

Overview of the Ministerial Ordinance on the Partial Revision of the Ordinance on Prevention of Ionizing Radiation Hazards and Related Regulations, etc.

31 August 2015

Office for Radiation Protection of Workers
Ministry of Health, Labour and Welfare

Overview of the Review Meeting on the Ministerial Ordinance

1 Objectives of the establishment of the expert meeting*

* Expert Meeting on the Long-term Healthcare of Workers at the TEPCO Fukushima Daiichi Nuclear Power Plant

- Consideration of long-term healthcare for **emergency workers at the TEPCO Fukushima Daiichi Nuclear Power Plant** including the period after termination of their employment and radiation exposure dose control for emergency workers whose exposure exceeded the dose limit for regular radiation works
- Investigation of the preferred way of healthcare, medical care system, exposure dose control and special education **in the case of carrying out emergency works in the future**

2 Points of consideration at the expert meeting

- ① Approach for managing long-term healthcare of emergency workers
- ② **Medical examinations during the emergency works**
- ③ Pre-planning to ensure the medical care system in nuclear facilities during emergency works
- ④ Preferred way of mid- to long-term exposure dose control for the emergency workers whose exposure has exceeded the dose limit for regular radiation works
- ⑤ **Preferred way of healthcare during the emergency works**
- ⑥ **Special education provided to exceptional emergency workers**

(Note) Underlined items are those related to the revision of the ministerial ordinance.

3 Participants of the review meetings

Names	Affiliations
Makoto Akashi	Executive Director, National Institute of Radiological Sciences
Kazunori Kodama	Chief Scientist, Radiation Effects Research Foundation
Nobuyuki Sugiura	Director of Research Center for Radiological Environmental Effects, Nuclear Safety Research Association
Tomotaka Sobue	Professor, Environmental Medicine and Population Sciences, Department of Social Medicine, Graduate School of Medicine, Osaka University
Nobuhiko Ban	Professor, Faculty of Nursing at Higashigaoka, Tokyo Healthcare University
Kazuhiko Maekawa	Professor Emeritus, University of Tokyo and Chairman, Humanitarian Medical Assistance
Mari Michinaga	Executive Board Member, Japan Medical Association (Occupational Health)
Koji Mori	Professor and Director, Occupational Health Training Center, Institute of Industrial Ecological Sciences, University of Occupational and Environmental Health

4 Schedule

- Period of the expert meetings (December 2014 to April 2015)
- Publication of the report summarizing the results of the meetings (May 2015)
- Accepting public comments on the draft Ministerial Ordinance, etc. (May – June 2015)
- Consultation with and Recommendations from the Labor Policy Council on the draft Ministerial Ordinance (18 June 2015)
- Recommendations from the Radiation Council (30 July 2015)
- Promulgation of the Ministerial Ordinance (31 August 2015)
- Enactment of the Ministerial Ordinance (1 April 2016)

1. Exposure Dose Control during Emergency Works (Objectives)

Setting up and application of emergency radiation exposure dose limit at the time of the Fukushima Daiichi Nuclear Power Plant accident

- **After the nuclear emergency declaration, an exceptional emergency dose limit of 250 mSv was stipulated in an exemption of the Ministerial Ordinance** while balancing health risks of the workers and the interest of protecting life and property of the neighboring residents.
- In light of the reduced exposure dose with time, the applicable works were limited in a step-by-step manner and **the exemption of the Ministerial Order was abolished when the stability of the nuclear reactors was ensured.**

Principles

- **The ICRP (International Commission on Radiological Protection) principles of justification**
 - ◆ The emergency dose limit beyond 100 mSv needs a justification reason.
 - The reason used in international documents is “**to avoid a catastrophic situation**”.
 - The application should be limited to those workers who can respond to such a situation (**with sophisticated knowledge and skills**).
- **Concept of the emergency dose limit**
 - ◆ It is hard to **foresee at this point any necessity** of working **beyond the dose limit of 250 mSv.**
 - ◆ For **ensuring prevention of depression of the immune function, it is conservative, yet appropriate to adopt 250 mSv**
- **Risk management for a nuclear disaster**
 - The “catastrophic situation” is defined in the Act on Special Measures Concerning Nuclear Emergency Preparedness (The Nuclear Emergency Act) as the case that a “**nuclear emergency situation**” or a **high concern that a situation leading to it** has occurred.
 - For risk management in a nuclear disaster, **appropriate measures need to be taken immediately.**
- **The ICRP principles of optimization** (minimize the radiation exposure dose)
 - ◆ Conduct **limitation of the works for application of the exposure dose limit and conduct the step-by-step reduction of the exposure dose limit** immediately, depending on the work progress, etc.
 - ◆ **Lift the exceptional emergency dose limit immediately if** the stability of the nuclear reactor is secured.

1. Exposure Dose Control during Emergency Works (Contents of the Ministerial Ordinance - 1)

(1) Setting of the exceptional emergency dose limit

- Considering the situation of the accident concerning the emergency works and other circumstances, **the Minister of Health, Labour and Welfare may separately set an exposure dose limit (exceptional emergency dose limit) or change it within the range not exceeding 250 mSv** when he/she considers that it is difficult to follow the dose limit of 100 mSv for effective dose during the emergency works.
- In a situation **when a nuclear emergency or a state highly likely to lead to it* arises**, the Minister of Health, Labour and Welfare shall **immediately define the exceptional emergency dose limit as 250 mSv**.
- The Minister of Health, Labour and Welfare shall **change the exceptional emergency dose limit and lift it as soon as possible** by taking into consideration the radiation exposure doses of the exceptional emergency workers, works required to terminate the accident and other conditions.
- When the Minister of Health, Labour and Welfare has set separately, changed or lifted the exceptional dose limit, he/she shall **issue a public notice** to that effect.

* Designated by the notice from the Minister of Health, Labour and Welfare from among events specified in Article 10 (Notification events) of the Act on Special Measures Concerning Nuclear Emergency Preparedness, to those that show the increase of radiation doses or the detection or signs of radioactive materials, and likely to immediately lead to nuclear emergencies, and are assumed to require works under a high radiation environment to prevent its spread.

(2) Limitation of exceptional emergency workers

- The exceptional emergency workers should be selected from among the **nuclear disaster prevention workers, etc.** * prescribed in the Nuclear Emergency Act.

* **This refers to nuclear disaster prevention workers specified in Article 8 , paragraph 3 of the Nuclear Emergency Act, nuclear disaster prevention managers specified in Article 9 , paragraph 1 of the said act or nuclear disaster prevention sub-managers specified in paragraph 3 of the said article. They shall be the workers under the nuclear facility employer, in principle.** In the case that a nuclear facility employer **outsources part of the works (e.g. remediation of damaged equipment)**, in accordance with the laws and regulations, **the workers belonging to the outsourced operator shall be included in the nuclear disaster prevention workers, etc.**

1. Exposure Dose Control during Emergency Works (Contents of the Ministerial Ordinance - 2)

(3) Optimization of exposure dose control for exceptional emergency workers

- Employers **shall ensure that the exposure dose of workers will not exceed the exceptional emergency dose limit** during the exceptional emergency works.
- Employers **shall make efforts**, depending on the circumstances of the accident, **to minimize the risks that exceptional emergency workers are exposed to ionizing radiation.**

(4) Submission of records of exceptional emergency workers

- Employers shall report the following matters for the exceptional emergency workers to the Minister of Health, Labour and Welfare.
 - **Medical examination results for the individual workers (without delay after the examinations)***
 - **Radiation exposure dose records of individual workers (at the end of every month during the emergency work period)***
- * These records are accumulated in the database operated by the Ministry of Health, Labour and Welfare for long-term follow-up healthcare management of the subject workers.

(5) Measuring exposure doses of emergency workers, and then confirming, recording and reporting of the results

- Employers shall conduct **internal exposure measurement*** of emergency workers **once within every month** for the workers entering any place in radiation controlled areas where radioactive materials might be inhaled or ingested by the workers.
 - * **External exposure measurement** shall be conducted **at all times** during the period when workers enter the radiation controlled areas (not revised).
- For the exposure dose of workers during the emergency works, employers shall **calculate** and **record** the **sum of their effective doses monthly, annually and in every five years without delay, and preserve the records for 30 years***.
 - * However, this shall not apply to the case where the data are delivered to an organization designated by the Minister of Health, Labour and Welfare after preservation for five years.
- Employers shall report the following matters periodically to the Minister of Health, Labour and Welfare.
 - **The number of workers whose external exposure doses exceed 50 mSv in one year that fall under every classification of dose (15 days after the emergency works start and on every subsequent 10 days thereafter)***
 - **The number of workers that fall under every classification of effective dose (at the end of every month (except for the month that the accident has occurred in)).***
- * Including workers of the related contractors when this provision applies to any employees of the primary contractor.

2. Special Education Provided to Exceptional Emergency Workers (Ministerial Ordinance)

Principles

- The purpose is to reduce exposure doses of the workers during the exceptional emergency works by ensuring their understanding of risks such as possible health impact due to radiation as well as giving information about the work and instructing them how to handle and wear the protective gear.

Note: This is provided to workers only who have had the special education for regular radiation workers

- Limited to those workers who have **sophisticated knowledge and skills to respond to emergencies***

* Nuclear disaster prevention workers, nuclear disaster prevention managers or nuclear disaster prevention sub-managers, as specified in the Nuclear Emergency Act.

Special education provided to exceptional emergency workers (Details of the Ministerial Ordinance)

- When assigning workers to the exceptional emergency works, employers shall provide those workers with the special education for the following subjects

Note: Details of the scope, hours etc. will be defined in the “Exceptional Emergency Work Special Education Rule” (tentative name).

< Lectures (Approximately 6.5 hours) >

(1) Knowledge on the structures and the handling methods of the facilities and equipment which are used in exceptional emergency works (2 hours), (2) Knowledge on the methods of the works involved in exceptional emergency works (3 hours), (3) Knowledge on the biological effects of ionizing radiations and the exposure dose control method (1 hour) and (4) Relevant laws and regulations (0.5 hours)

< Practices (Approximately 6 hours) >

(1) Handling methods of the facilities and equipment used for the works involved in the exceptional emergency works (3 hours) and (2) Methods of the works involved in the exceptional emergency works (3 hours)

Note: For the implementation frequency, the “Guideline for Safety and Health Education for Workers that Are Engaged in Dangerous or Hazardous Works” will be revised so as to provide the workers with retraining for practices once a year in order for them to maintain the required skills, and with reeducation in lectures when educational contents are changed.

3. Healthcare during Emergency Works (Ministerial Ordinance)

Emergency Ionizing Radiation Medical Examinations (Details of the Ministerial Ordinance)

- Employers shall provide medical examinations for the following items* to the emergency workers (a) once within a month regularly during their working period, and (b) when the workers are transferred from emergency works to other work or at the time of termination of their employment.
 - Existence of subjective symptoms and objective symptoms
 - Examination of white blood cell count and differential count
 - Examination of red blood cell count and examination of hemoglobin content or hematocrit
 - Examination of thyroid stimulating hormone, free triiodothyronine and free thyroxine
 - Eye examination for cataract
 - Skin examination
- * Employers can omit the medical examinations for items other than existence of subjective symptoms and objective symptoms when those examinations are conducted periodically and are recognized unnecessary by a medical doctor.
- Employers shall conduct recording, hearing of opinions from the medical doctor, notification to workers, and reporting to the Labour Standards Inspection Officer with jurisdiction of the results of the medical examinations, and employers shall take aftercare measures in accordance with the medical examination results.

4. Long-term Healthcare after the Emergency Works (Ministerial Guideline)

Principle

- Medical examinations of emergency workers such as cancer screening in accordance with the Ministerial guideline* were reviewed based on the state of the art knowledge.
 - * Guideline for maintenance/improvement of the health of emergency workers at TEPCO Fukushima Daiichi Nuclear Power Plant (Public Notice No. 5, 11 October 2011)

Healthcare after the emergency works (Revised Ministerial Guideline)

- Newly added examination items such as cancer screening
 - Added cancer screening items (Chest CT and colonoscopy)
 - Added infectious disease tests (pylori antibody test and hepatitis screening), and mandated neck ultrasound test for thyroid gland inspection
 - Added chronic kidney disease test (renal function tests) and antismoking education
- Implementation of a stress check
 - To be provided to all emergency workers as much as possible
 - Support by nuclear facility employers and primary contractors to related contractors in implementing the check.

Ensuring the healthcare system in nuclear facilities (Financing)

- Establish a network organization that could dispatch medical doctors to nuclear facilities immediately if such disasters should occur.
 - Conduct recruitment, training and dispatch of medical staff members, organization of coordination, practices etc.

5. Exposure Dose Control for the Emergency Workers Whose Exposure Dose Exceeded the Dose Limit for Regular Radiation Works (Ministerial Guideline)

Principles

- Employ lifetime dose of 1 Sv as used by the ICRP as a base for setting exposure dose limit
 - **Mid- to long-term exposure dose control** includes ensuring that workers **not be exposed beyond the exposure dose limit for regular radiation works (100 mSv/5 year and 50 mSv/1 year) as well the lifetime dose of 1 Sv** for the cumulative exposure dose (total of emergency exposure dose and regular exposure dose)
- In the accident of the TEPCO Fukushima Daiichi Nuclear Power Plant, the exposure dose limit shall be set for every worker because their employers are clearly known.
 - Additional policy will be considered in cases when the employment system should be significantly different from this in future emergency works.
- For the dose control term including the time of accident occurrence (5-year term), the concept that allows **a certain margin** should be adopted regarding application of the dose limit for regular radiation works only if it is inevitable to do so in order to guarantee safe operation of the nuclear facility.

Dose control after the dose control terms subsequent to that including the time of the accident occurrence (Revised in the Ministerial Guideline) for workers who are exposed to the dose beyond the dose limit for regular radiation works

Employers shall set the additional radiation dose limit in the following manner

- Radiation dose limit for 5 years* = **(Remaining dose/Remaining working period) x 5 years**
 - **Remaining dose:** Dose for the lifetime (1 Sv) minus cumulative dose (total of emergency dose and regular dose)
 - **Remaining working period:** Age when he/she is to retire (68 supposing that a worker starts working at age 18 and works for 50 years) minus the current age.
 - Example: Emergency dose = 500mSv, Radiation exposure dose from regular works = 100 mSv (cumulative exposure dose = 600mSv); Age = 45
 - $(1000 \text{ mSv} - 600 \text{ mSv}) / (68 - 45) = 17.4 \text{ mSv/year}$
 - Radiation exposure limit per 5-year period: $17.4 \text{ mSv/year} \times 5 \text{ years} = 87 \text{ mSv} \Rightarrow 85 \text{ mSv}$ (by rounding down)
- * The radiation dose limit for regular works (100 mSv/5 years) shall not be exceeded.

Dose control for regular radiation works during the dose control terms including the time of the accident occurrence (Revised in the Ministerial Guideline)

- Employers may assign regular radiation works to a worker whose total radiation exposure dose (the emergency radiation exposure dose and the regular radiation exposure dose) exceeds 100 mSv/5-year period, where radiation exposure is additionally being controlled under **5 mSv/year, only if he/she is a member of the essential human resources needed to guarantee safe operation of the nuclear facility.**