



VERIFICATION REPORT THE WORLD BANK

VERIFICATION OF THE UkrHydroEnergo (UHE) Hydropower Rehabilitation Project in Ukraine (FOR THE PERIOD 01/01/2010 – 31/12/2010)

REPORT No. UKRAINE-VER/0249/2011
REVISION No. 02

BUREAU VERITAS CERTIFICATION



VERIFICATION REPORT

Date of first issue: 05/08/2011	Organizational unit: Bureau Veritas Certification Holding SAS
Client: The World Bank	Client ref.: Mr. Kari Hamekoski

Summary:
Bureau Veritas Certification has made the 2nd periodic verification of the "UkrHydroEnergo (UHE) Hydropower Rehabilitation Project in Ukraine" project, Registration Reference Number UA1000226, project of The World Bank, located in 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 described in the approved project design document and the determined changes occurred during project implementation. 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 139232 tons of CO₂eq for the monitoring period.

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/0249/2011	Subject Group: JI
Project title: UkrHydroEnergo (UHE) Hydropower Rehabilitation Project in Ukraine	
Work carried out by: Igor Kachan - Team Leader, Climate Change Lead Verifier Sergiy Kustovskyy - Team Member, Climate Change Verifier-Trainee Julia Berdnikova - Team Member, Technical Specialist	
Work reviewed by: Ivan Sokolov - Internal Technical Reviewer Daniil Ukhanov - Technical Specialist	
Work approved by: Flavio Gomes – Operational Manager	
Date of this revision: 02/09/2011	Rev. No.: 02
Number of pages: 29	

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1 INTRODUCTION

The World Bank has commissioned Bureau Veritas Certification to verify the emissions reductions of its JI project “UkrHydroEnergo (UHE) Hydropower Rehabilitation Project in Ukraine” (hereafter called “the project”) 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.

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, 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:

Igor Kachan

Bureau Veritas Certification, Team Leader, Climate Change Lead Verifier

Sergiy Kustovskyy

Bureau Veritas Certification, Climate Change Verifier-Trainee

Julia Berdnikova

Bureau Veritas Certification, Team Member, Technical Specialist



This verification report was reviewed by:

Ivan Sokolov
Bureau Veritas Certification, Internal Technical Reviewer

Daniil Ukhanov
Bureau Veritas Certification, 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 the World Bank 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 and 1.1 and project as described in the determined PDD.

2.2 Follow-up Interviews

On 10/07/2011 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 Mitsubishi



UFJ Morgan Stanley Securities Co., Ltd. and UkrHydroEnergo were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
UkrHydroEnergo	<ul style="list-style-type: none"> ➤ Organizational structure. ➤ Responsibilities and authorities. ➤ Training of personnel. ➤ Quality management procedures and technology. ➤ Implementation of equipment (records). ➤ Metering equipment control. ➤ Metering record keeping system, database.
Consultant: Mitsubishi UFJ Morgan Stanley Securities Co.	<ul style="list-style-type: none"> ➤ Baseline methodology ➤ Monitoring plan ➤ Monitoring report ➤ Deviations from 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 2 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

During previous verification conducted for the period of 01/01/2008 – 31/12/2009 one Forward Action Request was issued:

FAR 01. Please, submit any documented instruction which indicates that the data monitored and required for ERUs calculation (including the historical data for 2002-2005) are to be kept for two years after the crediting period as per *Jl determination and verification manual, v.01*.

As a response to the issue raised by BVC, the project participants provided the Instruction for monitoring information storage dated 11/11/2010. Based on the submitted documentation the FAR is considered to be closed.

3.2 Project approval by Parties involved (90-91)

The project obtained approval by the Host party (Ukraine) on 18/05/2007 (Letter of Approval issued by the Ministry of Environmental Protection of Ukraine), see References.

Written project approval by the Netherlands (sponsor party) has been issued by the DFP of the Party when submitting the first verification report, see References. The above mentioned written approvals are unconditional.

3.3 Project implementation (92-93)

The Project involves rehabilitation of 46 hydro units which are located on the Dnipro river and the Dnister river. The actual operation of the proposed project includes the replacement of hydraulic power, electro-technical and hydro-mechanical equipment such as gates, turbines, generators, excitation and governor systems, control, protection and automation systems, switchyard equipment and auxiliary equipment. The Project also includes works on hydraulic structures and installation of computer-aided dam safety monitoring systems.

The Project is not result in an increase in the reservoir area; the rehabilitated hydropower plants generate additional electricity without emitting GHG. This lead to the reduction of anthropogenic GHG emissions by displacing electricity produced by fossil fuel fired power plants.

Since technological equipment directly related to the project will no vary from the old equipment, no special training for the staff is required. New equipment maintenance is performed according to the schedule provided in the operation manuals established by the company in accordance with the sectoral norms. Usually routine maintenance is performed every year, while overhauls of main generating equipment performed every 6-7 years. In terms of environmental benefits, the Project helps to reduce air pollution caused by the emission of SO₂ and NO_x by outdated thermal plants.

From the start of the Project to December 31, 2010, rehabilitation was completed on 20 hydro units at the Kyiv HPP, Kanyv HPP, Kremenchuk HPP, Dniprodzerzhynsk HPP, Dnipro HPP and Kakhovka HPP. The names of the rehabilitated hydro units and the dates of completion of the rehabilitation are provided below.

Year/Plant Name	2006 (HPU# - DD/MM)	2007 (HPU# - DD/MM)	2008 (HPU# - DD/MM)	2009 (HPU# - DD/MM)	2010 (HPU# - DD/MM)
Kyiv HPP	-	HPU#19 - 16/12 HPU #10 - 29/09	-	HPU#11 - 15/11 HPU#17 - 15/05 HPU#20 - 14/11	HPU#9 - 15/12
Kanyv HPP	-	HPU # 7 - 15/12 HPU # 5 - 01/10	-	HPU#22 - 25/05 HPU#24 - 30/06	HPU#10 - 03/09 HPU#21 - 31/01
Kremenchuk HPP	-	-	-	HPU#2 - 10/07	-
Dniprodzerzhynsk HPP	HPU #4 - 30/11	-	HPU#8 - 31/03	HPU#7 - 13/10	-



Dnipro HPP	-	-	-	HPU#15 – 23/07	-
Kakhovka HPP	-	HPU # 1 - 01/04	HPU#5 – 28/04	HPU#6 – 25/12	-

The identified areas of concern as to the project implementation, project participants response and BVC's conclusion are described in Appendix A, Table 2 (refer to CL01).

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

The monitoring occurred in accordance with the monitoring plan included in the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website:

<http://ji.unfccc.int/JIITLProject/DB/QUI36U4PN29LM0ZF8DKHL7KRGYE1U2/details>

Baseline and monitoring methodology follows the elements of the approved CDM Methodology ACM0002 Consolidated methodology for grid-connected electricity generation from renewable sources, ver. 7, as well as Tool to calculate the emission factor for an electricity system, ver. 1.01 (which was active at the time of the start of the project determination), with modifications to make these applicable to the conditions found in Ukraine. The approach also follows the criteria for baseline setting included in Appendix B of Guidelines for the Implementation of Article 6 of the Kyoto Protocol and is in line with the recent guidance provided by the Joint Implementation Supervisory Committee.

The baseline determination and monitoring approach deviates from ACM0002 in the following two points:

Unlike the prescriptions of ACM0002, ver. 7 and the Tool to calculate the emission factor for an electricity system, referred to in the methodology, the grid emission factor for the Ukrainian grid is calculated as the Simple Operational Margin only, as the implementation of the project will have no effect on the built margin and on the operation of any low-cost/must-run resources (for a more information please refer to Section B.1 of the final version of the PDD). The Operational Margin for each monitoring year was determined ex-post based on the power generation and fuel data for the appropriate year.

Unlike the approach in ACM0002, ver 7, baseline generation in any year is determined based on the ex-ante developed correlation between the total water flow through each hydropower plant and its power generation at a historical efficiency rate. This correlation is based on historical data for the period 2002 - 2005.

For calculating the emission reductions key factors, such as power generation by each rehabilitated hydro unit $EG_{pr,HPP}$, and water flow



$WF_{HPP,y}$ influencing the baseline emissions as well as risks associated with the project were taken into account. Data sources used for calculating emission reductions or enhancements of net removals are clearly identified, reliable and transparent.

Emission factors and the data from official statistics, including default emission factors (amount of each fossil fuel consumed by grid connected TPPs in 2009, carbon emission factor of each fuel type, oxidation factor, electricity generation by grid connected TPPs in 2009), 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 response and BVC's conclusion are described in Appendix A, Table 2 (refer to CAR 01 and CL 02).

3.5 Revision of monitoring plan (99-100)

Not applicable.

The monitoring plan of the project was not revised.

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 approach in the monitoring plan requires monitoring and measurement of all the variables and parameters necessary to quantify the baseline emissions and project emissions in a conservative and transparent way.

Internal and external data are obtained according to the determined PDD and the monitoring plan included in the MR. Fixed default and baseline values is presented in the section 2.3.1 and 2.3.2 of the MR.

The following items are monitored in order to determine baseline emissions in a conservative and transparent manner:

$EG_{pr,HPP}$ amount of generation (MWh/yr) by each project hydropower plant.

$WF_{HPP,y}$ total water flow (m^3/yr) for each project hydropower plant

$EF_{grid,y}$ the Simple OM emission factor of the Ukrainian power grid (tCO₂/MWh)



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$FC_{i,y}$ aggregated annual fuel consumption data (tce/yr) for all thermal generation sources connected to the Ukraine grid.

$EF_{C,l}$ carbon emission factor of each fuel type as per the most recent submission of the Ukrainian National GHG Inventory.

F_{oxyd} oxidation factor for each fuel type as per the most recent submission of the Ukrainian National GHG Inventory.

$EG_{BL,FF,y}$ aggregated electricity generation data (MWh/yr) for all generation sources connected to the Ukraine grid.

The historical efficiency factors for the hydro power plants were determined ex ante based on actual data from 2002 to 2005 by utilizing the correlation between the water flow and the electricity generation. The correlation is used to determine the amount of the baseline hydropower generation that would have occurred in the absence of the Project activity, as described in the section 2.2.1 of the MR.

All the internal operational data required for ERU calculation is collected by UHE as part of routine operations. The data and their sources, provided in the 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 function of the monitoring equipment, including its calibration status, is in order.

The evidence and records used for the monitoring are maintained in a traceable manner. The data collection and management system for the project is in accordance with the monitoring plan.

It is evidenced that the whole monitoring system was fully operational during the entire monitoring period. The verification team confirms that the emission reduction calculations have been performed according to the monitoring plan and to the calculation methodology reported in the final MR in accordance with the PDD. The verification team checked the transfer of monitored data, correctness of the formulae versus the PDD as well as calculations of emission reductions. No inaccuracies in calculations were detected by the verifiers. Finally, our own calculations have shown the same results as given in the final Monitoring Report.

At UHE the best available techniques are used in order to minimize uncertainties. Uncertainties are generally low. All monitoring equipment that used for monitoring purposes is in compliance with national legislative requirements and standards; this ensures that uncertainties are accounted in data collected.

The function of the monitoring equipment, including its calibration status, is in order.

The evidence and records used for the monitoring are maintained in a traceable manner.



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

The identified areas of concern as to the data management, project participants response and BVC's conclusion are described in Appendix A Table 2 (refer to CAR02).

3.7 Verification regarding programmes of activities (102-110)

Not applicable.

4 VERIFICATION OPINION

Bureau Veritas Certification has performed periodic verification of the "UkrHydroEnergo (UHE) Hydropower Rehabilitation Project in Ukraine" 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 the World Bank 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 indicated in the final PDD version 08. 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 1.1 for the reporting period as indicated below. Bureau Veritas Certification confirms that the project is implemented as described in the approved project design document and the determined changes (described in the Verification Report by Bureau Veritas Certification No. UKRAINE-ver/0023/2008 dated 11/04/2011) occurred during project implementation. 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.



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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 31/12/2010

Baseline emissions	: 139232	t CO ₂ equivalents.
Project emissions	: 0	t CO ₂ equivalents.
Emission Reductions	: 139232	t CO ₂ equivalents.



5 REFERENCES

Category 1 Documents:

Documents provided by the World Bank that relate directly to the GHG components of the project.

- /1/ Monitoring Report "UkrHydroEnergo (UHE) Hydropower Rehabilitation Project in Ukraine" version 1.0 dated 23rd of May 2011
- /2/ Monitoring Report "UkrHydroEnergo (UHE) Hydropower Rehabilitation Project in Ukraine" version 1.1 dated 27th of July 2011
- /3/ PDD "UkrHydroEnergo (UHE) hydropower rehabilitation project in Ukraine", version 08 dated 04/02/2010
- /4/ Determination Report by SGS United Kingdom Ltd. No. JI.VAL.0040 "UkrHydroEnergo (UHE) hydropower rehabilitation project in Ukraine" dated 14/07/2010
- /5/ Verification Report by Bureau Veritas Certification No. UKRAINE-ver/0023/2008 "UkrHydroEnergo (UHE) Hydropower Rehabilitation Project in Ukraine" dated 11/04/2011.
- /6/ Letter of Approval # 5633/10/3-10 Issued by the Ministry of Environmental Protection of Ukraine, dated 18.05.2007
- /7/ Declaration of Approval Issued by the Netherlands` Ministry of Economic Affairs dated 28.06.2007

Category 2 Documents:

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

- /1/ Photo - meter. Model A1805RAL-P4GB-DW-4. Reg.number 01184671
- /2/ Statement of electric power production and distribution by Kyiv HPP dated 31.12.2010
- /3/ Statement of electric power production and distribution by Kyiv HPP dated 30.11.2010
- /4/ Statement of electric power production and distribution by Kyiv HPP dated 31.10.2010
- /5/ Statement of electric power production and distribution by Kyiv HPP dated 30.09.2010
- /6/ Statement of electric power production and distribution by Kyiv HPP dated 31.08.2010
- /7/ Statement of electric power production and distribution by Kyiv HPP dated 31.07.2010
- /8/ Statement of electric power production and distribution by Kyiv HPP dated 30.06.2010
- /9/ Statement of electric power production and distribution by Kyiv HPP dated 31.05.2010



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- /10/ Statement of electric power production and distribution by Kyiv HPP dated 30.04.2010
- /11/ Statement of electric power production and distribution by Kyiv HPP dated 31.03.2010
- /12/ Statement of electric power production and distribution by Kyiv HPP dated 28.02.2010
- /13/ Statement of electric power production and distribution by Kyiv HPP dated 31.01.2010
- /14/ Certificate of measurement device verification №39-03-0455. Metering overpressure transformer №503032 dated 25.03.2010
- /15/ Certificate of measurement device verification №39-03-0454. Metering overpressure transformer №503031 dated 25.03.2010
- /16/ Protocol of measurement device calibration №10-184. Set (level meter 4390, milliammeter JUMO di08) reg.number 835205-001 dated 22.09.2010
- /17/ Protocol of measurement device calibration №10-184. Set (level meter 4390, milliammeter JUMO di08) reg.number 835204-001 dated 21.09.2010
- /18/ Certificate of measurement device calibration №10-185. Set (level meter 4390, milliammeter JUMO di08) reg.number 835205-001 dated 22.09.2010
- /19/ Certificate of measurement device calibration №10-184. Set (level meter 4390, milliammeter JUMO di08) reg.number 835204-001 dated 21.09.2010
- /20/ Passport ДЯИМ.41115.018 ПС. Meter. Model - A1805RAL-P4GB-DW-4 Reg.number 01184693
- /21/ Passport ДЯИМ.41115.018 ПС. Meter. Model - A1805RAL-P4GB-DW-4 Reg.number 01184683
- /22/ Passport ДЯИМ.41115.018 ПС. Meter. Model - A1805RAL-P4GB-DW-4 Reg.number 01184672
- /23/ Passport ДЯИМ.41115.018 ПС. Meter. Model - A1805RAL-P4GB-DW-4 Reg.number 01184668
- /24/ Passport ДЯИМ.41115.018 ПС. Meter. Model - A1805RAL-P4GB-DW-4 Reg.number 01184694
- /25/ Passport ДЯИМ.41115.018 ПС. Meter. Model - A1805RAL-P4GB-DW-4 Reg.number 01184670
- /26/ Passport ДЯИМ.41115.018 ПС. Meter. Model - A1805RAL-P4GB-DW-4 Reg.number 01184682
- /27/ Passport ДЯИМ.41115.018 ПС. Meter. Model - A1805RAL-P4GB-DW-4 Reg.number 01184680
- /28/ Passport ДЯИМ.41115.018 ПС. Meter. Model - A1805RAL-P4GB-DW-4 Reg.number 01184692
- /29/ Passport ДЯИМ.41115.018 ПС. Meter. Model - A1805RAL-P4GB-DW-4 Reg.number 01184669
- /30/ Passport ДЯИМ.41115.018 ПС. Meter. Model - A1805RAL-P4GB-DW-4 Reg.number 01184690
- /31/ Passport ДЯИМ.41115.018 ПС. Meter. Model - A1805RAL-P4GB-



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- DW-4 Reg.number 01184667
- /32/ Photo - meter. Model A1805RAL-P4GB-DW-4. Reg.number 01184673
 - /33/ Photo - meter. Model A1805RAL-P4GB-DW-4. Reg.number 01184667
 - /34/ Photo - meter. Model A1805RAL-P4GB-DW-4. Reg.number 01184666
 - /35/ Photo - meter. Model A1805RAL-P4GB-DW-4. Reg.number 01184691
 - /36/ Photo - meter. Model A1805RAL-P4GB-DW-4. Reg.number 01184677
 - /37/ Information on water flow rate on Kaniv HPP for January 2010
 - /38/ Information on water flow rate on Kaniv HPP for February 2010
 - /39/ Information on water flow rate on Kaniv HPP for March 2010
 - /40/ Information on water flow rate on Kaniv HPP for April 2010
 - /41/ Information on water flow rate on Kaniv HPP for May 2010
 - /42/ Information on water flow rate on Kaniv HPP for June 2010
 - /43/ Information on water flow rate on Kaniv HPP for July 2010
 - /44/ Information on water flow rate on Kaniv HPP for August 2010
 - /45/ Information on water flow rate on Kaniv HPP for September 2010
 - /46/ Information on water flow rate on Kaniv HPP for October 2010
 - /47/ Information on water flow rate on Kaniv HPP for November 2010
 - /48/ Information on water flow rate on Kaniv HPP for December 2010
 - /49/ Statement #9 on generation, supply of electricity generated by "UkrHydroEnergo" for September 2010
 - /50/ Statement on sale of electricity generated by "UkrHydroEnergo" to DP "Energorynok" for September 2010
 - /51/ Calculation of collection for special water usage for hydropower needs in Kakhovka HPP for December 2010
 - /52/ Final acceptance certificate HPU #9 after Rehabilitation in 2010
 - /53/ Instruction for monitoring information storage dated 11.11.2010
 - /54/ Letters from HPPs with the data on electricity generation and water flow rate dated 28/04/2011 and 05/05/2011

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.

- /1/ Oleksandr Chaika – Head of production and technical division, Generation Department, Kyiv HPP:
- /2/ Vyacheslav Synenko – lead engineer, Kaniv HPP
- /3/ Vadym Horbenko – engineer, Kaniv HPP
- /4/ Vasyl Siryk – engineer-metrologist, Kaniv HPP



/5/ Volodymyr Laskarevskyi – JI and CDM projects Consultant,
Mitsubishi UFJ Morgan Stanley Securities



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**APPENDIX A: PROJECT VERIFICATION PROTOCOL
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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?	The project has been approved by both Host Party (Ukraine) and Sponsor Party (The Netherlands). The written project approvals were issued by NFPs of the Parties involved (see chapter 7 References of the Verification Report).	OK	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	Generally, the project has been implemented in accordance with the PDD version 8 (final). CL01	CL01	OK

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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	listed on the UNFCCC JI website?	According to the Project Design Document (see Table 14 of PDD), 25 hydro power units were planned to complete the rehabilitation by the end of 2010. Still only 20 hydro units were installed. Please, provide the explanation of the delay in hydro units installation.		
93	What is the status of operation of the project during the monitoring period?	The project was operational during complete monitoring period.	OK	OK
Compliance with monitoring plan				
94	Did the monitoring occur in accordance with the monitoring plan included in the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website?	The algorithm for monitoring is in line with the monitoring plan included in the determined and registered PDD and the determined revisions of the monitoring plan provided in the Verification Report for 2008.	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	Yes. The key factors, e.g. those listed in 23 (b) (i)-(vii) of the DVM check list, influencing the baseline emissions and the activity level of the project and the emissions as well as risks associated with the project were taken into account	OK	OK



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	activity level of the project and the emissions or removals as well as risks associated with the project taken into account, as appropriate?	for calculating the emission reductions.		
95 (b)	Are data sources used for calculating emission reductions or enhancements of net removals clearly identified, reliable and transparent?	CAR01 Please, in the Monitoring Report provide the explanation for the abbreviation "SCSU" (page 14 of the MR).	CAR01	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?	All the emission factors, including default emission factors are used in line with the registered PDD and the determined revisions of the monitoring plan provided in the Verification Report for 2008. In order to calculate the emissions form each fuel type, the most recent submission of the Ukrainian National GHG Inventory was used.	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. CL02 The Monitoring Report indicates (page	CL02	OK



VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		8) that “only the emission reductions from the hydro units that completed rehabilitation are accounted for during the monitoring period from January 1, 2010 to December 31, 2010”. However, the electricity generation is not monitored separately for each hydro unit. Considering this, please, clarify how emission reductions can be accounted only for hydro units that are already rehabilitated.		
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?	N/A	OK	OK
Applicable to bundled JI SSC projects only				
97 (a)	Has the composition of the bundle	N/A	OK	OK



VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	not changed from that is stated in F-JI-SSCBUNDLE?			
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	OK	OK
98	If the monitoring is based on a monitoring plan that provides for overlapping monitoring periods, are the monitoring periods per component of the project clearly specified in the monitoring report? Do the monitoring periods not overlap with those for which verifications were already deemed final in the past?	N/A	OK	OK
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?	The monitoring was occurred in accordance with the registered monitoring plan and the determined revisions of the monitoring plan listed in the Verification Report for 2008. No	OK	OK



VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		deviations were detected by the verification team during the site-visit.		
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?	N/A	N/A	N/A
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 detailed description of the data collection procedures is included in the MR. The data collection is performed in accordance with the monitoring plan in the determined PDD. CAR02 Please, note that the item 2.5.1 in not listed in the Contents of the Monitoring Report. Please, make corresponding corrections.	CAR02	OK
101 (b)	Is the function of the monitoring equipment, including its	The procedure of the electricity meters calibration was found satisfactory. Each	OK	OK

VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	calibration status, is in order?	meter was calibrated in accordance with the Ukrainian national standards. The documented evidences were checked onsite. All confirmatory documentation on level meters calibration was checked onsite. The documental evidences were found satisfactory.		
101 (c)	Are the evidence and records used for the monitoring maintained in a traceable manner?	All the relevant data is maintained in clear and transparent 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 is completely in accordance with the original monitoring plan and the determined changes.	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?	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	N/A	N/A	N/A



VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	enhancements of removals generated by each JPA?			
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 included JPA, has the AIE informed the JISC of its findings in writing?	N/A	N/A	N/A
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	N/A	N/A	N/A



VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	characteristics of JPAs, such as: <ul style="list-style-type: none"> - 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 - 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	N/A	N/A	N/A



 VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	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?			
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 Corrective Action and Clarification Requests**

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
<p>CAR01 Please, in the Monitoring Report provide the explanation for the abbreviation “SCSU” (page 14 of the MR).</p>	95 (b)	SCSU stands for “State Committee of Statistic of Ukraine”. The corresponding corrections are made in the updated Monitoring Report	CAR is closed based on the corrections made in the MR.
<p>CAR02 Please, note that the item 2.5.1 in not listed in the Contents of the Monitoring Report. Please, make corresponding corrections.</p>	101 (a)	The corresponding corrections are made in the updated Monitoring Report.	CAR is closed based on the corrections made in the MR.



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<p>CL01 According to the Project Design Document (see Table 14 of PDD), 25 hydro power units were planned to complete the rehabilitation by the end of 2010. Still only 20 hydro units were installed. Please, provide the explanation of the delay in hydro units installation.</p>	<p>92</p>	<p>The delay in the reconstruction of HPU from 2006 to 2010 occurred due to the following reasons: - Shortage of funding on UHE side in 2009 and 2010; - Delays in the supply of equipment by manufacturers; - The implementation of some security measures on the sites as a result of more than expected delays in the implementation of the reconstruction activities; The security measures were triggered the forecasts of the Centre of Hydrometeorology of Ukraine of much higher than average water levels during the snow melting season in 2010; - The need for additional reconstruction works identified at several HPUs, mainly due to the extensive operational time of the equipment;</p>	<p>The issue is closed based on the clarifications provided.</p>
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<p>CL02 The Monitoring Report indicates (page 8) that “only the emission reductions from the hydro units that completed rehabilitation are accounted for during the monitoring period from January 1, 2010 to December 31, 2010”. However, the electricity generation is not monitored separately for each hydro unit. Considering this, please, clarify how emission reductions can be accounted only for hydro units that are already rehabilitated.</p>	<p>95 (d)</p>	<p>The electricity generation is not monitored separately for each hydro unit, as already clarified at previous verifications. The GHG reduction calculation model accounts for GHG emission reductions based on the monitoring result of “total” water flow through the HPP and “total” electricity generation on the HPP, as there is no possibility of measuring separately water flows through each HPU.</p> <p>According to the methodology in the finally determined PDD, increase in the electricity generation with the same water flow reflects increased HPU efficiency after reconstruction.</p>	<p>The provided information was found appropriate. The issue is closed.</p>
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