Radiation exposure of residents near Semipalatinsk

W-III-2 Current Situation of Residual Radioactivity at the Former Soviet Union’s Semipalatinsk Nuclear Test Site

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During the period of 1994-1998, field missions were sent six times to the former Semipalatinsk Nuclear Test site and its surrounding areas in Kazakhstan to investigate the current radioactivity situation of the land from residual long-lived radionuclides. The surface and core soil were sampled at more than 80 sites. The radioactivities of $^{137}$Cs, $^{238}$Pu and $^{239,240}$Pu as well as $^{241}$Pu/$^{239}$Pu atomic ratios in the soil were determined by γ- or α-ray spectrometric and ICP-MS methods, respectively. With the exception of areas near underground tests and near ground zero for atmospheric or surface tests, all the areas visited showed levels within typical environmental levels of $^{137}$Cs, but for $^{239,240}$Pu showed elevated levels with weapons-grade plutonium. These nuclides were detected in soil as deep as 30 cm from the surface at some sites, but most of them existed in soil 5 cm or 10 cm deep from the surface. 50-80% of total $^{239,240}$Pu, depending on the sampling sites, was found to be tightly incorporated in various size of solid masses such as vapoiraied soil and A-bomb components.

W-III-3 Radiation Doses on residents near Semipalatinsk nuclear test site


We report here results of external dose evaluation by TLD technique and discussions on reported values of Internal/External dose ratio for the purpose of dose reconstruction for residents near Semipalatinsk nuclear test site. We evaluated external doses 100cGy and 60cGy for residents in Dolon and Semipalatinsk City by using a conversion factor between brick dose and external human dose, which we estimated. The ratios of Internal/External doses are evaluated to be 1.1 and 0.4 based on data from Kazakh and Russia. The former is lager than the latter as same as in case of reported values on the external dose. The detail evaluation will be needed in the future.