ISTC, a Crucial Mechanism to Solve the Problem of Uranium Tailings in Central Asia

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In Central Asia, the problem of uranium wastes is deemed a serious one for the people and the environment. Over 800 million tons of wastes are stored in tailings, waste dumps and abandoned mines in Kazakhstan, Kyrgyzstan, Uzbekistan and Tajikistan, including approximately 440 million tons of radioactive waste, stored on the earth’s surface in tailings of mining enterprises belonging to the former military-industrial complex of the USSR. Many tailings are located near towns, populated areas and state borders. The issue of uranium tailings and toxic industrial waste in Central Asia is really urgent.

Figure 1. One of the most dangerous uranium tailings liquid “mud” dump near Khujdzan, Tajikistan.
In a quite probable case of a failure of the damp dam the whole city of Khujdzan can be flooded by radioactive liquid waste.

Actions taken by ISTC

Radioactive Waste Management
ISTC has supported a number of projects in the area of Radioactive Waste Management and projects related to radioactive contaminated sites. By May 2009 the ISTC Parties in this area provided about $48.5 million US for 140 projects. About 50 institutions are involved, 75% of them being Russian and 25% are CIS countries. About 350 institutes, companies and governmental organizations from the United States, the European Union, Norway, Japan and
the Republic of Korea have been participating in the projects related to Radioactive Waste Management as collaborators.

**Tailings**

More than 40 projects related to tailings and transboundary monitoring of central Asian rivers were submitted to ISTC. ISTC Parties, which provided about US$ 4 millions, funded 19 projects. Most part of the ISTC projects was related to monitoring and development of rehabilitation actions of contaminated sites.

**Projects**

Some project examples in this area are:

**#K-632 Koshkar-Ata**

One of the most challenging radio-ecological problems in Kazakhstan has been the rehabilitation and restoration of lands at the tailings pond, KOSHKAR-ATA. ISTC Project #K-632 provided a solution to this seemingly intractable problem by making it possible to perform a comprehensive environmental study of the land at the tailings pond and four adjacent territories. The project also facilitated the development of an electronic database and a GIS that is continuously updated. A primary outcome of the project was the development of substantial proposals for stage-by-stage technical rehabilitation of the land. Two control sites within the project are now also the basis of a special government program to perform a full-scale rehabilitation of the tailings pond. The ISTC project was crucial in raising awareness among state and local authorities on the need to address the rehabilitation problems at KOSHKAR-ATA.

In 2007 the Republic of Kazakhstan allocated $1 million from the state budget for the first stage of rehabilitation and restoration works at KOSHKAR-ATA.

**#KR-1044p Kaji-Say**

The Kyrgyz Republic has several uranium tailings that are of environmental concern and require near-term attention. Of the five sites where these tailings are located, the smallest, Kaji-Say, site was selected as a pilot site to develop and demonstrate the feasibility and applicability of technologies for reconstruction and rehabilitation. Participants of ISTC Project #KR-1044 focused their efforts on engineering aspects, design, construction and establishment of an ecological monitoring network. A post construction radiation survey over the entire rehabilitated territory showed that radiation expositions are within permissible levels. The successful result of this pilot project has led to the reconstruction of the Kaji-Say uranium tailings and the rehabilitation of adjacent tailings contaminated territories.

**#K-884, #KR-850, and #T-1000 (NAVRUZ)**

Monitoring of environmental radiation has a special importance for the countries of Central Asia, where mining of radioactive ores was common during the Soviet Union, and the rugged terrain makes it difficult to localize and isolate pollution from abandoned mines. Radioactive wastes easily enter streams and rivers, flowing across trans-national boundaries and causing environmental crises on an international scale.

ISTC is funding projects in Central Asia to develop a joint international study and database on radiation and ecological conditions of aqueous arteries in Central Asia, promoting nonproliferation and a nuclear-free zone in Central Asia.

In November 2000, the Central Asian states of Kazakhstan, Uzbekistan, Tajikistan, and Kyrgyzstan came to agreement on carrying out joint studies and monitoring of Central Asia’s two major life-supporting water arteries: the Syrdarya and Amudarya Rivers. This program “Navruz” is coordinated with the Sandia National Laboratory in the United States, which acts as a collaborator on a number of ISTC-funded projects under Navruz. Under these projects,
basic parameters were measured from river waters, bottom sediments, and inshore soil samples collected throughout the year, for further analysis and correlation between the Central Asian countries. The teams of project participants created a joint database, accessible through the Internet, to promote international learning and usage toward radiation remediation. ISTC has allocated $960,000 on projects in the Navrus program, while the Science and Technology Center Ukraine funds related projects in Uzbekistan.

**#K-884: Radionuclides and Toxic Elements Contamination in Syrdarya River Basin, National Nuclear Center, Almaty, Kazakhstan**

This project forms a crucial piece of the regional Navruz program by analyzing all basins of all drains of the Syrdarya River, using a wide range of investigative techniques (chemical, element and radionuclide water composition, bottom sediments, and soil and vegetation). Special attention was focused to the nuclear explosion test site “Meridian-3.”

**#KR-850: Transboundary Monitoring of the Central Asia Rivers, Institute of Physics, Bishkek, Kyrgyz Republic**

Project participants conducted on-site measuring of quality parameters of the Syrdarya and Amudarya Rivers, including temperature, pH, specific conductivity, general structure of dissolved matters, salinity, dissolved oxygen, and redox potential.

**#T-1000: Radioactive Pollution of Central Asia Rivers, Physical-Technical Institute, Dushanbe, Tajikistan**

This project supports the Navruz database, identifying and measuring the presence of radionuclides in the rivers of Tajikistan, and the related impact on the rivers of Afghanistan and cleanliness of water of the Amudarya River.

Three of these projects, #K-884, #KR-850, and #T-1000, were completed in 2006, while three new projects K-1296, Kr-1103 and T-1163 are at the stage of implementation.

In addition to the above projects under the Navruz program, the ISTC funds an additional $1.4 million for other projects supporting the Navruz mission of transnational radiation monitoring.

**#KR-715: Ecology adjacent to Uranium Production, Institute of Physics, Bishkek, Kyrgyz Republic**

This project investigated the ecological consequences of uranium production at the Kara-Baltý Mining combine in Kyrgyzstan, and developed methods and strategies for rehabilitation of the site.

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