Environmental Monitoring Report

Bi-annual report
Covering the period of July - December 2016

KGZ: Power Sector Rehabilitation Project, Phase 1

Project Number: 44198 - KGZ
ADB Loan/Grant Number: L2869/G0294-KGZ
Prepared: January 2017

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.

Table of Contents

List of tables

List of pictures

List of schemes:

ABBREVIATIONS:

ADB	Asian Development Bank
CC	Designed Construction Contractor
Contractor	Designed Construction Contractor
EMP	Environmental Management Plan within IEE
EPP	Electric Power Plant Company
ES	Environmental Specialist to be recruited by EPP
GRM	Grievance Redress Mechanism
HPP	Hydro Power Plant
HSE	Health, Safety, Environment
IPIU	Investment Projects Implementation Unit within EPP
IEE	Initial Environmental Examination
PAM	Project Administration Manual
PIC	Project Implementation Consultant = FICHTNER
PIU	Project Implementation Unit within EPP for 'Power Sector Rehabilitation Project'
ROV	Remotely Operated (underwater) Vehicle
SSEMP	Site Specific Environmental Management Plan
WB	World Bank

I. INTRODUCTION

1.1. Project background and description for Phase 1

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

2. 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 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output is limited due to low river discharge, while cuts arise from problems due to technical failures in the outdated generating equipment.

3. 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.

4. However, the future security of this electricity capability is to be doubted 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.

5. In order to sustain power generation at HPP Toktogul (Picture 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 a final up-date was done on 28.02.2015 reflecting the actual technical measures which have been tendered in three lots:

- Lot 1 - Underwater Inspection
- Lot 2 - Electrical Equipment
- Lot 3 - High Voltage Cables

6. *Lot 1, Underwater Inspection* includes the inspection of all submerged Hydraulic Steel Structures by means of an ROV, including the supply of a new ROV, which will become the property of the cascade for future inspections of Toktogul HPP and of the other power plants.

Picture 1. Location of ToktogulHPP in the scale of the country

7. *Lot 2, Electrical Equipment* includes the refurbishment or replacement of following electrical components:

- Four new special SF6 type generator circuit-breakers;
- Replacement of Main Transformers for Units 1, 2, 3 and 4;
- Replacement of the 6 kV switchgear with auxiliaries;
- Replacement of the 0.38 kV unit related switchgear with auxiliaries;
- Replacement of the 0.38 kV general station switchgear;
- Replacement of station auxiliary transformer 15.75/6.3 kV;
- Replacement of LV unit auxiliary transformer 15.75/0.42 kV;
- Replacement of bus ducts;
- New protection equipment and FOC for Line Protection (cable and OHL) between powerhouse and 500 kV switchyard.

8. *Lot 3, High Voltage Cables* includes the replacement of all four oil-filled cable systems by new 500 kV XLPE cable systems.

9. This six monthly Environmental Monitoring Report is the second for the Project, covering the second half of the 2016 construction season.

1.2. Documents relevant for Environmental Safeguard

10. The following documents were prepared for the Project and include environmental safeguards:

- 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. Schedule 5, clauses 16 – 21;
- Appendix B of the Special Conditions of the Contract between Fichtner and EPP;

11. The IEE describing the required actions for the EMP performance monitoring and supervision has been approved by ADB and the latest up-dated version is published on the ADB Website (http://www.adb.org/sites/default/files/project-document/154930/44198-013-iee-02.pdf).

12. In April 2012, the national State Agency on Environmental Protection and Forestry (SAEPF) issued the environmental approval (No. 01-21/1083 dated 25th of April 2012) to the Project based on this IEE/EMP report (Annex 1.).

1.3. Construction activities and project progress during the reporting period

13. In August 2013, the first round of tendering was conducted. The offers to this tender were received in November 2013. However, during the evaluation process deviations and non-compliances were found in the bids. In May 2014, it was decided to reject all bids.

14. It was agreed to proceed with re-tendering of works to be done during Phase 1. In order to enhance the competition, as well as 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.

15. Lot 1 was won by the Korean Consortium BSR Co. Ltd and Aquadron Inc., Lot 2 was won by Chinese Company JOC International Technical Engineering Co., Ltd. and Lot 3 won the Korean Consortium of LS Cable and System & SM Powertech.

16. The progress and status of each Lot until now is presented in the following:

Lot 1, Underwater Inspection:

17. Underwater inspectionwas performed in June/July 2015. The works of Lot 1 was completed in November 2015.The Certificate of completion of works of Lot 1 was signed on 11 November 2015 (Annex 2.)

Lot 2, Electrical Equipment:

18. The following activities were under implementation during the reporting period for the Lot 2 works:

- 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
- Contract effective on 8 February 2016

19. In the course of 2016, most of the design for the equipment has been prepared and submitted for approval of EPP/PIC. Submitted design documents (drawings, calculation notes etc.) have been mostly approved and for some of them certain modifications were requested. Contractor's suppliers have started manufacturing and in November-December 2016 manufacturing and testing of one main transformer and four generator circuit breakers were completed. This equipment will be prepared for transportation, packed and sent to Toktogul HPP site.It is expected that the equipment will be delivered to the site in around April 2017 in case of one main transformer and in around March 2017 in case of all four generator circuit breakers. Manufacturing of all other equipment of Lot 2 is planned to be completed in 1st quarter of 2017 and will be delivered accordingly, except of one last main transformer, which will be completed in summer 2017.

Lot 3, High Voltage Cables:

20. The following activities were under implementation during the reporting period for the Lot 3 works:

- 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

21. A first set of design drawings and descriptions for Lot 3 was submitted and was reviewed by EPP/PIC in 2nd quarter of 2016. After receiving comments Contractor revised and resubmitted the documents 2nd half of 2016, which was followed by the manufacturing process. Actual construction works for Lot 3 on site starts started in December 2016 with the installation of storage areas for oil and old equipment. At the moment only civil work activities of storage areas have been completed and the structural part of the oil storage area is planned to be assembled in Spring 2017, before arrival of new equipment on site.

22. In the meantime, manufacturing process of 500kV cable is starting and cables will be ready for factory acceptance testing in around February 2017. Delivery of cables and its accessories is planned in 2nd quarter of 2017.

23. The following activities were implemented in the reporting period on Lot 2 – see Table 1 below:

Table 1. ActivitiesimplementedduringJuly-December 2016 reportingperiodfortheLot 2

#	Month, 2016	Activity
1	July	Design and engineering
2	August	Design and engineering
3	September	Design and engineering
4	October	Design and engineering
5	November	Design and engineering incl. factory acceptance testing of transformers and generator circuit breakers
6	December	Design and engineering incl. factory acceptance testing of transformers and generator circuit breakers

24. Following activities were implementedin the reporting period on Lot 3 – see Table 2.

Table 2. Activities implemented during July-December 2017 reporting period for the Lot 3:

#	Month, 2016	Activity
1	July	Design and engineering
2	August	Design and engineering
3	September	Design and engineering
4	October	Design and engineering
5	November	Levellingandpreparationofstorageareas (forscrapmetalsandforoil)
6	December	Concreting oil storage area

1.3.1. Preparation of the waste oil and scrap metal areas

25. The earth works to build the trenches for the oil storage area foundation were completed ahead of the work schedule. During the period of the Project staff‘s stay on the site, soil compaction measures of the site for the scrap metal storage were under implementation at the end of November 2016 (Picture 2).

26. All works were carried out in accordance with the safety requirements. Areas with trenches for the foundation are marked by a bright red-white colored ribbon and a caution board prohibiting entering to unauthorized people. The working personnel's PPE complies with all technical requirements. Used equipment for soil compaction was in good condition, no emissions were observed. Pictures below shows the status of works implemented in reporting period (Picture 3).

Picture 2. Works to compact ground on site, preparation the area for the oil and scrap metal storage construction are implemented in accordance with environmental requirements (workers equipped by PPE, area is fenced by band) – status in November 2016.

27. Metallic constructions for the oil storage area have to be delivered in the construction contractor's disposal during the next year, 2017. The roof of this area will be installed in March 2017.

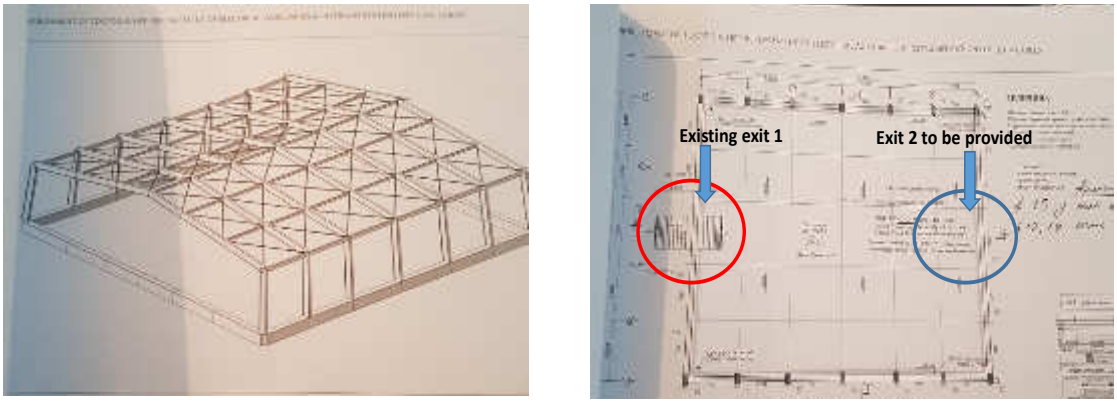
Picture 3. Completed earthworks at the site «Area for oil storage» - area is fenced by the red-white ribbon and warning signs are installed - status in November 2016.

28. As presented technical papers on the oils warehouse have shown that it will have only one exit, the Contractor was proposed by the national environmental specialist and national

electric engineer of PIC Fichtner to revise the design and to provide the second exit to be located from the opposite side, as required by existing Kyrgyz building codes and SNiPs. The second exit should enable a smooth evacuation from the area in case of a fire. The contractor company representatives have agreed with the comments made and have accepted to amend the oil storage area design by December 24, 2016.

29. Contractor and Project experts have signed a relevant minutes, according to which these issues should be resolved by December 24,2016, and a detailed description of the oil storage area to be submitted by December 2,2016. A copy of the minutes is provided inAnnex 4.

30. Later, during the discussion of the situation with the Contractor, the PIC experts were informed that the design of the oil storage area has been a little changed and the initially planned concrete belt at the floor of the construction will be replaced by the cemented floor trenches for catching the oil leaks, if available. Hence, the trench, where emergency exit (Exit 2 at the Picture 2) is located will create a single 20 cm high standard step outside. Further discussion of the oil storage site design in relation to the Exit 2 resulted in decision that the Exit 2 will be equipped by the special signs “EXIT” and “Keep this exit access free”, that means this exist cannot be in any case blocked by drums and any other equipment and should provide smooth evacuation of the working staff from the storage area in the case of emergency (see Picture 4).



Picture 4. Design sketch and top view of Oil storage area proposed by Contractor –it does not comply with safety requirements and has only one emergency exit.

31. Also the issues of access to the oil storage area from the road side, where it is expected to supply containers with oil from the cable tunnel, were discussed. One option involves the removal of two sections of a concrete fence, a few meters from the gate. The Contractor therewith also expressed suggestions to hold a conduit from the cable tunnel directly to the oil storage area, where the oil will be poured into the prepared barrels fixed in the storage area. Project experts considered this oil transportation option sufficiently justified, as it would eliminate some intermediate stages of working with the cable oil. This would clearly reduce the risks of oil spills, creation of emergency situations, and various threats to the personnel and the environment, especially since almost all the required communications exist from the preceding period, and are located adjacent to the transition point.

1.3.2. Construction of the oil storage facility

32. The construction site for the oil storage area consists of the site itself and a concrete mixing area located very close to the storage area (about 500 m upstream). At the concrete mixing zone a closed container is placed where the cement bags are stored being safe in case of rainfall (Picture 5).

Picture 5. Container for keeping cement bags to protect them of rainfall – oil storage construction site, status in December 2016.

33. The size of the future oil storage area is now 25 x 25 m = 625 m² as tendered. Concreting was ongoing during the site visit. Around the concreted site a small trench leading to four small concreted pits are foreseen to collect oil in case of leakages. The storage site will be roofedin March-April 2017.

Picture 6. Future oil and scrap metal storage area with construction equipment. The floor of the oil storage area at each corner is equipped with oil catchers in the case of oil leaks.

34. All workers were wearing helmets and proper working clothes (PPE) (Picture 7).

Picture 7. The worker' PPE comply with all the safety requirements -November 2016

35. The concrete work was finalized before the end of 2016in full compliance with the approved work schedule. The metallic roof will be finished in March 2017.

1.3.3. Scrap metal storage site

36. The scrap metal storage is another site located nearby the future oil storage area. The scrap metal storage site is intended for keeping parts of demounted power equipment and has already been levelled and will be finalized until January 2017 (
37. Picture **8**).

Picture 8. Scrap metal storage area fenced with the red-white ribbon and prepared for further works.

38. It is recommended to analyze oil from the equipment to be replaced for PCB (eventually other oil too) and the concrete waste for possible occurrence of asbestos. Then, the IEE/EMP developed to the overall rehabilitation project for Toktogul HPP Phase 1 shall be updated with these findings. This will be a part of the Corrective Action Plan.

1.4. Changes in projectorganizationand environmental managementteam

39. 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.

40. The structure of IPIU is as follows:

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

41. 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. One engineer from the technical department of EPP is assigned to perform duties of the Project's technical engineer. Since middle of September 2016, Ms. Jyldyz Moldosanova is employed within EPP as Environmental Specialist (ES) being responsible from EPP side for the implementation of the EMP developed to the rehabilitation Project. Her employment will last 3 years and shall cover all three phases of the Toktogul Rehabilitation Project.

42. 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.

43. 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.

44. 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.

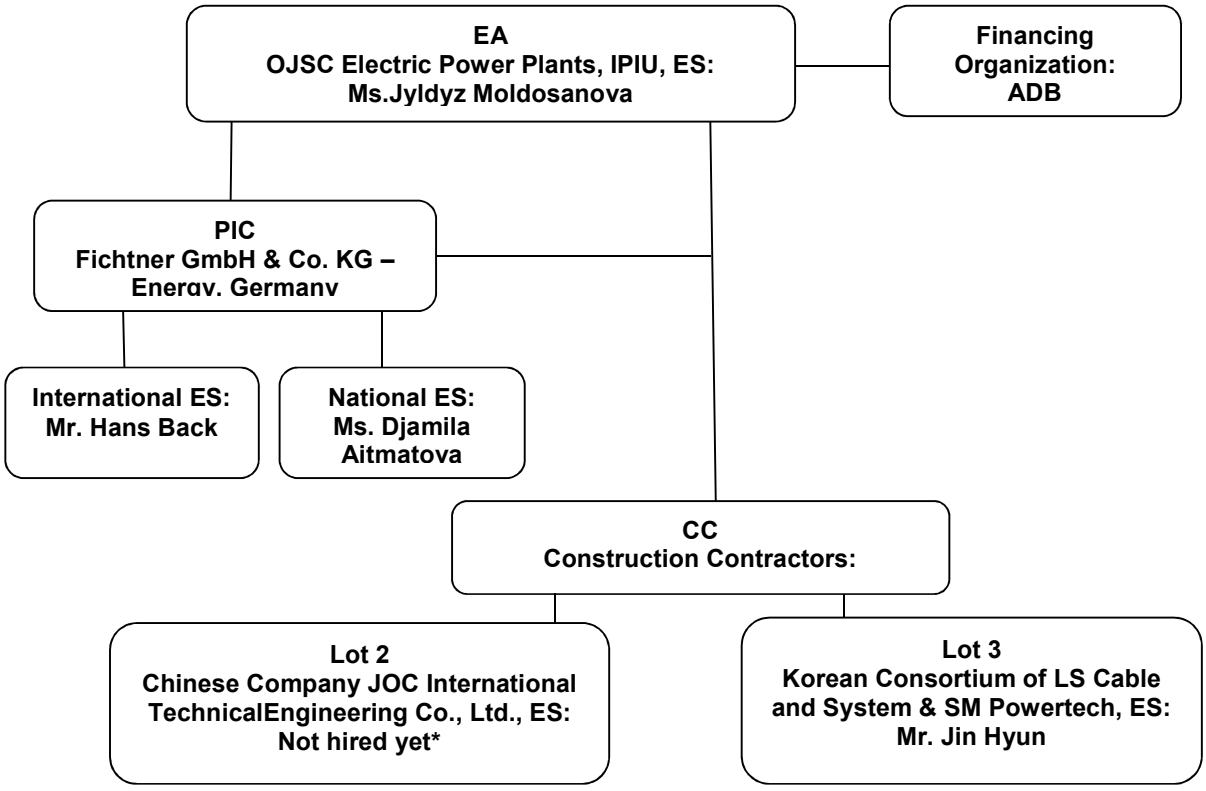
45. The PIU manager will report directly to the Deputy General Director of EPP. The PIU will be the main point of contact for working communication between EPP and ADB. The PIU will coordinate the consultants and contractors.

46. 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.

47. 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-Kul is responsible for Toktogul HPP.

48. 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.

49. The structure diagram of the agencies involved in the project implementation is as follows:



* ES will be hired before civil works start.

Scheme1. *Environmental management of the Rehabilitation of Toktogul HPP Phase 1 Project (as on December 2016)*

1.5. Relationships with contractors, owner, lender, etc.

50. In this chapter the relationships with contractors and lenders will be described. It should be noted that the connection of the Client, Contractors and Lenders are characterized by their active and productive nature. There were many meetings of EPP/PIU/PIC staff with the construction contractors on site and in the EPP office conducted on the regular basis. Lots of issues were discussed by telephone and by email. The contractors regularly provide their daily and weekly reports, which are reflected in PIU/PIC bi-annual reports.

51. The connection of the Project/EPP/PIU/PIC personnel with ADB staff was implemented via regular meetings and discussions of arising issues by email and in person. The ABD staff provided advice and conducted monitoring over the Project activities.

52. During a meeting with Mr. Almaz Asipjanov, ADB national environmental safeguards consultant and Fichtner on 13 June 2016 some questions came up concerning the technical

procedure during 500 kV cable dismantling process. Doing so following clarification questions were sent to the selected construction contractor:

- Give detailed information about procedure of dismantling the cable, e.g. how to bring the cable out of the tunnel: as a whole (600 m pieces) on a roll or cutting the cable in the tunnel in small pieces, or how?
- How exactly the handling of the old oil of the cables will be: extraction, how to take the oil from the cable systems to the storage site and finally to the trucks.
- Stipulate emergency measures during this process.

2. Environmental Monitoring

53. According to IEE/EMP, no any parametersof water,air and noise are planned to be instrumentally measured. During the routine works, no any harmful impacts are expected.

2.1. Water quality monitoring

54. No instrumental measurements of water quality are foreseen for this Project according to IEE/EMP. The Project does not impact water bodies as all works will be implemented at the relevant distance from water sources.

55. During the works of oil storage construction facility Lot 3 the following machines were used during the reporting period: crane 25 tons (1 piece); excavator (1piece); front loader (1 piece); truck (1 piece); five concrete aggregates; compactor (1 piece). All heavy machines were in good condition, checked in a daily basis.

56. Special attention will be paid to the relevant condition of trucks, which will be used for transportation of transformer on Lot 2 by route proposed in IEE and agreed with EPP in order to avoid any spills into water bodies. Map 2 with mentioned route is shown below.No civil works on Lot 2 were implemented during the reporting period.

2.2. Air quality

57. No instrumental measurements of air quality are foreseen for this Project according to IEE/EMP.

58. Physical works for reporting period included earth works for the oil and scrap metal storage areas, levelling the areasand compacting of soil by small-sized equipment (soil compactor) works of Lot 3

59. Works on oil storage facility construction, Lot 3 were conducted in November-December 2016 (winter season). Significant dust emissions during this works were not observed. The exhausts from trucks transporting cement, gravel and concrete were within Toktogul HPP site.

2.3. Noise and vibrations monitoring

60. A regular monitoring of noise and vibrations is not foreseenfor this Project according to IEE/EMP. However the construction contractor is obliged to take care that workers shall wear ear protectors when 85 dB(A) are exceeded. This will become relevant when demolition works inside the buildings will start.

2.4. Flora and fauna monitoring

61. A monitoring of flora and/or fauna is not foreseenfor this Project according to IEE/EMP. All works will take place within the fenced area of Toktogul HPP. All access roads are already

paved.All rehabilitation measures will be implemented within the facilities and building constructions of the EPP.

3. Environmental Management

3.1. Environmental Safeguards Program

62. 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.

63. 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 16 - 21.

3.2. The environmental managementsystem (EMS), site-specific environmental management plans (SSEMPs), and work plans.

3.2.1. Contractor's Health&Safety(H&S) Plan and SSEMPs

64. A general H&S Plan for the construction site is set up by the CC of Lot 3 Korean consortium and was already approved by EPP. For the oil storage area a SSEMP has been approved by EPP and ADB. A site specific EMP for cable handling is under preparation.

65. Implementation of Lot 3 works on of oil-filled high-voltage cables replacement requires development of emergency response measures in accordance with relevant national laws and ADB policies.An emergency response plan (ERP) concerning oil handling and oil transportation waselaborated by EPP with assistance of PIC Fichtner and approved by ADB in December 2016.Andit covered all issues related with oil cable dismantling, storage and transportation (Annex 3.).

66. CC of Lot 2 JOC has submitted a SSEMP for their work to EPP which is under review at present.

67. The following table identifies the status of environment documentation on the project.

Table 3. Status of environment documentation on the Project

Management Plan	Status
Site-Specific EMP (SSEMP) for oil storage facility construction. Lot 3	Submitted on 03.11.2016 and Approved on 13.12.2016.
Site-Specific EMP (SSEMP) for dismantling and instalation works of cable systems. Lot 3	Yet to be submitted
Site-Specific EMP (SSEMP). Lot 2	Yet to be submitted
Emergency response plan (ERP). Lot 3	Submitted on 21.12.2015 and Approved on 29.12.2015
H&S plan. Lot 3	Submitted on 18.05.2016 and Approved on 14.09.2016
H&S plan. Lot 2	Yet to be submitted

3.3. Site Inspections and Audits

Information of site inspections in period fromJuly-December 2016 is given in Table 4 below.

Table 4. Site visits and audits in the reporting period

Organisation	Purpose	Performed by	Date
ADB,PIU EPP, PIC Fichtner	KGZ Country Safeguard Review (Environment)	ADB Senior ES Ms Tran T. Thanh Phuong; PIU EPP ES MsMoldosanova J.; PIC Fichtner National ES MsAitmatova D.	19.09.2016
PIC FICHTNER	Grievance Redress Mechanism leaflet distribution. Site inspection to monitor status of environmental performance during construction of oil and scrap metal storage areas (Lot 3)	National ES SC Ms Aitmatova D.	23-25.11.2016
PIC FICHTNER; EPP	Construction site visit (oil and scrap metal storage area). Conducting of HS&E training. Survey of additional proposed measures as rehabilitation of 500 kV substation, cable duct etc.	PIU EPP ES Ms Moldosanova J; PIC Fichtner International ES Mr H.Back; National ES Ms Aitmatova D.	13-15.12.2016

68. The first Project Phase 1 civil works at site Toktogul HPP was started at the end of November 2016 – the oil storage facility construction, Lot 3 works. Visiting the construction area at the Toktogul HPP territory was conducted jointly with employees of the Project Coordination group at CTHPPs and Fichtner‘s Engineer.

69. Directly on the construction site, a working meeting with representatives of the Construction Contractor SM Power Tech Co, Project Director Mr. Jin Hyun and an employee of the Sub-contractor Mr.Ermek Soronbaev was held. During this meeting, issues concerning earth work and the related schedule as well as aspects of compliance of the future oil and metal storage area design with the requirements of the Kyrgyz legislation and safety regulations were discussed.

70. Mr. Zafar Khaidarov, representative of the Korean Contractor, Lot 3, was available during the survey of the actual construction site (future oil storage area).

71. ADB Mission to Toktogul HPP Site on 19 September 2016, KGZ Country Safeguard Review (Environment). The Mission, ADB Senior Environment Specialist Ms Tran T. Thanh Phuong visited the Toktogul HPP site, together with the EPP PIU environmental specialist and Fitchner national environmental consultant. The Mission met with HPP chief engineer, Technical department, Health and Safety staff, and staff of the Toktogul HPP PIU.

3.4. On-Site Inspection and Audit in November 2016

72. On November 23-25, 2016Fichtner’s national safeguard specialist undertook a site visit during a mission concerning implementation of the Grievance Redress Mechanism (GRM). Results of this visit are presented in paragraphs 57-70 below.

73. The regular main audit for the reporting period second half year 2016 was executed middle of December 2016 by Fichtner’s national and international safeguard specialists. The

actual construction sites (future oil storage area and future scrap metal storage place) were inspected. Other works have not commenced yet.

74. As some additional measures to perform a complete rehabilitation of the 500 kV Switchyard and the 500 kV transition point were proposed by Cascade of THPP/EPP, a site survey was being conducted. Aim of this survey was to get an overview about the proposed measures and whether the expected environmental impacts were covered by the existing IEE to the overall rehabilitation measures at HPP Toktogul Phase 1 or whether new environmental impacts would arise.Fact finding mission report 'additional rehabilitation works at and around 500 kV switchyard' is given in Annex 8.

75. This will be an amendment to the existing contract and requires an update of the existing IEE but not a separate document. All impacts are covered by the existing IEE/EMP. At present those additional measures/works are under the approval stage.

3.5. On-Site Inspection and Audit in December 2016

76. In December 2016, Fichtner's international environmental expert together with EPP Environmental safeguards specialist and national counterpart were performing an audit inspection at Toktogul HPP. Actual construction sites have been inspected as well as the 500 kV switchyard and 6 kV cable duct running from the 500 kV switchyard to the power house.

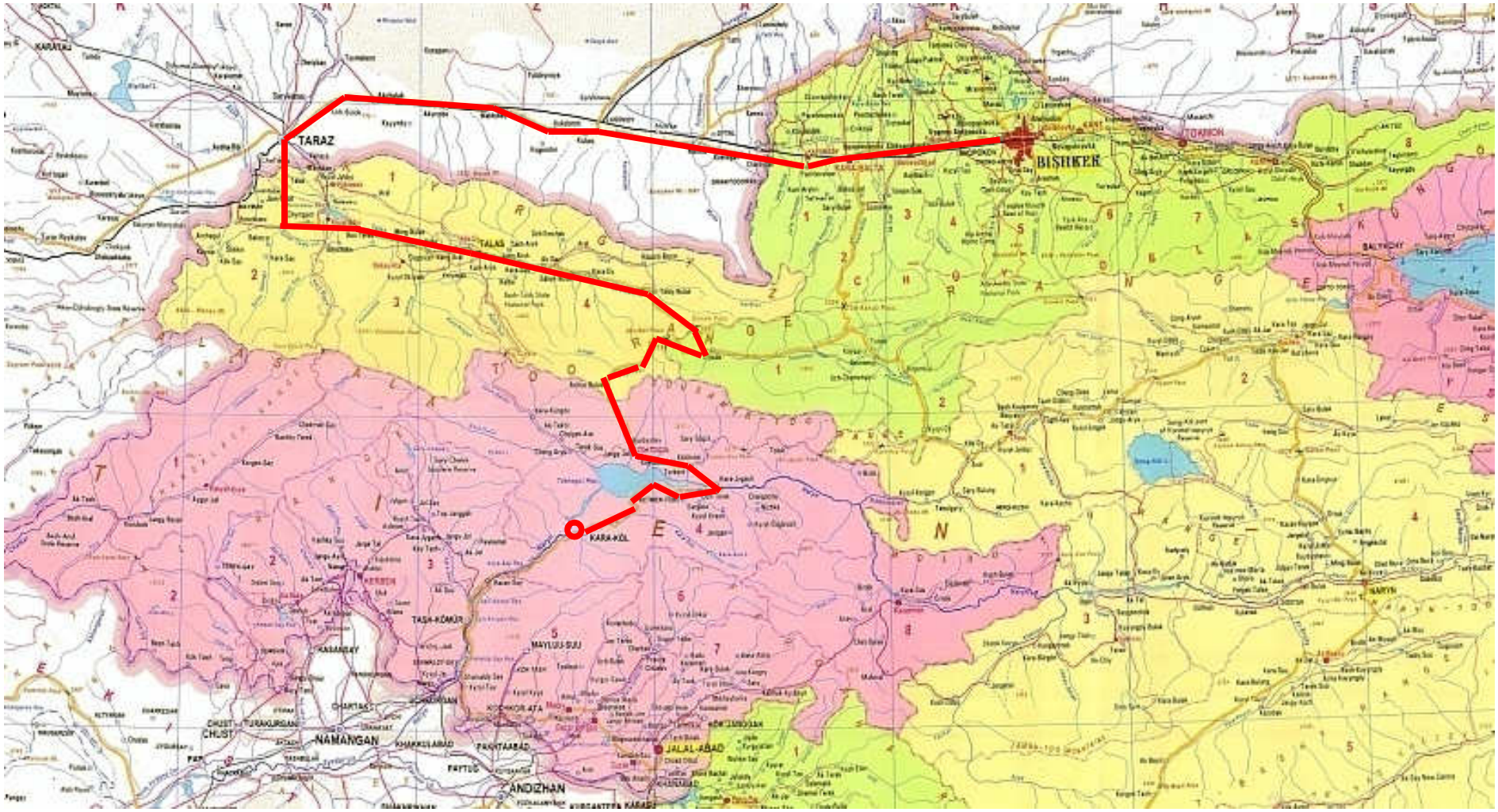
3.5.1. Implementation report on the IEE mitigation/environmental safeguards requirements

Transportation of new transformers, Lot 2 works

77. During the tender process and review of the submitted design documents a final decision about the route to Toktogul HPP for delivering the heavy power transformers was made (Lot 2 works). As shown in Picture 9the route starts from Bishkek through Kazakhstan to Taraz and from there to Toktogul HPPsite (red line). The contractor intends to bring the transformer to Bishkek via Khorgos near the Kazakh border and Almaty.

78. The contractor for Lot 2 submitted their proposal for transportation the heavy power transformer together with the bidding documents. During the negotiation and review process the contractor inspected different possible routes. The contractor found the option as shown in Picture 9being the most reasonable. It is much longer than other options but avoids passing e.g. the Töö-Ashuu Pass and has least restrictions due to tunnels or bridges. Where necessary the constructor performs needed temporary bridge reinforcement and strengthening of road section. But according to the road survey there will be no major problems occurring. This proposal was accepted by EPP.But no any works has been done in 2016 in this sphere.

The delivery of a first transformer along this route to Toktogul HPP is expected for March/April 2017.



Picture 9. Selected route for power transformer transportation through Kyrgyz Republic (red line)

3.6. Non-compliance Notices

79. There were not any serious non-compliance notices during oil storage construction. If some smaller environmental issues such as small amount of debris/rubbish at site, idle operation of vehicleswere found, they were corrected immediately in-placein accordance with the approved SSEMP for oil storage construction.

80. In general, no any non-compliance notices in written form were issued in reporting period due to immediate on-site correction measures applied by Contractor during the site inspections.

3.7. Corrective Action Plan

81. In order to comply with EMP, with EPP/ADB agreements and with ADB and national environmental safeguard requirements the following corrective actions shall be implemented (Table 5).

Table 5. Corrective Action Planfor January-June 2017

#	Issue	Action	Due Date as given in last bi-annual report	Status / New Due Date	Responsible for implementation/ monitoring
1.	Site- specific Env. Management and H&S Plans for Lot 2 and 3	Develop a SSEMP for cable handling	May, 2016	January 2017	Contractor/ EPP, PIC
		Review of SSEMP submitted by JOC			EPP, PIC
2.	Temporary oil and scrap metal storage areas	Construct the site for temporary storage of old oil and old equipment	June, 2016	January 2017	Contractor/ EPP, PIC
4.	Quarterly audit I 2017	On-site inspection		March/ April 2017	PIC
5.	Additional rehabilitation measure 500 kV switchyard and cable duct	PCB and asbestos analyses, search for a landfill for concrete wastes		April 2017	EPP, PIC
		Update IEE/EMP			
6.	General survey of the slope at the road, 1 km from the HPP's checkpoint by MoE staff or specialists in slope stability issues re possibility of a catastrophic event (rockfall) repetition	Contact with relevant exert community and field trip to the Site	March 2017, before arrival of the trucks with transforme r from China	March-April 2017	EPP, PIC
7.	Analyze oil from the equipment to be replaced for PCB and the concrete waste for possible occurrence of asbestos.	IEE/EMP developed to the overall rehabilitation project for Toktogul HPP Phase 1 shall be updated according with these findings		April-May 2017	EPP, PIC

3.8. Awareness Raising and HSE Trainings

82. The first training program was executed in 2013 (Ref. BA-EMR for July-December 2013). On 14 December 2016, the second HSE training was conducted by the Project Consultant's environmental team (Mr. Hans Back and Ms. Djamila Aitmatova) jointly with environmental specialist of PIU (Ms. Jyldyz Moldosanova) at the HPP premises in Kara-Kul City. Altogether 21 persons were taking part in this training (Annex 5.), including the Director of Toktogul HPP Mr. Almaz Kushubakov (has not signed the list of participants). He was participating in the presentations and discussions the entire time and guided the international experts personally across the construction sites in the afternoon.

83. Regarding the contractors, the local representative from JOC Lot 2 and the project and sales manager (Mr. Khaidarov) from the Korean Consortium of LS Cable and System & SM PowertechLot 3 were taking part in the training.

84. During the training, the general ADB safeguard requirements and some specific tasks of EPP have been presented by the ES of PIU EPP Ms. Jyldyz Moldosanova and the specific requirements to the project as given in the Environmental Management Plan were communicated by International ES of PIC Fichtner Mr. Hans Back.

85. Because no HSE responsible is on site at the moment (the real rehabilitation works start in 2017) no regular instruction on H&S items of HIV/AIDs issues take place.

3.9. Consultation and complaints, Grievance Redress Mechanism

86. ADB's safeguard policies require that any persons, who may undergo under the adverse effects of the Project activities, must be informed in advance about possibilities of making complaints through Grievance Mechanism (GRM), if the Project activity generates any negative impact on their health or create certain inconveniences for their livelihoods. 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.

87. GRM is now under full implementation. All the required awareness raising materials have been widely distributed and Log Book for grievances arranged.

88. National ES of Fichtner conducted meeting with the Kara-Kul City Administration (Mayor Office management) regarding Grievance Redress Mechanism for the population during the works at the Toktogul HPP;

89. For these purposes, as well as due to the fact that preparatory work for the subsequent construction of the waste oil and scrap metal storage areas (after cable demounting works) at the Toktogul HPP territory were started, in November 23-25, 2016, environmental expert Dj. Aitmatova with the support of EPP IPIU staff and Project Coordination Unit at CTHPP, organized a meeting with the Karakul City first Vice-mayor Mr. Jeksheev Nurmanbet. The meeting was agreed upon a few days prior the field trip and took place on November 24, 2016, afternoon. The meeting was also attended by the FichtnerLocal Engineer Mr. Abdylda Israilov, who was attending at the Project site according to his scheduled works, for two weeks.

90. During the meeting D. Aitmatova spoke about ADB's policy and safeguard measures in accordance with which it is required to inform the local community about the ongoing works. The Vice-mayor was handed 30 booklets, which contained general information on the GRM. D. Aitmatova requested to disseminate information leaflets among the local population through the neighborhood and house committees, so that the information on GRM reached the target group in a timely manner (Picture 10). The meeting was also attended by an employee of the Karakul City Office responsible for

social affairs, which was tasked with the immediate dissemination of booklets among the local people.

Picture 10. Meeting with Kara-Kul City Vice-Mayor

91. Also, the environmental expert of PIC Fichtner transferred advertisements (leaflets of A3 format) to the Vice-Mayor with the same content (as for GRM booklets) to be placed on the urban billboards to make it possible for as many local residents as possible to read them.

92. GRM leaflet was elaborated by PIU EPP with assistance of PIC Fichtner and approved by ADB in October 2016 (Annex 6.).

93. GRM leaflets were placed in the Seryi's street, next to the City House of Culture, and on Lenin Street, in the city center, near the cafe "Edelweiss" in Kara-Kul city. Photos are provided below.

1 2 3 4

Picture 11. Advertisements at the Seryi's street, near the City House of Culture (1-3), and at the Lenin's street at the center of the Kara-Kul City (4)

94. Mr. Isak Khudaiberdiev, the Project's Coordination group head at the Cascade of Toktogul Hydro Power plants (CTHPPs) was also closely connected to this work and arranged information on announcement boards in the City and CTHPPs office.

95. Below there are pictures of advertisements placed in CTHPPs office premises:

Picture 12. Information on GRM placed at the announcement boards in CTHPPs office (Karakul City)

The Log Book for Grievances was arranged by the Coordinator of the Project at the site Mr. Isak Khudaiberiev in full compliance with the ADB requirements. The picture of the Log Book is provided in the Annex 7 to this report.

Annexes

Annex 1. The environmental approvalon IEE developedforthe Project Phase 1.

КЫРГЫЗ РЕСПУБЛИКАСЫНЫН
ӨКМӨТҮНӨ КАРАШТУУ КУРЧАП
ТУРГАН ЧӨЙРӨНҮ КОРГОО
ЖАНА ТОКОЙ ЧАРБАСЫ
МАМЛЕКЕТТИК АГЕНТТИГИ

720001, Бишкек ш., Токтогул көч. 228
тел.: (996-312) 35-27-27, факс: 35-31-02

ГОСУДАРСТВЕННОЕ АГЕНТСТВО
ОХРАНЫ ОКРУЖАЮЩЕЙ
СРЕДЫ И ЛЕСНОГО ХОЗЯЙСТВА
ПРИ ПРАВИТЕЛЬСТВЕ
КЫРГЫЗСКОЙ РЕСПУБЛИКИ

720001, г. Бишкек, ул. Токтогула, 228
тел.: (996-312) 35-27-27, факс: 35-31-02

26.04 2012 г. № 01-21/1083

ОАО «Электрические станции»

Государственное агентство охраны окружающей среды и лесного хозяйства при Правительстве Кыргызской Республики рассмотрев представленный отчет о предварительной экологической оценке (ПЭО) проекта АБР «Реабилитация сектора энергетики КР» сообщает.

Зона реализации проекта находится в Джалал-Абадской области.

Проектом предусмотрено провести следующие реабилитационные работы на Токтогульской ГЭС:

- Реабилитация периферийных отделов генераторов;
- Замена четырех выключателей генератора, работающих на масле современными выключателями SF6;
- Замена четырех заполненных маслом кабелей на 500 кВ длиной приблизительно в 1 150 метров каждый. Эти кабели содержат все вместе приблизительно 250 000 литров старого отработанного кабельного масла, от которого нужно освободиться;
- Возобновление противопожарной системы главных трансформаторов. Старая система основана на системе распыления с использованием воды для того, чтобы охладить систему. Она будет заменена системой, с использованием N_2 (газообразный азот), который вдувается в трансформаторы при пожаре.

При реализации проекта предполагаемые воздействия на окружающую среду могут быть связаны с:

- Откачкой старого масла и кабельной бумаги, пропитанной маслом, возможно содержащей ПХД;
- Удалением стали, меди, керамики и других отходов.

Все мероприятия по реабилитации будут производиться в пределах зданий и сооружений электрических станций.

В рамках ПЭО разработано План мероприятий по охране окружающей среды (ПМООС). В этом плане предусмотрены проведение мониторинга и

принятие мер по сокращению воздействия на окружающую среду во время реабилитационных работ.

Отходы металлолома сдаются в ГП «Темир», а отходы промасленной бумаги и 250 000 литров отработанного кабельного масла в результате замены кабеля на 500 кВ. сдаются в Ошскую ТЭЦ.

Все меры по уменьшению воздействия во время реабилитационных работ должны быть осуществлены подрядчиком согласно природоохранного законодательство Кыргызской Республики.

ОАО «Электрические станции» регулярно поводить мониторинг выполнения предложенных мер по уменьшению воздействия на окружающую среду во время всего периода реализации проекта.

Рассмотрев представленные материалы, Государственное агентство охраны окружающей среды и лесного хозяйства при Правительстве КР согласовывает представленный отчет о предварительной экологической оценке (ПЭО) проекта АБР «Реабилитация сектора энергетики КР».

Директор **С.Атаджанов**

УГЭОиП
568 986

Informal Translation

The environmental approval on IEE developed for the Project Phase 1.

State Agency on
Environmental Protection and Forestry under the
Government of Kyrgyz Republic

720001, 228 Toktogul str., Bishkek
Ph.: +(996-312) 62-77-27; fax: +(996-312) 35-31-02

25.04.2012 #01-21/1083

JSC "Electric Power Plants"

The State Agency on Environmental Protection and Forestry under the Government of the Kyrgyz Republic having observed the submitted inception report on the Initial Environmental Examination (IEE) of ABD project "Rehabilitation of the power sector of KR", would like to inform.

Project implementation zone is located in Djalal-Abad oblast.

It is envisioned by the project to implement the following rehabilitation works at Toktogul HPP:

- Rehabilitation of the periphery sectors of generators;
- Replacement of four oil operated generator circuit breakers by the modern SF6 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 old 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_2 (gaseous nitrogen) that is blown into the transformers in case of fire to quench it.

Possible impacts on environment, during the project implementation can be related with:

- Disposal of old oil and oil impregnated paper possibly containing PCB;
- Disposal of steel, copper, ceramics and other wastes;

All rehabilitation measures will be implemented within the facilities and building constructions of the EPP.

An Environmental Management Plan (EMP) has been developed within the IEE. The Plan envisages monitoring and mitigation measures during rehabilitation works.
Metal scrap wastes are disposed at "Tonni" State Enterprise, while oil paper wastes and 250,000 l of old cable oil, caused by 500 kV cable replacements, are disposed at Osh TPP.
All mitigation measures during rehabilitation works shall be implemented by the contractor in accordance with the legislation on Environmental Protection of the Kyrgyz Republic.
Joint Stock Company Electric Power Plants shall regularly conduct monitoring of the proposed impact mitigation measures in full duration of the project implementation period.
After observation of the submitted materials, the State Agency on Environmental Protection and Forestry within the Government of KR reconciles the submitted report on the Initial Environmental Examination (IEE) of ABD project on "Rehabilitation of the power sector of the Kyrgyz Republic".

Director S.Atudjanov

УТЭЭиП
568 086

Annex 2.Certificateofcompletionofworksof Lot 1.

СЕРТИФИКАТ
о завершении работ

CERTIFICATE
of completion of works

Дата «11» ноября 2015 г.

Date «11» November 2015

Лот № 1 «Подводное обследование гидромеханического оборудования и сооружений Токтогульской ГЭС с поставкой аппарата дистанционного управления со вспомогательным оборудованием».

Lot 1 "Underwater inspection of hydro-mechanical equipment and civil structures of Toktogul HPP and provision of ROV system and associated equipment"

Настоящий Сертификат выдан консорциуму BSR Co.Ltd и AQUADRON Inc. в подтверждении того, что все работы*, предусмотренные по Контрактному соглашению № Д34-26/235 от 18.05.2015 г. полностью завершены. По качеству выполненных работ претензий не имеется.

This certificate is issued to the Consortium of BSR Co.Ltd and AQUADRON Inc. to confirm that all works*, required by Contract agreement № D34-26/235 dated 18.05.2015 has been fully completed. There are no complaints regarding the quality of performed works.

Руководитель проекта
Заместитель главного инженера
Каскада Токтогульских ГЭС
Курманалиев Т.С.

Project Manager
Deputy Chief Engineer of
Cascade of Toktogul HPP's
Tokon Kurmanaliev

Представитель Консультанта
Компания Fichtner GmbH & Co.KG
Мартин Фасил

Representative of the Consultant
Fichtner GmbH & Co.KG
Martin Fasil

*Детали выполненных работ прилагаются

* Details of the performed works are attached

Annex 3. Emergency Response Plan

Open Joint Stock Company
«ELECTRIC POWER PLANTS»
BISHKEK, KYRGYZ REPUBLIC

Power Sector Rehabilitation Project

Toktogul HPP Reconstruction
Emergency Response Plan

EMERGENCY RESPONSE PLAN

This Emergency Response plan is designed for the "Toktogul HPP Reconstruction" project, Phase 1, which is funded by the Asian Development Bank. The project focuses on the reconstruction of the Toktogul HPP, the largest power plant of the Naryn Cascade. The following activities for Phase 1, as it was planned, should be carried out in three lots:

- Lot 1 - Underwater inspection;
- Lot 2 - Electrical equipment;
- Lot 3 - High-voltage cables.

Lot 3 of the Phase 1 involves the replacement of all four systems of oil-filled cable lines towards the new 500-kV cable systems with CLP insulation

Implementation of Lot 3 works on of oil-filled high-voltage cables replacement requires development of emergency response measures in accordance with relevant national laws and ADB policies. During elaboration of mitigation measures, one should take into account that those measures can be divided into two types: preventive and response measures. The preventive measures are a part of the Environmental Management Plan (EMP). The response measures are included in the Emergency Response Plan (ERP) and are applied when an emergency case happens.

All the risks of emergencies were taken into account during development of the ERP. Each of them was provided with response measures, required equipment, and responsible personnel. The contact data of the Emergency ambulance, road police, and fire brigade are provided in the separate document which will be provided to the drivers and escort vehicles

Responsible persons should be assigned for emergency cases at the Toktogul Hydropower Plant (HPP) site. They should be at least three, so that in necessity they easily could replace each other and directly manage the situation at the site, if emergency requires. In EPP/IPIU, a person in charge of emergencies management shall be assigned and be at permanent contact with the on-site group.

In case of emergency, the responsible persons on-site immediately notify the responsible person at EPP/IPIU, who in turn, notifies the Ministry of Emergencies, SAEPF, GETI and Department of Sanitary and Epidemiological Control (or their respective territorial departments).

Transformer and cable oils are of low-hazard and the degree of impact on the human body belongs to the 4th class of danger according to GOST 12.1.007.

Emergencies can take place during the following **four stages**:

I Demounting old equipment (cable);
II Loading the cable oil for transporting to Osh Thermal Power Plant (TPP)site;
III Transporting cable oils;
IV Temporary storage of cable oils.

All the possible emergencies/risks during the four indicated stages are specified and grouped in the Table 1 below. Emergency events (e.g. truck breakdown/glitch, truck accident) and their specific outcomes/ catastrophic consequences (e.g. oil spillage, oil fire, and health damage), which also can be considered as independent sources of danger for natural environment, Toktogul HPP's personnel and material assets, are assigned specific **emergency event reference numbers**:

1. Truck breakdown/glitch;
2. Truck accident (with oncoming vehicle);
3. Oil spillage;

4. Oil fire;
5. Health damage.

Response measures to be taken in the case of the mentioned emergency events are described further jointly with required equipment and resources, in detail, in section "Emergency measures". A set of response measures for each emergency case is different and can be combined of the **five emergency events**:

1. Truck breakdown/glitch;
2. Truck accident (with oncoming vehicle);
3. Oil spillage;
4. Oil fire;
5. Health damage.

Response measures to be taken in the case of the mentioned emergency events are described further jointly with required equipment and resources, in detail, in section "Emergency measures". A set of response measures for each emergency case is different and can be combined of the five numbered emergency events.

Table 1: Possible emergency scenarios

STAGE	EMERGENCIES/ RISKS	SPECIFIC OUTCOMES/ CATASTROPHIC CONSEQUENCES	**Emergency event reference number[1] (1-5)**	Responsible organization
I DEMOUNTIN Gof cable lines	**Oil spillage** at Toktogul HPP site during withdrawing oil from the cable	Polluting some areas of the Site, possible contamination of soils and grounds if not protected by concrete coverage	3	Construction Contractor for the Lot 3during transporting oil from the cable tunnel **until its disposal in the oil storage area**;
II LOADING and preparing the drums for further transportation to trucks	**Oil fire** by improper handling of oil	(1) Burning trucks intended for transporting oil from the HPP and other material losses of the nearby facilities at the Site	4	THPP staff responsible for Health, Safety and Environment (HSE) and emergency responding issues – **after disposing the oil in the storage area and during further steps to remove oil to the final destination points**. Participating parties: local and central environmental, emergency, fire authorities
		(2) Possible health damage to the persons involved into the loading and managing the works with oil	5	THPP staff responsible for HSE and emergency responding issues; Participating parties: local and central environmental bodies, medical emergency ambulance service
III TRANSPOR - TATION of cable oil to **Osh TPP**	Forced truck stoppage along the highway due to **a break of vehicle**	No health damage to the drivers of trucks transporting the oil from the Site	1	THPP staff responsible for the vehicle technical maintenance and emergency issues
	Truck accident along the highway **without oil spillage or fire**	Possible health damage to the drivers of trucks transporting the oil from the Site	2+5	THPP staff responsible for emergency responding issues; Participating parties: local road police, medical emergency service
	Truck accident along the highway **with oil spillage**	(1) Possible health damage to the drivers of oil transporting trucks from the Site	5+3	THPP staff responsible for HSE and emergency issues; Participating parties: medical emergency service, road police,

[1]Description of specific components in Emergency response is provided further in the text of this section "Response measures".

STAGE	EMERGENCIES/ RISKS	SPECIFIC OUTCOMES/ CATASTROPHIC CONSEQUENCES	**Emergency event reference number[1] (1-5)**	Responsible organization
				environmental bodies, Dept. of Emergencies
		(2) Possible contamination of soils and grounds as well as surface water and groundwater pollution	5+3	THPP staff responsible for HSE and emergency issues; Participating parties: local and central environmental bodies, Dept. of Emergencies
		(3) Road pollution with large amount of oil can cause risks of road accidents	2+3	THPP staff responsible for HSE and emergency issues; Dept. of Emergencies, road police
	Truck accident **with fire and oil spillage**	Possible health damage to the drivers of trucks transporting the oil from the Site Possible contamination of soils and grounds as well as surface water and groundwater pollution	2+3+4	THPP staff responsible for HSE and emergency issues; Participating parties: local and central environmental bodies, medical emergency service
	Oil spillage without accident (drums are not hermetically closed or their integrity is disturbed)	Possible contamination of soils and grounds as well as surface water and groundwater pollution	3	THPP staff responsible for HSE and emergency issues; Participating parties: local and central environmental bodies, Dept. of Emergencies
IV STORAGE of cable oil at the Toktogul HPP	**Oil spillage and fire** at the storage area	(1) Oil spillage at the storage area	3+4	THPP staff responsible for HSE and emergency issues; Participating parties: local and central environmental bodies, medical emergency service, if required, THPP and public fire service
		(2) Oil fire at the storage area	4	THPP staff responsible for HSE and emergency issues; Participating parties: local and central environmental bodies, medical emergency service, if required, THPP and public fire service

Work to dismantle the old cable lines was originally approved by IPIU/EPP in September 2016 with Progress Report submitted by Construction Contractor. However, after an internal discussion, the Contractor company decided to introduce some changes in the procedure, which will optimize the entire process. The meaning of this procedure is to use a special pipeline to ensure the supply of oil from the cable tunnel directly to the oil storage area followed by draining the oil in barrels previously installed at the oil storage area. This will eliminate several intermediate stages of working with the cable oil, which, clearly, reduce the risks of spills, avoid emergencies and various threats to personnel and the environment, the more so that almost all the necessary communications for this exercise are still available from the previous period and located next to the transition point.

This procedure will include the following steps:

1. Reducing the pressure in the casing of oil-filled cables;
2. Connecting the transition point with the oil storage areawith using with the 50 mm diameter (about 200 m)pipeline;
3. Installation of the compressor at the highest point of the cable tunnel;

4. Connecting the pipeline to the lowest point of the casing near the transformer;
5. Installation of the pumps at both ends of the cable;
6. Drain the cable oil;
7. Drain 80% of the cable oil will be carried out into the prepared 200 liters drums pre-installed inside the oil storage area;
8. Using similar pipe, the remaining 20% of the oil will be collected in drums, mounted on a truck inside the Toktogul HPP machine room. After the remaining 20% of the oil will be collected, a truck will carefully transport the barrels to the oil storage area.
9. Barrels with oil cable will be cautiously installed in the oil storage area.

Temporary storage of oil before transporting it to its final destination point (Osh TPP) is administered by the Toktogul HPP. The oil in the tanks will be located on the territory of the area oil storage area of Toktogul HPP (see Photos 1-4 below). The oil storage site will be provided with a roof and protective belt made of concrete. Due to the fact that there are some risks of oil leaks in the event of improper handling/storage, overflow launders located around the oil storage area perimeter will be arranged with a descending gradient so as to allow to drain the oil in the event of a spill to one of four oil catchers at the corners of the building. The volume of each oil sump is 1 cubic meter. The amount of the old cable oil is about 210-230 tons.

Photo 1. Future oil storage area

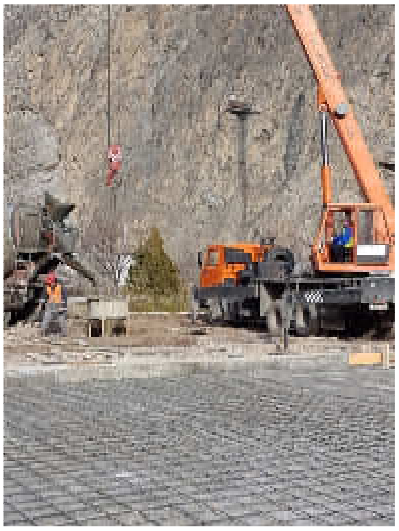


Photo 2. Future oil storage area

Photo 3. Oil catchers

Photo 4. Future oil storage area

Photo 1-4. Location of oil storage area

When transporting the waste oil, it is necessary to comply with the following requirements:

- ensure the integrity of the packaging; barrel corks must be firmly tightened to prevent them from leaking or deformation;
- make sure that during transportation, there is enough space in a barrel left taking into account the coefficient of expansion of the liquid;
- barrels of waste oil should be placed so that they do not experience any mechanical action (to exclude the possibility of falling/deformation).

EMERGENCY MEASURES

When handling waste containing oil, under the term of emergency (accident) situation it is meant:

- accidentally spilled liquid oily products;
- inflammation of the oil-containing liquid products.

1. TRUCK BREAKDOWN/GLITCH

The driver acts according to the official Rules of Road Traffic Regulations.

Additionally, the driver:

- immediately informs the road police or internal affairs department on forced stoppage reasons;
- calls to the nearest technical service station to fit the vehicle;
- makes primary steps to liquidate break or its consequences, if any;
- upon the arrival of the road police and/or internal affairs department representatives, informs about the dangerous loading as well as undertaken measures and provides documents for the loading under transportation.

Upon the arrival of an officer of the Road Police and/or Internal Affairs, the officer:

- checks the situation and organizes, if necessary, evacuation of a broken vehicle with dangerous loading to a safe zone;
- organizes, in the case of necessity, traffic by-pass of the area of the vehicles' forced stoppage;
- renders possible assistance to remove breaks of oil transporting vehicle;
- upon removal of breaks and reasons for the forced stoppage, he/she notifies the road police dispatch center on the possibility of further movement of the convoy/vehicle.

When information on the traffic accident with the oil transporting vehicles arrives to the road police unit or internal affairs department, a police officer on duty:

- enquires information on the location and reasons of a vehicle accident, its nature and consequences, name and dangerous properties of the loading, code of emergency measures, presence or absence of oil leaks and burning, center of destruction;
- informs and requests the emergency ambulance to provide first aid to the drivers harmed in the accident;
- directs a police road inspector or a patrol-guard service of police to the place of accident and informs them regarding necessary precaution measures.

Required equipment and resources:

– Well trained personnel;

- Special equipment for oil catching, oil receivers, emergency catchers, closed drip trays, catch pits;
- Absorbent materials for oils and solvents
- Plastic bags for waste, with double sealed bottom,
- A container for the aforementioned equipment and materials for cleaning spills,
- Shovel with a long handle;
- First-aid kit;
- Portable fencing;
- Cleaning materials;
- Information leaflet with contact data of all technical, medical and law enforcement bodies for the drivers and accompanying persons.

2. TRUCKACCIDENT(including that with fire):

The drivershall:

- immediately stop the vehicle;
- switch off the engine (shut the trunk and balloon valves on vehicles powered by gas);
- take all measures for the evacuation of cargo and begin extinguishing the fire until a fire brigade arrives;
- call the emergency ambulance to the place of the road accident, if required;
- check the personnel in view of fire extinguisher handling, use of gloves, and prevention of ignition of clothing and facial burns, hands, etc.
- remove the harmed persons from the area of road accident;
- arrange a primary care to the harmed persons[2].

Required equipment and resources:

- Equipment for marking the area of accident;
- First aid kit;
- Communication means;
- Information leaflet with contact data of all technical, medical and law enforcement bodies for the drivers and accompanying persons.

3. OIL SPILLAGE

The driver acts according to the Rules of Road Traffic Regulations.
Additionally, the driver:

- shall make primary steps to liquidate accident consequences, if any, according to the transport emergency card;
- marks/outlines the point/area of the accident according to the Rules of Road Traffic Regulations and the point 5.1. of the Instruction;
- restricts bystanders to the place of accident, as far as possible;
- place the oil spill abundantly with the available sand;
- collects the sand with a shovel into the dedicated hermetic package;
- sand contaminated with oil is transmitted to the specialized recycling enterprises;
- immediately reports about the accident and its immediate consequences to (1) Territorial Emergency Department, which notifies the appropriate (2) local self-government bodies of the areas located downstream, where the water oil pollution

[2]How to arrange a primary care of the damaged persons, see section “Emergency Measures, point 5”.

took place. Bodies of local self-government in their jurisdictions are taking measures to limit public access to the polluted water from the river, and organize the delivery of drinking water by transport means for the period until the river water pollution consequences are eliminated. Also the staff of the Territorial Emergency Office urgently informs about the accident the Territorial Departments of: (3) Sanitary and Epidemiological Surveillance (4) Environmental and Technical Inspections and (5) Environmental Protection.

Emergency bodies in conjunction with the personnel in charge of the Toktogul HPP, in accordance with established for such cases practices, should take care of cleaning water to remove the oil through the following measures:

- The personnel working on cleaning must be specially trained; this training[3] should be provided by the specialized organization (Ministry of Emergencies or its regional divisions in accordance with the Regulations of the Ministry of Emergency of the Kyrgyz Republic, Chapter 3, paragraph 4);
- Limiting the oil filling hole by sealing (using rags or other materials available);
- For oil contaminated soil, absorbent to be laid (1-1.5 hours) to absorb the spilled oil;
- All of the spilled oil and material used for cleaning must be securely placed in drums and removed from the territory;
- Plugging filler plug for oil by sealing (using existing cloth or other materials);
- Avoiding that the water from water sources or nearby irrigation canals flows into the contaminated areas;
- The contaminated area shall be visited by the authorized environment protection bodies (SAEPF, Monitoring Unit), and, if necessary, representatives of the local emergency department, together with an assistant of a chemical laboratory for making sampling and assessing the scale of the accident and environmental pollution;
- Samples of the polluted soils and water resources shall be brought to the chemical laboratory for further chemical analyses;
- Calculations of environmental damage shall be performed by officially approved methods. When contacting the national court, on the basis of data contained in the report of the environmental body with respect to the environmental damage and results of the chemical laboratory analysis, cases are heard in two categories of damages: (1) Environmental damage; (2) Economic damage. The amount of the fine to be paid as well as the procedure to eliminate pollution / damage the consequences at epyexpense of the party, whose activities caused the environmental damage. Carrying out recovery works by the guilty party shall be established by the court.

Required equipment and resources:

- Special equipment for oil catching, oil receivers, emergency catchers, closed drip trays and catch pits;
- Absorbent materials for oils and solvents (the first class fuel oil or kerosene, etc.);
- Plastic bags for waste, with double sealed bottom;
- A container for the aforementioned equipment and materials for cleaning spills;
- Shovel with a long handle;
- First-aid kit;

[3]In accordance with the Regulations of the Ministry of Emergencies, Kyrgyz Republic, approved by the government of KR, 20.02.2012, №115, the Ministry has the right to transfer socially important messages related to information the public concerning the safety of human life and healththrough the media (TV, radio), mobile operators, free of charge. Also, Emergency departments in guiding the work of emergency response in coordination with the authorities decided to impose a state of emergency in the disaster areas are eligible to apply measures in accordance with the Kyrgyz legislation.

– Portable fencing;
– Cleaning materials;
– Information leaflet with contact data of all technical, medical and law enforcement bodies for the drivers and accompanying persons.

4. OIL FIRE

The driver and/or accompanying persons shall:

- made aware the THPP and its relevant subdivisions' supervisors about the occurrence of fire;
- call the THPP fire brigade, if necessary, due to the scale of the oil fire; the person responsible for the safety requirements to call additional fire group from the town;
- organize fire reconnaissance to obtain information on the status of tanks, firefighting systems and the possible consequences of the fire;
- immediately organize rescue of people, if required;
- ensure compliance with safety regulations, from the part of persons participating in firefighting;
- monitor the switching-on of automatic fire protection systems (sirens, fire extinguishing equipment, smoke protection);
- turn off electricity when needed;
- block the commodity, gas, steam and water communication;
- stop the operation of ventilation systems and perform other activities that contribute to the prevention of fire and smoke premises of the building;
- remove all employees who do not participate in extinguishing the fire from the dangerous area;
- prepare a foam or dry powder extinguisher operation as soon as possible, bearing in mind that the longer the fire, the more likely it spreads to adjacent tanks/buildings;
- Fire control to be carried out by all means simultaneously and continuously until the termination of the combustion. The intensity of foam supply shall be considered as a crucial condition for the successful elimination of the fire;
- During the fire extinguishing in tanks, primarily use stationary (automatic) fire extinguishing systems. Air-mechanical foam is fed into the tank via a foam-collecting chamber directly to the tank wall on the windward side.

Required equipment and resources:

– Well trained personnel;
– First-aid kit;
– Means of communication with the fire brigade;
– Foam or dry powder extinguishers;
– Information leaflet with contact data of all technical, medical and law enforcement bodies for the drivers and accompanying persons.

5. HEALTH DAMAGE

The person in charge of the safety requirements and emergency cases shall:

1) call the emergency ambulance to the place of fire;
2) remove the harmed persons from the area covered by fire;
3) arrange a primary care to the persons harmed in fire:
   a) In the case of light and medium burns of first and second degree (redness, blisters), an affected person should be provided the following first aid:
   i) Cooling

To reduce the effect of thermal energy absorbed by the skin, one should immerse the burned body part under running cold water for at least 15 minutes. This will significantly reduce pain, reduce the depth and surface of the affected area and facilitate the healing process.

ii) Protection

Burnsaredangerous due to possible penetration of infection through the wound surface. Therefore, the wound should be necessarily closed by a sterile bandage, which will reduce pain and protect the burn blisters.

iii) Relieve the pain/anaesthetize

In severe pain, one can give to the victim an analgesic medicine, and feed him/her with warm sweet tea (coffee).

b) In case of severe burns of the third and fourth degree (appearance of crusts, charring) or skin lesions of a large surface area, it is necessary to call an ambulance quickly; before its arrival, proceed as follows:

i) Make a damaged person(s) safe of further harmful impacts

- Remove the affected person from the flame or heat zone; stop trying burning persons' to escape, as the movement only aggravates the situation and allow the fire to spread further; igniting clothes rip or settle pouring the water (throwing snow in the winter period). If there is no water, limiting the oxygen access to the fire, one need to throw on any affected clothing or a thick cloth, not shutting his head, put out the smoldering clothes. Do not use a pressure bandage. When third-degree burns, it is necessary to cover the burnt areas of the body with a damp, clean textile. Running water for 3rd degree burns is contraindicated, because it is a source of infection for the fire wounds.
- Give the victim a pain reliever. In a particularly painful burns (3d degree), sprinkle the wound with 0.5% novocaine solution (must always be kept in the first-aid kit) with the syringe.
- Drink the liquid. Burns body loses water very fast. It is enough to recover the water balance with sips of regular drinking water.

ii) Resuscitate

If no pulse or breathing can be determined at a damaged person, one should start chest compressions. If the person is unconscious, turn him/her on its side and lift the burned areas of the body above the heart level.

iii) Cool down and Cover

Attach towels soaked in cold water to the burns (only if the burns are of small-area), cover the woundsloosely and sterile with sheets.

iv) Disinfect

With burns of 1 and 2 degrees (redness, blistering), a sterile bandage is to be applied to the affected areas of the skin (vegetable, mineral oil, lard not be applied to broken skin in any case). If there are 3d degree burns, the first aid consists of treating the surface of the skin with a disinfectant solution (potassium permanganate, chlorhexidine, and others.), overlaid with sterile dressings; 4^{th} degree severe burns (necrosis of the skin, charring) before the arrival of the professional medical staff, the injured persons need to be wrapped in a clean sheet and something warm, like a blanket, because the loss of body heat in this situation can lead to additional complications; if burnt clothes particles got

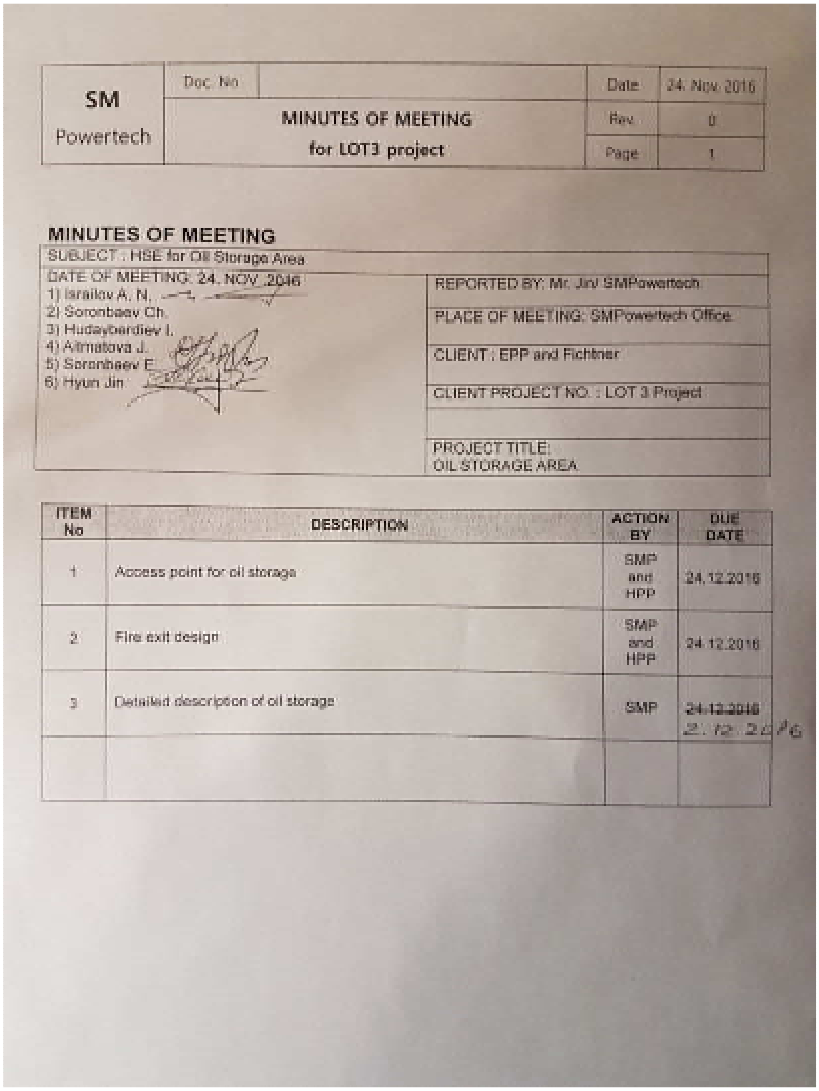
stuck to the burned skin, removal of them in the provision of first aid is strictly prohibited. The burnt clothes are cut and carefully removed from the victim's body.

One must give 1-2 tablets analgin or other drugs relieve pain to an affected person. The victim is necessary to drink plenty of liquids: this may be a warm tea or mineral water. If the victim is in shock, one should provide him/her to take any sedative medicine. Prior to the arrival of medical personnel, to the patient needs to stay in a complete rest.

Required equipment and resources:

- Well trained personnel;
- First-aid kit;
- Information leaflet with contact data of all technical, medical and law enforcement bodies for the drivers and accompanying persons.

Annex 4. Minutes of the oil storage area design discussion with the Contractor during the field trip in November 2016.



SM Powertech	Doc. No.	Date	24. Nov. 2016
	MINUTES OF MEETING for LOT3 project	Rev.	0
		Page	1

MINUTES OF MEETING

SUBJECT : HSE for Oil Storage Area	
DATE OF MEETING: 24. NOV. 2046 1) Israilov A. N. 2) Soronbaev Ch. 3) Hudayberdiev I. 4) Atmatova J. 5) Soronbaev E. 6) Hyun Jin	REPORTED BY: Mr. Jin/ SMPowertech
	PLACE OF MEETING: SMPowertech Office
	CLIENT : EPP and Fichtner
	CLIENT PROJECT NO. : LOT 3 Project
	PROJECT TITLE: OIL STORAGE AREA

ITEM No	DESCRIPTION	ACTION BY	DUE DATE
1	Access point for oil storage	SMP and HPP	24.12.2016
2	Fire exit design	SMP and HPP	24.12.2016
3	Detailed description of oil storage	SMP	~~24.12.2016~~ 24.12.2016

Annex 5. List of participants of the HSE training session held on 14.12.16 at Toktogul HPP.

#	Name	Position
1.	Turdubaeva B.	1st class Engineer, Production&Technical Department, OJSC EPP
2.	R. Abdullaeva	H&S Senior Engineer, Thermal Power Plant of Osh City
3.	Kalmatova E.A.	Head of chemical laboratory, Thermal Power Plant ofOsh City
4.	Sadabaev A.	Dept. Head, Service of Reliability and Safety, Cascade of Toktogul HPPs
5.	Modomurov T.	Head of Vehicle Department, OJSC EPP, Cascade of Toktogul HPPs
6.	Maratov A.	Local representative, General Contractor Chinese Company JOC International Technical Engineering Co., Ltd. (Lot 2)
7.	Soronbaev E.	Project Manager, Sub-contractor «BIOR» (Lot 3)
8.	Shakulieva A.	Engineer, Production&Technical Department, Cascade of Toktogul HPPs
9.	Mamyrov T.A.	Engineer- inspector, Service of Reliance and Safety, Cascade of Toktogul HPPs
10.	Mamadaliev I.	Deputy Head of Service of Reliance and Safety, Cascade of Toktogul HPPs
11.	Khudaiberdiev I.	Supervisor of the Project Coordination Unit, Cascade of Toktogul HPPs
12.	U. Imanbaev	Head of Production&Technical Department, Cascade of Toktogul HPPs
13.	Z. Khaidarov	Project Manager, General Contractor Korean Consortium of LS Cable and System & SM Powertech (Lot 3)
14.	SoronbaevCh.S.	Advisor to Director of Cascade of Toktogul HPPs
15.	Akunov A.	Head of Capital Construction Department, Cascade of Toktogul HPPs
16.	Hans Back	International HSE specialist, Fichtner
17.	Israivlov A.	Local Engineer, Fichtner
18.	Aitmatova D.	Local HSE specialist, Fichtner
19.	Moldosanova J.	Environmental Specialist, EPP IPIU
20.	Medetbekov O.	Engineer, Production and Technical Dept, Cascade of Toktogul HPPs
21.	KushubakovA.	Director, Cascade of Toktogul HPP

FICHTNER

	Power Sector Rehabilitation Project (PSRP)
FSO-LOP-00003-OT	**List of Participants from EPP for Capacity Building**

Project: 7929 A01; Project No.: L2869 / G0294 - KGZ / PSRP
Phase 1 of Rehabilitation of Toktogul HPP

Place, Date: Bishkek, EPP Head Office, ________________________

List of Participants from EPP for Capacity Building

FICHTNER team has performed the capacity building of EPP team.

Capacity building was performed by:

Topic of capacity building:

The following team attended the capacity building from EPP:

	Name / Имя, Фамилия	Position / Должность	Signature / Подпись
1	Турдубаев Б.А.	ОАО „ЭС" ПТО инженер	
2	Абдыкалова Р.А.	ОАО „ЭС" ТДУ г.Баш. инж. ТБ	
3	Камматов Э.А.	ОАО „ЭС" ТДУ г.Баш. нач. х/раб	
4	Садыбаев А.С.	ОАО „ЭС" ведущ. инж. СНТБ	
5	Молдомуратов Т.Т.	КТГЭС. нач. д/бауч	
6	Акжолтой Маратов	УОС	
7	Шакулиева Л.А.	инженер	
8	Маширов Т.А.	инж. инспектор	
9	Мелтенбеков О.М.	инженер ПТО	
10	Момогулиев Н.А.	Зам. нач. СНТБ	
11	Худайбергенов И.А.	руководитель ГКР	
12	Жайпаров З.Р.	Консорциум СМ и КСК	
13	Исмаилов У.М.	нач. ПОО КГГЭС	
14	Сорондаев Г.С.	ком. дир. ТКГЭС	

OJSC Electric Power Plants **FICHTNER**

____________________ ____________________

Samat ALDEEV Otar GAVASHELI

FICHTNER

	Power Sector Rehabilitation Project (PSRP)
FSO-LOP-00003-OT	**List of Participants from EPP for Capacity Building**

Project: 7929 A01; Project No.: L2869 / G0294 - KGZ / PSRP
Phase 1 of Rehabilitation of Toktogul HPP

Place, Date: Bishkek, EPP Head Office, ________________________

List of Participants from EPP for Capacity Building

FICHTNER team has performed the capacity building of EPP team.

Capacity building was performed by:

Topic of capacity building:

The following team attended the capacity building from EPP:

	Name / Имя, Фамилия	Position / Должность	Signature / Подпись
15	[illegible] А.А.	нач. [illegible]	[signature]
16	[illegible]	Project manager	[signature]
17	[illegible]	HSE Specialist Fichtner	[signature]
18	[illegible]	Fichtner cons.	[signature]
19	[illegible]	ОАО "ЭС"	[signature]
20	[illegible]	HSE Specialist Fichtner	[signature]
21			
22			

OJSC Electric Power Plants

____

Samat ALDEEV

FICHTNER

____

Otar GAVASHELI

Annex 6.GRM LEAFLET

INFORMATION ON GRIEVANCE REDRESS MECHANISM FOR THE LOCAL POPULATION DURING CONSTRUCTION ACTIVITIES AT TOKTOGUL HPP

In order to achieve a more reliable level of power supply not only for the population of Kyrgyzstan, but also for the entire Central Asian region, the Government of the Kyrgyz Republic requested the Asian Development Bank (ADB) to provide financial support for the rehabilitation project of the power sector including the Toktogul hydroelectric power plant reconstruction (HPP). This rehabilitation project is part of the Naryn Cascade, which is of paramount importance for the entire region.

Executing Agency for the Toktogul HPP rehabilitation project is OJSC "Electric Power Plants".

Toktogul HPP rehabilitation (The Project) covers the restoration and replacement of obsolete priority and auxiliary mechanical and electrical equipment, including 500 kV transformers, generator circuit-breakers, high voltage cables 500 kV, switchgear cubicles and auxiliary transformers.

The Project work will start in autumn 2016 and will last until 2019.

Not any electric power supply interruption is expected during the project work at the Toktogul HPP. However, there may be negative side-effects on the environment and population of the district. In order to take account of and mitigate/eliminate those effects and further to reduce the impact of work for the local people, a Grievance redress mechanism (GRM) is implemented to deal with complaints, which characteristics are below.

As a whole, the impact of the project work on the natural and social environment of the area will be very limited, since almost all of the work will be implemented at the territory of the Toktogul HPP. Project activities outside the HPP will be connected with the transport of scrap metal (copper and steel), released as a result of the replacement of obsolete units, cables, generators and other equipment, as well as the old cable and transformer oils and oiled paper. All mitigating and preventive measures for the protection of the environment and the local communities are provided in the design documentation and will be used in all appropriate cases.

GRIEVANCE REDRESS MECHANISM

The ADB has no direct relation to the complaints procedure, but it closely monitors the process of implementation of the projects. ADB requires reports concerning the nature of the complaints and the procedures for their processing and offers measures to mitigate a negative impact, if any occurred. In this regard, a special grievance mechanism was developed, which, if necessary, and with the appearance of the relevant precedents, will also be used in this project. In accordance with its new policy, the ADB and the guiding documents for the social sphere, and in particular for grievances, GRM covers the issues involuntary resettlement, environmental performance and information disclosure.

Despite the fact that GRM also includes the registration of complaints in cases of corruption and fraud, these issues are dealt with as a separate process in the framework of ADB's Anticorruption Policy (1998).

The grievance redress mechanism is designed to avoid a long trial, but does not limit the right of a citizen in the case to refer directly to a court acting on the basis of the common law.

In this case, all of the steps and claims for restoration of justice and the impact of project activities on the local community are implemented free of charge.

COMPLAINT PROCEDURE

The complaint procedure includes several stages:

- Registration of a complaint of the local population in a special registration book, and to provide information about the timing of the complaint examination to the complainant;
- Screening the complaint for eligibility and defining if it really deserves to be considered within this framework;
- GRM Group (GRG) as a mandatory element of this mechanism reviews the complaints;
- Deciding on a complaint resolution process;
- Resolution of the complaint and closing the case.

TERMS OF COMPLAINT IN GRM

The responsible department coordinating the GRM issues is the Group on coordination of Toktogul HPP Rehabilitation, contact tel. numbers: +996-3746-51435;+996-555-332929. An authorizedpersonperforming GRM duties should initiate the grievance review and convene the GRG meeting not later than 5 days since the complaint was registered as eligible for the GRM. All supporting documents – photo and video materials, required certificates, legal opinions, technical expert opinions – should be prepared prior to the meeting. The minutes of each meeting should be agreed and signed by all members of the GRG notlater than 3 days following the gathering.

The complaint registered with the GRM should be reviewed and addressed (declared valid or invalid) within 14 calendar days. If the case is complex and requires an investigation (e.g. scrutiny by technical experts or legal opinion from the state or certified private entities) complaint review period may be extended to a maximum of 30 calendar days. In such cases, the written notification should be sent to the complainant, explaining reasons for extension, describing the process and indicating an expected date for delivering the results of the review.

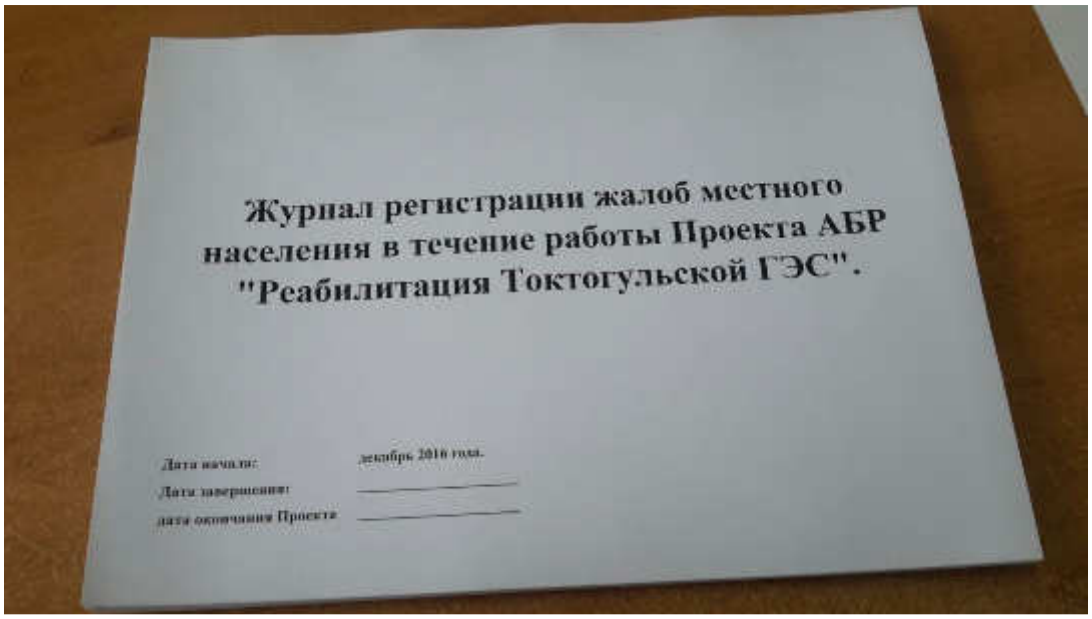
If the complaint is found invalid, the GRG formulates a response and sends a written letter to the complainant, explaining reasons for the rejection. The complainant can appeal the decision and bring the case to the ADB Accountability Mechanism or the local courts. The project level GRM does not impede in any way the access of the complainants (affected persons) to the ADB Accountability Mechanism (AM) or to the country's judicial or administrative remedies. Should the AP wish to register a complaint with the ADB AM, he can address himself to the following addresses given below:

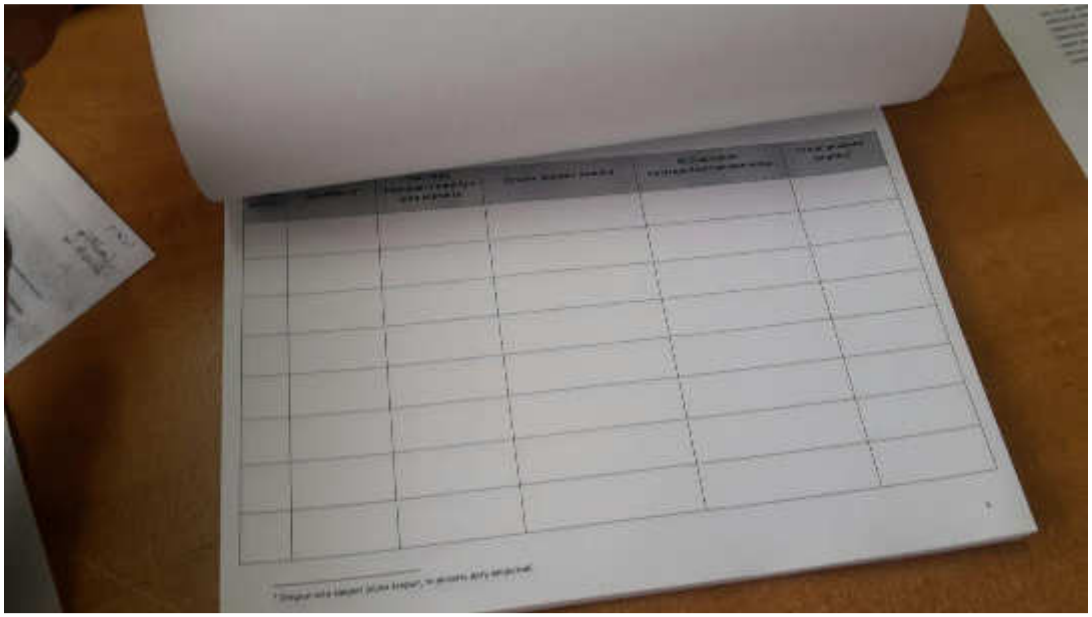
Office of the Special Project Facilitator: Email: www.adb.org/site/accountability-mechanism/contacts Fax number: (+63-2) 636-2490 Asian Development Bank 6 ADB Avenue, Mandaluyong City 1550 Metro Manila, Philippines	Compliance Review Panel Email: access via www.adb.org/site/accountability-mechanism/contacts Fax number: (+63 2) 636 2088 Asian Development Bank 6 ADB Avenue, Mandaluyong City 1550 Metro Manila, Philippines

Complaints related to the integrity issues are registered at the complaints log and forwarded to the ADB Office of Anticorruption and Integrity (OAI) for further review. In case of such complaints, the complainants should apply to the ADB OAI at the following address:

Office of Anticorruption and Integrity (OAI), Asian Development Bank, 6 ADB Avenue, Mandaluyong City, 1550, Metro Manila, Philippines, email: integrity@adb.org or anticorruption@adb.org, telephone: +63 2 636 2152.

Annex 7. Log book on GRM at Toktogul HPP.





Annex 8. Fact Finding Mission Report of December 12, 2016

Fact finding mission report 'additional rehabilitation works at and around 500 kV switchyard'

Fact finding mission: 14.12.2016
Reason for mission:
Within the framework of Project No. 44198 (KGZ) Power Sector Rehabilitation Project Rehabilitation of Toktogul HPP – Phase 1 some additional measures to perform complete rehabilitation of the 500 kV Switchyard and 500 kV transition point have been proposed by EPP. Fichtner justified the proposal and ADB approved it. A site survey has been performed to check whether expected environmental impacts of these additional rehabilitation works are covered by the existing IEE/EMP report to Phase 1.
Location: HPP Toktogul, Kyrgyz Republic, 500 kV
Switchyard and cable connection between power houseand 500 kV switchyard.

Participants: Hans Back, HSE Specialist, Fichtner
Djamila Aitmatova, national HSE Specialist
Jyldyz Moldosanova, Environmental Safeguard Specialist within EPP
Almaz Kushubakov, Director of Cascade of Toktogul HPPs

Proposed additional measures:
The needed rehabilitation works shall include the following:

i. 500 kV Reactor, 1 phase;
ii. All disconnecting switches in set (including earthing switches and operating mechanisms);
iii. Current Transformers
iv. Voltage Transformers;
v. Surge Arresters;
vi. High Frequency Communication Equipment;
vii. Communication Equipment (Capacitors, Filters, etc.);
viii. Auxiliary Transformers;
ix. Switchyard Battery and UPS Systems;
x. Switchyard control system (control, alarm, synchronization, interlocking, operating current);
xi. Switchyard protection system (including line protection for two 500kV overhead lines);
xii. All power and control cables related to new equipment;
xiii. Refurbishment of switchyard fire fighting system;
xiv. Refurbishment of lighting system;
xv. Refurbishment of cable channel between substation and powerhouse, approximately 4 km.

The cable channel between substation and power house runs about 1 km outside and around 3 km inside a tunnel (see photo documentation below).The concrete cable duct is broken in main parts (especially the concrete cover plates) and rain water or condensed water inside the tunnel is entering the cable duct and affecting the electrical cables.
In addition to the above listed equipment, scope of the supply will include certain electromechanical equipment, which are associated to the above equipment and which are in need of replacement. Such equipment will be identified during site assessment at the stage of preparation of technical specifications for tendering.
In the meantime, team of EPP is considering to finance the purchasing of 1 phase of 500kV reactor from alternative sources. Most probably this reactor will not be included in the scope of rehabilitation of the switchyard, financed by the funds of ADB.

Expected impacts:

During the site visit it became clear that the proposed measures will create similar impacts as the rehabilitation works to be done in Phase 1 of the overall rehabilitation works for Toktogul HPP. For this Phase 1 an Initial Environmental Examination (IEE) has been prepared and an Environmental Management Plan (EMP) has already been developed and approved by ADB. This EMP covers in principle all upcoming impacts by the proposed additional works. No new environmental impacts are expected for the additional measures.
The main impacts caused by these additional works will arise by creation of different types of waste that has to be handled as:

- old used oil;
- ceramics;
- concrete waste (high amount);
- scrap metals;
- old batteries (about 100);
- general construction waste;
- domestic wastes (generated by workers).

All foreseen works will be done on Toktogul HPP property. No social impacts are expected to occur.

Recommendations:

- Oil samples especially from the reactor shall be taken and analyzed for PCB;
- Probes from the concrete to be disposed of (from cable channel) shall be analyzed for asbestos;
- An appropriate landfill for concrete waste shall be selected;
- The additional measures shall be incorporated into the existing IEE/EMP either as Annex or directly into the main text body;
- The implementation of the new EMP shall be part of the tender and contractual documents;
- The new contractor shall develop a general Health and Safety Plan and implement a general Health & Safety Management System at construction site;
- The selected construction contractor shall set up a site specific EMP (SSEMP) focusing on the handling of concrete construction waste.

Photo report for this fact finding missionis provided below.

Photo1. Reactor to be replaced (containing about 40 t of oil)

Photo2. Actually installed reactor

Photo3. Cable duct to be rehabilitated outside and inside the tunnel

Photo4. Batteries to be replaced