EXPERIENCE OF INVESTIGATION OF CONTAMINATED SITES IN LITHUANIA

L. Pilkyte
Radiation Protection Centre, Kalvariju 153, 08221 Vilnius, Lithuania

Abstract. Cases of investigations of contaminated sites in Lithuania and evaluation of exposure doses are presented in paper. For every case a plan for investigation was created using known information. Sampling and measurements methods where chosen, scenarios for calculations of exposure doses were created.

After dose rate screening a spot of contaminated soil was detected in one of the former Soviet military bases. Due to military human driven activities soil was contaminated with radium. Investigation of situation, dose assessment was done. Subsequent measures were recommended and analyzed from the point of view of optimization of radiation protection as a case study.

Urgent dose rate scan of land where Russian fighter crashed was done. Metal sticks were founded and ^{238}U identified with dose rate meter-identifinder. Sticks were analyzed by gamma spectrometer and MGAU code. It was depleted uranium (^{235}U – (0.325±0.004) %, ^{238}U – (99.674±0.004) %) spread around.

Radiological assessment of site with stored sewage sludge from Visaginas city where workers of Ignalina nuclear power plant live was performed. The optimization of the number of samples to be sampled was performed using the program Environ-Calc of American Chemical Society. Concentrations of the ^{60}Co and ^{137}Cs in the sewage sludge were determined by gamma spectrometry. The average concentrations were 42 Bq/kg of ^{60}Co and 10 Bq/kg of ^{137}Cs. Remedial actions were recommended. Effective doses to the members of reference groups were assessed.

In situ gamma spectrometric measurements of two plots were done for construction of a new nuclear power plant. Since plots under investigations were in the vicinity of Ignalina nuclear power plant, results on activities of reactor radionuclides ^{60}Co and ^{137}Cs were found. Measurements were done by a spectrometer fixed on a tripod holder; detector without collimator is directed downwards, 1 m above the ground. Energy calibration of *in situ* gamma spectrometer with HpGe detector was done in the range from 59-1836 keV using reference standard of a mixture of 10 radionuclides. An efficiency of *in situ* gamma spectrometer was calibrated by ISOCS software. Geometry for efficiency calibration was characterized by thickness of layer of soil and area of soil. If presumption is made that surface of soil is flat, this area is of shape of a circle. Soil density is also an important factor. Density of contamination of soil with ^{137}Cs and ^{60}Co was recorded in Bq/m^2, though these radionuclides were distributed in the layer of some thickness.