VERIFICATION REPORT

GLOBAL CARBON BV

VERIFICATION OF THE

IMPROVEMENT OF THE ENERGY EFFICIENCY AT ENERGOMASHSPETSSTAL (EMSS), KRAMATORSK, UKRAINE

SECOND PERIODIC FOR THE FOURTH QUARTER OF 2009

REPORT NO. UKRAINE/0098/2010

REVISION NO. 02

BUREAU VERITAS CERTIFICATION

Report No: UKRAINE/0098/2010

VERIFICATION REPORT

Date of first issue: 26 March 2010	Organizational unit: Bureau Veritas Certification Holding SAS
Client: Global Carbon BV	Client ref.: Mr. Lennard de Klerk

Summary:

Bureau Veritas Certification has made the verification of the "Improvement of the Energy efficiency at Energomashspetsstal (EMSS), Kramatorsk, Ukraine" project of Global Carbon BV located in Kramatorsk, 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 October 1st 2009 – December 31st 2009), the Monitoring Plan revision 1.2, the determined PDD, Version 3.9, 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 59485 t CO2e reductions during period from 01/10/2009 up to 31/12/2009.

Report No.: UKRAINE/0098/2010	Subject Group: JI	
Project title: Improvement of the Energy efficiency at Energomashspetsstal (EMSS), Kramatorsk, Ukraine		
Work carried out by: Team Leader : Ivan Sokolov Team Member : Kateryna Zinevych Team Member : Oleg Skoblyk Specialist : Pavel Rosen		
Work verified by: Leonid Yaskin		
Date of this revision: 30.03.2010	Rev. No.: 2	Number of pages: 56

Indexing terms

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

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

☐ Limited distribution

☐ Unrestricted distribution

Abbreviations

AIE	Accredited Independent Entity
BVCH	Bureau Veritas Certification Holding SAS
CAR	Corrective Action Request
CL	Clarification Request
CO_2	Carbon Dioxide
ERU	Emission Reduction Unit
FAR	Forward Action Request
GHG	Green House Gas(es)
IETA	International Emissions Trading Association
IEEC	Institute for Environment and Energy Conservation
JI	Joint Implementation
JISC	JI Supervisory Committee
MoV	Means of Verification
MP	Monitoring Plan
PCF	Prototype Carbon Fund
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change

Table of Contents *Page*

1 INTRODUCTION

Global Carbon BV has commissioned Bureau Veritas Certification to verify the emissions reductions of its JI project "Improvement of the Energy efficiency at Energomashspetsstal (EMSS), Kramatorsk, Ukraine" (hereafter called “the project”) at Kramatorsk, Ukraine, UNFCCC JI Reference Number 0104.
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.
This report includes the findings of the 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).
The results of the determination were documented by Bureau Veritas Certification Holding SAS in the report: “Improvement of the Energy efficiency at Energomashspetsstal (EMSS), Kramatorsk, Ukraine” Report No. UKRAINE/0003/2007 dated August 31st, 2009 See Section 6).
The results of initial and first periodic verification were documented by Bureau Veritas Certification Holding SAS in the report: “Improvement of the Energy efficiency at Energomashspetsstal (EMSS), Kramatorsk, Ukraine” Report No. UKRAINE/0016/2008 dated November 16th, 2009 (See Section 6). The results of the periodic verification for the period January-September 2009 were documented by Bureau Veritas Certification Holding SAS in the report: “Improvement of the Energy efficiency at Energomashspetsstal (EMSS), Kramatorsk, Ukraine” Report No. UKRAINE/0072/2009 dated December 31st, 2009. The changes to the existing Monitoring Plan were determined by BVC Holding SAS in the report “Determination of the Monitoring Plan version 1.1 of the project “Improvement of the Energy efficiency at Energomashspetsstal (EMSS), Kramatorsk, Ukraine” No. UKRAINE/0072A/2009 dated December 31st, 2009.
Project is approved by the National Environmental Investment Agency of Ukraine and Ministry of Economical Affairs in Netherlands (Letters of approval are presented, see Section 6) and registered under Track 2.

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 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 1.2 dated 19th of November 2009 and next version 1.3 dated 22nd of December 2009, Monitoring Plan revision 1.1 dated 30th of December 2009, and underlying data records, covering the period 01 January 2009 to 30 September 2009 inclusive (see Section 6).

1.3 GHG Project Description

The project activity consists of the energy efficiency measures at the premises of EMSS by the implementation of four subprojects:

Subproject 1. Reconstruction of thermal and heating furnaces – there are 35 thermal and heating furnaces in operation in different shops at the premises of EMSS. The main goal of this subproject is the reduction of the natural gas (NG) consumption on 26 of these furnaces by commissioning of new automated NG burners (this enables to maintain the required temperature inside of the furnace) and by implementation of new thermal insulation for the walls, front doors and roofs of the furnaces.

Subproject 2. Installation of a new vacuum system – Installation of a new vacuum system for the vacuumed steel production. The old vacuum system used heat and electricity. The reconstructed vacuum system uses only electricity.

Subproject 3. Installation of an arc ladle furnace – New arc ladle furnace is installed for the steel production. This means that the part of the process of the steel preparation doing in the ladle from which the steel will be cast into the forms. As a result there is reduction of the electricity consumption.

Subproject 4. Modernization of press equipment – Replacing the old pump system, serving the 15,000 ton press, with a new one, more effective pump system. The number of old pumps is 24 (with 500 kW installed capacity each), and the number of new pumps will be 11 (with 800 kW installed capacity each).

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 6). 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	Identify the key controls for each area with potential reporting risks. Assess the adequacy of the key controls and	Identify areas of residual risks, i.e. areas of potential reporting risks

procedures, i.e. ➢ the calculation methods, ➢ raw data collection and sources of supporting documentation, ➢ reports/databases/information systems from which data is obtained. Identify key source data. Examples of source data include metering records, process monitors, operational logs, laboratory/analytical data, accounting records, utility data and vendor data. Check appropriate calibration and maintenance of equipment, and assess the likely accuracy of data supplied. Focus on those risks that impact the accuracy, completeness and consistency of the reported data. Risks are weakness in the GHG calculation systems and may include: ➢ manual transfer of data/manual 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.	eventually test that the key controls are actually in operation. Internal controls include (not exhaustive): ➢ Understanding of responsibilities and roles ➢ Reporting, reviewing and formal management approval of data; ➢ Procedures for ensuring data completeness, conformance with reporting guidelines, maintenance of data trails etc. ➢ Controls to ensure the arithmetical accuracy of the GHG data generated and accounting records e.g. internal audits, and checking/ review procedures; ➢ Controls over the computer information systems; ➢ Review processes for identification and understanding of key process parameters and implementation of calibration maintenance regimes ➢ 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?	where there are no adequate management controls to mitigate potential reporting risks 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 risks	**Additional verification testing performed**	**Conclusions and Areas Requiring Improvement (including Forward Action Requests)**
List the residual areas of risks (Table 2 where detailed audit testing is necessary. In addition, other material areas may be selected for detailed audit testing.	The additional verification testing performed is described. Testing may include: 1. Sample cross checking of manual transfers of data 2. Recalculation 3. Spreadsheet 'walk throughs' to check links and equations 4. Inspection of calibration and maintenance records for key equipment ➢ Check sampling analysis results ➢ Discussions with process engineers who have detailed knowledge of process uncertainty/error bands.	Having investigated the residual risks, the conclusions should be noted here. Errors and uncertainties should be highlighted. Errors and uncertainty can be due to a number of reasons: ➢ Calculation errors. These may be due to inaccurate manual transposition, use of inappropriate emission factors or assumptions etc. ➢ Lack of clarity in the monitoring plan. This could lead to inconsistent approaches to calculations or scope of reported data. ➢ Technological limitations. There may be inherent uncertainties (error bands) associated with the methods used to measure emissions e.g. use of particular equipment such as meters. ➢ Lack of source data. Data for some sources may not be cost effective or practical to collect. This may result in the use of default data which has been derived based on certain assumptions/conditions and which will therefore have varying applicability in different situations. The second two categories are explored with the site personnel, based on their knowledge and experience of the processes. High risk process parameters or source data (i.e. those with a significant influence on the reported data, such as meters) are reviewed for these uncertainties.

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 1.1 dated 3 of March 2010 submitted by Global Carbon BV 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, Global Carbon BV revised the MR and resubmitted it on 19th of March 2010 as version 1.2.

The verification findings presented in this report relate to the project as described in the PDD version 3.9 and Monitoring Report versions 1.2.

2.2 Follow-up Interviews

On 13/01/2010 Bureau Veritas Certification performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of EMSS, developer 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
Energomashspetsstal (EMSS)	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: Global Carbon BV	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 SECOND PERIODIC VERIFICATION FINDINGS FOR THE FOURTH QUARTER OF 2009

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 issue.

Forward Action Request (FAR)1

Please provide the written instruction for the data archiving system until the next verification.

Response

Instructions provided to the AIE as a SD1 and SD2.

Conclusion of the Verification team

Evidencing documents were seen and found satisfactory. Issue is closed.

3.2 Project Implementation

3.2.1 Discussion

Project implementation schedule has faced some delays caused by the global financial crisis. At the same time there has been no new measures implemented or new equipment installed since last verification.

3.2.2 Findings

None.

3.2.3 Conclusion

The project complies with the requirements.

3.3 Internal and External Data

3.3.1 Discussion

The monitoring approach in the Monitoring Plan of the PDD version 3.9 requires monitoring and measurement of variables and parameters necessary to quantify the baseline emissions and project emissions in a conservative and transparent way. The same approach is applied in the revised Monitoring Plan revision 1.2 developed for the monitoring period that is not one year.
The parameters that are determined to quantify the baseline and project emissions are presented in the monitoring report.

It should be mentioned that in order to get normalized volume of natural gas combusted at workshop, temperature and pressure data has been used. The temperature and pressure measuring devices were installed after MP was developed as a part of natural gas measuring equipment. The formula for calculation used in MR is specific for vortex flow meter and it is not applicable for other type of gas meter (i.e. orifice flow meter). Decision on the type of flow meter was optional and therefore it was not included into the PDD. For year 2008 calculation was performed manually using formula given in the monitoring report for 2008. Fore year 2009 the calculation was performed for one furnace automatically using similar devices yielding figures of NG quantity directly in Nm3 and since 2010 it is planned to equip all furnaces with such devices and figures will be obtained in Nm3.

The list of monitoring equipment, which is used in all the sub-projects is present in the Monitoring Report version 3.1 Tables 2-7. All the monitoring equipment is to be checked and calibrated according calibration plans.

According to the determined monitoring plan project and baseline emissions and emission reductions are calculating on the annual basis for every subproject. In order to make monitoring process for the nine months possible formulas for the calculations has been updated. Updates with compare to determined monitoring plan are presented in the MR version 1.3.

Changes that have been implemented do not affect conservativeness of the approach to the emission reductions calculations and procedures of the data collection and archiving.

3.3.2 Findings

Identified areas of concern are described in Appendix A Table 5 (refer to CAR 1).

3.3.3 Conclusion

The project complies with the requirements.

3.4 Environmental and Social Indicators

3.4.1 Discussion

The project improved efficiency of use of natural gas, electricity and heat at the enterprise and thus leaded to decrease of harmful emissions. This project by reducing GHG emissions contributes towards a better environment and hence works towards social well-being for all. Project implementation will lead to improvement of ecological climate of the region, increase of payments to the budgets of all levels for social needs, prevention of reduction of working places and better working conditions at EMSS.

3.4.2 Findings

None

3.4.3. Conclusion

The project complies with the JI requirements as well as with the local requirements.

3.5 Management and Operational System

3.5.1 Discussion

Subproject 1. Reconstruction of thermal and heating furnaces. Each reconstructed furnace has a natural gas flow meter with pressure and temperature sensors in order to calculate normal cubic meters of natural gas burned in the furnace. Information from flow meters, pressure and temperature sensors are transmitting to the control and monitoring computer system.

Recalculation of NG consumption from actual to normalized cubic meters was introduced on the furnaces during the year 2009 for the most of the reconstructed furnaces. Furnaces were updated not simultaneously but through the year. So, in order to keeps consistency of data flow, manual recalculating from actual to normal cubic meters was used.

All information about technological process is saved continuously. The

archiving period for the log files is at least one year. Information that corresponds to the natural gas consumption in 2009 has been burned on CDs. These CDs are stored till the end of the crediting period plus two years.
Every half-finished product that processes through the furnaces has his own unique certificate. This certificate reflects all operations performed on the product and the weight on the exit of every workshop. So, the weight of half-finished products that proceed through each furnace could be easily monitored. Information from the certificates is saved in the log books in order to simplify the monitoring process.
A report including natural gas consumption and weight of half finished products is generating on a monthly basis. The report is signing by Head of Energy Saving Department, Head of corresponding workshop and approved by Chief Engineer.
Every furnace has specific natural gas consumption factor. This factor is using for the daily basis meter's checking procedure. In case specific natural gas consumption is deviate from the factor, furnace is shutting down for the checking procedures.

Subproject 2. Installation of a new vacuum system. Electricity that is consumed during the vacuum process is metered by meters, dedicated especially for this system. Information from meters is coming to the control and monitoring computer system of the vacuumizator. A computer system records information about every vacuumization session, including melt passport, time and electricity consumption. The archiving period for the log files is at least one year. Information that corresponds to the electricity consumption in 2009 has been burned on CDs. These CDs are stored till the end of the crediting period plus two years.
The vacuumizator has a specific electricity consumption factor. In case the electricity consumption is deviating from the factor, the facility is shutting down to perform troubleshooting procedures.
The steel to the vacuum degasser (VD) coming either from ladle furnace (LF) or from the electric arc furnace (EAF) in special ladle. Each ladle with liquid steel has unique certificate of melt. The following figure presents the electricity supplying system to the VD with metering points.

Subproject 3. Installation of an arc ladle furnace. LF is a comprehensive solution for high quality steel melting has been installed in the Steel Making Workshop (SMW). The main electricity consumers of the SMW are powered by the following scheme.
Close Distribution Unit (CDU) #1, 2 are electricity powering points for the EAFs (EAF50 #1, EAF100 #3, EAF100 #5 and EAF12) and LF. CDUs are powering from Transformers (T1, and T2) and Autotransformers (AT1 and AT2). EAFs and LF could be powered from any of the Transformers or Autotransformers. Commercial electricity meters are installed on each of the Transformers and Autotransformer. Cross-checking of the meters is performed by the following formulae:

∑(AT1+ AT2 +T1 + T2) - ∑(EAF50 #1 + EAF100 #3 + EAF100 #5+ EAF12+LF)≤ 1.5%

In case difference is more than 1.5%, verification of meters is performed. The defective meter is substituted within one day.
The data from electricity meters concerning electricity consumption is transmitted to the control and monitoring computer system continuously. The computer system records information about each melt process, including melt certificate. This certificate includes information about the number of EAF where steel was melted, steel content, amount of electricity consumed during melting and weight of steel. The archiving period for the log files is at least one year. All melt certificates for the year 2009 has been burned to CDs. These CDs are stored till the end of the crediting period plus two years.

Subproject 4. Modernization of press equipment. Serving motors of the press pump station are powered from the 6kV line. Substation 110/6 kV has two transformers. Each transformer has a commercial electricity meter. There are some addition consumers on the 6kV line. The check of meters is performed using the following formulae:
∑(Tp1+Tp2) - ∑(Consumers+Pump Station) ≤ 1.5%
In case difference is more than 1.5%, verification of meters is performing. Defective meter is substituted within one day.
All data concerning electricity consumption is transmitted to the control and monitoring computer system. The press has a special registry log book, where working time of press is logged, among other data.

3.5.2 Findings

Identified areas of concern are described in Appendix A Table 5 (refer to CAR 2).

3.5.3 Conclusion

The Monitoring Report and the Management and Operational Systems are eligible for reliable project monitoring.

3.6 Completeness of Monitoring

3.6.1 Discussion

Revised Monitoring Plan (revision 1.1) Determination. In the revised monitoring plan the formulae for calculation of variables are adjusted for the period 1 month instead of period of 1 year that was in the initial monitoring plan determined in the PDD. This allowed to calculated figures for last 3 months of 2009.

The reporting procedures reflect the revised monitoring plan completely. It is confirmed that the monitoring report does comply with the monitoring methodology described in the PDD and Monitoring Plan revision 1.1.
All parameters were determined as prescribed. The complete data is stored electronically and documented. The necessary procedures have been defined in internal procedures.

In the PDD version 3.9 the amount of emission reduction units in the last three months of 2009 is stated as 51 409 t CO_2e while in the Monitoring Report version 1.1 the amount of ERU's for the forth quarter of 2009 is 59 485 t CO_2e.

3.6.2 Findings

It was requested to provide the clarification on the difference of the amount of emission reductions in PDD and Monitoring Report (please refer to CL 1 in Appendix A Table 5). The clarification was accepted.

3.6.3 Conclusion

The project complies with the requirements.

3.7 Accuracy of Emission Reduction Calculations

3.7.1 Discussion

The audit team confirms that emission reduction calculations have been performed according to the Monitoring Plan.
According to the Article 10 paragraph 1 of the Ukrainian Law "On Metrology and Metrological Activity" measurement results can be used in case if appropriate characteristics of errors and uncertainty are known. Characteristics of errors are presented in the passports of the equipment. The level of uncertainty is considered as low which is why it can be neglected in the calculations.
Project consists of the 105 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.

3.7.2 Findings

None.

3.7.3 Conclusion

The project complies with the requirements.

3.8 Quality Evidence to Determine Emissions Reductions

3.8.1 Discussion

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.

3.8.2 Findings

None.

3.8.3 Conclusion

The project complies with the requirements.

3.9 Management System and Quality Assurance

3.9.1 Discussion

The general management of the monitoring team is implemented by the Deputy Chief Engineer of the EMSS through supervising and coordinating activities of his subordinates, such as the head of Energy Saving Department, the head of Steel Making Shop, Press-Forging Shop and Thermal Shop. On-site day-to-day (operational) management is implemented by the heads of corresponding shops. The technological process data is logged into the PCs continuously. The PCs at reconstructed furnaces, LF, VD, etc., have not only monitoring but control functions as well. Keeping the PCs in a working condition is a responsibility of the Department of the automated control systems.

All data necessary for the CO_2 emission reductions calculation is collected in the Energy Saving Department. The head of the Energy Saving Department is making calculations on a monthly basis. The general supervision of the monitoring system is executed by the Deputy Chief Engineer.

For this monitoring period the names of the personnel involved is as follows:

- Deputy Chief Engineer: A. Masyuk
- Head of Energy Saving Department: A. Suprun

- Head of the Steel Making Shop: A. Gorkusha
- Head of the Press-Forging Shop: N. Bondar
- Head of the Thermal Shop: V. Stankov

All contracts for the equipment supplying include chapter describing personnel training. Training is providing by equipment producers.

CO_2 emission reductions calculations are performing on the monthly basis by the head of the Energy Saving Department. All energy sources flows (such as electricity and natural gas) are logged on the server in the Energy Saving Department. Hence the head of Department checks the correctness of measurements by the indirect calculations.

3.9.2 Findings

None.

3.9.3 Conclusion

The project complies with the requirements.

4 PROJECT SCORECARD

Risk Areas		Conclusions			Summary of findings and comments
		Baseline Emissions	Project Emissions	Calculated Emission Reductions	
Completeness	Source coverage/ boundary definition	✓	✓	✓	All relevant sources are covered by the monitoring plan and the boundaries of the project are defined correctly and transparently.
Accuracy	Physical Measurement and Analysis	✓	✓	✓	State-of-the-art technology is applied in an appropriate manner. Appropriate 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.

5 SECOND PERIODIC VERIFICATION STATEMENT (FOURTH QUARTER OF 2009)

Bureau Veritas Certification has performed a verification of the JI project "Improvement of the Energy efficiency at Energomashspetsstal (EMSS), Kramatorsk, 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 EMSS 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 Monitoring Plan revision 1.1 that was determined by Bureau Veritas Certification and found more accurate for the monitoring period stated. 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 1.2 for the reporting period as indicated below. Bureau Veritas Certification confirms that the project is implemented as planned and described in validated 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 01/10/2009 to 31/12/2009
Baseline emissions : 86 953 t CO2 equivalents.
Project emissions : 27 468 t CO2 equivalents.
Emission Reductions : 59 485 t CO2 equivalents.

6 REFERENCES

Category 1 Documents:
Documents provided by that relates directly to the GHG components of the project.

/1/ Monitoring Report version 1.1, dated 4th of March 2010

/2/ Monitoring Report version 1.2 dated 19th of March 2010

/3/ Verification Report by Bureau Veritas Certification Holding SAS dated 16th of November 2009

/4/ Verification Report by Bureau Veritas Certification Holding SAS dated 31st of November 2009

/5/ Project Design Document, version 3.9 dated 31 of August 2008

/6/ Letter of Approval of National Ecological Investment Agency of Ukraine, № 48/23/7 from 23.01.2009

/7/ Approval of Voluntary participation in a Joint Implementation project of Ministry of Economical Affairs in Netherlands №20097JI01, dated 3 of March 2009

/8/ Supporting Document 1. Archivation system instruction on the information of gas expenditure for subprojects 1 and 2 for the years 2008-2009.

/9/ Supporting Document 1. Archivation system instruction on the information of gas expenditure for subprojects 3 and 4 for the years 2008-2009.

/10/ Supporting Document 3. Calibration certificates for gas flow meters “IRVIS- K – 300” #5274, 5275, 5182, 5183, 5740, natural gas pressure meter “Metran 100 DI” #376707 wages “ErMack-Vk1rk-20” 205122.

Category 2 Documents:

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

/11/ 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/ Bondar Nikolay, the Head of the Forge Press workshop

/2/ Chubar Oleg, the Head of the environmental safety department

/3/ Garkusha Aleksandr, the Head of the Steel Making workshop

/4/ Malenko Mikhail, the Head of bureau of the energy department

/5/ Masyuk Aleksandr, Deputy Chief Engineer

/6/ Philenko Aleksandr, the profkom representative, deputy of the City Hall

/7/ Polyachenko Vladimir, Head of the personnel training centre

/8/ Romanenko Sergey, the Head of the automation department

/9/ Smirnof Sergey, the Chief metrologist

/10/ Stankov Vitaliy, the Head of the Thermal workshop

/11/ Suprun Aleksandr, Head of the energy saving department

/12/ Zubkov Aleksandr, the Chief Engineer

- o0o -

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	/4/	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: Mr. Ivan Sokolov Lead Auditor, Bureau Veritas Ukraine, Mrs. Nadezhda Kaiiun, Auditor, Bureau Veritas Ukraine, Mrs. Kateryna Zinevych, Auditor, Bureau Veritas Ukraine, Mr. Oleg Skoblyk, Auditor, Bureau Veritas Ukraine, Mr. Pavel Rosen, Auditor, Bureau Veritas Ukraine. Interviewed persons: EMSS: Bondar Nikolay, the Head of the Forge Press workshop Chubar Oleg, the Head of the environmental safety departement Garkusha Aleksandr, the Head of the Steel Making workshop Malenenko Mikhail, the Head of bureau of the energy department	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		Masyuk Aleksandr, Deputy Chief Engineer Polyachenko Vladimir, Head of the personnel training centre Romanenko Sergey, the Head of the automation departement Smirnov Sergey, the Chief metrologist Stankov Vitaliy, the Head of the Thermal workshop Suprun Aleksandr, Head of the energy saving department Zubkov Aleksandr, the Chief Engineer	
1.2. Clarification of access to data archives, records, plans, drawings etc.	/4/	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	/4/	Project has been implemented as defined in the PDD version 3.9 and the implementation is evidenced by statements of work completion (see list of verified documents).	OK
1.4. Actual status of installation works	/4/	There are some delays in the implementation of Subproject 1 in comparison to the schedule caused by lack of financing.	OK
2. Open issues indicated in validation report			
2.1. Missing steps to final approval	/4/	Based on the validation report the verification team identified no missing steps. The project has been approved by both NFPs. The Letters of Approval were presented to	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		the verification team.	
3. Implementation of the project			
3.1. Physical components	/4/	Project implementation schedule has faced some delays: SP1. Heating and thermal furnaces are commissioning with delay in compare with the schedule. Thermal furnaces #19, 20, 21, 32, 33, 37 were put into operation with delay caused by the financial crisis. SP2, SP3, SP4 were put into operation in 2008.	OK
3.2. Project boundaries	/4/	Yes, the project boundaries are as defined in the PDD version 3.9.	OK
3.3 Emission reductions achieved	/4/	In the PDD version 3.9 the amount of emission reduction units in the last three months of 2009 is stated as 51 409 t CO_2e while in the Monitoring Report version 1.1 the amount of ERU's for the forth quarter of 2009 is 59 485 t CO_2e. Clarification Request (CL) 1 Please provide the clarification on the difference of the amount of emission reductions in PDD and Monitoring Report.	CL1
3.4. Monitoring and metering systems	/4/	**SP1. Reconstruction of thermal and heating furnaces.** Each reconstructed furnace has a natural gas flow meter with pressure and temperature sensors in order to calculate normal cubic meters of natural gas burned in the furnace. Information from flow meters, pressure and temperature sensors are transmitting to the control and monitoring	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		computer system. Recalculation of NG consumption from actual to normalized cubic meters was introduced on the furnaces during the year 2009 for the most of the reconstructed furnaces. In order to keep consistency of data flow, manual recalculating from actual to normal cubic meters was used. All information about technological process is saved continuously. The archiving period for the log files is at least one year. Information that corresponds to the natural gas consumption in 2009 has been burned on CDs. These CDs are stored till the end of the crediting period plus two years. **SP 2. Installation of a new vacuum system.** Electricity that is consumed during the vacuum process is metered by meters, dedicated especially for this system. Information from meters is coming to the control and monitoring computer system of the vacuumizator. A computer system records information about every vacuumization session, including melt passport, time and electricity consumption. The archiving period for the log files is at least one year. Information that corresponds to the electricity consumption in 2009 has been burned on CDs. These CDs are stored till the end of the crediting period plus two years. **SP 3. Installation of an arc ladle furnace.** The data from electricity meters concerning electricity	

Objective	Reference	Comments	Conclusion (CARs/FARs)
		consumption is transmitted to the control and monitoring computer system continuously. The computer system records information about each melt process, including melt certificate. This certificate includes information about the number of EAF where steel was melted, steel content, amount of electricity consumed during melting and weight of steel. The archiving period for the log files is at least one year. All melt certificates for the year 2009 has been burned to CDs. These CDs are stored till the end of the crediting period plus two years. **SP 4. Modernization of press equipment.** Serving motors of the press pump station are powered from the 6kV line. Substation 110/6 kV has two transformers. Each transformer has a commercial electricity meter. All data concerning electricity consumption is transmitted to the control and monitoring computer system. The press has a special registry log book, where working time of press is logged, among other data. The following figure presents electricity supplying system of the press with metering points.	
3.5. Data uncertainty	/4/	Level of uncertainty of data collected is established in the measuring equipment certificates and verified according established schedules. During calculation of the GHG emissions the level of uncertainty is taken into account according to the Article 10 part 1 of “Law of Ukraine on Metrology and Metrological	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		Activity", which states the level of uncertainty.	
3.6. Calibration and quality assurance	/4/	All the calibration procedures are performed according to the detailed calibration plan. On the date of verification, calibration records of the measuring and monitoring equipment have been verified on site. The list of all monitoring equipment with all the serial numbers and calibration dates is presented in the Monitoring Report version 1.1. <u>Corrective Action Request (CAR) 1</u> Please check and correct the date of next calibration of the natural gas flow meters "IRVIS- K – 300" #5274, 5275, 5182, 5183, 5740 in the Table 5 of the Monitoring Report version 1.1, natural gas pressure meter "Metran 100 DI" #376707 in the Table 6 of the Monitoring Report version 1.1, wages "ErMack-Vk1rk-20" 205122 in the Table 7 of the Monitoring Report version 1.1.	CAR1
3.7. Data acquisition and data processing systems	/4/	**SP 1. Reconstruction of thermal and heating furnaces.** Information from flow meters, pressure and temperature sensors are transmitting to the control and monitoring computer system. All information about technological process is saved continuously. The archiving period for the log files is at least one year. Information that corresponds to the natural gas consumption in nine month of 2009 has been burned on CDs. These CDs are stored till the end of the	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		crediting period plus two years. Every half-finished product that process through the furnaces has his own unique certificate. This certificate reflects all operations performed on the product and the weight on the exit of every workshop. So, the weight of half-finished products that proceed through each furnace could be easily monitored. Information from the certificates is saved in the log books in order to simplify the monitoring process. A report including natural gas consumption and weight of half finished products is generating on a monthly basis. The report is signing by Head of Energy Saving Department, Head of corresponding workshop and approved by Chief Engineer. **SP 2. Installation of a new vacuum system.** Information from meters is coming to the control and monitoring computer system of vacuumator. A computer system records information about every vacuumation session, including melt passport, time and electricity consumption. The archiving period for the log files is at least one year. Information that corresponds to the electricity consumption in nine month of 2009 has been burned on CDs. These CDs are stored till the end of the crediting period plus two years. **SP 3. Installation of an arc ladle furnace.** The data from electricity meters concerning electricity consumption is transmitted to the control and monitoring computer system	

Objective	Reference	Comments	Conclusion (CARs/FARs)
		continuously. The computer system records information about each melt process, including melt certificate. This certificate includes information about the number of EAF where steel was melted, steel content, amount of electricity consumed during melting and weight of steel. The archiving period for the log files is at least one year. All melt certificates for the year nine month of 2009 has been burned to CDs. These CDs are stored till the end of the crediting period plus two years. **SP 4. Modernization of press equipment.** All data concerning electricity consumption is transmitted to the control and monitoring computer system. The press has a special registry log book, where working time of press is logged, among other data. The following figure presents electricity supplying system of the press with metering points. The overall data processing scheme is presented in the Monitoring Report version 1.1.	
3.8. Reporting procedures	/4/	All data necessary for the CO_2 emission reductions calculation is collected in the Energy Saving Department. The head of the Energy Saving Department is making calculations on a monthly basis. The general supervision of the monitoring system is executed by the Deputy Chief Engineer.	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
3.9. Documented instructions	/4/	Section C.1. of the Monitoring Report version 1.1. Data processing and archiving (including software used) of the Monitoring Report version 1.2 provides with the necessary information relating the procedures for the monitoring, measurements and reporting. These were verified onsite and found satisfactory. Forward Action Request (CAR)2 Please provide the written instruction of the data archivation system.	CAR2
3.10. Qualification and training	/4/	All contracts for the equipment supplying include chapter describing personnel training. Training is provided by equipment producers. New centre for professional qualification was found in February 2008. This centre is responsible for qualification trainings and attestation of all the employees. All the training plans and reports were presented to the verification team during site visit.	OK
3.11. Responsibilities	/4/	The general management of the monitoring team is implemented by the Deputy Chief Engineer of the EMSS through supervising and coordinating activities of his subordinates, such as the head of Energy Saving Department, the head of Steel Making Shop, Press-Forging Shop and Thermal Shop. On-site day-to-day (operational) management is implemented by the heads of corresponding shops. The technological process data is logged into the PCs continuously. The PCs at reconstructed furnaces, LF,	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		VD, etc., have not only monitoring but control functions as well. Keeping the PCs in a working condition is a responsibility of the Department of the automated control systems. All data necessary for the CO_2 emission reductions calculation is collected in the Energy Saving Department. The head of the Energy Saving Department is making calculations on a monthly basis. The general supervision of the monitoring system is executed by the Deputy Chief Engineer. For this monitoring period the names of the personnel involved is as follows: • Deputy Chief Engineer: A. Masuk • Head of Energy Saving Department: A. Suprun • Head of the Steel Making Shop: A. Gorkusha • Head of the Press-Forging Shop: N. Bondar • Head of the Thermal Shop: V. Stankov	
3.12. Troubleshooting procedures	/4/	Every day the Energy Saving Department reports to the Chief Engineer about energy resources consumption by EMSS. That report is the result of analyzing of the data logging on a dedicated server. So, in case of any meter failure, data discrepancy will be found within one day. The meter will be substituted by working one. CO_2 emissions reduction will be calculated by cross-checking method for this period.	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
4. Internal Data			
4.1. Type and sources of internal data	/4/	The control and monitoring system can be divided into an electrical part, a gas part and steel weight part. **Electrical measurements** For the purpose of monitoring the emission reductions the following parameters are measured: • Electricity consumption at EAFs; • Electricity consumption at arc ladle furnace; • Electricity consumption at vacuum degasser; • Electricity consumption at press' pump station. **Natural gas measurements** For the purpose of monitoring the emission reductions the following parameters are measured: • Natural gas consumption at nine reconstructed heating and thermal furnace. **Steel weight measurement** For the purpose of monitoring the emission reductions the following parameters are measured: • Weight of steel proceeded through the arc ladle furnace; • Weight of steel proceeded through the vacuum degasser; • Weight of half-finished products proceeded through reconstructed heating and thermal furnaces.	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
4.2. Data collection	/4/	See section 3.5 of this protocol. All data necessary for the CO_2 emission reductions calculation is collected in the Energy Saving Department. The head of the Energy Saving Department is making calculations on a monthly basis. The general supervision of the monitoring system is executed by the Deputy Chief Engineer.	OK
4.3. Quality assurance	/4/	CO_2 emission reductions calculations are performing on the monthly basis by the head of the Energy Saving Department. All energy sources flows (such as electricity and natural gas) logging on the server in the Energy Saving Department. So, head of Department could check the correctness of measurements by the indirect calculations.	OK
4.4. Significance and reporting risks	/4/	Every day the Energy Saving Department reports to the Chief Engineer about energy resources consumption by EMSS. That report is the result of analyzing of the data logging on a dedicated server. So, In case of any meter failure, data discrepancy will be found within one day. The meter will be substitute by working one. CO_2 emissions reduction will be calculated by cross-checking method for this period.	OK
5. External Data			
5.1. Type and sources of external data	/4/	See section B.2.1. of the MR version 1.2.	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
5.2. Access to external data	/4/	See section B.2.1. of the MR version 1.0.	OK
5.3. Quality assurance	/4/	The documents that confirmed the external data (calorific value of natural gas, efficiency of the boiler at KramCHP) were provided for the verification team.	OK
5.4. Data uncertainty	/4/	See section 3.5. of this table.	OK
5.5. Emergency procedures	/4/	Every day the Energy Saving Department reports to the Chief Engineer about energy resources consumption by EMSS. That report is the result of analyzing of the data logging on a dedicated server. So, in case of any meter failure, data discrepancy will be found within one day. The meter will be substituted by working one. CO_2 emissions reduction will be calculated by cross-checking method for this period.	OK
6. Environmental and Social Indicators			
6.1. Implementation of measures	/4/	The project improved efficiency of use of natural gas, electricity and heat at the enterprise and thus leaded to decrease of harmful emissions.	OK
6.2. Monitoring equipment	/4/	See section B.2.6. of the MR version 1.2.	OK
6.3. Quality assurance procedures	/4/	See section B.2.6. of the MR version 1.2.	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
6.4. External data	/4/	See section B.2.6. of the MR version 1.2.	OK
7. Management and Operational System			
7.1. Documentation	/4/	The company complies with all legal and statutory requirements of the Ukraine and the same were made available to the verification team. EMSS has all the necessary permissions and licenses.	OK
7.2. Qualification and training	/4/	See chapter 3.10. of this Table of this protocol	OK
7.3. Allocation of responsibilities	/4/	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.	OK
7.4. Emergency procedures	/4/	See chapter 3.12 and 5.5. of this Table of this protocol	OK
7.5. Data archiving	/4/	Data are archived in the physical and electronic forms and then stored in Planning Department.	OK
7.6. Monitoring report	/4/	Data information is laid down in the monitoring report version 1.1.	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
7.7. Internal audits and management review	/4/	CO_2 emission reductions calculations are performing on the monthly basis by the head of the Energy Saving Department. All energy sources flows (such as electricity and natural gas) logging on the server in the Energy Saving Department. So, head of Department could check the correctness of measurements by the indirect calculations.	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	For this monitoring period the names of the personnel involved is as follows: • Deputy Chief Engineer: A. Masyuk • Head of Energy Saving Department: A. Suprun • Head of the Steel Making Shop: A. Gorkusha • Head of the Press-Forging Shop: N. Bondar • Head of the Thermal Shop: V. Stankov
1.2. Responsibilities	Full	See section B.2.for the scheme of responsibilities within the monitoring team. The general management of the monitoring team is implemented by the Deputy Chief Engineer of the EMSS through supervising and coordinating activities of his subordinates, such as the head of Energy Saving Department, the head of Steel Making Shop, Press-Forging Shop and Thermal Shop. On-site day-to-day (operational) management is implemented by the heads of corresponding shops. The technological process data is logged into the PCs continuously. The PCs at reconstructed furnaces, LF, VD, etc., have not only monitoring but control functions

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
		as well. Keeping the PCs in a working condition is a responsibility of the Department of the automated control systems.
1.3. Competencies needed	Full	The 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	The monitoring plan is as per the registered PDD version 3.9. The applauded version of PDD version 3.9. is publicly available at the site http://ji.unfccc.int/JI_Projects/DB/VY889VYDTR7YGFRYTY9TXLB4AWBLUR/PublicPDD/IVJBACXLGFD21BA49H52H5MTW35ZTL/view.html where it was placed during determination process. The monitoring methodology developed for specifically for this project was used in monitoring process.

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
2.2. Necessary Changes	Full	Project implementation schedule has faced some delays: SP1. Heating and thermal furnaces are commissioning with delay in compare with the schedule. Thermal furnaces #19, 20, 21, 32, 33, 37 were put into operation with delay caused by the financial crisis. According to the determined monitoring plan project and baseline emissions and emission reductions are calculating on the annual basis for every subproject. In order to make monitoring process for the nine months possible formulas for the calculations has been updated. Updates with compare to determined monitoring plan are presented in the part A.8. of the Monitoring Report version 1.1.
3. Application of GHG determination methods		
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	See section 3.4 of the Table 1 of this protocol.
3.3. Data transfer	Full	See section 3.4 of the Table 1 of this protocol.
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

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
		the monitoring plan
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 3.9.
4.2. Calibration/maintenance	Full	The company maintains the elaborate calibration plan for each of the equipment. The audit team verified the status of all the equipment at the sites sampled for the audit and found them to be complying to the plan.
5. GHG Calculations		
5.1. Use of estimates and default data	Full	See section B.2.1. of the MR version 1.1.
5.2. Guidance on checks and reviews	Full	CO_2 emission reductions calculations are performing on the monthly basis by the head of the Energy Saving Department. All energy sources flows (such as electricity and natural gas) logging on the server in the Energy Saving Department. So, head of Department could check the correctness of measurements by the indirect calculations.

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
5.3. Internal validation and verification		Monitoring procedure for JI Project includes the responsibility and frequency for carrying out internal audits.
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,	Regarding the potential reporting risks identified in the left column the following mitigation measures have been observed during the document review and the on site mission: Key source data for this parameter are: • meter reading. • Invoices and record for Fuels (and coal) 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 and also additionally deducting the project emissions caused by fossil fuel.	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 3.9 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
Appropriate calibration and maintenance 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
Corrective Action Request (CAR) 1 Please check and correct the date of next calibration of the natural gas flow meters "IRVIS- K – 300" #5274, 5275, 5182, 5183, 5740 in the Table 5 of the Monitoring Report version 1.1, natural gas pressure meter "Metran 100 DI" #376707 in the Table 6 of the Monitoring Report version 1.1, wages "ErMack-Vk1rk-20" 205122 in the Table 7 of the	3.6.	Corrections has been implemented into the MR. Calibration protocols provided to the AIE as SD3.	Evidences presented were found satisfactory. Issue is closed.

Report clarifications and corrective action requests	Ref. to checklist question in tables 2/3	Summary of project owner response	Verification conclusion
Monitoring Report version 1.1.			
Clarification Request (CL) 1 Please provide the clarification on the difference of the amount of emission reductions in PDD and Monitoring Report.	3.3.	**SP1.** According to the PDD balance of the emissions for the 4th quarter of 2009 should be as follows: BE = 37 174 tCO_2 PE = 18 796 tCO_2 ER = 15 378tCO_2 Emissions calculating based on: • Amount of steel that proceeds through the furnaces; • Amount of furnaces operated in 4Q 2009; • Amount of natural gas consumed at furnaces. According to the PDD, amount of half-finish products that should be treated during nine months in 21 reconstructed furnaces is 29 048t. In fact it is 29 423t that has been treated in 16 furnaces.	Evidences presented were found satisfactory. Issue is closed.

Report clarifications and corrective action requests	Ref. to checklist question in tables 2/3	Summary of project owner response	Verification conclusion
		That is why in fact balance of emissions has the following balance: BE = 40 270 tCO_2 PE = 7 934 tCO_2 ER = 32 336 tCO_2 The difference of PE could be explain by fact that newly reconstructed furnaces loaded much more than it was predicted in PDD in order to minimize specific natural gas consumption. **SP2.** According to the PDD balance of the emissions for the 4Q of 2009 should be as follows: BE = 19 400 tCO_2 PE = 90 tCO_2 ER = 19 310 tCO_2 According to the PDD amount of steel that should be vacuumated during the 4Q is 40 268. But in fact 21 206t of steel has been	

Report clarifications and corrective action requests	Ref. to checklist question in tables 2/3	Summary of project owner response	Verification conclusion
		proceeding through vacuumator. As a result the balance of emissions looks as follows: BE = 10 254 tCO_2 PE = 51 tCO_2 ER = 10 203 tCO_2 **SP3** According to the PDD balance of the emissions for the 4Q of 2009 should be as follows: BE = 37 115 tCO_2 PE = 25 727 tCO_2 ER = 11 388 tCO_2 According to the PDD amount of steel that should be melted during the 4Q is 40 268t with an average electricity consumption 0.71MWh/t. But in fact 23 224t of steel has been melted with an average electricity consumption 0.9MWh/t.	

Report clarifications and corrective action requests	Ref. to checklist question in tables 2/3	Summary of project owner response	Verification conclusion
		As a result the balance of emissions looks as follows: BE = 21 433 tCO_2 PE = 18 755 tCO_2 ER = 2 678 tCO_2 **SP4** According to the PDD balance of the emissions for the 4Q of 2009 should be as follows: BE = 19 999 tCO_2 PE = 14 666 tCO_2 ER = 5 333 tCO_2 In fact newly reconstructed pumps system worked less time than 15,000 press has worked because of modern control system which kept pumps in stand by mode when pressure in the hydraulic system of press was enough to drive the equipment. So, consumption of electricity was less and balance of emissions looks as follows:	

Report clarifications and corrective action requests	Ref. to checklist question in tables 2/3	Summary of project owner response	Verification conclusion
		BE = 14 996 tCO_2 PE = 728 tCO_2 ER = 14 269 tCO_2	
Forward Action Request (CAR)2 Please provide the written instruction of the data archivation system.	3.9.	Instructions provided to the AIE as a SD1 and SD2.	Evidences presented were found satisfactory. Issue is closed.

APPENDIX B: VERIFICATION TEAM

The verification team consists of the following personnel:

Ivan G. Sokolov, Dr. Sci. (biology, microbiology)
Bureau Veritas Certification Internal reviewer, Climate Change Lead Verifier, 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 is Lead Tutor of the Clean Development Mechanism /Joint Implementation Lead Verifier Training Cours and he was involved in the determination/verification of 50 JI/CDM projects.

Kateryna Zinevych, M.Sci. (environmental science)
Climate Change Verifier

Bureau Veritas Ukraine HSE Department manager.

She has graduated from National University of Kyiv-Mohyla Academy with the Master Degree in Environmental Science. She is a Lead auditor of Bureau Veritas Certification for Environment Management System (IRCA registered). She performed 6 audits since March of 2009. She has undergone intensive training on Clean Development Mechanism /Joint Implementation and she is involved in the validation of 20 JI projects.

Oleg Skoblyk, Specialist (Power Management)
Climate Change Verifier
Bureau Veritas Ukraine HSE Department project manager.
He has graduated from National Technical University of Ukraine ‘Kyiv Polytechnic University” with specialty Energy Management. He is a Lead auditor of Bureau Veritas Certification for Environment Management System (IRCA registered). He performed over 10 audits since 2008. He has undergone intensive training on Clean Development Mechanism /Joint Implementation and he is involved in the validation of 20 JI projects.

Pavel Rosen, M. Sci. (Power Management)
Energy auditor
He has graduated from National Technical University of Ukraine "Kyiv Polytechnic Institute" Institute of Energy Saving and Power

Management Specialty "Power Management". He is a Deputy Chief on the energy saving issues at JSC «Yuzhteploenergomontazh». He managed and took part in holding of 4 energy audits. Over all he performed 13 energy audits.

The report was reviewed by:

Leonid Yaskin, PhD (thermal engineering)
Internal Technical Reviewer
Bureau Veritas Certification Rus General Director- Lead Auditor, Lead Tutor, Climate Change Lead Verifier
He has over 30 years of experience in heat and power R&D, engineering, and management, environmental science and investment analysis of projects. He worked in Krrzhizhanovsky Power Engineering Institute, All-Russian Teploelectroproject Institute, JSC Energoperspectiva. He worked for 8 years on behalf of European Commission as a monitor of Technical Assistance Projects. He is a Lead auditor of Bureau Veritas Certification for Quality Management Systems (IRCA registered), Environmental Management System (IRCA registered), Occupational Health and Safety Management System (IRCA registered). He performed over 250 audits since 2002. Also he is a Lead Tutor of the IRCA registered ISO 14000 EMS Lead Auditor Training Course, and a Lead Tutor of the IRCA registered OHSAS 18001 Lead Auditor Training Course. He is an Assuror of Social Reports. He is Lead Tutor of the Climate Change Lead Verifier Training Course and was/is involved in the determination of over 50 JI projects.

APPENDIX C: DOCUMENTS CHECKED DURING VERIFICATION

1. Set of weight measuring instruments. 01 ВКТ-200М. Passport 2164-00-000 ПС from March 2006.
2. Passport #09-22 of ТСМУ Metran -274-05 Ser. #655355. Date of calibration 17.09.2008.
3. Passport #09-22 of ТСМУ Metran -274-05 Ser. #655358. Date of calibration 16.09.2008.
4. Passport. Vortical transducer ser. #5480 from 18.02.2009.
5. Passport. Vortical transducer ser. #5482 from 18.02.2009.
6. Passport. Vortical transducer ser. #5483 from 18.02.2009.
7. Passport. Resistance transducer ser. #8360 from 23.09.2008.
8. Passport. Resistance transducer ser. #8362 from 23.09.2008
9. Passport. Resistance transducer ser. #8365 from 23.09.2008.
10. Passport. Thermal element ser.#655340 from December 2008.
11. Passport СПГК.5070.000.00 ПС. Pressure-sensing element Metran-100. #600466/2 275890.
12. Passport. Ба 4.728.036 ПС. Current transformers. Т-0,66-1; ТШ-0,66-1.
13. Passport. Crane scales. Ser. #VK0115047. Date of the last verification 11.12.2008.
14. Passport. Crane scales. Ser. #КР205122. Date of the last verification 11.12.2008.
15. Passport. Crane scales. Ser. #КР506149. Date of the last verification 11.12.2008.
16. Passport. Crane scales. Serial #КР806148. Last verification date 11/12/2008.
17. Vortex flow transducers ИРВИС-К300. Passport ИРВС 9102.0000.00 ПС. Kazan, 2005.
18. Protocol of the calibration. Метран-100-ДИ #422353 dated 29/08/2008.
19. Certificate of the device calibration #02-09 dated 10/02/2009.
20. Certificate of the device calibration #05-10 dated 25/05/2009, valid to 25/05/2010.
21. Certificate of the device calibration #05-11 dated 25/05/2009, valid to 25/05/2010.
22. Certificate of the device calibration #12-35. Метран-100-ДИ-1131. Valid from 05/12/2008 to 05/12/2009.

Certificate of the device calibration #12-36. Метран-100-ДИ-1131.
23. Valid from 05/12/2008 to 05/12/2009.
Certificate of the device calibration. Метран-100-ДИ #000088 dated
24. 02/04/2009.
Certificate of the device calibration. Метран-100-ДИ #376707 dated
25. 09/03/2009.
Certificate of the device calibration. Метран-100-ДИ #387352 dated
26. 18/02/2009.
Certificate of the working measure equipment verification #325 dated
27. 05/03/2008, valid to 05/03/2010.
Certificate of the working measure equipment verification #326 dated
28. 05/03/2008, valid to 05/03/2010.
Certificate of the working measure equipment verification #327 dated
29. 05/03/2008, valid to 05/03/2010.
Certificate of the working measure equipment verification #328 dated
30. 05/03/2008, valid to 05/03/2010.
31. Current transformer and voltage furnace transformer at the ЭСПЦ.