

The 2<sup>nd</sup> emergency recommendation regarding the response to the Great East Japan Earthquake

## Regarding the necessity of the investigation of radiation levels after the accident of the Fukushima Daiichi Nuclear Power Plant

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Science Council of Japan

Great East Japan Earthquake Task Force

Due to the accident of the Fukushima Daiichi Nuclear Power Plant, a high level of radiation has been observed over the wide area up to 30km from the nuclear power plant. Because the measured values differ significantly even when the measured locations are relatively close to each other, a detailed contaminant distribution map is essential to assure the safety of the restoration activities conducted in the evacuation areas as well as for decide on the timing of the return of the evacuees. If 1 measurement point is set in each square km of the area for various analyses, there are approximately 1,500 points, and if the area is divided into squares of a length of a few hundred meters and one measurement point is put in each square, there are 15,000 points. However, measurement on this scale has not been conducted yet.

Thus, a large-scale investigation by many measurement professionals is necessary, and immediate implementation is desired with the cooperation of universities etc.

Items that need to be measured include surface contamination on the ground, concentration levels of radiation in the air, radiation dose rate of the ground, and exposure dose of the residents.

Document: Example of the measurement plan

The items included in the measurement plan may be as follows, for example.

### 1. Surface contamination of the ground

Periphery of the nuclear power plant: Conduct a soil sampling of points in a 1km x 1km mesh in the 30km range, to 5 – 10 cm depth, and measure the distribution of the radioactive elements. When the samples are taken, measure the radiation dose rate with the survey meter.

Moreover, in parallel with the above, obtain a soil sampling from one point in each square several hundred meters in length, and measure the detailed distribution

with a GM detector.

(These measurements will be the most important data for the future farming activities. Moreover, it will serve as basic data for determining the radiation levels in the living environment of the residents and basic evidence for them to confirm their safety upon returning. These measurements will also be a basis for future database preparation and for the scientific analyses.)

2. Concentration level of radiation in the air

From the same location where the measurement of the radioactive element distribution in the ground was conducted, conduct the sampling by using an air sampler and measure the distribution of concentrations in the air.

3. Exposure dose of the residents

In addition to the screening of the residents that is already being implemented, make a special request to the evacuees and others for their cooperation and measure their level of I-131 and Cs-137 in the thyroid gland as well as the whole body with a counter. Keep a record of each person's lifestyle history prior to and after the accident as well.

Measurement and investigation of radiation requires mobilization of specialists and large-scale sampling. Moreover, it is desirable to start measurement immediately because the radioisotope of iodine has a short half-life.

The content of radioactive substances in the soil is significantly influenced by the amount of rain. For that reason, conducting the first complete measurement before the rainy season in June is a critical requirement, especially in order for this measurement to be usable as a standard for later measurements.

The number of samples, if multiple soils from one place are to be obtained, will exceed 5,000. Moreover, if one sampling is to be obtained in each of the squares several hundred meters in length, the number of samples will reach 15,000, which means that an extensive and well organized processing system will be required.

For that reason, under the leadership of the central government and with the cooperation of many universities, it is essential to construct a measurement/analysis system promptly to conduct the measurement investigation described above.