

Evaluation of Environmental Radiation Monitoring Results

Original released at March 30, 2011 16:45
Nuclear Safety Commission

The Nuclear Safety Commission evaluates the Environmental Monitoring Result published by MEXT (Ministry of Education, Culture, Sports, Science and Technology). The evaluation results based on the information published between March 29, 2011, 16:00 and March 30, 13:00 are described as below:

1. Spatial radiation dose rate

- Observation of spatial radiation dose rate at a distance of 20 km or more from Fukushima 1st Nuclear Power Plant found a relatively higher dose rate locally at several measuring points. It however does not reach the level that affects people's health.
- Some area that exceeds 100 $\mu\text{Sv/h}$ (Note 1) may reach the indoor sheltering index (10 mSv to 50 mSv) (Note 2). The area is still limited; for the time being, there are no needs to change the indoor sheltering area.

We need to further watch the variation of dose rate carefully, considering other factors such as weather and wind direction.

2. Radioactivity in the air

- With regard to the measuring results of dust samplings collected in March 29, maximum I-131 radioactivity is 75.0 Bq/m^3 ($7.5 \times 10^{-5} \text{Bq/cm}^3$); maximum Cs-137 radioactivity is 46.0 Bq/m^3 ($4.6 \times 10^{-5} \text{Bq/cm}^3$).
- For I-131, the value exceeds the concentration limit (Note 3). Considering that the half-life period of I-131 is such a short period as about 8 days, this concentration does not affect people's health in the current condition.
- We found that in some location the concentration of Cs-137 exceeds the limit (Note 3). This however was a transitory event; the concentration subsequently has been smaller than the limit, causing no effects on people's health in such a condition.

We need to further watch the variation of dose concentration in the air carefully, considering other factors such as weather and wind direction.

3. Aviation monitoring

- We obtained measuring results from the aviation monitoring.

We consider that to figure out the proliferation of emitted radioactive material, measurement of spatial radiation dose rate at the low altitude and low-speed must be conducted.

4. Environmental samples

- Monitoring results have been obtained on the land water (pond water or rain water), soil, fallout and sea water. Weed and land water showed a relatively higher values; we further need continued measurement on the drinking water (tap water) and foods.

- According to the measurement conducted in March 28, the maximum radioactive concentration in the seawater was as follows: on the surface layer, 11.8 Bq/L (1.18×10^{-2} Bq/cm³) for I-131 and 19.6 Bq/L (1.96×10^{-2} Bq/cm³) for Cs-137, and in the low layer (depth: 112 to 160m), 2.17 Bq/L (2.17×10^{-3} Bq/cm³) for I-131 and 8.64 Bq/L (8.64×10^{-3} Bq/cm³) for Cs-137. The maximum radioactive concentration for I-131 and Cs-137 in the dust above the sea was 23.5 Bq/m³ (2.35×10^{-5} Bq/cm³) and 3.27 Bq/m³ (3.27×10^{-6} Bq/cm³) respectively.

- It is considered that the concentration of radioactive materials emitted into the sea water will be considerably thinned since it is proliferated along with the tidal current before actually ingested by marine life such as fish and seaweed. In the measurement result in March 28, we found that upper and lower layer waters are mixed in the shallow water zone, requiring further observation. Since the I-131 has a relatively shorter half-life period, 8 days, it is assumed that its concentration will be substantially decreased before people take such marine foods.

We also need to continue environmental monitoring, in view of various elements such as change of weather.

5. Environmental radioactivity level survey by prefecture

1) Spatial radiation dose rate

Some prefectures showed a higher value compared with the average values before the accident; however, it will not affect people's health.

2) Drinking water (tap water)

- Be aware of the information related with the requirement announced by the MHLW (Ministry of Health, Labor and Welfare).

- In the prefectures of Fukushima, Ibaraki, Tochigi and others, readings of drinking water (tap water) measurement are 11 Bq/kg for I-131 and 5.4 Bq/kg for radioactive cesium at maximum. Both are lower than the index concerning the limited ingestion of food and drink (Note 4) as far as the data on “Environmental radiation level survey result (drinking water (tap water))” prepared by MEXT is evaluated.

We consider that further monitoring is needed on a continuous basis.

- (Note 1) Namie-machi about 30 km northwest of the Fukushima 1st Nuclear Power Plant (Location 32: measuring result in March 29, 10:57 was 43 $\mu\text{Sv/h}$; integrated value from March 28, 10:51 to March 29, 10:57 was 893 μSv (37.1 $\mu\text{Sv/h}$))
 Iitate-mura about 30km northwest of the Fukushima 1st Nuclear Power Plant (Location 33: measuring result in March 29, 11:19 was 18.9 $\mu\text{Sv/h}$; integrated value from March 28, 11:18 to March 29, 11:19 was 507 μSv (21.1 $\mu\text{Sv/h}$))
- (Note 2) “Disaster prevention measures at nuclear facilities” (Adopted in June 30, 1980, Nuclear Safety Commission)
<http://www.nsc.go.jp/shinsashishin/pdf/history/59-15.pdf>
- (Note 3) Limit of the radioactivity in the air outside the peripheral monitoring area boundary as specified by the law is: $5 \times 10^{-6} \text{Bq/cm}^3$ for I-131 and $3 \times 10^{-5} \text{Bq/cm}^3$ for Cs-137.
- (Note 4) “Disaster prevention measures at nuclear facilities” (Adopted in June 30, 1980, Nuclear Safety Commission), Index concerning the limited ingestion of food and drink (drinking water) are 300 Bq/kg for I-131 and 200 Bq/kg for Cs-137.