VERIFICATION REPORT
OJSC "ALCHEVSK IRON AND STEEL MILL"

VERIFICATION OF THE
REVAMPING AND MODERNIZATION OF THE ALCHEVSK STEEL MILL

PERIODIC 1ST QUARTER 2009

REPORT NO. UKRAINE- VER#/0051/2009

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BUREAU VERITAS CERTIFICATION

Report No: UKRAINE- VER#/0051/2009

VERIFICATION REPORT

Date of first issue: 19 October 2009	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 "**Revamping and Modernization of the Alchevsk Steel Mill**" project of OJSC "Alchevsk Iron and Steel Mill" located in Alchevsk, 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 under Track 1 procedure.

The verification scope is defined as a periodic independent review and post determination by the Independent Accredited 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.

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 264 150 t CO2e reductions during period from 01/01/2009 up to 31/03/2009.

On the 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- VER#/0051/2009	Subject Group: JI	
Project title: Revamping and Modernization of the Alchevsk Steel Mill		
Work carried out by: Team Leader : Flavio Gomes Team Member : Ivan Sokolov Team Member : Kateryna Zinevych Specialist : Oleg Skoblyk		
Work verified by: Ashok Mammen		
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Indexing terms

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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

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1 INTRODUCTION

Institute for Environment and Energy Conservation has commissioned Bureau Veritas Certification to verify the emissions reductions of its JI project "Revamping and Modernization of the Alchevsk Steel Mill" (hereafter called “the project”) at Alchevsk, Ukraine, UNFCCC JI Reference Number 1000022.
This report summarizes the findings for the period 01/01/2009 up 31/03/2009 periodic 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 Verification Report is based 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 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 1.
Current periodic verification has been performed with the account of findings and conclusions of the integral initial and first periodic verification report No. UKRAINE- VER#/0024/2008 and Early Credit Verification Report No. 0007/2008 dated December 1st, 2008.
The results of the determination were documented by "Climate and Energy" of TÜV Süddeutschland in the report: “Revamping and Modernization of the Alchevsk Steel Mill, Ukraine” Report No. 947241 dated April 23d, 2008.

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.
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 Independent Accredited 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 and underlying data records, covering the period 01 January 2009 to 31 March 2009 inclusive (see Section 6).

1.3 GHG Project Description

OJSC Alchevsk Iron and Steel Works (AISW) is currently the 5th largest integrated iron and steel plant in Ukraine. It is located in the city of Alchevsk in Lugansk Oblast, Eastern Ukraine. It is part of the Industrial Union of Donbass (IUD), an industrial group that is a major shareholder in a number of metallurgical enterprises in Ukraine as well as in Poland and Hungary.
While one of the more modern integrated steel works in Ukraine, AISW was fairly typical of the Ukrainian iron and steel sector up to 2004 in terms of the vintage of technologies. The current facilities are mainly built in the 1950s and 1960s with the exception of new Open Hearth Furnace (TSU 1,2) commissioned in 2005. The plant has high energy intensity. AISW has a Sinter Plant, Lime Kilns, four Blast Furnaces, four old Open Hearth Furnaces and one recent Tandem Open Hearth Furnace, Ingot Casting, Blooming Mill and several other mills.

IUD is implementing a US$1.5 billion capital investment program to modernize operations in its two Ukrainian plants including AISW over the period of 2004 - 2010 with financing of currently committed components in part being supplied by IFC through a US$100 million direct loan and participation in a syndicated loan facility in the amount of US$250 million. The rest of the financing is being sourced from commercial banks.

Beginning in 2004 and now coming on stream, modernization program at AISW has the integrated objectives of applying more efficient technology, improving environmental performance, increasing capacity and therefore competitiveness (reducing costs per tonne of steel produced). This modernization program is planned to involve technology replacement or upgrade of all major components of the iron and steel making and finishing processes.

The program's initial focus at AISW has been on steel production with the replacement of the old OHFs with two modern basic oxygen furnaces (Converters) integrated with continuous Slab Casters to replace the existing Blooming Mill utilizing Joint Implementation with the total investment costs of US$ 944 million as described in PDD.

Planned but as yet uncommitted due to lack of financing and other impediments are other upstream investments including replacement of the existing sinter machines and upgrading of Blast Furnaces on a progressive basis. These activities could be subject to additional JI projects. The overall capacity of the plant expressed as steel production will be increased approximately from 3.6 Mt/a to 6.9 Mt/a.

When the discussions concerning modernization and capacity increases at AISW were initiated in order to increase competitiveness, the business-as-usual choice would have been to base the project on the existing technology as occurred during a similar upgrade commissioned in 2005 as a result of an investment decision made in 2002. OHF technology was available, well known at the company and had considerably lower initial investment costs than other more efficient technologies. OHF, Ingot Casting, and Blooming Mills might not be state of art in some parts in the world, but it is still prevalent in Ukraine, i.e. competitiveness could have been increased with traditional technology.

As documented in minutes of Meeting of the Technical Council of the Plant, 26th May, 2003, possibility to utilize Kyoto mechanisms provided the incentive to invest in more energy efficient technology. In the baseline scenario, the AISW would add new facilities using the recent OHF technology. The project, however, will replace the old OHF process by modern Linz-Donawitz Method (LD) Converters, as well as the substitution of the current Ingot Casting and Blooming Mill by a modern Slab Caster. Due to the improvement in technology, less fossil fuels and material inputs (pig iron) will be needed after implementation of the project compared to the baseline case and therefore carbon dioxide emissions are reduced.

Steel making process

Steel is a metal alloy whose major component is iron, with carbon content between 0.02% and 1.7% by weight. Carbon and other elements act as hardening agents. The first part of the process of producing steel is to combine the main ingredients of coal (coke), iron ore in the pelletized form of sinter and lime in Blast Furnaces to produce pig iron. Pig iron is the immediate product of smelting iron ore with coke and limestone in a blast furnace. It has a very high carbon content, typically 3.5%, which makes it very brittle and not useful directly as a material except for limited applications.

In the basic oxygen process proposed in this project, molten pig iron and some scrap steel are placed in a ladle, and 99% pure oxygen are blown onto the steel and iron, causing the temperature to rise to about 1700℃. This melts the scrap, lowers the carbon content of the molten iron and helps remove unwanted chemical elements. Fluxes (like lime) are fed into the vessel to form slag which absorbs impurities of the steelmaking process. Steel is further refined in the Ladle Furnace and cast into slabs in a Continuous Caster.

AISW has used a traditional steel making technology - Open Hearth Furnaces (OHF), Ingot Casting, and Blooming Mills to produce semi-finished products. The pig iron, limestone and iron ore go into an Open Hearth Furnace which has a wide, saucer-shaped hearth and a low roof. It is heated to about 1600 ℉ (871 ℃). The limestone and ore forms a slag that floats on the surface. Impurities, including carbon, are oxidized and float out of the iron into the slag.

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 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?	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) for the 1st quarter 2009 submitted by IEEC 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.
Burea Veritas Certification Holding SAS has reviewed new version of the Monitoring Report submitted 17.10.2009, which is #2, due to the organizational changes in the MR that led to the issuance of second revision of the Verification Report.

The verification findings presented in this report relate to the project as described in the PDD version 4 and Monitoring Report version 2.

2.2 Follow-up Interviews

On 17/06/2009 Bureau Veritas Certification performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of OJSC „AISW" were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
OJSC „Alchevsk Steel Mill"	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 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 verification report prepared by Bureau Veritas Holding SAS notes following open issues.

Forward Action Request 1
Please include the information considering qualification and training of the staff to the next version of the Monitoring Report.

Response

The information considering qualification and training of staff is available now at the project site. However following the request from verifier this Monitoring report incorporates the more detailed explanation about formation of stuff training and qualification programs.

Conclusion of the verification team

The issue was checked and is closed.

3.2 Project Implementation

3.2.1 Discussion

Open Joint Stock Company “Alchevsk Iron and Steel Mill” (OJSC “AISW”) has implemented the JI project by revamping and modernization of the Steel Plant. The project activity aims to replace existing production line with Open Hearth Furnaces, Ingot Casting and Blooming Mills by new LD Converters, Ladle Furnace, Vacuumator and Slab Casting Machines (Slab Casters).
OJSC “AISW” has used a traditional steel making technology – Open Hearth Furnaces, Ingot Casting and Blooming Mill to produce semi-finished products. The produced ingots are conglomeration of cavities. Around 20-21% of ingots have to be cut off at the exit of the Blooming Mills and put back to the Open Heath Furnaces.
Alternatively with introduction of new Slab Casters and Ladle Furnace only around 3% of slabs have to be cut and put back to Open Hearth Furnaces of LD Converters. So the difference between traditional and existing production line and new Slab Caster line in terms of material losses is around 17-18% leading to reduced GHG emissions.
The project category is energy efficiency that is serving the reduction of end-user energy consumption in industrial applications and processes.
The project was started in 2005 with introduction of the first Slab Caster.
According to the investment plan, the following major stages of project implementation have been envisaged:
Phase 1: Installation of Slab Caster #1 along with Ladle-Furnace;
Phase 2: Installation of Slab Caster #2 along with Vacuumator;
Phase 3: Installation of LD Converter #2;
Phase 4: Installation of LD Converter #1;
Phase 5: Reconstruction of Oxygen Plant #4;

Phase 6: Installation of Oxygen Plant #7;
Phase 7: Installation of Oxygen Plant #8.
Phases 5-7 consist in implementation of secondary units in the metallurgical process, which are indissolubly linked with the main steel production units (Phases 1-4). Thus, Phases 5-7 are indissolubly linked with Phases 1-4.
There is no leakage of GHG emissions associated with the project.
By the end of 2007 only first two stages (Phases) were completed. The Slab Caster #1 was put into operation in August 2005 and Slab Caster # 2 - in March 2007.
Phase 3 was completed in January 2008 when LD Converter #2 was launched. LD Converter #1 started operation in September 2008 (Phase 4 was completed).
However then, in about a month, LD Converter #1 has stopped its operation because of impact of the financial and economical crisis. LD Converter #1 was launched again in March 2009. Thus, in the reporting period LD Converter #1 was operational for only one month.
Phase #5 was completed on 30th of September 2005 (almost together with Slab Caster-1). Phase #6 was completed on 19th of March 2008. Phase #7 is at the final stage of completion (must be completed in the 3rd quarter of 2009). Such delay is caused by the influence of financial and economical crisis, because the Steel Mill is not operating at full capacity and there is no need to produce big volumes of oxygen. Thereby, in the reporting period 6 units, which are mentioned in the phases of project implementation above, were operational.
The project was operational for the whole monitoring period, and emission reduction were considered for the whole period. As it was mentioned above, only Phase #7 wasn't completed as planned, which was caused by the impact of global crisis. The crisis stipulated reduction of steel production capacities and also caused the considerable change of planned indicators for electricity consumption and other materials consumption based on producing 1 t. of steel and therefore impacting on projectline and baseline emissions and also on emission reductions.
Thus, the production of OHF steel was significantly decreased (concerning the decrease of overall production capacity from 71% in 2008 to 40% in the first quarter of 2009). Approximately output of slabs from Blooming was decreased by half (baseline slabs). The main portion of slabs was produced in Slab Caster-1,2.
The reduction of productivity in the baseline causes increase of conditionally constant volumes of energy consumption (increase of specific costs per unit). At the same time, the increase of productivity in the project line (in LD Converters and Slab Casters) causes the decrease of specific volumes of energy consumption.
Monitoring was based on actual data (mentioned in the reporting documents) of products output and consumption of energy and material resources as in projectline and in baseline scenario as it is required by the joint implementation project-design document (PDD).

AISW already does to collect energy consumption data and measure inputs and outputs. Three set of instructions at the AISW regulate the monitoring procedures and responsibilities. They are called Guiding Metrological Instructions:
1) “Metrological product quality assurance” (RMI-I-19.0.1-07)
2) “Metrological expertise of documentation” (RMI-I-19.0.2-07)
3) “Management of measurement technique” (RMI-I-19.1.1-07)
The procedures for calibration of all monitoring equipment are described in RMII.19.0.1-07 and RMI-I.19.1.1-07.
The above mentioned instructions also secure the traceability of monitoring/metering devices.
The instructions have been developed in accordance with ISO 9001 requirements. They secure required accuracy of all the measurements done using monitoring equipment.
Best available techniques are used in order to minimize uncertainties. Uncertainties are generally low, typically below 2% with as all parameters are or will be monitored. All the equipment used for monitoring purposes is in line with national legislative requirements and standards and also in line with ISO 9001 standards.
Details are given in Guiding Metrological Instructions.

3.2.2 Findings

Corrective Action Request (CAR) 1

The List of measuring and monitoring equipment provided by the project developer differs a lot from the one presented to the verification team onsite by the project participant. Please clarify the difference and correct the wrong version.

Response
Obviously at the plant the verifier has seen documents related to the all monitoring equipment and devices even though some of them are not related with the carbon emissions.
However we believe that such a situation does not represent any problem because calculations and monitoring of carbon emissions for the JI project is fully based and depending on requirements of PDD and on data that are anyway monitored on routine basis at Alchevsk Iron and Steel Mill in compliance with national standards.
At the same time, according to the CAR1, project developers and Alchevsk Iron and Steel Mill prepared updated List of measuring and monitoring equipment (available upon request) fully in compliance with all the requirements mentioned in the PDD.

Conclusion of the verification team

Issue is closed.

Clarification Request (CL) 1

The PDD version 4 states that phase 3 was supposed to be completed in the third quarter of 2007 while the Monitoring Report says it was completed in January 2008, also according to the PDD phase 6 was supposed to be completed in the 2-3 quarter of 2007 while MR states that it was completed on 19th of March 2008. While the delay of completeness phase 7 is properly described there is no explanation of the deviation in implementation phases 3 and 6. Please provide necessary clarification.

Response

The introduction with delay of Converter #2 (phase #3) was caused by several factors: financial, technical, technological, customs problems and also by declines in schedules of delivery of equipment and materials.

The delay of implementation of phase #6 is caused by the same reasons as phase #3 and in order to accomplish phase #6, phase #3 should be completed first because Oxygen Plant #7 is designed for LD Converter #2 in order to supply oxygen.

Conclusion of the verification team

Issue is closed.

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 4 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.

Table 1. Baseline and projectline parameters

ID Number	Data variable	Units
	Baseline Emissions (BE), Project Emissions (PE)	Tonnes CO_2
B-1, P-1	Total Steel Output (TSO)	Tonnes
B-2, P-2	Total CO2 of Pig Iron (TCPI)	Tonnes CO_2
B-3, P-3	Total CO2 from Fuel Consumption in	Tonnes CO_2

	Pig Iron production (TCFCPI)	
B-4, P-4	Percentage of Total amount of Pig Iron Produced Used in project Steel Making Activity (PII)	share
B-5, P-5	Total Pig Iron Input into Steel Making Process (TPII)	Tonnes
B-6, P-6	Total Pig Iron Produced (TPIP)	Tonnes
B-7, P-7	Quantity of each fuel (fpi) used in making Pig Iron (Q_{fpi})	m^3, 1000 m^3
B-8, P-8	Emission factor of each fuel (fpi) EF_{fpi}	Tonnes CO2 per m^3
B-9, P-9	Total CO2 from Electricity used in Pig Iron production (TCEPI)	Tonnes CO_2
B-10, P-10	Electricity Consumed in producing Pig Iron (ECPI)	MWh
B-11, P-11	Emissions Factor for Electricity Consumption in making Pig Iron (EFECPI)	Tonnes CO_2/Mwh
B-12, P-12	Total CO2 from inputs into Pig Iron (TCIPI)	Tonnes CO_2
B-13, P-13	Total Carbon from Fuel Consumption in Sintering (TCFIO)	Tonnes CO_2
B-14, P-14	Quantity of each fuel (fio) used in Sintering (Q_{fio})	m^3
B-15, P-15	Emission factor of each fuel in Sintering (fio) EF_{fio}	m^3
B-16, P-16	Total CO2 from Electricity used in Sintering (TCEIO)	Tonnes CO_2
B-17, P-17	Electricity Consumed in Sintering (ECIO)	MWh
B-18, P-18	Emissions Factor for Electricity Consumption in Sintering (EFECIO)	Tonnes CO_2/MWh
B-19, P-19	Total CO2 from Reducing Agents (TCRAPI)	Tonnes CO_2
B-20, P-20	Total CO2 from limestone (TCLPI) in Pig Iron production	Tonnes CO_2
B-21, P-21	Total CO2 from steam production in Pig Iron Production (TCSPI)	Tonnes CO_2
B-22, P-22	Quantity of each fuel (fspi) used in steam production in Pig Iron Production (Q_{fspi})	m^3
B-23, P-23	Emission factor of each fuel in steam production (fspi) EF_{fspi}	Tonnes CO_2 per m^3
B-24, P-24	Total CO2 emissions from the furnace process (TCFP)	
B-25, P-25	Total CO2 emissions from fuel consumptions in the furnace process	Tonnes CO_2

	(TCFCFP)	
B-26, P-26	Quantity of each fuel (ffp) used in furnace process (Q_{ffp})	m^3
B-27, P-27	Emission factor of each fuel in furnace process (ffp) EF_{ffp}	Tonnes CO_2 per m^3
B-28, P-28	Total CO2 emissions from electricity consumption in the furnace process (TCECFP)	Tonnes CO_2
B-29, P-29	Electricity Consumed in furnace process (ECFP)	MWh
B-30, P-30	Emissions Factor for Electricity Consumption in furnace process (EFECFP)	Tonnes CO_2/MWh
B-31, P-31	Total CO2 emissions from inputs to the furnace process (TCIFP)	Tonnes CO_2
B-32, P-32	Total CO2 from Argon entering the furnace (TCAFP)	Tonnes CO_2
B-33, P-33	Total CO2 from steam production in furnace process (TCSFP)	Tonnes CO_2
B-34, P-34	Quantity of each fuel (fsp) used in steam production in furnace process (Q_{fsp})	m^3
B-35, P-35	Emission factor of each fuel in furnace process (fsp) EF_{fsp}	Tonnes CO_2 per m^3
B-36, P-36	Total CO2 from compressed air production in furnace process (TCCAFP)	Tonnes CO_2
B-37, P-37	Quantity of each fuel (fca) used in compressed air production in furnace process (Q_{fca})	m^3
B-38, P-38	Emission factor for each fuel in furnace process (fca) EF_{fca}	Tonnes CO_2 per m^3
B-39	Electricity Consumed in making compressed air for the furnace process in steel making (ECCA)	MWh
B-40	Emissions Factor for Electricity Consumption (EFECCA)	Tonnes CO_2/MWh
B-41, P-41	Total CO2 from oxygen production (TCOFP)	Tonnes CO_2
B-42, P-42	Quantity of each fuel (fop) used in oxygen production (Q_{fsp})	m^3
B-43, P-43	Emission factor of each fuel in oxygen production (fop) EF_{fop}	Tonnes CO_2 per m^3
B-44, P-44	Electricity Consumed in making oxygen (ECOP)	MWh
B-45, P-45	Emissions Factor for Electricity Consumption in making oxygen	Tonnes CO_2/MWh

	(EFECOP)	
B-46, P-46	Total CO2 from limestone for furnace process (TCLFP)	Tonnes CO_2
B-47	Total CO2 from blooming (TCBM)	Tonnes CO_2
B-48	Total CO2 from fuel consumption in blooming (TCFCBM)	Tonnes CO_2
B-49	Quantity of each fuel (fbm) used in blooming (Q_{fbm})	m^3
B-50	Emission factor of each fuel in blooming (fbm) EF_{fbm}	Tonnes CO_2 per m^3
B-51	Total CO2 from electricity consumption in blooming (TCECBM)	Tonnes CO_2
B-52	Electricity Consumed in blooming (ECBM)	MWh
B-53	Emissions Factor for Electricity Consumption in blooming (EFECBM)	Tonnes CO_2/MWh
P-39	Electricity Consumed in making compressed air for the furnace process (ECCA)	MWh
P-40	Emission Factor for Electricity Consumption in compressed air production (EFECCA)	Tonnes CO_2/MWh
P-47	Total CO2 from casting (TCBM)	Tonnes CO_2
P-48	Total CO2 from fuel consumption in casting (TCFCBM)	Tonnes CO_2
P-49	Quantity of each fuel (fbm) used in casting (Q_{fbm})	m^3
P-50	Emission factor of each fuel used in casting (fbm) EF_{fbm}	Tonnes CO_2 per m^3
P-51	Total CO2 from electricity consumption in casting (TCECBM)	Tonnes CO_2
P-52	Electricity Consumed in casting (ECBM)	MWh
P-53	Emissions Factor for Electricity Consumption in casting (EFECBM)	Tonnes CO_2/MWh

According to the PDD version 4 during verification the AIE has to check the specific consumption of pig iron consumed during the monitoring period and compare it with the calculations provided in the Project Design Document. The amount of total pig iron input into steel making process stated in PDD version 4 is 4 447 326/4 = 1 111 831,5 t while the monitoring report states the number of 572 891 t. (The difference is explained by the sluggish situation on the steel market due to the global economic crisis.) The amount of total steel output calculated in PDD version 4 is 4 944 000/4 = 1 236 000 t while the monitoring report states the number of 613 533 t. The pig iron specific consumption in 2008 was

0,93 but initial calculations in the PDD gave specific consumption 0,89. The increase of the pig iron specific consumption was explained by the use of Convertors instead of the open hearth furnaces.

3.3.2 Findings

None.

3.3.3 Conclusion

The project complies with the requirements.

3.4 Environmental and Social Indicators

3.4.1 Discussion

The project activity is an energy efficient project which saves consumption of natural gas and coke oven gas as well as coal and coke. During the monitoring period, significant amount of fossil fuel and electricity, that would have been required if the project had not been implemented, has been saved.
This project, by reducing GHG emissions, contributes towards a better environment. Project implementation will lead to increase of payments to the budgets of all levels for social needs, prevention of reduction of working places and better working conditions at Still Mill.
After modernization AISW became the most Integrated Steel Producer based on Converter Steel Making in Ukraine. This has large demonstration effect for other Ukrainian Steel Mills. Also see Clarification Request 1.

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

Data is collected into electronic database of OJSC “AISW” as well as in paper format. Data is further compiled in day-to-day records and annual records. All records are finally stored in Planning Department.
The performance of the measurements is being used by relevant services and technical personnel of the iron works. They will be considered in the technological instructions for the regimes of conducting the technological processes and in the revision of Guiding Metrological Instructions.

3.5.2 Findings

None.

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

The reporting procedures reflect the monitoring plan completely. It is confirmed that the monitoring report does comply with the monitoring methodology and PDD.
All parameters were determined as prescribed. The complete data is stored electronically and documented. The necessary procedures have been defined in internal procedures.
According to PDD version 4, emission reductions during first quarter of 2009 monitoring period were expected to be 219 366 t CO2 e. According to Monitoring Report emission reductions achieved are 264 150 t CO2 e. The difference in the emission reductions is explained as follows. The project was operational for the whole monitoring period, and emission reduction was considered for the whole period. However the amount of emission reductions presented in the PDD is stated for the whole 2009 year. In order to compare data from the PDD with the one from Monitoring Report verification team divided the amount of ERU's from PDD on four (because monitoring period is ¼ of the whole year). At the same time the amount od ERU's according to PDD does not account seasonal, technological or other fluctuations in the production that influence project activity.

3.6.2 Findings

Clarification Request (CL) 2
Please provide information on the amount of ERU's for the 1 quarter of 2009 according to the calculations in PDD.

Response

Market situation influences on the manufacturing of steel, assortment of steel and also on the emission reductions of CO2. Taking into account that calculations of both baseline and projectline are based on the real data of fuel and raw materials consumption, as methodology requires, the amount of emission reductions is purely based on the market situation.
Besides, since crisis has provoked the fall of output it reflected on baseline and projectline. Because AISW didn't work at full capacity, this has caused certain fluctuations in fuel and raw materials consumption, as can be seen from given calculations of the first quarter of 2009, these calculations reflected stronger than initially envisaged in PDD on baseline scenario. However, all this fluctuations are determined by market and are not beyond project owner and developers control.

Conclusion of the verification team

Issue is closed.

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.
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.

The project error can be calculated from the two error components described above. The total project error (Standard Error, SE) can be calculated by taking the square root of the sum of the squares of the individual error components, as below:
$SE = \sqrt{[(\text{measurement error})^2 + (\text{stipulation error})^2]}$

The monitoring plan developed for this project does not rely on any estimates and is therefore free of any stipulation errors.

Thus, $SE = \sqrt{[(\text{measurement error})^2 + (0)^2]} = (\text{measurement error})$

Project consists of the 53 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. Data correction regarding accuracy of the meters was checked onsite and found to be adequate.

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 Chief Metrological Specialist of the AISW is in charge for maintenance of the monitoring equipment and installations as well as for their accuracy required Regulation PP 229-Э-056-863/02-2005 “On metrological services of the iron works” and on Guiding Metrological Instructions. In case of defect is discovered in the monitoring equipment the actions are determined in Guiding Metrological Instructions. The

measurements are conducted on continuous basis and automatically.

Data is collected into electronic database of AISW as well as in paper format. Data is further compiled in day-to-day records and annual records. All records are finally stored in Planning Department.
The results of the measurements are being used by relevant services and technical personnel of the iron works. They are reflected in the technological instructions for the regimes of conducting the technological processes and in the revision of Guiding Metrological Instructions.
The data are cross checked as well as internal audits and corrective actions are taken as defined in Instructions. For the project case, similar procedures are followed and based on Orders of Director General of the Plant. Responsibilities for JI monitoring are indicated in table, which can be given additionally.
To operate the project equipment the direction of OJSC "AISW" organized regular training sessions and staff training. Thus, for operating Slab Casters and LD Converters the trainings were conducted at the neighboring plants and also abroad. With the introduction of project equipment the workers of OJSC "AISW" are having the opportunity to update their working skills, which are stimulated by the permanent educational, theoretical and practical courses at the Steel Plant. The information about the trainings and courses of professional development can be given additionally.

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

Risk Areas		Conclusions			Summary of findings and comments
		Baseline Emissions	Project Emissions	Calculated Emission Reductions	
	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 1ST QUARTER 2009 PERIODIC VERIFICATION STATEMENT

Bureau Veritas Certification has performed a verification of the JI project "Revamping and Modernization of the Alchevsk Steel Mill". 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 "AISW" 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 04. 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 Quarterly Monitoring Report of the JI project 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. 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 01/01/2009 to 31/03/2009
Baseline emissions : 1 763 888 t CO2 equivalents.
Project emissions : 1 499 738 t CO2 equivalents.
Emission Reductions : 264 150 t CO2 equivalents.

6 REFERENCES

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

/1/ Project Design Document, version 04 dated 30 of March 2008

/2/ Quarterly Monitoring Report

/3/ Quarterly Monitoring Report version#2 submitted 17.10.2009

/4/ Verification Report on Early Credits # 0007/2008 by Bureau Veritas Certification Holding SAS, dated 1 December 2008

/5/ Verification Report #UKRAINE- VER#/0024/2008 dated 29 of May 2009

/6/ Determination Report by the TÜV Süddeutschland #947241, Germany, dated 25 of May 2004

/7/ Letter of Approval of National Ecological Investment Agency of Ukraine, № 540/23/07 from 29.07.2008

/8/ Approval of Voluntary participation in a Joint Implementation project of Ministry of Economical Affairs in Netherlands №2007JI03, dated 25 of October 2007

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/ Ageeva Valentina, Deputy Head of Environmental Prc.

/2/ Belakh Olga, Head of Planning & Economy Department

/3/ Bremze Georgy, Deputy Energetic General

/4/ Fokin Igor, Deputy Energetic General

/5/ Kosenko Evgeniy, Chief Master

/6/ Masula Vyacheslav, Acting Head engineer

/7/ Menyailo Valentin, Head of Safety Department

/8/ Pashenko Mykola, Engineer-metrologist

/9/ Pavlonikov Valery, Capital Construction - Head of Unit

/10/ Poyanov Maksym, Master of Measuring Systems Calculation

/11/ Prutkov Genadiy, Human Resources Deputy Director

/12/ Sidorov Pavel, Metrologist General, Shop PSI Head

/13/ Zinovyev Aleksandr, Head of the bureau of metallurgic constructions, Production department.

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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	/7/	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, Mr. Oleg Skoblyk, Auditor, Bureau Veritas Ukraine, Kateryna Zinevych, Auditor, Bureau Veritas Ukraine. Interviewed persons: Alchevsk Iron & Steel Works: Ageeva Valentina, Deputy Head of Environmental Prc. Belakh Olga, Head of Planning & Economy Department Bremze Georgy, Deputy Energetic General Fokin Igor, Deputy Energetic General Kosenko Evgeniy, Chief Master Masula Vyacheslav, Acting Head engineer Menyailo Valentin, Head of Safety Department Pashenko Mykola, Engineer-metrologist Pavlonikov Valery, Capital Construction - Head of Unit	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		Poyanov Maksym, Master of Measuring Systems Calculation Prutkov Genadiy, Human Resources Deputy Director Sidorov Pavel, Metrologist General, Shop PSI Head Zinovyev Aleksandr, Head of the bureau of metallurgic constructions, Production department.	
1.2. Clarification of access to data archives, records, plans, drawings etc.	/2/	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	/2,7/	Project has been implemented as defined in the PDD version 4 and the implementation is evidenced by statements of work completion.	OK
1.4. Actual status of installation works	/2/	The project was started in 2005 with introduction of the first Slab Caster. According to the investment plan, the following major stages of project implementation have been envisaged: Phase 1: Installation of Slab Caster #1 along with Ladle-Furnace; Phase 2: Installation of Slab Caster #2 along with Vacuumator; Phase 3: Installation of LD Converter #2; Phase 4: Installation of LD Converter #1; Phase 5: Reconstruction of Oxygen Plant #4; Phase 6: Installation of Oxygen Plant #7; Phase 7: Installation of Oxygen Plant #8. Phases 5-7 consists in implementation of secondary units in the metallurgical process, which are indissolubly linked with	

Objective	Reference	Comments	Conclusion (CARs/FARs)
		the main steel production units (Phases 1-4). Thus, Phases 5-7 are indissolubly linked with Phases 1-4. By the end of 2007 only first two stages (Phases) were completed. The Slab Caster #1 was put into operation in August 2005 and Slab Caster # 2 - in March 2007. Phase 3 was completed in January 2008 when LD Converter #2 was launched. LD Converter #1 started operation in September 2008 (Phase 4 was completed). However then, in about a month, LD Converter #1 has stopped its operation because of impact of the financial and economical crisis. LD Converter #1 was launched again in March 2009. Thus, in the reporting period LD Converter #1 was operational for only one month. Phase #5 was completed on 30th of September 2005 (almost together with Slab Caster-1). Phase #6 was completed on 19th of March 2008. Phase #7 is at the final stage of completion (must be completed in the 3rd quarter of 2009). Such delay is caused by the influence of financial and economical crisis, because the Steel Mill is not operating at full capacity and there is no need to produce big volumes of oxygen. <u>Clarification Request (CL) 1</u> The PDD version 4 states that phase 3 was supposed to be completed in the third quarter of 2007 while the Monitoring Report says it was completed in January 2008, also	CL1

Objective	Reference	Comments	Conclusion (CARs/FARs)
		according to the PDD phase 6 was supposed to be completed in the 2-3 quarter of 2007 while MR states that it was completed on 19th of March 2008. While the delay of completeness phase 7 is properly described there is no explanation of the deviation in implementation phases 3 and 6. Please provide necessary clarification.	
2. Open issues indicated in validation report			
2.1. Missing steps to final approval	/5,6/	Based on the validation report the verification team identified no missing steps. The project has been approved by both NFPs.	OK
3. Implementation of the project			
3.1. Physical components	/2/	The project was started in 2005 with introduction of the first Slab Caster. According to the investment plan, the following major stages of project implementation have been envisaged: Phase 1: Installation of Slab Caster #1 along with Ladle-Furnace; Phase 2: Installation of Slab Caster #2 along with Vacuumator; Phase 3: Installation of LD Converter #2; Phase 4: Installation of LD Converter #1; Phase 5: Reconstruction of Oxygen Plant #4; Phase 6: Installation of Oxygen Plant #7;	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		Phase 7: Installation of Oxygen Plant #8. Phases 5-7 consists in implementation of secondary units in the metallurgical process, which are inseparably linked with the main steel production units (Phases 1-4).	
3.2. Project boundaries	/1/, /2/, /3/, /4/	Yes, the project boundaries are as defined in the PDD version 4.	OK
3.3. Emission reductions achieved	/2/	In the PDD version 4 it is stated that emission reduction units in 2009 are supposed to be 877 465 t CO_2 while the Monitoring Report says the amount of ERU's achieved in first quarter of 2009 is 264 150 t CO_2. Clarification Request (CL) 2 Please provide information on the amount of ERU's for the 1 quarter of 2009 according to the calculations in PDD.	CL2
3.4. Monitoring and metering systems	/2/	The monitoring procedures for the most part are straightforward in term of what AISW already does to collect energy consumption data and measure inputs and outputs within certified to ISO 9001 Quality Management System. Three set of instructions at the AISW regulate the monitoring procedures and responsibilities. They are called Guiding Metrological Instructions: 1) "Metrological product quality assurance" (RMI-I-19.0.1-07) 2) "Metrological expertise of documentation" (RMI-I-19.0.2-07)	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		3) “Management of measurement technique” (RMI-I-19.1.1-07) The procedures for calibration of all monitoring equipment are described in RMII.19.0.1-07 and RMI-I.19.1.1-07. The above mentioned instructions also secure the traceability of monitoring/metering devices.	
3.5. Data uncertainty	/2/	Best available techniques are used in order to minimize uncertainties. Uncertainties are generally low. All the equipment used for monitoring purposes is in line with national legislative requirements and standards; this ensures that uncertainties are accounted in data collected. Supporting documents that demonstrate how the level of uncertainty is calculated are presented (see list of SD). Monitoring equipment is controlled by ISO 9001 procedures.	
3.6. Calibration and quality assurance	/2/	All monitoring equipment is part of detailed calibration plan. The procedures for calibration of all monitoring equipment are described in RMII. 19.0.1-07 and RMI-I.19.1.1-07. On the date of verification, Calibration records of the measuring and monitoring equipment has been verified at site. All the meters have been found to be calibrated regularly as per determined calibration plan for each shop. Corrective Action Request (CAR) 1 The List of measuring and monitoring equipment provided	CAR1

Objective	Reference	Comments	Conclusion (CARs/FARs)
		by the project developer differs a lot from the one presented to the verification team onsite by the project participant. Please clarify the difference and correct the wrong version.	
3.7. Data acquisition and data processing systems	/2/	Data is collected into electronic database of AISW as well as in paper format. Data is further compiled in day-to-day records and annual records. All records are finally stored at the Planning Department.	OK
3.8. Reporting procedures	/2/	The Monitoring Plan defines the responsibilities to consolidate the data required for emission reduction calculations. According to PDD version 4 the general coordination and reporting of the monitoring is responsibility of Chief Energy Specialist.	OK
3.9. Documented instructions	/2/	Section 8 of the Monitoring Report. Data processing and archiving (including software used) of the Monitoring Report provides with the necessary information relating the procedures for the monitoring, measurements and reporting. These were verified onsite and found satisfactory.	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
3.10. Qualification and training	/2/	Verification report of the initial and first periodic verification contained one Forward Action Request (FAR), which requested inclusion of the information considering qualification and training of the staff to the next Monitoring Report. During interviews onsite training was checked and found adequate and the information on training was included to the Monitoring Report. To operate the project equipment the direction of OJSC "AISW" organized regular training sessions and staff training. Thus, for operating Slab Casters and LD Converters the trainings were conducted at the neighbouring plants and also abroad. With the introduction of project equipment the workers of OJSC "AISW" are having the opportunity to update their working skills, which are stimulated by the permanent educational, theoretical and practical courses at the Steel Plant. The information about the trainings and courses of professional development can be given additionally.	OK
3.11. Responsibilities	/2/	The Chief Metrological Specialist of the AISW is in charge for maintenance of the monitoring equipment and installations as well as for their accuracy required Regulation PP 229-Э-056-863/02-2005 "On metrological services of the iron works" and on Guiding Metrological	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		Instructions.	
3.12. Troubleshooting procedures	/2/	In case of defect is discovered in the monitoring equipment the actions are determined in Guiding Metrological Instructions. The measurements are conducted on continuous basis and automatically.	OK
4. Internal Data			
4.1. Type and sources of internal data	/2/	The internal parameters are obtained according to the monitoring plan: Monitoring report, section 6 contains internal parameters that are monitored.	OK
4.2. Data collection	/2/	Data is collected into electronic database of AISW as well as in paper format. Data is further compiled in day-to-day records and annual records. All records are finally stored in Planning Department. The results of the measurements are being used by relevant services and technical personnel of the iron works. They will be reflected in the technological instructions for the regimes of conducting the technological processes and in the revision of Guiding Metrological Instructions.	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
4.3. Quality assurance	/2/	Section 9 of the Monitoring Report. The data will be cross checked as well as internal audits and corrective actions are taken as defined in Instructions. For the project case, similar procedures will followed based on forthcoming Order of Director General of the Plant defining the exact JI monitoring procedures. Responsibilities for JI monitoring are indicated in table 6 of the PDD version 4. Within the management system measures are foreseen for the data obtained during the period when monitoring equipment is failed.	OK
4.4. Significance and reporting risks	/2/	In case of defect is discovered in the monitoring equipment the actions are determined in Guiding Metrological Instructions. The measurements are conducted on continuous basis and automatically.	OK
5. External Data			
5.1. Type and sources of external data	/2/	The external parameters are obtained according to the monitoring plan: Monitoring report, section 6 contains external parameters that are monitored.	OK
5.2. Access to external data	/2/	The external parameters are obtained according to the monitoring plan: Monitoring report, section 6 contains external parameters that are monitored.	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
5.3. Quality assurance	/2/	See section 5.1. of this protocol.	OK
5.4. Data uncertainty	/2/	See section 5.1. of this protocol.	OK
5.5. Emergency procedures	/2/	See section 5.1. of this protocol.	OK
6. Environmental and Social Indicators			
6.1. Implementation of measures	/2/	The project activity is an energy efficient project which saves consumption of natural gas and coke oven gas as well as coal and coke. During the monitoring period, significant amount of fossil fuel and electricity, that would have been required if the project had not been implemented, has been saved. This project, by reducing GHG emissions, contributes towards a better environment. Project implementation will lead to increase of payments to the budgets of all levels for social needs, prevention of reduction of working places and better working conditions at Still Mill. After modernization AISW became the most Integrated Steel Producer based on Converter Steel Making in Ukraine. This has large demonstration effect for other Ukrainian Steel Mills. Also see Clarification Request 1.	OK
6.2. Monitoring equipment	/2/	See section 6.1. of this protocol	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
6.3. Quality assurance procedures	/2/	See section 6.1. of this protocol	OK
6.4. External data	/2/	See section 6.1. of this protocol	OK
7. Management and Operational System			
7.1. Documentation	/2/	The company complies with all legal and statutory requirements of the Ukraine and the same were made available to the verification team. AISW has all the necessary permissions and licenses, issued by the State Inspection on Labor Safety.	OK
7.2. Qualification and training	/2/	See section 3.9 of this protocol.	OK
7.3. Allocation of responsibilities	/2/	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	/2/	The emergency procedures with respect to operation controls are available in data control	OK
7.5. Data archiving	/2/	Data are archived in the physical and electronic forms and then stored at Planning Department.	OK
7.6. Monitoring report	/2/	Data information is laid down in the monitoring report.	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
7.7. Internal audits and management review	/2/	The data is cross checked as well as internal audits and corrective actions are taken as defined in Instructions. For the project case, similar procedures are followed based on the Order of Director General of the Plant defining the exact JI monitoring procedures. Responsibilities for JI monitoring are indicated in table 6 of the PDD version 4.	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	The Chief Metrological Specialist of the AISW is in charge for maintenance of the monitoring equipment and installations as well as for their accuracy required Regulation PP 229-Э-056-863/02-2005 “On metrological services of the iron works” and on Guiding Metrological Instructions.
1.2. Responsibilities	Full	The Chief Metrological Specialist of the AISW is in charge for maintenance of the monitoring equipment and installations as well as for their accuracy required Regulation PP 229-Э-056-863/02-2005 “On metrological services of the iron works” and on Guiding Metrological Instructions.
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 4. The uploaded version of PDD version 4 is publicly available at the site http://ji.unfccc.int/JIITLProject/DB/V75OZ8TQOFTB325LEDMXE2628ZD548/de

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
		tails where it was placed during determination process. The monitoring methodology developed for specifically for this project was used in monitoring process.
2.2. Necessary Changes	Full	By the end of 2007 only first two stages (Phases) of the implementation plan presented in the PDD version 4 were completed. The Slab Caster #1 was put into operation in August 2005 and Slab Caster # 2 - in March 2007. Phase 3 was completed in January 2008 when LD Converter #2 was launched. LD Converter #1 started operation in September 2008 (Phase 4 was completed). However then, in about a month, LD Converter #1 has stopped its operation because of impact of the financial and economical crisis. LD Converter #1 was launched again in March 2009. Thus, in the reporting period LD Converter #1 was operational for only one month. Phase #5 was completed on 30th of September 2005 (almost together with Slab Caster-1). Phase #6 was completed on 19th of March 2008. Phase #7 is at the final stage of completion (must be completed in the 3rd quarter of 2009). Such delay is caused by the influence of financial and economical crisis, because the Steel Mill is not operating at full capacity and there is no need to produce big volumes of oxygen.
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 is collected into electronic database of AISW as well as in paper format. Data is further compiled in day-to-day records and annual records. All records are finally stored in Planning Department. The results of the measurements are being used by relevant services and technical personnel of the iron works. They will be reflected in the technological instructions for the regimes of conducting the technological processes and in the revision of Guiding Metrological Instructions.
3.3. Data transfer	Full	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. List of documents verified onsite is attached to the Verification report.
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 4.

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
4.2. Calibration/maintenance	Full	The company maintains the elaborate 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 complying with the plan.
5. GHG Calculations		
5.1. Use of estimates and default data	Full	Emission factor of each fuel in Pig Iron Production, Emissions Factor for Electricity Consumption in Pig Iron Production, Emission factor of each fuel in Sintering, Emissions Factor for Electricity Consumption in Sintering, Emission factor of each fuel in used in steam production, Emission factor of each fuel in the furnace process, Emissions Factor for Electricity Consumption in the furnace process, Emission factor of each fuel in the furnace process, Emission factor of each fuel in compressed air production, Emissions Factor for Electricity Consumption in compressed air production, Emission factor of each fuel in oxygen production, Emissions Factor for Electricity Consumption in making oxygen, Emission factor of each fuel used in casting, Emissions Factor for Electricity Consumption in casting are used as a predetermined default value which have been defined in the PDD version 4 and confirmed during validation of the project.
5.2. Guidance on checks and reviews	Full	The data is cross checked as well as internal audits and corrective actions were taken as defined in Instructions were verified. For the project case, procedures are followed based on the Order of Director General of the Plant defining the exact JI monitoring procedures. Responsibilities for JI monitoring

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
		are indicated in table 6 of the PDD version 4. Information obtained during site-visit was analyzed with the view of technological requirements, legal requirements and general home situation.
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.
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 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 4as 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
Corrective Action Request (CAR) 1 The List of measuring and monitoring equipment provided by the project developer differs a lot from the one presented to the verification team onsite by the project participant. Please clarify the difference and correct the wrong version.	3.6	Obviously at the plant the verifier has seen documents related to the all monitoring equipment and devices even though some of them are not related with the carbon emissions. However we believe that such a situation does not represent any problem because calculations and monitoring of carbon emissions for the JI project is fully based and depending on requirements of PDD and on data that are anyway monitored on routine basis at Alchevsk Iron and Steel Mill in compliance with national standards. At the same time, according to the CAR1, project developers and Alchevsk Iron and Steel Mill prepared updated List of measuring and monitoring equipment (available upon request) fully in compliance with all	Updated List of Monitoring and Measuring equipment was analyzed and found adequate. Closed.

Report clarifications and corrective action requests	Ref. to checklist question in tables 2/3	Summary of project owner response	Verification conclusion
		the requirements mentioned in the PDD.	
Clarification Request (CL) 1 The PDD version 4 states that phase 3 was supposed to be completed in the third quarter of 2007 while the Monitoring Report says it was completed in January 2008, also according to the PDD phase 6 was supposed to be completed in the 2-3 quarter of 2007 while MR states that it was completed on 19th of March 2008. While the delay of completeness phase 7 is properly described there is no	1.4	The introduction with delay of Converter #2 (phase #3) was caused by several factors: financial, technical, technological, customs problems and also by declines in schedules of delivery of equipment and materials. The delay of implementation of phase #6 is caused by the same reasons as phase #3 and in order to accomplish phase #6, phase #3 should be completed first because Oxygen Plant #7 is designed for LD Converter #2 in order to supply oxygen.	Monitoring Report was updated. Explanation is accepted. Closed.

Report clarifications and corrective action requests	Ref. to checklist question in tables 2/3	Summary of project owner response	Verification conclusion
explanation of the deviation in implementation phases 3 and 6. Please provide necessary clarification.			
Clarification Request (CL) 2 Please provide information on the amount of ERU's for the 1 quarter of 2009 according to the calculations in PDD.	3.3	Market situation influences on the manufacturing of steel, assortment of steel and also on the emission reductions of CO2. Taking into account that calculations of both baseline and projectline are based on the real data of fuel and raw materials consumption, as methodology requires, the amount of emission reductions is purely based on the market situation. Besides, since crisis has provoked the fall of output it reflected on baseline and projectline. Because AISW didn't work at full capacity, this has caused certain fluctuations in fuel and raw	Monitoring Report was updated. Explanation is accepted. Closed.

Report clarifications and corrective action requests	Ref. to checklist question in tables 2/3	Summary of project owner response	Verification conclusion
		materials consumption, as can be seen from given calculations of the first quarter of 2009, these calculations reflected stronger than initially envisaged in PDD on baseline scenario. However, all this fluctuations are determined by market and are not beyond project owner and developers control.	

APPENDIX B: VERIFICATION TEAM

The verification team consists of the following personnel:

Flavio Gomes, M.Sci. (civil engineering)

Team Leader

Bureau Veritas Certification, Climate Change Verifier
Flavio Gomes is a Chemical and Safety Engineer graduated from «UNICAMP – Universidade Estadual de Campinas», with a MSc title in Civil Engineer (Sanitation). He spent four years at RIPASA Pulp and Paper as Environmental Process Engineer. He is, since 2006 the Global Manager for Climate Change. Previously and since 1997, he was senior consultant for Bureau Veritas Consulting in fields of Environment, Health, Safety, Social Accountability and Sustainability audit and management systems. He also acted as Clean Development Mechanism verifier, and Social/Environmental Report auditor, in the name of Bureau Veritas Certification. Flavio is pursuing his PhD on Energy Management at the Imperial College – London.

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

Bureau Veritas Ukraine HSE Department manager.

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 130 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 validation of 6 JI projects.

Kateryna Zinevych, M.Sci. (environmental science)
Team member

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 5 JI projects.

Oleg Skoblyk, Specialist (Energy Management)
Team member

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 3 JI projects.

Ashok Mammen - PhD (Oils & Lubricants)

Bureau Veritas Certification Internal reviewer
Over 20 years of experience in chemical and petrochemical field. Dr. Mammen is a lead auditor for environment, safety and quality management systems and
a lead verifier for GHG projects. He has been involved in the validation

and verification processes of more than 60 CDM/JI and other GHG projects.

APPENDIX C: DOCUMENTS CHECKED DURING VERIFICATION

1. Photo, factual calculation for March 2009 at the blast-furnace workshop for pig iron
2. Photo, balance of the natural gas at the field for March 2009
3. Photo, balance of the coke oven gas at the field for March 2009
4. Photo, balance of the oxygen at the field for March 2009
5. Photo, diagaram of the natural gas usage dated 10.03.2009
6. Photo, diagaram of the coke oven gas usage dated 10.03.2009
7. Photo, diagaram of the natural gas usage dated 07.03.2009
8. Photo, screenshot of the meters data for 16.03.2009
9. List of monitoring and measuring equipment