ASSESSMENT OF THE RADIONUCLIDE FLUXES FROM THE CHEROBYL SHELTER AND COOLING POND INTO PRIPYAT RIVER AND GROUNDWATER

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The destroyed Chernobyl Unit 4 under the constructed "Shelter" and the Chernobyl Cooling Pond are potentially most hazardous object in the Chernobyl zone. The model based assessment of the consequences of the Shelter collapse on surface water contamination was provided in the frame of the Environmental Impact Assessment of New Safe Confinement (NSC), designed above the Shelter. For the conservative "worst hydrological scenario" the wind direction was taken to deposit the maximum amount of radionuclides directly on the Pripyat River surface and floodplain upstream the Chernobyl NPP. Assuming the atmospheric dispersion of 8 kg of reactor fuel due to the Shelter collapse, it was assessed that 2.4 TBq of ^{137}Cs and 1.1 TBq of ^{90}Sr will be released into the Pripyat River within 3 days. The 1-D model RIVTOX was used to simulate the propagation of released radionuclides through Dniper reservoir cascade. It was shown that the concentrations of ^{137}Cs and ^{90}Sr in Dnieper reservoirs for the simulated scenario will not be higher than during last high spring flood 1999. The impact of the NSC on the diminishing of the surface water and groundwater contamination was simulated. Most of the initial contamination of the Chernobyl Cooling Pond (CCP) by long lived radionuclides, such as ^{137}Cs, ^{90}Sr and transuranics, has accumulated in its bottom sediments. The water elevation in the CCP is at 6 m higher than in the neighbouring Pripyat river. The scenario of a collapse of CCP's dam, has been considered, which hypothetical cause can be earthquake, dam score during high flood, terrorist attack. The propagation of contaminated water and sediments from the CPP dam breach through the Pripyat River floodplain, downstream river and than through the Dnieper reservoirs was modelled by the chain of 2-D and 1-D models.