VERIFICATION REPORT
SE "PA YUZHNY MACHINE-BUILDING PLANT NAMED AFTER A.MAKAROV"

VERIFICATION OF THE
"IMPLEMENTATION OF ENERGY SAVING EQUIPMENT AND TECHNOLOGIES AT THE STATE ENTERPRISE "PRODUCTION ASSOCIATION YUZHNY MACHINE-BUILDING PLANT NAMED AFTER A. MAKAROV"

FORTH PERIODIC
(01/01/2011 – 30/06/2011)

REPORT NO. UKRAINE-VER/0355/2011
REVISION NO. 01

BUREAU VERITAS CERTIFICATION

Date of first issue: 23/09/2011	Organizational unit: Bureau Veritas Certification Holding SAS
Client: SE "PA Yuzhny Machine-Building Plant named after A. Makarov"	Client ref.: Iuriy Pashchenko

Summary:

Bureau Veritas Certification has made the forth periodic verification of the project "Implementation of Energy Saving Equipment and Technologies at the State Enterprise "Production Association Yuzhny Machine-Building Plant named after A. Makarov", project of SE "PA Yuzhny Machine-Building Plant named after A.Makarov" located in Dnipropetrovsk city, Ukraine, and applying the JI specific approach, on the basis of UNFCCC criteria for the JI, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the JI rules and modalities and the subsequent decisions by the JI Supervisory Committee, as well as the host country criteria.

The verification scope is defined as a periodic independent review and ex post determination by the Accredited Independent Entity of the monitored reductions in GHG emissions during defined verification period, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the verification process is a list of Clarification Request, Corrective Actions Requests, Forward Actions Requests (CR, CAR and FAR), presented in Appendix A.

In summary, Bureau Veritas Certification confirms that the project is implemented as planned and described in approved project design documents. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions. The GHG emission reduction is calculated accurately and without material errors, omissions, or misstatements, and the ERUs issued totalize 355 022 tons of CO_2 equivalent for the monitoring period 01/01/2011 – 30/06/2011.

Our opinion relates to the project's GHG emissions and resulting GHG emission reductions reported and related to the approved project baseline and monitoring, and its associated documents.

Report No.: UKRAINE-ver/0355/2011	Subject Group: JI
Project title: Implementation of Energy Saving Equipment and Technologies at the State Enterprise "Production Association Yuzhny Machine-Building Plant named after A. Makarov"	
Work carried out by: Oleg Skoblyk – Team Leader, Lead Verifier Igor Kachan - Team member, Verifier Olena Manziuk – Team member, Verifier	
Work reviewed by: Ivan Sokolov – Internal Technical Reviewer	
Work approved by: Flavio Gomes – Operational Manager	
Date of this revision: 23/09/2011	Rev. No.: 01 / Number of pages: 33

Bureau Veritas Certification Holding SAS

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Abbreviations

AIE	Accredited Independent Entity
BVC	Bureau Veritas Certification Holding SAS
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CL	Clarification Request
CO_2	Carbon Dioxide
DVM	Determination and Verification Manual
ERU	Emission Reduction Unit
FAR	Forward Action Request
GHG	Green House Gas(es)
IPCC	Intergovernmental Panel on Climate Change
JI	Joint Implementation
JISC	Joint Implementation Supervisory Committee
MP	Monitoring Plan
MR	Monitoring Report
DFP	Designated Focal Point
QA/QC	Quality Assurance/Quality Control
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change

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1 INTRODUCTION

State Enterprise “Production Association Yuzhny Machine-Building Plant named after A. Makarov” has commissioned Bureau Veritas Certification to verify the emissions reductions of its JI project “Implementation of Energy Saving Equipment and Technologies at the State Enterprise “Production Association Yuzhny Machine-Building Plant named after A. Makarov” (hereafter called “the project”) at Dnipropetrovsk city, Ukraine.

This report summarizes the findings of the verification of the project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

Verification is the periodic independent review and ex post determination by the Accredited Independent Entity of the monitored reductions in GHG emissions during defined verification period.

The objective of verification can be divided in Initial Verification and Periodic Verification.

UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the JI rules and modalities and the subsequent decisions by the JI Supervisory Committee, as well as the host country criteria.

1.2 Scope

The verification scope is defined as an independent and objective review of submitted monitoring report and the determined project design document including the project’s baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

The verification is not meant to provide any consulting towards the Client. However, stated requests for clarifications, corrective and/or forward actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.

1.3 Verification Team

The verification team consists of the following personnel:

Oleg Skoblyk
Bureau Veritas Certification Team Leader, Climate Change Lead Verifier

Igor Kachan
Bureau Veritas Certification Team Member, Climate Change Verifier

Olena Manziuk
Bureau Veritas Certification Team Member, Climate Change Verifier

This verification report was reviewed by:

Ivan Sokolov
Bureau Veritas Certification Internal Technical Reviewer

2 METHODOLOGY

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

In order to ensure transparency, a verification protocol was customized for the project, according to the version 01 of the Joint Implementation Determination and Verification Manual, issued by the Joint Implementation Supervisory Committee at its 19 meeting on 04/12/2009. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from verifying the identified criteria. The verification protocol serves the following purposes:

- It organizes, details and clarifies the requirements a JI project is expected to meet;
- It ensures a transparent verification process where the verifier will document how a particular requirement has been verified and the result of the verification.

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

2.1 Review of Documents

The Monitoring Report (MR) submitted by SE “PA Yuzhny Machine-Building Plant named after A. Makarov” and additional background documents related to the project design and baseline, i.e. country Law, Project Design Document (PDD), JI specific approach developed in accordance with Guidance on criteria for baseline setting and monitoring, Host party criteria, Kyoto Protocol, Clarifications on Verification Requirements to be Checked by an Accredited Independent Entity were reviewed.

The verification findings presented in this report relate to the Monitoring Report version 01 dated 08/09/2011, the Monitoring Report version 02 dated 21/09/2011, and project as described in the determined PDD.

2.2 Follow-up Interviews

On 15/09/2011 Bureau Veritas Certification during site visit performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of State Enterprise "Production Association Yuzhny Machine-Building Plant named after A.Makarov" and Institute of Engineering Ecology were interviewed (see section 5 References). The main topics of the interviews are summarized in Table 1 below.

Table 1 Interview topics

Interviewed organization	Interview topics
State Enterprise "Production Association Yuzhny Machine-Building Plant named after A.Makarov"	➢ Organizational structure ➢ Responsibilities and authorities ➢ Training of personnel ➢ Quality management procedures and technology ➢ Implementation of equipment (records) ➢ Metering equipment control ➢ Metering record keeping system, database ➢ Monitoring procedure
Institute of Engineering Ecology	➢ Baseline methodology ➢ Monitoring plan ➢ Monitoring report ➢ Deviations from PDD ➢ Emission reduction calculation

2.3 Resolution of Clarification, Corrective and Forward Action Requests

The objective of this phase of the verification is to raise the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the GHG emission reduction calculation.

If the Verification Team, in assessing the monitoring report and supporting documents, identifies issues that need to be corrected, clarified or improved with regard to the monitoring requirements, it should raise these issues and inform the project participants of these issues in the form of:

(a) Corrective Action Request (CAR), requesting the project participants to correct a mistake that is not in accordance with the monitoring plan;

(b) Clarification Request (CL), requesting the project participants to provide additional information for the Verification Team to assess compliance with the monitoring plan;

(c) Forward Action Request (FAR), informing the project participants of an issue, relating to the monitoring that needs to be reviewed during the next verification period.

The Verification Team will make an objective assessment as to whether the actions taken by the project participants, if any, satisfactorily resolve the issues raised, if any, and should conclude its findings of the verification.

To guarantee the transparency of the verification process, the concerns raised are documented in more detail in the verification protocol in Appendix A.

3 VERIFICATION CONCLUSIONS

In the following sections, the conclusions of the verification are stated.

The findings from the desk review of the original monitoring documents and the findings from interviews during the follow up visit are described in the Verification Protocol in Appendix A.

The Clarification Request, Corrective Action Requests and Forward Action Requests are stated, where applicable, in the following sections and are further documented in the Verification Protocol in Appendix A. The verification of the Project resulted in five Corrective Action Requests.

The number between brackets at the end of each section corresponds to the DVM paragraph.

3.1 Remaining issues and FARs from previous verifications

No FARs from previous verifications were raised by verification team. Thus, the following section is not applicable.

3.2 Project approval by Parties involved (90-91)

Written project approval (LoA #2591/23/7 dated 16/09/2011) by the host Party (Ukraine) has been issued by the State Environmental Investment Agency of Ukraine.

Moreover, the Federal Office for the Environment (FOEN, Switzerland) has issued the Letter of Approval #J294-0485 dated 24.01.2011 for this

project acting as the Designated National Authority of that Party (refer to the section 5 References of this report).

The abovementioned written approval is unconditional.

The identified areas of concern as to project approval by Parties involved, project participants response and BV Certification's conclusion are described in Appendix A (refer to CAR02 and CAR04).

3.3 Project implementation (92-93)

The JI project "Implementation of Energy Saving Equipment and Technologies at the State Enterprise "Production Association Yuzhny Machine-Building Plant named after A. Makarov" main goal is reduction of fuel (i.e., natural gas) and electricity consumption due to implementation of energy-saving equipment and technologies at the SE "PA Yuzhny Machine-Building Plant named after A. Makarov". Regarded JI project activity will result in decreasing of anthropogenic greenhouse gas emissions, mainly it is CO_2.

In addition, modernization of the existing and installation of the new modern boiler, turbine, technological and other equipment will enable to reduce not only GHG but also toxic gases emission in order to improve ecological situation in the center of the densely populated Dnipropetrovsk city, where the State Enterprise "Production Association Yuzhny Machine-Building Plant named after A. Makarov" is located.

According to the documents, the starting date of JI project operation is 11/10/2004. It is the date when the Agreement between State Enterprise «Production Association Yuzhny Machine-Building Plant named after A. Makarov» and the Institute of Engineering Ecology on energetic and ecological survey of the enterprise and development of materials for the project on greenhouse gases emission reduction was signed, and JI project activity has been started to be implemented by the Project Participants.

As a fact, the JI specific approach was used for JI project realization that developed in accordance with Guidance on Criteria for Baseline Setting and Monitoring.

Actually, for considered monitoring period a list of project activity that planned in the PDD was implemented, such as:

- distribution networks was rehabilitated;
- some new technological equipment were installed,
- frequency controllers were installed;
- boiler units were reconstructed;
- steam turbines were rehabilitated, etc.

In detailed, hot water boiler type KV-GM-116,3-150-1 was commissioned, and steam turbines type AP-25-2 (st. #2) and type AT-25-2 (st.# 5) rehabilitation of the were rehabilitated.

On the whole, implementation of the energy saving measures is realized according to the schedule stated in the registered project design document.

As stated in the Monitoring Report, GHG emission reductions were achieved due to the JI project activity implementation, and the amount of the emission reductions (ER) for the monitoring period 01/01/2011 – 30/06/2011 is equal 355 022 t CO_2 equivalent.

Within the regarded monitoring period there are no deviations or revisions to the determined PDD.

3.4 Compliance of the monitoring plan with the monitoring methodology (94-98)

The monitoring occurred in accordance with the monitoring plan included in the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website. According to the PDD, selection of monitoring approach was made in compliance with “Guidance on criteria for baseline setting and monitoring”. The project developer used JI specific approach for establishing the monitoring. Collection of all key parameters required to calculate greenhouse gas emissions is undertaken in compliance with the established practice of the State Enterprise “Production Association Yuzhny Machine-Building Plant named after A. Makarov” to meter fuel, heat, energy, pollutant emissions into the air, and environmental impact assessment.

For calculating the emission reductions key factors, such as natural gas consumption by the enterprise equipment, natural gas consumption for heat energy production for external consumers, natural gas consumption for electricity generation for external and other consumers, natural gas consumption for production of the non-core products, Delivery of natural gas to the external consumers, electricity consumption for production of the aerospace products, average Net Calorific Value of natural gas, carbon emission factor for natural gas, carbon emission factor for JI projects reducing electricity consumption, delivery of heat energy for external consumers, gross production output of aerospace products at the enterprise, aerospace products price change index, influencing the baseline emissions and the activity level of the project and the emissions as well as risks associated with the JI project were taken into account, as appropriate.

Data sources used for calculating emission reductions, such as calibrated measurement equipment, the study of standardized emission factors for the Ukrainian electricity grid, IPCC guidelines are clearly identified, reliable and transparent. On site responsible persons register data from the measurement equipments and fixed monitoring data to logbooks. Moreover, there is electronic database of monitoring data. In detail, registration of monitoring data of natural gas consumption and electricity consumption at the enterprise is conducted in accordance with identified procedure of data collection. For example, chief of CHP, chiefs of workshops, chief of compressor station, and chief of metrology department deliver the monitoring records to the main energy engineer. Further the information is transferred to the main specialist of JI project where it is collected before the processing. Next step is Monitoring Report preparation by the specialists of the Institute of Engineer Ecology. In general, all roles and responsibilities connected with JI project at the SE “PE Yuzhny Machine-Building Plant named after A. Makarov” are established in accordance with procedure described in section D “Monitoring plan” of the registered PDD version 07 dated 16/08/2011.

Emission factors, including default emission factors, are selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice. According to the JI project documents, several emission factors are used for calculation of emission reductions, such as carbon emission factor for natural gas and carbon emission factor for JI projects electricity consumption.

The calculation of emission reductions is based on conservative assumptions and the most plausible scenarios in a transparent manner.

The identified areas of concern as to compliance of the monitoring plan with the monitoring methodology, project participants response and BV Certification’s conclusion are described in Appendix A (refer to CAR03 and CAR05).

3.5 Revision of monitoring plan (99-100)

There are no revisions to the Monitoring Plan of the JI project “Implementation of Energy Saving Equipment and Technologies at the State Enterprise “Production Association Yuzhny Machine-Building Plant named after A. Makarov”. Thus, the section is not applicable for considered monitoring period.

3.6 Data management (101)

As a result of site visit, documents revision, and verification process at all there is concluded that the data and their sources, provided in monitoring report, are clearly identified, reliable and transparent.

The implementation of data collection procedures is in accordance with the monitoring plan, including the quality control and quality assurance procedures. For instance, internal audits and control measures are conducted by the main specialist of the State Enterprise “Production Association Yuzhny Machine-Building Plant named after A. Makarov”. These procedures are described in detailed in the registered project design document.

According to the documents on measurement equipments and its calibration certificates, the function of the monitoring equipment, including its calibration status, is in order.

During site visit logbooks were revised, and electronic database was checked and the last one was discovered as reliable and functional. Thus, the evidence and records used for the monitoring are maintained in a traceable manner.

The data collection and management system for the JI project “Implementation of Energy Saving Equipment and Technologies at the State Enterprise “Production Association Yuzhny Machine-Building Plant named after A. Makarov” is in accordance with the registered monitoring plan.

The identified areas of concern as to the data management, project participants response and BV Certification’s conclusion are described in Appendix A (refer to CAR01).

3.7 Verification regarding programmes of activities (102-110)

Not applicable.

4 VERIFICATION OPINION

Bureau Veritas Certification has performed the forth periodic verification of the project “Implementation of Energy Saving Equipment and Technologies at the State Enterprise “Production Association Yuzhny Machine-Building Plant named after A. Makarov” in Dnipropetrovsk city, Ukraine, which applies the JI specific approach developed in accordance with the Guidance on Criteria for Baseline Setting and Monitoring. The verification was performed on the basis of UNFCCC criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

The verification consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up

interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion.

The management of the SE "PA Yuzhny Machine-Building Plant named after A. Makarov" is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the project on the basis set out within the project Monitoring and Verification Plan indicated in the final PDD version 07 dated 16/08/2011. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the project, is the responsibility of the management of the project.

Bureau Veritas Certification verified the Project Monitoring Report version 02 dated 21/09/2011 for the reporting period as indicated below. Bureau Veritas Certification confirms that the project is implemented as planned and described in approved project design documents. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions.

Bureau Veritas Certification can confirm that the GHG emission reduction is accurately calculated and is free of material errors, omissions, or misstatements. Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the approved project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated, we confirm, with a reasonable level of assurance, the following statement:

Reporting period: From 01/01/2011 to 30/06/2011
Baseline emissions : 456 575 t CO_2 equivalents
Project emissions : 101 553 t CO_2 equivalents
Emission Reductions (1-2 quarter 2011) : 355 022 t CO_2 equivalents

5 REFERENCES

Category 1 Documents:
Documents provided by State Enterprise "Production Association Yuzhny Machine-Building Plant named after A. Makarov" that relate directly to the GHG components of the project.

/1/ Project design Document of JI project "Implementation of Energy Saving Equipment and Technologies at the State Enterprise "Production Association Yuzhny Machine-Building Plant named after A. Makarov" version 07 dated 16/08/2011

/2/ Monitoring report of JI project "Implementation of Energy Saving Equipment and Technologies at the State Enterprise "Production Association Yuzhny Machine-Building Plant named after A. Makarov" for the period 01/01/2011 – 30/06/2011 version 01 dated 08/09/2011

/3/ Monitoring report of JI project "Implementation of Energy Saving Equipment and Technologies at the State Enterprise "Production Association Yuzhny Machine-Building Plant named after A. Makarov" for the period 01/01/2011 – 30/06/2011 version 02 dated 21/09/2011

/4/ Letter of Approval #2591/23/7 dated 16/09/2011 of the JI project "Implementation of Energy Saving Equipment and Technologies at the State Enterprise "Production Association Yuzhny Machine-Building Plant named after A. Makarov" issued by the State Environmental Investment Agency of Ukraine.

/5/ Letter of Approval #J294-0485 dated 24/01/2011 of the JI project "Implementation of Energy Saving Equipment and Technologies at the State Enterprise "Production Association Yuzhny Machine-Building Plant named after A. Makarov" issued by the Federal Office for the Environment (FOEN) of Switzerland.

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

/1/ Periodic calibration card on device type 22 Ex-M-ДД, serial #702173. The calibration date is of 10/07/2009.

/2/ Periodic calibration card on device type 22 Ex-M-ДД, serial #5222. The calibration date is of 10/07/2009.

/3/ Periodic calibration card on device type 22 Ex-M-ДД, serial #702174. The calibration date is of 26/06/2010.

/4/ Periodic calibration card on device type БПС-24, serial #3263. The calibration date is of 10/07/2010.

/5/ Periodic calibration card on device type Sapfir, serial #024537. The calibration date is of 10/07/2010.

/6/ Periodic calibration card on device type БПС-24, serial #1800. The calibration date is of 10/07/2010.
/7/ State calibration certificate on measurement equipment #19-2/1728-08, type SKU-01, serial #2710259, dated 19/09/2008. Valid till 19/09/2010
/8/ Photo - Flowtech-TM measurement and control unit, serial #1-525 dated 16/03/2009
/9/ Passport on multiparameter meter type ПМ-3, serial #496 dated 18/03/2009
/10/ Passport on multiparameter meter type ПМ-3, serial #505 dated 30/03/2009
/11/ Passport on multiparameter meter type ПМ-3, serial #504 dated 30/03/2009
/12/ Statement dated 10/02/2010 on acceptance into operation of air compressor type H280H-WL «GARDNER DENVER», England, serial #C004143, mounted in compressor building #77, shop #65, complex #308
/13/ ЭУС 125 ФО data sheet. Ultrasound heat meter type Ergomera-125, serial #027705. Calibration dated 16/08/2007
/14/ State calibration certificate on measurement equipment #19-2/1728-08, type SKU-01, serial #2706197, dated 23/07/2008. Valid till 23/07/2010
/15/ State calibration certificate on measurement equipment #19-2/1728-08, type SKU-01, serial #2711314, dated 18/07/2008. Valid till 18/07/2010
/16/ State calibration certificate on measurement equipment #19-2/1728-08, type SKU-01, serial #2610309, dated 24/07/2008. Valid till 24/07/2010
/17/ State calibration certificate on measurement equipment #19-2/1728-08, type SKU-01, serial #2710217, dated 21/07/2008. Valid till 21/07/2010
/18/ State calibration certificate on measurement equipment #19-2/1728-08, type SKU-01, serial #2809017, dated 28/07/2008. Valid till 28/07/2010
/19/ State calibration certificate on measurement equipment #19-2/1728-08, type SKU-01, serial #2711314, dated 04/08/2004. Valid till 04/08/2006
/20/ Statement #2009-12 on monthly heat energy delivery from HPP of State Enterprise “Production Association Yuzhny Machine-Building Plant named after A. Makarov” for Teplotrans public utility company for December 2009 according to the agreement #966 dated 27/12/2007
/21/ Calculation of natural gas consumption used for heat generation by of State Enterprise “Production Association Yuzhny Machine-Building Plant named after A. Makarov” for Teplotrans public utility company in December 2009
/22/ Statement dated 31/12/2009 on consumed gas and generated heat

amount delivered to Teplotrans public utility company in December 2009

/23/ Statement on acceptance-transmitting of energy services dated 31/12/2005 in accordance to the agreement #643 of 01.06.2002

/24/ Statement on acceptance-transmitting of energy services dated 31/05/2005 in accordance to the agreement #643 of 01.06.2002

/25/ Statement on acceptance-transmitting of energy services dated 01/03/2005 in accordance to the agreement #643 of 01.06.2002

/26/ Energy consumption and distribution at State Enterprise "Production Association Yuzhny Machine-Building Plant named after A. Makarov" for every month 2007

/27/ Periodic calibration card on equipment type ИТ, serial #131460 (shop #67). Calibration date 11/10/2010

/28/ Periodic calibration card on equipment type САЗУ-ИТ, serial #031018 (shop #67). Calibration date 11/10/2010

/29/ Periodic calibration card on equipment type ИТ, serial #174257 (shop #67). Calibration date 11/10/2010

/30/ Periodic calibration card on equipment type САЗУ-ИТ, serial #278640 (shop #67). Calibration date 19/01/2011

/31/ Periodic calibration card on equipment type САЗУ-ИТ, serial #266878 (shop #67). Calibration date 19/01/2011

/32/ Periodic calibration card on equipment type САЗУ-И670М, serial #443359 (shop #67). Calibration date 07/09/2010

/33/ Periodic calibration card on equipment type САЗУ-ИТ, serial #118199 (shop #67). Calibration date 29/11/2010

/34/ Periodic calibration card on equipment type САЗУ-И670М, serial #435117 (shop #67). Calibration date 25/05/2011

/35/ Periodic calibration card on equipment type ИТ, serial #279059 (shop #67). Calibration date 16/10/2010

/36/ Periodic calibration card on equipment type ИТ, serial #76186 (shop #67). Calibration date 16/10/2010

/37/ Periodic calibration card on equipment type САЗУ-ИТ, serial #174056 (shop #67). Calibration date 10/11/2010

/38/ Periodic calibration card on equipment type САЗУ- ИЧ3, serial #154004 (shop #67). Calibration date 11/02/2008

/39/ Periodic calibration card on equipment type САЗУ-И670М, serial #723831 (shop #67). Calibration date 12/10/2010

/40/ Periodic calibration card on equipment type САЗУ-ИТ, serial #029535 (shop #67). Calibration date 10/10/2010

/41/ Periodic calibration card on equipment type ИТ, serial #131765 (shop #67). Calibration date 25/10/2010

/42/ Periodic calibration card on equipment type САЗУ-ИТ, serial #229264 (shop #67). Calibration date 01/11/2010

/43/ Periodic calibration card on equipment type САЗУ-И670М, serial #739817 (shop #67). Calibration date 12/10/2010

/44/ Periodic calibration card on equipment type САЗУ-И670М, serial #521396 (shop #67). Calibration date 07/07/2011

/45/ Periodic calibration card on equipment type САЗУ-И670М, serial #630841 (shop #67). Calibration date 07/07/2011
/46/ Periodic calibration card on equipment type САЗУ-И670М, serial #675648 (shop #67). Calibration date 07/07/2011
/47/ Order #612 dated 28/12/2010 on documents storage needed for monitoring of the JI project "Implementation of Energy Saving Equipment and Technologies at the State Enterprise "Production Association Yuzhny Machine-Building Plant named after A. Makarov"
/48/ Operation manual. Gas volume corrector type Tandem, serial #1968 dated 29/07/2009. Calibration date 22/07/2011
/49/ АЧЦА 407251.001ФО data sheet. Ultrasound gas meter type Курс-01, serial #5343 dated 05/08/2009. Calibration date 22/07/2011
/50/ Certificate on state metrological attestation #19-22/200-0 dated 06/08/2009 on gas volume corrector type Tandem, serial #1968
/51/ Permit #120039 dated 05/08/1998 on stationary sources air pollution at the State Enterprise "Production Association Yuzhny Machine-Building Plant named after A. Makarov". Valid till 31/12/1999
/52/ Statements and notes issued by the Dnipropetrovsk region State Environmental Protection Office as of 2004, 2007, 2008
/53/ Form 2-TP (the air). Report of the air protection for 2005
/54/ Form 2-TP (the air). Report of the air protection for 2006
/55/ Form 2-TP (the air). Report of the air protection for 2007
/56/ Form 2-TP (the air). Report of the air protection for 2008
/57/ Form 2-TP (the air). Report of the air protection for 2009
/58/ Form 2-TP (the air). Report of the air protection for 2010
/59/ Form 2-TP (the air). Report of the air protection for the first quarter and second quarter 2011
/60/ Passport on natural gas physical and chemical characteristics for every month of the 1 and 2 quarters of 2011
/61/ Passport on natural gas physical and chemical characteristics for every month of 2010
/62/ Passport on natural gas physical and chemical characteristics for every month of 2009
/63/ Passport on natural gas physical and chemical characteristics for every month of 2008
/64/ Passport on natural gas physical and chemical characteristics for every month of 2007
/65/ Passport on natural gas physical and chemical characteristics for every month of 2006
/66/ Passport on natural gas physical and chemical characteristics for every month of 2005
/67/ Passport on measuring devices oa environmental characteristics measurement, serial #506, #3219. Calibration date 10/08/2010
/68/ Acceptance certificate on ultrasound heat meter type Ergomera-125, serial #162509. Calibration dated 03/09/2009

/69/ Acceptance certificate on ultrasound heat meter type Ergomera-125, serial #207810. Calibration dated 14/10/2010
/70/ Electric data base on gas distribution at the State Enterprise "Production Association Yuzhny Machine-Building Plant named after A. Makarov"
/71/ Statement on natural gas acceptance-transmitting for every month in 2005, 2006, 2007, 2008, 2009, 2010 and 1-2 quarters of 2011
/72/ Statement on energy consumption for every month in 2005, 2006, 2007, 2008, 2009, 2010 and 1-2 quarters of 2011
/73/ Explanatory notes to the financial report for 2005-2010 and 1-2 quarters 2011
/74/ Photo – power meter
/75/ Photo – Flowtech measurement unit
/76/ Photo – new boiler unit of boiler #9

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

/1/ Muhailo Korobov – chief power engineer of SE "PA Yuzhny Machine-Building Plant named after A. Makarov"
/2/ Larysa Kovika – chief of environmental bureau at SE "PA Yuzhny Machine-Building Plant named after A. Makarov"
/3/ Oleksandr Nikolaenko – executive director EPC "Yuzhmashenergo"
/4/ Iakiv Tahterin – chief specialist of SE "PA Yuzhny Machine-Building Plant named after A. Makarov"
/5/ Anatolij Lobashov – chief metrologist of SE "PA Yuzhny Machine-Building Plant named after A. Makarov"
/6/ Vladyslav Dogonov – head of TPP at SE "PA Yuzhny Machine-Building Plant named after A. Makarov"
/7/ Iuriy Pashchenko – deputy of director general of SE "PA Yuzhny Machine-Building Plant named after A. Makarov"

APPENDIX A: JOINT IMPLEMENTATION PROJECT VERIFICATION PROTOCOL

Table 1 Check list for verification, according to the JOINT IMPLEMENTATION DETERMINATION AND VERIFICATION MANUAL (Version 01)

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
Project approvals by Parties involved				
90	Has the DFPs of at least one Party involved, other than the host Party, issued a written project approval when submitting the first verification report to the secretariat for publication in accordance with paragraph 38 of the JI guidelines, at the latest?	All Parties involved in the JI project issued written project approvals. Namely, the State Environmental Investment Agency of Ukraine has issued the Letter of Approval #2591/23/7 dated 16/09/2011 of the JI project "Implementation of Energy Saving Equipment and Technologies at the State Enterprise "Production Association Yuzhny Machine-Building Plant named after A. Makarov"; and the Federal Office for the Environment (FOEN), Switzerland (Party B), has issued the Letter of Approval for this project No. J294-0485 dated 24.01.2011. Corrective Action Request 02 (CAR02). Please, provide Letters of Approvals from Parties involved in the project. Corrective Action Request 04 (CAR04).	CAR02 CAR04	OK OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		Section A.7 of the MR version 01 includes information of written approvals of the regarded JI project, but this information does not concern to the indicated section. Please, provide the information about LoAs from Parties involved in the project in section A.2.		
91	Are all the written project approvals by Parties involved unconditional?	All LoAs of regarded JI project are unconditional.	OK	OK
Project implementation				
92	Has the project been implemented in accordance with the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website?	As a result of the verification process, the JI project is implemented in accordance with the PDD version 07 which has been deemed final. As a matter of fact, implementation of the energy saving measures is realized mainly according to project schedule. Based on the provided documents and results of the site visit, the JI project is generation emission reductions since 01/01/2005. In the Monitoring Rerort version 02 stated that the achieved amount of emission reduction for the monitoring period	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		01/01/2011 – 30/06/2011 is 355 022 t CO_2 equivalent. On the whole, the JI project activities are conducted according to the Project Design Documents. There are no deviations or revisions to the determined PDD.		
93	What is the status of operation of the project during the monitoring period?	Monitoring report indicated the current status of the project activity implementation. Based on provided materials, there is known that all project equipments were operational in the reporting period and generating emission reductions. Also, refer to section 92 above.	OK	OK
Compliance with monitoring plan				
94	Did the monitoring occur in accordance with the monitoring plan included in the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website?	The monitoring procedure at SE "PA Yuzhny Machine-Building Plant named after A. Makarov" is strictly following the monitoring plan included in the PDD version 07 dated 16/08/2011 regarding which the determination has been deemed final. Data used for calculation of emissions reduction based on information that confirmed by SE "PA Yuzhny Machine-	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		Building Plant named after A. Makarov" documents.		
95 (a)	For calculating the emission reductions or enhancements of net removals, were key factors, e.g. those listed in 23 (b) (i)-(vii) above, influencing the baseline emissions or net removals and the activity level of the project and the emissions or removals as well as risks associated with the project taken into account, as appropriate?	According to reviewed information, there are taken into account key factors (such as emission factor of the natural gas consumption and carbon emission factor for the JI project reducing electricity consumption, etc.), natural gas consumption by the enterprise equipment, natural gas consumption for heat energy production for external consumers, natural gas consumption for electricity generation for external and other consumers, delivery of natural gas to the external consumers, electricity consumption by the enterprise equipment for production of the aerospace products, delivery of heat energy for external consumers, gross production output of aerospace products at the enterprise, average Net Calorific Value of natural gas, and other risks associated with the implementation of the project activity that can influence to the baseline and project emission, and emission reduction due to the JI project.	OK	OK
95 (b)	Are data sources used for	Data sources used for calculating emission		

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	calculating emission reductions or enhancements of net removals clearly identified, reliable and transparent?	reductions are clearly identified, reliable and transparent. On site responsible persons register data from the measurement equipments and fixed monitoring data to logbooks, monthly data collected to the reporting documents of the SE "PA Yuzhny Machine-Building Plant named after A. Makarov". Moreover, there is electronic database of monitoring data. All roles and responsibilities are described in details in the Monitoring report. Corrective Action Request 03 (CAR03). The situation described in section A.8 of the MR is not considered to be revision to the registered monitoring plan because this was envisaged in the MP of the PDD. Please, provide the clarification of the situation in relevant section.	CAR03	OK
95 (c)	Are emission factors, including default emission factors, if used for calculating the emission reductions or enhancements of net removals, selected by carefully balancing accuracy and reasonableness, and	CO_2 emission factor from natural gas consumption is used for calculation of emissions and emission reductions. This factor is to be monitored from the normative documents (i.e., IPCC "Guidelines for National Greenhouse Gas Inventories").	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	appropriately justified of the choice?	Also, CO_2 emission factor for electricity consumed from Ukrainian grid by the project activity is used in calculation. It is to be regularly monitored from the national study documents (i.e., "Ukraine - Assessment of new calculation of CEF" that confirmed by TUV SUD Industrie Service GmbH, etc.).		
95 (d)	Is the calculation of emission reductions or enhancements of net removals based on conservative assumptions and the most plausible scenarios in a transparent manner?	The calculation of emission reductions is based on conservative assumptions and the most plausible scenarios in a transparent manner. as was approved in the PDD. Namely, JI specific approach are used regarding monitoring and emission reduction assessment that has been developed in accordance with the Guidance on criteria for baseline setting and monitoring. This project JI specific approach is in the main similar to the project JI specific approach developed by the Institute of Engineering Ecology for the JI projects on rehabilitation of District Heating systems in Ukrainian conditions and already approved by AIEs for several such JI projects in regions and cities of		

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		Ukraine (e.g., AR Crimea, Chernihiv, Donetsk and Dnipropetrovsk regions, Kharkiv, Sevastopol, Rivne, Luhansk cities), the main idea of which is to build the dynamic baseline for each reported year, with taking into account the actual changes of internal and external factors. As a result of documents revision, all data connected with estimation of emission reduction are consistent through the Monitoring report and excel spreadsheets with calculation. Corrective Action Request 05 (CAR05). Please, compare in the Monitoring Report the calculated emission reductions for the reported period and estimated emission reduction in the registered PDD.	CAR05	OK
Applicable to JI SSC projects only				
96	Is the relevant threshold to be classified as JI SSC project not exceeded during the monitoring period on an annual average basis? If the threshold is exceeded, is the maximum emission reduction	Not applicable	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	level estimated in the PDD for the JI SSC project or the bundle for the monitoring period determined?			
Applicable to bundled JI SSC projects only				
97 (a)	Has the composition of the bundle not changed from that is stated in F-JI-SSCBUNDLE?	Not applicable	OK	OK
97 (b)	If the determination was conducted on the basis of an overall monitoring plan, have the project participants submitted a common monitoring report?	Not applicable	OK	OK
98	If the monitoring is based on a monitoring plan that provides for overlapping monitoring periods, are the monitoring periods per component of the project clearly specified in the monitoring report? Do the monitoring periods not overlap with those for which verifications were already deemed final in the past?	Not applicable	OK	OK
Revision of monitoring plan				
Applicable only if monitoring plan is revised by project participant				

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
99 (a)	Did the project participants provide an appropriate justification for the proposed revision?	No deviations or revisions to the registered monitoring plan are occurred.	OK	OK
99 (b)	Does the proposed revision improve the accuracy and/or applicability of information collected compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishment of monitoring plans?	Not applicable	OK	OK
Data management				
101 (a)	Is the implementation of data collection procedures in accordance with the monitoring plan, including the quality control and quality assurance procedures?	Procedures of data collection are implemented in compliance with the approved monitoring plan. For monitoring there are used measuring equipments, such as gas meters, heat meters, and electricity meters, etc. Monitoring data of the project is monitored in compliance with scheduled frequency approved in the developed monitoring plan and monitoring procedure. The quality control and quality assurance procedures realised due to performing of	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		internal audits and checking measures, participation of third parties, and carrying out of troubleshooting procedures.		
101 (b)	Is the function of the monitoring equipment, including its calibration status, is in order?	All project equipments were operating within the considered monitoring period. As a fact, the monitoring equipments have calibration. It is calibrated with periodic frequency (passport states the calibration frequency for every device) according to the national regulations. During site visit verification team received and reviewed passports and/or certificates on calibration of all measurement equipment that confirm the fact stated above. Detailed information about the equipment accuracy, calibration dates of the measurement devices, etc. is stated in the Annex 5 to the Monitoring Report. Corrective Action Request 01 (CAR01). Please, provide Annex 5 to the Monitoring Report with detailed description of measurement equipments of JI project.	CAR01	OK
101 (c)	Are the evidence and records used for the monitoring maintained in a traceable	Monitoring records are used for the emissions calculation and emission reductions estimation maintained in a	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	manner?	traceable and transparent manner.		
101 (d)	Is the data collection and management system for the project in accordance with the monitoring plan?	The data collection and management system for the project in accordance with the approved monitoring plan. Implementation of monitoring system was checked through site visit, and concluded that monitoring system is completely in accordance with the monitoring plan. This fact is also confirmed by the documented evidences.	OK	OK
Verification regarding programs of activities (additional elements for assessment)				
102	Is any JPA that has not been added to the JI PoA not verified?	Not applicable	OK	OK
103	Is the verification based on the monitoring reports of all JPAs to be verified?	Not applicable	OK	OK
103	Does the verification ensure the accuracy and conservativeness of the emission reductions or enhancements of removals generated by each JPA?	Not applicable	OK	OK
104	Does the monitoring period not overlap with previous monitoring periods?	Not applicable	OK	OK
105	If the AIE learns of an erroneously included JPA, has	Not applicable	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	the AIE informed the JISC of its findings in writing?			
Applicable to sample-based approach only				
106	Does the sampling plan prepared by the AIE: (a) Describe its sample selection, taking into account that: (i) For each verification that uses a sample-based approach, the sample selection shall be sufficiently representative of the JPAs in the JI PoA such extrapolation to all JPAs identified for that verification is reasonable, taking into account differences among the characteristics of JPAs, such as: − The types of JPAs; − The complexity of the applicable technologies and/or measures used; − The geographical location of each JPA; − The amounts of expected	Not applicable	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	emission reductions of the JPAs being verified; − The number of JPAs for which emission reductions are being verified; − The length of monitoring periods of the JPAs being verified; and − The samples selected for prior verifications, if any?			
107	Is the sampling plan ready for publication through the secretariat along with the verification report and supporting documentation?	Not applicable	OK	OK
108	Has the AIE made site inspections of at least the square root of the number of total JPAs, rounded to the upper whole number? If the AIE makes no site inspections or fewer site inspections than the square root of the number of total JPAs, rounded to the upper whole number, then does the AIE provide a reasonable explanation	Not applicable	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	and justification?			
109	Is the sampling plan available for submission to the secretariat for the JISC.s ex ante assessment? (Optional)	Not applicable	OK	OK
110	If the AIE learns of a fraudulently included JPA, a fraudulently monitored JPA or an inflated number of emission reductions claimed in a JI PoA, has the AIE informed the JISC of the fraud in writing?	Not applicable	OK	OK

Table 2 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
Corrective Action Request 01 (CAR01). Please, provide Annex 5 to the Monitoring Report with detailed description of measurement equipments of JI project.	Table 1, 101 (b)	Detailed information of the measurement devices was described in the Annex 5 of the MR and provided to the verification team.	Issue is closed based on provided documents.
Corrective Action Request 02 (CAR02). Please, provide Letters of Approvals from Parties involved in the project.	Table 1, 90	The LoAs from host Party and Party B involved in the JI project were provided to the verifiers.	According to the provided LoAs, issue is closed.
Corrective Action Request 03 (CAR03). The situation described in section A.8 of the MR is not considered to be revision to the registered monitoring plan because this was envisaged in the MP of the PDD. Please, provide the clarification of the situation in relevant section.	Table 1, 95 (b)	Description of the situation in question is removed from section A.8 of the MR and is provided in the relevant Section B.2.1 of the MR version 02.	Issue is closed due to amendments that were made in the MR.

Corrective Action Request 04 (CAR04). Section A.7 of the MR version 01 includes information of written approvals of the regarded JI project, but this information does not concern to the indicated section. Please, provide the information about LoAs from Parties involved in the project in appropriate section.	Table 1, 90	Information about LoAs from Parties involved in the project is removed from section A.7 of the MR and is provided in the more relevant Section A.6 of the MR version 02.	The information was clarified and corrected that is why issue is closed.
Corrective Action Request 05 (CAR05). Please, compare in the Monitoring Report the calculated emission reductions for the reported period and estimated emission reduction in the registered PDD.	Table 1, 95 (d)	Comparison of the calculated emission reductions according to the Monitoring Report for the reported period and estimated emission reductions in the registered PDD for the same period along with relevant clarification is provided in the Section D.3.4 of the MR version 02.	Based on provided information issue is closed.