Behaviour of radioactive substances in the Vltava and Elbe Rivers during nuclear accident

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Abstract

This work is focused in the research of the behaviour of radioactive substances released into the hydrosphere of the Vltava River and the subsequent Elbe stretch during a severe accident at the Temelín Nuclear Power Plant. The background values of anthropogenic radionuclides in surface water, residual contamination after the Chernobyl accident and after atmospheric tests of nuclear weapons, were evaluated using two methods and these methods were compared. The migration of the accidental radioactive contaminants in the watercourse would be mainly influenced by their ability to sorb onto the solid phase in the hydrosphere. Therefore, the sorption of particular anthropogenic radionuclides onto bottom sediments and solids suspended in the water column was monitored and evaluated at several sites along the Vltava and the Elbe Rivers. Furthermore, the possibility of using tritium, which is discharged during normal operation of the Temelín power plant, as tracers for the purposes of modelling the migration of pollution, was assessed.