

Nuclear experts discuss radioactive waste repository options for Russia's Northwest

It is time to remediate waste sites in the old Soviet complexes but perhaps with less expense and bureaucracy than has been present in the US.

Bellona (St. Petersburg)
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ST. PETERSBURG—Storage facilities for radioactive waste in Northwest Russia will be overflowing within 3 to 4 years and constructions of reinforcements has yet to begin, but several plans for permanent geological disposition are currently on the drawing board, said Rosatom officials and other experts at a St. Petersburg conference earlier this week.

“There is some 500 million cubic metres of radioactive waste piled up in Russia now with an average activity of 1.5 billion curies—this exceeds the radioactivity of the Chernobyl disaster by 30 times,” said Sergey Dyakov, head of nuclear safety at Rosatom at the conference. The Nuclear Society of St. Petersburg, the All-Russia Scientific Research Institute for Energy Technology (VNIPIET in its Russian abbreviation) and the Swedish organisations SKI ICP and SKB IC hosted the conference.

The Radon complex

All participants in the conference spoke about the critical situation that has been created by over-filled radioactive waste storage facilities in Russia's Northwest.

At present the Radon complex, which deals with radioactive waste storage for the entire Northwest area of Russia, is holding 80,000 cubic metres of waste. According to Radon Director Alexander Ignatov, the complex has only 1000 cubic metres of free storage space left, all of which will be filled within the next three to four years.

VNIPIET has worked out a new storage plan for Radon, but the government has for the past several years refused to earmark money for its construction. Ignatov said that funding for a new building at Radon to be built between 2007 and 2010 is now included in a Federal Target Programme for dealing with radioactive waste.

Geologic Repositories

Conference participants said that the best solution to the problem is to create a long term repository for radioactive waste that would guarantee its safe storage for several hundred years.

VNIPIET specialists with SKB IC—which is studying the possibilities for construction of a geologic repository in Sweden—presented project outlines for two repository types, underground and surface, which the two organisations have been developing co-operatively for the past two years.



A map of the Leningrad Region in Northwest Russia. The red square represents Sosnovy Bor and the red circle the Koporye region where plans for an underground radwaste facility are being considered. The grey area represent the Gulf of Finland and far right is St. Petersburg.

The underground repository plan presented by VNIPIET's Valery Sorokin, envisions the burial of radioactive waste in Cambrian clay at a depth of 100 metres. This sort of storage is analogous to the construction of St. Petersburg's deep metro. According to the project outline, the facility would consist of six chambers, five for burial, and a sixth for controlling the waste

The plan suggests constructing the repository near Sosnovy Bor—hometown to the Leningrad Nuclear Power Plant 70 kilometres west of St. Petersburg—in the Koporye-Globintsa area. The repository is designed to hold 340 cubic metres of radioactive waste, but can also be expanded if necessary. The price tag for this design would be some \$7500 per cubic metre.

"If we begin now, then by 2020 we can begin to accept the first loads" of waste, Sorokin said. He added that by 2020, the Leningrad Region—in which Sosnovy Bor and St. Petersburg are located—will have piled up some 200,000 to 250,000 cubic metres of radioactive waste.

Surface storage

SKB IC President Klaes Lindberg made a presentation on the project of surface repositories.

"When we built a repository in Sweden 20 years ago, we chose the underground method. But at that time we did not have any other experience to draw on and had to go on what we had," he told the conference.



SKB IC's schematic for surface storage.

Now, surface repositories have begun to appear and are in use in countries like France and Spain. According to Lindberg, the advantage of surface storage is its comparatively low cost and ease of siting a location. But Lindberg refused to put a price tag on the surface repository method because expenses for such a project in Russia have yet to be calculated.

According to Lindberg's project plans, the storage facility would have to be built at the level of ground waters at a low altitude. The project envisions that radioactive waste would be placed in cement containers, and the walls of the repository would be constructed of concrete and waterproof clay.

The lions share of expenses for a surface repository come during the concluding stages of filling it with waste. After the facility is packed, geological barriers are erected and the repository is sealed. Underground storage, on the other hand, requires the most funding during the beginning stages of constructing underground chambers.

Comparison of the projects

SKB IC and VNIPIET specialists emphasised that both project presentations need further research, including more exact financial calculations, which play an important role in choosing the variant of radioactive waste disposition. It is also necessary that the specialists compare the projects from the viewpoint of safety.

According to VNIPIET's Ignatov, underground storage of radioactive waste is the safest route. "I have always considered geologic repositories more far-sighted and reliable," he said.

Alexander Nikitin, chairman of the Environment and Rights Centre Bellona in St, Petersburg said: "I don't think surface repositories are less dangerous than underground repositories. The economical constituent will define everything."

According to Nikitin, the advantage of surface storage is its universality. "I am not sure that all regions of Russia contain Cambrian clay. It will be much cheaper to make one project template and pass it on to other regions."