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IDENTIFICATION OF SYSTEMIC PROBLEMS IN RADIOACTIVE WASTE MANAGEMENT IN UKRAINE

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Abstract. One of such significant environmental problems in Ukraine is the presence of large-tonnage radioactive waste, the volume of which is calculated in millions of cubic meters. Besides, Ukraine has a uranium mining and processing industry, which has accumulated about 65 million tons of solid low-level waste. Military operations in Ukraine can significantly aggravate the environmental situation. The problem of RW management is complex and requires consideration of numerous factors. The initial basis, should be a functional approach, because the process of choosing the best technology and further detailed strategy happens best when the security logic is clearly understood by the experts.

Today, radioactive waste (RW) in Ukrainian exist in the form of nuclear and radioactive substances and ionizing radiation sources. The main producers and custodians of RW are: 4 nuclear power plants, 6 storage facilities of the state specialized plant «Radon», 5 storage facilities of the military-industrial complex, the 30-kilometer Chernobyl Zone, decontamination waste disposal sites, medical institutions, industrial enterprises and research laboratories. Nuclear power plants (NPPs) make the most significant contribution to the total amount of RW. On average, Ukrainian NPPs produce up to 27 m³ of solid RW and 35 m³ of liquid RW per 1 billion kWh of electricity, depending on the type of reactor [1]. However, the Zaporozhye NPP is an exception. At the site of the Zaporizhzhya NPP, a repository for «dry» container storage of VVER-1000 nuclear fuel waste was built [2]. In total, operating VVER-440 and VVER-1000 reactors, taking into account the extension of their design life by 20 years, can produce up to 17,500 tons of spent nuclear fuel. Thus, military operations on the territory of Ukraine can significantly aggravate the environmental situation, and the study of the most rational processes of radioactive waste management is an urgent task.

Since system analysis is an effective tool for solving complex, poorly formalized problems, then it is the best tool to identify systemic problems in RW management in Ukraine.

The process of choosing the best technology and further detailed strategy happens best when the security logic is clearly understood by the experts. A key point is the need to ensure that there are clear links between the characteristics and volumes of RW, proposed technologies and associated risks, safety management mechanisms and costs. This approach makes it possible develop technological processes based on the logic of which the main criterion is safety.

Used information sources:

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