



VERIFICATION REPORT

CARBON TRADE & FINANCE SICAR S.A.

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

REPORT No. RUSSIA - VER/0112/2011

REVISION No. 01

BUREAU VERITAS CERTIFICATION



Verification Report on the project
 “Reduction of PFC emissions from RUSAL Krasnoyarsk Smelter”

Date of first issue: 11/05/2011	Organizational unit: Bureau Veritas Certification Holding SAS
Client: CARBON TRADE & FINANCE SICAR S.A.	Client ref.: Mr. Ingo Ramming

Summary:

Bureau Veritas Certification has made the second periodic verification of the “Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter” project of OJSC “RUSAL Krasnoyarsk” located in the city of Krasnoyarsk, Russian Federation, applying the JI specific approach regarding baseline setting and additionality demonstration and assessment, on the basis of UNFCCC criteria for the JI, as well as criteria given to provide for 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 scope is defined as a periodic independent review and ex post determination by the Accredited Independent Entity of the monitored reductions in GHG emissions during defined verification period, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the verification process is a list of six Corrective Actions Requests, four Clarification Request and one Forward Actions Request (CAR, CL and FAR), presented in Appendix A.

In summary, Bureau Veritas Certification confirms that the project is implemented as planned and described in the approved project design document. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions. The GHG emission reduction is calculated accurately and without material errors, omissions, or misstatements, and the generated ERUs are 284,745 tCO₂e for the monitoring period 01 January 2010 – 31 December 2010.

Our opinion relates to the project’s GHG emissions and resulting GHG emission reductions reported and related to the approved project baseline and monitoring, and its associated documents.

Report No.: RUSSIA-ver/0112/2011	Subject Group: JI
Project title: “Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter”	
Work carried out by: Vera Skitina – Team Leader, Lead verifier	
Work reviewed by: Andrey Rodionov - Internal Technical Reviewer	
Work approved by: Leonid Yaskin– Country Operational Manager	
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1 INTRODUCTION

Carbon Trade & Finance SICAR S.A. has commissioned Bureau Veritas Certification to verify the emissions reductions of its JI project "Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter" (hereafter referred 'the project') located at the city of Krasnoyarsk, Russian Federation

This report summarizes the findings of the verification of the project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

Verification is the periodic independent review and ex post determination by the Accredited Independent Entity of the monitored reductions in GHG emissions during defined verification period.

The objective of verification can be divided in Initial Verification and Periodic Verification.

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.

1.2 Scope

The verification scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

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

1.3 Verification Team

The verification team consists of the following personnel:

Vera Skitina,

Bureau Veritas Certification Team Leader, Climate Change Lead Verifier

This verification report was reviewed by:

Andrey Rodionov,

Bureau Veritas Certification, Internal Technical Reviewer



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2 METHODOLOGY

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

In order to ensure transparency, a verification protocol was customized for the project, according to the version 01 of the Joint Implementation Determination and Verification Manual, issued by the Joint Implementation Supervisory Committee at its 19 meeting on 04/12/2009. 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 a JI project is expected to meet;
- 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 completed verification protocol is enclosed in Appendix A to this report.

2.1 Review of Documents

The Monitoring Report (MR) submitted by CTF Consulting, LLC (subsidiary of Carbon Trade & Finance SICAR S.A.) and additional background documents related to the project design and baseline, i.e. country Law, Project Design Document (PDD), Guidance on criteria for baseline setting and monitoring, Host party criteria, Kyoto Protocol to be checked by an Accredited Independent Entity were reviewed.

The verification findings presented in this report relate to the Monitoring Reports version 1.0 dated 17/02/2011, version 1.1 dated 18/04/2011 and the project as described in the determined PDD Version 3 dated 27/10/2008.

2.2 Follow-up Interviews

On 30.03.2011 the AIE verifier V.Skitina conducted a visit to UC «RUSAL» and performed on-site interviews with UC «RUSAL» managers as well as interviews through teleconference with the project stakeholders (OJSC «RUSAL Krasnoyarsk», the All-Russian Aluminium and Magnesium Institute (VAMI)) to confirm selected information and to resolve issues identified in the document review. The list of the persons interviewed is provided in References. The main topics of the interviews are summarized in Table 1.



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Table 1 Interview topics

Interviewed organization	Interview topics
UK RUSAL, OJSC “RUSAL Krasnoyarsk”, the All-Russian Aluminium and Magnesium Institute (VAMI)	<ul style="list-style-type: none"> ➤ Status of project equipment ➤ Revisions of Monitoring plan ➤ Collected data ➤ Passports and evidence of calibration of measuring equipment ➤ Data logs (samples) ➤ Data reports (samples) ➤ QC and QA procedures ➤ Use of calculation tool ➤ Emission calculations ➤ QC and QA procedures ➤ Monitoring report ➤ Environmental impact
(LOCAL Stakeholder)	<ul style="list-style-type: none"> ➤ N/A
CTF Consulting, LLC, CONSULTANTS	<ul style="list-style-type: none"> ➤ Baseline methodology. ➤ Monitoring plan. ➤ Monitoring report. ➤ Deviations from PDD. ➤ Emission Reduction Calculation Model.

2.3 Resolution of Clarification, Corrective and Forward Action Requests

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

If the Verification Team, in assessing the monitoring report and supporting documents, identifies issues that need to be corrected, clarified or improved with regard to the monitoring requirements, it should raise these issues and inform the project participants of these issues in the form of:

(a) Corrective action request (CAR), requesting the project participants to correct a mistake that is not in accordance with the monitoring plan;



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(b) Clarification request (CL), requesting the project participants to provide additional information for the AIE to assess compliance with the monitoring plan;

(c) Forward action request (FAR), informing the project participants of an issue, relating to the monitoring that needs to be reviewed during the next verification period.

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

3 VERIFICATION CONCLUSIONS

In the following sections, the conclusions of the verification are stated.

The findings from the desk review of the original monitoring documents and the findings from interviews during the follow up visit are described in the Verification Protocol in Appendix A.

The Clarification, Corrective and Forward Action Requests are stated, where applicable, in the following sections and are further documented in the Verification Protocol in Appendix A. The verification of the Project resulted in 6 Corrective Action Requests, 4 Clarification Request and 1 Forward Action Request.

The number between brackets at the end of each section corresponds to the DVM paragraph.

3.1 Project approval by Parties involved (90-91)

The project has been approved by host Party and Party involved in the JI project other than the host Party.

Written approval of the project by the Russian Government is issued by the decree of the Ministry of Economic Development N709 dated 30 December 2010.

The Declaration of Approval from State of the Netherlands, acting through the Ministry of Economic Affairs, Agriculture and Innovation and its implementing agency "NL Agency", being the Designated Focal Point for Joint Implantation (JI) in The Netherlands has been received for the project on 18th March 2011.

The approvals were provided to the AIE.



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Outstanding issue related to Project approvals by Parties involved (90-91), PP's response and the AIE conclusion are summarized in Appendix A Table 2 (refer to CAR 01).

3.2 Project implementation (92-93)

The implementation status of the project is as in Appendix A paragraph 92, and the starting date of operation is 01/01/2008.

The progress of the proposed JI project achieved is steady. Work under the project implementation including building and commissioning stages has been completed.

The project continues generation of Emission Reduction Units since 01/01/2008 after reconstruction of the steelmaking operations at OJSC "RUSAL Krasnoyarsk" as confirmed by measuring monitoring data in the Monitoring Reports version 1.0 dated 17/02/2011 and version 1.1 dated 18/04/2011.

Outstanding issues related to Project implementation (92-93), PP's response and the AIE conclusion are summarized in Appendix A Table 2 (refer to CL 01).

3.3 Compliance of the monitoring plan with the monitoring methodology (94-98)

The monitoring occurred in accordance with the PDD version 3.0 of 27th October 2008, the positive determination opinion of DNV is received, report № 2008-1624. Determination of the project is not deemed final as the AIE did not make its determination publicly available through the secretariat as per Paragraph 34 of JI Guidelines.

For calculating the emission reductions, key factors, such as those listed in 23 (b) (i)-(vi) DVM, influencing the baseline emissions and the activity level of the project and the emissions as well as risks associated with the project were taken into account (refer to Appendix A para 95 (a)).

Other key factors which influence project emissions were taken into account such as listed in Appendix A, para 95 (c). There are 8 parameters to be monitored within the project boundary to get the project emission (refer to PDD Section D.1.1.1 and MR Section B.2 "Accounting, registration and storage of data. Scheme of data flow").

Data sources used for calculating emission reductions, as provided in Appendix A para 95 (b), are clearly identified, reliable and transparent.



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There is no default but once measured and fixed as ex-ante for a certain period of time emissions factors, which are used for calculating the emission reductions.

The values of slope coefficient and weight fraction C₂F₆/CF₄ differ for two periods of monitoring in 2010: before and after 1st September 2010 (refer to MR, Annex 1).

The Tier 3 Slope coefficient for CF₄, has been 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.

New values of slope coefficient and the weight fraction of C₂F₆/CF₄ used in the calculations since 01.09.2010 are resulted from measurements carried out in July-August 2010 by VAMI institute in accordance with contract # 29.03.04/2010 “Execution of instrumental measurements of GHG emissions at OJSC “RUSAL Krasnoyarsk”, stage 2. The new slope coefficients and weight fraction CF₄/C₂F₆ are applied for each of the electrolysis technology since September, 1 2010.

It is assumed that the values of these parameters will be kept at least until December 31, 2012.

The calculation of emission reductions is based on the most plausible scenario in a transparent manner as described in Appendix A paragraph 95 (d).

Outstanding issues related to Compliance of the monitoring plan with the monitoring methodology (94-98), PP’s response and the AIE conclusion are summarized in Appendix A Table 2 (refer to CAR 02, CAR 03, CAR 04, CL 02, CL 03, CL 04 and FAR 01).

3.4 Revision of monitoring plan (99-100)

In the course of the second monitoring period (01/01/2010 – 31/12/2010) monitoring of GHG emission reductions is complete, effective and reliable.

It was carried out as per the revised Monitoring Plan presented in the MR Version 2.1 dated 30/06/2010 “Reduction of PFC emission from RUSAL Krasnoyarsk Aluminium Smelter” for the first monitoring period 01.01.2008 – 31.12.2009.

The revision was as follows: the monitoring plan was added with data variable “Average weight of 1 cm of liquid metal in pot”, which is applied



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for estimation of mass of liquid aluminium in progress. Information on the value of this parameter is contained in the monthly and annual technical report of the smelter.

No additional revisions were made during the second monitoring period.

The revision introduced was sufficiently described in the Monitoring Report ver. 2.1 dated 30/06/2010 (refer to MR Section B.5. "Revisions of the monitoring plan in accordance with paragraph 40 of the Guidance on criteria for baseline setting and monitoring (version 02)").

The proposed revision improves the accuracy and applicability of information collected compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishment of monitoring plans.

The verifier positively determined this revision as appropriate to the project conditions.

The Management and Operational Systems are eligible for reliable project monitoring according to the Monitoring Plan

3.5 Data management (101)

The data and their sources, provided in monitoring report, are clearly identified, reliable and transparent.

QC and QA procedures are the part of the Certified Integrated Management System (IMS) of KRAZ certified to ISO 9001:2008, ISO 14001:2004 and OHSAS 18001:2007) /1, 33/.

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.

Corresponding standard operating procedures are in place and followed. The personnel responsible for the monitoring are trained in an appropriate manner.

An information/process flow diagram, describing the entire process from raw data to reported totals is developed at the stage of the initial and first periodic verification is fulfilled without changes. Refer to MR Section B.2 "Accounting, registration and storage of data. Scheme of data flow".



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The Plant is equipped with appropriate metering systems. The function of the monitoring equipment, including its calibration status, is in order. Verification of meters is provided by Centers of standardization and metrology /30, 31/.

The measurements used for emission monitoring 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 and communicated as a part of routine operational process at KRAZ.

The evidence and records used for the monitoring are maintained in a traceable manner. Records of calibration of measuring devices were checked and the status of calibration was positively verified during the site visit.

The data collection and management system for the project is in accordance with the revised determined monitoring plan.

Implementation of the quality control (QC) and quality assurance (QA) procedures is the responsibility of each involved department of KRAZ within Integrated Management system. The key monitoring parameters are recorded automatically using the automated process control system.

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". RAZ is equipped with appropriate metering systems for weighting of ladles with liquid aluminium taken from each potroom 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).

Amount (mass) of liquid aluminium in pots is determined monthly



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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”).

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”.

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 $\pm 0.2\%$.

The departments of KRAZ participated in monitoring of GHGs emission reductions are presented in MR Section B.2. “Accounting, registration and storage of data. Scheme of data flow”.



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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 1-4, 8-11).

Environmental department of UC RUSAL controls the completeness of the data and the term of data transfer. Every year all the relevant data are transferred to CTF Consulting, LLC. (Consultant for the project) by e-mail. Similarly the information matrix of parameters and other important information is sent to CTF Consulting, LLC in order that relevant definitions are made during a preparation of the monitoring report.

CTF Consulting, LLC develops for OJSC "RUSAL Krasnoyarsk" the annual monitoring report on CO2 emission reduction.

The used monitoring methodology formalized in terms of the electronic tool was properly documented in MR and closely followed. The tool was made available to the verifier at the first periodic verification stage, so it as easy to check the calculations reported in MR.

Reporting procedures fully reflect the monitoring methodology content.

Storage of all records on monitoring for JI project (describing the period from January 1, 2008 to December 31, 2012) in electronic form is provided until January 1, 2018 by OJSC "RUSAL Krasnoyarsk".

Annual monitoring report is approved by Managing Director of OJSC "RUSAL Krasnoyarsk".

The Monitoring Report ver.1.1 provides sufficient information on the assigning roles, responsibilities and authorities for implementation and maintenance of monitoring procedures including control of data. The verifier confirms effectiveness of the existing management and operational systems and found them eligible for reliable project monitoring.

Outstanding issues related to Data management (101), PP's response and the AIE conclusion are summarized in Appendix A Table 2 (refer to CAR 05, CAR 06).



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3.6 Verification regarding programmes of activities

N/A

4 VERIFICATION OPINION

Bureau Veritas Certification has performed the 2nd periodic verification for the period from 01 January 2010 to 31 December 2010 of the "Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter" Project, which applies the JI specific approach. The verification was performed on the basis of UNFCCC criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

The verification consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion.

The management of OJSC "RUSAL Krasnoyarsk" is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the project on the basis set out within the project Monitoring Plan indicated in the PDD Version 3.0 dated 27/10/2008. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the project, is the responsibility of the management of the project.

Bureau Veritas Certification verified the Project Monitoring Reports version 1.0 dated 17/02/2011 and version 1.1 dated 18/04/2011 for the reporting period as indicated below. Bureau Veritas Certification confirms that the project is implemented as per determined changes. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions.

The Declaration of Approval from State of the Netherlands, acting through the Ministry of Economic Affairs, Agriculture and Innovation and its implementing agency "NL Agency", being the Designated Focal Point for Joint Implantation (JI) in The Netherlands has been received for the project on 18th March 2011.

Bureau Veritas Certification can confirm that the GHG emission reduction is accurately calculated and is free of material errors, omissions, or misstatements. Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the approved project baseline and monitoring, and its associated documents. Based on



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the information we have seen and evaluated, we confirm, with a reasonable level of assurance, the following statement:

Reporting period: From 01/01/2010 to 31/12/2010
 Baseline emissions :699,798 tCO₂e
 Project emissions :415,054 tCO₂e
 Leakeges :N/A
 Emission Reduction :284,745 tCO₂e

5 REFERENCES

Category 1 Documents:

Documents provided by OJSC “RUSAL Krasnoyarsk” that relate directly to the GHG components of the project.

- /1/ Monitoring Report Version 1.0 dated 17/02/2011 “Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter”. Monitoring period 01.01.2010 – 31.12.2010. Monitoring Report Version 1.1 Date: 18.04.2011.
Supporting documentation: Excel spreadsheet with estimation of emission reduction.
- /2/ PDD “Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter”
” Version 3.0 dated 27/10/2008.
- /3/ Production data of RUSAL Krasnoyarsk Aluminium Smelter for 2010 in form of IAI PFC001
- /4/ Letter of Approval by the Russian Federation on the JI project “Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter” in form of the Order #709 of Ministry for Economic Development of the RF dated on 30.12.2010.
- /5/ Letter of Approval by the NL Agency (DFP of the Netherlands), the State of the Netherlands Ministry of Economic Affairs, Agriculture and Innovation on the JI project “Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter”. Issue dated 18.03.11.
- /6/ 2006 IPCC Guidelines on National Greenhouse Gas Inventories. Volume 3 Chapter 4.
- /7/ Guidelines for Users of the Joint Implementation Project Design Document Form/Version 04, JISC.
- /8/ JISC Guidance on criteria for baseline setting and monitoring. Version 02.

Category 2 Documents:

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



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Documents obtained in the course of 2nd verification

- /1/ Corporate Provision "Environmental accountability UC RUSAL", Annex to Order #RGP-08-G048 dated 25.04.08
- /2/ Corporate Provision "Data management of JI "Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter", approved by the Managing director valid for the audit date.
- /3/ RUSAL Krasnoyarsk maximum permissible discharge (MPD in 2 books) issued for KRAZ by VAMI. All valid on the date of the site visit.
- /4/ State Statistic Forms 2-tp of OJSC "RUSAL Krasnoyarsk" (air emission) for 2010
- /5/ Monitoring Data of air emissions (KRAZ) for 2005-2010(actual) and 2011-2015 (expected)
- /6/ Environmental permissions and limits issued for KRAZ by Enissyieskiy Department of Rostekhnadzor for Krasnoyarsk Federal Okrug #964. All valid on the date of the site visit.
- /7/ Air pollution sources Register for MPD of OJSC "RUSAL Krasnoyarsk". . All valid on the date of the site visit.
- /8/ Accreditation attestation of SPL of KRAZ #POCC RU.0001.5105117 valid till 04.05.14
- /9/ Environmental Production Control Procedure of KRAZ dated 18.06.09 PK-2009-414
- /10/ Environmental Sanitary Control Procedure of KRAZ dated 08.07.09 PK-2009-488.
- /11/ Official Response of KRAZ #7-44-10 dated 18.06.10 to Krasnoyarsk nature-oriented public prosecution
- /12/ Official Letter "Summary of Environmental legal Requirements of Russian Federation compliance in part of air pollutions of KRAZ" dated 03.06.10
- /13/ Inspection Act issued by Territorial ROSSPRIRODNADZOR Body to KRAZ dated 12.11.10 "Summary of Environmental legal Requirements of Russian Federation compliance in part of air pollutions of KRAZ"
- /14/ Analytic justification of KRAZ JI "Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter" to the project data compliance with the strategic energy and environmental performance targets of the project.
- /15/ A decree of Federal Service in Ecological, Technological & Atomic Watching dated 31.03.2005 N N 182
- /16/ Monitoring Data Results of air pollutions within the Sanitary Zone of KRAZ of 2010
- /17/ APM01-08-2010 Monitoring Data
- /18/ Technological Instruction 10-03-2002 "Measurement of production



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- remaining residue”
- /19/ Annex 1 to to Protocol #2 dated 21.02.11. Technical Policy of RUSAL
 - /20/ Working Standard PC211.016.2007.
 - /21/ Technical Provisions for technical&economical indicators calculation for RUSAL Aluminium Divisions. Annex 1 to Order #RSM-07-R263 dated 25.12.07rder.
 - /22/ Estimation procedure for Quantity and composition of hazards discharged into air
 - /23/ Technological Instruction TI 101-CN-EAFP – 64 – 2007 with changes ##1-7
 - /24/ Technical Provisions for Equipment Maintenance RK-2008-468 dated 06.08.08 (Regulations for service and repairs between RUSAL Krasnoyarsk and RIC)
 - /25/ Technical Instruction #TI 449.01.01-2009
 - /26/ Technical Instruction #TI 449.01.02-2008
 - /27/ Technical Guidance for Production Process #TRP 449.01.01.01, rev.02,03, 10-19 (Technical process manual (smelter feeding through Automatic Alumina feeder))
 - /28/ VSS operations manual
 - /29/ PFPB operations manual
 - /30/ Calibration Records for control anode effects on the voltage measure channel on the anode and cathode (Ua-k) section. Order #H-013 dated 18.04.11
 - /31/ Calibration Certificate to scales “Scalex-1000” #8/010 valid till 07.02.2012
 - /32/ Technical reports, 2010 (production, flow etc)
 - /33/ ISO 9001:2008, 14001:2004, OHSAS 18001:2007 Certificates

Persons interviewed:

List persons interviewed during the verification or persons that contributed with other information that are not included in the documents listed above

- /1/ I.Rebrik - UC RUSAL , Environmental department director
- /2/ M.Krasov - UC RUSAL, Environmental department manager
- /3/ A.Bernyatskiy - UC RUSAL, Head of Ecological norms &Controlling Department
- /4/ N.Peyertsev – - UC RUSAL, Head of Aluminium Technology Department,
- /5/ A.Gavva – CTF Consulting, LLC (CTF), Lead Specialist
- /6/ V.Burkat- VAMI, Senior scientific manager
- /7/ K.Myachin - CTF Consulting, LLC (CTF), Carbon Projects Manager
- /8/ E.Nagrelli - RUSAL Krasnoyarsk Aluminium Smelter, Environmental and Quality Director
- /9/ E.Kuznetsov - RUSAL Krasnoyarsk Aluminium Smelter, Head of Metrology Department



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"Reduction of PFC emissions from RUSAL Krasnoyarsk
Smelter"

- /10/ G.Botvich - RUSAL Krasnoyarsk Aluminium Smelter, Head of Environmental department
- /11/ M.Korobkov - RUSAL Krasnoyarsk Aluminium Smelter, manager, coordinator of the JI proect



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VERIFICATION PROTOCOL

Table 1

Check list for verification, according to the JOINT IMPLEMENTATION DETERMINATION AND VERIFICATION MANUAL (Version 01)

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
Project approvals by Parties involved				
90	Has the DFPs of at least one Party involved, other than the host Party, issued a written project approval when submitting the first verification report to the secretariat for publication in accordance with paragraph 38 of the JI guidelines, at the latest?	<p>JI Project “Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter JI Project” was approved by the Ministry of Economic Development of the Russian Federation on 30/12/2010. Monitoring Report Version 1.0 dated 17/02/2011 /1/ (thereafter referred MR) refers to the Letter of Approval (LoA) that have been issued by the Russian Federation designated focal point.</p> <p>The letter was provided to AIE which does not question its authenticity.</p> <p>CAR 01 was not closed in the Determination Report issued by DNV based on the PDD Version 3.0 dated 27/08/2008.</p> <p>CAR 01. A written project approval from a Party involved different from the Host Party was not issued.</p>	CAR 01	OK
91	Are all the written project approvals by Parties involved unconditional?	<p>Yes, all the written project approvals by Parties involved are unconditional.</p> <p>Please refer to CAR 01 in paragraph 90.</p>	OK	OK
Project implementation				
92	Has the project been implemented in	The project has been implemented in accordance with	CL 01	OK



Verification Report on the project

“Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter”

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	<p>accordance with the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website?</p>	<p>the PDD /2/ which was positively determined by DNV. Determination of the project is not deemed final.</p> <p>The project intends 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). No additional equipment and installation works required.</p> <p>On the day of audit, the project had been realized at 21 potrooms with vertical stud Søderberg process and 3 potrooms with the prebaked anodes technology. Therefore within the project boundaries all 2233 electrolytic cells totally an all cells are equipped with point feeders were operating.</p> <p>During the monitoring period, no changes were made to the operational equipment.</p> <p>The project continues generation of emission reductions on starting from 01/01/2008, as confirmed by measuring data in accordance with the monitoring plan.</p> <p>Still CL01 is requested response.</p>		



Verification Report on the project
 “Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter”

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		<p>CL 01. Please specify the effect of the project in the MR version 1.0 dated 17.02.11 with regard to the given one in the MR version 2.1 dated 30.06.10: “Project started in 1st January 2006. <u>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 Krasnoyarsk” 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.</u>”</p>		
93	What is the status of operation of the project during the monitoring period?	The project was operated in the design mode.		OK
Compliance with monitoring plan				
94	Did the monitoring occur in accordance with the monitoring plan included in the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website?	<p>The Monitoring System is in place and operational. Monitoring of GHG emission reductions occurred basically in accordance with the determined Monitoring Plan presented in section D of PDD, version 3.0 dated 27/08/2008, regarding which the determination has not been deemed final as the AIE did not make its determination publicly available through the secretariat as per Paragraph 34 of JI Guidelines /7/.</p> <p>FAR 01. Please consider the necessity instrumental measure of the slope coefficient and the weight fraction of C2F6/CF4 on KrAZ in 1-6 potrooms taking into account objectives in CAR 02.</p>	FAR 01	OK



Verification Report on the project

“Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter”

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
95 (a)	For calculating the emission reductions or enhancements of net removals, were key factors, e.g. those listed in 23 (b) (i)-(vii) above, influencing the baseline emissions or net removals and the activity level of the project and the emissions or removals as well as risks associated with the project taken into account, as appropriate?	<p>CL 02. Please clarify in the MR whether for calculating the emission reductions, key factors, those listed in 23 (b) (i)-(vi) DVM, influencing the baseline emissions and the activity level of the project as well as risks associated with the project were taken into account as follows:</p> <ul style="list-style-type: none"> - Metallurgical sector reform policies and legislation (the Strategy of development of the metallurgical industry of Russia until 2020 approved by Order of Ministry of Industry and Trade of Russia by March 18, 2009 № 150); - Economic situation in the metallurgical sector of Russia as well as resulting predicted demand; - Technical specifics of the electrolytic aluminium technology; - Availability of capital; - Local availability of technologies/techniques; - Fuel prices and availability. 	CL 02	OK
95 (b)	Are data sources used for calculating emission reductions or enhancements of net removals clearly identified, reliable and transparent?	<p>The data sources used for calculating emission reductions are clearly identified, reliable and transparent with the following reservations:</p> <p>There are the following types of external data in the monitoring plan:</p> <ul style="list-style-type: none"> - Default data used are: the taken ex-ante Tier 3 Slope coefficient for CF4 measured in accordance to last version of Protocol for 	CAR 02 CL 03	OK OK



Verification Report on the project
 “Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter”

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		<p>Measurement of Tetrafluoromethane (CF₄) and Hexafluoroethane (C₂F₆) Emissions from Primary Aluminium Production, US EPA and IAI; and Weight fraction of C₂F₆/CF₄.</p> <p>Internal data to be monitored throughout the crediting period are:</p> <ul style="list-style-type: none"> - 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 ; - SCF₄ 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 C₂F₆/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, Unit fraction; - Average weight of 1 cm of metal in the pot, kg. 		



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 “Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter”

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		<p>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.</p> <p>Calculation of emission reduction was carried out on the excel spreadsheet “ERUs_calculation RUSAL Krasnoyarsk_ver 1.0_17.02.2011.xls” and “KrAZ PFC001-2011.xls” which were made available to AIE. The results of calculation of emission reduction are presented in MR Table C.1.A. Calculation of the actual PFC emissions and ERUs for potrooms in 2010 (period of 01.01.10-31.08.10) and Table C.1.B. Calculation of the actual PFC emissions and ERUs for potrooms in 2010 (period of 01.09.10-31.12.10).</p> <p>CAR 02. Please ensure that the reference to Tier 2 IPCC for fixed ex-ante Slope coefficient data and Weight fraction C2F6/CF4, Tier 2 IPCC data are correct. The Report of VAMI institute in accordance with contract # 29.03.04/2010 “Execution of instrumental measurements of GHG emissions at OJSC “RUSAL Krasnoyarsk”, stage 2, page 12 indicates Tier 3 IPCC as applicable (refer also to PDD, page 23 and MR, page 15-16).</p> <p>CAR 03. Please ensure that the reference to Tier 2 IPCC for fixed ex-ante Slope coefficient data and</p>		



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		<p>Weight fraction C₂F₆/CF₄, Tier 2 IPCC data are correct. The Report of VAMI institute in accordance with contract # 29.03.04/2010 “Execution of instrumental measurements of GHG emissions at OJSC “RUSAL Krasnoyarsk”, stage 2, page 12 indicates Tier 3 IPCC as applicable (refer also to PDD, page 23 and MR, page 15-16).</p> <p>CL 03. Please clarify in the MR whether the number of potrooms for measuring and the choice of rooms are in line with the IAI expert opinion in order to be representative enough to make it possible to use the obtained results for the all operating in the prproject boundary potrooms.</p>		
95 (c)	<p>Are emission factors, including default emission factors, if used for calculating the emission reductions or enhancements of net removals, selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice?</p>	<p>The verifier confirms that the emission factors which are used for calculating the emission reductions are selected by carefully balancing accuracy and reasonableness, and the choice is appropriately justified by MR developer.</p> <p>There is no default but once measured and fixed as ex-ante for a certain period of time emissions factors, which are used for calculating the emission reductions. S_{CF₄}, the Tier 3 Slope coefficient for CF₄, <u>measured</u> in accordance to last version of Protocol for Measurement of Tetrafluoromethane (CF₄) and Hexafluoroethane (C₂F₆) Emissions from Primary Aluminium Production, US EPA and IAI. New values of slope coefficient and the weight fraction of C₂F₆/CF₄ used in the calculations since 01.09.2010 are resulted from measurements</p>	OK	OK



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 “Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter”

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		<p>carried out in July-August 2010 by VAMI institute in accordance with contract # 29.03.04/2010 “Execution of instrumental measurements of GHG emissions at OJSC “RUSAL Krasnoyarsk”, stage 2. The new slope coefficients and weight fraction CF_4/C_2F_6 are applied for each of the electrolysis technology since September, 1 2010.</p> <p>For the purpose of conservativeness in the calculation of baseline and project emissions the values of weight fraction C_2F_6/CF_4 estimated after measurements of 2010 and exceeding IPCC 2006 Tier 2 standard values, have been replaced to them.</p> <p>It is assumed that the values of these parameters will be kept at least until December 31, 2012.</p>		



Verification Report on the project

“Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter”

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
95 (d)	Is the calculation of emission reductions or enhancements of net removals based on conservative assumptions and the most plausible scenarios in a transparent manner?	<p>AIE confers that the calculation of emission reductions is based on conservative assumptions and the most plausible scenarios in a transparent manner.</p> <p>Also pending a response to CL 03.</p> <p>Implementation of the smelter modernization project with installation of alumina point feeder systems and implementation of the efficiency upgrading project of RUSAL Krasnoyarsk is convincingly justified in PDD as the most plausible scenario.</p> <p>Calculations are carried out on the following excel spreadsheets, all made available to AIE:</p> <ul style="list-style-type: none"> - “ERUs_calculation RUSAL Krasnoyarsk_ ver 1.0_17.02.2011.xls” ; - “KrAZ PFC001-2011.xls”. <p>CL 04. Please provide to AIE the scientific opinion to the influence of upgrade “Environmental vertical stud Söderberg process” technology on PFC emissions in comparison with the common vertical stud Söderberg aluminum electrolysis process. Please justify the necessity of instrumental measurement to make a final decision if applicable.</p>	CL04	OK
<p>Applicable to JI SSC projects only_Paragraph 96_not applicable</p>				
<p>Applicable to bundled JI SSC projects only_Paragraphs 97-98_No applicable</p>				
<p>Revision of monitoring plan</p>				
<p>Applicable only if monitoring plan is revised by project participant</p>				
99 (a)	Did the project participants provide an appropriate justification for the proposed	Monitoring of GHG emission reductions is complete, effective and reliable. It was carried out as per the	OK	OK



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“Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter”

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	revision?	<p>revised Monitoring Plan presented in the MR Version 2.1 dated 30/06/2010 “Reduction of PFC emission from RUSAL Krasnoyarsk Aluminium Smelter” for the first monitoring period 01.01.2008 – 31.12.2009.</p> <p>The revisions that have been implemented do not affect conservativeness of the approach to the emission reductions calculations and procedures of the data collection and archiving.</p> <p>The proposed revision improves the accuracy and applicability of information collected compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishment of monitoring plans.</p> <p>The verifier positively determined these deviations as appropriate to the project conditions.</p> <p>They are:</p> <ul style="list-style-type: none"> - the monitoring plan 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. Information on the value of this parameter is contained in the monthly and annual technical report of the smelter. <p>No additional revisions were made during the second monitoring period.</p> <p>Other monitoring parameters and calculation formulae are in compliance with the MP of PDD.</p>		
99 (b)	Does the proposed revision improve the	As follows from the initial findings in 99(a) above the	OK	OK



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	accuracy and/or applicability of information collected compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishment of monitoring plans?	proposed revisions (a-d) improve accuracy and applicability of the information collected compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishment of monitoring plans. The revision does not affect the accuracy and/or availability of information collected.		
Data management				
101 (a)	Is the implementation of data collection procedures in accordance with the monitoring plan, including the quality control and quality assurance procedures?	An information/process flow diagram, describing the entire process from raw data to reported totals is developed at the stage of the initial and first periodic verification is fulfilled without changes. Refer to MR Section B.2 “Accounting, registration and storage of data. Scheme of data flow”. The implementation of data collection procedures is in accordance with the revised monitoring plan and is an integral part of the operational routine at UC RUSAL. KrAZ has and certified integrated management system in accordance to ISO 9001, 14001 и OHSAS 18001. And all equipment related to electrolysis production and the project is covered by calibration procedures of plant. The equipment of VAMI used for PFC measurements are calibrated in accordance to technical requirements for measurement equipment maintenance. CAR 05. No response is provided in the MR to FAR 01 - 06 issued by AIE in the Initial and First Monitoring	CAR 05	OK



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		Report No. Russia - ver /0048-2/2010 concerning GHG Data Management.		
101 (b)	Is the function of the monitoring equipment, including its calibration status, is in order?	<p>OJSC “RUSAL Krasnoyarsk” has relevant plans, procedures and schedules for calibration of monitoring equipment. Measuring devices have records of calibration and are periodically exposed to due maintenance procedures. Records of calibration of all measuring devices were checked and the status of calibration was verified as proper. All measuring equipment complies with national law and regulations.</p> <p>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.</p> <p>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</p>	OK	OK



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		<p>of verification).</p> <p>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”.</p> <p>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”.</p> <p>Slope coefficients (S_{SF_4}) and weight fraction C_2F_6/CF_4 have been obtained during PFC measurements, carried out by VAMI institute in accordance with contract # 29.03.04/2010 “Execution of instrumental measurements of GHG emissions at OJSC “RUSAL Krasnoyarsk”, stage 2 in July - August 2010.</p> <p>Using IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories,</p>		



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		<p>(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 give a result that is $\pm 12\%$ of the actual value. The main sources of uncertainty during continuous measuring are:</p> <ul style="list-style-type: none"> - spectrometer calibration uncertainty, - the effectiveness of the analytical method in calculating the CF_4 and C_2F_6 concentrations from the measured spectrum, - the measurement of the flow rate of exhaust gases in the collection ducts. <p>All measuring equipment complies with national law and regulations. Also pending a response to CAR 03.</p>		
101 (c)	Are the evidence and records used for the monitoring maintained in a traceable manner?	<p>The evidence and records can be traced to origins. The monitoring and metering systems are installed and were inspected on site during the first and initial verification. They are in compliance with national law and power industry regulations. OJSC “RUSAL Krasnoyarsk” had monitored all parameters used in the revised monitoring plan. 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</p>	CAR 06	OK



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		<p>Directorate of OJSC “RUSAL Krasnoyarsk”. (Refer to list of Persons interviewed (numbers 1-4, 8-11). Monitoring report is subject for verification. Information about each parameter is presented in MR Section B.2 “Accounting, registration and storage of data. Scheme of data flow”.</p> <p>The data relating to the monitoring of the project is posted on a dedicated server of OJSC “RUSAL Krasnoyarsk”.</p> <p>Internal validation of data is performed by the five dedicated persons from UC «RUSAL» and OJSC “RUSAL Krasnoyarsk”.</p> <p>Monitoring report is validated by the signature of OJSC “RUSAL Krasnoyarsk” Managing Director E.V.Nikitin.</p> <p>CAR 06. MR does not indicates the storage QA procedure for all key parameters required for determining of both project and baseline perfluorocarbon emissions on monitoring for JI project (the crediting period from January 1, 2008 to December 31, 2012). Please refer to 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 keep for two years after the last transfer of ERUs for the project” /7/</p> <p>Conclusion is also pending a response to CAR 03.</p>		
101 (d)	Is the data collection and management system for the project in accordance with	The data collection and management system for the project is developed at the stage of PDD determination	Pending	OK



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	the monitoring plan?	and is maintained in accordance with the revised monitoring plan. Conclusion is pending a response to CAR 03, CAR 04.		
Verification regarding programs of activities (additional elements for assessment)_ Paragraphs 102-105_ Not applicable				
Applicable to sample-based approach only_ Paragraphs 106-110_ Not applicable				



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Table 2 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
<p>CAR 01. A written project approval from a Party involved different from the Host Party was not issued.</p>	<p>90</p>	<p>Response 1: The Declaration of Approval from State of the Netherlands, acting through the Ministry of Economic Affairs, Agriculture and Innovation and its implementing agency “NL Agency”, being the Designated Focal Point for Joint Implementation (JI) in The Netherlands has been received for the project by 18th March 2011. The information has been added to the Monitoring report, version 1.1 of 18.04.2011.</p>	<p>Conclusion on Response 1: The clarifications are accepted. Please provide the evidence to the AIE. The CER is closed.</p>



Verification Report on the project

"Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter"

<p>CAR 02. Presented to AIE Excel spreadsheet with calculation of PFC emissions for 2010 // the new measured values for each technology of the slope coefficient and the weight fraction of C₂F₆/CF₄ // were applied for each of the electrolysis technology since September, 1 2010. It is assumed in the MR, that the values of these parameters will be kept at least until December 31, 2012. The statement in the MR "There are no reasonable objections to the use in 2011 and 2012 of determined values of the slope coefficient and the weight fraction C₂F₆/CF₄ (subject to the absence of significant changes in technology and operation of electrolytic cells in comparison to 2010)" is not correct as during 2010 a new "Environmental vertical stud Søderberg process" was launched due to approved by "UC RUSAL Technical Policy" in 1-6 potrooms //.</p>	94	<p>Response 1: Indeed the mentioned statement turned to be incorrect and has been deleted, Annex 1 to the Monitoring report revised accordingly. Nevertheless based on the fact that "EcoSøderberg" technology has no principal difference with Søderberg one from PFC emission factors point of view and the fact that new value of slope coefficient for PFVSS does not exceed IPCC Tier 2 standard value as well as the small number of "EcoSøderberg" cells installed in the potrooms at RUSAL Krasnoyarsk Aluminium Smelter it is reasonable to apply new value of slope coefficient for PFVSS technology in 2010 for the period of September 1, 2010 to December 31, 2010. However for the purpose of conservativeness in the calculation of baseline and project emissions the values of weight fraction C₂F₆/CF₄ for PFVSS and PFPB technology estimated after measurements of 2010, which exceed IPCC 2006 Tier 2 standard values, have been replaced to them. (i.e. for PFVSS 0,065->0,053, for PFPB 0,264->0,121), and baseline and project emissions were recalculated in the Monitoring report, version 1.1 of 18.04.2011.</p>	<p>Conclusion on Response 1: The conservative approach to apply IPCC 2006 Tier 2 standard values for the weight fraction C₂F₆/CF₄ for PFVSS and PFPB technology in the calculation of baseline and project emissions in 2010 for the period of September 1, 2010 to December 31, 2010 and new value of slope coefficient for PFVSS technology, as it does not exceed IPCC Tier 2 standard value, is accepted by the AIE. The corrections are checked and found reasonable. The CAR is closed.</p>
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Verification Report on the project

"Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter"

<p>CAR 03. Please ensure that the reference to Tier 2 IPCC for fixed ex-ante Slope coefficient data and Weight fraction C2F6/CF4, Tier 2 IPCC data are correct. The Report of VAMI institute in accordance with contract # 29.03.04/2010 "Execution of instrumental measurements of GHG emissions at OJSC "RUSAL Krasnoyarsk", stage 2, page 12 indicates Tier 3 IPCC as applicable (refer also to PDD, page 23 and MR, page 15-16).</p>	95 (b)	<p>Response 1: The IPCC Tier 2 standard value of slope coefficient has not been used in the calculation of PFC emissions during 2010 as this parameter has been determined in 2007 and in 2010 based on instrumental measurements that are correspondent by accuracy to the Tier 3 level, and IPCC Tier 2 only was mentioned for the comparison. However since the value of weight fraction C2F6/CF4 determined based on measurements of 2010 has exceeded the standard value of IPCC Tier 2 both relevant to PFVSS and PFPB (CWPB) technology it was decided to use them for the period of monitoring September 1, 2010-December 31, 2010. See additional explanations in the response to CAR 02.</p>	<p>Conclusion on Response 1: The conservative approach to apply IPCC 2006 Tier 2 standard values for the weight fraction C2F6/CF4 for PFVSS and PFPB technology in the calculation of baseline and project emissions in 2010 for the period of September 1, 2010 to December 31, 2010 and new value of slope coefficient for PFVSS technology, as it does not exceed IPCC Tier 2 standard value, is accepted by the AIE. The corrections are checked and found reasonable. The CAR is closed.</p>
<p>CAR 04. The excel spreadsheets, all made available to AIE: "ERUs_calculation RUSAL Krasnoyarsk_ ver 1.0_17.02.2011.xls" contains not correct data for the parameter "Production of electrolytic aluminium, tones" for Potroom #12 (refer to line#18). Please ensure the PFC emissions are calculated correctly. Please provide AIE with the detailed excel data for the monitoring period within the project boundary.</p>	95 (d)	<p>Response 1: The appropriate correction has been made and baseline and project emissions were recalculated in the Monitoring report, version 1.1 of 18.04.2011 with the reference for the input data to the Excel spreadsheet of Technical reports of RUSAL Krasnoyarsk of 2010 downloaded from Informational and Technological System of RUSAL server.</p>	<p>Conclusion on Response 1: The explanation and amendments are accepted. The CAR is closed.</p>



Verification Report on the project

"Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter"

<p>CAR 05. No response is provided in the MR to FAR 01 - 06 issued by AIE in the Initial and First Monitoring Report No. Russia - ver /0048-2/2010 concerning GHG Data Management.</p>	101 (a)	<p>Response 1: The respective response for each open FAR has been given in Appendix 3 to the Monitoring report of 2010, version 1.1 of 18.04.2011.</p>	<p>Conclusion on Response 1: The respective response is accepted. The CAR is closed.</p>
<p>CAR 06. MR does not indicates the storage QA procedure for all key parameters required for determining of both project and baseline perfluorocarbon emissions on monitoring for JI project (the crediting period from January 1, 2008 to December 31, 2012). Please refer to 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 keep for two years after the last transfer of ERUs for the project" [2].</p>	101(c)	<p>Response 1: By 26.04.2009 the Managing Director of RUSAL Krasnoyarsk Aluminium Smelter mr. E.V. Nikitin has approved the "Regulation of data control for Joint Implementation project "Reduction of PFC emissions from RUSAL Krasnoyarsk Aluminium Smelter" which prescribes the ensuring of safely storage of data related to the monitoring for 10 years. The respective timeline for storage of data for each parameter of monitoring is provided in the Section B.2. of the Monitoring report.</p>	<p>Conclusion on Response 1: The respective response is accepted. The CAR is closed.</p>



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<p>CL 01. Please specify the effect of the project in the MR version 1.0 dated 17.02.11 with regard to the given one in the MR version 2.1 dated 30.06.10: “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 Krasnoyarsk” 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.</p>	<p>92</p>	<p>Response 1: During the 2010 the target on AEF has changed several times at RUSAL Krasnoyarsk and it was connected to the overcome of the negative consequences of the alumina deficit in January-February 2010. The target on AEF is prescribed in the Technological Regulation TR 449.01.01.01 “Technological parameters of production of crude aluminium in electrolytic cells of RUSAL Krasnoyarsk”. The edition 11 of this document of 12.01.2010 established the target for PFVSS technology on 0.3 anode effects/cell-day (common for the majority of potrooms) and 0.1 anode effects/cell-day for PFPB technology. The edition 19 of the TR 449.01.01.01 of 14.12.2010 has established the AEF target for PFVSS technology on 0.35-0.4 anode effects/cell-day and for PFPB technology the target was set as 0.2 anode effects/cell-day.</p> <p>The information has been added to the Monitoring report, version 1.1 of 18.04.2011.</p>	<p>Conclusion on Response 1: The respective clarifications are accepted. The CL is closed.</p>
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<p>CL 02. Please clarify in the MR whether for calculating the emission reductions, key factors, those listed in 23 (b) (i)-(vi) DVM, influencing the baseline emissions and the activity level of the project as well as risks associated with the project were taken into account as follows:</p> <ul style="list-style-type: none"> - Metallurgical sector reform policies and legislation (the Strategy of development of the metallurgical industry of Russia until 2020 approved by Order of Ministry of Industry and Trade of Russia by March 18, 2009 № 150); - Economic situation in the metallurgical sector of Russia as well as resulting predicted demand; - Technical specifics of the electrolytic aluminium technology; - Availability of capital; - Local availability of technologies/techniques; - Fuel prices and availability. 	95(a)	<p>Response 1: The mentioned analysis has been added to the Monitoring report, version 1.1 of 18.04.2011.</p>	<p>Conclusion on Response 1: The respective clarifications are accepted due to sufficient amendments in the MR. The CL is closed.</p>
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<p>CL 03. Please clarify in the MR whether the number of potrooms for measuring and the choice of rooms are in line with the IAI expert opinion in order to be representative enough to make it possible to use the obtained results for the all operating in the prproject boundary potrooms.</p>	<p>95(b)</p>	<p>Response 1: According to the Protocol for Measurement of Tetrafluoromethane (CF₄) and Hexafluoroethane (C₂F₆) Emissions from Primary Aluminium Production, IAI, 2003 it is fully acceptable to determine slope coefficient and weight fraction C₂F₆/CF₄ for one potroom of the specific technology used at the smelter and spread the values for the other potrooms of this technology. The same approach is applied by Jerry Marks for the measurements of 2007.</p> <p>Clarification has been added to the Monitoring report, version 1.1 of 18.04.2011.</p>	<p>Conclusion on Response 1: The respective clarifications are accepted due to sufficient amendments in the MR. The CL is closed.</p>
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<p>CL 04. Please provide to AIE the scientific opinion to the influence of upgrade "Environmental vertical stud Søderberg process" technology on PFC emissions in comparison with the common vertical stud Søderberg aluminum electrolysis process. Please justify the necessity of instrumental measurement to make a final decision if applicable.</p>	<p>95(b)</p>	<p>Response 1: In accordance with the e-mail of the Director of Environmental Department of "RUSAL ITC", LLC in Saint-Petersburg (VAMI institute) mr. Burkat: New type of the cell (EcoSoderberg) differs from the old one by use of colloid anode, construction of bell cover and number of structural and technological improvements. But despite the difference in construction and improvements of the performance of the "EcoSøderberg" it remains by international gradation the "EcoSøderberg" type of cell is classified as "vertical stud Søderberg" technology for which the IPCC Tier 2 standard coefficients for PFVSS technology remain applicable. However from point of view of the measurements by Tier 3 accuracy the conversion from Søderberg to "EcoSøderberg" type of the cell may request the additional study to determine associated PFC emissions.</p> <p>See also response to FAR 01.</p>	<p>Conclusion on Response 1: The respective clarifications are accepted due to sufficient amendments in the MR. The CL is closed.</p>
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<p>FAR 01. Please consider the necessity instrumental measure of the slope coefficient and the weight fraction of C2F6/CF4 on KrAZ in 1-6 potrooms taking into account objectives in CAR 02.</p>	<p>94</p>	<p>Such necessity has been considered by UC RUSAL. It shall be taken into account that existing approach for the instrumental measurement of PFC emissions applies the exhaust gas current from potroom, not individual cell, therefore as soon as process of replacement of the cells to "EcoSøderberg" type would take 5 year the new approach for the estimation of PFC emissions from "EcoSøderberg" technology should be applied.</p>	<p>Conclusion on Response 1: The respective clarifications are accepted due to sufficient amendments in the MR. Subject to the third periodic verification</p>
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