

Midterm Policy Report of the Committee for Validation of Decontamination

Following the Great East Japan Earthquake in March 11, 2011, severe accident in Nuclear Power Plant resulted in huge spread of radioactive materials over wide areas of Fukushima prefecture, and evacuation from the area had been ordered. Hirono town was also suffered radioactive contamination throughout of the town.

Systematic decontamination works started in March 2012 by launching special group in the Construction Division, aiming at reducing environmental radiation level and establishing safe level of radiation.

We report about division of radiation monitoring and decontamination.

Hirono Town Office

Sep, 2015

RSHPC

The group name of the Decontamination Inspection Committee has changed in 2015 to the Radiation Safety and Health Promotion committee (RSHPC)

Hirono-machi Houshasen taisakuka
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Concerning the Decontamination Committee for Hirono Town

Hirono Town has been designated an "Intensive investigation area for the degree of pollution" and drew up a decontamination plan.

- Radioactive materials released from the Fukushima No.1 Nuclear Power Plant of the Tokyo Electric Power Company were initially detected everywhere, in the dirt of lateral drainage grooves around living areas, and were recollected in fallen leaves and dead branches gathered as part of the daily cleanup following the disaster.
- The Act Concerning Special Measures for dealing with pollution by radioisotopes identified areas of special concern about environmental pollution from released radioisotopes following the disaster, and in the designated area the local communities were instructed to proceed with decontamination plans.
- After preparing an outline decontamination plan, Hirono Town was placed where the area for intensive investigation and decontamination.

Hirono Town established a Verification Committee to evaluate the effectiveness of decontamination activities.

- The Committee relied primarily on the reports of local residents to evaluate the overall current situation of the town, and the Committee focused especially on the health effects of resident's lives from the decontamination. Further, the Committee tried to find various ways to help the residents understand the situation in order to make decisions by themselves.



Plan and the Verification Hirono Town

The Decontamination Plan of Hirono Town

Goal of the Plan

The goal of the Plan was to decontaminate the entire community by removing all radioisotopes in order to relieve the anxiety of the residents about radioisotopes, and if possible to reconstruct normal life as it was before the nuclear plant disaster.

Implementing the Plan

The national government took responsibility for decontaminating the environment for the children of the community, including adopting any means necessary including financial measures, to reduce the annual additional exposure to a point below the level of 1mSv in the longer term. Tentatively, Hirono Town started decontamination activities to halve the additional exposure of residents since the nuclear plant incident. Eventually the town administration reduced the annual additional exposure to below 1mSv. Locations where children gather such as kindergartens, nurseries, public children's homes, elementary and middle schools, were targeted to hopefully achieve lower levels of additional annual exposure as soon as possible.

Plan Outline

Target to be achieved by August 2012:

Decontaminate environments where children gather including educational facilities, school zones, and communal facilities.

Target to be achieved by December 2012:

Decontaminate houses, rented accommodations, private properties, shops, offices, hospitals and factories.

Goal for 2013:

Decontaminate living spaces, including lands, fields, hybrid zones, cemeteries, railways, to include areas within 20 meters from roads.

Evaluation of the Decontamination Plan at Present

1

The Decontamination Process

By December 2014 most of the decontamination process had been completed.

The status of the decontamination process is shown in the panel to the right. The decontamination of public areas including educational facilities was completed. In the cases of living spaces, agricultural lands, and forests (within living areas), decontamination was undertaken as soon as the owner's consent was obtained.

The decontamination process (Dec,2014)	
living spaces	97.2%
agricultural lands	96.3%
public areas	100.0%
public roads	100.0%
forests (within living areas)	92.3%

2

Radiation Dose Rates of Living Areas

Most of the living areas were decontaminated as scheduled.

Based on the monitoring done in houses, at all of the five measuring points outside of a single house, the additional exposure doses were halved or decreased to below 1 mSv/year ($0.23 \mu\text{Sv/h}$). However, there remained some possibilities that the method of selecting the five measurement points for each house might have failed to completely record the exposure of the habitants. Thus, in some cases additional measurements were required within a house or agricultural-use field when taking into account the individual life patterns of the people who live and work there. In educational facilities, the air dose rate of exposure was sufficiently decreased, but additional protection might be required based on the actual situation because some measurement points showed an ambient dose rate of $0.40 \sim 0.45 \mu\text{Sv/h}$.



3

Individual Doses

Additional radiation exposure for students of elementary and junior high schools was reduced as planned, and the exposure rate of adults varied depending on life patterns.

The additional exposure rate of students was measured by using glass badge dosimeters and was reduced as was planned, although some adults showed a high exposure dose. Individual exposure doses are heavily affected not only by the location of the house, but also by the location of the work place and the life patterns of the adults. Therefore, evaluating the exposure in individual cases is still important, even when the air dose rate at the home is lower than $0.23 \mu\text{Sv/h}$.

In the survey of internal exposure to radiation, radioactive Cesium was detected in approximately 10 % of those surveyed, but none of them showed a continual effective dose higher than 1 mSv. Stricter quality control of the measurements might be required because some of the data showed higher doses of Cs-134 than Cs-137, in spite of the shorter half-life of Cs-134 than Cs-137.

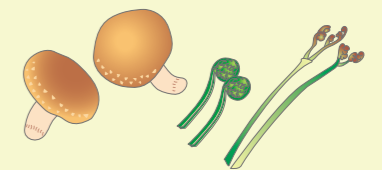


4

Food for Self-Consumption

Wild mushrooms and wild vegetables sometimes showed cesium concentrations exceeding the predetermined threshold.

Among plants used as food for self-consumption, only wild mushrooms and wild vegetables showed a higher value than the predetermined threshold. Thus, it is safest to check these plants before consumption. Since the half-life of Cs-134 is shorter than that of Cs-137, it is difficult to interpret the data obtained, suggesting the requirement of re-evaluating and maintaining quality control of the target material (such as the contamination of soil).



Taking these points into account, the exposure of radiation doses in Hirono Town is low enough to consider it inhabitable.

Recommendations by the Committee and the Practical Approach of the Town Government

Four Recommendations by the Committee

1 Measurement of ambient dose rate

It was worthwhile to perform the five-point monitoring exercises of all the houses for on five occasions between October 2011 to Aug 2014), and to additionally monitor from 2014 on. However, forest areas outside of the living areas as well as agricultural-use fields should also be included in this monitoring.

2 Measurement of the Personal Exposure Dose

Since the individual external exposure dose is affected by an individual's occupation and life pattern, it is necessary to carry out measurements more effectively, more precisely, and in a more specific way suited to the activities of each individual.

3 Obtaining Cooperation from Local Citizens

In order to devise a plan for the future of the town, including how to carry out continual decontamination, it is necessary to talk not only with the local government but also to get the cooperation of local citizens. Thus, government officials should devise a plan from the point of view of the local citizens by recollecting their own anxieties, and being willing to deal with the anxieties, questions and distress of all citizens.

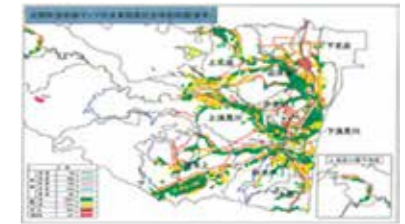
4 Providing Information

Although various types of decontamination activities were carried out, most citizens were not given an explanation of the entire plan. Also, information disclosures were performed by different divisions of the local government, and this was not done in a fully organized or efficient manner. It is still difficult for most citizens to estimate the risks they face from the radiation in Hirono Town.

Practical Approaches to be Carried Out by the Local Government

Measuring the Air Doses of Radiation

Not only continue the various kinds of survey monitoring done so far, but generate a colored map of the entire town based on ambient dose rate.



Measuring Personal Exposure Doses of Radiation

The goal is to accurately record hourly doses for different areas and for different occupations by the hour, using the D-shuttle personal badge which collects hourly data.



Obtaining Cooperation with Local Citizens

In order to return the confidence of local citizens by disclosing precise information on radiation and its effects of personal health and to consult with citizens about anxieties concerning their living environment, Hirono Town established a Radiation Counseling Office in November 2014. Local officials organize counseling meetings about radiation risks on a regular basis, and they publish official newsletters to provide the latest information on the radiation status of the town.

Providing Information

It is highly recommended that data obtained on radiation be explained to the local citizens. The local government is creating a new framework by centralizing the measurement of personal exposure doses, including both external and internal exposure, as well as for food and the environment, and providing this data along with counseling as part of the functions of the Radiation Counseling Office.

The town government will collect updated information about additional decontamination, and the removal of decontaminated waste to interim storage facilities.



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