VERIFICATION REPORT VEMA S.A.

VERIFICATION OF THE

"Reconstruction and modernization of main-line electrical grids of NPC "Ukrenergo"

THE SECOND PERIODIC
FOR THE PERIOD OF 01/07/2011 – 31/12/2011

REPORT NO. UKRAINE- VER /0469/2012
REVISION NO. 03

BUREAU VERITAS CERTIFICATION

VERIFICATION REPORT

Date of first issue:	Organizational unit:
02/02/2012	Bureau Veritas Certification Holding SAS
Client:	**Client ref.:**
VEMA S.A.	Fabian Knodel

Summary:

Bureau Veritas Certification has made the 2nd periodic verification of the "Reconstruction and modernization of main-line electrical grids of NPC "Ukrenergo" project of VEMA S.A. located in Ukraine, and applying 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 (but for the crediting period) 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 monitoring report against 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 per determined changes. 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 208 470 tonnes of CO2 equivalent for the monitoring period from 01/07/2011 to 31/12/2011.

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

Report No.:	Subject Group:
UKRAINE-ver/0469/2012	JI

Project title:

"Reconstruction and modernization of main-line electrical grids of NPC "Ukrenergo"

Work carried out by:

Oleg Skoblyk - Lead Verifier, Team Leader
Kateryna Zinevych - Lead Verifier, Team member
Daniil Ukhanov - Technical Specialist

Work reviewed by:

Ivan Sokolov – ITR
Leonid Yaskin - ITR specialist

Work approved by:

Ivan Sokolov – Climate Change Operational Manager

Bureau Veritas Certification Holding SAS

Date of this revision:	Rev. No.:	Number of pages:
11/06/2012	03	30

☒ No distribution without permission from the Client or responsible organizational unit

☐ Limited distribution

☐ Unrestricted distribution

Table of Contents *Page*

1 INTRODUCTION

VEMA S.A. has commissioned Bureau Veritas Certification to verify the emissions reductions of its JI project "Reconstruction and modernization of main-line electrical grids of NPC "Ukrenergo" (hereafter called "the project") that is implemented in 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.

Verification encompasses the period from July 1, 2011 to December 31, 2011.

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, monitoring plan and monitoring report, 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, Lead Verifier, Team Leader
Kateryna Zinevych
Bureau Veritas Certification, Lead Verifier, Team member
Daniil Ukhanov
Bureau Veritas Certification, Team Member, Technical Specialist

This verification report was reviewed by:

Ivan Sokolov
Bureau Veritas Certification, Internal Technical Reviewer
Leonid Yaskin
Bureau Veritas Certification, Internal Technical Reviewer Technical Specialist

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 VEMA S.A. and additional background documents related to the project design and baseline, i.e. country Law, Project Design Document (PDD), Determination Report of the project, issued by Bureau Veritas Certification Holding SAS, No. UKRAINE-det/0273/2011 dated 24/06/2011, 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 for the period from 01/07/2011 to 31/12/2011, version 01 as of January 23, 2012, version 02 as of March 5, and version 03 as of June 10 2012 as well as the project as described in the determined PDD.

2.2 Follow-up Interviews

On 21/03/2012 Bureau Veritas Certification visited the site of project implementation and performed on-site interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of NPC "Ukrenergo" and VEMA S.A. were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
NPC "Ukrenergo"	➢ Organizational structure ➢ Responsibilities and authorities ➢ Personnel training ➢ Quality control procedures and technology ➢ Equipment use (records) ➢ Metering equipment control ➢ Metering record keeping system, database
Consultant: VEMA S.A.	➢ Baseline methodology ➢ Monitoring plan ➢ Monitoring report ➢ Deviations from the PDD

2.3 Resolution of Clarification, Corrective and Forward Action Requests

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

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, 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 9 Corrective Action Requests and 2 Clarification 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

There are no CARs, CLs and FARs remaining from previous verifications.

3.2 Project approval by Parties involved (90-91)

The project received approval from the Host Party (Ukraine) - Letter of Approval No. 1961/23/7, issued by the State Environmental Investment Agency of Ukraine as of 27/07/2011, and written approval of the project from the side of the buyer of the ERUs (Switzerland) - Letter of Approval No. J294-0485, issued by the Federal Office for the Environment of Switzerland (FOEN) as of 28/06/2011.

The abovementioned written approval is unconditional.

The identified areas of concern as to the project approval by the parties involved, project participants responses and conclusions of Bureau Veritas Certification are described in Appendix A to this report (see CAR 01).

3.3 Project implementation (92-93)

The project that is implemented at the National Power Company “Ukrenergo” provides for the implementation of the program on the technical improvement of electrical grids and equipment, introduction of advanced technologies, transition to a higher level of organisation of transmission and

distribution of electric energy. These measures are aimed at improvement of the reliability and efficiency of operation of NPC "Ukrenergo" electricity transmission main-lines; this promotes reduction of the amount of electricity that is lost during transportation to the distribution power grids. As a result this leads to the reduction of electricity production at power plants and this in turn leads to lower GHG emissions (if compared with those that would have occurred in the absence of the project).

The project provides for implementation of new energy efficient equipment and complex of organizational and technical measures aimed at reduction of process losses of electricity (hereinafter – PLE) as well as creation of the PLE management system at the Company that is aimed at efficient implementation of a set of organizational measures, technical measures and improvement of methodological support of PLE reduction in the course of implementation of licensed types of activity of electricity supply and transfer. The list of these measures is provided below:

- Modernization activity and introduction of new energy efficient equipment;
- Improvement of the reliability of electricity supply;
- Introduction of the automated system of electricity consumption commercial accounting (ASECCA) in the perimeter of energy supply company, ASECCA of consumers and substations;
- Introduction of a complex Program on electricity process loss reductions.

Status of implementation of the project activities during 01/07/2011 – 31/12/2011 is presented in table 2:

Table 2 Information on the equipment installed in the framework of the project in the reporting period

Name of equipment installed in the period from 01/07/2011 to 31/12/2011	*Number of equipment units installed, units*
Transformers	7
Circuit breakers	86
Insulators	5455
Measuring transformers	274
Overhead protection cable	117.9 km

Implementation of the project measures in the monitoring period is carried out according to the the determined PDD version 02.

Based on visual inspection and analysis of documentation, the Verification

team confirms, that the JI project, including the system of data collection and storage have been implemented according to the PDD.

The identified areas of concern as to the project implementation, project participants responses and conclusions of Bureau Veritas Certification are described in Appendix A to this report (see CAR 02).

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

To calculate the emission reductions the following key factors were taken into account: carbon dioxide emission factors for electricity production, net amount of electricity at the inlet to the main-line power grid in the monitoring period, net amount of electricity at the inlet to the distribution grid, total amount of electricity at the inlet to the main-line power grid and total amount of electricity corona losses in the main-line power grid affecting the baseline emissions, level of activity on the project and the project emissions as well as risks associated with the project.
Data sources used for calculating emission reductions such as appropriately calibrated metering equipment (electricity meters), industry-specific reporting forms 1B-TVE DAEK, official information on carbon dioxide emission factors for the Ukrainian power grid, etc. 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.
The monitoring periods per component of the project are clearly specified in the Monitoring report and do not overlap with those for which verifications were already deemed final in the past.

The identified areas of concern as to the compliance of the monitoring plan with the monitoring methodology project participants responses and conclusions of Bureau Veritas Certification are described in Appendix A to this report (see CAR 03, CAR 04, CAR 05, CAR 06).

3.5 Revision of monitoring plan (99-100)

The project participants provided an appropriate justification for the proposed revision.

The proposed revision improves the accuracy and applicability of the information collected compared to the initial monitoring plan without changing conformity with the applicable rules and regulations for the establishment of monitoring plans.

Because of the fact that the initial monitoring plan provided for the calculation of project and baseline emissions as well as emission reductions on an annual basis, it was revised in order to make it possible to carry out the monitoring process on a monthly basis. Formulae to calculate emissions have been adapted for both the monitoring period of 1 month and the monitoring period of 1 year. This allowed making calculations for the period from July 2011 to December 2011.

The changes that were introduced do not affect the conservative approach to emission reduction calculations. The proposed revision improves the accuracy and applicability of information without changing conformity with the relevant rules and regulations for the establishment of monitoring plans.

Management system and operating system are suitable for reliable monitoring of the project according to the proposed revision.

3.6 Data management (101)

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.

The monitoring of the project is conducted according to practices established at NPC “Ukrenergo” in the framework of the existing system of data collection, accounting and reporting. Scheme of data collection using the automated system of electricity consumption commercial accounting (ASECCA) in the perimeter of the energy supply company is shown in Figure 3 of the Monitoring report. Scheme of data collection that was applied before implementation of the automated system of electricity consumption commercial accounting (ASECCA) is shown in Figure 4 of the Monitoring report. Detailed project operational and management structures are shown below in Figure 1.

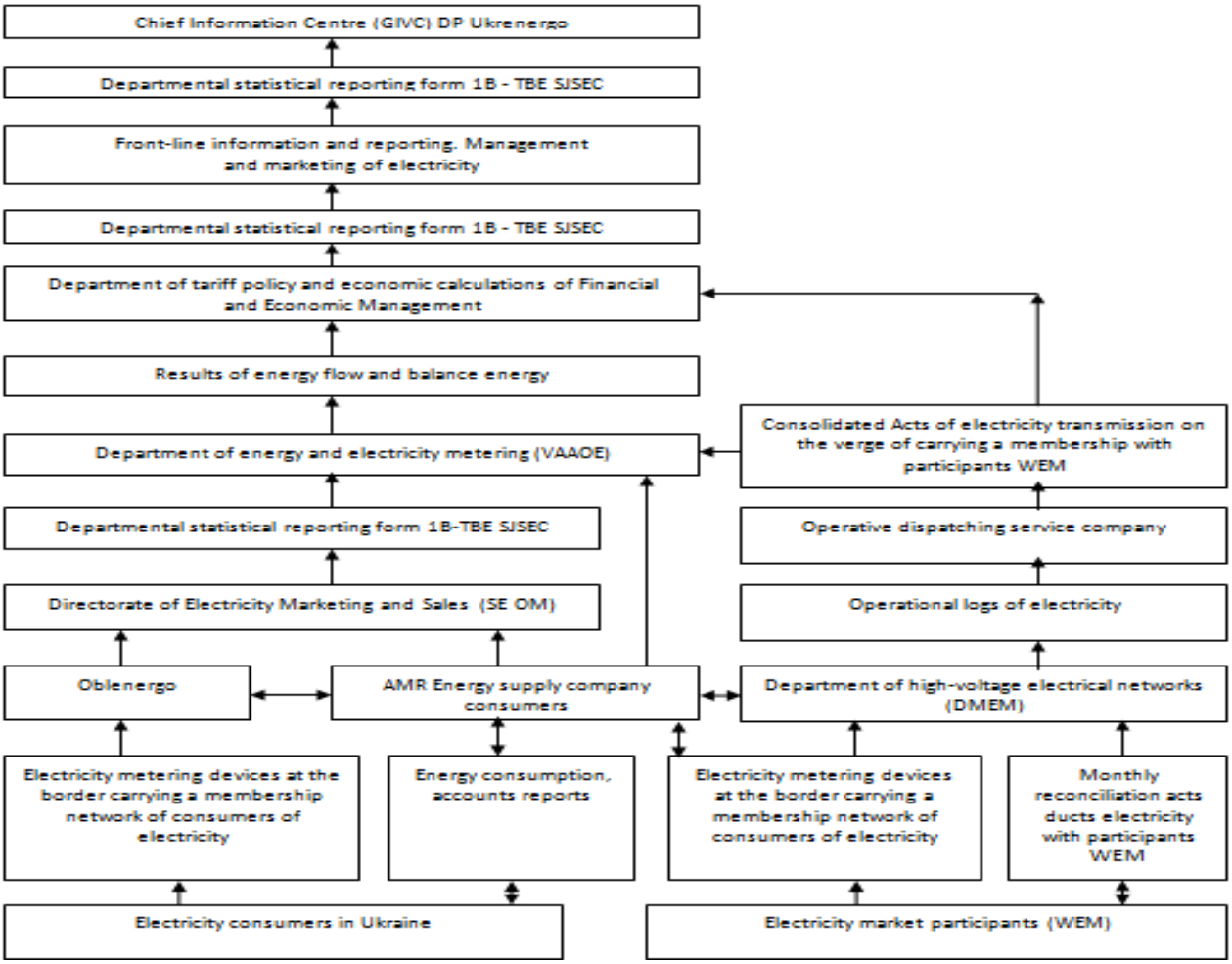

Figure 1 Scheme of operational structure of project management

To arrange data collection process as well as to account the amount of electricity transmitted by the main ETLs of NPC “Ukrenergo” the company has the automated system of electricity consumption commercial accounting (ASECCA) which was created on the basis of electronic and computative complex DGC-500, manufactured by "Landis & Gyr" (Switzerland). Collection of data from meters was performed by using pulse output of meter that is connected to the ASECCA. Collection of monitoring data was mainly carried out by duty shift staff manually at the sub-stations that were not equipped with ASECCA in the monitoring period. These data were then transferred by telephone to the headquarters of the energy system (hereinafter - ES) for further calculations. ASECCA is built as hierarchical three-level system, that has local level, regional level and central level in the administrative structure of the ES. Commissioning of ASECCA was carried out in stages.

The function of the monitoring equipment, including its calibration status, is in order. Measuring equipment used for monitoring, is maintained, calibrated and operated according to manufacturer's instructions and industry standards; the relevant records on metering equipment are maintained properly. In addition, to mandatory calibration of meters, in accordance with the Regulations on the Procedure of commercial metering of electric energy (RCM), additional meter performance control procedures, namely, scheduled departmental verifications of meters, are applied. For calculation meters that are installed at power plants, annual inspections to control their metrological characteristics are performed. Staff of NPC "Ukrenergo" participates in the annual routine verifications of electricity meters in the framework of joint with energy companies calculation points of accounting. The list of metering equipment units used in the monitoring is provided in Annex 4 to the Monitoring report (Excel file).

The evidence and records used for the monitoring are maintained in a traceable manner. All information required to monitor GHG and emission reductions, is stored in paper and / or electronic formats.

The Monitoring Report provides sufficient information on the assigned roles, responsibilities and authorities for implementation and maintenance of monitoring procedures including control of data. The Verification team confirms effectiveness of the existing management and operational systems and found them eligible for reliable project monitoring.

The identified areas of concern as to the data management, project participants response and conclusions of Bureau Veritas Certification are described in Appendix A to this report (see CAR 07, CAR 08, CAR 09, CL 01, CL 02).

3.7 Verification regarding programmes of activities (102-110)

Not applicable.

4 VERIFICATION OPINION

Bureau Veritas Certification has performed the second periodic verification of the JI project "Reconstruction and modernization of main-line electrical grids of NPC "Ukrenergo" for the period from July 1, 2011 to December 31, 2011, which applies 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 phases: i) desk review of the monitoring report against 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 VEMA S.A. 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 Plan indicated in the final PDD version 02 and the revised Monitoring Plan. 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 03, for the reporting period of 01/07/2011-31/12/2011 as indicated below. Bureau Veritas Certification confirms that the project is implemented according to the approved version of the PDD. 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.

There is a discrepancy between the amount of emission reductions in the monitoring period (01/07/2011-31/12/2011) and the estimated amount of emission reductions in the determined PDD version 02. This discrepancy is more than 5%. This is due to:

1. Emission reductions in 2011 that are stated in the determined PDD version 02, were estimated according to the energy industry development plan, while in the monitoring report the actual data were used.

2. The data used in the calculations of annual GHG emission reductions in the determined PDD version 02 were taken as the sum of reporting monthly values for one year. According to the principle of conservatism in the monitoring report for the period from 01/07/2011 to 31/12/2011 to calculate

GHG emission reductions monthly reporting values for 6-month period were used.

Estimated GHG emission reductions in the PDD (average values for 6 months) are 178 187 tonnes of CO_2 equivalent.

GHG emission reductions according to calculations of the Monitoring Report (01/07/2011-31/12/2012) are 208 470 tonnes of CO_2 equivalent.

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 01/07/2011 to 31/12/2011

Baseline emissions:	2 342 346	tonnes of CO_2 equivalent.
Project emissions:	2 133 876	tonnes of CO_2 equivalent.
Emission reductions:	208 470	tonnes of CO_2 equivalent.

5 REFERENCES

Category 1 Documents:
Documents provided by the project participants that relate directly to the GHG components of the project.

/1/	The PDD of the JI project "Reconstruction and modernization of main-line electrical grids of NPC "Ukrenergo", version 02 dated June 15, 2011
/2/	The Monitoring Report of JI project "Reconstruction and modernization of main-line electrical grids of NPC "Ukrenergo" for the period from 01/07/2011 to 31/12/2011, version 01 dated January 23, 2012
/3/	The Monitoring Report of JI project "Reconstruction and modernization of main-line electrical grids of NPC "Ukrenergo" for the period from 01/07/2011 to 31/12/2011, version 02 dated March 5, 2012
/4/	The Monitoring Report of JI project "Reconstruction and modernization of main-line electrical grids of NPC "Ukrenergo" for the period from 01/07/2011 to 31/12/2011, version 03 dated June 10, 2012
/5/	Annex 1 to the Monitoring Report of JI project "Reconstruction and modernization of main-line electrical grids of NPC "Ukrenergo" for the period from 01/07/2011 to 31/12/2011 "Implementation of new and reconstruction of existing elements of the electrical grid"
/6/	Annex 2 to the Monitoring Report of JI project "Reconstruction and modernization of main-line electrical grids of NPC "Ukrenergo" for the period from 01/07/2011 to 31/12/2011 "Number of implemented electricity equipment units"
/7/	Annex 3 to the Monitoring Report of JI project "Reconstruction and modernization of main-line electrical grids of NPC "Ukrenergo" for the period from 01/07/2011 to 31/12/2011, "Calculation of GHG emission reductions"
/8/	Annex 4 to the Monitoring Report of JI project "Reconstruction and modernization of main-line electrical grids of NPC "Ukrenergo" for the period from 01/07/2011 to 31/12/2011 "List of metering equipment units"
/9/	Determination Report of the project "Reconstruction and modernization of main-line electrical grids of NPC "Ukrenergo", issued by Bureau Veritas Certification Holding SAS No. UKRAINE-det/0273/2011, dated 24/06/2011
/10/	Verification Report of the JI project "Reconstruction and modernization of main-line electrical grids of NPC "Ukrenergo" for the period from 01/01/2008 to 30/06/2011 issued by Bureau Veritas Certification Holding SAS, dated September 20, 2011
/11/	Letter of Approval of the Joint Implementation project "Reconstruction and modernization of main-line electrical grids of NPC "Ukrenergo" No. 1961/23/7, issued by the State Environmental Investment Agency of Ukraine dated 27/07/2011

/12/	Letter of Approval of the project No. J294-0485, issued by the Federal Office for the Environment (FOEN) of Switzerland dated 28/06/2011

Category 2 Documents:

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

/1/	Information on equipment depreciation or damage of Western ES in 2011
/2/	Information on equipment depreciation or damage at SS 330-750 kV of Dnipro ES in 2011
/3/	Information on equipment depreciation or damage at SS 220-750 kV of Central ES in 2011
/4/	Information on equipment depreciation or damage at SS 220-330 kV of Southern ES in 2011
/5/	Information on equipment depreciation or damage at SS 220-750 kV of Crimea ES in 2011
/6/	Information on equipment depreciation or damage at SS 220-750 kV of Northern ES in 2011
/7/	Information on equipment depreciation or damage at SS 220-750 kV of Donbas ES in 2011
/8/	Inspection schedule for commercial metering devices for electricity supply to the grid of Wholesale Electricity Market members for substations of 220 kV and above that are serviced by Western power system in 2011 dated 20/12/2010
/9/	Plan and Schedule of inspection and replacement of metering equipment of commercial, technical and international electricity flows of Northern ES in 2011 dated 24/12/2010
/10/	Schedule of official inspection of calculation electricity meters installed at KES borders with energy saving companies in 2011 dated 24/01/2011
/11/	Schedule of official inspection of calculation electricity meters installed at interstate lines and within the WEM of Ukraine in the region of Southern ES in 2011 dated 10/01/2011
/12/	Inspection schedule for meters installed at interstate lines in 2011 dated 17/01/2011
/13/	Schedule of official inspection of calculation electricity meters installed at inter-state electricity transmission lines, borders of Central ES with electricity supply and generation companies in 2011 dated 23/12/2010
/14/	Schedule of inspection and replacement (calibration) of meters installed at interstate lines, borders of Donbas ES with electricity supply and generation companies in 2011 dated 23/12/2010
/15/	Schedule of routine inspections and replacement of electricity meters of calculation accounting in 2011, Zaporizhzhya dated 29/12/2010
/16/	Schedule of routine inspections and replacement of electricity meters of technical accounting in 2011, Zaporizhzhya dated 29/12/2010
/17/	Inspection schedule for technical devices of electricity metering at substations of 220 kV and above of Western power system in 2011, Lviv, dated 14/12/2010
/18/	Calibration certificate of working calibration standard № 11-P/1199 valid until

	December 2012 (three-phase standard wattmeter)
/19/	Calibration certificate of working calibration standard № 11-P/1198 valid until December 2012 (three-phase standard wattmeter)
/20/	Calibration certificate of working calibration standard № 11-P/1197 valid until November 2012 (one-phase standard wattmeter)
/21/	Passport M,.2. 844.000 SS for Hygrometer psychometric VIT designed to measure relative humidity and air temperature
/22/	Calibration certificate of working calibration standard № 11-P/1329 valid until December 2011 (three-phase standard wattmeter)
/23/	Calibration certificate of working calibration standard № 11-P/1114 valid until October 2011 (three-phase standard wattmeter)
/24/	Calibration certificate of working calibration standard № 11-P/1227 valid until November 2011 (three-phase standard wattmeter)
/25/	Calibration certificate of working calibration standard № 11-P/887 valid until September 2011 (one-phase standard wattmeter)
/26/	Calibration certificate of working calibration standard № 11-P/882 valid until September 2011 (three-phase standard wattmeter)
/27/	Calibration certificate of working calibration standard № 11-P/1021 valid until November 2011 (installation for electricity meter calibration)
/28/	Certificate of metrological state certification No. 25-03/A-155 dated June 24, 2010 (Automated installation AUP-3, № 015,2011
/29/	Fax dated 31/10/2011 on the purchase of electricity meters under the contract dated 29/04/2011
/30/	Structure of balance of electricity and process losses of electricity (PLE) at main-line grids (MLG) (MEM) total in Ukraine for 12 months in 2011
/31/	Structure of balance of electricity and process losses of electricity (PLE) at main-line grids (MLG) (0,4-800 kV) total in Ukraine for 12 months in 2011
/32/	Structure of electricity supply from power grids of neighboring grids and grids of other countries as well as useful electricity output in the grids of neighboring power systems and grids of other countries, total all over Ukraine for 12 months in 2011
/33/	Structure of balance of electricity and process losses of electricity (PLE) for transmission in main-line power grids (MPG), total in Ukraine for 12 months in 2011
/34/	Structure of balance of electricity and process losses of electricity (PLE) for transmission in power grids of 0-800 kV, total in Ukraine for 12 months in 2011
/35/	Structure of balance of electricity and process losses of electricity (PLE) at main-line grids (MLG) of Dnipro energy system for 12 months in 2011
/36/	Structure of balance of electricity and process losses of electricity (PLE) for transmission in power grids of (0,4-800 kV) of Donbas region for 12 months in 2011
/37/	Structure of balance of electricity and process losses of electricity (PLE) for transmission in power grids of (0,4-800 kV) of Dnipro region for 12 months in 2011
/38/	Structure of balance of electricity and process losses of electricity (PLE) for transmission in power grids of (0,4-800 kV) in Crimea region for 12 months in

	2011
/39/	Structure of balance of electricity and process losses of electricity (PLE) for transmission in main-line power grids (MPG) of Western power system for 12 months in 2011
/40/	Structure of balance of electricity and process losses of electricity (PLE) for transmission in main-line power grids (MPG) of South-Western power system for 12 months in 2011
/41/	Structure of balance of electricity and process losses of electricity (PLE) for transmission in main-line power grids (MPG) of Southern power system for 12 months in 2011
/42/	Structure of balance of electricity and process losses of electricity (PLE) for transmission in main-line power grids (MPG) of Northern power system for 12 months in 2011
/43/	Structure of balance of electricity and process losses of electricity (PLE) for transmission in power grids of (0,4-800 kV) of South-Western region for 12 months in 2011
/44/	Structure of balance of electricity and process losses of electricity (PLE) for transmission in power grids of (0,4-800 kV) Центрального регіону for 12 months in 2011
/45/	Structure of balance of electricity and process losses of electricity (PLE) for transmission in main-line power grids (MPG) of Central power system for 12 months in 2011
/46/	Structure of balance of electricity and process losses of electricity (PLE) for transmission in power grids of (0,4-800 kV) of Northern region for 12 months in 2011
/47/	Block diagram of ASCCA of s/s “Dnipro-750"
/48/	Photos of ASCCA servers
/49/	Photos of "Actaris" meters at transformer substations
/50/	Photos circuit breakers at transformer substations
/51/	Photos of insulators at transformer substations
/52/	Information on calibration of laboratory of NPC "Ukrenergo"
/53/	Statement of cost of service and maintenance ZVT performed by State Consumer Standard bodies, other organizations and enterprises (by contract) to the NPC "Ukrenergo"
/54/	Statement on the status of SS switch to calculation of energy amount on the verge of balance sheet attribution
/55/	Metrological certification (calibration) of measuring TS and TN at SS NEC "Ukrenergo"
/56/	Statement on significance of costs for company’s own and administrative needs of NPC "Ukrenergo» in 2011
/57/	Information regarding application of funds by NPC "Ukrenergo"

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

	Name	**Organization**	**Title**
/1/	Timchenko V.T.	NPC «Ukrenergo»	Acting Director
/2/	Kravchuk V.V.	NPC «Ukrenergo»	Head of electrical and technical service
/3/	Uschapovskyi K.V.	NPC «Ukrenergo»	Deputy Director, Chief dispatcher
/4/	Solohub O.M.	NPC «Ukrenergo»	Head of line service
/5/	Kovalenko I.	NPC «Ukrenergo»	Head of SS 330 kV “Zhovtneva”, Central power system
/6/	Kulemza S.O.	NPC «Ukrenergo»	First deputy Director for issues relating to capital construction, economics and purchases of Central power system
/7/	Halushka V.S.	NPC «Ukrenergo»	Head of service of equipment and automatization of accounting system of Central power system
/8/	Palamarchuk D.	“CEP” LLC	VEMA S.A. consultant

APPENDIX A: JI PROJECT VERIFICATION PROTOCOL

BUREAU VERITAS CERTIFICATION HOLDING SAS

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 DFP 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?	The project has been approved by both parties. The Letters of Approval were presented to the verification team. **CAR 01**. The number of the Letter of Approval from Switzerland is stated incorrectly. Please, make appropriate corrections in the MR.	**CAR 01**	OK
91	Are all the written project approvals by Parties involved unconditional?	Yes, all the written project approvals by Parties involved 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?	Yes, the project has been implemented in accordance with the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website. The project scenario provides for the implementation of	**CAR 02**	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		new energy efficient equipment and complex of organizational and technical measures aimed at reduction of process losses of electricity During the period from 01/07/2011 to 31/12/2011 7 transformers, 86 circuit breakers, 5455 insulators, 274 measuring transformers installed and 117.9 km of overhead protection cables were constructed. Details are provided in Annex 1 to the MR. **CAR 02.** In Section A.6. of the MR, the reporting period is stated incorrectly. Please make necessary corrections.		
93	What is the status of operation of the project during the monitoring period?	Project was operational for the whole monitoring period, which is 01/07/2011-31/12/2011.	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?	**CAR 03.** It is stated in Section A.5.1. of the MR that the algorithm for calculating baseline emissions is provided in the PDD version 01, while the final determined version of the PDD is version 02.	**CAR 03**	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 project taken into account, as	To calculate the emission reductions the following key factors were taken into account: carbon dioxide emission factors for electricity production, net amount of electricity at the inlet to the main-line power grid in the monitoring period, net amount of electricity at the inlet to the distribution grid, total amount of electricity at the inlet to the main-line power grid and total amount of electricity corona losses in the main-line power grid	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	appropriate?	affecting the baseline emissions, level of activity on the project and the project emissions as well as risks associated with the project.		
95 (b)	Are data sources used for calculating emission reductions or enhancements of net removals clearly identified, reliable and transparent?	Data sources used for calculating emission reductions are clearly identified, reliable and transparent. **CAR 04.** Please state baseline and project emissions as well as emission reductions in tonnes of CO_2 equivalent. **CAR 05.** In Tables 4 and 5 of Section B.2.2 as well as in formulae 1 and 3 the name of CO_2 emission factor, according to NEIA Decree No. 75, is stated incorrectly. Please make necessary corrections.	**CAR 04** **CAR 05**	OK 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 appropriately justified of the choice?	Yes, emission factors, including default emission factors, that were used for calculating the emission reductions or enhancements of net removals, were selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice.	OK	OK
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 is based on conservative assumptions and the most plausible scenarios in a transparent manner. **CAR 06.** Please, in Section E.4. state how GHG emission reductions are calculated.	**CAR 06**	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	N/a	N/a	N/a

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	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?			
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?	N/a	N/a	N/a
97 (b)	If the determination was conducted on the basis of an overall monitoring plan, have the project participants submitted a common monitoring report?	N/a	N/a	N/a
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?	N/a	N/a	N/a
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?	Because of the fact that the initial monitoring plan provided for the calculation of project and baseline emissions as well as emission reductions on an annual	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		basis, it was revised in order to make it possible to carry out the monitoring process on a monthly basis. Formulae to calculate emissions have been adapted for both the monitoring period of 1 month and the monitoring period of 1 year. This allowed making calculations for the period from July 2011 to December 2011. The changes that were introduced do not affect the conservative approach to emission reduction calculations.		
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?	The proposed revision improves the accuracy and applicability of the information collected compared to the initial monitoring plan without changing conformity with the applicable rules and regulations for the establishment of monitoring plans.	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?	**CAR 07.** Please provide a schematic description of the procedures for project management. **CL 01.** Please provide information on data collection from meters at SSs not equipped with ASECCA.	**CAR 07** **CL 01**	OK OK
101 (b)	Is the function of the monitoring equipment, including its calibration status, is in order?	Measuring equipment used for the project monitoring operates properly and is duly calibrated. **CAR 08.** Please provide information on the frequency of calibration of measuring equipment involved in the monitoring.	**CAR 08** **CAR 09**	OK OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		CAR 09. Please provide information on individuals / organizations that carry out verification / calibration of measuring equipment at the facility.		
101 (c)	Are the evidence and records used for the monitoring maintained in a traceable manner?	Yes, the evidence and records used for the 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 of the project is in accordance with the monitoring plan. Verification team confirms the effectiveness of existing management system and operating system and considers them suitable for reliable monitoring of the project. **CL 02.** Please, check the numbering of Tables and Figures in the Monitoring report.	**CL 02**	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?	N/a	N/a	N/a
103	Is the verification based on the monitoring reports of all JPAs to be verified?	N/a	N/a	N/a
103	Does the verification ensure the accuracy and conservativeness of the emission reductions or enhancements of removals generated by each JPA?	N/a	N/a	N/a
104	Does the monitoring period not overlap with previous monitoring periods?	N/a	N/a	N/a
105	If the AIE learns of an erroneously	N/a	N/a	N/a

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	included JPA, has 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 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	N/a	N/a	N/a

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	− 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?	N/a	N/a	N/a
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 and justification?	N/a	N/a	N/a
109	Is the sampling plan available for submission to the secretariat for the JISC.s ex ante assessment? (Optional)	N/a	N/a	N/a
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?	N/a	N/a	N/a

TABLE 2 RESOLUTION OF CLARIFICATION AND CORRECTIVE ACTION 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
CAR 01. The number of the Letter of Approval from Switzerland is stated incorrectly. Please, make appropriate corrections in the MR.	90	The project was approved by the party-buyer of GHG emission reductions (Switzerland) - Letter of Approval No. J294-0485, issued by the Federal Office for the Environment of Switzerland (FOEN) as of 28/06/2011.	The issue is closed based on necessary corrections made.
CAR 02. In Section A.6. of the MR, the reporting period is stated incorrectly. Please make necessary corrections.	92	The reporting period is from 01/07/2011 to 31/12/2011. The period that was stated mistakenly was corrected in the MR version 03.	The issue is closed based on necessary corrections made.
CAR 03. It is stated in Section A.5.1. of the MR that the algorithm for calculating baseline emissions is provided in the PDD version 01, while the final determined version of the PDD is version 02.	94	Detailed information regarding the algorithm for calculating baseline emissions is provided in the PDD version 02. Necessary corrections were made in the MR version 03.	Necessary corrections were made in the MR version 03. The issue is closed.
CAR 04. Please state baseline and project emissions as well as emission reductions in tonnes of CO_2 equivalent.	95 (b)	Necessary corrections were made in the MR version 03.	The issue is closed based on necessary changes made.

CAR 05. In Tables 4 and 5 of Section B.2.2 as well as in formulae 1 and 3 the name of CO_2 emission factor, according to NEIA Decree No. 75, is stated incorrectly. Please make necessary corrections.	95 (b)	CEF^y - Carbon dioxide emission factor for electricity losses in the course of transportation in local power grids in monitoring period. Necessary corrections were made in the MR version 03.	The issue is closed based on necessary changes made.
CAR 06. Please, in Section E.4. state how GHG emission reductions are calculated.	95 (d)	Emission reductions generated by the project are calculated as the difference between the baseline and project emissions. Relevant information is provided in Section E.4. in the MR version 03.	The issue is closed based on the information added to the MR.
CAR 07. Please provide a schematic description of the procedures for project management.	101 (a)	A schematic description of the procedures for project management is shown in Figure 2 of Section C.1. in the MR version 03.	The issue is closed based on provision of relevant information.
CAR 08. Please provide information on the frequency of calibration of measuring equipment involved in the monitoring.	101 (a)	Information on the frequency of calibration of measuring equipment involved in the monitoring is provided in Table 2 of the MR version 03. Detailed information is provided in Annex 4 “List of metering equipment units” to the MR.	Information was verified. The issue is closed.

CAR 09. Please provide information on individuals / organizations that carry out verification / calibration of measuring equipment at the facility.	101 (b)	Calibration of metering equipment was carried out by territorial agencies authorized to conduct such calibrations. Calibration was performed by employees of territorial agencies and metrological centers – state verifiers certified according to procedure established by legislative regulations of central executive authority in the sphere of metrology.	Information was provided. The issue is closed.
CL 01. Please provide information on data collection from meters at SSs not equipped with ASECCA.	101 (a)	Collection of monitoring data was mainly carried out by duty shift staff manually at the sub-stations that were not equipped with ASECCA in the monitoring period. These data were then transferred by telephone to the headquarters of the energy system (hereinafter - ES) for further calculations.	The issue is closed based on information provided.
CL 02. Please, check the numbering of Tables and Figures in the Monitoring report.	101 (d)	Necessary corrections were made in the MR version 03.	The issue is closed based on necessary changes made.