TAJIKISTAN: CAPACITY BUILDING TO STRENGTHEN THE CLIMATE RESILIENCE OF ENERGY SECTOR ASSETS AND INVESTMENTS

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BACKGROUND & ACTIVITIES TO DATE

This activity was launched by the European Bank for Reconstruction & Development (EBRD) as part of a major programme of investment in the modernisation of the Tajik energy sector. With the objective of strengthening the capacity of the state utility Barki Tojik together with the state hydro-meteorology agency Tajik Hydromet and other relevant institutions to build awareness of the effects of climate change and to be better equipped to manage the impacts on water resources and hydropower generation, two training programs were carried out in 2016, one in Tajikistan in August and the other in Quebec, Canada in October. Details of these sessions were reported on in our previous newsletter. Following on from feedback from both of these sessions a training program prioritized to meet the needs of Barki Tojik and Tajik Hydromet is planned for 2017. The first of these 2017 training programs was completed in the last week of March and first week of April in Tajikistan and is highlighted below.

Hydropower Plant Operation & Optimization - in Tajikistan- 24th March to 7th April 2017

This training mission was run by Isabelle Thériault a senior engineer from Hydro Quebec (MWH Consortium). The workshop sessions and follow-up meetings were attended by personnel from Barki Tojik and Tajik Hydromet. The training was geared for personnel involved in plant operations and Barki Tojik personnel were from the various HPPs, namely the Varzob HPP, Qairokkum HPP, Baypaza HPP and Nurek HPP and a few from the Barki Tojik Central Dispatch Centre and the Production & Technical service department. During the training tour in Canada, Hydro-Québec briefly presented the tools used in order to plan the production of its hydroelectric facilities and optimize the

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production. It appeared during interactive discussions with the Tajik participants that some specific constraints make it impossible for Barki Tajik to operate the powerhouses exactly like Hydro-Québec, but some common principles may still be adapted.

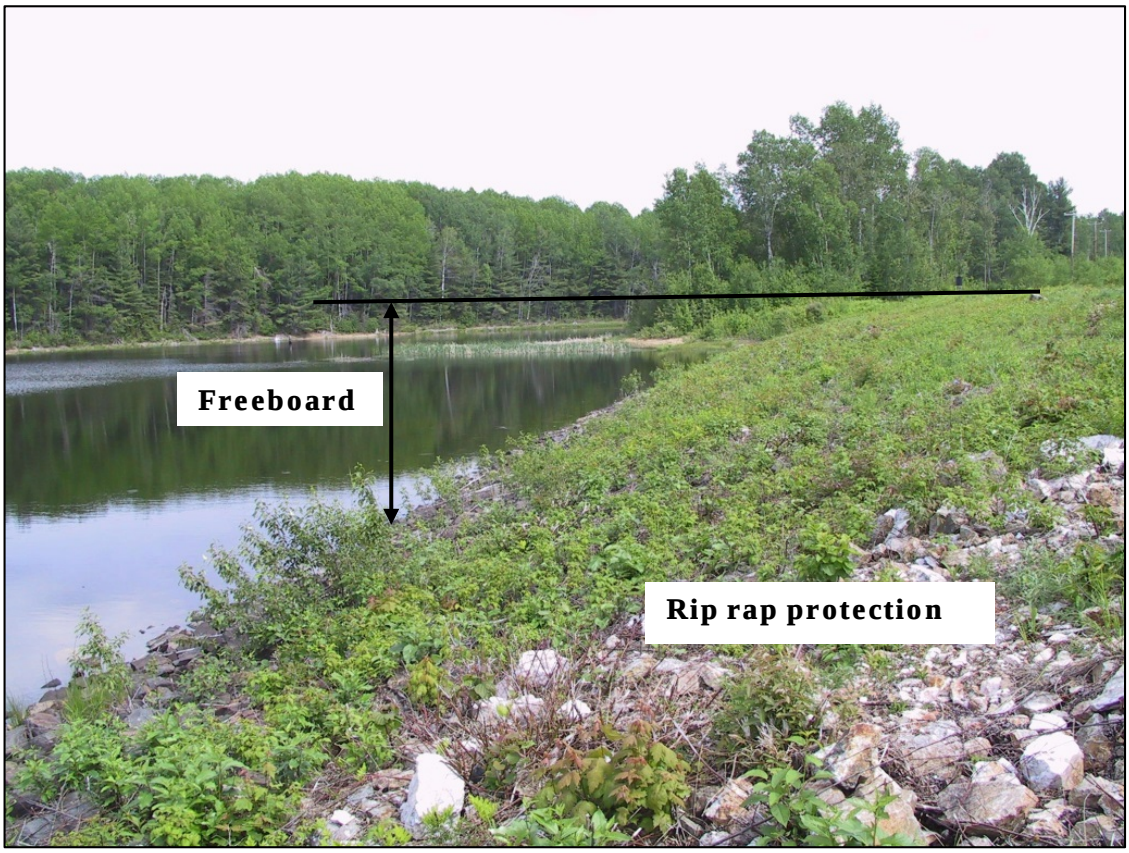
Isabelle Thériault (MWH Consortium) with participants from Barki Tojik and Tajik Hydromet

The aim of the training was to demonstrate how to build a simple hydrologic model in order to simulate production of a single powerhouse or a cascade including several powerhouses over a short period (up to ten days) or a mid-term period (one year). Before developing the model, time was devoted to explaining the main constraints of the Barki Tojik hydroelectric production, such as irrigation demand, energy demand, electric network stability, maintenance activities, the link between the control centre, the powerhouses and the necessity to provide energy optimizations and flood management.

In order to prepare this model it was explained that the following activities had to be considered:

1. The importance of utilizing the efficiency curves to decide which combinations of units to operate for a particular inflow and reservoir level to maximize plant efficiency.
2. Integrating a volume-elevation equation for each reservoir in the system;
3. Integrating a stage-discharge relationship at the tailrace of each powerhouse;
4. Integrating other head losses.

A training session was also held on the design parameters for rip rap protection and freeboard provision on dams as a lead up to the upcoming dam safety training in summer.



Typical Slope Protection in Embankment Dam

Program for Remainder of 2017

The following program is planned throughout 2017:

- Seasonal forecasting regional & hydro climate & reservoir inflows – June/July
- Dam Safety – May and October
- Hydro climatic hazard forecasting for the energy sector - August/September
- Hydro meteorological data reconstruction and repair – August/September
- Climate Science, Climate Modeling and Scenarios –September/October

- Hydropower Generation in a Changing Climate – June & October
- Infrastructure Vulnerability and Climate Change – sJune & October
- Adaptation Best Practices Worldwide - June & October

The next training program – Dam Safety in mid-May is planned to be a hands on training for a small group of engineers to go through an actual dam safety exercise on one of the Tajik HPPs chosen by Barki Tojik. It is intended to carry out a field visit to the project where a condition assessment of the structures will be made.

Survey in Sughd Province

The Consultant, working with a Tajik specialist socio-economic survey research company - Zerkalo Analytics, undertook surveys and focus group discussions:

- Randomised statistical survey of households in Sughd Province: A total of 400 questionnaires were administered across a sample which covered settlements in valleys, mountainsides, plains, and in urban and rural locations. The responses are gender disaggregated.
- A survey of 20 small businesses in Sughd Province selected for their high dependency on electricity supply for their production and/ or service delivery. These businesses were located in urban and rural settlements and comprised 50/50 split of male and female owners or managers.
- A series of gender-disaggregated focus group discussions covering Households and small business owners split into location type (urban and rural). This information was used to assist in the interpretation of the findings of the two surveys, and covered the same topics, while exploring attitudes to, and beliefs in climate change and energy efficiency.
- Interviews with other key players including NGOs involved in climate change awareness and the National Association of Electricity Users of Tajikistan.

The findings from the surveys and focus group discussions are being assessed and will be reported in the next newsletter.

Survey of small business in Sughd province

. Economic expansion and population growth in Sughd province continues to grow, and as a consequence, energy demand. Recent infrastructure and service delivery improvements implemented by BT have improved energy supply to Khujand and other urban areas in Sughd where supply has been increased to 24 hours, and to 12 hours in the surrounding rural areas. However both scheduled and unscheduled energy cuts, and voltage fluctuations still occur in some areas. In this context ensuring future energy security and a reliable supply poses a major challenge. The field research which took place in November/December 2016 in Sughd Province explored the public's perception of a range of issues including climate change, reliability of electricity supply, energy saving measures mitigating scarcity of electricity supply etc. The survey targeted households and small business and because of the different roles and responsibilities of men and women in Tajik society, the survey was gender disaggregated. Respondents among households and small businesses have provided answers that show a consistent understanding of the link between climate change and its consequences for their lives and the economy of their country. The large majority of households indicated that they had an interest to learn more about climate change through the media.

Survey of a focus group of female households in Sughd province