency and duration of anode effects killing, weight of raw aluminium (without weight of aluminium in progress (AIP)) is recorded automatically. Transfer of primary data of weight of aluminium in progress (AIP) is transferred to the month technical reports manually as per “Act of definition of metal-in-progress in electrolytic cells of “OJSC “RUSAL Krasnoyarsk” and stored not less than 5 years in the archive of Group of planning and analysis of electrolytic production according to current practice. The responsibilities are clearly described in the

		Responsibility Structure in the Act. Manual transfer has occurred for the taken ex-ante the ex-ante Tier 3 Slope coefficient for CF_4 measured in accordance to last version of Protocol for Measurement of Tetrafluoromethane (CF4) and Hexafluoroethane (C_2F_6) Emissions from Primary Aluminium Production, US EPA and IAI; and Weight fraction of C_2F_6/CF_4. However, request has to be responded. **CAR 11.** The excel spreadsheets /3/ contain incorrect default data on CWPB - type of Electrolyzers for *CF_4 Slope factor* (0,133 kg PFC / t Al / AE min / cell-day). That data is fixed ex-ante for PFVSS - type of Electrolyzers (refer to excel spreadsheets with production data of RUSAL Krasnoyarsk Aluminium Smelter for 2008, 2009 in form of IAI PFC001/4/ and PDD Annex 2, Table A.2.11.T). Please note that at RUSAL Krasnoyarsk Aluminium Smelter CWPB type of Electrolyzers are not applied within the project boundaries. Calculation of emission reduction should be corrected accordingly or otherwise state it is correct.
C.4. Data trails Requirements for documented data trails are defined and implemented and all documentation are physically available.	Partial	Requirements for documented data trials are implemented as defined in PDD Section D.3 with the only exception: RUSAL has eliminated the position of “Kyoto Protocol” project manager. Instead of it the manager of Environmental Department of UC RUSAL process the monitoring and other supporting data and prepare the monitoring report. Additionally CTF Consulting, LLC company consult UC RUSAL and supervises the process of verification as interested party (the founder of CTF Consulting – Carbon Trade & Finance SICAR S.A. is a contracted buyer of ERUs from the project). Requirements for documented data trials are implemented as defined in the MR Section B.2. FAR 02, FAR 05 from Initial Verification Protocol has to be responded.
D. Identification and maintenance of key process parameters		
D.1. Identification of key parameters	Full	The key physical process parameters are identified in MR in full compliance with PDD Monitoring Plan.

The key physical process parameters that are critical for the determination of emission factors are identified.		
D.2. Calibration/maintenance Appropriate calibration/maintenance requirements are determined.	Full	Records of calibration of all measuring devises were checked and the status of calibration was verified as proper. Refer to 3.6 in the Initial verification Protocol. *Weight of raw aluminium:* - Scalex-1000 scales are checked as per GOST 8.453-82 Static Weighing Scales. Methods and Means of Checking, with an examination certificate issued. A copy of the examination certificate is stored at the workplace of scales operator, and the original of the certificate and scales certificate are stored at the measuring equipment calibration and repair area. The maintenance of scales is performed by the personnel of the measurement equipment calibration and repair area as per the requirements of the Operational Manual and STP 8.01-2009 Repair, Maintenance and Monitoring of Scales. *Frequency and duration of anode effects:* - The measurement channel of the Process Control System is calibrated as per the methods of the “GUIDELINES. MEASUREMENT SYSTEM OF THE PROCESS CONTROL SYSTEM OF ALUMINIUM REDUCTION. CALIBRATION METHODS”. The calibration minutes and the original of the measurement system calibration certificate are stored at the measuring equipment calibration and repair area. A copy of the calibration certificate is submitted to the Process Control System Maintenance and Repair Unit of the operating potrooms. The maintenance and repair of the Process Control System are performed as per the schedule of preventive maintenance for automation means and Process Control System.
E. GHG calculations		
E.1. Use of estimates and default data	Full	Refer to 5.1 and 5.3 in the Initial Verification Protocol.

Where estimates or default data are used, these are validated and periodically evaluated to ensure their ongoing appropriateness and accuracy, particularly following changes to circumstances, equipment etc. The validation and periodic evaluation of this is documented.		Default data used are: the taken ex-ante Tier 3 Slope coefficient for CF_4 measured in accordance to last version of Protocol for Measurement of Tetrafluoromethane (CF4) and Hexafluoroethane (C_2F_6) Emissions from Primary Aluminium Production, US EPA and IAI; and Weight fraction of C_2F_6/CF_4. Conclusion is also pending a response to CAR 10 (C.3) and CL 03 from INV.
E.2. Guidance on checks and reviews Guidance is provided on when, where and how checks and reviews are to be carried out, and what evidence needs to be documented. This includes spot checks by a second person not performing the calculations over manual data transfers, changes in assumptions and the overall reliability of the calculation processes.	Partial	According to the existed overall management Responsibility Structure of the JI monitoring and reporting the overall responsibility for the control of data quality is rested with OJSC RUSAL Krasnoyarsk, Chief Manager of electrolysis producrion, and UC RUSAL, Environmental Department Director (refer to MR Section A.4). Conclusion is also pending a response to FAR 01, FAR 02, and FAR 05 (INV).
E.3. Internal verification Internal verifications include the GHG data management systems to ensure consistent application of calculation methods.	Partial	According to the existed overall management Responsibility Structure of the JI monitoring and reporting, the managers responsible for collection, analysis and monthly reporting of primary data send the monthly report for further analysis to the UC RUSAL, Environmental Department Director (refer to MR Section A.4 and Section B.2). The consolidated monthly reports are sent to the UC RUSAL, Environmental Department Director. Monitoring report is verified by the signatures of OJSC “RUSAL Krasnoyarsk” Director of Environmental and Quality, Electrolysis Production Director, Chief of Manager of Electrolysis Production and UC RUSAL Environmental Department Director, UC RUSAL Environmental Department Manager. Conclusion is also pending a response to FAR 01, FAR 02, and FAR 05 (INV).
E.4. Internal validation Data reported from internal departments should be validated visibly (by signature or	Partial	Internal validation of data is overall combined with internal verification. Monitoring report is validated by the signature of OJSC “RUSAL Krasnoyarsk” Managing Director.

electronically) by an employee who is able to assess the accuracy and completeness of the data. Supporting information on the data limitations, problems should also be included in the data trail.		Conclusion is also pending a response to FAR 01, FAR 02, and FAR 05 (INV).
E.5. Data protection measures Data protection measures for databases/spreadsheets should be in place (access restrictions and editor rights).	Full	According to the existed overall management Responsibility Structure of the JI monitoring and reporting, archived databases and spreadsheets are stored in a separate directory on the server of UC RUSAL and in paper form in the UC RUSAL Environmental Department. Data are stored up to 10 years. Also refer to /39/ and MR Section B.1.
E.6. IT systems IT systems used for GHG monitoring and reporting should be tested and documented.	Full	Data collection and results reporting are based on standard Microsoft Windows tools. The supporting IT systems are maintained on the basis of IT procedures. Role of IT-Service Head is specified in the Responsibility Structure (refer to MR Section B.1).

Table 3/4 GHG calculation procedures and management control testing & Detailed audit and random testing of residual risk areas

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing performed	Conclusions and Areas Requiring Improvements (including Forward Action Requests)
The following potential risks were identified and divided and Responsibility Structured according to possible	*The following measures were implemented in order to minimize the corresponding risks.*	*Despite the measures implemented in order to reduce the occurrence probability the following residual risks remain and*	*Additional verification testing performed is described. Testing may include: sample cross checking of manual*	*Having investigated the residual risks, the conclusions should be noted here. Errors and uncertainties are*

areas of occurrence.		*have to be addressed in the course of verification*	*transfers of data; recalculation; spreadsheet ‘walk throughs’ to check links and equations; inspection of calibration and maintenance records for key equipment; check sampling analysis results; discussions with process engineers who have detailed knowledge of process uncertainty and error bands.*	*highlighted.*

I Raw data generation				
• Installation of new monitoring equipment • Dysfunction of installed equipment • Maloperation by personnel • Downtimes of equipment • Replacement of equipment	• All installed measuring devices are to high industry standard • Overall responsibility is for maintenance assigned to contractor specialists as per the Regulations “Calibration of instrumentation”. • Only skilled and trained personnel is allowed to operate the relevant equipment and take metering records	• None	• N/A	N/A

	• Regular visual inspections of equipment • Immediate replacement of dysfunctional equipment • Stand-by equipment is available • Internal checks of technological discipline			
II Raw data collection				
• Metering records • Process monitors • Operational logs • Calibration and maintenance data • Passports and other vendor data • Accounting records • Accuracy of data supplied	• Exclusively installation and operation by duly calibrated equipment • Proper maintenance of data and document control procedure • Implementation of data traceability checking • Responsibilities for the raw data collection are established in General and specific monitoring and reporting tasks and responsibilities of	• Human mistakes in measurements • Incomplete records and documentation • Ex-post corrections of data records • Big amounts of information • Manual data collection mistakes can only be minimized	• On-site interviews with the personnel in charge • Inspection of calibration and maintenance records • Passports for key monitoring equipment were inspected • On-site evaluation of the monitoring routines and practices • On-site review of records and documents • Cross-checking of	All interviewed staff showed competence based on training and experience. Human mistakes in measurements seem unlikely. Nonetheless **CAR 02, FAR 01, FAR 02, FAR 03, FAR 05, FAR 06, FAR 06** were issued.

	relevant managers are specified the existed job descriptions and procedures, applied during routine production management at OJSC “RUSAL Krasnoyarsk” • Proper verification of data by an appointed manager • Appropriate archiving system defined by the Responsibility Structure • Regular inspections by Internal Auditors under the certified integrated management system of OJSC “RUSAL Krasnoyarsk”		accounting records • Discussions with process engineers who have detailed knowledge of process uncertainty & error ranges	

III Data aggregation				
• Annual reports • IT systems • Data spreadsheet programming • Manual data	• Verification of reported data by the experienced manager • Maintenance of IT Systems by Department AMS&IT	• Manual data transfer mistakes can only be minimized • Unintended change of spreadsheet at data base entry	• On-site discussions with the personnel in charge • Sample cross checking of the information of the data base	All interviewed staff showed competence based on training and experience. Human mistakes in measurements seem

transmission • Data protection • Responsibilities	• Clear allocation of responsibilities • Training to MP procedures • Use of internally verified spreadsheet • Corporate procedures for protection and back-up of electronic and paper data	• Entry of estimated rather then measuring data	• All data which was used in the calculation sheets was explicitly checked for consistency and adequacy	unlikely. No significant uncertainties or errors regarding data aggregation were observed in the course of verification. Nonetheless **CAR 02** was issued. **FAR 03, FAR 04** were issued to mitigate the risks.

IV Calculation parameters				
• Data sources • Uncertainties	• All parameters and data to be used are defined in the validated monitoring plan	• Danger of underestimation of project emissions as a result of using improper default values of grid emission factor and grid losses	• Conservative estimations of emission reductions in 2009 are ensured	No uncertainties or errors regarding calculation parameters were observed in the course of verification. Human mistakes in misuse of data seem unlikely.

V Calculation methods				
• Inaccurate input data • Calculation equations • Applied formulae • Implemented IT Systems • Data storage • Consistency in following the monitoring plan • Control of electronic data	• Quality of input data is ensured • Validated methodology and electronic tool for calculation of emission reduction • Use of standard software • Implementation of data traceability • Check of transfer of formulas and algorithms into excel • Detail review of excel spreadsheet	• Input data are checked for adequacy • The use of the electronic calculation tool requires permanent assessment • Manual data transfer mistakes can only be minimized • The danger of miscalculation can only be minimized • Uncontrolled copies of spreadsheets can be mixed with the controlled ones	• Conservative estimations of emission reductions are ensured • Off-site check of all equation and algorithms used in spreadsheets • Random-wise electronic recalculations • Uncertainties due to unstable composition of APG and precipitate can only be minimized • Overlook of inadequate input data can only be minimised	No uncertainties or errors regarding calculation methods were observed in the course of verification. Human mistakes in misuse of electronic tool seem unlikely. Nonetheless **CAR 10** was issued. **FAR 01** was issued to mitigate the risks.

VI Monitoring reporting				
• Data transfer to/by the author of the monitoring report • Issuance of the monitoring report	• An experienced specialist is appointed for preparation of the MR. • Report is checked for	• The danger of the manual data transfer can only be minimized • The danger of insufficient control of	• Cross checking of the information in the monitoring report and the original data by verifier • Check of the MR	Some flaws regarding the monitoring reporting were observed in the course of verification. Please refer to **CAR 10.**

• Verification and validation of the monitoring report	adequacy • Monitoring report is verified and validated • Signs of verification and validation are in evidence	adequacy	adequacy by verifier	**FAR 01, FAR 02, FAR 03, FAR 05, FAR 06, FAR 06** were issued.

VII Management system				
• Inadequacy of management system (MS) • Nonconformities in maintenance of management system	• Responsibility Structure and MR describe main elements of MS • Personnel shows competence and commitments • Internal audit is conducted • Monthly management reviews are planned.	• None	• NA	**FAR 01, FAR 02, FAR 03, FAR 05, FAR 06, FAR 06** were issued.

Table 5: Resolution of Corrective Action and Forward Action Requests

Corrective Action and Forward Action Requests by verification team	Ref. to check list	Summary of project owner Response (please describe the action and refer to the page in amended MR)	Verifacation team conclusion

	question in INV and FPV		
CAR 01 in [8]	Determination Report Table 1 Item 1		Conclusion is pending. The approval should be obtained following the determination of the project.
CAR 01. Please include in MR the justification of exclusion from the project boundary pots for aluminium refining (74 pots for production of high purity aluminium (HPA).	INV 3.2	In accordance with PDD the electrolytic cells for production of high-purity aluminium (74 pots in potroom 25) are outside the project boundary because these pots have been designed for aluminium refinement by three-layer method instead of its initial generation. During such electrolysis the anode is situated underneath in the layer of the metal and PFCs are not evolved due to the absence of anode effects. See page 3 in the MR.	<u>Conclusion on response.</u> This CAR is closed based on the appropriate amendments made in the MR.
CAR 02. Please eliminate differences in the approach to monitor Overall production of electrolytic aluminium per year by potrooms, tonnes (MP) in MR Section B.1 (exel spreadsheets), PDD Section D.2 and Production Data Form PFC001. The latter states that MP is calculated by means of	INV 3.4	A new form PFC001 was sent to Bureau Veritas on 03.05.2010 Indeed the electrolytic aluminium production is calculated with account of	<u>Conclusion on response.</u> This CAR is closed based on the

adding up the metal weight, which is determined by weighting of ladles with metal taken from potrooms, without determining the weight of liquid aluminium in potrooms as metal in progress.		metal-in-progress. The description is added into MR as well.	appropriate amendments made in the MR.
CAR 03. It is tracked down at the site visit that the weight of liquid aluminium in potrooms as metal in progress is determining on a monthly base. Please correct the MR Section B.1, Cl.2, which states that it is determined quarterly.	INV 3.4	The necessary corrections have been done in the Monitoring report. For instance on page 5 it is stated that overall production of electrolytic aluminium per potroom for reporting period (month) is defined by addition of weight of raw aluminium determined by weighting of ladles with metal taken from potroom and weight of aluminium in progress that consists of liquid aluminium being in pots at the end of the month, and small amount of solid aluminium.	Conclusion on response. This CAR is closed based on the appropriate amendments made in the MR.
CAR 04. Please include in the MR the obligatory frequency of calibration performed on the process control system to control anode effects on the voltage measure channel on the anode and cathode (Ua-k) section.	INV 3.6	The measuring channel is calibrated once per two years, page 7 in he MR.	Conclusion on response. This CAR is closed based on the appropriate amendments made in the MR.
CAR 05. Monitored data of all key parameters required for determining of both project and baseline perfluorocarbon emissions are kept for five years as per MR Section B.1 and PDD Section D.2. The approach does not meet the requirements of Guidance for users of the JI PDD form	INV 3.7	Access to the electronic date of frequency and duration of anode effects as well as raw aluminium production is provided through workstation ARM SMIT. A duration of the storage of these data in	Conclusion on response. This CAR is closed based on the

version 04, Section D: “Please note that the data monitored and required for determination are to keep for two years after the last transfer of ERUs for the project” [2].		ITS of RUSAL Krasnoyarsk is limited by free disk space only which is periodically enlarged. Therefore the electronic data will be kept not less than 10 years. Records on quantity of aluminium in electrolytic cells are documented by “Act of definition of metal-in-progress in electrolytic cells of “OJSC “RUSAL Krasnoyarsk” and stored not less than 5 years in the archive of Group of planning and analysis of electrolytic production according to current practice. A quantity of solid aluminium is estimated by multiplication of volume of the metal to its density and documented in acts for inventory of working remains. The acts are stored in Group of planning and analysis of electrolytic production for 5 years. For proper reporting on the considered Joint Implemented project the additional copying of these documents is provided for the aim of their guaranteed storage during 10 years. Reports on measurement of slope coefficient for CH_4 and weight fraction of C_2F_6/CF_4 will be stored 10 years by Environmental Department of UC RUSAL. See additionally the section B.2 in the Monitoring report.	appropriate amendments made in the MR.

CAR 06. Overall production of electrolytic aluminium for Baseline and Project line (*MP*) is measured monthly as per MR Section B.1 and PDD Section D.1.1.1 and D.1.1.3. As a matter of fact it is calculated by means of adding up the metal weight, which is measured of ladles with metal taken from potrooms on the scales "Scalex-1000", and summarizing the weight of liquid aluminium in potrooms as metal in progress (so called "work-in-progress aluminium or WIP"). But the later one is determined quarterly (refer to PDD Annex 2, p.56). Please provide the description of the approach of *MP* monitoring with regard to the existed production practice.	INV 3.7	See response for CAR03.	
CAR 07. Please provide in MR the applied Default Data used for GHG emission calculations.	INV 3.7	As per Monitoring report page 10 the slope coefficient for CF_4 (kg of CF4 per tonne of aluminium times the number of minutes of anode effect / pot per day) is set as 0,032 for VSS and 0,133 for PFPB.	<u>Conclusion on response.</u> This CAR is closed based on the appropriate additions made in the MR.
CAR 08. For the *quantity of liquid aluminium in pots* (WIP) determined quarterly with the "Techniques for determining liquid aluminium in pots" according to instruction I 10.03-02 "Techniques for inventory accounting of raw materials, materials, metal in progress in potrooms", a data of *Average weight of one centimeter of liquid metal* (calculated on a yearly base) is used. Please provide the assessment of the significance and reporting risks related to the *average weight of one centimeter of liquid metal* determination. Refer to MR Section B.1, p.6 and PDD Section D.2. Please	INV 4.4	It should be noted that amount of metal-in-progress consist of less than 1% of the annual electrolytic aluminium production. An average weight of one centimeter of the liquid metal is defined not less than once per year with metal indicator. The method is based on estimation of the difference between mass fraction of the copper in aluminium during 24 hours, measurement of the level of metal and further calculation by formula.	<u>Conclusion on response.</u> This CAR is closed based on the appropriate amendments made by the MR developer.

explicitly explain the sample of 10% pots as appropriate to use the data in calculations of WIP.		Measurement is done at 10% of the pots installed in the potroom according to instruction I 10.03.2002 “Methodology of accounting of the stock of raw materials, goods and metal in progress in electrolysis potrooms”, item 5.11. The copper is weighted with accuracy of 0.1 g. Therefore the significance of uncertainty in parameter for overall aluminium production is low. The estimation of average weight of one centimeter of the liquid metal in the pot performed due to the form of working space in the electrolytic cell changes against change of technological parameters such as used raw material, current strength and time of use of the cell. For example the average weight of one cm of metal for the last years at typical cell C8BM was: 30.12.2005 – 583,3 kg 29.11.06 – 577,0 kg 31.12.2007 – 597,4 kg 31.12.2008 – 599,9 kg 31.07.2009 – 616,2 kg. Mass of aluminium in cell C8BM for	

		31.07.2009 was 31 528 kg.	
CAR 09. The data of *Average weight of one centimeter of liquid metal* (calculated on a yearly base) are not considered as the data that should be monitored for the project activity. PDD Section D.1 and D.2 also lacks of the information requested.	INV 4.4	As per recommendation the monitoring plan has been added by this parameter to ensure a transparency. The information for average weight of one centimeter of liquid metal is provided for each potroom in the Technical report.	Conclusion on response. This CAR is closed based on the appropriate amendments made by the MR developer.
CAR 10. Please include the process flow scheme in the MR.	FPV C.2	The scheme of data flow has been added to the monitoring report in section B.2. which was also renamed accordingly. The levels of information processing and storage are marked up by colour for clarity.. The new version of Monitoring report has been issued (version 2.1 of 30 June 2010).	Conclusion on response. This CAR is closed based on the appropriate amendments made by the MR developer.
CAR 11. The excel spreadsheets /7/ contain incorrect default data on CWPB -type of Electrolyzers for *CF_4 Slope factor* (0,133 kg PFC / t Al / AE min / cell-day). That data is fixed ex-ante for PFVSS - type of Electrolyzers (refer to excel spreadsheets with production data of RUSAL Krasnoyarsk Aluminium Smelter for 2008, 2009 in form of IAI PFC001/7/ and PDD Annex 2, Table A.2.11.T). Please note that at RUSAL Krasnoyarsk Aluminium Smelter CWPB type of Electrolyzers are not applied within the project boundaries. Calculation of emission reduction should be	FPV C.3	In the Excel spreadsheet was made a printing mistake. A version 2.1 is issued.	Conclusion on response. This CAR is closed based on the appropriate corrections made by the MR developer.

corrected accordingly or otherwise state it is correct.			
FAR 01. Based on the first experience of monitoring, RUSAL Krasnoyarsk Aluminium Smelter (KrAZ) may wish to issue a separate Manual of the Monitoring Management System though the present managerial set up is observed by the verifier as appropriate enough.	INV 7.1	The process scheme was incorporated in the MR, section B.2.	Conclusion on the response: FAR 01 is left open till the next periodic verification. Please issue a separate Manual of the Monitoring Management System or some Annex to the existed Environmental Corporate Standard though the present managerial set up is observed by the verifier as appropriate enough.
FAR 02. Based on the first experience of monitoring, RUSAL Krasnoyarsk Aluminium Smelter (KrAZ) may wish to issue a formal order to formalize the status of a JI working group responsible for the JI Project Monitoring Management System, in particular to appoint a JI coordinator to ensure the alignment with the existed managerial set up.	INV 7.3	CTF Consulting LLC, which is subsidiary of Carbon Trade & Finance SICAR S.A. has provided RUSAL with consultancy services for preparation of initial copy of the Monitoring report and ERUs calculation spreadsheet. However it was a one-time operation after a previous manager for Kyoto related aspects in RUSAL has left the company. During the preparation of the final version of MR the UC RUSAL takes a full responsibility for quality of the calculations. In any case the	Conclusion on the response: FAR is left open till the next periodic verification. Please issue a formal order to formalize the status of a JI working group responsible for the JI Project Monitoring

		monitoring data (PFC001 form) has been processed in CTF Consulting as per established QA/QC procedure (attached file) and verification of Monitoring report and Excel spreadsheet by US RUSAL and RUSAL Krasnoyarsk was Adobe Acrobat 7.0 Document done.	Management System, in particular a JI coordinator to ensure the alignment with the existed managerial set up.
FAR 03. Please develop a procedure, which provides emergency concepts in case of unexpected problems with data gathering and/or data quality.	INV 7.4	Project started in 1st January 2006. The implementation of the project that is expressed in achievement of the annual targets for reduction of frequency and duration of anode effects will be held at least until 31st December 2012, however OJSC “RUSAL Krasnoyarks” has also the long-term aim for anode effects until 2015. For 2009 the target on AEF for PFPB technology was 0.2 anode effects per pot-day and for PFVSS technology the target was 0.45 anode effect per pot-day (page 3 of MR).	<u>Conclusion on the response:</u> FAR is left open till the next periodic verification. Please issue a separate Manual of the Monitoring management System or some Annex to the existed Environmental Corporate Standard though the present managerial set up is observed by the verifier as appropriate enough.
FAR 04. Based on the first experience of monitoring, RUSAL Krasnoyarsk Aluminium Smelter (KrAZ) may wish to issue a formal procedure for data archiving as partialy	INV 7.5	In accordance with instruction I 8-21-2001 «Order of performance of the measurements at electrolytic cells with	<u>Conclusion on the response:</u>

defined in the MR.		top current feed" a gauge for measurement of the level of metal and electrolyte are subject for Quality Department Control during issuance from fabrication line and by technological staff during exploitation. During fabrication a producer company OJSC "Siberian instrument and repair factory" performs an initial calibration with issuance of the certificate on calibration. In process of exploitation the personnel performing the measurements observe the state of the ruler by comparison with calibrated ruler and visual inspection to check the defacement of the bottom part of the ruler and its mechanic damage. Thereby the ability for further application of the ruler is done. The calibration of the ruler is 1 cm, according to work standard RS 211.010.2008 (Measurement of level of metal and electrolyte) the level of metal is measured with accuracy of ±1 cm.	Response is not accepted as irrelevant to the FAR. FAR is left open till the next monitoring.
FAR 05. Based on the first experience of monitoring, RUSAL Krasnoyarsk Aluminium Smelter (KrAZ) may wish to issue a formal procedure for the calculation of emission reductions and the preparation of the monitoring report in particular respect to internal verification and validation of data and responsibilities assigned for that. The extended and comprehensive Responsibility Structure of the MR is observed and discussed on the site visit.	INV 7.6	The changes into form PFC001 have been implemented. The new forms were sent on 03.05.2010 to Bureau Veritas.	<u>Conclusion on the response:</u> FAR is left open till the next periodic verification. Please issue a separate Manual of the

			Monitoring management System or some Annex to the existed Environmental Corporate Standard though the present managerial set up is observed by the verifier as appropriate enough.
FAR 06. Based on the first experience of monitoring, RUSAL Krasnoyarsk Aluminium Smelter (KrAZ) may wish to issue a formal procedure for the internal control procedures (Internal audits and management review), which allow the identification and solution of problems at an early stage of calculation of emission reductions and the preparation of the monitoring report.	INV 7.7	This option will be considered.	<u>Conclusion on the response:</u> FAR is left open till the next periodic verification. Please issue a separate Manual of the Monitoring management System or some Annex to the existed Environmental Corporate Standard though the present managerial set up is observed by the verifier as appropriate enough.
CL 01. Please clarify in MR the real status of implementation schedule so to ensure the statement in PDD Section A.4.2:" Although, the main AEF improvements were gained in 2006-2007, the work to achieve further reductions	INV 1.4	It is planned to make changes in the Ecological Reporting procedure that will reflect the structure and responsible	<u>Conclusion on the response:</u> This CL is closed

of PFC emissions will continue until 2015. Thus, the proposed JI project goes beyond the RUSAL Krasnoyarsk Aluminium Smelter's Operational Efficiency Improvement project."		people for JI projects in the Company	based on the appropriate explanations made by PDD developer.
CL 02. Please clarify in MR if a gauge, used for Quantity of liquid metal in the potroom determination, is included into the "List of measuring tools subject to control", and annually checked? What is a permissible maximum accuracy for it?	INV 3.4	The procedure is planned to be developed based on the existing data management system at Krasnoyarsk smelter.	<u>Conclusion on the response:</u> This CL is closed based on the appropriate explanations made by PDD developer.
CL 03. Please clarify why in excel spreadsheets with production data of RUSAL Krasnoyarsk Aluminium Smelter for 2008, 2009 in form of IAI PFC001/7/ it is stated that Tier 3, specified in 2006 IPCC guidelines are not applicable, since PDD Section B.1, p.14 reads: "… to calculate emissions before the end of 2007, the three above mentioned slope coefficients were used. For the surveyed period 2008-2012, only two coefficients for the PFVSS and PFPB technologies were used. "Given the similarity of technology of the manual fed VSS cells, the point fed VSS cells across the Krasnoyarsk location, I recommend adopting the newly measured IPCC Tier 3 coefficients for CF4 Slope and for weight ratio of C2F6/CF4 for calculation of PFC emissions at the Krasnoyarsk site for potlines operating with similar technology to those measured and reported here", - Mr. Jerry Marks (IAI consultant)." Section D.1 PDD states that these values of the determined by Mr. Jerry Marks (IAI consultant) in September 2007 slope	INV 3.4	Same as FAR02	<u>Conclusion on the response:</u> This CL is closed based on the appropriate explanations made by PDD developer.

coefficients based on Tier 3 approach of measuring were applied in GHG’s calculations.			

Appendix D: Verification Team’s CV

Vera Skitina, PhD (chemicals)
Climate change Lead Verifier
Bureau Veritas Certification Russia Technical Director - Lead Auditor, IRCA Lead Tutor, Lead Verifier.

She has over 15 years of experience in powder metallurgy, aluminium metallurgy, plastic metal working, physical-chemistry processes, gas production at power plant, environmental science. She worked in Irkutsk Aluminium Plant, SUAL powder metallurgy plant, Nadvoitzky aluminium plant, Central Scientific Institute of Metals. She is a Lead auditor of Bureau Veritas Certification for Quality Management Systems (IRCA registered), Environmental Management System (IRCA registered), Occupational Health and Safety Management System (IRCA registered). She performed over 200 audits since 2004. Also she is a Lead Tutor of the IRCA registered ISO 14000 EMS Lead Auditor Training Course, and a Lead Tutor of the IRCA registered ISO 9001 Lead Auditor Training Course. She is an Assuror of Social Reports. She has undergone intensive training on Clean Development Mechanism /Joint Implementation and was/is involved in the determination of over 15 JI projects and verification of 5 JI projects.

Mr. Leonid Yaskin, PhD (thermal engineering)
Climate change Lead Verifier.
Bureau Veritas Certification Rus General Director, Climate Change Local Manager, Lead Auditor, IRCA Lead Tutor, Lead Verifier

He has over 30 years of experience in heat and power R&D, engineering, and management, environmental science and investment analysis of projects. He worked in Krrzhizhanovsky Power Engineering Institute, All-Russian Teploelectroproject Institute, JSC Energoperspectiva. He worked for 8 years on behalf of European Commission as a monitor of Technical Assistance Projects. He is a Lead auditor of Bureau Veritas Certification for Quality Management Systems (IRCA registered), Environmental Management System (IRCA registered), Occupational Health and Safety Management System (IRCA registered). He performed over 250 audits since 2002. Also he is a Lead Tutor of the IRCA registered ISO 14000 EMS Lead Auditor Training Course, and a Lead Tutor of the IRCA registered OHSAS 18001 Lead Auditor Training Course. He is an Assuror of Social Reports. He has undergone intensive training on Clean Development Mechanism /Joint Implementation and was/is involved in the determination of over 60 JI projects.