

# Environmental Monitoring Report

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Bi-annual report  
Covering the period of July - December 2015

## **KGZ: Power Sector Rehabilitation Project, Phase 1**

Project Number: 44198 - KGZ  
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Prepared by the Open Joint Stock Company Electric Power Plants, with the assistance of the Project Implementation Consultant (Fichtner GmbH & Co. KG – Energy, Germany) for the Kyrgyz Republic and the Asian Development Bank.

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# 1. Introduction

The backbone of Kyrgyz power generation is the Naryn River with its several hydropower plants (HPP) Kambarata 2, Toktogul, Kurpsai, Tash-Kumur, Shamaldy-Say and Uch Kurgan.

Electricity demand in Kyrgyz Republic is highly seasonal with two thirds of domestic consumption taking place in autumn and winter. Although electricity generation capacity has nearly doubled since the Soviet era, load shedding is frequent especially in the winter when hydropower output is limited due to low river discharge, while cuts arise from problems due to technical failures in the outdated generating equipment.

Hydroelectric generation from the Naryn Cascade is central to the present and future economic development of the Kyrgyz Republic, also with view on an electric power generation and transmission system regionally managed between the Central Asian Countries in future.

However, the future security of this electricity capability is to doubt somehow because of the age of most of the named facilities. They are over 50 years old, obsolete and many spare parts are no longer available.

## 1.1 Project Description for Phase 1

In order to sustain power generation at HPP Toktogul (see Map 1-1) in future, the Asian Development Bank (ADB) will finance the rehabilitation of this hydropower station. For that purpose, an Initial Environmental Examination (IEE) with Environmental Management Plan (EMP) was prepared in 2012 and up-dated in 2014. The up-dated IEE was published on the ADB project web-site.

This IEE/EMP included following measures:

- Rehabilitation of the periphery of the generators requiring the temporary shutdown of the generator actually worked on;
- Replacement of four oil operated generator circuit breakers by state-of-the-art SF<sub>6</sub> circuit breakers;
- Replacement of four oil-filled 500 kV cables of a length of approx. 1,150 m each. These cables contain all together about 250,000 l of oil that has to be disposed of;
- Renewing of the fire-fighting system of the main transformers. The old system is based on a sprinkler system using water for cooling and will be replaced by a system using N<sub>2</sub> (gaseous nitrogen) that is blown into the transformers in case of fire to quench it;
- Installation of four static excitation and control systems for the main generators and the auxiliary generators, including integrated supervision/control equipment and AVR;
- Integration of four generator temperature monitoring systems;
- Installation of a measuring program for all four main generators;

- Placement of two new cast-resin station transformers 6/0.4 kV, 1000 kVA;
- Installation of four special fire-fighting system for each of the 500 kV transformers;
- Refurbishment of all four hydraulic turbine governor systems;
- Replacement of the 6 kV switchgear (23 new cubicles) with auxiliaries (optional);
- Replacement of the 0.38 kV switchgear (15 new cubicles) with auxiliaries (optional);
- Installation of one complete set of rotor windings for generator #2 (optional).

In the course of preparing the first set of bidding documents, the scope of work has been reduced to the following:

- Replacement of 500 kV Power Cable Systems;
- Replacement of Excitation Systems for all units;
- Supply of Main Generator Stator Winding Spare Parts;
- Measuring Program to all Main Generators;
- Replacement of Generator Circuit Breakers for all units;
- Replacement of Turbine Governor Systems for all units;
- Installation of Temperature / Unit Condition Monitoring Systems for all units;
- Installation of Joint Power and Voltage Control System;
- Transformer Explosion and Fire Prevention Systems for Main Step-Up Transformers.

Now the scope of work changed again and will be tendered from in the year 2015 in three lots. Following measures are now foreseen to implement for Phase 1:

*Lot 1, Underwater Inspection:*

Inspection of Hydraulic Steel Structures  
(Underwater part) with Remotely Operated Vehicle (ROV) , including supply of new ROV

*Lot 2, Electrical Equipment:*

Replacement of Generator Circuit Breakers for all units  
Replacement of Main Transformers for Unit 1 and Unit 3  
Replacement of Electrical Auxilliary Systems, including MV and LV Switchgears and Auxilliary Transformers  
Replacement of Differential Protection for 500kV Cable and related Transmission Line  
Replacement of Protection System for Main Transformers  
Minor Civil Works in Switchgear Rooms

*Lot 3, High Voltage Cables:*

Replacement of 500 kV Power Cable Systems

This new scope of work is presented in the updated IEE.



**Map 1-1: Location of HPP Toktogul**

## 1.2 Documents relevant for Environmental Safeguard

- Initial Environmental Examination (IEE) for Rehabilitation of Toktogul HPP. ADB - TA-7704 (KGZ) Power Sector Rehabilitation Project, May 2012;
- Project Administration Manual (PAM) to Power Sector Rehabilitation Project, May 2012;
- Financing Agreement between Kyrgyz Republic and ADB of September 2012.
- Updated Initial Environmental Examination (IEE) for Rehabilitation of Toktogul HPP under the Power Sector Rehabilitation Project was prepared by the Project Implementation Consultant Fichtner and approved on 5 December 2014.

## 1.3 Implementation Progress

In August 2013, the tender documents to the Project's construction were published. The offers to the tender were received in November 2013.

Three companies have submitted their bids. After the preliminary check of the contents and eligibility of the bids, only two bids were accepted for further evaluation, while one of the bids was considered as non responsive and it was rejected. Detailed evaluation of the two bids was performed. During the evaluation process deviations and non-compliances were found in the bids. As a result of the extensive bid clarification and evaluation process, it was decided to reject all bids. Decision was made in May 2014.

It was agreed to proceed with re-tendering. In order to enhance the competition, and also to optimize the scope of the works, it was decided to split and rearrange the scope of works of Phase 1 in several lots. Updated versions of the Phase 1 tender documents have been prepared in three different lots.

The progress and status of each Lot until to the end of the reporting period is presented here below:

*Lot 1, Underwater Inspection:*

- Invitation for Bids on 23 January 2015
- Bid Submission & Opening on 23 March 2015
- Award of Contract to Joint venture BSR Co. Ltd. and Aquadron Inc. (South-Korea) on 29 April 2015
- Contract Signed on 15 May 2015
- Underwater surveys by ROV in the period from June 4<sup>th</sup> until 25<sup>th</sup> .
- Draft Report submitted to EPP on 29 June 2015
- Delivery of ROV system to EPP on 10 July 2015
- Final Report submitted to EPP on 10 November 2015
- Certificate for Completion of Works issued 11 November 2015

Main activities of Lot 2 and Lot 3 were related to the bidding process.

*Lot 2, Electrical Equipment:*

- Invitation for Bids on 17 April 2015
- Submission of Bids on 24 August 2015
- Submission of Bid Evaluation Report on 20 October 2015
- ADB no-objection received on 1 December 2015
- Notification of Contract Award / Letter of Acceptance issued to the successful Bidder JOC Technical Engineering Co. Ltd. on 2 December 2015
- Contract signed on 21 December 2015

*Lot 3, High Voltage Cables:*

- Invitation for Bids on 3 April 2015
- Bid Submission & Opening on 22 June 2015
- Submission of Draft Bid Evaluation Report on 22 July 2015
- Re-submission of Bid Evaluation Report on 7 September 2015
- ADB no-objection received on 11 September 2015
- Notification of Contract Award / Letter of Acceptance issued to the successful Bidder / Joint Venture of LS Cables & Systems Ltd. & SM Powertech Co., Ltd. on 17 September 2015
- Contract signed on 12 October 2015
- Contract effective on 18 December 2015

## 2. Environmental Management

### 2.1 Institutional Arrangement of the Project

The Investment Projects Implementation Unit (IPIU), which is one of EPP's departments, is specially assigned for implementing projects funded by international development organizations such as World Bank (WB), Asian Development Bank (ADB), etc. Currently, IPIU is implementing two different projects (including ADB project). Within IPIU, EPP has established a dedicated project implementation unit (PIU) for implementing concerned components of the "Power Sector Rehabilitation Project" in February 2013.

The structure of IPIU is as follows.

- PIU Manager,
- Project Engineer,
- Procurement specialist,
- Project accountant,
- Safeguard Specialist,
- Engineers of Technical and Maintenance departments.

The head of IPIU is assigned to execute duties of the PIU Manager and two of IPIU's key specialists execute duties of the Project Engineer/ Procurement Specialist and Project accountant. Three engineers from the technical departments of EPP are assigned to perform duties of the Project's technical engineers. Because of absence of the safeguard specialist within EPP, one of the Project's technical engineers is also assigned to perform duties of the project's Safeguard specialist. Laying specific environmental and social responsibilities on a technical engineer of EPP with no qualification and experience is weakening the capability and effectiveness of IPIU in the related area. But, this is due to the lack of such specialists in EPP. Lack of knowledge of the English language by the safeguard specialist of EPP/IPIU makes a direct communication with the Project Implementation Consultant's safeguards specialist impossible. The above mentioned reasons lead to inefficient monitoring of environmental issues by EPP in the construction period and delays in preparing and submission of various environmental reports to ADB (that is already taking place).

According to PAM, the safeguard specialist of EPP/PIU is responsible for the following:

- Ensure that the requirements identified in the initial environment examination are included in the bidding documents and contracts.
- Ensure the implementation and monitoring of the safeguard and published results in project quarterly progress reports and a semi-annual environmental report.
- Supervise the Project Implementation Consultant (PIC) on mitigation measures and monitoring plan as specified in the EMP and ensure that the PIC submits semi-annual environmental monitoring reports.

- Supervise PIC on preparation of an updated initial environment examination.

The PIU will administer all consulting and procurement contracts on behalf of EPP. It will be responsible for bid evaluation, contract award, construction supervision, and report to the Government and ADB.

The PIU manager will report directly to the General Director of EPP. The PIU will be the main point of contact for working communication between EPP and ADB. The PIU will coordinate the consultants and contractors.

The PIU, assisted by the PIC, will submit necessary project plans, tender evaluation reports, progress reports, applications for withdrawal of funds, and any other required reports to ADB and the Government.

Within EPP, a department named ‘Service of Reliability and Safety’ exists. It is the responsible department for dealing with all safety and health issues relevant for workers at the HPPs. Environmental aspects are not covered by this department. The headquarters of this Service are based at Bishkek with six people working in it. There are branches of this service established in the Oblasts. In Djalal-Abad Province three of them exist. The one at Kara-Köl is responsible for Toktogul HPP.

Fichtner is now reviewing and updating the tender documents on behalf of ADB. For construction, EPP as responsible PIU for the Project recruited Fichtner as PIC for Phase 1 of the Toktogul Rehabilitation Project (Project Management and Supervision of Toktogul HPP Component). In this sense, the national and international team of consultants will assist EPP as project supervision consultant on the rehabilitation of Toktogul HPP.

According to the IEE of the Project, EPP/PIU shall assign an environmental expert for the duration of the whole construction period of 3 years. This person shall support and assist the ‘Service of Reliability and Safety’ with respect of implementation of the EMP.

Taking into account the scope of the professional duties of the expert responsible for the environmental issues in EPP, this person shall not only support and assist the ‘Service of Reliability and Safety’ with respect of implementation of the EMP, but should also be a strong professional in the whole range of environmental issues including hazardous waste management, which can appear during construction and operation works.

EPP intends to reassign a responsible person as environmental expert for Phase 1 and Phase 2 of the Project in early 2016.



## 2.2 Environmental Safeguards Program

The aim to implement the environmental safeguard program is to ensure that the preparation, design, construction, implementation, operation and decommissioning of the Project and all Project facilities comply with (a) all applicable laws and regulations of the Beneficiary relating to environment, health and safety; (b) with the environmental safeguards requirement as set out in the SPS (ADB Safeguard Policy Statement, 2009); and (c) with all measures and requirements set forth in the IEE/EMP, and any corrective or preventative actions set forth in a Safeguards Monitoring Report.

The different obligations of the Beneficiary in this regard are given in the Financing Agreement between Kyrgyz Republic and ADB of September 2012 in Schedule 5, paragraphs 17 to 26.

Detailed measures to bring the Project's implementation in line with ADB and national requirements are given in the EMP that has been developed during the elaboration of the IEE. EPP as responsible PIU for the Project has recruited a PIC. This Consultant assignment includes the update of the environmental management and monitoring plan (EMP) detailing environmental mitigation measures, to address each identified impact and recommend appropriate environmental mitigation measures. In addition, a hazardous waste management specialist may be included in the PIC to review the technical specifications and operating procedures related to the waste management component and carry out the overall supervision. EPP will assign an environmental expert for the duration of the whole construction period of 3 years. This person shall support and assist the 'Service of Reliability and Safety' with respect of implementation of the EMP. He/she shall perform regular site visits that also include the road between Toktogul HPP and Osh Thermal Power Plant site to ensure that all mitigation measures are implemented adequately.

The IEE describing the needed actions for monitoring and supervision of the implementation of the EMP has been approved by ADB and was published on the ADB Website. In April 2012, the national State Agency on Environmental Protection and Forestry (SAEPF) issued the environmental approval (No. 01-21/1083) to the Project based on this IEE/EMP report.

Considering the new scope of work for Phase 1 of Toktogul Rehabilitation the updated Initial Environmental Examination (IEE) for Rehabilitation of Toktogul HPP under the Power Sector Rehabilitation Project was prepared by the Project Implementation Consultant Fichtner and submitted on 5 December 2014.

The up-dated IEE and further safeguard documents are published on the ADB project's website and can be downloaded under the following link: <http://www.adb.org/projects/44198-013/documents> .

## 2.3 Grievance Redress Mechanism

A Grievance Redress Mechanism (GRM) was developed within the scope for preparing the IEE and EMP. This GRM shall be maintained during the whole duration of the Project's implementation. It describes the mechanism how to redress the affected peoples' (AP) grievances in a timely and effective manner.

Details of the GRM can be found in the up-dated IEE to the Project. The former GRM has been completely replaced by a GRM applicable for all ADB projects in the Kyrgyz Republic.

In principle, the structures to implement the GRM exist - except for e.g. the construction contractor that has not been contracted yet. Because the tender processes were only finished within the reporting period and the construction has not been commenced, the execution of the GRM has not been necessary so far.

In the year 2016 the PIU will start with the implementation of the GRM.

## 2.4 Awareness Raising and Environmental Training

A first training program was done in 2013 (see semi-annual report July-December 2013).

## 2.5 On-Site Inspections and Audits

In October, 2015, ADB Country Safeguard Review mission, comprising senior safeguards specialist, Central and West Asia Department, ADB (Manila) and environmental safeguards consultant, Kyrgyz Republic Resident Mission (KYRM), ADB met with PIU Management.

The senior safeguards specialist of Central and West Asia Department, ADB, gave the following recommendations on environment protection during project implementation.

- Recruitment of PIU environmental specialist by mid-2016;
- Prepare the sites for temporary storage of dismantled equipment;
- Establishment of track record system on environmental management;
- Implementation of GRM by PIU in 2016;

### 3. Environmental Monitoring

#### 3.1 Environmental Monitoring Program

Environmental monitoring actions are outlined in the IEE/EMP elaborated to this Project. Monitoring measures for both construction and operation phases are given. This report will be updated considering the new scope of work.

The monitoring program will then further be updated by the Construction Contractor, when site specific environmental management plans are developed prior to the start of the construction activities.

No on-site monitoring has been applied since the construction activities have not commenced yet.

#### 3.2 Non-compliance Notices

n.a. for the reporting period

#### 3.3 Corrective Action Plans

In order to comply with EMP, and recommendations of the senior safeguards specialist of Central and West Asia Department, ADB, the following corrective actions should be implemented in close cooperation with ADB and Contractor (Table 1).

**Table 1: Corrective Actions Plan**

#	Environmental issues identified	Corrective actions	Due Date	Responsible for implementation/supervision
1.	Absence of environmental specialist (ES)	- Develop and approve ToR - Recruitment of ES	- March 2016 - May 2016	EPP
3.	Absence of SSEMPs for Lot 2 and 3	Development of SSEMPs for Lots 2 and 3	May 2016	Contractor/PIC
4.	Absence of sites for temporary storage of old equipment	Furnishing the site for temporary storage of old equipment	June 2016	EPP
5.	Lack of functional GRM at EPP structure.	Establishment of GRM	May 2016	PIC/EPP
6.	No environmental management track record system.	Establishment of track record system;	May 2016	PIC/EPP

## 4. Findings and Recommendations

The Project's implementation schedule has been extended and new milestones will be defined, based on achieved contract awards in the year 2015 and up-dates of the Contractors' time schedules.

The updated IEE Report for Phase 1 of Toktogul Rehabilitation considering the project changes and the new scope of measures was finalized in both versions (English and Russian) and published on the ADB-website in February 2015.

EPP shall address all recommendations made during last ADB CSR Mission. As a first priority EPP shall employ a qualified environmental specialist by mid-2016 to get familiar with the Project and to monitor the contract implementation with regards to Health, Safety and Environmental issues. Money for an employment of such a specialist is allocated by ADB and specified in the IEE Report.

A fire accident happened in the Toktogul HPP end of December 2015 affecting and destroying equipment, which will be replaced within Lot 2 and Lot 3 of the Project. Unit #2 and #3 of Toktogul HPP were shut-down for repair. No injuries of persons are reported. Repair works and investigations are on-going.

The Contractors will start with contractual services in spring 2016 e.g. site surveys, measurements on the project site. The construction works are scheduled to start in summer 2016.