VERIFICATION REPORT

INSTITUTE FOR ENVIRONMENT AND ENERGY CONSERVATION LTD

VERIFICATION OF THE INSTALLATION OF A NEW WASTE HEAT RECOVERY SYSTEM IN ALCHEVSK COKE PLANT, UKRAINE

INITIAL AND 1ST PERIODIC (2008)

REPORT NO. UKRAINE/0054/2009

REVISION NO. 01

BUREAU VERITAS CERTIFICATION

Date of first issue: 15/03/2010	Organizational unit: Bureau Veritas Certification Holding SAS
Client: Institute for Environment and Energy Conservation	Client ref.: Vasyl Vovchak

Summary:

Bureau Veritas Certification has made the verification of the "Installation of a new waste heat recovery system in Alchevsk Coke Plant, Ukraine" project of Institute for Environment and Energy Conservation located in Alchevsk, Lugansk region, Ukraine on the basis of UNFCCC criteria for the JI, as well as criteria given to provide for consistent project operations, monitoring and reporting, as well as the host country criteria.

The verification scope is defined as a periodic independent review and 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 Monitoring Report, Project Design Document 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 Clarification Requests, Corrective Actions Requests, Forward Actions Requests (CL, CAR and FAR), presented in Appendix A.

The verification is based on the Monitoring Report (covers January 1st 2008 – December 31st 2008), the Monitoring Plan, the determined PDD, version 7 of 22/12/2009, and supporting documents made available to Bureau Veritas Certification by the project participant.

In summary, Bureau Veritas Certification confirms that the project is implemented as planned and described in validated and registered project design documents. 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 without material misstatements.

Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the valid and registered project baseline and monitoring, and its associated documents. Based on information seen and evaluated we confirm that the implementation of the project has resulted in 134542 t CO_2e reductions during period from 01/01/2008 up to 31/12/2008.

On behalf of verification team, Flavio Gomes, the Bureau Veritas Certification Holding SAS Global Product Manager for Climate Change, approved final version of the Verification Report and it is signed by Ivan Sokolov authorized Bureau Veritas Certification Holding SAS Local product manager for Climate Change in Ukraine.

Report No.: UKRAINE/0054/2009	Subject Group: JI	
Project title: Installation of a new waste heat recovery system in Alchevsk Coke Plant, Ukraine		
Work carried out by: Team Leader, Lead verifier: Nadiia Kaiiun Team Member, verifier: Oleg Skoblyk Team Member, verifier: Victoria Legka		
Work verified by: Ivan Sokolov – Internal Technical Reviewer		
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Indexing terms

Climate Change, Kyoto Protocol, JI, Emission Reductions, Verification

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Abbreviations

AIE	Accrediting Independent Entity
AISW	Alchevsk Iron and Steel Works
BFG	Blast furnace gas
BVCH	Bureau Veritas Certification Holding SAS
CAR	Corrective Action Request
CDQ	Coke Dry Quenching
CL	Clarification Request
CO_2	Carbon Dioxide
COG	Coke Oven Gas
CWQ	Coke Wet Quenching
ERU	Emission Reduction Unit
FAR	Forward Action Request
GHG	Green House Gas(es)
IETA	International Emissions Trading Association
JI	Joint Implementation
JISC	JI Supervisory Committee
MoV	Means of Verification
MP	Monitoring Plan
MR	Monitoring Report
PCF	Prototype Carbon Fund
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change

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1 INTRODUCTION

Institute for Environment and Energy Conservation, Ltd has commissioned Bureau Veritas Certification to verify the emissions reductions of its JI project “Installation of a new waste heat recovery system in Alchevsk Coke Plant, Ukraine” (hereafter called “the project”) at Alchevsk, Lugask region, Ukraine, JI Registration Reference UA 1000130.
This report summarizes the findings of the verification of the project, performed on the basis of criteria given to provide for consistent project operations, monitoring and reporting, and contains a statement for the verified emission reductions. The order includes the initial and first periodic verification of the project.
This report summarizes the findings of the initial and first periodic verification. It is based on the Initial Verification Report Template Version 3.0, December 2003 and on the Periodic Verification Report Template Version 3.0, December 2003, both part of the Validation and Verification Manual (VVM) published by International Emission Trading Association (IETA).
Initial and first periodic verification has been performed as one integrated activity. It consisted of a desk review of the project documents including PDD, monitoring plan, determination report, monitoring report and further documentation.
The results of the determination were documented by Bureau Veritas Certification in the report: “Determination of The Installation of a New Waste Heat Recovery System in Alchevsk Coke Plant, Ukraine” No. UKRAINE/0035/2009 dated 22nd of December 2009.

Project is approved by the National Environmental Investment Agency of Ukraine and Ministry of Economy, Trade and Industry of Japan on behalf of Government of Japan (Letters of approval are presented, see Section 7) and registered under Track 1.

1.1 Objective

Verification is the periodic independent review and ex post determination by the AIE of the monitored reductions in GHG emissions during defined verification period.
The objective of verification can be divided in Initial Verification and Periodic Verification.
Initial Verification: The objective of an initial verification is to verify that the project is implemented as planned, to confirm that the monitoring system is in place and fully functional, and to assure that the project will generate verifiable emission reductions. A separate initial verification prior to the project entering into regular operations is not a mandatory requirement.
Periodic Verification: The objective of the periodic verification is to verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan;

furthermore the periodic verification evaluates the GHG emission reduction data and express a conclusion with a high, but not absolute, level of assurance about whether the reported GHG emission reduction data is free of material misstatements; and verifies that the reported GHG emission data is sufficiently supported by evidence, i.e. monitoring records. If no prior initial verification has been carried out, the objective of the first periodic verification also includes the objectives of the initial verification.
The verification follows UNFCCC criteria referring to the Kyoto Protocol criteria, the JI/CDM rules and modalities, and the subsequent decisions by the JISC, as well as the host country criteria.

1.2 Scope

Verification scope is defined as an independent and objective review and ex post determination by the Accredited Independent Entity of the monitored reductions in GHG emissions. The verification is based on the submitted monitoring report and the determined project design document including 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. Bureau Veritas Certification has, based on the recommendations in the Validation and Verification Manual employed a risk-based approach in the verification, focusing on the identification of significant risks of the project implementation and the generation of ERUs.
The verification is not meant to provide any consulting towards the Client. However, stated requests for forward actions and/or corrective actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.
The audit team has been provided with a Monitoring Report version 1 dated 28/01/2010 and underlying data records, covering the period from 01 January 2008 to 31 December 2008 inclusive (see Section 7).

1.3 GHG Project Description

The project activity is to reduce greenhouse gas (GHG) emissions through the introduction of captive co-generation with waste heat recovery technology by using Coke Dry Quenching (CDQ) system—instead of conventional Coke Wet Quenching (CWQ) system—with 9.13 MW captive generator at Alchevsk Coke Plant (Alchevskkoks) when it expands its coke oven battery. The 75 t/h highly-efficient boiler firing coke oven gas (COG) and blast furnace gas (BFG) and new steam turbine is also installed at Alchevskkoks as a part of establishing industrial synthesis in

energy source with its neighbouring Steel Plant (Alchevsk Iron and Steel Works).

The project activity is split into three stages, i.e. stage 1, 2 & F due to construction schedule.

In the stage 1 of the project activity, only the CDQ system with boilers (35 t/h x 3 units) is installed while a new boiler and a new generator are not in service although internal demands are increased to 1,680,000 t/y for steam and 181,200 MWh/y for electricity due to production capacity expansion by installing a new coke oven battery.

For steam demand, 390,000 t/y is generated with CDQ boilers, 941,000 t/y with the existing boiler shop and the old boiler firing all COG available. The rest 349,000 t/y is imported from AISW.

In the stage 2, a new 75 t/h boiler will be put in service and BFG will be introduced from AISW. Then the new boiler will start to generate 588,000 t/y of steam firing about 10% of available COG and all BFG available. The remaining 90% 0f COG will be kept fired in the existing boiler as the old boiler is abolished and stops generating steam as it is planned. Total steam and electricity generation will maintain the same.

In the stage F which is the final stage of the project activity, in addition to the CDQ system and a new 75 t/h boiler, a new 9.13 MW captive generator will be put in service.

Internal demands for steam and electricity are the same as those in the stage 2 of the project activity, i.e. 1,680,000 t/y and 181,200 MWh/y respectively.

For steam demand, 390,000 t/y of steam is generated with CDQ boilers, 588,000 t/y with new 75 t/h boiler firing COG and BFG, and 353,000 t/y with the existing boiler shop firing COG only. The rest 349,000 t/y is imported from AISW.

For electricity demand, 54,200 MWh of net electricity is to be generated from the new 9.13 MW captive generator connected to CDQ boilers and the new boiler shop, and 8,640 MWh from the one set of existing 2.15 MW, and the rest 118,360 MWh/y is imported from the national grid to meet total demand, annually.

In this stage, the project activity generates 1,330,000 t/y of steam and more electricity than that in the baseline so that electricity import from the national electricity grid is reduced by 30,830 MWh/y.

By putting a new boiler and captive generator in service, this reduction will be made without firing natural gas which would have been used in the baseline. The amounts of COG and BFG utilized are common for the baseline and the project.

The other benefit from installing CDQ is to produce harder and drier coke compared with the conventional Coke Wet Quenching technology (CWQ), which would have installed without the project activity. It has been empirically proved that this quality improvement results in reducing coke

input per unit of pig iron production at the blast furnace. Accordingly, CO2 emissions derived from burning coke is alleviated at the blast furnace of the Alchevsk Iron and Steel Works (AISW).

In summary, the project activity comprises three components of GHG emissions reductions as follows:

1. GHG emissions reductions due to dismissing natural gas that would have been burnt at the baseline boilers for steam generation by installing CDQ waste heat recovery technology together with high-efficient boiler.
2. GHG emissions reductions due to replacing grid electricity by installing the power generator with CDQ waste heat recovery technology together with high-efficient boiler by improving the efficient use of COG and BFG.
3. GHG emissions reductions due to reducing coke input per unit of pig iron production at the blast furnace by installing CDQ waste heat recovery technology.

Other than GHG emissions the project activity entails significant environmental co-benefits. While CDQ enables Alchevskkoks to utilize waste heat and promote energy conservation, it also reduces emissions of air pollutants such as nitrogen oxides (NOx) and particulates from CWQ, boilers, and grid-connected power plants by replacing natural gas burning and grid electricity. In addition, the reduction of coke consumption at the blast furnace contributes to resource conservation.

2 METHODOLOGY

The verification is as a desk review and field visit including discussions and interviews with selected experts and stakeholders.

In order to ensure transparency, a verification protocol was customized for the project, according to the Validation and Verification Manual (IETA/PCF) a verification protocol is used as part of the verification (see Section 7). 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 organises, details and clarifies the requirements the project 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 consists of one table under Initial Verification checklist and four tables under Periodic verification checklist. The different columns in these tables are described in Figure 1.

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

The completed verification protocol is enclosed in Appendix A to this report.

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 Checklist 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 estimation procedures, i.e. ➢ the calculation methods, ➢ raw data collection and sources of supporting	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):	Identify areas of residual risks, i.e. areas of potential reporting risks where there are no adequate management controls to mitigate potential reporting risks

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 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.	➢ 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 ➢ 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? 5.	Areas where data accuracy, completeness and consistency could be improved are highlighted.

Periodic Verification Protocol Table 4: Detailed audit testing of residual risk areas and random testing		
Areas of residual	**Additional verification**	**Conclusions and Areas Requiring**

risks	testing performed	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.

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 Verification protocol tables

2.1 Review of Documents

The Monitoring Report (MR) version 1 dated 28/01/2010 submitted by Institute for Environment and Energy Conservation and additional background documents related to the project design and baseline, i.e. country Law, Project Design Document (PDD), applied methodology, Kyoto Protocol, Clarifications on Verification Requirements to be checked were reviewed.

To address Bureau Veritas Certification corrective action and clarification requests, Institute for Environment and Energy Conservation revised the MR and resubmitted it as version 2 on 24th February 2010, then version 3 dated 1st of March 2010 and final version 4 on 10th of March 2010.

The verification findings presented in this report relate to the project as described in the PDD version 7 of 22/12/2009 and Monitoring Report version 1 and 4.

2.2 Follow-up Interviews

On 29/01/2010 Bureau Veritas Certification performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of Institute for Environment and Energy Conservation, Alchevsk Coke Plant and local stakeholders were interviewed (see 6 References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
OJSC „Alchevsk Coke Plant”	Organizational structure. Responsibilities and authorities. Training of personnel. Quality management procedures and technology. Implementation of equipment (records). Metering equipment control. Metering record keeping system, database.
Local Stakeholder: District State Administration	Social impacts. Environmental impacts.
Consultant: Institute for Environment and Energy Conservation	Baseline methodology. Monitoring plan. Monitoring report. Deviations from PDD.

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 actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the GHG emission reduction calculation.

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

Corrective Action Requests (CAR) are issued, where:
i) there is a clear deviation concerning the implementation of the project as defined by the PDD;
ii) requirements set by the MP 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 MP is recommended.

The verification team may also use the term Clarification Request (CL), which would be 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 verification protocol in Appendix A.

3 INITIAL 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) The findings from the desk review of the original project activity documents and the findings from interviews during the follow up visit are summarized. A more detailed record of these findings can be found in the Verification Protocol in Appendix A.
2) The conclusions for verification subject are presented.

In the final verification report, the discussions and the conclusions that followed the preliminary verification report and possible corrective action requests are encapsulated in this section.

3.1 Remaining issues CAR's, FAR's from previous determination/verification

One task of the verification is to check the remaining issues from the previous determination and verification or issues which are clearly defined for assessment in the PDD. The determination report prepared by Bureau Veritas Certification Holding SAS notes following open issues:

Outstanding Issue No. 1:
There is no evidence of written project approvals by the Parties involved.

Response
National Environmental Investment Agency of Ukraine issued Letter of Approval № 1588/23/7 on 29th December 2009; Government of Japan issued Letter of Approval on 7th September 2009.

Conclusion of the verification team
Evidencing documents were seen and found satisfactory.

3.2 Project Implementation

The JI project at OJSC "Alchevsk Coke Plant" (Alchevskkoks), Lugansk Region, Ukraine envisaged implementation of a new waste heat recovery system based on installation of Coke Dry Quenching facility (CDQ facility), 75 t/h highly-efficient boiler firing coke-oven gas (COG) and blast-furnace gas (BFG) and also installation of 9.13 MWe captive electricity generator together with steam turbine.

Before the project implementation Alchevskkoks was using conventional Coke Wet Quenching (CWQ) technology at batteries 5, 6, 7, 8 and 9-bis for coke quenching. In 2006 the coke battery 10-bis was launched in order to increase manufacturing capacity of the Plant. Additional coke battery 10-bis required installation of other quenching facility. In order to upgrade coke production technology to produce high quality coke the management of Alchevskkoks decided to install the CDQ facility. CDQ facility was set up to quench coke from battery 10-bis and partly from 9-bis. In comparison with CWQ technology, the CDQ technology has such major advantages: it is environmentally capable and more energy efficient.

Project implementation leads to greenhouse gas (GHG) emission reductions. Emission reductions are achieved due to (1) displacement of natural gas consumption that would have been burnt at the steam generators according to the baseline of the project, (2) displacement of grid electricity consumption by installation of captive electricity generator for own electricity production and (3) reduction of coke input per unit of pig iron production at the blast furnaces of Alchevsk Iron and Steel Works (AISW), by producing high-quality coke at CDQ facility. Hence, the project category is waste heat recovery and increase of energy efficiency, which

is serving the reduction of end-user energy consumption in industrial applications and processes.

There are no leakages of GHG emissions associated with the project.

According to the Project Design Document (PDD) – version 7 of 22/12/2009, the project envisaged the following basic stages of project implementation:

- Stage 1: Installation of CDQ facility (35 t/h of dry coke output x 3 boilers);
- Stage 2: Installation of steam generator firing COG and BFG (75 t/h of steam output);
- Stage F: Installation of 9,13 MWe captive electricity generator.

According to the PDD Stage 1 was expected to be completed in September 2007, Stage 2 is expected to be completed in September 2009 and Stage F – in December 2009.

By the end of December 2008 only first stage, namely installation of Coke Dry Quenching facility at Alchevskkoks, was operational which corresponds to project implementation schedule stipulated in the PDD.

The Monitoring System is in place and operational. Alchevskkoks is equipped with the monitoring equipment such as scales, meters and gas, water, steam, electricity consumption meters which complies with the national standards of Ukraine and ДСТУ ISO 9001:2001. Specifications of all the meters are in compliance with the industrial standard of Ukraine. All monitoring equipment is covered by the detailed verification (calibration) plan and is verified with established periodicity. Calibration and verification records showed that all devices are in satisfactory condition. The documented instructions to operate the facilities are stored at the working places.

No areas of concern were identified as to Project Implementation.

3.3 Internal and External Data

The monitoring approach in the Monitoring Plan of the PDD version 7 requires monitoring and measurement of variables and parameters necessary to quantify the baseline emissions and project emissions in a conservative and transparent way.
The parameters that are determined to quantify the baseline and project emissions are presented in the Table 1 below.

Table 1. Baseline and project measurable variables

ID	Data variable	Units

Number		
	Baseline parameters	
B-1	Fraction of total heat generated by the project activity using waste energy, (f_{wcm})	Fraction
B-2	Total amount of electricity generated in the project activity, ($E_{GPJ,y}$)	MWh/y
B-3	Amount of electricity self-consumed by CDQ, ($E_{CCDQ,y}$)	MWh/y
B-4	Average amount of electricity generated in the most recent three years prior to the project activity, ($EG_{hist,BL}$)	MWh/y
B-5	CDQ system operation hours, ($h_{PJ,y}$)	Hours per year
B-6	Average operating hours of existing captive power generators in the most recent three years prior to the project activity, ($h_{hist,BL}$)	Hours per year
B-7	The CO_2 emission factor for the electricity source, national electricity grid, displaced due to the project activity, ($EF_{elec,gr}$)	tCO_2/MWh
B-8	Output/intermediate energy that can be theoretically produced, to be determined on the basis of maximum recoverable energy from the Waste Energy Carrying Medium (WECM), which would have been released (or WECM would have been flared or energy content of WECM would have been wasted) in the absence of JI project activity, ($Q_{OE,BL}$)	Tonnes per year
B-9	Amount of steam generated in CDQ boiler in the project activity, ($SG_{PJ,CDQ,y}$)	Tonnes per year
B-10	Specific enthalpy of steam generated in CDQ boiler in the project activity, ($H_{steam,CDQ,y}$)	kcal/kg
B-11	Specific enthalpy of feed water in CDQ boiler in the project activity, ($H_{water,CDQ,y}$)	kcal/kg
B-12	The CO2 emission factor per unit of energy of natural gas in the baseline used in the existing boiler used by Alchevskkoks in absence of the project activity, ($EF_{CO2,NG}$)	tCO2/TJ
B-13	Efficiency of the existing boiler that would have supplied heat to Alchevskkoks in the absence of the project activity, ($h_{ExBoiler}$)	No dimension
B-14	Fraction of total heat that is used by Alchevskkoks in the project that in absence of the project activity would have been supplied by the existing boiler, ($ws_{Ex\text{-}Boiler}$)	No dimension
B-15	Increased pig iron production due to dry coke input in a blast furnace, ($F_{pigiron}$)	No dimension
B-16	Decreased coke consumption due to dry coke	No

	input in a blast furnace, (F_{coke})	dimension
B-17	Index for coke hardness of coke produced in the baseline activity, ($M_{25,BL}$)	%
B-18	Index for reduced coke abrasion for coke produced in the baseline activity, ($M_{10,BL}$)	%
B-19	Index for reduced coke faction content over 80mm for coke produced the baseline activity, ($M_{80,BL}$)	%
	Projectline	
P-1	Total volume of coke consumed at blast furnaces, ($Q_{coke,PJ,y}$)	Tonnes per year
P-2	Index for coke hardness of coke produced in the project activity, ($M_{25,PJ}$)	%
P-3	Index for reduced coke abrasion for coke produced in the project activity, ($M_{10,PJ}$)	%
P-4	Index for reduced coke fraction content over 80mm for coke produced in the project activity, ($M_{80,PJ}$)	%

The list of default data and their values are included in the Monitoring Report version 4, the relevant references to data sources and justification of applied estimates of default data are provided.
The monitoring equipment used for baseline and project emission calculation is present in the Annex 2 of Monitoring Report.

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

The identified areas of concern as to Internal and External Data, project participants response and BV Certification's conclusion are described in Appendix A Table 5 (refer to CAR 01, CAR 02, CAR 03, CAR 04, CAR 05, CAR 13, CAR 08, CAR 09, CAR 11, CAR 12, CAR 13, CL 01, CL 02, CL 03, CL 04, CL 06).

3.4 Environmental and Social Indicators

The project leads to increase of energy efficiency, which reduces the consumption of fuel and energy resources per output unit, and improvement of the environment due to introduction of state-of-art equipment with environmentally friendly technologies.

In conventional CWQ technology, the sensible heat of the hot coke from the coke-making process is emitted into the atmosphere in the form of steam during quenching. Also CWQ is a source of dust pollution to the surroundings. Hence, CDQ facility reduces noxious emissions of air pollutants such as nitrogen oxides (NOx), carbon monoxides (CO), sulphur dioxides (SO_2). CDQ technology also leads to a decrease of

sewage waters, and therefore of dust, carbon oxides, ammonia, hydrogen sulphide, phenol, cyanic hydrogen emissions which would have been emitted during CWQ facility operation. In addition, the reduction of coke consumption at the blast furnaces contributes to reduction of harmful substances.
The interview with district state administration representative conducted by the verification team during site-visit revealed that the project implementation was positively accepted by the local community as it lead to the improvement of the district's environment.

3.5 Management and Operational System

In order to ensure a successful operation of a Client project and the credibility and verifiability of the emissions reductions achieved, the project must have a well defined management and operational system.

The Management and Operational System supporting GHG emission monitoring is a part of the company's Quality Management System certified to ДСТУ ISO 9001:2001.

The procedures of receiving data for monitoring and responsibility for its realization at Alchevskkoks are regulated by the normative documents of the plant and by the "Guiding Meteorological Instructions" in accordance with project documentation and monitoring plan. The Guiding Metrological Instructions were developed in accordance with DTSU ISO 9001:2001. They secure required level of accuracy by using monitoring equipment and by the possibility to crosscheck the data compliance; the error is calculated and confirmed by device certificates. All monitoring equipment is covered by the detailed verification (calibration) plan and is verified with established periodicity. The verification and calibration process is under strict control.

The monitoring at Alchevskkoks is conducted on monthly basis according to monitoring plan described in the PDD; the operational manager at the plant is in charge of monitoring of GHG emissions and emission reductions and preparation of annual monitoring reports. The Project Developers will also supervise the implementation of the Monitoring Plan for the project at regular intervals.

The management of Alchevskkoks has organized appropriate staff training to operate the project equipment. Quality assurance and quality control training was conducted as well. Practical training programs will continue on-the-job during project operation.

4 FIRST PERIODIC VERIFICATION FINDINGS

4.1 Completeness of Monitoring

The reporting procedures reflect the monitoring plan completely.
All parameters were determined as prescribed. The complete data is stored electronically and documented. The necessary procedures have been defined in internal procedures.
It is confirmed that the monitoring report does comply with the monitoring methodology and PDD with some insignificant deviation which are comprehensively justified in the Monitoring Report version 4. The deviations relates to CDQ operation hours and calculation of coke quality indicators.
As to CDQ operation hours the value of 8640 hours was identified at the stage of PDD development by taking into account special coefficient of installed capacity for operation hours (was estimated at the level of 1,39%) reflecting any delays of the CDQ facility and of the plant in general that could have occurred, while in fact monitoring data showed the value of 8784 hour for 2008 (leap-year) and 8760 hours for historical operation hours.
Another insignificant deviation, that can be considered as an amendment to the monitoring report, was introduced in order to obtain more accurate calculation results on coke quality indicators taking into account actual coke consumption volumes (in the reporting month). A formula to calculate weighted average for each of the coke quality indicator was included to the monitoring report.
The introduced deviations to the monitoring plan are insignificant and ensure better accuracy of emission calculation results; detailed justifications of all changes are presented in the Monitoring report version 4.

According to PDD, version 7, emission reductions during 2008 monitoring period were expected to be 134590 tCO2 e. According to Monitoring Report version 4 emission reductions achieved are 134542 tCO2 e. The difference in the emission reductions revealed because 2008 monitoring year was a bissextile year, which naturally increased amount of CDQ operation hours on 24 hours (8784) and the fact that historical operation hours (8760) are based on operation hours of the plant in general (during 2005-2007) it caused insignificant decrease of emission reductions in comparison to the monitoring plan in PDD.

The identified areas of concern as Completeness of Monitoring, project participants' response and BV Certification's conclusion are described in Appendix A Table 5 (refer to CAR 06, CL 07).

4.2 Accuracy of Emission Reduction Calculations

Possible uncertainties and errors for such type project may arise from two main reasons: measurement and stipulation. Measurement error is due to metering equipment inaccuracies. Stipulation occurs when some values are required to complete calculations, but these values cannot be

measured directly. In these cases estimates are used in place of actual measurements, and therefore error may be introduced. The stipulation error itself may be estimated based on the expected accuracy of the stipulated values.
At Alchevskkoks the best available techniques are used in order to minimize uncertainties. Uncertainties are generally low (less than 2%). All monitoring equipment that used for monitoring purposes is in compliance with national legislative requirements and standards; this ensures that uncertainties are accounted in data collected.

Project consists of the 23 monitoring parameters. Some of the parameters that are used in the calculation of the baseline and project emissions are measured directly with the use of special equipment while others are estimated with the use of appropriate coefficients.

The verification team received access to all relevant documentation needed to verify the emission reduction calculation. All used information was traceable and appropriately archived.

The verification team confirms that emission reduction calculations have been performed according to the monitoring plan with some insignificant deviations appropriately justified and to the calculation methodology reported in the final MR in accordance with the PDD. The verification team 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 verifiers.

The identified areas of concern as Completeness of Monitoring, project participants response and BV Certification's conclusion are described in Appendix A Table 5 (refer to CAR 07, CAR 10, CL 05, CL 08).

4.3 Quality Evidence to Determine Emissions Reductions

Concerning verification the calculation of emission reductions is based on internal data. The origin of those data was explicitly checked. Further on, entering and processing of those data in the monitoring workbook Excel sheet was checked where predefined algorithms compute the annual value of the emission reductions. All equations and algorithms used in the different workbook sheets were checked. Inspection of calibration and maintenance records for key equipment was performed for all relevant meters.
Necessary procedures have been defined in internal procedures and additional internal documents relevant for the determination of the various parameters on daily basis.

4.4 Management System and Quality Assurance

The Management and Operational System supporting GHG emission monitoring is a part of the company's Quality Management System certified to ДСТУ ISO 9001:2001.

The procedures of receiving data for monitoring and responsibility for its realization at Alchevskkoks is regulated by the normative documents of Alchevskkoks and by the "Guiding Meteorological Instructions" which are developed in accordance with ДСТУ ISO 9001:2001.

Data are collected and stored in electronic database and in paper format. The data is reported in the monthly report of Alchevskkoks which are compiled into an annual monitoring report for verification process.

The Chief Metrological Specialists of Alchevskkoks is in charge of maintenance of the facility and monitoring equipment as well as of their accuracy. In case of defect, discovered in the monitoring equipment, the actions of the staff are determined in Guiding Metrological Instructions. The measurements are conducted constantly in accordance with national standards.

All measuring equipment is included in the verification schedule and verified with established periodicity. According to the schedule of verification, all devices are in satisfactory condition.

The measurement results are being used by the Chief power-engineering specialist department, by the following services and technical staff of the Plant. They are reflected in the technological instructions of production processes regime and also in the "Guiding Metrological Instructions" revised versions. The monitoring data and calculations are under the competence of the Chief power-engineering specialist assistants in accordance to the interior order of Alchevskkoks.

The documented instructions to operate the facilities are stored at the working places.

Monitoring Report provide sufficient information about the elements of the system related to assigning roles, responsibilities and authorities for implementation and maintenance of monitoring procedures including control of data. The verification team confirms effectiveness of this management system. The personnel responsible for monitoring are trained in an appropriate manner.

5 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 backup solutions are provided.
	Data calculations	✓	✓	✓	Emission reductions are calculated correctly
	Data management & reporting	✓	✓	✓	Data management and reporting were found to be satisfying.
Consistency	Changes in the project	✓	✓	✓	Results are consistent to underlying raw data.

6 INITIAL AND FIRST PERIODIC VERIFICATION STATEMENT

Bureau Veritas Certification has performed a verification of the JI project "Installation of a new waste heat recovery system in Alchevsk Coke Plant, Ukraine". The verification is based on the currently valid documentation of the United Nations Framework Convention on the Climate Change (UNFCCC).

The management of the OJSC "Alchevsk Coke Plant" 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 and Verification Plan indicated in the final PDD version 7. 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 Report version 4 for the reporting period as indicated below. Bureau Veritas Certification confirms that the project is implemented as planned and described in determinated and registered project design documents and revised Monitoring Plan. 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.
Bureau Veritas Certification can confirm that the GHG emission reduction is calculated without material misstatements. Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the valid and registered project baseline and

monitoring, and its associated documents. Based on the information we have seen and evaluated we confirm the following statement:

Reporting period: From 01/01/2008 to 31/12/2008
Baseline emissions : 2 202 731 t CO2 equivalents.
Project emissions : 2 068 189 t CO2 equivalents.
Emission Reductions : 134 542 t CO2 equivalents.

7 REFERENCES

Category 1 Documents:
Documents provided by Institute for Environment and Energy Conservation that relates directly to the GHG components of the project.

/1/ Project Design Document, version 07 dated 22/12/2009

/2/ Monitoring Report version 01 dated 28/01/2010

/3/ Monitoring Report version 02 dated 24/02/2010

/4/ Monitoring Report version 03 dated 01/03/2010

/5/ Monitoring Report version 04 dated 10/03/2010

/6/ Determination Report by Bureau Veritas Certification Holding SAS No UKRAINE/0035/2009 of 22/12/2009

/7/ Letter of Approval of National Environmental Investment Agency of Ukraine No 1588/23/7 of 29/12/2009

/8/ Approval of a JI project and authorization of participation under the Kyoto Protocol by the Government of Japan dated 07/09/2009

Category 2 Documents:
Background documents related to the design and/or methodologies employed in the design or other reference documents.

/9/ Documents checked during the verification onsite are presented in Annex C

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

/1/ Andriy Shenshyn, Member of Alchevsk City Council

/2/ Artur Danylov, Chief engineer of Alchevsk Coke Plant

/3/ Dmytro Zelentsovskiy, Head of coke shop #3 of Alchevsk Coke Plant

/4/ Fedir Vatulin, Head of control measurement device shop of Alchevsk Coke Plant

/5/ Iryna Skoryk, Control supervisor of Quality control department of Alchevsk Coke Plant

/6/ Ivan Skoryh, Chief power engineer of Alchevsk Coke Plant

/7/ Kyrylo Evtushenko, Processing engineer of production and technical department of Alchevsk Coke Plant

/8/ Myhaylo Solovyov, Head of production and technical department of Alchevsk Coke Plant

/9/ Olena Shabunina, Operator of control desk of Alchevsk Coke Plant

/10/ Sergiy Falchenko, Deputy chief power engineer for electric equipment of Alchevsk Coke Plant

/11/ Valeriy Pyankov, Head of Quality control department of Alchevsk Coke Plant

/12/ Viktor Zhuchenko, Head of environment protection department of Alchevsk Coke Plant

/13/ Volodymyr Boychuk, Head of energy-saving bureau of Alchevsk Coke Plant

/14/ Svitlana Matus, Environmental project manager of Sumitomo Corporation

/15/ Shamil Khakimzyanov – Consultant of “Institute for Environment and Energy Conservation ”

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APPENDIX A: COMPANY JI PROJECT VERIFICATION PROTOCOL

Initial Verification Protocol Table 1

Objective	Reference	Comments	Conclusion (CARs/FARs)
1. Opening Session			
1.1. Introduction to audits	9	The intention and the target of the audit were illustrated to the participants of the audit. Participants at the audit were the following persons: Verification team: - Ms. Nadiia Kaiiun – Team Leader, Lead Verifier, Bureau Veritas Ukraine, - Mr. Oleg Skoblyk – Team Member, Verifier, Bureau Veritas Ukraine, - Ms. Victoria Legka – Team Member, Verifier, Bureau Veritas Ukraine; Interviewed persons: Andriy Shenshyn – Member of Alchevsk City Council, Artur Danylov – Chief engineer of Alchevsk Coke Plant, Dmytro Zelentsovskiy – Head of coke shop #3 of Alchevsk Coke Plant Fedir Vatulin – Head of control measurement device shop of Alchevsk Coke Plant, Iryna Skoryk – Control supervisor of Quality control department of Alchevsk Coke Plant,	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		Ivan Skoryh – Chief power engineer of Alchevsk Coke Plant, Kyrylo Yevtushenko – Processing engineer of production and technical department of Alchevsk Coke Plant, Myhaylo Solovyov – Head of production and technical department of Alchevsk Coke Plant, Olena Shabunina – Operator of control desk of Alchevsk Coke Plant, Sergiy Falchenko – Deputy chief power engineer for electric equipment of Alchevsk Coke Plant, Valeriy Pyankov – Head of Quality control department of Alchevsk Coke Plant, Viktor Zhuchenko – Head of environment protection department of Alchevsk Coke Plant, Volodymyr Boychuk – Head of energy-saving bureau of Alchevsk Coke Plant, Svitlana Matus – Environmental project manager of Sumitomo Corporation, Shamil Khakimzyanov – Consultant of "Institute for Environment and Energy Conservation "	
1.2. Clarification of access to data archives, records, plans, drawings etc.	9	The verification team got open access to all required plans, data, records, drawings and to all relevant facilities.	OK
1.3. Contractors for equipment and installation works	1, 9	Project has been implemented as defined in the PDD version 7 and the implementation is evidenced by statements of work completion (see list of verified documents).	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
1.4. Actual status of installation works	2, 9	The first stage of the project (installation of Coke Dry Quenching (CDQ) facility) was implemented as planned. CDQ facility was installed at Alchevskkoks at the end of 2007 which corresponds to project implementation schedule stipulated in the PDD and it is operational since then.	OK
2. Open issues indicated in determination report			
2.1. Missing steps to final approval	6, 7, 8	Based on the determination report the verification team identified no missing steps. The project has been approved by both NFPs. The Letters of Approval were presented to the verification team.	OK
3. Implementation of the project			
3.1. Physical components	1, 2, 9	The first stage of the project (installation of Coke Dry Quenching facility at Alchevskkoks) was implemented within the timeframe stipulated by the project implementation schedule in the PDD.	OK
3.2. Project boundaries	1, 2, 9	Yes, the project boundaries are as defined in the PDD version 7.	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
3.3. Monitoring and metering systems	2, 5, 9	The monitoring at Alchevskkoks is conducted on monthly basis according to monitoring plan described in the PDD. The procedures of receiving data for monitoring and responsibility for its realization at Alchevskkoks are regulated by the normative documents of the plant and by the "Guiding Meteorological Instructions" developed in accordance with ДСТУ ISO 9001:2001. All measuring equipment is included in the verification schedule and verified with established periodicity; monitoring equipment is in satisfactory condition. The operational manager at each plant is in charge for monitoring of all project indicators. *Corrective Action Request 01* Please provide passports and calibration certificates for scales 2315VV-50E/2SD and 2361VV-80E/1D for weighing coke. *Corrective Action Request 02* The data in the Monitoring Report regarding type of measuring equipment used for monitoring of the amount of steam generated in CDQ boilers (parameter B-9, $SG_{PJ,CDQ}$) do not comply with the PDD ver.07. Please explain how the parameter is measured.	CAR 01 CAR 02 CAR 03 CAR 04 CL 01 All above-mentioned issues are closed.

Objective	Reference	Comments	Conclusion (CARs/FARs)
		Corrective Action Request 03 The measuring equipment for monitoring of enthalpy of steam generated in CDQ boiler in project activity (the parameter B-10, $H_{steam,CDQ}$) indicated in the Monitoring Report does not include all relevant data sources as per PDD which are needed for definition of enthalpy value. *Corrective Action Request 04* The type of scales for measuring parameters M_{10}, M_{25} and M_{80} indicated in the Monitoring Report does not correspond to the type of scales actually used on-site. *Clarification Request 01* The measuring equipment for monitoring of parameters P-2, B-17, P-3, B-18, P-4, B-19 (coke specification indices) in the Monitoring Report does not comply with the information on monitoring stated in the PDD. Please explain.	
3.4. Data uncertainty	2, 5	At Alchevskkoks the best available techniques are used in order to minimize uncertainties. Uncertainties are generally low (less than 2%). All monitoring equipment that used for monitoring purposes is in line with national legislative requirements and standards; this ensures that uncertainties are accounted in data collected.	CL 02 The issue is closed

Objective	Reference	Comments	Conclusion (CARs/FARs)
		Clarification Request 02 Please provide information on how the level of uncertainty is taken into account.	
3.5. Calibration and quality assurance	2, 5, 9	All monitoring equipment is covered by the detailed verification (calibration) plan. The verification and calibration process is under strict control. All measuring equipment is included in the verification schedule and verified with established periodicity. According to the schedule of verification, all devices are in satisfactory condition. *Corrective Action Request 05* The information regarding calibration of power meters measuring electricity generation and consumption (parameters B-2 and B-3) are not provided in the table in Annex 2 of the Monitoring report. Please also submit calibration records of the relevant equipment.	CAR 05 CAR is closed
3.6. Data acquisition and data processing systems	2, 5, 9	Data are collected and stored in electronic database as well as in paper format. The data is reported in the monthly report of Alchevskkoks which are compiled into an annual monitoring report for verification process. The measurement results are being used by the Chief power-engineering specialist department, by the following services and technical staff of the Plant. They are reflected in the	CAR 06 CAR 07 CL 03 CL 04

Objective	Reference	Comments	Conclusion (CARs/FARs)
		technological instructions of production processes regime and also in the "Guiding Metrological Instructions" revised versions. The monitoring data and parameters are archived at Unit for Control of Measuring Devices and Equipment (CMDE) and Unit of Chief Energy Specialist (CESU) and Facility's Departments after verified by the responsible dispatcher. *Corrective Action Request 06* As calculation of weighted annual average values for parameters $M_{10,PJ}$, $M_{25,PJ}$, $M_{80,PJ}$, $M_{10,BL}$, $M_{25,BL}$, $M_{80,BL}$ was not described in the PDD, it is considered as supplement to the determined Monitoring Plan and explicit explanation must be provided in respect of this deviation. *Corrective Action Request 07* Formula for calculation of total baseline emissions and formula for calculating baseline emissions from coke processed by CWQ in blast furnace stated in the Monitoring Report are inconsistent with PDD ver.07 of 22/12/2009. Please correct. *Clarification Request 03*	CL 05 All above-mentioned issues are closed.

Objective	Reference	Comments	Conclusion (CARs/FARs)
		Please specify how the CDQ operation hours are accounted and monitored. *Clarification Request 04* Please explain how the value of parameter $Q_{OE,BL}$ was received. *Clarification Request 05* Please provide a justification of difference between expected and actually received amounts of emission reductions.	
3.7. Reporting procedures	2	The procedures of receiving data for monitoring and responsibility for its realization at Alchevskkoks are regulated by the normative documents and by the "Guiding Meteorological Instructions". The data is reported in the monthly report of Alchevskkoks which are compiled into an annual monitoring report for verification process. The monitoring data and calculations are under the competence of the Chief power-engineering specialist assistants in accordance to the interior orders of Alchevskkoks.	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
3.8. Documented instructions	2, 9	Data processing and archiving (including software used) of the Monitoring Report version 4 provides with the necessary information relating the procedures for the monitoring, measurements and reporting. These were verified onsite and found satisfactory. The documented instructions to operate the facilities are stored at the working places.	OK
3.9. Qualification and training	2, 9	The management of Alchevskkoks has organized appropriate staff training to operate the project equipment. Information considering qualification and training is not provided in the Monitoring Report version 4 however the list of employees training was provided onsite. During interviews onsite training was checked and found adequate.	OK
3.10. Responsibilities	2, 9	The Chief Metrological Specialist of Alchevskkoks is in charge for maintenance of the facilities and monitoring equipment (as well as for its accuracy).The measurement results are being used by the Chief power-engineering specialist department, by the following services and technical staff of both Plants. They are reflected in the technological instructions of production processes regime and also in the “Guiding Metrological Instructions” revised versions. The monitoring data and calculations are under the competence of the Chief power-engineering specialist assistants in accordance to the interior order of the Plant.	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
3.11. Troubleshooting procedures	2	In case of defect, discovered in the monitoring equipment, the actions of the staff are determined in Guiding Metrological Instructions. The measurements are conducted constantly in accordance with national standards.	OK
4. Internal Data			
4.1. Type and sources of internal data	1, 2, 5	The internal parameters are obtained according to the monitoring plan in the PDD. Monitoring report version 4, Annex 1, contains internal parameters that are monitored. Annex 2 of the Monitoring Report indicated all sources of monitored internal data. *Corrective Action Request 08* No information is provided on the variable $ws_{Ex\text{-}Boiler}$ included in the formula for calculating CO_2 emission factor for the element process supplying heat $EF_{heat,CDQ}$ in the Monitoring Report Please correct. *Corrective Action Request 09* Units of parameters B-15 and B-16 indicated in the sub-section 3 table of the Annex 1 of the Monitoring report are incorrect. Please also identify units for dry coke consumption in the same sub-section.	CAR 08 CAR 09 All issues are closed

Objective	Reference	Comments	Conclusion (CARs/FARs)
4.2. Data collection	2	The data and parameters monitored are measured, collected, and recorded at the designated frequency described in the monitoring plan. Data are collected and stored in electronic database as well as in paper format. The data is reported in the monthly report of Alchevskkoks which are compiled into an annual monitoring report for verification process. The measurement results are being used by the Chief power-engineering specialist department, by the following services and technical staff of the Plant.	OK
4.3. Quality assurance	2	The Management and Operational System supporting GHG emission monitoring is a part of the company's Quality Management System certified to ДСТУ ISO 9001:2001. Section 9 of the Monitoring report specifies procedure for data collection and processing, and also reflects monitoring, metering and reporting procedures. This information was verified during the visit to Alchevskkoks and is found satisfactory.	OK
4.4. Significance and reporting risks	2, 5	In case of defect, discovered in the monitoring equipment, the actions of the staff are determined in Guiding Metrological Instructions. The measurements are conducted constantly in accordance with national standards. *Corrective Action Request 10* The amount of baseline emissions from thermal energy	CAR 10 CAR is closed

Objective	Reference	Comments	Conclusion (CARs/FARs)
		(steam) is calculated incorrectly. The same applies to the calculation of quantity of electricity supplied to the recipient by the newly installed equipment (EG_y) which leads to inaccurate value of baseline emissions from electricity displacement. Please provide accurate calculation results.	
5. External Data			
5.1. Type and sources of external data	2, 5	The external data are obtained according to the monitoring plan in the PDD. Annex 1 of the Monitoring Report version 4 contains external data used. *Corrective Action Request 11* Please provide data sources for all default values (factors, constants) stated in the Monitoring Report including such parameters as CO_2 emission factor per unit of energy of natural gas($EF_{CO2,NG}$), emission factor for electricity source ($EF_{elec,gr}$), emission factor for ton coke to ton CO_2. *Corrective Action Request 12* In sub-section 1 of the Annex 1 of the Monitoring Report the value 4,187 J/cal stand for conversion of calories into Joules, but not kcal into TJ. Please correct. *Clarification Request 06* Please clarify why the amount of coke consumed in October	CAR 11 CAR 12 CL 06 All above-mentioned issues are closed.

Objective	Reference	Comments	Conclusion (CARs/FARs)
		2008 is zero and how this affects coke specification indices in respective month.	
5.2. Access to external data	1, 2	The external data are obtained according to the monitoring plan in the PDD. Annex 1 of the Monitoring Report version 4 contains external data used. The documents that confirmed the external data were provided for the verification team.	OK
5.3. Quality assurance	2	The Management and Operational System supporting GHG emission monitoring is a part of the company's Quality Management System certified to ДСТУ ISO 9001:2001. Section 9 of the Monitoring report specifies procedure for data collection and processing including external parameters. This information was verified during the visit to Alchevskkoks and was found satisfactory.	OK
5.4. Data uncertainty	2	See section 3.4 of this table.	OK
5.5. Emergency procedures	2	See section 3.11 of this table.	OK
6. Environmental and Social Indicators			
6.1. Implementation of measures	2, 9	The project leads to increase of energy efficiency, due to reduction of fuel consumption, and improvement of the environment due to introduction of state-of-art equipment with environmentally friendly technologies. Measures related to the first stage of the project (installation of Coke Dry Quenching facility) were implemented. Raw data on environmental performance are	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		collected and stored at Alchevsk Coke Plant. All required forms concerning environmental impacts are filled in and sent to the local environmental protection authority of Alchevsk.	
6.2. Monitoring equipment	2, 9	Monitoring equipment is in place, functional and appropriately calibrated. Supporting evidences were checked onsite.	
6.3. Quality assurance procedures	2, 9	Quality assurance regarding environmental performance is covered by the company's Quality, Environment, Health and Safety Management System in accordance with ДСТУ ISO 9001:2001, ISO 14001:2004 и OHSAS 18001:2007 respectively.	OK
6.4. External data	2, 9	The relevant documents on environmental external data were provided for the verification team. The information was found satisfactory.	OK
7. Management and Operational System			
7.1. Documentation	1, 2, 9	The company complies with all legal and statutory requirements of the Ukraine and the same were made available to the verification team. Alchevsk Coke Plant has all the necessary permissions and licenses, issued by the Legal State Authorities.	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
7.2. Qualification and training	2, 9	See chapter 3.9 of this protocol.	OK
7.3. Allocation of responsibilities	2, 9	The responsibilities and authorities are described for each individual in job descriptions as required statutorily. Persons working at sites are aware of their responsibilities, and relative records are maintained. The documented instructions to operate the facilities are stored at the working places.	OK
7.4. Emergency procedures	2	In case of defect, discovered in the monitoring equipment, the actions of the staff are determined in Guiding Metrological Instructions. The measurements are conducted constantly in accordance with national standards.	OK
7.5. Data archiving	2	All data during the crediting period will be stored until two years after the end of the crediting period both in paper and electronic format. Responsible personnel are defined.	OK
7.6. Monitoring report	2, 5	Data information is laid down in the Monitoring report version 4. *Corrective Action Request 13* Please fill in all missing information in the Annex 2 table, if not applicable please state so. *Clarification Request 07*	CAR 13 CL 07 CL 08 All issues are closed.

Objective	Reference	Comments	Conclusion (CARs/FARs)
		Please clarify if there were deviations from monitoring plan and describe them with sufficient justification of all changes occurred (if any). *Clarification Request 08* Please number all formulas stated in the Monitoring Report in order to ensure traceability and explicitness of the calculations.	
7.7. Internal audits and management review	2	The data is cross checked as well as internal audits and corrective actions are taken. Internal audits and management review are performed as integral part of existing Quality, Environment, Health and Safety Management System in accordance with ДСТУ ISO 9001:2001, ISO 14001:2004 и OHSAS 18001:2007.	OK

Periodic Verification Checklist Protocol Table 2: Data Management System/Controls

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
1. Defined organizational structure, responsibilities and competencies		
1.1. Position and roles	Full	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. Internal orders of assignment are available. The operational manager of the Alchevsk Coke Plant is in charge for monitoring of all project indicators.
1.2. Responsibilities	Full	Specific monitoring and reporting tasks and responsibilities are included in job descriptions and work instructions for employees.The Chief Metrological Specialist of Alchevskkoks is in charge for maintenance of the facilities and monitoring equipment (as well as for its accuracy). The measurement results are being used by the Chief power-engineering specialist department, by the following services and technical staff of both Plants. The monitoring data and calculations are under the competence of the Chief power-engineering specialist assistants of the Plant.

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
1.3. Competencies needed	Full	The competencies, responsibilities and authorities are described for each individual in job descriptions as required statutorily. Training needs were identified in advance and training was delivered that was checked onsite.
2. Conformance with monitoring plan		
2.1. Reporting procedures	Full	Reporting procedures used reflects the monitoring methodology content. There were not deviations of reporting procedures from the monitoring plan in the PDD.
2.2. Necessary Changes	Full	The reporting procedures reflect the monitoring plan completely. All parameters were determined as prescribed. It is confirmed that the monitoring report does comply with the monitoring methodology and PDD with some insignificant deviation which are comprehensively justified in the Monitoring Report version 4. The deviations relates to CDQ operation hours and calculation of coke quality indicators. The introduced deviations are insignificant and ensure better accuracy of emission calculation results; detailed justifications of all changes are presented in the Monitoring report version 4.
3. Application of GHG determination methods		

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
3.1. Methods used	Full	The reporting procedures reflect the monitoring plan content. The calculation of the emission reduction is correct.
3.2. Information/process flow	Full	Data are collected and stored in electronic database as well as in paper format. The data is reported in the monthly report of Alchevskkoks which are compiled into an annual monitoring report for verification process. The measurement results are being used by the Chief power-engineering specialist department, by the following services and technical staff of the Plant. All records are finally stored in Commercial Unit of the Plant.
3.3. Data transfer	Full	Data transfer between or within different areas of responsibilities is highlighted in the internal procedures. Manual transfer occurred as well. The complete data is stored electronically and also the part of Management information system which is controlled by accounts.
3.4. Data trails	Full	The necessary procedures have been defined in internal procedures and additional internal documents relevant for the determination of the all the parameters listed in the monitoring plan. Requirements for documented data trials are implemented in general as defined in PDD Section D.3 as well as in internal procedures.
4. Identification and maintenance of key process parameters		
4.1. Identification of key parameters	Full	The critical parameters for the determination of GHG emissions are the parameters listed in section D of the approved PDD version 7.

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
4.2. Calibration/maintenance	Full	The Plant maintains the calibration plan for each of the equipment. The audit team verified the status for all the equipment at the sites sampled for the audit and found them to be in conformity with calibration and verification requirements.
5. GHG Calculations		
5.1. Use of estimates and default data	Full	The estimates and default data used are indicated in Annex 1 of the Monitoring Report together with their values. These are periodically evaluated to ensure their ongoing appropriateness and accuracy. For 1st monitoring period (2008) some of the estimated values were changed as to those stated in the monitoring plan which was sufficiently justified in the Monitoring report.
5.2. Guidance on checks and reviews	Full	The data is cross checked as well as internal audits and corrective actions are taken as defined in Instructions. Responsibilities for JI monitoring are indicated in section D.3 of the PDD version 7. The Project Developers supervise the implementation of the Monitoring Plan for the project at regular intervals.
5.3. Internal validation and verification	Full	Monitoring procedure for JI Project includes the responsibility and frequency for carrying out internal audits. Internal audits did not reveal any non-conformances. The audit team did verify all the parameters listed in monitoring report.

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
5.4. Data protection measures	Full	The necessary procedures relating to Information technology are in place to provide necessary data security, and also prevent the unauthorized use of the same.
5.5. IT systems	Full	Data is collected in electronic database.

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
Potential reporting risks based on an assessment of the emission estimation procedures can be expected in the following fields of action: ➢ the calculation methods, ➢ raw data collection and sources of supporting documentation, ➢ reports/databases/information systems from which data is obtained. Key source data applicable to the project assessed are hereby: ➢ metering records, ➢ process monitors, ➢ operational logs (metering records), ➢ laboratory/analytical data (for energy content of fuels), ➢ accounting records, Appropriate calibration and maintenance	Regarding the potential reporting risks identified in the left column the following mitigation measures have been observed during the document review and during site visit: Key source data for this parameter are: • meter reading. • Invoices and record for Fuels for consumption and purchase. The metering equipments are installed appropriately in the enclosure panels and same are of reputed make. Calculation methods: The reporting procedures reflect the monitoring plan content and the calculation of the emission reduction is correct.	The issue remaining is the way the data obtained is used to calculate the emission reduction in a conservative manner according to the approach prescribed in the PDD version 7 as well as the way data obtained is used to calculate the emissions reductions.

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
of equipment resulting in high accuracy of data supplied should be in place. It is hereby needed to 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 calculations, ➢ position of the metering equipment, ➢ 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).		

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)
The issue remaining is the way the data obtained is used to calculate the emission reduction in a conservative manner according to the approach prescribed in the PDD.	There has been a complete check of data transferred from daily consumption and generation readings to the calculation tool. There was no error in such transfer. The correct installation of the metering equipment can be confirmed.	Having investigated the residual risks, the audit team comes to the following conclusion: Immediate action is not needed with respect to the current emission reduction calculation. Those corrections have been considered during the verification process, so no residual risk is open.

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
CAR 01. Please provide passports and calibration certificates for scales 2315VV-50E/2SD and 2361VV-80E/1D for weighing coke.	3.3	A mistake occurred when AISW was providing information regarding scales for weighting coke. Basically scales 2315VV-50E/2SD and 2361VV-80E/1D are not used for weighting dry quenched coke. This aspect was discussed with the specialists of AISW and now the correct information on scales that are actually weighting dry quenched coke is received. The data is now added to Annex 2 of the monitoring report. The copies of passports are provided additionally. The information on calibration can be found and checked in the passports.	The CAR is closed based on the due amendments made to the 1st version of Monitoring Report and supporting documentation provided.
CAR 02. The data in the Monitoring Report regarding type of measuring equipment used for monitoring of the amount of steam generated in CDQ boilers (parameter B-9, $SG_{PJ,CDQ}$) do not comply with the PDD ver.07. Please explain how the parameter	3.3	Some mistakes were made while the table in Annex 2 was developed. Information regarding monitoring equipment that is used to receive data on volumes of steam generation at CDQ boilers (parameter B-9, $SG_{PJ,CDQ}$) is now modified.	The CAR is closed based on the due amendments made to the 1st version of Monitoring Report.

Report clarifications and corrective action requests	Ref. to checklist question in tables 2/3	Summary of project owner response	Verification conclusion
is measured.			
CAR 03. The measuring equipment for monitoring of enthalpy of steam generated in CDQ boiler in project activity (the parameter B-10, $H_{steam,CDQ}$) indicated in the Monitoring Report does not include all relevant data sources as per PDD which are needed for definition of enthalpy value.	3.3	Some mistakes were made while the table in Annex 2 was developed. Information regarding monitoring equipment that is used to identify enthalpy value of steam that is generated in CDQ boilers (parameter B-10, $Hs_{team,CDQ}$) is now modified.	The CAR is closed based on the due amendments made to the 1st version of Monitoring Report.
CAR 04. The type of scales for measuring parameters M_{10}, M_{25} and M_{80} indicated in the Monitoring Report does not correspond to the type of scales actually used on-site.	3.3	The mistake was made in serial number of monitoring equipment (scales) while it was translated to English. Wrong serial number RR-200 SH-13M is now changed to correct serial number RP-200 SH-13M.	The CAR is closed based on the due corrections made to the 1st version of Monitoring Report.
CAR 05. The information	3.5	The information concerning first calibration is provided in	The CAR is closed

Report clarifications and corrective action requests	Ref. to checklist question in tables 2/3	Summary of project owner response	Verification conclusion
regarding calibration of power meters measuring electricity generation and consumption (parameters B-2 and B-3) are not provided in the table in Annex 2 of the Monitoring report. Please also submit calibration records of the relevant equipment.		passports for power meters. The periodicity of power meter SA-3U-I670M calibration is indicated in passport and the periodicity of power meter LZQM 321.02.534 calibration is in accordance with normative document that was issued by the Lugansk standardization, metrology and certification center (is provided additionally). Calibration for power meter LZQM 321.02.534 is conducted once in 6 years. Calibration for power meter SA-3U-I670M is conducted once in 6 years. This information is now added to the monitoring report.	based on the due amendments made to the 1st version of Monitoring Report and supporting documentation provided.
CAR 06. As calculation of weighted annual average values for parameters $M_{10,PJ}$, $M_{25,PJ}$, $M_{80,PJ}$, $M_{10,BL}$, $M_{25,BL}$, $M_{80,BL}$ was not described in the PDD, it is considered as supplement to the determined Monitoring Plan and explicit explanation must be provided in respect of this deviation.	3.6	The weighted average for each of the parameter (coke quality indexes) is received by multiplying monthly index on the volume of dry coke consumption in the following month, then by adding results for each month together and, finally, by dividing the last final result by the total (annual) volume of dry coke consumption. The special formula and explanation of calculation method is now included to the monitoring report.	The CAR is closed based on the due amendments made to the 1st version of Monitoring Report and justifications provided.

Report clarifications and corrective action requests	Ref. to checklist question in tables 2/3	Summary of project owner response	Verification conclusion
CAR 07. Formula for calculation of total baseline emissions and formula for calculating baseline emissions from coke processed by CWQ in blast furnace stated in the Monitoring Report are inconsistent with PDD ver.07 of 22/12/2009. Please correct.	3.6	The formulas in monitoring report that are showing how to calculate total baseline emissions together with baseline emissions from coke consumption are now modified in accordance with PDD. Regarding baseline emissions from coke consumption the parameters F_{coke} and $F_{pigiron}$ in PDD were based on estimated coke quality indicators that were received before weighted average for each of the coke quality indicators in 2008 was calculated. Correct values of parameters are indicated in the monitoring report.	The CAR is closed based on the due corrections made to the 1st version of Monitoring Report.
CAR 08. No information is provided on the variable $ws_{Ex\text{-}Boiler}$ included in the formula for calculating CO_2 emission factor for the element process supplying heat $EF_{heat,CDQ}$ in the Monitoring Report Please correct.	4.1	The value of indicator ($ws_{Ex\text{-}Boiler}$) was included in the formula that calculates CO2 emission factor for the element process supplying heat ($EF_{heat,CDQ}$). However it wasn't reflected in the separate cell of the monitoring report calculations. The cell with indicator ($ws_{Ex\text{-}Boiler}$) is added to sub-section 1 of the Annex 1 in the monitoring report.	The CAR is closed based on the due amendments made to the 1st version of Monitoring Report.
CAR 09. Units of parameters B-15 and B-16 indicated in the sub-	4.1	Units for parameters B-15 and B-16 are now modified in the monitoring report. Units for volume of dry coke consumption are now included to the monitoring report.	The CAR is closed based on the due amendments made to

Report clarifications and corrective action requests	Ref. to checklist question in tables 2/3	Summary of project owner response	Verification conclusion
section 3 table of the Annex 1 of the Monitoring report are incorrect. Please also identify units for dry coke consumption in the same sub-section.			the 1st version of Monitoring Report.
CAR 10. The amount of baseline emissions from thermal energy (steam) is calculated incorrectly. The same applies to the calculation of quantity of electricity supplied to the recipient by the newly installed equipment (EGy) which leads to inaccurate value of baseline emissions from electricity displacement. Please provide accurate calculation results.	4.4	The mentioned inconsistency regarding calculation of the level of baseline emissions from thermal energy (steam) discovered while the calculations where rechecked by verifier occurred due to the fact that indicator $HG_{CDQ,y}$ was reflected in the monitoring report as rounded to the whole number. Now the indicator is shown with two decimal places. The formula that is used to calculate baseline emissions from electricity (in particular formula to indicate parameter EGy) is now modified in accordance with PDD.	The CAR is closed based on the due amendments made to the 1st version of Monitoring Report.
CAR 11. Please provide	5.1	CO_2 emission factor from natural gas ($EF_{CO2,NG}$) consumption is	The CAR is closed

Report clarifications and corrective action requests	Ref. to checklist question in tables 2/3	Summary of project owner response	Verification conclusion
data sources for all default values (factors, constants) stated in the Monitoring Report including such parameters as CO_2 emission factor per unit of energy of natural gas($EF_{CO2,NG}$), emission factor for electricity source ($EF_{elec,gr}$), emission factor for ton coke to ton CO_2.		in accordance with table 1.4 of 2006 IPCC guidelines for national greenhouse gas inventories. (http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf). CO_2 emission factor from coke (3,1) consumption is in accordance with 2006 IPCC guidelines for national greenhouse gas inventories (it is calculated by multiplying net calorific value of coke (28.2 TJ/Gg is provided in table 1.2) and effective CO_2 emission factor of coke (107 000 kg/TJ is provided in table 1.4). (http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf). CO_2 emission factor from electricity ($EF_{elec,gr}$) is in accordance with annex 2 of "Ukraine – Assessment of new calculation of CEF". (http://ji.unfccc.int/UserManagement/FileStorage/46JW2KL36KM0GEMI0PHDTQF6DVI514). Links are now included in the monitoring report.	based on the due amendments made to the 1st version of Monitoring Report.
CAR 12. In sub-section 1 of the Annex 1 of the Monitoring Report the value 4,187 J/cal stand for conversion of calories into Joules, but not kcal into	5.1	The formula that calculates indicator ($HG_{CDQ,y}$) was simplified so that the verifier would have a clear view of how the value ($HG_{CDQ,y}$) is received.	The CAR is closed based on the due corrections made to the 1st version of Monitoring Report.

Report clarifications and corrective action requests	Ref. to checklist question in tables 2/3	Summary of project owner response	Verification conclusion
TJ. Please correct.			
CAR 13. Please fill in all missing information in the Annex 2 table, if not applicable please state so.	7.6	All missing information is now filled in. The parameters that are not applicable and are also indicated in the Annex 2 table.	The CAR is closed based on the due corrections made to the 1st version of Monitoring Report.
CL 01. The measuring equipment for monitoring of parameters P-2, B-17, P-3, B-18, P-4, B-19 (coke specification indices) in the Monitoring Report does not comply with the information on monitoring stated in the PDD. Please explain.	3.3	The measuring equipment actually complies with information that is stated in PDD. The parameters P-2, B-17, P-3, B-18, P-4, B-19 are identified with analyzers such as cylindrical steel drum, rotor sieve and scales. Scales are the main monitoring equipment because they are actually weighting coke that is left after the special process in cylindrical steel drum and rotor sieve to identify the percentage of each index. Scales are under periodic calibration.	Clarification is accepted, the issue is closed.
CL 02. Please provide the information on how the level of uncertainty is taken into account.	3.4	At Alchevskkoks the best available techniques are used in order to minimize uncertainties. Uncertainties are generally low (less than 2%). All monitoring equipment that used for monitoring purposes is in line with national legislative requirements and standards; this ensures that uncertainties are accounted in data collected. Monitoring equipment is controlled by ISO 9001:2001 procedures.	Clarification is accepted, the issue is closed.

Report clarifications and corrective action requests	Ref. to checklist question in tables 2/3	Summary of project owner response	Verification conclusion
CL 03. Please specify how the CDQ operation hours are accounted and monitored.	3.6	Operation hours of the CDQ facility are accounted in real time by the special automatic process control system that archives all necessary parameters. All data is then displayed at the CDQ workstation. Every minute the system checks that the CDQ facility is still operating. In case of necessity it is possible to view all accounted data regarding CDQ operation hours in the form of trends or tables. The company where the automatic control system was developed is called "NPF "S.T.A. – technique Ltd.". Insignificant delays that are continuing less than 24 hours are officially not considered as a delay (in log books and etc). It is also considered that the CDQ facility is operating even when only one CDQ boiler is working.	Clarification is accepted, the issue is closed.
CL 04. Please explain how the value of parameter $Q_{OE,BL}$ was received.	3.6	As it is stated in PDD the parameter $Q_{OE,BL}$ (considered to be equal to 907 200 t/y) means intermediate energy that can be theoretically produced, to be determined on the basis of maximum recoverable energy from the carriers of secondary energy, which would have been released in the absence of project activity. The value of 907 200 t/y is defined from energy balances of Alchevskkoks. So basically it is the maximum value that can be theoretically produced from the secondary energy carriers during the project activity.	Clarification is accepted, the issue is closed.

Report clarifications and corrective action requests	Ref. to checklist question in tables 2/3	Summary of project owner response	Verification conclusion
CL 05. Please provide a justification of difference between expected and actually received amounts of emission reductions.	3.6	Taking into account that 2008 was a bissextile year, which naturally increased amount of CDQ operation hours on 24 hours (8784) and the fact that historical operation hours (8760) are based on operation hours of the plant in general (during 2005-2007) it caused insignificant decrease of emission reductions in comparison with the monitoring plan in PDD.	Clarification is sufficient, the issue is closed.
CL 06. Please clarify why the amount of coke consumed in October 2008 is zero and how this affects coke specification indices in respective month.	5.1	The amount of dry coke consumption in October 2008 was equal to zero because of different factors. Firstly, because in October 2008 it was a peak of global financial crisis which caused the significant decrease of steel output at AISW and therefore on decrease of coke consumption volumes (almost equal to zero). Secondly, is that actually some portion of coke was consumed at the blast furnaces of AISW but the consumption volumes were very small so dry coke was mixed together with wet coke and basically AISW did not record (in log books etc) actual volumes of dry coke consumption and therefore volumes of mixed coke could not be included to the monitoring report. Regarding coke quality specification indices for October 2008, they where identified at Alchevskkoks and taking into account that annual average coke quality specification indices are based on consumption volumes in relevant month (weighted average), the coke quality specification indices for October	Clarification is accepted, the issue is closed.

Report clarifications and corrective action requests	Ref. to checklist question in tables 2/3	Summary of project owner response	Verification conclusion
		2008 do not affect on baseline emissions from coke consumption.	
CL 07. Please clarify if there were deviations from monitoring plan and describe them with sufficient justification of all changes occurred (if any).	7.6	In comparison with monitoring plan in PDD only some insignificant deviations took place while the monitoring report was developed. The discrepancy occurred regarding CDQ operation hours and historical operation hours. The value of 8640 hours was identified at the stage of PDD development by taking into account special coefficient of installed capacity for operation hours (was estimated at the level of 1,39%). So basically the actual value of 8760 hours was divided by 1,0139 to show (in PDD) that theoretically some insignificant delays of the CDQ facility and of the plant in general, could occur. This explanation is now included in the monitoring report. Also because it is more accurate when the coke quality indicators are calculated based on actual coke consumption volumes (in the reporting month), the special formula to calculate weighted average for each of the coke quality indicator is now included to the monitoring report. This can be considered as an additional insignificant deviation in comparison with the monitoring plan in PDD.	Deviations are sufficiently justified; clarification is accepted.
CL 08. Please number all formulas stated in the	7.6	In order to ensure traceability and explicitness of calculations all formulas are now numbered (from 1 to 15) to show how the	The CL is accepted based on the due

Report clarifications and corrective action requests	Ref. to checklist question in tables 2/3	Summary of project owner response	Verification conclusion
Monitoring Report in order to ensure traceability and explicitness of the calculations.		emission reductions from the project activity are calculated step-by-step.	amendments made to the 1st version of Monitoring Report.

APPENDIX B: VERIFICATION TEAM

The verification team consists of the following personnel:

Nadiya Kaiiun, M. Sci. (environmental science)

Team Leader, Climate Change Lead Verifier
Bureau Veritas Ukraine Health, Safety and Environment Department Project Manager

Nadiya Kaiiun has graduated from National University of Kyiv-Mohyla Academy with the Master Degree in Environmental Science. She has successfully completed IRCA registered Lead Auditor Training Course for Environment Management Systems. She has undergone intensive training on Clean Development Mechanism /Joint Implementation and is involved in the determination/verification of 20 JI projects.

Oleg Skoblyk, Specialist (energy management)

Team member, Climate Change Verifier
Bureau Veritas Ukraine Health, Safety and Environmental Project Manager

He has graduated from National Technical University of Ukraine 'Kyiv Polytechnic University" with specialty Power Management. He is a Lead auditor of Bureau Veritas Certification for Environment Management System (IRCA registered). He performed over 5 audits since 2008. He has undergone intensive training on Clean Development Mechanism /Joint Implementation and he is involved in the determination/verification of 11 JI projects.

Victoria Legka, (biology)

Team Member, Verifier
Bureau Veritas Ukraine Health, Safety and Environment Project Manager

Victoria Legka has graduated from National University of Kyiv-Mohyla Academy with the Bachelor Degree in Biology. She has successfully completed IRCA registered Lead Auditor Training Course for Environment Management Systems and Quality Management Systems and participated in 5 audits. Ms. Legka has undergone a training course on Clean Development Mechanism /Joint Implementation. She is involved in the determination/verification of 4 JI projects.

The verification report was reviewed by:

Ivan G. Sokolov, Dr. Sci. (biology, microbiology)

Internal Technical Reviewer, Climate Change Lead Verifier
Bureau Veritas Certification Local Climate Change Product Manager for Ukraine

He has over 25 years of experience in Research Institute in the field of biochemistry, biotechnology, and microbiology. He is a Lead auditor of Bureau Veritas Certification for Environment Management System (IRCA registered), Quality Management System (IRCA registered), Occupational Health and Safety Management System, and Food Safety Management System. He performed over 140 audits since 1999. Also he is Lead Tutor of the IRCA registered ISO 14000 EMS Lead Auditor Training Course, and Lead Tutor of the IRCA registered ISO 9000 QMS Lead Auditor Training Course. He has undergone intensive training on Clean Development Mechanism /Joint Implementation and he is involved in the determination/verification of 50 JI projects.

APPENDIX C: DOCUMENTS CHECKED DURING VERIFICATION

1. Report of the exchangeable coke controller of the department of technical control of coke shop #2. It was started from 01.12.2008.
2. Log book of electrical energy according to the УСТК. It was started from 23.03.2008.
3. Log book of volume of coke consumption for May 2008.
4. Report of the result of fuel, heat energy, and electricity consumption for 2008.
5. Diagram of meter engaging. Verification certificate ser. #648848. Verification date 12.12.2008.
6. Diagram of meter engaging. Verification certificate ser. #54865. Verification date 12.11.2000.
7. Statement of the tool verification of gas removal working system parameters and gas purification plant of coke dry quenching of coke batteries complex #10-бис (ИВ #336) dated 19.04. 2008.
8. Statement of the tool verification of gas removal working system parameters and gas purification plant of coke dry quenching of coke batteries complex #10-бис (ИВ #338 dated 19.04. 2008.
9. Letter of endorsement #9876/10/3-10 of the Joint Implementation project "Reconstruction of OJSC "Alchevskkoks" based on the technology of coke dry quenching" dated 09.11.2006.
10. Certificate of attestation register #06544-2-4-11/2 ГОМС. Attestation date 19.07.2007 register #06544-2-4-104-ВЛ.
11. Annex to the Certificate of attestation dated 19.07.2007 №06544-2-4-104-ВЛ. Area of attestation of ВТК OJSC "Alchevskkoks" for measurements in and outside the distribution of state metrological supervision.
12. Coke with size 20 mm and more. Determination of strength mechanisms ДСТУ 2206-93 (ГОСТ 5953-93) (ISO 556:1980).
13. Industry standart of Ukraine. Cox coal, pitch and termoantratsit. Rules of acceptance.
14. Letter #10-204 to the plant manager dated 12.03. 1996.
15. Quality certificate of OJSC "Alchevskkoks", code ЕГРПОУ

00190816.

16. Industry standart of Ukraine. Cox coal, pitch and termoantratsit. Methods of selection and preparation samples for testing.
17. Certificate #3.2008 inv. #4761.
18. Certificate #1.2008 inv. #4878.
19. Photo - Thunder pyatisitny inv. #4761
20. Photo - Coke test drum inv. #4878
21. Photo - Low-temperature electric furnace СНОЛ 67/350 inv. #4982.
22. Passport #93-32 of thermostat ser. #10765 dated 11.06.2007.
23. Passport #93-33 of thermostat ser. #10768 dated 11.06.2007.
24. Photo - Boiler КСТК 35/40-100 reg. #7821, inv. #3270
25. Photo - Boiler КСТК 35/40-100 reg. #7820, inv. #3269
26. Photo - Boiler КСТК 35/40-100 reg. #7819, inv. #3268
27. Photo - САЗУ-И670М #067700105
28. Photo - СР4У-И673М #069841805
29. Photo - ВВОД №2 from ЦРП-4 яч.44
30. Photo - ВВОД №1 from ЦРП-4 яч.39
31. Passport ОПТ.468.007 ПС. Certificate on acceptance ser #069850705.
32. Passport ОПТ.468.007 ПС. Certificate on acceptance ser #067700105.
33. Passport ОПТ.468.007 ПС. Certificate on acceptance ser #069841805.
34. Passport ОПТ.468.007 ПС. Certificate on acceptance ser #067716205.
35. Photo - Sensor inv. #341196
36. Passport #06-971 ser. #0706096.
37. Photo - Turbogenerator #2steam turbine Р-215-14/06 generator Т-25-2У3 inv. #8141
38. Photo - Turbogenerator #1steam turbine Р-215-14/06 generator Т-25-2У3 inv. #6140
39. Photo - Type Т-25-2У3 ser. #066/0007
40. Photo - Meter inv. #8147

41. Photo - Meter inv. #8146
42. Consumption of electrical energy by OJSC "Alchevskkoks" for 28.01.2010.
43. Passport ОПТ.468.007 ПС. Three-phase induction electricity meter. Ser. #067700105.
44. Passport. Multirate meter of active and reactive electricity LZQM 321.02.534 ser. #648848.
45. Passport ОПТ.468.007 ПС. Three-phase induction electricity meter. Ser. #069850705.
46. Passport ОПТ.468.007 ПС. Three-phase induction electricity meter. Ser. #069841805.
47. Passport ОПТ.468.007 ПС. Three-phase induction electricity meter. Ser. #067716205.
48. Technological instruction of device of dry coke quenching (DCQ) ТИ-51229-КХ-17-08 dated 28.12.2008.
49. Order #83-A dated 01.08.2002.
50. List of measuring devices.
51. Guidance document dated 24.11.1987. Furnace. Standards of coke consumption.
52. Total information of working of blast-furnace shop.
53. "Koksohimik" labor team newspaper of OJSC "Alchevsk coke Plant" #25-26 (1978) dated 22.07.2008.
54. "Koksohimik" labor team newspaper of OJSC "Alchevsk coke Plant" #46-47 (1956) dated 16.01.2008.
55. Passport EL 2.720.186 PS. Multirate meters of active and reactive power LZQM 211.02 ser. #56304.
56. Block diagram АСУЭ of Alchevsk Coke Plant (commercial accounting and generators accounting).
57. Automatized accounting system and control system of electricity consumption at the OJSC "Alchevsk Coke Plant" (АСКУЭ АМК) (Commercial accounting). Working project. Explanatory note with annexes dated 04.05.2001.
58. Contract #А5011/15-115/1050ю of electricity supply dated 01.12.2007.
59. Supplement #1 (inclusion in АСКУЄ metering points of electricity production by generators АКХЗ) to the working project: Automatized accounting system and control system of electricity consumption at the OJSC "Alchevsk Coke Plant" (АСКУЭ АМК) (Commercial accounting).

60. Passport-protocol of measuring complex Type LZQM #74352.
61. Passport-protocol of measuring complex Type LZQM #64816.
62. Passport-protocol of measuring complex Type LZQM #74350.
63. Passport-protocol of measuring complex Type LZQM #64838.
64. Passport-protocol of measuring complex Type LZQM #64834.
65. Passport-protocol of measuring complex Type LZQM #64842.
66. Passport-protocol of measuring complex Type LZQM #64903.
67. Passport-protocol of measuring complex Type LZQM #64868.
68. Passport-protocol of measuring complex Type LZQM #64866.
69. Passport-protocol of measuring complex Type LZQM #64824.
70. Results of pollutants emissions measurements dated 06.12.2009. OJSC "Alchevskkoks" ССТЛ certificate of attestation 6544-2-4-169-ВЛ dated 28.11.2006.
71. Order of Ministry of Environmental Protection of Ukraine dated 29.09.2009 #507 of adoption of technological standards of allowable pollutant emissions from coke oven.
72. Passport of gas cleaning device. Aspiration device for loading and re-loading of the dry coke quenching device (DCQD) АУ-22, inv. #336.
73. Passport of gas cleaning device. Coke dust-removal. Gas cleaning device АУ-24, inv. #338.
74. Passport #06-903 ser. #279564. Verification date 08.10.2009.
75. Passport #06-916 ser. #1490. Verification date 16.06.2009.
76. Passport #06-893 ser. #369048. Verification date 13.10.2009.
77. Passport #06-1008 ser. #02844. Verification date 22.05.2009.
78. Passport #06-860 ser. #279562. Verification date 22.07.2009.
79. Passport #06-1004 ser. #070622. Verification date 11.03.2009.
80. Passport #06-1003 ser. #2096. Verification date 24.03.2009.
81. Passport #06-840 ser. #272546. Verification date 21.07.2009.
82. Passport #06-993 ser. #0706021. Verification date 19.02.2009.

83. Passport #06-1002 ser. #0706100. Verification date 27.02.2009.
84. Passport #06-884 ser. #272545. Verification date 18.08.2009.
85. Passport #06-875 ser. #279563. Verification date 21.08.2009.
86. Passport #06-976. Verification date 26.02.2008.
87. Passport #06-975 ser. #0706013. Verification date 29.04.2009.
88. Passport #06-981 ser. #0706024. Verification date 29.04.2009.
89. Passport #06-980 ser. #0706019. Verification date 29.04.2009.
90. Passport #06-964 ser. #282421. Verification date 22.04.2009.
91. Passport #06-960 ser. #393639. Verification date 22.07.2009.
92. Passport #06-959 ser. #279568. Verification date 22.04.2009.
93. Passport #06-958 ser. #341196. Verification date 10.11.2009.
94. Passport #190 ser. #1217. Calibration date 06.01.2010.
95. Passport #191 ser. #1218. Calibration date 06.01.2010.
96. Passport #192 ser. #1221. Calibration date 13.01.2010.
97. Passport #193 ser. #1220. Calibration date 13.01.2010.
98. Passport #194 ser. #1218. Calibration date 13.01.2010.
99. Passport #195 ser. #1224. Calibration date 13.01.2010.
100. Passport #196 ser. #1222. Calibration date 11.01.2010.
101. Passport #197 ser. #1223. Calibration date 11.01.2010.