

Atmospheric Dispersion Simulation System - Tritium Release

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The Rokkasho Reprocessing Plant, located in northeastern Aomori prefecture, is currently undergoing the final commissioning test using actual spent nuclear fuels (the Active Test). Tritium had been discharged from the reprocessing plant and some effects to the environment were observed since the Active Test had been started at the reprocessing plant on March 31, 2006. The purpose of this study is to predict the environmental impact of the reprocessing plant once it becomes operational. An atmospheric dispersion simulation system, developed by the authors, has been utilized to predict the expected tritium dispersion during the plant future operations. This model considers HT, HTO, and the reemission of HTO over the complex topography of the region. In this study, a simulation of tritium dispersion was carried out using wind velocities and wind directions as prediction factors for future HTO concentration. The simulation results were compared with actual HTO concentration measurements taken during the autumn of 2006 and the spring and autumn of 2007. The results of the simulation appear to accurately reflect the actual measured results from HTO measurements in the autumn seasons of both 2006 and 2007, however, there were discrepancies between the data set from the spring of 2007 and predicted results formulated by the simulation for that same period. Upon the discovery of these discrepancies, the parameters relating to tritium had to be adjusted in order to produce more accurate results within the simulation. This paper describes the resultant data produced with these adjusted tritium parameters.