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## Kazakhstan: Experts Report Progress On Safeguarding Nuclear Site

By Nikola Krastev

The U.S. Department of Energy is reporting progress in its efforts to provide for the safe shutdown of the BN-350 nuclear breeder reactor in Aktau, Kazakhstan. At a time of heightened concern over the proliferation of nuclear materials, experts say the U.S.-led program is on track to eliminate a major source of weapons-grade plutonium production, while at the same time avoiding any possible environmental incident on the eastern shores of the Caspian Sea.

New York, 11 December 2001 (RFE/RL) -- The BN-350 fast-breeder reactor in Aktau, in western Kazakhstan, was commissioned in 1972 for the dual purpose of producing plutonium for the Soviet nuclear arsenal and providing electricity, heating, and water desalination.

After a 1998 report from the International Atomic Energy Agency (IAEA) criticized safety at the reactor, Kazakhstan announced it would shut down the plant and secure it. It requested technical and financial assistance from the United States, which earlier in the 1990s removed a large quantity of weapons-grade uranium from another site in the country.

The U.S. State and Energy departments in May 1999 initiated a project to provide assistance to Kazakhstan. This past summer, U.S. and Kazakh officials marked the completion of one phase of the project -- packaging spent fuel from the reactor. An international team of technicians placed the last of 478 canisters of spent fuel in the BN-350 water storage pool under the seal of the IAEA, completing one of the largest such efforts ever undertaken.

Other key accomplishments recently announced include the installation of extensive fire-safety equipment, the design and fabrication of "cesium traps" to decontaminate the reactor's radioactive sodium coolant, and the start of procedures for sodium coolant draining and processing.

Douglas Newton, the project's manager, recently discussed the program at New York's Columbia University. Speaking later to RFE/RL, he praised the cooperation of the Kazakh government: "I don't think we can ask for very much more in terms of cooperation at a national level. On the individual day-to-day basis, the people at the Nuclear Technology Safety Center have been absolutely invaluable in organizing the various Kazakhstan organizations that have worked with us."

The U.S. concerns about these kinds of old-fashioned nuclear reactors are as much about safety as they are about the ability of these reactors to produce weapons-grade plutonium. During its lifetime, Newton said, Aktau's BN-350 has produced several tons of so-called "ivory-grade," premium plutonium.

Paul Josephson is an associate professor of Soviet history at Colby College in Maine and has written a book on Russian nuclear programs. He tells RFE/RL that the BN-350 type of reactor was long ago abandoned in the United States: "Breeder reactors were abandoned under President Jimmy Carter in the late 1970s because he recognized that reactors that produce as part of their operation more plutonium than they start with contribute directly to proliferation. They make more plutonium available throughout the world. It's much easier to make a nuclear weapon out of plutonium than it is out of uranium."

To make sure that Aktau's nuclear facility will never be able to restart plutonium production, the U.S. engineers have devised a plan that calls for "irreversible shutdown." Under this plan, the radioactive molten sodium coolant of the reactor will be gradually decontaminated (of Cesium-137) and then drained. Once the bulk sodium is drained, pockets will remain throughout the reactor's body. These pockets will be filled with an inert gas to corrode the steel and prevent the reactor from being used again.

Newton tells RFE/RL that the U.S. Energy and State departments are discussing with Kazakh officials where to store the plutonium that has already been produced: "The Kazakhs have signaled their intention to store the fuel in northeastern Kazakhstan. But the [U.S.] State Department is still working with them in conjunction with the Department of Energy. And there are several options, and [there has been] a series of options studies. And, of course, our primary concern is the nuclear safety and security of the material that's coming out of the reactor."

Professor Josephson, who has visited nuclear power plants in the former Soviet Union, tells RFE/RL that from a geographic and economic point of view, the best place to store the produced nuclear fuel would be in Russia: "Kazakhstan recognizes this, that it's best not to have any plutonium within your borders, but to have it somewhere where it can be safeguarded. And I would think that Russian facilities are the best place, given the geographic location and the long-term experience."

The U.S. Department of Energy and other agencies have also been active in helping to secure Russian nuclear facilities but acknowledge there are still many sites that require safeguarding. One difficulty at a number of formerly secret sites is the unwillingness of Russian officials to give U.S. technicians access.

But experts on nonproliferation issues say the experience in Kazakhstan has been very positive. Shutting down Aktau's BN-350 reactor has been a collaborative effort involving technical personnel and financing from the United States, Kazakhstan, the European Union, Japan, and Britain. The IAEA has been instrumental in organizing much of the international cooperative effort.

Andrew Weiss is a fellow at the Council of Foreign Relations in New York and former director for Russian, Ukrainian, and Eurasian affairs at the U.S. National Security Council. He tells RFE/RL that the Aktau shutdown project could serve as a model for international cooperation on nonproliferation issues: "The work at Aktau, I think, is just an illustration of the kind of cooperation that's developed. We've seen even in more sensitive circumstances -- like Operation Sapphire, where the United States helped secretly airlift a load of very sensitive material out of Kazakhstan -- that they are willing to do the right thing. I think that this kind of cooperation is something that's going to be enduring and hopefully continuing into the future."

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Operation Sapphire involved the removal of 600 kilograms of weapons-grade uranium from Kazakhstan in 1994. Aside from collaborating on improving its nuclear facilities, Kazakhstan has also turned over all of its nuclear weapons.

Since declaring independence in 1991, Kazakhstan has returned to Russia all 1,410 nuclear warheads stored on its territory and closed the Semipalatinsk nuclear test site, where 456 tests had been performed in the previous four decades.

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