

Responses and Actions

Taken by the Ministry of Health, Labour
and Welfare of Japan
on Radiation Protection at Works Relating
to the Accident at TEPCO's Fukushima
Daiichi Nuclear Power Station

13th Edition

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Executive Summary

1. Regulation of Dose in Emergency at the TEPCO Fukushima Daiichi Nuclear Power Station (NPS)

1) Exemption Ordinance

When the accident occurred at the TEPCO Fukushima Daiichi NPS, the dose limit for emergency tasks was 100 mSv based on Regulation on Prevention of Ionizing Radiation Hazards. After consideration of the security of the general public and the prevention of expansion of the nuclear disaster, however, the emergency dose limit in the affected plant was revised to 250 mSv on 14 March 2011 (Exemption Ordinance). On 1 November 2011, the emergency dose limit for new workers was returned to the original level (100 mSv) with some exceptions by the Minister of Health, Labour and Welfare. The exemption ordinance was lifted on 16 December 2011 when TEPCO completed step 2 of the road map.

2) Problems raised after the accident and the responses by MHLW and TEPCO

The responses and actions were taken for the following 22 cases by the Ministry of Health, Labour and Welfare (MHLW) and TEPCO. Identification of personal involved and dose control (8 cases): 1. Poor dose control system at the dose control department, 2. Insufficient numbers of personal dosimeters, 3. Lack of dosimeter-lending management, 4. Delayed notifications of doses to workers, 5. Delayed monitoring of internal exposure, 6. Re-evaluation of internal dose assessments, 7. Additional re-evaluation of internal dose assessments, 8. Unexpected events including inability to contact the people involved.

Concerns for respiratory protective equipment and protective clothing (4 cases): 1. Exceeding emergency dose limit for workers, 2. Exceeding dose limit for woman, 3. Improper use of respiratory protective equipment, 4. Improper protective gears.

Concerns for training for new workers (1 case): 1. Insufficient training hours for workers.

Concerns for health and medical care system (5 cases): 1. Establishment of the medical care system at the affected plant, 2. Prevention of heat stroke, 3. Instruction to conduct special medical examinations, 4. Establishing patient transport systems from the affected plant, 5. Long-term medical check-up program.

Preliminary review of work plans related to the accident (4 cases): 1. Poor management systems for developing work plans, 2. Lack of appropriate work plans, 3. Insufficient knowledge about contract conditions, 4. Improvement of lodging and meals.

3) Health management at the TEPCO Fukushima Daiichi NPS

MHLW established “Guidelines on Maintaining and

Improving Health of Emergency Workers at the TEPCO Fukushima Daiichi NPS” on 11 October 2011. Furthermore, these guidelines enhanced the provisions for long-term health management and dose control. On August 31, 2015, it was renamed “the Guidelines on Maintaining and Improving Health of Emergency Workers at Nuclear Facilities, etc.”. The Guidelines describe “Actions for long-term health control”, “Medium- to long-term dose control for emergency workers, etc., who exceed the ordinary exposure limits”, “Development of a database for workers who have been engaged in emergency works” and “Support provided by the Government”. Based on the guidelines, MHLW and TEPCO are implementing long term medical check-ups such as cancer screenings etc., according to the exposure dose values for the workers who had been engaged in the emergency works at the NPS.

4) Implementation status of measures against exposure to ionizing radiation in decommissioning works

In order to ensure the working conditions as well as the industrial safety and health of workers engaged in decommissioning works at the NPS, the Fukushima Prefectural Labour Bureau provided employers with focused supervision and instruction.

5) Recommendations

On 10 August 2012, in response to the issues of 20 cases, MHLW asked the employers who operate nuclear facilities to prepare for response to nuclear accidents that may necessitate emergency works and also to prepare for the actions that may need to be taken when such accidents occurred. This section shows preparations for accident, and the actions to be taken at the time of an accident by the employers in response to the directions.

6) Dose distribution of workers at the TEPCO Fukushima Daiichi NPS

The status of the radiation dose was summarized.

2. Decontamination Works in the Accident of the TEPCO Fukushima Daiichi NPS and Necessary Radiation Protection Measures

1) Radiation protection of workers involved in decontamination works

The Japanese Government has decided to carry out decontamination works and to manage the wastes from decontamination works and the clean-up of unmarketable contaminated goods. For prevention of contamination with radioactive materials of the workers, the Government has been required for ensuring that sufficient radiological protection is provided to them.

The Act on Special Measures Concerning the Handling of Environmental Pollution by Radioactive Materials Discharged by the Nuclear Power Station Accident Associated with the Tohoku District off the Pacific Ocean Earthquake was fully implemented starting from 1 January 2012.

The Nuclear Emergency Response Headquarters and the

National Reconstruction Agency revised the classification of the evacuation areas around the TEPCO Fukushima Daiichi NPS into 3 types of areas: 1. Area where evacuation orders are ready to be lifted, 2. Areas where the residents are not permitted to live, and 3. Areas where it is expected that the residents have difficulties in returning for a long time.

Activities for accident-derived waste disposal were subject to the Ionizing Radiation Ordinance; however, this ordinance did not contain sufficient regulations for employers involved in disposal work. Therefore, the Ionizing Radiation Ordinance was amended and the new guidelines were developed that summarize relevant laws and regulations.

2) Outline of ordinances which provide radiation protection during decontamination works and restoration and reconstruction works

The Decontamination Ordinance specifies actions to be taken by the employer to prevent radiation exposure of workers engaged in decontamination of soil, collection of removed soil/waste in the areas contaminated with radioactive materials released from the NPS. Actions are largely divided into three types, namely actions to reduce exposure, those to prevent spread of contamination, and education and health care of workers.

The MHLW published the ministerial ordinance which partially revised the Ionizing Radiation Ordinance for Decontamination. The ordinance was enacted on 1 July 2012. The revision focuses on the following points: 1. Work for contaminated soil with radioactivity higher than 10,000 Bq/kg (designated contaminated soil handling work) shall also be included in the decontamination operation, and 2. the Ionizing Radiation Ordinance for Decontamination shall also be applied to works other than decontamination at areas with an average ambient dose rate higher than 2.5 μ Sv/h.

The MHLW published a ministerial ordinance to revise the Ionizing Radiation Ordinance for Decontamination and it was enacted on 1 July 2013. This revision was made in light of the fact that disposal of waste contaminated with radioactive materials discharged by the NPS accident is expected to increase in scale with the progress of decontamination projects. In parallel with the revision, “Guidelines on Prevention of Radiation Hazards for Workers Engaged in the Accident-derived Waste Disposal” were prepared.

3) Status of the implementation of radiation protection in decontamination works

The Fukushima Prefectural Labour Bureau (PLB) has conducted inspections and given instructions within the jurisdiction of the Labour Standards Inspection Offices to employers in order to ensure proper conditions of employment and safety, and the health of workers engaged in decontamination works, etc.

3. Overview of Guidelines and Notifications

The following guidelines and notifications were issued.

- “Guidelines on Maintaining and Improving Health of Emergency Workers at Nuclear Facilities”

- Ordinance on Prevention of Ionizing Radiation Hazards at Works to Decontaminate Soil and Wastes Contaminated by Radioactive Materials Resulting from the Great East Japan Earthquake and Related Works

- “Guidelines on Prevention of Radiation Hazards for Workers Engaged in Decontamination Works”

- “Guidelines on Prevention of Radiation Hazards for Workers Engaged in Works under a Designated Dose Rate”

- Improvement of the safety and health management system of radiation and emergency works at nuclear facilities

- “Guidelines on Prevention of Radiation Hazards for Workers Engaged in (Nuclear) Accident-derived Waste Disposal”

- Radiation exposure doses registration systems for decontamination and related works

- “Guidelines on Occupational Safety and Health Management at the TEPCO Fukushima Daiichi Nuclear Power Station”

4. Epidemiological Studies on Emergency Workers

1) MHLW compiled a report of the expert meeting series held since February 2014, in which discussions were made about how to make plans for epidemiological studies targeting emergency workers concerning radiation effects on human health.

This report describes the study target and method, health effect examinations, ascertaining cumulative doses, control of confounding factors, implementation system of studies, study period and evaluation and publication of study results.

2) A report was compiled regarding the Research on Thyroid Gland Examinations, etc. of Workers at the TEPCO Fukushima Daiichi Nuclear Power Station. The aim of this research was the epidemiological analysis of radiation effects on the thyroid gland by setting an exposed group (emergency workers exposed to radiation exceeding a thyroid equivalent dose of 100 mSv) and a control group (thyroid equivalent dose of 100 mSv or less), performing ultrasonic examinations for both groups and comparing the results. The results of the analysis were to be evaluated from the viewpoint of clinical medicine in terms of radiation effects on the thyroid gland.

5. Promoting to provide the information on the radiation doses of workers at TEPCO's Fukushima Daiichi NPS to the world

MHLW has been implementing *the Promotion to provide the information on the radiation doses of workers at TEPCO's Fukushima Daiichi NPS to the world* since the fiscal year 2013 in order to provide accurate information in a timely manner to international organizations and media abroad on the radiation exposure situation at this power station and the related exposure countermeasures. As part of the project for the fiscal year 2025, MHLW conducted activities to appeal for understanding of occupational safety and health during the emergency response and the decommissioning of the power station among experts by holding its own Webinar.

Introduction

In response to the accident of the Fukushima Daiichi Nuclear Power Station (NPS) that resulted from the Great East Japan Earthquake on 11 March 2011, the Tokyo Electric Power Company (TEPCO) undertook emergency works to which an emergency dose limit applied. The dose limit for the emergency works, which was originally 100 mSv, was temporarily increased to 250 mSv from 14 March to 16 December 2011, the day on which the Japanese Government declared that the affected plant had been stabilized as explained in Section 1.1.

During the emergency works, the Japanese Government observed various problems with the radiological protection of emergency workers. To regulate the implementation of radiological protection measures, the Ministry of Health, Labour and Welfare (MHLW) issued a series of compulsory directives and administrative guidance to TEPCO.

Based on the experiences and lessons learned, the MHLW recognized that to properly manage radiological exposure should a similar accident occur at another NPS, sufficient measures and systematic preparation for radiological management must be ensured, including the use of an exposure control system; the implementation of an exposure data control system, and worker training and work planning; and the maintenance of stockpiles of dosimeters, personal protective equipment and protective garments.

This document outlines the problems that occurred during the emergency response to the accident and the measures taken by the MHLW and TEPCO in Section 1.2. The recommendations to avoid the recurrence of similar problems are provided in Section 1.5.

Furthermore, as a result of the accident at the Fukushima Daiichi NPS, large amounts of radioactive materials were released. For rehabilitation of the contaminated areas, the Japanese Government decided to carry out decontamination works (e.g., clean-up of buildings and remediation of soils and vegetation) and to manage the wastes resulting from decontamination and unmarketable contaminated goods.

For the radiological protection of the decontamination workers, the Japanese Government needed to establish new regulations because the existing regulations did not fit the “Existing exposure situations” in which radioactive sources have been scattered in wide areas from the plant. The new regulations aim to set the appropriate protection standards in accordance with the risk of the ambient dose rates, radioactivity concentrations, and types of radionuclides resulting from the NPS accident, which are equivalent to or more than the typical protection standards required in planned situations. This document explains the key issues of the new regulation and guidelines in Section 2, and the established regulations and guidelines are outlined in Section 3.

The 13th edition is updated with new information in Sections 1.3.2 and 2.3, reflecting the latest numeric data and reports. The dose distribution tables in Section 1.6 were thoroughly updated using the latest information of October 2025.

As part of the project enhancing the International Transmission of Radiation-Related Information on the workers at TEPCO's Fukushima Daiichi NPS, Section 5 summarizes its activities including organization of the webinar.