

Decommissioning of radioisotope thermal generators (RTGs) in the Republic of Tajikistan

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The Republic of Tajikistan, as well as other republics of the former USSR, used radioisotope thermoelectric generators (RTGs) as electricity power source for autonomous hydro- and weather-navigation equipment, located in hard-to-reach mountainous areas.

Radionuclide heating sources (RHS) in all RTGs are made on the basis of Strontium-90 (half-life 29.1 years). Depending on type, RTGs may contain 185 to 12.950 TBq. The total activity of all produced RTGs taking into account daughter radionuclide –Yttrium-90 is about 3.7 PBq.

RTGs were under permanent control in the former USSR. However, after the disintegration of the USSR, hundreds of these small facilities, equipped with powerful sources, have been left without control. The radioactive substance contained within them may easily be used as a source for a radiation dispersion device (RDD). Using the Strontium-90 (as a material for a common bomb, this radioactive substance can be dispersed after an explosion). Having detonated one of these “dirty bombs”, a terrorist could contaminate entire parts of towns. The only organization in the Russian Federation that develops, produces, makes general overhauls, modernization and prolongation of RTGs is the All-Russian Research Institute of Technical Physics and Automatization in Moscow. This Institute supplies RTGs to various ministries, bodies and enterprises. The main customers of the Institute are the Ministry of Defense, the Ministry of Transport, Goskomgidromet and the Ministry of Geology.

According to unofficial data, there were 15 RTGs installed in the Republic of Tajikistan during the Soviet Union by Tajikgidromet (Tajikistan’s hydrometeorological service). After expiration of their operation life, most of these RTGs were disassembled and shipped back to the Soviet Union. Control over some of the RTGs in the Republic of Tajikistan was lost during the period of civil war.

The employees of the Ministry of Extreme Situations and Civil Defense of the Republic of Tajikistan (MESCD) accidentally detected an emergency situation in the territory of a coal storehouse of Tajikgidromet in Dushanbe. This emergency situation was caused by the loss of one of four RTGs. The dose rate at the distance of one meter from the source was 180 microsieverts per hour.

The procedure for handling RTGs found in the Republic of Tajikistan is planned to consist of four stages:

- Stage 1. Perform an investigation and search mountainous areas by specialists of MESCD and Nuclear and Radiation Safety Agency (Regulatory Authority) of the Academy of Sciences of the Republic of Tajikistan (NRSA). Receive expert assistance for RTGs from specialists from Minatom of the Russian Federation and IAEA experts. Assistance should focus on how to store these RTGs in TRWRS and to determine their transportation requirements;
- Stage 2. Transportation of RTGs from TRWRS by special transport to an interim platform and area of Tajik railways for loading to special carriage;
- Stage 3. Transportation of RTGs in a special carriage by train to the Russian Federation for dismantling and extraction of the radioisotope sources. Radioactive sources will be placed in special transport containers and placed in special carriages;
- Stage 4. Transportation of high-level radioactive sources, extracted from RTGs, in transport containers by special railroad car to State Enterprise “Mayak”(Ozyorsk city, Chelyabinskaya oblast) for disposal

Country or International Organization

TAJIKISTAN

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