JI VERIFICATION REPORT

- 1ST PERIODIC –

JSC "ZAPORIZHSTAL"

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

Monitoring period: 01.01.2008 – 31.12.2008

Report No: 8000377391 – 09/477

Date: 2010-10-07

TÜV NORD CERT GmbH
JI/CDM Certification Program
Langemarckstraße, 20
45141 Essen, Germany
Phone: +49-201-825-3335
Fax: +49-201-825-3290
www.tuev-nord.de
www.global-warming.de

Verification Report:	***Report No.***	***Rev. No.***	***Date of 1st issue:***	***Date of this rev.***
	80003777391	1	2009-11-30	2010-10-07
Project:	***Title:***		***Registration date:***	***UNFCCC-No.:***
	"Reconstruction of the Oxygen Compressor plant at the JSC "Zaporizhstal" Ukraine"		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: 01.01.2008 – 31.12.2008		365	1
Monitoring report:	***Title:***		***Draft version:***	***Final version:***
	"Reconstruction of the oxygen compressor plant at the JSC "Zaporizhstal" Ukraine"		Version 2 29.09 2009	Version 5 27.11.009
Verification team / Technical Review and Final Approval	***Verification Team:***		***Technical review:***	***Final approval:***
	Eric Krupp Evgeni Sud Valery Aleykin	Stefan Winter Sergej Friesen	Lars Kirchner	Rainer Winter
Emission reductions: [t CO_{2e}]	***Verified amount:***			
	149,951			
Summary of Verification Opinion:	JSC "Zaporizhstal" has commissioned the TÜV NORD JI/CDM Certification Program (CP) to carry out the 1st 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 2008-01-01 to 2008-12-31 (including both days). In the course of the verification 12 Corrective Action Requests (CAR) and 3 Clarification Requests (CR) were raised and successfully closed. 3 Forward Action Requests (FAR) have been raised to improve the monitoring system in the future. The verification is based on the monitoring report (dated: 2009-09-29/MR-2/), final monitoring report (dated: 2009-11-27/MR/) the monitoring plan as set out in the registered PDD, the revision of the monitoring plan/MR-Ch/ Version 01 dated 15/09/2010, the determination report/VAL/, 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 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 are verified appropriately • the monitoring system is in place and functional. The GHG emission reductions were measured accurately.			

	As the result of the 1st 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: 547,343 t CO_{2e} Project emissions: 397,392 t CO_{2e} Leakage: - t CO_{2e} Emission reductions: **149,951** t CO_{2e}	
Document information:	*Filename:*	*Num. of pages:*
	2010-10-07 Final Verification Zaporozhstal (change cr. per)	67

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)**
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**

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1. INTRODUCTION

JSC "Zaporizhstal" has commissioned the TÜV NORD JI/CDM Certification Program (CP) to carry out the 1st 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: 01.01.2008 – 31.12.2008

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 1st 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,
- other relevant rules, including the host country legislation,
- monitoring plan as given in the registered PDD /PDD/,
- Applied project specific methodology which was positive validated in the course of determination PDD.

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 November 2009 to January 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	☒	-	☐	☒
☒ Mr. ☐ Ms.	Evgeni Sud	TÜV Nord Cert GmbH	TM	E	☒	-	☒	☐
☒ Mr. ☐ Ms.	Valery Aleykin	TÜV Nord Ukraine	-	T	☐	-	☒	☐
☒ Mr. ☐ Ms.	Stefan Winter	TÜV Nord Cert GmbH	TM	TE	☐	G	☐	☐
☒ Mr. ☐ Ms.	Sergej Friesen	TÜV Nord Cert GmbH	TM	E	☒	-	☒	☐
☒ Mr. ☐ Ms.	Lars Kirchner	TÜV Nord Cert GmbH	TR[3)]	E	☐	G	☐	☐
☒ Mr. ☐ Ms.	Rainer Winter	TÜV Nord Cert GmbH	FA	SA	☒	G	☐	☒

[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].

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*	*Having investigated the residual risks, the conclusions should be noted here. Errors and uncertainties are highlighted.*

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

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*)**
			analysis results Discussions with process engineers who have detailed knowledge of process uncertainty/error bands.	

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 /VAL/,
- 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

Interviewed Persons / Entities	Interview topics

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[/VAL/] 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	0	0	0
U - Update on Changes and Incidents	0	0	0
R - Monitoring Report – General	3	0	0
P - Monitoring Parameters	2	2	1
C - Emission Reduction Calculation	0	0	0
Q - Quality Management	7	0	2
SUM	**12**	**2**	**3**

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 R1**			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	Please include the date of the monitoring report (day, months, year)			
Corrective Action	Provided			
Assessment AIE	The revised monitoring report clearly indicates the data of its issuance.			
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 R2**			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	Please revise in the monitoring report the description of the date collecting and monitoring. Please indicate the structure and functions that were valid within the monitoring period (2008). Please include information about double check of the reported figures and about archiving of the collected data. Please revise the Fig. B.1. In particular the name of department of environmental and radiation protection deemed to be incorrect.			
Corrective Action 1	The description of the date collecting and monitoring, the structure and functions of department in monitoring, information about double check are revised in accordance with the monitoring period 2008 and provided in section B.2. of Monitoring report. The Fig. B.1. is revised.			
Assessment AIE 1	The Fig. B 2-1 has some minor inconsistencies. Please revise.			
Corrective Action 2	The Fig. B.2-1 is revised: Deputy Chief Power Engineer is added to the Scheme of collecting and carrying of monitoring data (Fig. B.2-1). The table B.2.-1 is revised: The primary recording data on oxygen production and distribution are daily prepared by Recording bureau of Chief Power Engineer department based on measured data of flow meters in oxygen-compressor plant.			
Assessment AIE 2	The monitoring report has been appropriately corrected and description of operational structure for data collecting and monitoring has been duly described. The same could be verified during the on-site visit.			
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 R3**			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	Please indicate the exact date (day/month/year) of calibration/verification for all relevant monitoring equipment. Please indicate all relevant monitoring equipment the last and previous date of calibration/verification.			
Corrective Action 1	The exact dates of previous, last and next verification are provided for all relevant monitoring equipment in section B of monitoring report.			

Monitoring Report	**CAR R3**
Assessment AIE 1	The date of verification for electricity meter № 01112353 in the version 4 deviates from that in version 3. Please clarify.
Corrective Action 2	Date of SIT Euro Alfa # 01112353 verification is 04.03.2005. Verification's certificate for SIT Euro Alfa # 01112353 is attached.
Assessment AIE 2	The Monitoring report has been revised. Verification evidences have been provided and the verification date (04.03.2005) could be verified/EL-M/.
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 correct the electricity consumption for January 2008.			
Corrective Action	The electricity consumption for January 2008 is corrected. The change of results of GHGs emission reductions estimation is provided in monitoring report.			
Assessment AIE	Yes, has been appropriately corrected.			
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	**FAR P2**			
Classification	☐ CAR	☒ FAR	☐ CR	☐ None
Findings	Please provide the appropriate data source for barometric value used for determination of oxygen generation/distribution volumes.			
Corrective Action	For the monitoring of fuel and energy resources (including oxygen) are used barometric pressure data. The barometric pressure data are daily provided for JSC "Zaporizhstal" by JSC "Zaporizhgaz" and also the barometric pressure are measured on the territory of JSC "Zaporizhstal". Average daily barometric pressure data from JSC "Zaporizhgaz" and measured on territory of JSC "Zaporizhstal" may differ insignificantly. In order to avoid possible errors in barometric pressure measurements in JSC "Zaporizhstal" and for the sake of transparency the barometric pressure data for oxygen generation/distribution monitoring will be taken in future from JSC "Zaporizhgaz". Appropriate changes will be included in the Manual for planimetrist.			
Assessment AIE	Barometric pressure data for oxygen generation/distribution monitoring will be taken in future from JSC "Zaporizhgaz" which is considered to be an appropriate data source. During the on-site visit it has been observed that the difference between average daily barometric pressure data from JSC "Zaporizhgaz" and measured on territory of JSC "Zaporizhstal" is negligible.			
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	**CR P3**			
Classification	☐ CAR	☐ FAR	☒ CR	☐ None
Findings	Table in the section please clarify whether the verification period for electricity meter SIT Euro-Alfa is once in 8 years.			
Corrective Action	The verification period for electricity meter SIT Euro-Alfa is once in 6 years (determined by State Register of SIT of Ukraine). The calibration period can not be more than the verification period. For monitoring are used the electricity meter SIT Euro-Alfa that are verified (table B.3.1, table B.3.4 of monitoring report).			
Assessment AIE	The indicated verification period for electricity meter SIT Euro-Alfa 6 years is in line Verification interval for electricity meters as per the registration (reestr) of the Host Country[EL-V/].			
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	**CR P3**			
Classification	☐ CAR	☐ FAR	☒ CR	☐ None
Findings	Accuracy as per the table in section B.3.1. Meter (КСФ-3) please clarify whether the accuracy (1,0) has been appropriately indicated.			
Corrective Action	The accuracy of Meter (КСФ-3) is 1.0. Supporting materials (Manual of КСФ-3) are attached.			
Assessment AIE	Yes the indicated accuracy class is as per the technical specification of KSF meter including the information about accuracy and verification interval[/KSF/].			
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 P5**			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	As per the PDD verification period for electricity meters is 4 years and for volume meters 1 year. As per the monitoring report verification of the electricity meters is 8 years (control 6 years) and that of volume meters 1-3 years. Please clarify.			
Corrective Action	The verification periods of all meters are revised and provided in table B.3.4 of monitoring report. All meters that are used for monitoring will be verified.			
Assessment AIE	The verification period for electricity and volume meters has been appropriately revised and included in the monitoring report.			
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 P6**			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	In the context of the quality assurance and verification of the monitoring equipment please clarify the responsibility of the department for metrology and automatisation.			
Corrective Action	Department for metrology and automatisation of JSC "Zaporizhstal" is responsibility for organization of monitoring meters verification.			
Assessment AIE	Yes, this could be verified within the on-site-visit.			
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 Q1**			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	As per the PDD head of technical bureau of Plant of networks and substations prepares the monthly reports. As per the monitoring report this functions are carried out by the engineer of this department. Please clarify.			

Monitoring Report	**CAR Q1**
Corrective Action	The departments that are involved in monitoring and they function are revised and clearly presented in Section B.2. of monitoring report. The function of head of technical bureau of Plant of networks and substations are: – Preparation of monthly reports of electricity consumption for production in OCP (ID-1, $EC_{OCP,\ PJ,\ y}$) based on reading of electricity meters at the beginning of month and the end of a month received from the system of technical monitoring of electricity consumption. – Control and confirmation of monthly reports of electricity consumption for production in OCP based on logs of daily registration electricity consumption on substation of Plant of networks and substations. – Delivery of controlled and confirmed monthly reports of electricity consumption for production in OCP in energetic bureau of Chief Energetic department. – Storage of monthly reports of electricity consumption for production in OCP and reading of electricity meters at the beginning of month and the end of a month received from the system of technical monitoring of electricity consumption on the paper and electronic files. – Storage of logs of daily registration electricity consumption on substation of Plant of networks and substations on the paper files. The engineer of technical bureau of Plant of networks and substations isn't involved in monitoring.
Assessment AIE	All involved departments and their functions have been clearly described in the monitoring report. The same could be verified and observed during the on-site-visit. 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.
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 Q2**			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	Please correct in section B.3.1. the uncertainty level for WFS and DISk-250 meters.			
Corrective Action	The uncertainty level for WFS and DISk-250 meters is corrected in Section B.3.1. of monitoring report.			
Assessment AIE	The uncertainty level has been revised and is in line with technical specification of WFS and DISk-250 meters/WFS//DISK/.			
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 Q3**			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	Please correct in section B.3.2. the verification interval for SPG-762 and for ARG 31.2.meters.			
Corrective Action	The verification interval for SPG-762 and for ARG 31.2 meters are corrected in section B.3.2. of monitoring report.			
Assessment AIE	The uncertainty level has been revised and is in line with technical specification of SPG-762 and for ARG 31.2 meters/SPG-762//ARG/			
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 Q4**			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	The verification of the meter (ARG 31.2) has not been carried out within two years as per the technical specification. Please explain how the correctness of the reported figures has been ensured.			

Monitoring Report	**CAR Q4**
Corrective Action 1	The meter (ARG 31.2) is used for monitoring of oxygen consumption in heat and power plant. The data from this meter is summarized with data from meters of oxygen consumption by other consumers (table B.3.2. of monitoring report) so we find the value of distributed oxygen (ID-4, $D_{oxygen,PJ,day}$). The data of distributed oxygen is used for determination of Specific oxygen production in ASUs KAAr-32 ($SP_{oxygen,BL}$) (see Table D.1-1. of PDD "The operation of OCP in Baseline scenario"). In period as the meter (ARG 31.2) was not verified: 26.10.2008-31.12.2008 the value of oxygen production in baseline scenario was on minimal of possible level (60 000 m^3/hour), so the possible deviation in reading of meter (ARG 31.2) has not an influence on results of GHG emission reductions monitoring. The use of minimal oxygen production data for Baseline scenario ensures the conservative estimation of GHG emissions calculation (Annex 4 of monitoring report).
Assessment AIE 1	According to the technical specification the verification the first verification has been carried out in 25.10.2006 and the next in 09.11.09. However the verification has to be carried out every two years, so that the next verification had to be carried out in 25.10.08. However it has been carried out on 09.11.09. Hence the appropriateness of the figures recorded in the time period between 26.10.2008 and 31.12.2008 is affected. Verification team has proved the oxygen consumption and it could be proved in the time period between 25.10.2008 and 31.12.2008 the oxygen generation and consequently distribution was at a minimum level and significantly below of the technically feasible level. In particular the average oxygen distribution was 592 848 m^3 O_2 and the highest daily oxygen distribution was 792 892 m^3 O_2, which is significantly below 1 368 000 m^3 O_2 defined as highest value for operation condition Taking this into account operation condition Nr. 1 can be with sufficient confidence assumed for the considered time period and baseline emissions reflects really achieved.
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 Q5**			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	Please provide information about previous calibration/verification of the Rosemount meter.			
Corrective Action	The Rosemount meters (# 8066805, 8066806) were calibrated 12.03.2007 (Protocols of calibration are attached) by Laboratory of JSC "Zaporizhstal" (Attestation certificate for this period is attached). Date of calibration preceded date of Oxygen compressor plant commissioning (27.12.2007). The calibration/verification period for Rosemount meters as determined by State Register of SIT of Ukraine is 2 years (the extract of State Register of SIT of Ukraine is attached). The verification of Rosemount meters (# 8066805, 8066806) was provided 27.08.08 (SIT certificates are attached).			
Assessment AIE	It could be also verified that Rosemount have been calibrated in 2007 by Laboratory of JSC "Zaporizhstal". The attestation certificate of laboratory for this period has been provided and could be verified/AL/. Though the laboratory is not certified to carry out calibration for meters with accuracy 0,075% a sufficient confidence has been gained that Rosemount meter have been appropriately calibrated. Furthermore PP has carried out verification by an independent official organization on 27.08.08/Rosemt/. Based on provided verification certificates/Rosemt/ it could be verified that verification of Rosemount meters (# 8066805, 8066806) has been carried out on 27.08.08 and 13.08.2009 and hence in line with the calibration/verification period for Rosemount meters as determined by State Register of SIT of Ukraine/Rosemt-2/*. Taking this into account verification team is of the opinion that PP has spent a sufficient effort to ensure accurateness of the monitored values and the monitored parameters deemed to be appropriate.			
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 Q6**			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	The calibration/verification of the DM-3583, WFS, KSD-250 meters has been delayed for few days. Please explain how the correctness of the monitored parameters has been ensured.			
Corrective Action	The DM-3583 meters (# 12215, 5690, 2913, 58848), WFS (# 3539, 15506), KSD-250 (# 68584, 68583) for registration of oxygen production in air-separation units KtK-35-3 and BR-2 were not calibrated/verified in period 11.04.2008-17.04.2008. In this period the air-separation units KtK-35-3 and BR-2 were not in operation (Annex 1 of monitoring report) so the delay of verification for a few days for DM-3583, WFS, KSD-250 meters has not an influence on correctness of the monitored parameters and results of monitoring.			
Assessment AIE	It could be verified that in the considered time period air-separation units KtK-35-3 and BR-2 were not in operation. Hence it could be concluded that the delay in the verification has no impact on the accurateness of the achieved emission reductions.			
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 Q7**			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	The calibration/verification interval for electricity meters is 4 years. As per the documentation the calibration/verification of these meters has been delayed for few days. Please explain how the correctness of the monitored parameters has been ensured.			

Monitoring Report	**CAR Q7**
Corrective Action	The verification period for electricity meter SIT Euro-Alfa is once in 6 years (determined by State Register of SIT of Ukraine). The calibration period can not be more than the verification period. For monitoring are used the electricity meter SIT Euro-Alfa that are verified (table B.3.1, table B.3.4 of monitoring report). The verification was delayed for few days for electricity meters (# 01059594, 01050766, and 0159531). November 2009 these electricity meters were verified. The results of verification make it clearly that the above electricity meters had at a point of verification the accuracy in the range of admissible accuracy (Table B.3.3 of monitoring report). The confirmed documentation (verification certificates) is attached. The low uncertainty level of electricity meters reading ensures the correctness of the monitored parameters.
Assessment AIE	Project participant has carried out verification of the electricity meters and provided verification certificates/EL-C/. Within the verification the measurement accuracy 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.
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	**FAR Q8**			
Classification	☐ CAR	☒ FAR	☐ CR	☐ None
Findings	Please ensure the verification of the SPG-762 meter.			
Corrective Action	The SPG-762 meter was verified 14.10.2006, the next date of verification was determined on 14.10.2010 (confirming documentation is attached). Since 2008 verification of the SPG-762 meter will be provided yearly (SIT certificate is attached).			

Monitoring Report	**FAR Q8**
Assessment AIE	Based on provided technical specification of SPG-762 meter including the information about accuracy and verification interval[SPG-162] it could be verified that the next date of verification was determined on 14.10.2010. Taking this into account the appropriateness of the monitored values deemed to be provided. Taking into account that since 2008 verification of the SPG-762 meter will be provided yearly the raised forward action request deemed to be satisfactorily responded.
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	**FAR Q9**			
Classification	☐ CAR	☒ FAR	☐ CR	☐ None
Findings	During the on-site-visit it has been understood that new "Company standard" will be issued in the nearest future. This standard might have an impact on procedures for data collecting, monitoring and archiving. Please ensure the appropriateness of the data collecting and monitoring taking into account requirements of the above mentioned standard.			
Corrective Action	The Company standard is elaborated for the purpose of organisation of emission reductions regular monitoring in JSC "Zaporizhstal's" Joint Implementation projects. The Company standard will regulate the following action in emission reductions monitoring: - date collection, - date aggregation, - emission reductions calculation, - quality control and quality assurance procedures, - date archiving, - monitoring report preparation, - monitoring report verification. All positions of Company standard will be in accordance with international and national requirements for JI projects and obligatory for implementation. The elaboration of Company standard will ensure the quality of emission reductions monitoring in JI project.			

Monitoring Report	**FAR Q9**
Assessment AIE	During the on-site visit a sufficient confidence has been gained that new "Company standard" will improve procedures for data collecting, monitoring and archiving and ensure their quality.
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 process, the AIE might have raised a forward action request to highlight issues related to project implementation that require review during the first verification of the project activity. However for this project, there was no FAR raised in the determination PDD process.

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. Some minor deviations within the operational structure have been observed and CAR R2, CR P3 and CAR Q1 have been raised and successfully closed.

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. The completing of the spreadsheet is an integral part of the monitoring. This has been appropriately carried out by the responsible personnel.

For changes changes during project implementation from a determined project design please refer to the section 5.5.

5.5. Changes during project implementation from the determined project design

The project participant has prepared a detailed description of all changes that have occurred since the determination was deemed final and provided justification for these changes. This has been done in a separate document *Revision of the monitoring plan (Addition to the first monitoring report)*[/MR-Ch/]. The provided document has been reviewed by the determination team. Please find below the list of all revisions to the project design and the corresponding determination opinion

Revision No.1

- **Revision of the starting date of the crediting period**

The monitoring plan has been changed with regard to the starting date of the crediting period. The revised starting date of the crediting period is the 01.01.2008. The starting date of the crediting period stated in the registered PDD[/PDD/] version 03 dated 03.08.2009 is indicated as 19.02.2008.

- **Determination opinion on the revision of the starting date of the crediting period**

According to the JI guidelines[2] the crediting period for issuance of ERUs may start only after the beginning of 2008 and should not extend the operational lifetime of the project. Since the starting date is the 1st January 2008 it is after the beginning of 2008 and thus in line with JI guidelines[3].

Furthermore project becomes operational on 27.12.2007. This has been evidenced by the Decision of Executive Committee of Zaporizhzhya City Rada # 552/6 dated on 27.12.2007[/ESD/]. Thus the starting date of the crediting period taken as 01.01.2008 is after the date on which the project becomes operational.

Revision No.2

- **Revision of the description of monitoring plan chosen**.

Following has been added in the revised monitoring plan:

The chosen approach for monitoring plan is based on Guidance on criteria for baseline setting and monitoring. The approach chosen includes the following procedures:

  – *The collection and archiving of all relevant data necessary for estimating or measuring anthropogenic emissions by sources of GHGs occurring within the project boundary during the crediting period;*

[2] http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=2
[3] http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=2

- *The collection and archiving of all relevant data necessary for determining the baseline of anthropogenic emissions by sources of GHGs within the project boundary during the crediting period;*
- *The identification of all potential sources of, and the collection and archiving of data on increased anthropogenic emissions by sources of GHGs outside the project boundary that are significant and reasonably attributable to the project during the crediting period;*
- *The collection and archiving of information on environmental impacts, in accordance with procedures as required by the host Party;*
- *Quality assurance and control procedures for the monitoring process;*
- *Procedures for the periodic calculation of the reductions of anthropogenic emissions by sources by the proposed JI project, and for leakage effects.*

The application of the above described approach is provided below.

- **Determination opinion on the revision of the description of monitoring plan chosen**

The main goal of this additional explanation is to provide a clarity that chosen approach for the monitoring plan is based on Guidance on criteria for baseline setting and monitoring. The inclusion follows the provisions of the Guidelines for users of the joint implementation project design document form Version 04.

The included additional explanation does not change the monitoring procedure but provides a better understanding of the chosen approach of the monitoring plan. The additional provisions have been checked and it could be verified that they are in line with Guidance on criteria for baseline setting and monitoring.

Revision No.3

- **Revision of the formula for determination the total oxygen production in the baseline scenario**.

Following has been added in the revised monitoring plan:

In case the oxygen production in the baseline scenario ($P_{oxygen,BL,y}$) calculated on the conservative provisions of the monitoring plan will be less than the measured oxygen production in the project scenario ($P_{oxygen,VRU-60,y}$) than the oxygen production in the baseline ($P_{oxygen,BL,y}$) will be equal to the oxygen production in the project scenario ($P_{oxygen,VRU-60,y}$). This is a conservative assumption as that provides to the zero emission reductions.

- **Determination opinion on the revision of the formula for determination the total oxygen production in the baseline scenario**

This additional provision has been included in order to ensure the conservativeness of the approach for calculation the emission reductions. Since the project activity

aims to reduce the unnecessary oxygen production this additional provision deemed to be appropriate and in line with the entire monitoring procedure.

Revision No.4

- **Revision of the estimated emission reductions**

The project participant has shown the impact of the revised crediting period on the amount of the estimated emission reduction as this was presented in the registered PDD.

- **Determination opinion on the revision of the estimated emission reductions**

The impact has been duly elaborated and presented in a transparent manner in the Revision of the monitoring plan (Addition to the first monitoring report)/MR-Ch/. In essence the project participant has included the emission reductions for the time period between 01.01.2008 till 18.02.2008.

Summarizing the above mentioned the determination team can confirm that the conditions defined by paragraph 33 of the JI guidelines[4] are still met for the project, and that the changes do not alter the original determination opinion for the project.

Specifically, the determination team can confirm that:

(a) The physical location of the project has not changed;

(b) the emission sources have not changed

(c) Baseline scenario has not changed;

(d) The changes are consistent with the the JI specific approach upon which the determination was prepared for the project.

(e) the starting date of the crediting period has been duly changed and appropriately justified.

(f) The amount of the emission reductions estimated in the registered PDD/PDD/ has been duly revised and correctly calculated as 542,850 tonnes CO_2 within the time period between 01.01.2008 and 31.12.2012.

In addition it should be noted that the changes have been duly justified in accordance with provisions of the *"Procedures regarding changes during project implementation from a determined project design"* JISC 22 Annex 2

5.6. Compliance with the monitoring methodology

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

[4] http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=2

5.7. 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 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.

5.8. 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. 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.

5.9. ER Calculation

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

5.10. 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. As already indicated some minor deviations within the operational structure have been observed and CAR R2 and CAR Q1 have been raised and successfully closed.

5.11. 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).

5.12. Hints for next Periodic Verification

FAR P2, FAR Q8 and FAR Q9 have been raised.

6. VERIFICATION OPINION

JSC "Zaporizhstal" has commissioned the TÜV NORD JI/CDM Certification Program (CP) to carry out the 1st 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. This verification covers the period from 2008-01-01 to 2008-12-31 (including both days).

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.

In the course of the verification 12 Corrective Action Requests (CAR) and 3 Clarification Requests (CR) were raised and successfully closed. 3 Forward Action Requests (FAR) have been raised to improve the monitoring system in the future.

The verification is based on the monitoring report (dated: 2009-09-29/MR-2/), final monitoring report (dated: 2009-11-27/MR/) the monitoring plan as set out in the registered PDD, the revision of the monitoring plan/MR-Ch/ Version 01 dated 15/09/2010, the determination report/VAL/, 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 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 are verified appropriately
- the monitoring system is in place and functional. The GHG emission reductions were measured accurately.

As the result of the 1st 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:	547,343	t CO_{2e}
Project emissions:	397,392	t CO_{2e}
Leakage:	-	t CO_{2e}
Emission reductions:	**149,951**	t CO_{2e}

Essen 2010-01-09

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

Essen, 2010-01-09

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 and verification interval.
/**CC**/	Certificate of conformity of the air separation unit
/**DISK-250**/	Technical specification of DISK-250 meter including the information about accuracy and verification interval.
/**DM-3583**/	Technical specification of DM-3583 meter including the information about accuracy and verification interval.
/**DCS**/	Draft Company standard on the procedures for data collecting recording, reporting and approval.
/**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 verification
/**EL-V**/	Verification interval for electricity meters as determined by State Register of SIT of Ukraine
/**EL-1**/	Initial data for daily electricity consumption.
/**EL-2**/	Monthly reports on electricity consumption.
/**ESD**/	Decision of Executive Committee of Zaporizhzhya City Rada # 552/6 dated on 27.12.2007

Reference	Document
/**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 and verification interval
/**Rosemt**/	Technical specification of Rosemount meter including the information about accuracy and verification interval.
/**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 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.
/**Pr-D**/	Software program for determination of the oxygen volumes
/**Pr-D**/	Expert conclusion on the appropriateness of the software program for determination of the oxygen volumes
/**SAFIR**/	Technical specification of SAFIR meter including the information about accuracy and verification interval.
/**SPG-762**/	Technical specification of SPG-762 meter including the information about accuracy and verification interval.
/**TrPr**/	Training procedure for involved personnel.
/**WFS**/	Technical specification of WFS meter including the information about accuracy and verification interval.
/**MR**/	Emissions Reduction Report Version 5 dated 27.11.2009 1st Monitoring period 01.01.2008 – 31.12.2008

Reference	Document
/**MR-2**/	Emissions Reduction Report Version 2 dated 29.09.2009 1st Monitoring period 01.01.2008 – 31.12.2008
/**MR-Ch**/	Revision of the monitoring plan (Addition to the first monitoring report) Version 01 dated 15/09/2010
/**XLS**/	Emission reduction MS-Excel calculation spread sheet

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 Compressor plant at the JSC "Zaporizhstal" Ukraine",* dated 18.09.2009
/**DVM**/	JOINT IMPLEMENTATION DETERMINATION AND VERIFICATION MANUAL (Version 01) JISC 19
/**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

Reference	Document,
/**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 version 03 dated on 03.08.2009
/**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
/**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.

Reference	Link	Organisation
/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
/IM01/	V	☒ Mr. ☐ Ms.	Shejgus R.W.	Deputy chief power engineer
/IM01/	V	☒ Mr. ☐ Ms.	Jarish W.N.	Deputy chief of chief power engineer department
/IM01/	V	☒ Mr. ☐ Ms.	Grabko A.W.	Head of automation and metrology department
/IM01/	V	☒ Mr. ☐ Ms.	Dronov A.W. (Mr.)	Deputy chief of industrial control department
/IM01/	V	☒ Mr. ☐ Ms.	Kozachenko M.P.	Head of technical bureau of plant of networks and substations
/IM01/	V	☒ Mr. ☐ Ms.	Nikituk M.W.	Deputy chief of foreign trade company 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/	This is a first 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/	Please refer to the comment above	OK	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 RfDev or RfrevMP have 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/	In the course of the verification the verification team has inspected the project site and interviewed the operational personnel. By means of instrument specifications a it was 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.	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/	The operational structure slightly deviates from that envisaged in the monitoring plan as per the PDD. Nevertheless all involved departments and their functions have been clearly described in the monitoring report. The same could be verified and observed during the on-site-visit. 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 and accurateness of reported values. All the responsibilities of the personnel within the monitoring of the project activity are clearly defined. All tasks have been carried out by properly trained personnel. Training procedure for involved personnel/TrPr/ have been provided.	~~CR R2~~ ~~CAR Q1~~	OK
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/	Relevant legislation was considered, No relevant changes were identified.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
	/H-2/ /H-3/ /H-4/ /H-5/			
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/ /MP/ /DR/	This is the first monitoring report covering the time period between 01.01.2008 and 31.12.2008. This is in line with validated PDD/PDD/ and JI Guidelines/JI-G/.	~~CAR R1~~	OK
References *Check if the monitoring report provides the correct references, in detail: project title, applied methodology/ies, meth tools.*	/MP/	Page numbers, the date of issuance and revision number have been appropriately indicated in the monitoring report/MP/.	~~CAR R1~~	OK
Completeness *Assess if the monitoring report is complete, i.e. have all relevant issues been addressed?*	/MP/	The monitoring report is complete and provides all required information. In particular about: • 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	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		• 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/ /MP/	The monitoring reports include an accurate and clear description of the project activity, a daily and monthly data on the main monitoring parameters like the electricity consumption as well as oxygen generation and 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.	~~CR R3~~	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 "Monitoring Parameters".*	/PDD/ /DR/ /MP/	The following issues have been identified:		OK
		• Please include the date of the monitoring report (day, months, year)	~~CAR R1~~	
		• Please revise in the monitoring report the description of the date collecting and monitoring. Please indicate the structure and functions that were valid within the monitoring period (2008). Please include information about double check of the reported figures and about archiving of the collected data. Please revise the Fig. B.1. In particular the name of department of environmental and radiation protection deemed to be incorrect.	~~CAR R2~~	
		• Please indicate the exact date (day/month/year) of calibration/verification for all relevant monitoring equipment.	~~CAR R3~~	

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		Please indicate all relevant monitoring equipment the last and previous date of calibration/verification..		
Deviations from the validated monitoring plan *Assess whether the MR in line with the validated monitoring plan?*	/PDD/ /DR/ /MP/ /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. Some minor deviations within the operational structure have been observed and CAR R2 and CAR Q1 have been raised and successfully closed. 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. CR P3 has been raised w.r.t. the calibration/verification of the electricity meters and has been successfully closed. No further deviations from the validated monitoring plan have been identified. Hence it has been concluded that the monitoring report is in line with the validated monitoring plan.	~~CAR R2~~ ~~CAR Q1~~ ~~CR P3~~	OK
Deviations from the approved methodology	/PDD/	A project specific methodology developed for the considered project activity is has been applied. No deviations have been	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
Assess whether the MR in line with the applied monitoring methodology?	/DR/ /MP/	observed.		
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/ /MP/ /EL-M/	Within the verification the installed monitoring equipment (electricity meters) has been inspected at the project site. 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/EL-M/. Furthermore it has 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, with the national regulations and in an appropriate manner.	**OK**	OK
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/ /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/.	~~CAR P1~~	OK OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		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. CAR P1 has been raised due to the minor deviations of the electricity consumption in January 2008. The electricity consumption for January 2008 has been duly corrected. The change of results of GHGs emission reductions estimation was provided in monitoring report. The values given in the monitoring report and the corresponding Excel sheet are correct.		
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/ /MP/ /EL-M/ /EL-Ac/ /EL-C/ /EL-M/ /EL-V/	The initial verification dates as indicated in the monitoring report could be verified based on provided technical specification of the applied electricity meters, including the dates of the initial verification/EL-M/. There are some meters that have to be calibrated/monitored in 2008. For these meters the verification certificates and information about their accuracy have been provided. CAR R3, CR P3, CAR P5 and CAR Q7 were raised in this context and successfully closed, 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	~~CAR R3~~ ~~CR P3,~~ ~~CAR P5~~ ~~CAR Q7~~ ~~CAR R2~~ ~~CAR Q1~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
		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 electricity consumption. CAR R2 and CAR Q1 were raised in this context and successfully closed,		
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.*	/MP/ /EL-M/	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/. CAR P1 has been raised and successfully closed. No further significant inaccuracies have been identified for the monitoring parameters.	~~CAR P1~~	OK
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-V/ /EL-1/ /EL-2/	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 reports and the corresponding Excel spreadsheets are in line with provided evidences.	OK	OK
4.2. Oxygen generation/distribution				
Measurement / Determination method *Describe how the monitoring parameter was*	/PDD/ /MR/	Monitoring report provides (in table 3-2) information about flow-rate meters for oxygen production in air-separation units and oxygen distribution. The information provided specifies the	**OK**	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
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.*	/DR/ /APG/ /DISK-250/ /DM-3583/ /Flowm-1/ /Flowm2/ /KSF/ /Rosemt/ /Rosemt-2/ /Pr-D/ /Pr-D/ /SAFIR/ /SPG-762/ /WFS/	location of meters, type of meters specific meter numbering, date of last verification, date of current verification and the date of the next verification. Provide information could be verified based on the technical specification of the monitoring equipment and verification certificates. 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 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*	/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/.	FAR P2	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
descriptions of the CARs raised.		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. 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. FAR P2 has been raised w.r.t. the data source for barometric pressure data for oxygen generation/distribution. In response to the raised FAR project participant has provided an appropriate action. During the on-site visit it has been observed that the difference between average daily barometric pressure data from JSC "Zaporizhgaz" and measured on territory of JSC "Zaporizhstal" is negligible. The values given in the monitoring report and the corresponding Excel sheet are correct.		
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/	Table 3-2 of the monitoring report provides information about flow-rate meters for oxygen production in air-separation units and oxygen distribution including their date of last verification, date of current verification and the date of the next verification. Provide information could be verified based on the technical specification of the monitoring equipment and verification certificates. CAR R1, P4, Q2, Q3, Q4, Q5, Q6 and FAR Q8 have been raised w.r.t the indicated accuracy class and pending verification certificates. All pending evidences have been provided and all CARs and FAR could be closed. For details please refer to the	~~CAR R1~~ ~~CR P3~~ ~~CAR Q2,~~ ~~CAR Q3~~ ~~CAR Q4~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
	/Flowm-1/ /Flowm2/ /KSF/ /Rosemt/ /Rosemt-2/ /Pr-D/ /Pr-D/ /SAFIR/ /SPG-762/ /WFS/	assessment under particular findings. 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 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.	~~CAR Q5~~ ~~CAR Q6~~ FAR Q8	
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.*	/PDD/ /MR/ /DR/ /AL/ /APG/ /DISK-250/ /DM-3583/ /Flowm-	The monitoring plan clearly specifies the parameters to be 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. CR P3 and CAR Q2 have been raised in this context and could be successfully closed. No further significant inaccuracies have been identified for the monitoring parameters.	~~CR P3~~ ~~CAR Q2~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
	1/ /Flowm2/ /KSF/ /Rosemt/ /Rosemt-2/ /Pr-D/ /Pr-D/ /SAFIR/ /SPG-762/ /WFS/			
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.*	/OX-1/ /OX-2/ /EL-1/ /EL-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 based on the actual data have been carried out. A sufficient confidence has been gained the oxygen generation and distribution are monitored properly. It has been verified that the values in the monitoring reports and the corresponding Excel spreadsheets are in line with provided evidences.	OK	OK
5. ER Calculation				
Traceability *Assess if the calculation is fully traceable. In case of complex calculations an Excel calculation spread-*	/MP/ /XLS/	The excel calculation spreadsheet includes separate tables for baseline and project emissions on the monthly basis. Both calculations are summarized and emission reductions are	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
sheet shall be used. All applied formulae must be visible.	/EL-1/ /EL-2/ /OX-1/ /OX-2/ /OX&EL/	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.		
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".*	/MP/ /XLS/ /EF/ /PDD/ /DR/	The Excel – calculation sheet is completely in line with the 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/.	OK	OK
Applied formulae *Check if the applied formulae are in accordance with the monitoring plan and / or the approved methodology.*	/MP/ /XLS/	The verification team has reproduced the calculation of emission reductions based on the provided parameters and the amount of the emission reduction has been verified. The applied spreadsheet have been also reviewed and examined. It has been verified that the formulae and procedures as defined within the monitoring plan has been appropriately applied. No changes and deviations to the approved spreadsheet have been observed.	OK	OK
Completeness of calculation *Assess whether the provided calculations are*	/MP/	The calculation is completely traceable. No information or calculation gaps have been identified.	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
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.*	/BA-1/ /BA-2/ /BA-3/ /BA-4/ /BA-5/			
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.*	/MP/ /DR/ /PDD/	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 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 emission reductions. CAR R2, P6, Q1 and FAR Q9 have been raised in this context and could be successfully closed.	~~CAR R2~~ ~~CAR P6~~ ~~CAR Q1~~ FAR Q9	OK
Roles and Positions *Check if all roles and positions of each person in the GHG data management process are clearly defined*	/MP/ /DR/ /PDD/	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	OK	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verifiers Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
and implemented, from raw data generation to submission of the final data. *Check further if only duly qualified personnel is involved in the monitoring procedures.*		documented. Please refer to the comment above.		
Trainings *Check if initial trainings have been carried out, in case deemed necessary.*	/MP/ /DR/ /PDD/ /TrPr/	Training procedures /TrPr/ have been provided and sufficient confidence has been gained that the competences of involved staff and responsible persons ensure 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.*	/MP/ /DR/ /PDD/ /TrPr/	Please refer to the comment under QA/QC Procedures.	OK	OK
Maintenance procedures Are appropriate maintenance procedures in place?	/MP/ /DR/ /PDD/ /TrPr/	All relevant meters are 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*	/MP/ /DR/ /PDD/ /TrPr/	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.	/MP/ /DR/ /PDD/ /TrPr/	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.	/MP/ /DR/ /PDD/ /TrPr/	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