JI VERIFICATION REPORT

- 2ND PERIODIC –

JSC "ZAPORIZHSTAL"

"RECONSTRUCTION OF THE OXYGEN COMPRESSOR PLANT AT THE JSC "ZAPORIZHSTAL", UKRAINE"

Monitoring period: 01.01.2009 – 31.12.2009

Report No: 8000377391 – 10/151

Date: 2010-04-19

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Verification Report:	***Report No.***	***Rev. No.***	***Date of 1st issue:***	***Date of this rev.***
	80003777391	0	2010-04-19	2010-04-19
Project:	***Title:***		***Registration date:***	***UNFCCC-No.:***
	"Reconstruction of the Oxygen Compressor plant at the JSC "Zaporizhstal" Ukraine"		2009-12-14 (as per HCA)	N/A Track I project
Project Participant(s):	***Host party:***		***Other involved parties:***	
	Ukraine			
Applied methodology/ies:	***Title:***		***No.:***	***Scope:***
	Project specific methodology		N/A	3
Monitoring:	***Monitoring period (MP):***		***No. of days:***	***MP No.***
	Monitoring period: 01.01.2009 – 31.12.2009		365	1
Monitoring report:	***Title:***		***Draft version:***	***Final version:***
	"Reconstruction of the oxygen compressor plant at the JSC "Zaporizhstal" Ukraine"		Version 1 2010-01-15	Version 2 2010-04-14
Verification team / Technical Review and Final Approval	***Verification Team:***		***Technical review:***	***Final approval:***
	Eric Krupp Evgeni Sud		Lars Kirchner	Rainer Winter
Emission reductions: [t CO_{2e}]	***Verified amount:***			
	130,132.4			

Summary of Verification Opinion:

TÜV NORD JI/CDM Certification Program (CP) has been commissioned to carry out the 2nd periodic verification of the project "Reconstruction of the Oxygen Compressor plant at the JSC "Zaporizhstal" Ukraine" with regard to the relevant requirements for JI project activities.

The project activity involves reconstruction of the air oxygen compressor plant. The reconstruction resulted in the decrease of the electricity consumption and the corresponding amount of the GHG emissions as compared to the situation that would occur otherwise.

This verification covers the period from 2009-01-01 to 2009-12-31 (including both days). In the course of the verification 3 Corrective Action Requests (CAR) were raised and successfully closed. No Clarification Requests (CR) and no Forward Action Requests (FAR) have been raised.

The verification is based on the monitoring report (dated: 2010-01-15/MR-1/), final monitoring report (dated: 2010-04-14/MR/) the monitoring plan as set out in the registered PDD, the determination report/DR/, emission reduction calculation spreadsheet/XLS/ and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

As a result of this verification, the verification team confirms that:

- all operations of the project are implemented and installed as planned and described in the validated project design document
- the monitoring plan is in accordance with the validated project specific monitoring plan developed for this project activity
- the installed equipment essential for measuring parameters required for calculating emission reductions is verified appropriately
- the monitoring system is in place and functional. The GHG emission reductions were measured accurately.

As the result of the 2nd periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Baseline emissions:	**481,533.3**	t CO_{2e}
Project emissions:	**351,400.9**	t CO_{2e}
Leakage:	**-**	t CO_{2e}
Emission reductions:	**130,132.4**	t CO_{2e}

Document information:	*Filename:*	*Num. of pages:*
	2010-04-19 Final Verification Zaporozhstal_rev	52

Abbreviations:

CA	**Corrective Action / Clarification Action**
CAR	**Corrective Action Request**
CDM	**Clean Development Mechanism**
CER	**Certified Emission Reduction**
CO_2	**Carbon dioxide**
CO_{2eq}	**Carbon dioxide equivalent**
CR	**Clarification Request**
DH	**District Heating**
ER	**Emission Reduction**
ERU	**Emission Reduction Unit**
FAR	**Forward Action Request**
GHG	**Greenhouse gas(es)**
HCA	**Host Country Approval**
JI	**Joint Implementation**
JISC	**Joint Implementation Supervisory Committee**
MP	**Monitoring Plan**
MR	**Monitoring Report**
PDD	**Project Design Document**
PP	**Project Participant**
QA/QC	**Quality Assurance / Quality Control**
UNFCCC	**United Nations Framework Convention on Climate Change**
XLS	**Emission Reduction Calculation Spread Sheet**

Table of Contents *Page*

1. INTRODUCTION

TÜV NORD JI/CDM Certification Program (CP) has been commissioned to carry out the 2nd periodic verification of the project

"Reconstruction of the Oxygen Compressor plant at the JSC "Zaporizhstal" Ukraine"

with regard to the relevant requirements for JI project activities. The verifiers have reviewed the implementation of the monitoring plan (MP) in the positive validated JI project activity.

GHG data for the monitoring period covering: 01.01.2009 – 31.12.2009

was verified in detailed manner applying the set of requirements, audit practices and principles of the UNFCCC.

This report summarizes the findings and conclusions of this 2nd periodic verification of the above mentioned JI project activity.

1.1. Objective

The objective of the verification is the review and ex-post determination by an independent entity of the GHG emission reductions. It includes the verification of the:

- Implementation and operation of the project activity as given in the PDD,
- compliance with provisions of the monitoring plan,
- data given in the monitoring report by checking the monitoring records, the emissions reduction calculation and supporting evidence
- accuracy of the monitoring equipment
- quality of evidence
- significance of reporting risks and risks of material misstatements.

1.2. Scope

The verification of this registered project is based on the validated project design document/PDD/ including baseline, the monitoring report/MR/, emission reduction calculation spread sheet/XLS/, supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. Furthermore publicly available information was considered as far as available and required.

The verification is carried out on the basis of the following requirements, applicable for this project activity:

- Article 6 of the Kyoto Protocol /KP/,
- guidelines for the implementation of Article 6 of the Kyoto Protocol as presented UNFCCC/Kyoto Protocol requirements, in particular, the requirements of the JI as

set out in decision 9/CMP.1 the present annex and relevant decisions by the JISC,
- Host country legislation (Ukraine),
- monitoring plan as given in the registered PDD /PDD/,
- Applied project specific methodology which was positive validated in the course of determination PDD.
- other relevant rules,

2. GHG PROJECT DESCRIPTION

2.1. Project Characteristics

The project is carried out on the JSC "Zaporizhstal" - one of the largest metallurgical works in Ukraine. The project activity involves reconstruction of the air oxygen compressor plant. Oxygen is produced in air separation units installed in the premises of JSC "Zaporizhstal". Oxygen generated is used for production purposes – in particular in blast-furnace and open-hearth furnace for iron and steel smelting processes.

The installed oxygen compressor plant (OCP) is supplying oxygen in required level for pig iron and steel production. Also the project replaced the worn-out air-separation units. The reconstruction of OCP resulted in the decrease of the electricity consumption and the corresponding amount of the GHG emissions as compared to the situation that would occur otherwise.

Essential data of the project is presented in the following Table 2-1.

Table 2-1: Project Characteristics

Item	Data	
Project title	"Reconstruction of the Oxygen Compressor plant at the JSC "Zaporizhstal" Ukraine"	
Project size	☒ Large Scale ☐ Small Scale	
JI registration No.	Registered as per the Track I procedures	
Project Scope (according to UNFCCC sectoral scope numbers for JI)	3	Energy demand
Applied Methodology	Project specific methodology	

2.2. Involved Parties and Project Participants

The following parties to the Kyoto Protocol and project participants are involved in this project activity (Table 2-2).

Table 2-2: Project Parties and project participants

Characteristic	Party	Project Participant
Host party	Ukraine	JSC "Zaporizhstal"

2.3. Project Location

Project is located in the Ukraine.

The details of the project location are given in table 2-3:

No.	Project Scope
Host Country	Ukraine
Region:	Zaporizhzhya region
Project location address:	Zaporizhzhya
Latitude:	47°52' N.;
Longitude:	35°09' E.

2.4. Technical Project Description

Within the implementation of the project activity a new air separation unit has been installed at JSC "Zaporizhstal". The project has been commissioned in December 2007 and is already operational.

Furthermore there are three other existing air separation units currently installed at the plant. However these units are rather out-dated air separation constructed and commissioned approx. 25 years ago. However they have been appropriately maintained and are still in a working condition. For this reason the three out-dated air separation units will be kept only as reserve.

For detailed key parameters of the air separation Unit please refer to table 2-4-1:

Key parameters:	**Project Activity**	**Equipment kept as reserve**		
Ordinal Number:	**VRU-60**	**Kar-30**	**KtK-35-3**	**BR-2**
Manufacturer:	Air Liquide (France)	JSC "Kriogenmash" (Russia).	JSC "Kriogenmash" (Russia).	JSC "Kriogenmash" (Russia).
Type:	Air separation unit with **adjustable** capacity	Air separation unit with **non-adjustable** capacity	Air separation unit with **non-adjustable** capacity	Air separation unit with **non-adjustable** capacity
Capacity				
Capacity max	60.000 m^3/h	30.000 m^3/h	30.000 m^3/h	30.000 m^3/h
Capacity min	30.000 m^3/h			
Commissioning Date:	2007	1980	1976	1968
Operation	Main equipment	Reserved	Reserve	Reserved

3. METHODOLOGY AND VERIFICATION SEQUENCE

3.1. Verification Steps

The verification consisted of the following steps:

- Contract review
- Appointment of team members and technical reviewers
- Publication of the monitoring report
- A desk review of the Monitoring Report /MR/ submitted by the client and additional supporting documents with the use of customised verification protocol /CPM/ according to the Validation and Verification Manual /VVM/,
- Verification planning,
- On-Site assessment,
- Background investigation and follow-up interviews with personnel of the project developer and its contractors,
- Draft verification reporting
- Resolution of corrective actions (if any)
- Final verification reporting
- Technical review
- Final approval of the verification.

The verification of this project was carried out from March 2010 to April 2010.

3.2. Contract review

To assure that

- the project falls within the scopes for which accreditation is held,
- the necessary competences to carry out the verification can be provided,
- Impartiality issues are clear and in line with the JI requirements

a contract review was carried out before the contract was signed.

3.3. Appointment of team members and technical reviewers

On the basis of a competence analysis and individual availabilities a verification team, consistent of one team leader and 3 additional team members, was appointed. Furthermore also the personnel for the technical review and the final approval were determined.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the table 3-1 below.

Table 3-1: Involved Personnel

	Name	Company	Function [1)]	Qualification Status [2)]	Sectoral competence	Technical competence	Host country Competence	Controlling competence
☒ Mr. ☐ Ms.	Eric Krupp	TÜV NORD Cert GmbH	TL	SA	x		-	x
☒ Mr. ☐ Ms.	Evgeni Sud	TÜV NORD Cert GmbH	TM	E	x	x	-	-
☒ Mr. ☐ Ms	Lars Kirchner	TÜV NORD Cert GmbH	TR	E	x	x		x
☒ Mr. ☐ Ms.	Rainer Winter	TÜV NORD Cert GmbH	FA	SA	x	x	-	x

[1)] TL : Team Leader; TM : Team Member, TR: Technical review; FA: Final approval;

[2)] GHG Auditor Status: A : Assessor; E : Expert; SA: Senior Assessor; T : Trainee, TE: Technical Expert

3.4. Publication of the Monitoring Report

The monitoring reports, as received from the project participants, has been made publicly available on the TÜV Nord website[1].

[1] http://www.global-warming.de/e/1969/

3.5. Verification Planning

In order to ensure a complete, transparent and timely execution of the verification task the team leader has planned the complete sequence of events necessary to arrive at a substantiated final verification opinion.

Various tools have been established in order to ensure an effective verification planning.

Risk analysis and detailed audit testing planning

For the identification of potential reporting risks and the necessary detailed audit testing procedures for residual risk areas table A-1 is used. The structure and content of this table is given in table 3-2 below.

Table 3-2: Table A-1; Identification of verification risk areas

Table A-1: GHG calculation procedures and management control testing / Detailed audit testing of residual risk areas and random testing				
Identification of potential reporting risk	**Identification, assessment and testing of management controls**	**Areas of residual risks**	**Additional verification testing performed**	**Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)**
The following potential risks were identified and structured according to the possible areas of occurance.	*The potential risks of raw data generation have been identified in the course of the monitoring system implementation.* *The following measures were taken in order to minimize the corresponding risks.* *The following measures are implemented:*	*Despite the measures implemented in order to reduce the occurrence probability the following residual risks remain and have to be addressed in the course of every verification.*	*The additional verification testing performed is described. Testing may include:* - *Sample cross checking of manual transfers of data* - *Recalculation* - *Spreadsheet 'walk throughs' to check links and equations* - *Inspection of calibration and maintenance records for key equipment* - *Check sampling analysis results* *Discussions with process engineers who have detailed knowledge of process uncertainty/error bands.*	*Having investigated the residual risks, the conclusions should be noted here. Errors and uncertainties are highlighted.*

The completed table A-1 is enclosed in the annex (table A-1) to this report.

Project specific periodic verification checklist

In order to ensure transparency and consideration of all relevant assessment criteria, a project specific verification protocol has been developed. The protocol shows, in a transparent manner, criteria and requirements, means and results of the verification. The verification protocol serves the following purposes:

- It organises, details and clarifies the requirements a JI project is expected to meet for verification
- It ensures a transparent verification process where the verifying DOE documents how a particular requirement has been proved and the result of the verification.

The basic structure of this project specific verification protocol for the periodic verification is described in table 3-3.

Table 3-3: Structure of the project specific periodic verification checklist

Table A-2: Periodic Verification Checklist			
Expectations for GHG data management system/controls	***Comments***	***Draft Concl.***	***Final Concl.***
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.	*Description of circumstances and further commendation to the conclusion.*	*This is either acceptable based on review of MR and supporting Documents (**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 Draft Verification report. The Initial Verification has additional **Forward Action Requests (FAR)**. FAR indicates essential risks for further periodic verifications*	*CARs and CRs raised in the Draft Conclusion have to be closed or resolved. The final conclusion determines the final statement. FARs could remain in this section as they are subject in the next consecutive verification.*

The periodic verification checklist (verification protocol) is the backbone of the complete verification starting from the desk review until final assessment. Detailed assessments and findings are discussed within this checklist and not necessarily repeated in the main text of this report.

The completed verification protocol is enclosed in the annex (table A-2) to this report.

3.6. Desk review

During the desk review all documents initially provided by the client and publicly available documents relevant for the verification were reviewed. The main documents are listed below:

- the last revision of the PDD including the monitoring plan/PDD/,
- the last revision of the determination PDD report/DR/,
- the monitoring report including the claimed emission reductions for the project/MR/,
- the emission reduction calculation spreadsheet /XLS/

Other supporting documents, such as publicly available information on the UNFCCC website and background information were also reviewed.

3.7. On-site assessment

As most essential part of the verification exercise it is indispensable to carry out an inspection on site in order to verify that the project is implemented in accordance with the applicable criteria. Furthermore the on-site assessment is necessary to check the monitoring data with respect to accuracy to ensure the calculation of emission reductions. The main tasks covered during the site visit include, but are not limited to:

- The on-site assessment included an investigation of whether all relevant equipment is installed and works as anticipated.
- The operating staff was interviewed and observed in order to check the risks of inappropriate operation and data collection procedures.
- Information processes for generating, aggregating and reporting the selected monitored parameters were reviewed.
- The duly calibration/verification of all metering equipment was checked.
- The monitoring processes, routines and documentations were audited to check their proper application.
- The monitoring data were checked completely.
- The data aggregation trails were checked via spot sample down to the level of the meter recordings.

Before and during the on-site visit the verification team performed interviews with the project participants to confirm selected information and to resolve issues identified in the document review.

Representatives of project participant including the operational staff of the plant were interviewed. The main topics of the interviews are summarised in Table 3-4.

Table 3-4: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
1. Projects & Operations Personnel,	- General aspects of the project - Technical equipment and operation - Changes since validation - Monitoring and measurement equipment - Remaining issues from validation - Calibration/verification procedures - Quality management system - Involved personnel and responsibilities - Training and practice of the operational personnel - Implementation of the monitoring plan - Monitoring data management - Data uncertainty and residual risks - GHG calculation - Procedural aspects of the verification - Maintenance - Environmental aspects

3.8. Draft verification reporting

On the basis of the desk review, the on-site visit, follow-up interviews and further background investigation the verification protocol is completed. This protocol together with a general project and procedural description of the verification and a detailed list of the verification findings form the draft verification report. This report is sent to the client for resolution of raised CARs, CRs and FARs.

3.9. Resolution of CARs, CRs and FARs

Nonconformities raised during the 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 (CARs) are issued, if:

- there is a clear deviation concerning to the above mentioned applicable criteria (esp. the monitoring plan).
- requirements set by the monitoring plan or qualifications in the validation opinion have not been met; or
- there is a risk that the project would not be able to deliver emission reductions.

Forward Action Requests (FAR) indicate essential risks for further periodic verifications. Forward Action Requests are issued, if:

- the actual status requires a special focus on this item for the next consecutive verification, or
- an adjustment of the monitoring plan is recommended.

The verification team uses the term Clarification Request (CR), which is be issued if:

- additional information is needed to fully clarify an issue.

For a detailed list of all CARs, CRs and FARs raised in the course of the verification pl. refer to chapter 4.

3.10. Final reporting

Upon successful closure of all raised CARs and CRs the final verification report including a positive validation opinion can be issued. In case not all essential issues could finally be resolved, a final report including a negative validation opinion is issued.

The final report summarizes the final assessments w.r.t. all applicable criteria.

3.11. Technical review

Before submission of the final verification report a technical review of the whole verification procedure is carried out. The technical reviewer is a competent GHG auditor being appointed for the scope this project falls under. The technical reviewer is not considered to be part of the verification team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the verification opinion and the topic specific assessments as prepared by the verification team leader may be confirmed or revised. Furthermore reporting improvements might be achieved.

3.12. Final approval

After successful technical review an overall (esp. procedural) assessment of the complete verification will be carried out by a senior assessor located in the accredited premises of TÜV NORD.

After this step the request for issuance can be started.

4. VERIFICATION FINDINGS

In the following paragraphs the findings from the desk review of the monitoring report/MR/, the calculation spreadsheet/XLS/, PDD/PDD/, the Validation Report/DR/ and other supporting documents, as well as from the on-site assessment and the interviews are summarised.

The summary of CAR, FAR and CR issued are shown in Table 4-1:

Table 4-1: Summary of CAR, CR and FAR

Verification topic	No. of CAR	No. of CR	No. of FAR
H - Project history	1	0	0
U - Update on Changes and Incidents	0	0	0
R - Monitoring Report – General	0	0	0
P - Monitoring Parameters	2	0	0
C - Emission Reduction Calculation	0	0	0
Q - Quality Management	0	0	0
SUM	**3**	**0**	**0**

The following tables include all raised CARs, CRs and FARs and the assessments of the same by the verification team. For an in depth evaluation of all verification items it should be referred to the verification protocols (see Annex).

Monitoring Report	**CAR H1**			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	Please include in the monitoring report the information about how the Forward Action Requests raised within the previous verification have been taken into account in the considered monitoring period.			
Corrective Action	The information about how the Forward Action Requests raised within the previous verification have been taken into account in the considered monitoring period are provided in the section A.8, B.2 and B.3.2 of the monitoring report.			
Assessment AIE	FAR P2: In response to the FAR P2 raised in the previous verification project participant has applied barometric value used for determination of oxygen generation/distribution volumes as provided by JSC "Zaporizhgas. JSC "Zaporizhgas has been assessed an independent and well-reputed organisation. For this reason provided information deemed to be credible and ensures the quality of data used and results of emissions calculation. Based on provided Manual of planimetrist the verification team could verify that procedures of barometric pressure data collection, using and archiving are determined by Manual of planimetrist/M-Bar/. Manual of planimetrist/M-Bar/ has been provided and appropriate definition of the procedures could be verified. FAR Q8 In response to FAR Q8 has provided the technical specification and verification certificate of the SPG-762 meter. According to the technical specification/SPG-762/ the verification interval is 4 years. Based on provided certificates/SPG-762/ the initial verification carried out on 14.11.2006 and the date of the next verification on 14.11.2010 could be verified. Also the calibration of the meter carried out on 13.05.2009 could be verified/SPG-762/. Based on provided documentation it could be concluded that verification of the SPG-762 meter has been carried out according to the relevant requirements. FAR Q9 In response to FAR Q9 project participant has provided Company standard STP 8.2-13-10 "Integrated quality system. Monitoring of GHGs emission reductions", approved by Order #98 of JSC "Zaporizhstal" dated on 05.03.2010/CS/. Verification team was able to verify that the "Company standard" has been signed by person which has the authority to do so. The procedures of GHGs emission reductions monitoring have been duly addressed within the standard.			

Monitoring Report	**CAR H1**
Conclusion	☐ To be checked during next periodic verification ☒ Appropriate action was taken ☒ MR was corrected correspondingly ☐ Appropriate action was not taken ☒ The project complies with the requirements

Monitoring Report	**CAR P1**			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	Please apply in the Excel spreadsheet the exact values of the monitored oxygen generation (i.e. not rounded values).			
Corrective Action	The Excel spreadsheet is corrected with exact value of the monitored oxygen generation.			
Assessment AIE	The revised Excel spreadsheet/XLS/ has been provided and it could be verified that he exact values of the monitored oxygen generation have been used in the calculation.			
Conclusion	☐ To be checked during next periodic verification ☒ Appropriate action was taken ☒ MR was corrected correspondingly ☐ Appropriate action was not taken ☒ The project complies with the requirements			

Monitoring Report	**CAR P2**			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	Please apply in the Excel spreadsheet the exact values of the monitored oxygen distribution (i.e. not rounded values). Please provide daily and monthly reports of the monitored oxygen generation and distribution.			
Corrective Action	The Excel spreadsheet is corrected with exact value of the monitored oxygen distribution. The daily and monthly reports are attached to the monitoring report.			
Assessment AIE	The revised Excel spreadsheet/XLS/ has been provided and it could be verified that he exact values of the monitored oxygen distribution have been used in the calculation.			

Monitoring Report	**CAR P2**
Conclusion	☐ To be checked during next periodic verification ☒ Appropriate action was taken ☒ MR was corrected correspondingly ☐ Appropriate action was not taken ☒ The project complies with the requirements

5. SUMMARY OF VERIFICATION ASSESSMENTS

The following paragraphs include the summary of the final verification assessments after all CARs and CRs are closed out. For details of the assessments pl. refer to the discussion of the verification findings in chapter 4 and the verification protocol (Annex 1).

5.1. Implementation of the project

During the verification a site visit was carried out. On the basis of this site visit and the reviewed project documentation it can be confirmed that w.r.t. the realized technology, the project equipments, as well as the monitoring and metering equipment, the project has been implemented and operated as described in the validated project design documents, monitoring plans and the relevant baseline studies.

5.2. Project history

During the determination PDD and/or verification process, the AIE might have raised a forward action request (FAR) to highlight issues related to project implementation that require review during the subsequent verification of the project activity. Within the previous verification three FARs have been raised. It could be verified that required actions have been duly carried out by project participant and required documentation has been provided. For details please refer to assessment of the CAR H1.

No FAR has been raised in the course of this 2nd periodic verification.

5.3. Special events

No special events with effect on the monitoring of the project have been observed during the monitoring period.

5.4. Compliance with the monitoring plan

The monitoring system and all applied procedures have been reviewed. It has been verified that the monitoring system and all applied procedures are completely in compliance to the validated monitoring plan.

The validated monitoring plan specifies procedures for data collecting and reporting. These procedures have been appropriately followed by the project participant within the monitoring. In particular it has been verified that appropriate measurement equipment has been used. Also the collection and recording of the monitoring parameters has been duly carried out by the responsible personnel.

Furthermore the monitoring plan provides an Excel calculation spreadsheet/XLS/. The completing of the spreadsheet is an integral part of the monitoring. This has been appropriately carried out by the responsible personnel.

5.5. Compliance with the monitoring methodology

A project specific methodology developed for the considered project activity is has been applied. No deviations have been observed.

5.6. Monitoring parameters

During the verification all relevant monitoring parameters have been verified with regard to the appropriateness of the applied measurement / determination method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures. The results as well as the verification procedure are described in the project specific verification checklist.

After appropriate corrections (please refer to CAR P1 and P2) were carried out by the project participant it can be confirmed that all monitoring parameters have been measured / determined without material misstatements and in line with all applicable standards and relevant requirements.

5.7. Monitoring report

A draft monitoring report was submitted to the verification team by the project participants.

During the verification, mistakes and needs for clarification were identified(please refer to CAR H1). The PP has carried out the requested corrections so that it can be confirmed that the Monitoring report is complete and transparent and in accordance with the registered PDD and other relevant requirements.

5.8. ER Calculation

During the verification no mistakes in the ER calculation were identified. Thus it is confirmed that the ER calculation is overall correct.

5.9. Quality Management

Quality Management procedures for measurements, collection and compilation of data, data storage and archiving, calibration/verification, maintenance and training of personnel in the framework of this JI project activity have been defined. The procedures defined can be assessed as appropriate for the purpose of the monitoring.

The operational structure slightly deviates from that envisaged in the monitoring plan as per the PDD. Nevertheless all involved departments and their functions and responsibilities have been clearly defined in the monitoring report according to the "Company standard". The so called "Company standard"/CS/ STP 8.2-13-10 in accordance with the integrated quality system has been introduced in order to fix roles and responsibilities of the involved departments and to ensure the quality of the entire monitoring.

It could be verified that the operational structure of the monitoring complies with requirements of the validated monitoring plan because it provides appropriate procedures for collection of initial data and double check procedures to ensure the high quality and accurateness of reported values.

5.10. Overall Aspects of the Verification

All necessary and requested documentation was provided by the project participants so that a complete verification of all relevant issues could be carried out.

Access was granted to all installations of the plant which are relevant for the project performance and the monitoring activities.

No issues have been identified indicating that the implementation of the project activity and the steps to claim emission reductions are not compliant with the applicable UNFCCC criteria and relevant guidance provided by the COP/CMP and the JISC (clarifications and/or guidance).

5.11. Hints for next Periodic Verification

No Forward Action Requests (FARs) have been raised.

6. VERIFICATION OPINION

TÜV NORD JI/CDM Certification Program (CP) has been commissioned to carry out the 2nd periodic verification of the project "Reconstruction of the Oxygen Compressor plant at the JSC "Zaporizhstal" Ukraine" with regard to the relevant requirements for JI project activities.

The project activity involves reconstruction of the air oxygen compressor plant. The reconstruction resulted in the decrease of the electricity consumption and the corresponding amount of the GHG emissions as compared to the situation that would occur otherwise.

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As a result of this verification, the verification team confirms that:

- all operations of the project are implemented and installed as planned and described in the validated project design document
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- the installed equipment essential for measuring parameters required for calculating emission reductions is verified appropriately
- the monitoring system is in place and functional. The GHG emission reductions were measured accurately.

As the result of the 2nd periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Baseline emissions:	481,533.3	t CO_{2e}
Project emissions:	351,400.9	t CO_{2e}
Leakage:	-	t CO_{2e}
Emission reductions:	**130,132.4**	t CO_{2e}

Essen 2010-04-19

Eric Krupp
TÜV NORD JI/CDM Certification Program
Verification Team Leader

Essen, 2010-04-19

Rainer Winter
TÜV NORD JI/CDM Certification Program
Final Approver

7. REFERENCES

Table 7-1: Documents provided by the project participant(s)

Reference	Document
/**AC**/	Acceptance certificate for recinstruction of the ASU at Zaporozhstal
/**AL**/	Attestation certificate of the laboratory
/**APG**/	Technical specification of APG meter including the information about accuracy, verification interval and dates of the verification.
/**CC**/	Certificate of conformity of the air separation unit
/**CS**/	Company standard STP 8.2-13-10 "Integrated quality system. Monitoring of GHGs emission reductions", approved by Order #98 of JSC "Zaporizhstal" dated on 05.03.2010.
/**DISK-250**/	Technical specification of DISK-250 meter including the information about accuracy, verification interval and dates of the verification.
/**DM-3583**/	Technical specification of DM-3583 meter including the information about accuracy, verification interval and dates of the verification.
/**EF**/	Standardized emission factors for the Ukrainian electricity grid as determined by the Global Carbon B.V. and verified by TUV SÜD
/**EL-Ac**/	Information about the measurement accuracy of the electricity meters as provided by the manufacturer
/**EL-C**/	Verification certificates for the electricity meters
/**EL-M**/	Technical specification of the applied electricity meters, including the dates of the initial and subsequent verification
/**EL-V**/	Verification interval for electricity meters as determined by State Register of SIT of Ukraine
/**EL-1**/	Reports on electricity consumption reports including data about daily and monthly electricity consumption.
/**EL-2**/	Initial data for daily and monthly electricity consumption as per the

Reference	Document
	reports generated by the computerized system (used for cross check).
/**El-3**/	Daily recorded electricity consumption as per the company's journal
/**Flowm-1**/	Flowmeters commissioning dated 17.05.2007 and 14.06.2007
/**Flowm2**/	Certificates for the flowmeters as per the test reports of independent technical experts
/**KSF**/	Technical specification of KSF meter including the information about accuracy, verification interval and dates of the verification.
/**M-bar**/	Manual of planimetrist that defines procedures of barometric pressure data collection, using and archiving
/**MR**/	Emissions Reduction Report for *"Reconstruction of the oxygen compressor plant at the JSC "Zaporizhstal", Ukraine"* Version 2 dated 14.04.2010 2nd Monitoring period 01.01.2009 – 31.12.2009
/M**R-2**/	Emissions Reduction Report for *"Reconstruction of the oxygen compressor plant at the JSC "Zaporizhstal", Ukraine"* Version 1 dated 15.01.2010 2nd Monitoring period 01.01.2009 – 31.12.2009
/**Rosemt**/	Technical specification of Rosemount meter including the information about accuracy, verification interval and dates of the verification.
/**Rosemt-2**/	The calibration/verification period for Rosemount meters as determined by State Register of SIT of Ukraine
/**O&M**/	Plan for operating and maintenance works for 2008, 2009 and 2010 and corresponding reports.
/**OX-1**/	Daily recordings on the oxygen generation and distribution.
/**OX-2**/	Monthly reports on oxygen generation and distribution
/**OX&EL**/	Combined monthly reports on oxygen generation, distribution and electricity consumption as per Forma No.3.
/**Pr-D**/	Software program for determination of the oxygen volumes
/**Pr-D**/	Expert conclusion on the appropriateness of the software program for

Reference	Document
	determination of the oxygen volumes
/SAFIR/	Technical specification of SAFIR meter including the information about accuracy, verification interval and dates of the verification.
/SPG-762/	Technical specification of SPG-762 meter including the information about accuracy, verification interval and dates of the verification.
/TrPr/	Training procedure for involved personnel.
/WFS/	Technical specification of WFS meter including the information about accuracy, verification interval and dates of the verification.
/XLS/	Emission reduction MS-Excel calculation spread sheet: 2010-04-13-MONITORING-Zaporizhstal_OCP-2009-ver_02-rus-conservative.xls

Table 7-2: Background investigation and assessment documents

Reference	Document,
/BI-1/	Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques in the Ferrous Metals Processing Industry, December 2001
/BI-2/	Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques in the Ferrous Metals Processing Industry December 2001
/BI-3/	StahlFibel published by German Iron and Steel Institute 2007
/BI-4/	Operation of an open-hearth furnace with oxygen injection, V.I. Grankovskii, B.L. Yupko, P.M. Shchastnyi and E.Ya.Shvets. Zaporozh'e Branch of the Dnepropetrovsk Metallurgical Institute. Zaporozhstal' Plant. Translated from Metallurg, No. 1, pp. 18–21, January, 1971
/BI-4/	Air Separation Units, Design and Future Development A. R. Smith, J. C. Sorensen and V. E. Stein Air Products and Chemicals, Inc.
/CT/	Combined tool to identify the baseline scenario and demonstrate additionality (Version 02.1)
/DR/	Final Determination Report Version 0 *"Reconstruction of the Oxygen*

Reference	Document,
	Compressor plant at the JSC "Zaporizhstal" Ukraine", dated 18.09.2009
/**JI-G**/	JI Guidelines: UNFCCC/Kyoto Protocol requirements, in particular, the requirements of the JI as set out in decision 9/CMP.1 (Marrakech Accords), the present annex, and relevant decisions by COP/MOP & JI Supervisory Committee
/**H-1**/	Order Nr. 718, dated 10 August 2008. On Approval of the Procedure of Drafting, Review, Approval and Implementation of Projects Aimed at Reduction of Anthropogenic Emissions of Greenhouse Gases.
/**H-2**/	Order Nr. 341, dated 17.07.2006 On approval of the Requirements to the documents in which the volumes of anthropogenic emissions and absorption of greenhouse gases are substantiated for the receiving of the Letter of Endorsement by the owner of the emissions source, where the implementation of the joint introduction project is intended to be.
/**H-3**	Order Nr. 342, dated 17.07.2006 On approval of requirements to preparation of the joint implementation projects.
/**H-4**/	Decree Nr. 206, dated February 22, 2006 Cabinet of Ministers of Ukraine, "On Approval of the Procedure of Drafting, Review, Approval and Implementation of Projects Aimed at Reduction of Anthropogenic Emissions of Greenhouse Gases"
/**H-5**/	Order Nr. 33, dated June 25, 2008 National Environmental Investment Agency of Ukraine, "On approval of Requirements to preparation of the joint implementation projects"
/**PDD**/	Project Design Document *"Reconstruction of the Oxygen Compressor plant at the JSC "Zaporizhstal" Ukraine*
/**VVM**/	IETA, PCF Validation and Verification Manual (V. 4)

Table 7-3: Websites used

Reference	Link	Organisation
/**unfccc**/	http://unfccc.int/2860.php	United Nations Framework Convention on Climate Change

Reference	Link	Organisation
/dna-ukr/	National Environmental Investment Agency of Ukraine	National Environmental Investment Agency of Ukraine
/euro-alfa/	http://www.eu.sama.ru/meter-ea.html	Technical specification of the electricity meters as per manufacturer information.
/steel-ua/	http://metallurgy.at.ua/	Iron and steel sector of Ukraine

Table 7-4: List of interviewed persons

Reference	MoI[1]		Name	Organisation / Function
/IM01/	V	☐ Mr. ☒ Ms.	Holina I.W.	Head of laboratory of environment protection JSC "Zaporizhstal"
/IM01/	V	☒ Mr. ☐ Ms.	Akimov Ju.L.	Deputy chief of the Oxygen compressor plant JSC "Zaporizhstal"
/IM01/	V	☒ Mr. ☐ Ms.	Noumenko. E.S.	Senior engineer of the Oxygen compressor plant JSC "Zaporizhstal"
/IM01/	V	☒ Mr. ☐ Ms.	Grabko A.W.	Head of automation and metrology department JSC "Zaporizhstal"
/IM01/	V	☒ Mr. ☐ Ms.	Sharnin E. V.	Engineer of Import Department of Foreign Trade Company JSC "Zaporizhstal"
/IM01/	V	☒ Mr. ☐ Ms.	Jarish W.N.	Deputy chief of chief power engineer department JSC "Zaporizhstal"
/IM01/	V	☒ Mr. ☐ Ms.	Kazakov R.A.	JI Consultant National Carbon Sequestration Foundation

[1)] Means of Interview: (**T**elephone, **E**-Mail, **V**isit)

ANNEX

Verification Protocol

ANNEX: VERIFICATION PROTOCOL

Table A-1: GHG calculation procedures and management control testing / detailed audit testing of residual risk areas and random testing

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
Raw data generation				
• Installation of measuring equipment • Dysfunction of installed equipment • Maloperation by operational personnel • Downtimes of equipment • Exchange of equipment • Change of measurement equipment characteristic • Insufficient accuracy • Change of	• Installation of modern and state of the art equipment • Process control automation. • Internal data review • Regular visual inspect-ions of installed equip-ment • Only skilled and trained personnel operates the relevant equipment • Daily raw data checks • Immediate exchange of dysfunctional equipment • Stand-by duty is	• Inadequate installation / operation of the monitoring equipment. • Inadequate exchange of equipment. • Change of personnel • Undetected measurement errors • Inappropriateness of Management system procedures w.r.t. monitoring plan requirements (e.g. substitute value strategies) • Non-application of management system procedures • Insufficient accuracy	• Site – visit • Check of equipment • Check of technical data sheets • Check of suppliers information / guarantees. • Check of calibration records, if applicable • Check of maintenance records • Export and countercheck of raw data in EXCEL. • Counter-check of raw data and commercial	• **See Table A-2**

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
technology • Accuracy of values supplied by Third Parties	organized • Training • Internal audit procedures • Internal check of QA/QC measures of involved Third Parties	• Inappropriate QA/QC measures of Third Parties	data • Check of JI management system • Check of JI related procedures • Application of CDM management system procedures • Check of trainings • Check of responsibilities • Check of QA/QC documentation / evidences of involved Third Parties	
Raw data collection and data aggregation				
• Wrong data transfer from raw data to daily and monthly aggregated reporting forms • IT Systems • Spread sheet	• Cross-check of data • Plausibility checks of various parameters. • Appropriate archiving system • Clear allocation of responsibilities	• Unintended usage of old data that has been revised • Incomplete documentation • Ex-post corrections of records • Ambiguous sources of information	• Check of data aggregation steps • Counter-calculation • Data integrity checks by means of graphical data analysis and calculation of specific performance	• **See Table A-2**

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
programming • Manual data transmission • Data protection • Responsibilities	• Application of JI Management system procedures • Usage of standard software solutions (Spreadsheets) • Limited access to IT systems • Data protection procedures	• Non-application of management system procedures • Manual data transfer mistakes • Unintended change of spread sheet programming or data base entries • Problems caused by updating/upgrading or change of applied software	figures • Check of data archiving system • Check of application of Management system procedures	
Other calculation parameters				
• Emission factors, oxidation factors, coefficients	• The values and data sources applied are defined in the PDD and monitoring plan.	• Unintended or intended Modification of calculation parameters. • Wrong application of values • Misinterpretations of the applied methodology and/ or the PDD • Missing update of applicable regulatory framework (e.g. IPCC	• Update-check of regulatory framework • Countercheck of the applied MP in the MR against the methodology and the PDD.	• **See Table A-2**

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
		values).		
Calculation Methods				
• Applied formulae • Miscalculation • Mistakes in spread-sheet calculation	• Advanced calculation and reporting tools • A JI coordinator is in charge of the JI related calculations • Usage of tested / counterchecked Excel spreadsheets • Involvement of external consultants	• The danger of miscal-culation can only be minimized.	• Countercheck on the basis of own calculation. • Spread sheet walk-trough. • Plausibility checks • Check of plots	• **See Table A-2**
Monitoring reporting				
• Data transfer to the author of the monitoring report • Data transfer to the monitoring report • Unintended use of	• An experienced JI consultant is responsible for monitoring reporting. • JI QMS procedures are defined	• The danger of data transfer mistakes can only be minimized • Inappropriate application of QMS procedures	• Counter check with evidences provided. • Audit of procedure application	• **See Table A-2**

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
outdated versions				

Table A-2: (Project specific) Periodic Verfication Checklist

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
1. Project history				
Open issues from validation *Check (esp. in case of 1st periodic verification) whether there are any open issues indicated in the determination PDD report (e.g. FAR)?*	/DR/ /PDD/ /HCA/	Host country approval/HCA/ has been issued on 19.12.2009 by the National Environmental Investment Agency of Ukraine. This is a second periodic verification. No open issues from the determination PDD should be addressed.	OK	OK
Open issues from previous verification *Check in case of further periodic verifications whether there are any open issues indicated in previous verification (FAR)?*	/DR/ /PDD/	Open issues from the previous verification shave been addressed. For a detailed assessment please refer to CAR H1 raised in this context.	~~CAR H1~~	OK
Requests for Deviations / Revisions of MP *Check if there have been any requests for deviations from the registered monitoring plan or requests for revisions of the monitoring plan. If any, make sure that they are considered during verification?*	/DR/ /PDD/	The project related documentation was checked. No Request for Deviation (RfDev) or Request for revision of the monitoring plan (RfrevMP) has been raised before the start of the verification.	OK	OK
Initial verification *In case an initial verification has been carried out, check if all FARs, recommendations etc. have been addressed appropriately.*	/IM01/	N/A	OK	OK
Initial project implementation *In case of first periodic verification: Assess whether the project has been implemented and operated as per the registered PDD and are all physical features*	/IM01/	N/A	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
of the project in place? *In case of further periodic verifications: Go to next chapter.*				
2. Update on Changes and Incidents (during the Monitoring Period)				
Technical equipment *Check if relevant technical equipment of the project activity has been exchanged or modified during the monitoring period.* *Consider e.g. interviews with operational personnel, QMS records, maintenance records, instrument specifications.* *In case of changes, check whether the project is still in line with the registered PDD and assure that these changes have been considered in the monitoring report and the emission reduction calculation.*	/IM01/ /DR/ /PDD/ /O&M/	In the course of the verification the verification team has inspected the project site and interviewed the operational personnel. Equipment documentation and the yearly schedule for maintenance and repair of the main and reserved air separation units has been provided/O&M/. By means of equipment documentation and interview with responsible personnel it could be evidenced, that no relevant equipment was exchanged within the monitoring period.	OK	OK
Operation modes *Check if relevant operation modes of the project activity have been exchanged or modified during the monitoring period.* *Consider e.g. interviews with operational personnel, operation log sheets, data management system records.* *In case of changes, check whether the project is still in line with the registered PDD and assure that these*	/IM01/ /DR/ /PDD/	By means of interviews with the operational personnel it was evidenced, that no relevant operation modes were exchanged within the monitoring period. This conclusion can be supported by the fact that the amount of achieved emission reductions is in the plausible range with the amount achieved in the previous monitoring period.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
changes have been considered in the monitoring report and the emission reduction calculation.				
Incidents *Identify if there have been any significant incidents, deviant operation modes and / or downtimes of the equipment?* *Consider e.g. interviews with operational personnel, operational log sheets, analysis of performance data.*	/IM01/ /DR/ /PDD/	It was verified that no significant incidents have occurred during the monitoring period. This was also backed up by the data integrity check.	OK	OK
Personnel *Find out, if relevant personnel w.r.t. monitoring has been exchanged?* *In case of changes, assure that the implemented monitoring procedures have not been affected.*	/IM01/ /DR/ /PDD/ /CS/ /TrPr/	The operational structure slightly deviates from that envisaged in the monitoring plan as per the PDD. Nevertheless all involved departments and their functions and responsibilities have been clearly defined in the monitoring report according to the "Company standard". The so called "Company standard"/CS/ STP 8.2-13-10 in accordance with the integrated quality system has been introduced in order to fix roles and responsibilities of the involved departments and to ensure the quality of the entire monitoring. It could be verified that the operational structure of the monitoring complies with requirements of the validated monitoring plan because it provides appropriate procedures for collection of initial data and double check procedures to ensure the high quality and accurateness of reported values. It could be verified that particular tasks of the monitoring are carried by responsible personnel. Training procedures for involved personnel/TrPr/ have been provided and it could be verified that involved personnel has been properly trained	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		personnel.		
Legislation Find out whether relevant legislation with effect on the project activity in the host country has been changed.	/dna-ukr/ /IM01/ /DR/ /PDD/ /H-1/ /H-2/ /H-3/ /H-4/ /H-5/	Relevant legislation was considered, No relevant changes were identified.	OK	OK
3. Monitoring Report – General				
Monitoring period *Check if the monitoring period is in line with a) the crediting period and/or b) previous monitoring periods?*	/unfccc/ /MP-2/ /MR/ /DR/	This is the second monitoring report covering the time period between 01.01.2009 and 31.12.2009. This is in line with validated PDD/PDD/ and JI Guidelines/JI-G/.	OK	OK
References *Check if the monitoring report provides the correct references, in detail: project title, applied methodology/ies, meth tools.*	/MR/	Page numbers, the date of issuance and revision number have been appropriately indicated in the monitoring report/MR/.	OK	OK
Completeness *Assess if the monitoring report is complete, i.e. have*	/MR/	The monitoring report is complete and provides all required information. In particular about:	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
all relevant issues been addressed?		• General description of the project and monitoring • Main activity according to the monitoring plan • Quality control (QC) and quality assurance (QA) procedures • Results of GHGs emission reductions monitoring • Initial data for GHGs emission reductions monitoring • GHGs project emissions calculation • GHGs baseline emission calculation • Accessorial calculations for baseline		
Transparency *Assess if the monitoring report is transparent, i.e. clear and unequivocal in all respect?*	/MP-2/ /MR/	The monitoring report includes an accurate and clear description of the project activity, a daily and monthly data on the main monitoring parameters like the electricity consumption and oxygen generation/distribution. Furthermore the monitoring report clearly indicates the generated amount of emission reductions. All the information is provided in very transparently manner, in the table format and is in line with provided Excel spreadsheet.	OK	OK
Misstatements on general issues *Assess whether the monitoring report is free of material misstatements regarding issues other than the monitoring parameters.* *Discuss the monitoring parameters in detail in chapter*	/PDD/ /DR/ /MR/	The following issues have been identified: • Please include in the monitoring report the information about how the Forward Action Requests raised within the previous verification have been taken into account in the considered monitoring period.	~~CAR H1~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
"Monitoring Parameters".		•		
		•		
Deviations from the validated monitoring plan *Assess whether the MR in line with the validated monitoring plan?*	/PDD/ /DR/ /MR/ /EL-C/ /EL-M/ /EL-V/	The validated monitoring plan specifies procedures for data collecting and reporting. These procedures have been appropriately followed by the project participant within the monitoring. In particular it has been verified that appropriate measurement equipment has been used. Also the collection and recording of the monitoring parameters has been carried out by the responsible personnel. PP has provided a clear description of all involved departments and their functions. The same could be verified and observed during the on-site-visit. It could be verified that the operational structure of the monitoring complies with requirements of the validated monitoring plan. In particular it provides appropriate procedures for collection of initial data and double check procedures to ensure the high quality of reported emission reductions. Furthermore the reporting has been established in a transparent manner with regard to the choice of approaches, assumptions, parameters, data sources and key factors.	OK	OK
Deviations from the approved methodology *Assess whether the MR in line with the applied monitoring methodology?*	/PDD/ /DR/ /MR/	A project specific methodology developed for the considered project activity is has been applied. No deviations have been observed.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
4. Monitoring Parameters *(List all parameters of the PDD chapter B.7.1; pl. copy the 6 lines below for each parameter)*				
4.1. Electricity consumption				
Measurement / Determination method *Describe how the monitoring parameter was measured / determined.* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/PDD/ /DR/ /MR/ /EL-M/ /EL-1/ /EL-2/ /EL-3/	Within the verification the installed monitoring equipment (electricity meters) has been inspected at the project site. It has been verified that the installed equipment is suitable for measuring electricity consumption and is in line with provisions of the monitoring plan/EL-M/. Special computerized system has been introduced for monitoring of the electricity consumption. This introduced system enables generation of the reports for daily and monthly electricity consumption. Furthermore it is able to generate detailed reports for any required time period. In addition to this system daily electricity consumption is monitored and recorded in the log books. Department responsible for preparing monthly reports of the electricity consumption is the Technical bureau of Plant of networks and substations. This is in line with registered PDD. It could be confirmed that Technical bureau of Plant of networks and substations prepares monthly reports/EL-1/ of electricity consumption for production in OCP based on the daily figures as provided by the special computerized system. By doing this electricity consumption as per the reports generated by the computerized system are compared to the electricity consumption as per the meter reading recorded in the log books/EI-3/.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		This measurement and determination method is appropriate and is in line with registered PDD.		
Correctness *Determine whether the value given in the monitoring report is correct.* *In case of mistakes pl. provide details and descriptions of the CARs raised.*	/EL-1/ /EL-2/ /EL-3/ /OX&EL/	☒ Correct ☐ Not correct Comment: Project participant has provided the initial data for daily electricity consumption/EL-1/ and monthly reports on electricity consumption/EL-2/. In addition log books have been provided. The determination has inspected the control room and examined the applied system for monitoring of electricity consumption. It has been verified that the values given in the monitoring reports are in line with the information as per the metering system. Also a plausibility check has been carried out and the appropriateness and the correctness of the values given in the monitoring reports could be proved. The values given in the monitoring report are in line with the values applied within the corresponding Excel spreadsheet and are correct.	OK	OK
QA/QC Procedure *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration and maintenance of the monitoring equipment has been carried out by competent personnel.*	/PDD/ /DR/ /MR/ /EL-M/ /EL-Ac/ /EL-C/ /EL-M/ /EL-V/	Monitoring report provides (in table B.3-1) information about electricity meters. The information provided specifies the location of meters, type of meters specific meter numbering, date of last verification, date of current verification and the date of the next verification. Technical specification/EL-M/ and verification certificates of the applied electricity meters/EI-C have been provided. Provided documents include the information about the dates of the initial and subsequent verification of the meters. Based on the provided documentation/EL-M//EL-C/ the dates of initial and subsequent verification as indicated in the monitoring report	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		could be verified Three (out of 28) meters have been verified with a delay. This issue has been discussed with project participant within the previous verification. Within the previous verification project participant has carried out verification of the electricity meters and provided verification certificates/EL-C/. Within this verification the measurement accuracy of the considered three meters has been determined. According to the provided evidences the accuracy of the applied meters is in line with uncertainty level as per the manufacturer data (± (0,5-1,0)%. To further support the accuracy of the carried out measurements project participant has provided information about the measurement accuracy of the electricity meters as provided by the manufacturer/EL-Ac/. Taking into account provided evidences a sufficient confidence could be gained that uncertainty level of the electricity meters was in line with manufacturer data and the electricity consumption has measured accurately and in line with provisions of the monitoring plan.		
Accuracy *In case of measured (or estimated) values, check whether significant inaccuracies occur; in this case, make sure that appropriate discounts have been considered for ER calculation.*	/MR/ /EL-M/ /EL-1/ /EL-2/ /EL-3/	The monitoring plan clearly specifies the parameters to be monitored and the relevant monitoring equipment. The accuracy class of the electricity meters ± (0,5-1,0)% has been verified based on provided evidences/EL-M/. Electricity consumption as per the computerized system/EL-1/ is compared to the electricity consumption as per the meter reading recorded in the log books/EL-3/. Hence it could be concluded that electricity consumption has measured accurately.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Verification *Describe how the value was verified. Consider the measurement / determination procedure, accuracies, QA/QC procedures. Consider as well plausibility checks as far as possible. Check if the applied value could be backed up by corresponding evidences.*	/EL-Ac/ /EL-C/ /EL-M/ /EL-1/ /EL-2/ /EL-3/ /EL-V/	All monitoring parameters have been evidenced by project participant. The verification team has reviewed the provided evidences. It has been verified that the values in the monitoring report/MR/ and the corresponding Excel spreadsheets/XLS/ are in line with provided evidences/EL-1/. During the on-site visit verification team has received computerized reports/EL-1//EL-2/ and (hand written) journal/EL-3/. Cross check and plausibility check have been carried out. Based on this it could be confirmed that monthly reports have been appropriately prepared and information provided in these reports corresponds to the initial data. Hence it has been concluded that applied values of the electricity consumption are correct and measurement/determination method is in line with provisions of the monitoring plan as per the registered PDD.	OK	OK
4.2. Oxygen generation/distribution				
Measurement / Determination method *Describe how the monitoring parameter was measured / determined.* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/PDD/ /MR/ /DR/ /APG/ /DISK-250/ /DM-3583/ /Flowm-1/	The detailed scheme including responsible departments, responsible specialists and their functions for monitoring oxygen generation and distribution is described in the monitoring report. Based on provided documentation and interviews with responsible specialists of the departments involved it could be verified that monitoring is carried out according to the described scheme. Within the verification the installed monitoring equipment (flow meters) has been inspected at the project sites. It has been observed and verified that the installed equipment is suitable w.r.t. to the measurement of the monitoring parameters and is in line with provisions of the monitoring plan. Furthermore it has	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
	/Flowm2/ /KSF/ /Rosemt/ /Rosemt-2/ /Pr-D/ /Pr-D/ /SAFIR/ /SPG-762/ /WFS/	been observed that the installed equipment is operated appropriately. Taking this into account the verification team is of the opinion that the relevant parameters have been monitored in accordance with provisions of the monitoring plan.		
Correctness *Determine whether the value given in the monitoring report is correct.* *In case of mistakes pl. provide details and descriptions of the CARs raised.*	/OX-1/ /OX-2/ /OX&EL/	☒ Correct ☐ Not correct Comment: Project participant has provided the initial data for oxygen distribution and oxygen generation daily reports/OX-1/ and monthly reports/OX-2/. The determination has inspected the control room and examined the applied system and procedures for monitoring of oxygen generation and distribution. It has been verified that the values given in the monitoring reports are in line with the information as per the metering system. Plausibility check has been carried out. By doing this the appropriateness and the correctness of the values given in the monitoring reports could be proved. The values given in the monitoring report/MR/ and the corresponding Excel spreadsheet/XLS/ are correct.	~~CAR P1~~ ~~CAR P2~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
QA/QC Procedure *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration and maintenance of the monitoring equipment has been carried out by competent personnel.*	/PDD/ /MR/ /DR/ /AL/ /APG/ /DISK-250/ /DM-3583/ /Flowm-1/ /Flowm2/ /KSF/ /Rosemt/ /Rosemt-2/ /Pr-D/ /Pr-D/ /SAFIR/ /SPG-762/ /WFS/	Monitoring report provides (in table B.3-2) information about flow-rate meters for oxygen production in air-separation units and oxygen distribution. Table B.3-2 specifies the location of meters, type of meters specific meter numbering, date of last verification, date of current verification and the date of the next verification. Provided information could be verified based on the technical specification of the monitoring equipment and verification certificates of the applied equipment. Procedures for data management and processing within the particular stages of the monitoring comply are in line with provisions of the monitoring plan. Double check procedures have been introduced to ensure high quality of monitoring parameters. Different tasks within the monitoring are clearly allocated to the personal of the different departments. Personal and the corresponding tasks/responsibilities of the project monitoring are clearly defined. Furthermore all procedures have been clearly documented. A sufficient confidence has been gained that the introduced quality assurance system provides procedures and provisions for an accurate and appropriate monitoring of oxygen generation and distribution.	OK	OK
Accuracy	/PDD/	The monitoring plan clearly specifies the parameters to be	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
In case of measured (or estimated) values, check whether significant inaccuracies occur; in this case, make sure that appropriate discounts have been considered for ER calculation.	/MR/ /DR/ /AL/ /APG/ /DISK-250/ /DM-3583/ /Flowm-1/ /Flowm2/ /KSF/ /Rosemt/ /Rosemt-2/ /Pr-D/ /Pr-D/ /SAFIR/ /SPG-762/ /WFS/	monitored and the relevant monitoring equipment. The accuracy class of the meters required for oxygen generation/distribution is indicated in the monitoring report table B.3-3. The indicated accuracy class could be verified based on provided technical specification of the applied equipment. It has been concluded that measurements are accurate.		
Verification *Describe how the value was verified. Consider the*	/OX-1/ /OX-2/	All monitoring parameters have been evidenced by project participant. The verification team has reviewed the provided evidences. During the on-site-visit plausibility checks for oxygen	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
measurement / determination procedure, accuracies, QA/QC procedures. Consider as well plausibility checks as far as possible. Check if the applied value could be backed up by corresponding evidences.	/EL-1/ /EL-2/ /XLS/	generation and distribution have been carried out. By doing this information from different data sources/OX-1//OX-2/ has been compared. A sufficient confidence has been gained that the values for oxygen generation and distribution have been appropriately monitored. It has been verified that the values in the monitoring report/MR/ and the corresponding Excel spreadsheets/XLS/ are in line with provided evidences/OX-1//OX-2/.		
5. ER Calculation				
Traceability *Assess if the calculation is fully traceable. In case of complex calculations an Excel calculation spread-sheet shall be used. All applied formulae must be visible.*	/MR/ /XLS/ /EL-1/ /EL-2/ /OX-1/ /OX-2/ /OX&EL/	The excel calculation spreadsheet includes separate tables for baseline and project emissions on the daily and monthly values. Both calculations are summarized and emission reductions have been calculated in separate table. The daily amounts of oxygen distributed are clearly indicated and are in line with provided evidences. Also the monthly electricity consumption is indicated and is in line with provided evidences. The calculation is completely traceable. All applied formulae are visible. No information gaps have been identified.	OK	OK
Parameter consistency *Assess whether all internal and external parameters and data used for calculation are applied consistently in the monitoring report and the calculation spreadsheet?* *Consider only the correct data exchange between the monitoring report and the calculation spreadsheet (if any). The evaluation of the correctness of the parameter values itself should be discussed in the chapter "Monitoring Parameters".*	/MR/ /XLS/ /EF/ /PDD/ /DR/	The Excel – calculation sheet is completely in line with the monitoring report/MR/. No deviant parameter values have been used in the calculation sheet. The specific electricity consumption has been calculated based on the actual data in accordance with provisions with the monitoring plan. Grid emission factor has been duly applied in accordance with the monitoring plan/EF/. CAR P1 and CAR P2 has been raised and successfully closed.	~~CAR P1~~ ~~CAR P2~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Applied formulae *Check if the applied formulae are in accordance with the monitoring plan and / or the approved methodology.*	/MR/ /XLS/	The verification team has reproduced the calculation of emission reductions based on the provided parameters and the correctness of the computed amount of the emission reduction has been verified. The applied Excel spreadsheet has been reviewed and examined. It has been verified that the formulae and procedures as defined within the monitoring plan has been appropriately applied. It has been observed that determination of the operational conditions of the equipment in the baseline scenario for the months February and March 2009 deviates from the procedures as per the monitoring plan. This has been introduced by the project participant to ensure the conservativeness of the calculations. The explanation of the made deviation is clearly and transparently indicated in the monitoring report and corresponding Excel spreadsheet. This deviation leads to a more conservative (i.e. lower) amount of emission reductions. For this reason the deviation has been accepted. No further changes and deviations to the approved monitoring plan have been observed.	OK	OK
Completeness of calculation *Assess whether the provided calculations are complete and reflect all requirements of the monitoring plan.* *Check especially that no standard or old values have been used for calculation where calculations based on up-to-date data is required.*	/MR/ /XLS/	The calculation is completely traceable. No information or calculation gaps have been identified. No standard or old values have been used for calculation.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
6. Quality Management; defined organisational structure, responsibilities and competencies Internal QA/QC and document control				
Management System *Check if the GHG data monitoring system is embedded in a (certified) company quality management system, if so, check if all JI monitoring procedures been fully integrated in the project participant's quality management system. If not how the GHG management system has been implemented.*	/MR/ /PDD/ /CS/	Project participant has provided Company standard STP 8.2-13-10 "Integrated quality system. Monitoring of GHGs emission reductions", approved by Order #98 of JSC "Zaporizhstal" dated on 05.03.2010/CS/. Verification team was able to verify that the "Company standard" has been signed by person which has the authority to do so. The procedures of GHGs emission reductions monitoring have been duly embedded within the standard. Procedures for data management and processing within the particular stages of the monitoring comply with requirements of the monitoring plan. Double check procedures have been introduced to ensure high quality of monitoring parameters. Different tasks within the monitoring are clearly allocated to the personal of the different departments. Personal and the corresponding tasks/responsibilities within the monitoring are clearly defined. Furthermore all procedures have been clearly documented. A sufficient confidence has been gained that the introduced quality assurance system provides procedures and provisions for an accurate and appropriate monitoring of emission reductions.	OK	OK
Roles and Positions *Check if all roles and positions of each person in the GHG data management process are clearly defined and implemented, from raw data generation to submission of the final data.*	/MR/ /PDD/ /CS/	Different tasks within the monitoring are clearly allocated to the personal of the different departments. Roles and Positions of the project monitoring are clearly defined. Furthermore all procedures have been clearly documented. Please refer to the comment above.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Check further if only duly qualified personnel is involved in the monitoring procedures.				
Trainings *Check if initial trainings have been carried out, in case deemed necessary.*	/MR/ /DR/ /PDD/ /TrPr/	Training procedures/TrPr/ have been provided and sufficient confidence has been gained that the competence of involved staff ensures an appropriate quality of data. The involved personnel is familiar with monitoring procedures and with the technology applied.	OK	OK
Troubleshooting procedures *Assess whether troubleshooting procedures have been implemented.*	/MR/ /DR/ /PDD/ /TrPr/	In emergency cases the oxygen monitoring equipment is put out of operation. The monitoring plan ensures that no invalid or erroneous emission reduction can be claimed for emergency cases. Please refer to the comment under QA/QC.	OK	OK
Maintenance procedures Are appropriate maintenance procedures in place?	/MR/ /DR/ /PDD/ /O&M/	Yearly maintenance schedules for the oxygen generation equipment (VRU-60 and reserve equipment) have been provided/O&M/. Based on provided maintenance schedules for the years 2009 and 2010 it could be verified that procedures for maintenance of the equipment have been introduced and are duly followed. As already indicated all relevant meters have been verified.	OK	OK
Internal QA/QC *Assess whether there are any procedures in place on when, where and how checks and reviews are to be carried out, and what evidence needs to be documented? (This might include spot checks by a second person not performing the calculations over manual data transfers, changes in assumptions and*	/MR/ /PDD/	As already indicated double check procedures for all monitoring parameters have been introduced and are duly followed by responsible personnel. For further details please refer to the comment under QA/QC Procedures	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
the overall reliability of the calculation processes.)				
Data archive Check whether all records of monitoring parameters are archived according to the monitoring plan.	/MR/ /PDD/	Yes data archiving is in line with provisions of the monitoring plan.	OK	OK
Data protection Assess whether appropriate measures have been take in order to avoid unintended or intended manipulation of the measured data.	/MR/ /PDD/	This issue has been discussed and a sufficient confidence has been gained that appropriate measures have been take in order to avoid unintended or intended manipulation of the measured data.	OK	OK