

Fukushima Daiichi Nuclear Power Station: Am and Cm analysis result in the soil

1. Analysis result

(Unit: Bq/kg· Dry soil)

Sampling spot (): Distance from the stack of Unit 1, 2	Data sampling/Analysis organization	Pu-238 ^{*1}	Pu-239 ^{*1} Pu-240 ^{*1}	U-234 ^{*2}	U-235 ^{*2}	U-238 ^{*2}	Am-241	Cm-242	Cm-243 Cm-244
Playground (west-northwest approx. 500m)	May 9 Japan Chemical Analysis Center	$(1.1 \pm 0.11) \times 10^{-1}$	$(4.1 \pm 0.64) \times 10^{-2}$	$(13 \pm 0.7) \times 10^0$	$(6.7 \pm 1.1) \times 10^{-1}$	$(13 \pm 0.7) \times 10^0$	$(1.5 \pm 0.39) \times 10^{-2}$	$(1.3 \pm 0.05) \times 10^0$	$(8.0 \pm 0.89) \times 10^{-2}$
Bird forest (west approx. 500m)		N.D.	N.D.	-	-	-	N.D.	$(1.7 \pm 0.49) \times 10^{-2}$	N.D.
Near the industrial waste disposal plant (south-southwest approx. 500m)		$(6.5 \pm 0.82) \times 10^{-2}$	$(3.0 \pm 0.53) \times 10^{-2}$	$(5.7 \pm 0.36) \times 10^0$	$(1.9 \pm 0.53) \times 10^{-1}$	$(5.7 \pm 0.36) \times 10^0$	$(2.4 \pm 0.66) \times 10^{-2}$	$(9.9 \pm 0.52) \times 10^{-1}$	$(4.5 \pm 0.88) \times 10^{-2}$
Average nuclide density ratio of fuel in Units 1 to 3 (ratio in case the ratio of Pu-238 is considered as 1) ^{*3}		1	-	-	-	-	0 . 1	1 0	1

*1 : Released on May 25th, 2011 *2 : Released on June 25th, 2011 *3 : Values calculated by ORIGEN Code (round number)

2. Evaluation

Detected Am and Cm are considered to derive from the accident due to following reasons.

- Cm-242, Cm-243 and Cm-244 are nuclides that do not exist in the natural world. In particular, Cm-242 whose half-life is relatively short (approximately 160 days) was detected.

- The density ratio of each nuclides (Am-241/Cm-242/Cm-243,Cm-244) to Pu-238 in the sample and is almost the same as the average nuclide density ratio of fuel in Units 1 to 3.

Pu-238 in the sample : (Am-241/Cm-242/Cm-243,Cm-244) 1 : (0.1/12/0.7)

Pu-238 in the sample : (Am-241/Cm-242/Cm-243,Cm-244) 1 : (0.4/15/0.7)

END