

Secondary pollution budget of Fukushima nuclear power plant

Susumu Ogawa and Yasuyuki Sakata

Professor, Nagasaki University: 1-14 Bunkyo-machi, Nagasaki, 852-8521 Japan

Phone: +81-95-819-2611; E-mail: ogawasusumu@nagasaki-u.ac.jp

Keywords: ALOS, THEOS, Groundwater, Atmospheric pollution, Spatial dose

On March 11, 2011, Fukushima Daiichi nuclear power plant was attacked by the great earthquake and stopped by tsunami. Emergency core cooling systems did not work, three reactors in Dai-ichi nuclear power plant became meltdowns and hydrogen exploded to break the buildings. Finally a big amount of radioisotopes were emitted to the sky and polluted eastern Japan by radioisotopes. Especially the northwest area of the plant was polluted severely and the residents escaped. The pollution covers the atmosphere, hydrosphere and the geosphere, and the secondary pollution is progressing. Here, the northwest area pollution was analyzed in the atmosphere and hydrosphere pollution, especially groundwater and ocean pollutions. The atmospheric pollution was analyzed for transportation by the wind from pollution areas over Abukuma plateau. Used models were the Stokes model and the atmospheric diffusion model. Hydrospheric pollution was estimated in the watershed for rivers and groundwater pollution by runoff. Moreover, ocean pollution was calculated. As a result of the secondary pollution budget, the atmosphere was polluted by about 30 % of the total, the rivers were polluted by about 30 %, and the groundwater and ocean were polluted by about 40 %. The atmospheric pollution was near equal to Chernobyl nuclear power plant and the other pollutions were estimated by more than Chernobyl.