Mayak facility, Russia

Through a series of accidents and spills, the Russian nuclear facility at Mayak contaminated more than 15,000 km² with highly radioactive waste. In 1957, the so-called Kyshtym accident alone made large parts of the Eastern Urals uninhabitable. Thousands of people had to be relocated and, to this day, the region affected by nuclear fallout is considered one of the most contaminated places on earth.

History

The Mayak Production Association (MPA) was the first and largest nuclear facility in the Soviet Union, covering an area of about 200 km² between the cities of Ekaterinburg and Chelyabinsk. Initially built to provide plutonium for Soviet nuclear weapons, five nuclear reactors were constructed in the city called Chelyabinsk-40 (now renamed Ozyorsk) between 1945 and 1948. The facility was continually expanded until the production of weapons-grade plutonium was stopped in 1987 and the facility was gradually downsized. Between 1949 and 1956, 100 Petra-Becquerel of radioactive waste was dumped in the Techa river system — including strontium-90, cesium-137, plutonium, and uranium.

On September 29, 1957, one of the nuclear industry's worst disasters occurred here, radioactively contaminating huge tracts of land for generations to come.

Once known as “Chelyabinsk-40,” the heavily protected city of Ozyorsk contains the formerly top-secret nuclear facility of Mayak. Today, about 14,000 workers are still working at Mayak, mainly producing plutonium, uranium and other radioactive substances for the nuclear energy industry. Mayak also hosts Russia’s only nuclear reprocessing and waste treatment facility. Most decomposition of Russian nuclear wasteheads eventually end up in Mayak. Although nuclear contamination in the surrounding areas has decreased by about a factor of three in the past decades, the region around Mayak is still considered one of the most radioactively polluted places in the world. Reservoir lakes in the Techa River are still used as radioactive waste dumps, further polluting the river system and exposing people to continued radiation effects. The WHO assumes that at dose rates of 0.1 Sv, the leukemia risk is about 19 %, rising by another 19 % for every additional 0.1 Sv of radiation exposure.1 The Mayak workers’ relative risk of developing bone cancer was found to be eight times higher than that of the general population, the risk for developing liver cancer was 17 times higher.2

In addition to the workers, the nearly 300,000 residents of the contaminated regions affected. The estimated cumulative lifetime dose to this population is about 4,500 Person-Sv, about 60 % of the collective lifetime dose calculated after the Chernobyl meltdown.3 People living near Mayak or the Techa river were exposed to an average lifetime dose of up to 1,700 mSv from a combination of external radiation and the ingestion of radioactively contaminated drinking water and food. At such high dose levels, approximately 34 % of the population are likely to develop cancer cases, which they would not have developed without radioactive contamination.4

Chronic radiation effects and excess cases of leukemia, as well as tumors of lung, bone and liver have been found in the affected population, as well as a two- to five-fold increase in the frequencies of bone-marrow depression, chromosomal aberrations, miscarriages and still-births.4 Due to military censorship, people were not informed about the threats of radioactivity, while the true extent of radioactive contamination and its public health impact were never adequately documented or investigated.

Outlook

Today, about 14,000 workers are still working at Mayak, mainly producing plutonium, uranium and other radioactive substances for the nuclear energy industry. Mayak also hosts Russia’s only nuclear reprocessing and waste treatment facility. Most decomposition of Russian nuclear wasteheads eventually end up in Mayak. Although nuclear contamination in the surrounding areas has decreased by about a factor of three in the past decades, the region around Mayak is still considered one of the most radioactively polluted places on earth. Reservoir lakes in the Techa River are still used as radioactive waste dumps, further polluting the river system and exposing people to continued radiation effects. The Hibakusha of Mayak have suffered so much under Russia’s nuclear ambitions, which have paid little regard to the health and lives of the local population. Now, large-scale epidemiological studies and decontamination projects are urgently required in order to protect these people from further harm.

References

4. WHO. “Health effects from the nuclear accident after the 2011 disaster in TEPCO-owned sites in northern Japan.” (In English) Geneva, 2011