



VERIFICATION REPORT “SKHIDENERGO” LTD

VERIFICATION OF THE “RECONSTRUCTION OF UNITS 1, 2, 3 AND 4 AT ZUYEVSKA THERMAL POWER PLANT”

(SECOND PERIODIC VERIFICATION 01/01/2010 – 28/02/2011)

REPORT No. UKRAINE-VER/0253/2011

REVISION No. 02

BUREAU VERITAS CERTIFICATION



VERIFICATION REPORT "RECONSTRUCTION OF UNITS 1, 2, 3 AND 4 AT
ZUYEVSKA THERMAL POWER PLANT"

Date of first issue: 21/04/2011	Organizational unit: Bureau Veritas Certification Holding SAS
Client: "Skhidenergo" Ltd	Client ref.: Oleksii Mikhaylov

Summary:

Bureau Veritas Certification has made the 2nd periodic verification of the "Reconstruction of Units 1,2,3 and 4 at Zuyevska Thermal Power Plant", JI Registration Reference Number UA2000028, project of "Skhidenergo" Ltd located in Zugres village, Donetsk Region, 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 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, 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 189769 tons of CO₂eq for the monitoring period from 01/01/2010 to 28/02/2011.

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/0253/2011	Subject Group: JI
Project title: Reconstruction of Units 1, 2, 3 and 4 at Zuyevska Thermal Power Plant	
Work carried out by: Ivan Sokolov – Team Leader, Lead Verifier Vyacheslav Yeriomin – Team Member, Verifier, Trainee	
Work reviewed by: Leonid Yaskin - Internal Technical Reviewer	
Work approved by: Flavio Gomes - Operational Manager	
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1 INTRODUCTION

"Skhidenergo" Ltd has commissioned Bureau Veritas Certification to verify the emissions reductions of its JI project "Reconstruction of Units 1, 2, 3 and 4 at Zuyevska Thermal Power Plant" (hereafter called "the project") at Zugres village, Donetsk region, 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 the project design document, 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 and/or corrective 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 Verifier

Vyacheslav Yeriomin
Bureau Veritas Certification Climate Change Verifier.

This verification report was reviewed by:

Leonid Yaskin



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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 Global Carbon B.V. and additional background documents related to the project design and baseline, i.e. country Law, Project Design Document (PDD), Approved CDM methodology (if applicable) and/or 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 versions 1.0, 2.0 and project as described in the determined PDD.

2.2 Follow-up Interviews

On 22/04/2011 Bureau Veritas Certification performed on-site interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of "Skhidenergo" Ltd and Global Carbon B.V. were interviewed (see References). The main topics of the interviews are summarized in Table 1.

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Table 1 Interview topics

Interviewed organization	Interview topics
"Skhidenergo" Ltd	Organizational structure Responsibilities and authorities Roles and responsibilities for data collection and processing Installation of equipment Data logging, archiving and reporting Metering equipment control Metering record keeping system, database Training of personnel Quality management procedures and technology Internal audits and check-ups
Global Carbon B.V.	Monitoring plan Monitoring report Deviations from PDD ERUs calculation model

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 AIE 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.



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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, Corrective 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 6 Corrective Action Requests.

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

Two FARs were remaining from previous verification and they were closed during this verification.

FAR1: Please photograph every stages of unit reconstruction.

Response: Commissioning acts were presented, see references /6/-/10/ of category 2 documents.

Decision: Evidences were sufficient and FAR1 was closed.

FAR2: Please make sure that all journals and logbooks of fuel consumption and power generation will be archived and saved during Project period.

Response: Order on the data archiving was presented, see reference /156/ of category 2 documents.

Decision: Evidence was sufficient and FAR2 was closed.

3.1 Project approval by Parties involved (90-91)

Written project approval by Host Party has been issued by The National Environmental Investment Agency of Ukraine (#1231/23/7 dated 19.08.2010). Letter of Approval by Netherlands Ministry of Economic Affairs #2009JI22 has been issued 07/01/2010.

The abovementioned written approvals are unconditional.

3.2 Project implementation (92-93)



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The proposed project is aimed at increasing the fuel efficiency, reliability, and availability of all four coal fired units at Zuyevska TPP, which belong to the DTEK holding company, Ukraine. The TPP has four identical conventional condensing steam turbine units of 300 MW each. They were commissioned in 1982, 1986, and 1988, and as such, the TPP can be considered as one of the newest coal fired TPPs connected to the grid. Implementation of the proposed project activity allows generating electric energy with higher efficiency, thus reducing the amount of combustion of fossil fuels (mainly coal) significantly below the level of what would happen in the absence of the proposed project. It directly results in reduction of GHG emission as well as emission of pollutants (dust, SO_x)

The proposed project is intended to modernise all four units at the TPP in order to:

- Improve energy efficiency and reduce auxiliary equipment consumption
- Improve reliability and availability
- Improve part-load efficiency
- Introduce modern control systems
- Reduce the dust emission
- Reduce SO_x emission

The design solutions proposed for project implementation reflect the good engineering practices provided by major local and international equipment manufacturers.

The solutions allow increasing the efficiency of the existing power plant equipment to a level higher than foreseen by the original design. They represent state of the art modernisation technology which could be applied over the existing power plant equipment.

The scope of reconstruction of each of the units is generally identical, and differs only in details.

Plant auxiliaries, common for all units are involved in the reconstruction as well. Flue gas desulfurization (FGD) plant is also included, and it is planned at this stage to be common for Units #1, 3, and 4, with Unit #2 having an individual FDG plant.

The unit reconstruction consists of the following packages of individual measures:

- Modernisation of steam turbine generator (STG), including:
- Reconstruction of low pressure cylinder of STG, replacement and modernisation of STG auxiliaries
- Rehabilitation of high and middle pressure STG cylinders
- Rehabilitation of regeneration equipment and vacuum system
- Retrofit of alternator cooling system



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- Rehabilitation of the boiler
- Modernisation of the unit control system
- Rehabilitation of the unit step-up transformer
- Modernisation of switch room equipment, partial replacement of circuit breakers
- Improvement of ESP (electrostatic precipitators) operation
- Plant auxiliaries' modernisation (mainly plant cooling part, which includes cooling tower, cooling water supply and return channels).

It is expected that under normal operating conditions the specific fuel consumption of the plant will be decreased from current value of approximately 10.523 to some 10.04 GJ/MWh. This will allow operation of TPP units with high efficiency for a long period without the need to replace or substitute the equipment by more efficient one within the project period.

Since the main process of electricity production stays the same, it is not expected that operation and maintenance of equipment will represent difficulties for plant personnel. Some new equipment, like control and instrumentation, however would require initial training of staff. This will be provided by the respective suppliers.

By the beginning of the monitoring period for the Unit #1 was made as follows:

- Modernization of the boiler
- Modernization of the steam turbine generator
- Modernization of the electrostatic precipitator
- Modernization of turbines

The project activity started on the 31st of December 2008 with first start of the reconstructed unit #2. It was expected in PDD that the next scheduled unit #1 to start operation in December 2009. Actually the unit #1 was started after reconstruction on 18 December 2009 and is being operated in precommissioning mode. The regular operation is expected to begin in the third quarter of 2011. Within the first commitment period of 2008-2012 the following schedule is planned:

Start of Unit #4 after reconstruction - April 2012

Start of Unit #3 after reconstruction - April 2013

After completion of the last unit #3 the project will operate at full scale.



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3.3 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.

For calculating the emission reductions or enhancements of net removals, key factors 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 were taken into account, as appropriate.

Data sources used for calculating emission reductions are clearly identified, reliable and transparent.

Emission factors, including default emission factors, are selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice.

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

3.4 Revision of monitoring plan (99-100)

"Not applicable"

3.5 Data management (101)

The power produced by each of four plants alternators is measured by four individual meters located at each of the unit step-up transformers. Part of power produced is used to feed the unit and plant auxiliary systems at 6 kV voltage.

The amount of power consumed by auxiliaries is measured by 8 individual meters located after four auxiliary transformers, two meters per each transformer.

Each meter has a back up meter installed of same accuracy. Separately, the amount of power consumed by back-up excitation system is measure by individual meter.

The net power supplied to the grid is obtained by subtraction of power used to feed auxiliaries from the amount of power produced.

The coal is supplied to the TPP by rail and stored at the coal storage. The amount of coal received is measured by railway wagon scales. A measurement of coal consumed by all four units of the TPP is done by conveyor belt scales when the coal is being transported from coal storage to the coal milling department after which powdered coal is supplied to each of the units. The coal is being transported by two parallel belt conveyors ЛК-2А and ЛК-2Б and the daily consumption is recorded by fuel



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department in paper form and transferred to process department where it is stored and used for daily control.

Consumption of natural gas is metered by flow meter Flowtek-2 installed at gas pressure reducing station owned by gas suppliers. It is a meter certified as commercial metering device used for billing the power plant for gas consumed. Data are recorded and stored and constantly reported to the TPP.

Heavy fuel oil is supplied to the TPP by rail cisterns and it is stored in reservoirs from which it is pumped into fuel pipeline connected to the units. Consumption of heavy fuel oil is metered by measurement of level in the reservoirs 3 times a day (each shift). The daily volumetric consumption is recalculated to mass units. The data are recorded and transferred from fuel department to process department where has been stored and also used for daily control.

The NCV of coal, natural gas and heavy fuel oil is measured by TPP laboratory. The samples of coal are taken four times an hour, mixed together and are kept for testing which is carried out every 5 days. This provides measurement of the average coal NCV for 5 days. Testing of natural gas and heavy fuel oil is carried out every five days. For billing the gas supplier's data are used (monthly NCV certificates).

The calibration of monitoring equipment and accreditation of TPP chemical Laboratory is done by Ukrainian Centre for Standardization and Metrology and State Donetsk regional centre for standardisation, metrology and certification

The data collection and management system for the project is in accordance with the monitoring plan.

Data are measured, processed and stored by departments of the TPP. Standard plant reporting from 3-TEH (approved standard form according methodological guidelines GKD 34.09.103-96) is prepared on daily, monthly and yearly basis. The form contains amounts of power generated by each unit, power consumed by plant/unit auxiliaries, power exported to grid, total fuel consumption and its breakdown by fuel types, number of run and idle hours of equipment, number of starts, heat rate of steam turbogenerators, efficiency of boilers, boilers heat losses, steam, air temperatures and other detailed operational data.

3-TEH is a standard reporting form used in power industry.

The plant process department is responsible for collecting, processing the data and producing the 3-TEH form on a regular basis.

3.6 Verification regarding programmes of activities (102-110)

Not applicable.



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4 VERIFICATION OPINION

Bureau Veritas Certification has performed the 2nd periodic verification of the "Reconstruction of Units 1, 2, 3 and 4 at Zuyevska Thermal Power Plant" Project in Ukraine, which applies the JI specific approach. 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 "Skhidenergo" Ltd 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 2.7. 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 2.0 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 01/01/2010 to 28/02/2011

Baseline emissions	: 6435906 t CO ₂ equivalents.
Project emissions	: 6625675 t CO ₂ equivalents.
Emission Reductions	: 189769 t CO ₂ equivalents.



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5 REFERENCES

Category 1 Documents:

Documents provided by "Skhidenergo" Ltd that relate directly to the GHG components of the project.

- /1/ Project Design Document "Reconstruction of Units 1,2,3 and 4 at Zuyevska Thermal Power Plant" version 2.7 dated 30.08.2010
- /2/ Monitoring Report "Reconstruction of Units 1,2,3 and 4 at Zuyevska Thermal Power Plant" version 1.0 dated 12.04.2011
- /3/ Monitoring Report "Reconstruction of Units 1,2,3 and 4 at Zuyevska Thermal Power Plant" version 2.0 dated 05.05.2011
- /4/ ERU's calculation model Exel file "20110412_MR002_DTEK_ver_1.0"
- /5/ Determination and verification manual version 1.0
- /6/ Letter of approval issued by The National Environmental Investment Agency of Ukraine (#1231/23/7 dated 19.08.2010).
- /7/ Letter of approval issued by the Dutch Ministry of Economic Affairs #2009JI22 has been issued 07/01/2010

Category 2 Documents:

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

- /1/ Form 11-мтп, issued to Shidenerho Ltd Zuyevska Thermal Power Plant SU. Report on fuel, heat and power consumption results for January-December 2010
- /2/ Form 2-тп, issued to Shidenerho Ltd Zuyevska Thermal Power Plant SU. Report on air protection for 2010
- /3/ Form 2-тп, issued to Shidenerho Ltd Zuyevska Thermal Power Plant SU. Report on air protection for I quarter 2011
- /4/ Permit #1 415 070 500 – 12 a dated 05/01/2011 on alterations to the permit #1 415 070 500 – 12 dated 16/12/2008 on stationary sources air pollution, issued by Donetsk Region Environmental State Office to Shidenerho LTD
- /5/ Permit #1 415 070 500 – 12 dated 16/12/2008 on stationary sources air pollution, issued by Donetsk Region Environmental State Office to Shidenerho LTD
- /6/ Statement of working commission on equipment pre-commissioning dated 31/12/2009, Zuyevska Thermal Power Plant block #1 electric filter
- /7/ Statement of working commission on equipment pre-commissioning dated 31/12/2009, Zuyevska Thermal Power Plant block #1 turbines K-300-240-2
- /8/ Statement of working commission on equipment pre-commissioning dated 31/12/2009, Zuyevska Thermal Power Plant block #1 turbines K-300-240-2



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- /9/ Statement of working commission on equipment pre-commissioning dated 31/12/2009, Zuyevska Thermal Power Plant block #1 generator TГB-300-2Y3
- /10/ Fuel consumption logbook
- /11/ Protocol #14 dated 17/02/2010 on input control results, heavy fuel oil M-100
- /12/ Fuel sample analysis for 26-31/10/10
- /13/ Fuel sample analysis for 16-20/12/10
- /14/ Fuel sample analysis for 11-15/07/10
- /15/ Analysis result #51, coal
- /16/ Certificate #51 dated 28/01/10 on coal ДГ 0-100 quality
- /17/ Analysis result dated 11/02/10 on coal ДГ 0-100 мм
- /18/ Certificate #67 dated 11/02/10 on coal ДГ 0-100 quality
- /19/ Analysis result dated 29/03/10 on coal ДГ 0-100 мм
- /20/ Certificate #224 dated 29/03/10 on coal ДГ 0-100 quality
- /21/ Analysis result dated 25/04/10 on coal ДГ 0-100 мм
- /22/ Certificate #267 dated 25/04/10 on coal ДГ 0-100 quality
- /23/ Analysis result dated 01/05/10 on coal ДГ 0-100 мм
- /24/ Certificate #290 dated 01/05/10 on coal ДГ 0-100 quality
- /25/ Analysis result dated 26/06/10 on coal ДГ 0-100 мм
- /26/ Certificate #672 dated 26/06/10 on coal ДГ 0-100 quality
- /27/ Analysis result #573 dated 08/07/10 on coal ДГ 0-100 мм
- /28/ Certificate #534 dated 08/07/10 on coal ДГ 0-100 quality
- /29/ Analysis result #719 dated 15/08/10 on coal ДГ 0-100 мм
- /30/ Certificate #707 dated 15/08/10 on coal ДГ 0-100 quality
- /31/ Analysis result #814 dated 05/09/10 on coal ДГ 0-100 мм
- /32/ Certificate #804 dated 05/09/10 on coal ДГ 0-100 quality
- /33/ Analysis result #1413 dated 02/10/10 on coal ДГ 0-100 мм
- /34/ Certificate #1413 dated 02/10/10 on coal ДГ 0-100 quality
- /35/ Analysis result #1050 dated 12/11/10 on coal ДГ 0-100 мм
- /36/ Certificate #1000 dated 12/11/10 on coal ДГ 0-100 quality
- /37/ Analysis result #1974 dated 20/12/10 on coal ДГ 0-100 мм
- /38/ Certificate #1974 dated 20/12/10 on coal ДГ 0-100 quality
- /39/ Analysis result #205 dated 24/01/11 on coal ДГ 0-100 мм
- /40/ Certificate #205 dated 24/01/11 on coal ДГ 0-100 quality
- /41/ Analysis result #210 dated 14/02/11 on coal ДГ 0-100 мм
- /42/ Certificate #198 dated 14/02/11 on coal ДГ 0-100 quality
- /43/ Certificate dated 16/11/2006 on acceptance and calibration of Elster-Metronica power meter type 05RL-C-3, serial #01147106
- /44/ Certificate dated 16/11/2006 on acceptance and calibration of Elster-Metronica power meter type 05RL-C-3, serial #01147097
- /45/ Certificate dated 16/11/2006 on acceptance and calibration of Elster-Metronica power meter type 05RL-C-3, serial #01147095
- /46/ Certificate dated 16/11/2006 on acceptance and calibration of Elster-Metronica power meter type 05RL-C-3, serial #01147096
- /47/ Certificate dated 16/11/2006 on acceptance and calibration of

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- /48/ Elster-Metronica power meter type 05RL-C-3, serial #01147104
Certificate dated 16/11/2006 on acceptance and calibration of
- /49/ Elster-Metronica power meter type 05RL-C-3, serial #01147094
Certificate dated 16/11/2006 on acceptance and calibration of
- /50/ Elster-Metronica power meter type 05RL-C-3, serial #01147103
Certificate dated 16/11/2006 on acceptance and calibration of
- /51/ Elster-Metronica power meter type 05RL-C-3, serial #01147105
Certificate dated 16/11/2006 on acceptance and calibration of
- /52/ Elster-Metronica power meter type 05RL-C-3, serial #01147108
Certificate dated 20/11/2006 on acceptance and calibration of
- /53/ Elster-Metronica power meter type 02RAL-C-4, serial #01147039
Certificate dated 20/11/2006 on acceptance and calibration of
- /54/ Elster-Metronica power meter type 02RAL-C-4, serial #01147064
Certificate dated 20/11/2006 on acceptance and calibration of
- /55/ Elster-Metronica power meter type 02RAL-C-4, serial #01147080
Certificate dated 20/11/2006 on acceptance and calibration of
- /56/ Elster-Metronica power meter type 02RAL-C-4, serial #01147041
Passport #236 dated 29/01/10 on heavy fuel oil type 100 V
- /57/ Periodic calibration results on conveyor belt scales #1803, line B
- /58/ Periodic calibration results on conveyor belt scales #1757, line B
- /59/ Attestation certificate dated 17/12/2007 on Shidenerho LTD
Zuyevska Thermal Power Plant Structural Unit production chemical
laboratory
- /60/ Attestation certificate dated 16/12/2010 on Shidenerho LTD
Zuyevska Thermal Power Plant Structural Unit production chemical
laboratory
- /61/ Statement dated 31/12/10 on natural gas acceptance-
transmittance
- /62/ Statement dated 31/12/10 on natural gas transmittance-
acceptance
- /63/ Phonogram dated 16/03/10 on natural gas net calorific value
- /64/ Photo: Conveyor belt scales strain gauge sensor
- /65/ Photo: Conveyor belt speed sensor
- /66/ Photo: Scales switching unit
- /67/ Photo: Conveyor belt scales strain gauge sensor #d02957
- /68/ Photo: Conveyor belt scales strain gauge sensor #d02957
- /69/ Photo: MIKA remote digital detectors
- /70/ Photo: MIKA remote digital detector #1828
- /71/ Photo: MIKA remote digital detector #1830
- /72/ Photo: Data sheet #112 dated 22/04/11 on solid fuel consumed by
production
- /73/ Photo: Back-up power meter Energy-9, serial #36105
- /74/ Photo: Power meter Elster-Mtronica type 02RAL-C-4, serial
#01147041
- /75/ Photo: Power meter Elster-Mtronica type 02RAL-C-4, serial
#01147080



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- /76/ Photo: Back-up power meter Energy-9, serial #36106
- /77/ Photo: Power meter Elster-Mtronica type 05RL-C-3, serial #01147080; Back-up power meter Enerhomera type ЦЭ6805B, serial #02825501533
- /78/ Photo: Power meter Elster-Mtronica type 05RL-C-3, serial #01147105; Back-up power meter Enerhomera type ЦЭ6805B, serial #02825501534
- /79/ Photo: Power meter Elster-Mtronica type 05RL-C-3, serial #01147104; Back-up power meter Enerhomera type ЦЭ6805B, serial #02895500083
- /80/ Photo: Power meter Elster-Mtronica type 05RL-C-3, serial #01147094; Back-up power meter Enerhomera type ЦЭ6805B, serial #02825501538
- /81/ Form 22тп on fuel leftovers consumption at Zuyevska Thermal Power Plant for January 2010
- /82/ Form 22тп on fuel leftovers consumption at Zuyevska Thermal Power Plant for February 2010
- /83/ Form 22тп on fuel leftovers consumption at Zuyevska Thermal Power Plant for March 2010
- /84/ Form 22тп on fuel leftovers consumption at Zuyevska Thermal Power Plant for April 2010
- /85/ Form 22тп on fuel leftovers consumption at Zuyevska Thermal Power Plant for May 2010
- /86/ Form 22тп on fuel leftovers consumption at Zuyevska Thermal Power Plant for July 2010
- /87/ Form 22тп on fuel leftovers consumption at Zuyevska Thermal Power Plant for June 2010
- /88/ Form 22тп on fuel leftovers consumption at Zuyevska Thermal Power Plant for August 2010
- /89/ Form 22тп on fuel leftovers consumption at Zuyevska Thermal Power Plant for September 2010
- /90/ Form 22тп on fuel leftovers consumption at Zuyevska Thermal Power Plant for October 2010
- /91/ Form 22тп on fuel leftovers consumption at Zuyevska Thermal Power Plant for November 2010
- /92/ Form 22тп on fuel leftovers consumption at Zuyevska Thermal Power Plant for December 2010
- /93/ Form 22тп on fuel leftovers consumption at Zuyevska Thermal Power Plant for January 2011
- /94/ Form 22тп on fuel leftovers consumption at Zuyevska Thermal Power Plant for February 2011
- /95/ Form 23тп on fuel leftovers stock-taking at Zuyevska Thermal Power Plant for January 2010
- /96/ Form 23тп on fuel leftovers stock-taking at Zuyevska Thermal Power Plant for February 2010
- /97/ Form 23тп on fuel leftovers stock-taking at Zuyevska Thermal



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- Power Plant for March 2010
- /98/ Form 23тп on fuel leftovers stock-taking at Zuyevska Thermal Power Plant for April 2010
 - /99/ Form 23тп on fuel leftovers stock-taking at Zuyevska Thermal Power Plant for May 2010
 - /100/ Form 23тп on fuel leftovers stock-taking at Zuyevska Thermal Power Plant for July 2010
 - /101/ Form 23тп on fuel leftovers stock-taking at Zuyevska Thermal Power Plant for June 2010
 - /102/ Form 23тп on fuel leftovers stock-taking at Zuyevska Thermal Power Plant for August 2010
 - /103/ Form 23тп on fuel leftovers stock-taking at Zuyevska Thermal Power Plant for September 2010
 - /104/ Form 23тп on fuel leftovers stock-taking at Zuyevska Thermal Power Plant for October 2010
 - /105/ Form 23тп on fuel leftovers stock-taking at Zuyevska Thermal Power Plant for November 2010
 - /106/ Form 23тп on fuel leftovers stock-taking at Zuyevska Thermal Power Plant for December 2010
 - /107/ Form 23тп on fuel leftovers stock-taking at Zuyevska Thermal Power Plant Structural for January 2011
 - /108/ Form 23тп on fuel leftovers stock-taking at Zuyevska Thermal Power Plant for February 2011
 - /109/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for January 2010
 - /110/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for February 2010
 - /111/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for March 2010
 - /112/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for April 2010
 - /113/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for May 2010
 - /114/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for June 2010
 - /115/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for July 2010
 - /116/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for August 2010
 - /117/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for September 2010
 - /118/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for October 2010
 - /119/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for November 2010
 - /120/ Form 3тех on equipment operation technical and economic



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- parameters at Zuyevska Thermal Power Plant for December 2010
- /121/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for the 1 quarter 2010
 - /122/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for the 2 quarter 2010
 - /123/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for the 3 quarter 2010
 - /124/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for the 4 quarter 2010
 - /125/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for 01/01/10-31/01/10
 - /126/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for 01/01/10-28/02/10
 - /127/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for 01/01/10-31/03/10
 - /128/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for 01/01/10-30/04/10
 - /129/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for 01/01/10-31/05/10
 - /130/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for 01/01/10-30/06/10
 - /131/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for 01/01/10-30/07/10
 - /132/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for 01/01/10-31/08/10
 - /133/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for 01/01/10-30/09/10
 - /134/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for 01/01/10-31/10/10
 - /135/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for 01/01/10-30/11/10



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- /136/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for 01/01/10-31/12/10
- /137/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for 01/01/11-31/01/11
- /138/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for 01/01/11-28/01/11
- /139/ Form 3тех on equipment operation technical and economic parameters at Zuyevska Thermal Power Plant for 01/01/11-28/02/11
- /140/ Power supply amounts by Zuyevska Thermal Power Plant for January 2010
- /141/ Power supply amounts by Zuyevska Thermal Power Plant for February 2010
- /142/ Power supply amounts by Zuyevska Thermal Power Plant for March 2010
- /143/ Power supply amounts by Zuyevska Thermal Power Plant for April 2010
- /144/ Power supply amounts by Zuyevska Thermal Power Plant for May 2010
- /145/ Power supply amounts by Zuyevska Thermal Power Plant for June 2010
- /146/ Power supply amounts by Zuyevska Thermal Power Plant for July 2010
- /147/ Power supply amounts by Zuyevska Thermal Power Plant for August 2010
- /148/ Power supply amounts by Zuyevska Thermal Power Plant for September 2010
- /149/ Power supply amounts by Zuyevska Thermal Power Plant for October 2010
- /150/ Power supply amounts by Zuyevska Thermal Power Plant for November 2010
- /151/ Power supply amounts by Zuyevska Thermal Power Plant for December 2010
- /152/ Power supply amounts by Zuyevska Thermal Power Plant for January 2011
- /153/ Power supply amounts by Zuyevska Thermal Power Plant for February 2011
- /154/ Commissioning unit #2 act, 25.02.2009
- /155/ Statement of working commission on equipment pre-commissioning dated 31/12/2009, Zuyevska Thermal Power Plant block #1 boiler ТПП-312А
- /156/ LLC Vostokenergo Order #202 of 09.09.10 on archiving the JI project information.



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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/ Jaroshenko Sergey – Head of Perspective Development Department
- /2/ Denis Zhyvych – Head of Producing Department
- /3/ Volodymyr Prober – Head of Fuel Transport Department
- /4/ Iryna Fesenko – Head of Chemical Laboratory
- /5/ Gennadyi Usachev – Head of Electric Laboratory
- /6/ Ekateryna Kolesnikova – acting Head of Ecology Laboratory
- /7/ Oleksii Mikhailov - Leading Specialist, Department of Power Generation DTEK
- /8/ Natalya Belskaya - JI Consultant, Global Carbon BV



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APPENDIX A: COMPANY PROJECT VERIFICATION PROTOCOL

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?	CAR #01 The information about Project approval is missing in the Monitoring Report. Please, provide relevant information to the Monitoring Report.	CAR #01	OK
91	Are all the written project approvals by Parties involved unconditional?	See CAR 01 above.	-	-
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?	CAR #02. Please, provide in the Monitoring Report correct location of the Project CAR #03 Please, correct grammar mistakes in the Monitoring Report	CAR #02 CAR #03	OK OK
93	What is the status of operation of the project during the monitoring	CAR #04 Please, add to the Monitoring Report list	CAR #04	OK



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	period?	of energy saving measures completed during the monitoring period. CAR #05 Capital repairs, mid-repairs, permanent repairs are common practice in power generation industry. Please, prove that project activity during monitoring period is additional to repairs provided at the TPP	CAR #05	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 occurs in accordance with the monitoring plan included in PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website	OK	OK
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	All key factors 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 were taken into account, as appropriate for calculating the emission reductions or enhancements of net removals.	OK	OK



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	project taken into account, as appropriate?			
95 (b)	Are data sources used for calculating emission reductions or enhancements of net removals clearly identified, reliable and transparent?	<p>The daily consumption of natural gas, coal and fuel oil is recorded by fuel department in paper form and transferred to process department where it is stored and used for daily control.</p> <p>Net calorific value of fuel is measured by TPP chemical laboratory.</p> <p>The power produced by alternators, used to feed auxiliary equipment measured by individually meters. The power supply to the grid is obtained by subtraction of power used to feed auxiliaries from the amount of power produced.</p> <p>The data are used to prepare standard reporting form 3TEX on daily, monthly, yearly basis.</p> <p>3-TEH is a standard reporting form used in power industry.</p> <p>The plant process department is responsible for collecting, processing the data and producing the 3-TEH form on a regular basis.</p>	OK	OK
95 (c)	Are emission factors, including default emission factors, if used	CAR #06 Please clarify, why emission factor for	CAR#06	OK



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	for calculating the emission reductions or enhancements of net removals, selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice?	sub-bituminous coal is used in the Monitoring Report.		
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?	Yes, the calculation of emission reductions or enhancements of net removals are based on conservative assumptions and the most plausible scenarios in a transparent manner.	OK	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 level estimated in the PDD for the JI SSC project or the bundle for the monitoring period determined?	Not applicable	Not applicable	Not applicable
Applicable to bundled JI SSC projects only				



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
97 (a)	Has the composition of the bundle not changed from that is stated in F-JI-SSCBUNDLE?	Not applicable	Not applicable	Not applicable
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	Not applicable	Not applicable
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	Not applicable	Not applicable
Revision of monitoring plan				
Applicable only if monitoring plan is revised by project participant				
99 (a)	Did the project participants provide an appropriate justification for the proposed revision?	Not applicable	Not applicable	Not applicable
99 (b)	Does the proposed revision	Not applicable	Not	Not



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	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?		applicable	applicable
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?	The data collection procedures are in accordance with the monitoring plan. Quality control and cross-checking procedures were found satisfactory.	OK	OK
101 (b)	Is the function of the monitoring equipment, including its calibration status, is in order?	The function of the monitoring equipment is in order. Monitoring equipment is within its calibration interval. The calibration of monitoring equipment and accreditation of TPP chemical Laboratory is done by Ukrainian Centre for Standardization and Metrology and State Donetsk regional centre for standardisation, metrology and certification Calibration certificates of electric power	OK	OK



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		meters and coal scales were provided to verification team.		
101 (c)	Are the evidence and records used for the monitoring maintained in a traceable manner?	The evidence and records used for monitoring are maintained in a traceable manner.	OK	OK
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 are in accordance with the monitoring plan. The data monitored and used to ERU's calculation will be kept during two years after the crediting period.	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	Not applicable	Not applicable
103	Is the verification based on the monitoring reports of all JPAs to be verified?	Not applicable	Not applicable	Not applicable
103	Does the verification ensure the accuracy and conservativeness of the emission reductions or enhancements of removals generated by each JPA?	Not applicable	Not applicable	Not applicable
104	Does the monitoring period not overlap with previous monitoring	Not applicable	Not applicable	Not applicable



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	periods?		e	e
105	If the AIE learns of an erroneously included JPA, has the AIE informed the JISC of its findings in writing?	Not applicable	Not applicable	Not applicable
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	Not applicable	Not applicable	Not applicable



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	each JPA; – The amounts of expected 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	Not applicable	Not applicable
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	Not applicable	Not applicable	Not applicable



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	number, then does the AIE provide a reasonable explanation and justification?			
109	Is the sampling plan available for submission to the secretariat for the JISC.s ex ante assessment? (Optional)	Not applicable	Not applicable	Not applicable
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	Not applicable	Not applicable

TABLE 2 RESOLUTIONS 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 conclusion	team



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<p>CAR #01 The information about Project approval is missing in the Monitoring Report. Please, provide relevant information to the Monitoring Report.</p>	90	<p>The project has received the following letters of approval:</p> <ul style="list-style-type: none"> • Letter of approval issued National Environmental Investment Agency 19 August 2010 №1231/23/7 • Letter of approval issued SenterNovem Netherlands 7 January 2010 №2009JI22 	<p>The issue is closed based on appropriate information and corrections provided.</p>
<p>CAR #02. Please, provide in the Monitoring Report correct location of the Project</p>	92	<p>In the figure 1 in Monitoring Report indicate the location of the enterprise. Please find revised MR, version 2.0 (p.4).</p>	<p>Monitoring Report has been checked. The issue is closed.</p>
<p>CAR #03 Please, correct grammar mistakes in the Monitoring Report</p>	92	<p>Please find revised MR, version 2.0 (p.4).</p>	<p>Monitoring Report has been checked. The issue is closed.</p>
<p>CAR #04 Please, add to the Monitoring Report list of energy saving measures completed during the monitoring period.</p>	93	<p>By the beginning of the monitoring period for the Unit #1 was made as follows:</p> <ul style="list-style-type: none"> • Modernization of the boiler • Modernization of the steam turbine generator • Modernization of the electrostatic precipitator • Modernization of turbines 	<p>The required information was presented in the revised MR. The issue is closed.</p>



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<p>CAR #05 Capital repairs, mid-repairs, permanent repairs are common practice in power generation industry. Please, prove that project activity during monitoring period is additional to repairs provided at the TPP</p>	93	<p>Capital repairs, mid-repairs, permanent repairs are not project activities. All work was carried out as the reconstruction units according to the acts of commissioning. Please find files: List of energy saving measures.rar and Act of commissioning unit 2.rar</p>	<p>The CAR is closed on the basis of required information provided and corrections made to the MR.</p>
<p>CAR #06 Please clarify, why emission factor for sub-bituminous coal is used in the Monitoring Report.</p>	95(c)	<p>This ratio was used in the PDD and was determined. It was used because according to a form 3-TEH average net calorific value of coal in Zuyevska TPP corresponds to the most default net calorific value of sub-bituminous coal. Default net calorific value of sub-bituminous coal is 18,9 TJ/Gg (lower limit 11,5 TJ/Gg and upper limit 26,0 TJ/Gg) according to Default factor, 2006 IPCC Guidelines, V.2-Energy, Table 1.2, http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf.</p>	<p>Monitoring Report has been checked. The CAR is closed.</p>