Labour Standards Bureau Notification No.0810-1
10 August 2012

To:
Directors
District Labour Bureaus listed in Appendix

From:
Director
Labour Standards Bureau
Ministry of Health, Labour and Welfare (Official seal imprinted)

Re: Instructions to enhance actions for safety and health management measures for radiation works and emergency works at nuclear facilities

The Ministry of Health, Labour and Welfare (MHLW) has made efforts to ensure that actions for safety and health management are taken at nuclear facilities regarding the radiation works prescribed in the Attached Table 2 of the Order for Enforcement of the Industrial Safety and Health Act (Cabinet Order No.318) (hereinafter referred to as "radiation works"), by issuing a notification "Re: Instructions to enhance actions for safety and health management for radiation works at nuclear facilities (Labour Standards Bureau Notification No.581, 19 September 2000, partially revised on 30 March 2001, hereinafter referred to as "the Notification No. 581"). In order to conduct the emergency works under Article 7 of the Ordinance on Prevention of Ionizing Radiation Hazards (Ministry of Labour Ordinance No. 41, 1972, hereinafter referred to as "the Ionizing Radiation Ordinance") to respond to the accident at the Tokyo Electric Power Company (TEPCO) Fukushima Daiichi Nuclear Power Plant, associated with the Great East Japan Earthquake on 11 March 2011, and in light of the results of the similar instructions that MHLW has provided TEPCO so far, it is also important for nuclear facility employers to make necessary preparations in a systematic manner with respect to exposure dose management, use of protective equipment and clothing, and education and health care for workers during the emergency works at nuclear facilities.

Thus, MHLW has decided to enhance the comprehensive framework for safety and health management and ensure full compliance regarding radiation works and emergency works at nuclear facilities carried out by primary contractors and involved subcontractors, and requests the directors

of the District Labour Bureaus to ensure that all of the measures are properly conducted.

It should be noted that the Notification No. 581 has been abolished and replaced by this Notification.

Notes

Section 1 Objective, Applicable Activities and Actions

1. Objective

   In an effort to ensure the safety and health of workers, it is vital that not only the nuclear facility employers (the employers that own the nuclear facilities described in Section 1, Part 2 of this notification and referred to hereinafter), but also the primary contractors who undertake the work under a direct contract with the nuclear facility employer commit to safety and health management including safety management, exposure dose management, and health care by adopting the Plan-Do-Check-Act cycle. In addition to the nuclear facilities, the head office, other main offices, and the organization in the headquarters of the nuclear facility employer or the departments related to nuclear energy other than the nuclear facilities (hereinafter collectively referred to as "the head offices"), and the primary contractor should also fulfill each of their roles particularly for exposure dose management during emergency works. Therefore, a framework for safety and health management which clarifies the roles of the head offices, the head of the nuclear facility and the primary contractor, needs to be established under the primary responsibility of the nuclear facility employer.

2. Applicable activities

   This notification covers the radiation works and emergency works at nuclear facilities specified in the following laws and regulations.

   (1) Fuel facilities specified in Article 13 Paragraph 2 Item 2 of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (Act No. 166, 1957; hereinafter referred to as "Reactor Regulation Act").
   (2) Reprocessing facilities specified in Article 44 Paragraph 2 Item 2 of the Reactor Regulation Act.
   (3) Usage facilities, etc. (limited to the facilities using the nuclear fuel materials specified in Article 41 of the Order for Enforcement of the Act for the Regulations of Nuclear Source Materials, Nuclear Fuel Materials and Nuclear Reactors (Cabinet Order No.324, 1957)), specified in Article 53 Item 3 of the Reactor Regulation Act (Article 53 Item 2 after the

enforcement of the Act for Establishment of the Nuclear Regulation Authority (Act No. 47, 2012; hereinafter referred to as "the Revised Law")).

(4) Reactor facilities specified in Article 23 Paragraph 2 Item 5 of the Reactor Regulation Act (except those related to the TEPCO Fukushima Daiichi Nuclear Power Plant; after the enforcement of the Revised Law, reactor facilities for test and research and for power generation are respectively specified in Article 23 Paragraph 2 Item 5 and in Article 43-3-5 Paragraph 2 Item 5 of the law).

3. Actions

(1) The district labour bureaus with jurisdiction over nuclear facilities (hereinafter referred to as "the nuclear facility supervising labour bureaus") shall provide necessary instructions regarding the matters specified in Sections 2 to 5 to the heads of the nuclear facilities within their jurisdiction so that actions applicable to each nuclear facility are properly taken.

(2) The district labour bureaus supervising head offices of nuclear facility employers (hereinafter referred to as "the head offices supervising labour bureau") shall provide necessary instructions to the directors of the head offices within their jurisdiction, when requesting the voluntary inspection be performed as specified in Section 5 Paragraph 6 and the inspection results be submitted.

(3) Both the nuclear facility supervising labour bureau and the head offices supervising labour bureau shall make efforts to develop mutual and close cooperation so that they can respond to each nuclear facility employer in an integrated manner.

Section2 Actions to be taken by the nuclear facility employers as a primary contractor

1. Establishing the framework for safety and health management

Every nuclear facility employer is required to conduct safety and health management for radiation works at nuclear facilities (hereinafter referred to as “the safety and health management") in accordance with the Industrial Safety and Health Act (Act No. 57, 1972) and the Ionizing Radiation Ordinance. The nuclear facility employer is regarded as the primary contractor under Article 29 of the Industrial Safety and Health Act when assigning part of its business to other contractors at the same location. In addition, it is regarded as the primary contractor under Article 30-2 of the Act when the nuclear facility is categorized as a manufacturing industry.

Therefore, the nuclear facility supervising labour bureaus shall provide instructions to the head of the nuclear facility regarding the following actions to ensure that the nuclear facility, as the primary contractor, provides instructions or support to the involved subcontractor as the

employer to take the actions in a proper manner and conduct appropriate safety and health management for the entire nuclear facility.

(1) Designation of a general safety and health manager for the nuclear facility

A person shall be designated who supervises safety and occupational health management of the nuclear facility (hereinafter referred to as “general safety and health manager”) among the individuals who supervise and manage the business implementation, and the person shall be assigned the responsibility to conduct the tasks specified in Section 2 Paragraph 1 Items (3) and (4), in order to ensure that the safety and health management for the entire nuclear facility is conducted in an appropriate manner.

In addition, in order to properly manage radiation exposure doses of workers of the nuclear facility employer and involved subcontractors, a person shall be designated who supervises radiation management in the nuclear facility (hereinafter referred to as "radiation administrator") and the person shall be assigned to conduct tasks specified in Section 2 Paragraphs 2 and 3 in an appropriate manner under the direction of the general safety and health manager, and to provide instructions or support necessary to ensure that the radiation administrator of the involved subcontractor performs tasks necessary for the workers under the said subcontractor.

(2) Designation of a person responsible for safety and health management in the involved subcontractors

Instruction shall be provided to the involved subcontractors to designate a person responsible for safety and health management and to assign him/her the responsibility to conduct the following tasks.

a. Maintain contact with the general safety and health manager
b. Maintain coordination with the general safety and health manager to facilitate the tasks prescribed in Section 2 Paragraph 1 Items (3) and (4) relevant to the involved subcontractor.
c. Maintain contact and coordination of tasks with the persons responsible for safety and health management in all of the other involved subcontractors when the involved subcontractor commissions part of its business to other involved subcontractors.

(3) Holding safety and health coordinating meetings by all involved subcontractors engaged in radiation works.

a. The safety and health coordinating meeting framework shall be established to include all of the involved subcontractors, and meetings hall be held once within a month on a regular basis. The general safety and health manager and the persons responsible for safety and health management in the involved subcontractors shall be required to participate in the said meetings.

b. The matters to be discussed in the meetings shall include:

(a) Coordination among the nuclear facility employers and the involved subcontractors, and among the involved subcontractors.

(b) Measurement of working environment with respect to external radiation dose and concentrations of airborne radioactive materials, and improvement of the work environment or cautions to be taken during work based on the measurement results.

(c) Safety and health education regarding subjects such as radiation works including education for new workers.

(d) Preparation and improvement of work rules and work plans (including exposure dose management for workers and measures to reduce exposure dose that workers receive).

(e) Use of standardized signs and alarms during radiation works.

(f) Measures against heat stroke.

(g) Actions in the case that an accident or occupational hazard occurs such as evacuating workers, transporting injured workers, etc.

(4) Instructions or support for developing work rules and work plans

a. Provide instructions or support to the involved subcontractors as required as well as provide material and information necessary to ensure that they develop proper work rules and work plans.

b. Check the description of the work rules and work plans beforehand for activities to be conducted by the involved subcontractors that may cause their workers to receive effective doses exceeding 1 mSv per day.

c. The department responsible for radiation management of the nuclear facility shall focus on the management method of the exposure doses to check item (b), and provide instructions or support for improving the work rules and work plans if necessary.

d. Provide instructions to the involved subcontractors to make their workers aware of the work rules and work plans.

2. Strengthening the function of controlling access of radiation workers to the nuclear facility

The nuclear facility supervising labour bureaus shall provide instructions to the head of the nuclear facility to establish a place to control access of workers to controlled areas and to ensure that the following access control is implemented in order to collect information on all of the radiation workers.

(1) Collection of basic information on workers

In order to successfully control exposure dose and access of all of the radiation workers in the nuclear facility, the involved subcontractors shall be requested to submit documents that can identify the following basic information on the workers under their contract (copies of

the official documents as to their names, dates of birth, and addresses), and to save the documents.

a. Name of the site where work is to be carried out
b. Name of the worker
c. Date of birth
d. Address and phone number
e. The most recent dates of the ionizing radiation medical examination and general medical examination
f. Date of the education implemented for new workers

(2) Issuance of access permits and access control

Access permits with the personal identification number (hereinafter referred to as "ID number") and photo of the worker shall be issued for workers who completed the required special education for persons newly started work at the nuclear facility. Exposure dose measurements (including the duration of lending dosimeters) shall be recorded along with their ID numbers.

3. Strengthening of management of information on exposure doses

The nuclear facility supervising labour bureaus shall provide instructions to the heads of the nuclear facilities to implement the following actions.

(1) Be sure to obtain exposure dose information of all the radiation workers in the controlled areas of the nuclear facilities including those under the involved subcontractors, and provide instructions or support necessary to ensure that their exposure doses are reduced.

(2) Notify all the radiation workers in the controlled areas of the nuclear facilities (or the involved subcontractors as to the workers employed by them) by written notice of cumulative external exposure doses basically once a month, and the sum of cumulative external and internal exposure doses once every three months, and provide instructions or support to ensure that the involved subcontractors notify their workers by written notice of the cumulative exposure doses as soon as the involved subcontractors received the notification.

4. Instructions or support for safety and health management education

The nuclear facility supervising labour bureaus shall provide instructions to the heads of the nuclear facilities to implement the following actions.

(1) Instructions or support for safety and health management education

Provide, as appropriate, instructions and dispatch instructors, or provide support for educational materials and facilities to the involved subcontractors who implement education

that will be necessary for those engaged in radiation works at nuclear facilities such as special education, and education for managers. Particularly, consideration shall be given to implementing the education using actual protective equipment (including instructions on proper wearing of respiratory protective equipment using fitting testers, and preventive measures against leakage such as using seal pieces for those wearing eyeglasses), protective clothing, and radiation measurement instruments and the education regarding emergency actions and evacuation in case of an accident, and establishing a facility for safety and health education where visual and audio materials are available.

(2) Measurement of working environment

The nuclear facility employers shall basically measure the working environment in the nuclear facility with respect to external radiation doses and concentrations of airborne radioactive materials as a part of the nuclear facility management, and notify the involved subcontractors of the results and make the results available for them.

(3) Ionizing radiation medical examination

a. Provide necessary instructions or support by helping the involved subcontractor to implement the ionizing radiation medical examination at the same time as the examination by the nuclear facility employer, and by introducing qualified medical examination institutions, according to the involved subcontractor's request.

b. Provide support for health care of the workers employed by the involved subcontractor by giving opinions concerning the result of the ionizing radiation medical examination, health guidance and other necessary instructions by industrial medical doctors of the nuclear facility employer, according to the involved subcontractor's request. In addition, if the result of the ionizing radiation medical examination shows a need to take an occupational action for a worker employed by the involved subcontractor, provide instructions for the action and considerations necessary to ensure that the action is taken in an appropriate manner, according to the involved subcontractor's request.

(4) Actions in case of an accident or occupational hazard

a. Evacuation, etc. in case of an accident or occupational hazard

Establish an emergency system involving subcontractors including communication, evacuation, transportation and emergency care for disaster victims in case of an accident or occupational hazard, disseminate the emergency system to the involved subcontractors, and conduct the joint practical exercise with them as required.

b. Establishment of measures to prevent recurrence of the accident or occupational hazard

If an accident or occupational hazard occurs, thoroughly study the causes, course of development, communication and emergency works immediately and identify issues to be addressed and establish measures to prevent the recurrence, and require the involved

subcontractors to disseminate the information.

Section 3 Actions to be taken by the primary contractors and the heads of the nuclear facilities for regular inspections and construction works

1. Actions to be taken by the primary contractors

As for large-scale repair works of facilities or equipment, such as regular inspection works at nuclear facilities, which are commissioned by the head of a nuclear facility to an external contractor (hereinafter referred to as "regular inspections and construction works"), if the employer who was directly commissioned by the nuclear facility employer assigns part of its business to subcontractors at the same location, the employer is regarded as the primary contractor under Article 29 of the Industrial Safety and Health Act, and also as the specified primary contractor under Article 30 of the Act when the commissioned work falls under construction.

Thus, the nuclear facility supervising labour bureaus shall provide instructions to the primary contractor to note the following matters and implement those specified in Section 2 Paragraphs 1 to 4 in cooperation with the general safety and health manager of the nuclear facility.

(1) Provide proper instructions or support to the involved subcontractors in cooperation with the head of the nuclear facility.

(2) Designate a radiation administrator to properly manage the exposure doses of workers employed by the nuclear facility employer and the involved subcontractor, in cooperation with the radiation administrator of the nuclear facility. Furthermore, provide instructions or support to the radiation administrator of the involved subcontractor so that he/she can take necessary actions for the workers employed by the involved subcontractor.

(3) Participate in the safety and health coordinating meetings held by the head of the nuclear facility, and facilitate cooperation between its own involved subcontractor and the meeting group.

(4) Notify the workers to be employed and the involved subcontractor of their exposure doses in a proper manner by written notice, in cooperation with the head of the nuclear facility.

2. Actions to be taken by the heads of the nuclear facilities

The nuclear facility supervising labour bureaus shall provide instructions to the heads of the nuclear facilities to implement the following actions.

(1) In light of the uniqueness of radiation works, the actions described in Section 2 Paragraph 1 Items (3) and (4), Paragraphs 2 and 3, and Paragraph 4 Items (1), (2), and (4) shall be implemented again by the general safety and health manager of the nuclear facility while

keeping close cooperation with the primary contractor.

(2) Provide instructions to the radiation administrator of the nuclear facility to focus on the management method of the exposure doses when checking the work rules and work plans developed by the primary contractor, and to provide instructions or support for improving the work rules and work plans if necessary.

Section 4 Instructions for preparation and implementation of emergency works

1. Instructions to implement voluntary inspections and continuous instructions based on the inspection results

During emergency works associated with the accident at the TEPCO Fukushima Daiichi Nuclear Power Plant in March 2011, various issues were found regarding exposure dose management, use of protective equipment and clothing, implementation of education for workers, implementation of health care, preparation of the framework for developing work plans, and understanding the contracting status. It is presumed that many of them could have been managed in a proper and immediate manner by advanced preparation.

Thus, both the nuclear facility supervising labour bureaus and head offices supervising labour bureaus shall provide instructions to nuclear facilities, head offices and primary contractors to conduct voluntary inspections on a regular basis of the progress of actions described in Annex 1-1, 1-2, and 1-3 "Actions based on lessons learned from the accident at the TEPCO Fukushima Daiichi Nuclear Power Plant (voluntary inspection items)" while keeping in mind the matters described below. In addition, instructions shall be provided to take necessary actions based on the inspection results, and as for the actions that are difficult to implement immediately, continuous instructions shall be provided so as to achieve them step-by-step

(1) Establishment of the council for a medical care system

Aiming to facilitate development of a medical care system and establishment of a system for transporting patients during an emergency in the nuclear facility, the nuclear facility supervising labour bureaus shall coordinate with the relevant institutions such as prefectural health care and medical offices, prefectural fire departments, nearby medical centers, nuclear facilities' and District Labour Bureaus, and other relevant agencies to establish a council to discuss the following issues among them (hereinafter referred to as "the council for a medical care system"). The nature of the council can be flexible according to the situation in the supervising area. It is also acceptable to found the council by expanding the function of an existing council or other group.

a. System for transporting patients from the nuclear facility

b. Medical care system in the nuclear facility during emergency works

c. Implementation system for special medical examinations during emergency works

(2) Instructions to be provided to primary contractors

Primary contractors shall choose the most appropriate timing such as at the time of a regular inspection of the nuclear facility when providing instruction to the primary contractor to implement voluntary inspections. It is vital to have the support of the head of the nuclear facility that is the operator of the facility, to instruct the primary contractor. Therefore, the head of the nuclear facility shall be informed about the details of the instruction and made to provide necessary instruction or support to the primary contractor.

2. Matters to be instructed immediately during emergency works

In the case that an event occurs such that a state of nuclear emergency is declared by the Nuclear Emergency Response Headquarters, and, in addition, when emergency works are conducted at the nuclear facility in response to the event, action would be taken by the government as a whole in accordance with a guideline for measures against nuclear disaster and other guidelines. Both the nuclear facility supervising labour bureaus and the head offices supervising labour bureaus also shall provide proper instructions to the nuclear facility, head offices and primary contractor upon noting Annex 2-1, 2-2, and 2-3 "Actions to be instructed to the nuclear facility employers when a state of nuclear emergency is declared", in order to reduce as much as reasonably achievable the exposure doses of workers engaged in the emergency works ,while keeping close cooperation with the MHLW.

Section 5 Reporting

1. Reporting of accidents, etc.

The nuclear facility supervising labour bureaus shall provide instructions to the head of the nuclear facility to submit a report (any form is acceptable) immediately to the manager of the relevant Labour Standards Inspection Office when: (a) an accident that falls under any item in Article 42 Paragraph 1 of the Ionizing Radiation Ordinance has occurred; (b) an occupational hazard has occurred during radiation works (including health impairment such as conditions requiring treatment at a medical facility); (c) fire, explosion, or leakage of or abnormal exposure to radioactive materials or substances contaminated with radioactive materials occurred; (d) an additional area with considerably high ambient dose rate was found in the nuclear facility; or (e) improper wearing of dosimeters was identified.

2. Reporting of the designated general safety and health manager

The nuclear facility supervising labour bureaus shall provide instructions to the head of the nuclear facility to submit a report (any form is acceptable) on the designation of the general safety and health manager to the relevant Labour Standards Inspection Office. It shall also instruct the facility head to submit a report when the general safety and health manager is replaced.

3. Report on radiation works

The nuclear facility supervising labour bureaus shall provide instructions to the head of the nuclear facility and the primary contractors to implement the following matters.

(1) It is important to develop work plans beforehand in order to reduce the radiation exposure doses of workers working at the places with high ambient dose to the level as low as reasonably achievable. Thus, when implementing radiation works that may cause the effective dose of workers to exceed 1mSv per day, an instruction shall be provided to submit the "radiation work notice" (Form No.1) to the director of the relevant Labour Standards Inspection Office prior to the implementation (or immediately after completion if an action needs to be taken within 24 hours after the situation is understood, such as response to a contingency). The notice shall be submitted by each primary contractor, each building or facility, and each construction (work) contract by the head of the nuclear facility if the nuclear facility employer does the work on its own and by the primary contractor if the nuclear facility employer only orders the work and provides design supervision.

It should be noted that this shall also apply to the case when emergency works are implemented for accidents described in each item of Article 42 Paragraph 1 of the Ionizing Radiation Ordinance.

(2) An instruction shall be provided to immediately submit a report (any form is acceptable) to the director of the relevant Labour Standards Inspection Office on the average, highest, and total effective doses of workers engaged in the work stated in (1) after its completion.

4. Report on the status on safety and health management

The nuclear facility supervising labour bureaus shall provide instructions to the head of the nuclear facility to submit a report on the progress of actions stated in Section 2 and Section 3 Paragraph 2 using Form Nos.2 and 3 on a quarterly basis to the relevant Labour Standards Inspection Office. It should be noted that it shall provide instructions to submit the reports for the third quarter of 2012 and later in accordance with this notification, and those for the second quarter of the year and earlier in accordance with the Notification No.581 before its abolishment, to the director of the relevant Labour Standards Inspection Office.

5. Report on the annual effective doses of the workers

   The nuclear facility supervising labour bureaus shall provide instructions to the head of the nuclear facility to submit a report on the annual effective doses of all of the workers who were engaged in radiation works in the nuclear facility (including workers employed by the involved subcontractors who were engaged in regular inspections and construction works and other maintenance and inspection, as well as full-time workers) using Form No.4 to the relevant Labour Standards Inspection Office.

6. Reporting of voluntary inspection results

   (1) The nuclear facility supervising labour bureaus shall provide instructions to the head of the nuclear facility to submit a report on the implementation status of the voluntary inspection items in Annex 1-1 by 1 October 2012 and thereafter basically once every 6 months, and also to the primary contractor to submit a report on the implementation status of the voluntary inspection items in Annex 1-3 at the same time as implementing regular inspection works and construction works to the nuclear facility supervising labour bureaus.

   (2) The head offices supervising labour bureaus shall provide instructions to the director of the head offices to submit a report on the implementation status of the voluntary inspection items in Annex 1-2 by 1 October 2012 and thereafter basically once every 6 months to the head offices supervising labour bureaus.

7. Report on radiation exposure doses of workers engaged in emergency works at the TEPCO Fukushima Daiichi Nuclear Power Plant

   The nuclear facility supervising labour bureaus shall provide instructions to the head of the nuclear facility to implement the following matters.

   (1) When assigning workers that have engaged in emergency works at the TEPCO Fukushima Daiichi Nuclear Power Plant after 11 March 2011 to radiation works in a nuclear facility, copies of the workers' medical examination cards and exposure dose records shall be submitted to the MHLW in accordance with the provision in Article 59-2 of the Ionizing Radiation Ordinance for the period when they are engaged in the radiation works.

   (2) The reporting shall be done by the head of the nuclear facility for workers employed by the nuclear facility, and by the primary contractor for other workers including those employed by the involved subcontractors.

Appendix

- Hokkaido
- Aomori
- Miyagi
- Fukushima
- Ibaraki
- Chiba
- Tokyo
- Kanagawa
- Niigata
- Toyama
- Ishikawa
- Fukui
- Shizuoka
- Aichi
- Kyoto
- Osaka
- Shimane
- Okayama
- Hiroshima
- Kagawa
- Ehime
- Fukuoka
- Saga
- Kagoshima

Annex 1-1

Actions based on the lessons learned from the accident
at the TEPCO Fukushima Daiichi Nuclear Power Plant
(Voluntary inspection items)
Nuclear facilities

The head of the nuclear facility shall cooperate with the head offices to conduct voluntary inspections on a regular basis regarding the following items, and take necessary actions based on the results. As for the actions that are difficult to implement immediately, the head of the nuclear facility shall make efforts to implement the actions step by step.

1. Exposure dose management

Item	1-1. Establishment of the exposure dose control system by the radiation control department
Objective (including lessons learned from the accident; hereinafter stated simply as “Objective”)	As the conventional exposure dose control system could not be used, significant manual work emerged, such as making dosimeter lending records, inputting internal exposure data, and calculating the summed individual exposure doses; this has delayed regular work in the radiation control department of the Fukushima Daiichi Nuclear Power Plant (hereinafter referred to as "the power plant"). Although inputting exposure dose data has since been taken over by the head office, a lot of manual work still remains. This results in a substantial delay in collecting and consolidating individual exposure doses. The following actions should be

	taken based on this situation.
Actions to be taken for preparation	(1) In preparation for emergency works, a plan should be developed that establishes an organizational system to consolidate the exposure dose management for all the emergency workers before the works are started (hereinafter referred to as "the consolidated management organization") in the nuclear facility (or in the head offices if establishing the system is beyond the capability of the nuclear facility). (2) Develop an emergency action plan capable of temporarily increasing the persons to be engaged in dose control in the case that the exposure dose control systems become unavailable.
Action status	Completed / In preparation / Not yet implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	1-2 Preparation of dosimeters
Objective	Many personal alarm dosimeters (hereinafter referred to as "PADs") became unavailable, which resulted in their shortage. Thus, only one PAD per work group was distributed to all of the work groups temporarily and individual exposure dose control was insufficient. The following actions should be taken based on this situation.
Actions to be	(1) Prepare a sufficient number of spare PADs that may be used in an

taken for preparation	emergency (this includes battery chargers and emergency power generators, if not battery-powered; hereinafter referred to as PADs.) (2) Make agreements with other nuclear facilities in advance to prepare a sufficient number of PADs for all the emergency workers (including those who are not engaged normally in radiation works).
Action status	Completed / In preparation / Not yet implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	1-3 Establishing an administrative system for lending dosimeters
Objective	As the conventional access control system for the radiation controlled areas could not be used, dosimeter lending records were manually written down, and names, affiliations, and exposure doses have been manually recorded. However, some deficiencies and incorrect information in the dosimeter lending records have made it difficult to identify individuals and to collect and consolidate personal exposure doses. The following actions should be taken based on this situation.
Actions to be taken for preparation	(1) In preparation for the case that the conventional access control system is not operable, build a backup system in advance that can issue access permits with personal identification numbers (hereinafter referred to as "ID number(s)") and photos after verification of the person's official

	documents, and can manage exposure dose based on the ID number on personal computers or computer systems available in emergency situations (hereinafter referred to as "the backup system"). (2) In preparation for the case that the backup system is not operable, establish the form for a hand-written administrative list and an administration method in advance using the central registration number for each worker's radiation passbook and driver's license number (if it is difficult to use them, a combination of date of birth and name) as a temporary ID number (hereinafter referred to as "the temporary ID number"). (3) Training shall be conducted on a regular basis so that the actions stated in (1) and (2) could be implemented immediately in emergency situations.
Action status	Completed / In preparation / Not yet implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	1-4. Notification to workers of the exposure doses
Objective	The conventional exposure dose notification system could not be used. This caused a delay in inputting exposure dose data written in the dosimeter lending record, which resulted in the power plant falling behind in notifying

	individual exposure dose data to the primary contractor and in becoming unable to issue receipts on individual exposure dose at the time of returning dosimeters as before. The following actions should be taken based on the situation stated above.
Actions to be taken for preparation	(1) In preparation for unavailability of the conventional exposure dose control system, ensure that the backup system shall have the function of issuing receipts to provide daily individual exposure doses as a written notice. (2) Establish in advance procedures for immediately informing the primary contractor of the exposure dose data when they are input at the head offices.
Action status	Completed / In preparation / Not yet implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	1-5. Proper measurement of internal exposure
Objective	Unavailability of the whole body counters (hereinafter referred to as "WBCs") in the power plant led to their shortage, and delayed the progress in measurement. A significant delay in determining internal exposure dose resulted because it took time to consider how the exposure dose assessment method should be modified according to the changes in the target nuclide to

	be measured, as well as to identify the date of ingestion or inhalation. The following actions should be taken based on the situation stated above.
Actions to be taken for preparation	(1) In order to measure internal exposure, specify in advance the places where transportable WBCs should be located which can be borrowed in case of an accident under the agreement made by the head offices. (2) Develop in advance the method for evaluating internal exposure dose in emergency situations, by identifying the date of ingestion or inhalation based on behavior of workers.
Action status	Completed / In preparation / Not yet implemented (Expected completion date shall be noted if actions are in preparation or not yet been implemented.)
Description of actions	

Item	1-6 Actions for workers whose contact information is missing
Objective	Some workers were found whose existence could not be clearly identified in the collected data which was based on hand-written dosimeter lending records due to unavailability of the conventionally used system. The following actions should be taken based on this situation.
Actions to be taken for preparation	(1) Specify the procedures to successfully identify individuals by recording temporary ID numbers in the hand-written dosimeter lending record until the backup system is in operation. (Repeated notice) (2) In preparation for the case that any individuals whose contact

	information is missing are found, specify in advance the investigation methods including checking the original records, checking for overlap of similar names, asking other primary contractors, investigating at the relevant sites, making use of professional investigation agencies, and publicly announcing those individuals' names.
Action status	Completed / In preparation / Not yet implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

2. Protective equipment and clothing

Item	2-1 Actions for the cases that workers exceed the exposure dose limit
Objective	The measurement results of internal exposure revealed that six emergency workers exceeded their exposure dose limit of 250 mSv. This occurred presumably because the workers did not use charcoal filter respirators and ate and drank in the central operation room where the concentration of radioactive materials had increased after the hydrogen explosions. The following actions should be taken based on this situation.
Actions to be taken for preparation	(1) Prepare necessary measurement instruments and develop measurement procedures in advance so that airborne radiation dose can be measured at any time in the places where workers work or are on stand-by in

	emergency situations (including the places where air is considered to be uncontaminated under normal conditions; hereinafter referred to as "the stand-by areas"). (2) In preparation for the case that a stand-by area is contaminated, and based on the breakthrough time, prepare a sufficient number of charcoal filters in advance that allow workers to stay for several days at the stand-by area, and store spare filters in the seismically isolated building. (3) Educate emergency workers (particularly focusing on those such as drivers who do not wear respiratory protective equipment very often and those wearing glasses) on how to wear the equipment in an appropriate manner, and re-educate them at proper intervals. (4) Make agreements with other nuclear facilities in advance to borrow WBCs that can be transported in emergency situations so as to measure internal exposure of all the emergency workers. (Repeated notice)
Action status	Completed / In preparation / Not yet implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	2-2 Actions for the cases that female workers exceed the exposure dose limit

Objective	The measurement results of internal exposure revealed that two female workers exceeded the exposure dose limit for females (5 mSv per three months). The female workers were engaged in support work in the seismically isolated building after the accident occurred, and inflow of radioactive materials could not be avoided due to distortion of the entrance door caused by the hydrogen explosions. The following actions should be taken based on this situation.
Actions to be taken for preparation	(1) Prepare necessary measurement instruments and develop measurement procedures in advance so that airborne radiation dose can be measured at any time in stand-by areas and other areas. (Repeated notice) (2) Prepare charcoal filter respirators at each stand-by area, and store spares in the seismically isolated building in advance. (Repeated notice) (3) Prepare a sufficient number of personal dosimeters such as PADs for all the emergency workers (including those who are not engaged normally in radiation works) in advance. (Repeated notice)
Action status	Completed / In preparation / Not yet implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	2-3 Ensuring proper fitting of respiratory protective equipment

Objective	(1) Insufficient explanation was provided regarding the instructions on how to wear respiratory protective equipment in the education for new workers. Thus, there were still workers who received internal exposure even three months after the accident. (2) The survey on the way that the workers wore the respiratory protective equipment found that the percentage of leakage was particularly high for those wearing eyeglasses (highest 56%, average 17%). (3) There was a case that a worker was working without putting a charcoal filter in his full face mask, and cases that four workers had contamination on the inner faces of their mask filters. The following actions should be taken based on these cases.
Actions to be taken for preparation	(1) Store masks by sizes (or by products if multiple kinds of products are used) in order to have workers choose the one that fits their face best. (2) Promote introduction of masks with an electrically powered fan. (3) Educate new workers about masks with respect to their performance and usage focusing on the following points, and re-educate them at proper intervals. - Check for proper wearing using fitting testers - Preventive measures against leakage using seal pieces for those wearing eyeglasses - Procedures for putting on and taking off masks, and verification of inserting filters - Properly handling masks to prevent contamination inside of masks

Action status	Completed / In preparation / Not yet implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	2-4.Properly wearing protective clothing
Objective	(1) There was a case that a worker wearing short boots continued to work in 30 cm depth water although his dosimeter was giving an alarm; this caused the skin on both his feet to become contaminated (beta ray exposure). (2) There were also the case that a worker got contaminated by pouring contaminated water over his head while working with contaminated water without wearing hooded waterproof clothing and a case that another worker got contaminated with water while engaged in handling hoses without wearing the hooded waterproof equipment. The following actions should be taken based on these cases.
Actions to be taken for preparation	(1) Prepare a sufficient number of rubber boots, chemical protective suits, and waterproof protective clothing (hereinafter referred to "the protective clothing") in emergency situations. (2) Prepare a sufficient number of radiation dose measuring instruments including PADs in emergency situations (Repeated notice).
Action status	Completed / In preparation / Not yet implemented

	(Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

3. Education on safety and health

Item	3. Implementation of proper education for workers
Objective	Until around two months after the accident, only 30 minutes was spent at the places outside the power plant for educating workers regarding effects of radiation, radiation dose, and wearing and use of protective equipment. The space used for the education was also insufficient, accommodating only around 20 workers per session (for 30 minutes approximately). The following actions should be taken based on this situation.
Actions to be taken for preparation	(1) Preparing in advance the space and materials for education sessions, and training enough instructors so that they can provide sufficient sessions in emergency situations to all workers including new workers in need of the education. (2) In addition to the conventional special education on handling nuclear fuel, develop a text book on the evacuation method at the time of an accident, emergency actions and exposure dose management used for the education for the workers, and re-educate them at proper intervals. (3) Educate radiation workers (particularly focusing on those such as

	operators who scarcely wear respiratory protective equipment, and those wearing eyeglasses) on how to wear the equipment in an appropriate manner, and re-educate them at proper intervals. (Repeated notice)
Action status	Completed / In preparation / Not yet implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

4. Health care and medical care system

Item	4-1. Development of a medical care system
Objective	Medical doctors were made available only intermittently in the power plant, and meanwhile, 25 workers became sick or injured, and 31 workers were in poor physical condition during the first one month after the accident. Furthermore, there was a case that a worker suffered a heart attack. This boosted the demand for establishing a medical care system to have 24-hour availability of medical doctors and building a clinic, however, the process has not gone smoothly due to the difficulties in finding medical doctors, nurses, and radiation technologists, and coordinating for opening the clinic. The following actions should be taken based on this situation.
Actions to be taken for	(1) Coordinate with the relevant agencies under the support of the Labour Standards Bureau to establish a council consisting of prefectural health

preparation	care and medical offices, prefectural fire departments, nearby medical centers, nuclear facilities and District Labour Bureaus, and other relevant agencies (hereinafter referred to as "the council for the medical care system") which aims at establishing a proper medical care system for workers in nuclear facilities. (2) In preparation for the case that the conventional clinic becomes unavailable after an accident occurs, reserve a place which can accommodate materials and equipment for clinics in a building in the nuclear facility with a sufficient distance from the reactors to ensure safety (or an appropriate building to be located within several kilometers away from the nuclear facility if no such building can be found on the site), even for the event of hydrogen explosions of the reactors. (3) Consider and make preparations for a health and medical care system required to ensure mental and physical health of the workers engaged in emergency works.
Action status	Completed / In preparation / Not yet implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	4-2. Measures against heat stroke

Objective	It has been a concern since May that emergency workers may be at risk of occupational hazards derived from heat stroke while working for long hours in bright sun with heavy gear on, such as full-face mask, Tyvek suits, and rubber gloves. The following actions should be taken based on this situation.
Actions to be taken for preparation	(1) Take preventive measures against heat stroke in advance including determining where to purchase cool vests (including portable cooler boxes); considering building of rest areas with necessary functions; develop procedures for taking actions when heat strokes occurs; forecasting the temperature of the day to prevent heat stroke using Wet-Bulb Globe Temperature (hereinafter referred to as "WBGT values"); and preparing educational materials regarding heat stroke, taking into account that workers wear heavy gear in bright sun. (2) Establish in advance the framework to share information among the employers engaged in construction work in the nuclear facility.
Action status	Completed / In preparation / Not yet implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	4-3. Implementation of special medical examinations
Objective	As exposure dose exceeding the normal exposure dose limit may cause

	acute radiation hazards such as cataract, biannual special medical examinations have become insufficient in view of preventing radiation hazards of emergency workers. Furthermore, the longer emergency works continued, the greater the numbers of workers who were subject to medical examinations. This has made it difficult to collect information on the subcontractors, which resulted in a low percentage of workers undertaking medical examinations. The following actions should be taken based on this situation.
Actions to be taken for preparation	Build a consensus with the involved parties in the council for the medical care system regarding establishing the medical care system to immediately conduct special medical examinations in the case that emergency works leads to high levels of exposure.
Action status	Completed / in preparation / Not yet implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	4-4. Establishing emergency transport systems for patients
Objective	Faster ways to transport patients to a hospital is required as it would have taken a few hours at that time to take a seriously injured worker from the power plant. Thus, establishment of emergency transport systems has been undertaken, including use of air ambulances. The coordination, however,

	has not gone smoothly with the medical care institutions that will receive patients. The following actions should be taken based on this situation.
Actions to be taken for preparation	(1) Build a consensus with the involved parties in the council for the medical care system on the emergency transport systems. (2) Prepare a heliport near the nuclear facility to be used for air ambulances in advance to deal with an accident occurrence.
Action status	Completed / In preparation / Not yet implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	4-5. Proper implementation of long-term health care
Objective	In addition to the legal medical examinations, it became necessary to implement tests according to the exposure doses for workers who exceeded their normal exposure dose limit of 50 mSv per year and those who exceeded their conventional exposure dose limit of 100 mSv during emergency works. It also became necessary to conduct health consultation activities for workers who changed jobs to those that were not related to radiation works, in order to address their concerns about their long-term mental and physical health. The following actions should be taken based on this situation.
Actions to be	Make advance preparations to take actions for emergency workers,

taken for preparation	conforming to the MHLW guidelines.
Action status	Completed / in preparation / Not yet implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

5. Work plan and other items

Item	5-1. Establishing the framework for making work plans
Objective	A large number of work plans that need to be submitted in advance to the relevant Labour Standards Inspection Office (hereinafter referred to as "work notices") have been submitted since the accident. However, there were many deficiencies such as in exposure dose estimates and it took a lot of time to modify and review the description even after the instruction was given for correction. As there was no framework at the power plant for modifying work notices at that time, the situation was that the staff in charge at the plant could not respond to reminder notices. The following actions should be taken based on this situation.
Actions to be taken for preparation	Establish an organizational structure in both the nuclear facility and the head offices to plan and review the emergency works in advance.

Action status	Completed / In preparation / Not yet implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	5-2. Development of proper work plans
Objective	A lot of deficiencies were found in the submitted work notices including unrealistic estimates of the highest exposure dose, improper use of dosimeters (glass badges, ring badges, and alarms), incorrect descriptions of the workplace and works, and incorrect dose evaluation results. The following actions should be taken based on this situation.
Actions to be taken for preparation	Utilize the summary of the typical findings indicated by the relevant Labour Standards Inspection Office when developing work plans in normal situations as well as in emergencies.
Action status	Completed / In preparation / Not yet implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	5-3. Understanding the contracting structure
Objective	Due to the layered contracting system, it was initially impossible to collect

	only from TEPCO sufficient information on the contracting structure, the number of employers and workers, and whether or not sufficient education and medical examinations were provided at the time of employment. The following actions should be taken based on this situation.
Actions to be taken for preparation	Establish in advance the method for collecting information on workers under the involved subcontractors by way of the primary contractors in an emergency situation.
Action status	Completed / In preparation / Not yet implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	5-4. Preparation for proper accommodations and meals
Objective	Specifying the area within 20 km radius of the power plant as the restricted area meant that many workers could not go back home or to their dormitories or had to stay near the plant in preparation for the case of any unexpected events. They were forced to sleep crowded together on the floor in the seismically isolated building or the gymnasium in the vicinity of the power plant. Furthermore, the meals served were processed foods in retort pouches in order to prevent internal exposure. As the hard work was continued without sufficient rest and nutritious meals, there were concerns about worsening health of workers and accident occurrence caused by

	operational errors due to lack of sleep, etc. The following actions should be taken based on this situation.
Actions to be taken for preparation	(1) Prepare temporary sleepwear and blankets, etc. in advance, and plan where to keep them for emergency situations. (2) Prepare a sufficient volume of emergency food with good nutritional balance in advance for emergency situations.
Action status	Completed / In preparation / Not yet implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Annex 1-2

Actions based on the lessons learned from the accident
at the TEPCO Fukushima Daiichi Nuclear Power Plant
(Voluntary inspection items)
Head offices

The director of the head offices shall cooperate with the head of the nuclear facility to conduct voluntary inspections on a regular basis regarding the following items, and take necessary actions based on the results. As for the actions that are difficult to implement immediately, the head of the nuclear facility shall make efforts to implement the actions step-by-step.

1. Exposure dose management

Item	1-1. Establishment of the organizational system to manage exposure dose
Objective (including lessons learned from the accident; hereinafter stated simply as “Objective”)	As the conventionally used dose management systems could not be used, significant manual work emerged, such as making dosimeter lending record, inputting internal exposure data, and calculating the summed individual exposure doses, which delayed regular work in the radiation management organization of the Fukushima Daiichi Nuclear Power Plant (hereinafter referred to as "the power plant"). Although the work including exposure data input was taken over by the head office, a lot of manual work still remains. This results in a substantial delay in collecting and consolidating individual exposure doses. The following actions should be taken based on this situation.
Actions to be taken for preparation	In preparation for emergency works a plan should be formulated that establishes an organizational system to consolidate the exposure dose management of all the emergency workers (hereinafter referred to as "the consolidated management organization") in the nuclear facility (or the head offices if it is beyond the capability of the nuclear facility).
Action status	Completed / In preparation / Not implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	1-2 Preparation of dosimeters
Objective	Many personal alarm dosimeters (hereinafter referred to as "PADs") became unavailable, which resulted in their shortage. Thus, only one PAD per work group was distributed to some of the workers temporarily, allowing measurement of dose only for one representative worker in a group. The following actions should be taken based on the situation stated above.
Actions to be taken for preparation	Support the nuclear facility by such actions as discussing and making an agreement with head offices of other companies to share PADs.
Action status	Completed / In preparation / Not implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	1-3 Establishing the administrative system for lending dosimeters
Objective	As the conventional access control system for the radiation controlled areas could not be used, dosimeter lending records were created by hand, and names, affiliations, and exposure doses have been manually recorded. However, some deficiencies and incorrect information in the lending records have made it difficult to identify individuals and to collect and consolidate personal exposure dose. The following actions should be taken based on this situation.
Actions to be taken for preparation	Set up a backup system in the head offices as well, in preparation for the case that the backup system is not operable at the nuclear facility. It should be noted however, that this shall not apply to the case that the backup system is installed in the buildings with seismically isolated equipment, as well as at sufficient isolation distance and structure/equipment that can maintain internal radiation protective functions even when hydrogen explosions occur in a nuclear reactor ("hereinafter referred to as "seismically isolated buildings").
Action status	Completed / In preparation / Not implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	1-4. Notification to workers of their exposure doses
Objective	The conventional dose notification system could not be used. This created a delay in inputting data of the dose written in the dosimeter lending record, which resulted in the power plant falling behind in notifying the primary contractor of dose data and becoming unable to issue receipts regarding exposure dose at the time of returning dosimeters as before. The following actions should be taken based on this situation.
Actions to be taken for preparation	(1) Prepare in advance the methods for immediately informing the nuclear facility of the dose data to be input at the head offices, if the head offices are required to do so after the accident. (2) Set up a backup system with a function to issue receipts in the head offices, in the case that the backup system is not operable at the nuclear facility. It should be noted however, that this shall not apply to the case that the backup system is installed in the seismically isolated buildings. (Repeated notice)
Action status	Completed / In preparation / Not implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	1-5. Proper measurement of internal exposure
Objective	The following actions should be taken based on the facts that: unavailability of the whole body counters (hereinafter referred to as "WBCs") in the power plant led to their shortage, and delayed the progress in measurement; and that a significant delay in determining internal exposure dose resulted because it took time to consider how the exposure assessment method should be modified according to the changes in the target nuclide to be measured, as well as to identify the date of ingestion or inhalation.
Actions to be taken for preparation	(1) Provide support as appropriate such as negotiation and conclusion of agreements with other employers regarding borrowing transportable WBCs for measuring internal exposure at the time of an accident. (2) Develop in advance the evaluation model to evaluate post-accident exposure to radiocesium and radioiodine, in cooperation with JAEA

	and NIRS. (3) Develop in advance a plan for responding to an accident including the method for installing WBCs outside a nuclear facility, in the case that they cannot be installed inside, as well as make an agreement with other nuclear facility employers and the Federation of Electric Power Companies of Japan to make WBCs available for transport in emergency situations to accessible sites.
Action status	Completed / In preparation / Not implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	1-6 Actions for workers whose contact information is missing
Objective	Some workers were found whose existence could not be clearly identified in the collected data which was based on hand-written dosimeter lending records due to unavailability of the conventionally used system. The following actions should be taken based on this situation.
Actions to be taken for preparation	Provide support as appropriate when the nuclear facility develops the survey method.
Action status	Completed / In preparation / Not implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

2. Protective equipment and clothing

Item	2-1 Actions for the cases that workers exceed the exposure dose limit
Objective	The measurement results of internal exposure revealed that six emergency workers exceeded their exposure dose limits of 250 mSv. This occurred presumably because the workers did not use charcoal filter respirators and ate and drank in the central operation room where the concentration of radioactive material had increased after the hydrogen explosions. The following actions should be taken based on this situation.

Actions to be taken for preparation	Provide support as appropriate to allow the nuclear facility to take actions in an appropriate manner.
Action status	Completed / In preparation / Not implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	2-2 Actions for the cases that female workers exceeded the exposure dose limit
Objective	The measurement results of internal exposure revealed that two female workers exceeded exposure dose limit for females (5 mSv per three months). The female workers were engaged in support work in the seismically isolated building after the accident occurred, and inflow of radioactive material into the building could not be avoided due to distortion of the entrance door caused by the hydrogen explosions. The following actions should be taken based on this situation.
Actions to be taken for preparation	Provide support as appropriate to allow the nuclear facility to take actions in an appropriate manner.
Action status	Completed / In preparation / Not implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	2-3 Ensuring proper fitting of respiratory protective equipment
Objective	(1) Insufficient explanation was provided regarding the instructions on how to wear respiratory protective equipment in the education for new workers. Thus, there were still workers who received internal exposure even three months after the accident. (2) The survey on how to wear the respiratory protective equipment found that the percentage of leakage was particularly high for those wearing eyeglasses (highest 56%, average 17%). (3) There were cases that a worker worked without putting a charcoal filter

	on his full face mask, and that contamination was found on the inner faces of mask filters used by four workers. The following actions should be taken based on these cases.
Actions to be taken for preparation	Provide support as appropriate by such actions as preparing a text book and training sufficient numbers of instructors to be dispatched in emergency situations, to allow the nuclear facility to take actions in an appropriate manner.
Action status	Completed / In preparation / Not implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	2-4.Proper wearing protective clothing
Objective	(1) There was a case that a worker wearing short boots continued to work with his feet soaked in water 30 cm deep although his dosimeter was giving an alarm, which caused the skin on both his feet to get contaminated (beta ray exposure). (2) There were also case that a worker got contaminated by pouring contaminated water over his head while working with contaminated water, without wearing hooded waterproof clothing and a case that another worker got contaminated with water while engaged in handling hoses without wearing the hooded waterproof equipment. The following actions should be taken based on these cases.
Actions to be taken for preparation	Provide support to allow the nuclear facility to take actions in an appropriate manner.
Action status	Completed / In preparation / Not implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

3. Education regarding safety and health

Item	3-1. Implementation of proper education for workers
Objective	Until around two months after the accident, only 30 minutes was spent at places outside the power plant for educating workers regarding effects of radiation, radiation dose, and wearing and use of protective equipment. The space used for the education was also insufficient, accommodating only around 20 workers per session (for 30 minutes approximately). The following actions should be taken based on this situation.
Actions to be taken for preparation	(1) Support the nuclear facility to prepare textbooks for education. (2) Prepare a sufficient number of instructors to train workers, in order to dispatch them to the nuclear facility in emergency situations.
Action status	Completed / In preparation / Not implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

4. Health care and medical care system

Item	4-1. Development of a medical care system
Objective	Medical doctors were made available only intermittently in the power plant, and meanwhile, 25 workers became sick or injured, and 31 workers were in poor physical condition during the first one month after the accident. Furthermore, there was a case that a worker suffered a heart attack. This boosted the demand for establishing a medical care system to have 24-hour availability of medical doctors and building a clinic, however, the process has not gone smoothly due to the difficulties in finding medical doctors, nurses, and radiation technologists, and coordinating for opening the clinic. The following actions should be taken based on this situation.
Actions to be taken for preparation	Provide support to the nuclear facility by such actions as participating in the council for the medical care system and helping to establish a medical care system for emergency situations.
Action status	Completed / In preparation / Not implemented (Expected completion date shall be noted if actions are under preparation or have not yet been implemented.)
Description of	

actions	

Item	4-2. Measures against heat stroke
Objective	It has been a concern since May that emergency workers may be at risk of occupational hazards derived from heat stroke while working for long hours in bright sun with heavy equipment on, such as full-face mask, Tyvek suits, and rubber gloves. The following actions should be taken based on this situation.
Actions to be taken for preparation	Provide the nuclear facility with necessary support to take proper preventive measures against heat stroke.
Action status	Completed / In preparation / Not implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	4-3. Implementation of special medical examinations
Objective	As exposure exceeding the normal exposure dose limit may cause acute radiation hazards such as cataract, biannual special medical examinations have become insufficient in view of preventing radiation hazards of emergency workers. Furthermore, the longer the emergency works continued, the greater the numbers of workers who were subject to medical examinations. This has made it difficult to collect information on the subcontractors, which resulted in a low percentage of workers undertaking medical examinations. The following actions should be taken based on this situation.
Actions to be taken for preparation	In the case that the nuclear facility cannot conduct the special medical examination during the emergency works, make preparations necessary to directly conduct and manage the special medical examinations.
Action status	Completed / In preparation / Not implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	4-4. Establishing emergency transport systems for patients
Objective	Faster ways to transport patients to a hospital is required as it would have taken a few hours at that time to transport a seriously injured worker from the power plant. Thus, establishment of emergency transport systems has been undertaken, including making use of air ambulances. The coordination, however, has not gone smoothly with the medical care institutions that will receive patients. The following actions should be taken based on this situation.
Actions to be taken for preparation	Provide support to the nuclear facility for establishing a transport system by such actions as participating in the council for the medical care system.
Action status	Completed / In preparation / Not implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	4-5. Proper implementation of long-term health care
Objective	In addition to the legal medical examinations, it became necessary to implement tests according to the exposure doses for workers who exceeded their normal exposure limit of 50 mSv per year and those who exceeded their conventional exposure limit of 100 mSv during emergency works. It also became necessary to conduct health consultation activities for workers who changed jobs to those that were not related to radiation works, in order to ease their concerns about their long-term mental and physical health. The following actions should be taken based on this situation.
Actions to be taken for preparation	Provide support to the nuclear facility for properly implementing long-term health care in emergency situations by such actions as participating in the council for the medical care system.
Action status	Completed / In preparation / Not implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

5. Work plan and others

Item	5-1. Establishing the framework for making work plans
Objective	A large number of work plans that need to be submitted beforehand to the competent Labour Standards Inspection Office (hereinafter referred to as "work notices") have been submitted since the accident. However, there were many deficiencies such as in exposure dose estimates and it took a lot of time to modify and review the description even after the instruction was given for correction. As there was no framework at the power plant for modifying work notices at that time, the situation was that the staff in charge at the plant could not respond to reminder notices. The following actions should be taken based on this situation.
Actions to be taken for preparation	Prepare an organizational structure in advance to ensure that the head offices can directly review the descriptions of works in the case of an emergency.
Action status	Completed / In preparation / Not implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	5-2. Development of proper work plans
Objective	A lot of deficiencies were found in the submitted work notices including unrealistic estimates of the highest exposure dose, improper use of dosimeters (glass badges, ring badges, and alarms), incorrect descriptions of the workplaces and works, and incorrect dose evaluation results. The following actions should be taken based on this situation.
Actions to be taken for preparation	Prepare an organizational structure in advance to ensure that the head office can directly review the descriptions of works, in the case that the nuclear facility cannot do the task properly in an emergency.
Action status	Completed / In preparation / Not implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	5-3. Understanding the contracting structure
Objective	Due to the layered contracting system, it was initially impossible to collect

	only from TEPCO sufficient information on the contracting structure, the number of employers and workers, and whether or not sufficient education and medical examinations were provided at the time of employment. The following actions should be taken based on this situation.
Actions to be taken for preparation	Provide support as appropriate to allow the nuclear facility to take actions in an appropriate manner.
Action status	Completed / In preparation / Not implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	5-4. Preparation for proper accommodations and meals
Objective	Specifying the area within 20 km radius of the power plant as the restricted area meant that many workers could not go back home or to their dormitories or had to stay near the plant in preparation for the case of any unexpected events. They were forced to sleep crowded together on the floor in the seismically isolated building or the gymnasium in the vicinity of the power plant. Furthermore, the meals served were processed foods in retort pouches in order to prevent internal exposure. As the hard work was continued without sufficient rest and nutritious meals, there were concerns about worsening health of workers and accident occurrence caused by operational errors due to lack of sleep, etc. The following actions should be taken based on this situation
Actions to be taken for preparation	Provide support as appropriate to allow the nuclear facility to take actions in an appropriate manner.
Action status	Completed / In preparation / Not implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Annex 1-3

Actions based on the lessons learned from the accident
at the TEPCO Fukushima Daiichi Nuclear Power Plant
(Voluntary inspection items)
Primary contractors

The primary contractors shall cooperate with the nuclear facility to conduct voluntary inspection on a regular basis regarding the following items, and take necessary actions based on the result. As for the actions that are difficult to implement immediately, efforts shall be made to implement them step-by-step.

Item	1. Strengthening of the organizational system to manage exposure dose
Objective (including lessons learned from the accident; hereinafter stated simply as “Objective”)	As the conventional dose management system could not be used, significant manual work emerged, such as making dosimeter lending records, inputting internal exposure data, and calculating the summed individual exposure doses, which delayed regular work in the radiation control department of the Fukushima Daiichi Nuclear Power Plant (hereinafter referred to as "the power plant"). Although the work including data input has been taken over by the head office, a lot of manual work still remains. This results in a substantial delay in the task to collect and consolidate individual exposure doses. The following actions should be taken based on this situation.
Actions to be taken for preparation	Establish the organization system for radiation management in emergency situations, and foster the development of qualified persons who are able to conduct radiation control.
Action status	Completed / In preparation / Not implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Item	2. Understanding the contracting structure
Objective	Due to the layered contracting system, it was initially impossible to collect only from TEPCO sufficient information on the contracting structure, the number of employers and workers, and whether or not sufficient education and medical examinations were provided at the time of employment. The

	following actions should be taken based on this situation.
Actions to be taken for preparation	Establish in advance the method for obtaining the correct information on workers employed by the involved subcontractors and engaged in an emergency situation.
Action status	Completed / In preparation / Not implemented (Expected completion date shall be noted if actions are in preparation or have not yet been implemented.)
Description of actions	

Annex 2-1

Instructions to nuclear facility employers for actions to be taken
when the “Declaration of a Nuclear Emergency Situation” is issued
(Nuclear facilities)

In the case that an accident occurs that falls under any item of Article 42 Paragraph 1 of the Ordinance on Prevention of Ionizing Radiation Hazards (Ministry of Labour Ordinance No. 41, 1972; hereinafter referred to as "the Ionizing Radiation Ordinance"), or that an event occurs such that a nuclear emergency situation is issued by the Nuclear Emergency Response Headquarters and emergency works are conducted as an emergency action to respond to the accident or event, instructions should be provided to the head of the nuclear facility, upon noting the following actions in order to reduce the exposure doses of workers engaged in the emergency works to the level as low as reasonably achievable.

1. Radiation management

   Provide instructions to the head of the nuclear facility to take the following actions and check for their implementation.

   (1) Construct an organizational system to manage exposure dose

   Construct an organizational system to manage exposure dose by such actions as temporarily increasing the numbers of persons in charge of lending dosimeters in the case that the conventionally used dose management system is not available.

   (2) Preparation of dosimeters

   a. Check that a sufficient number of personal electrical alarm dosimeters (including battery chargers and emergency power generators, if not battery-powered; hereinafter referred to as "PADs") are available at the nuclear facility after an accident occurs.

   b. Once a shortage of PADs is found, immediately borrow them from other nuclear facilities pursuant to the agreement made in advance.

   (3) Dosimeter lending management

   a. Issue personal identification numbers (hereinafter referred to as "ID number(s)") and access permit photos, and then make available a backup system that allows management of exposure dose by the ID number on personal computers or computer systems available in emergency situations (hereinafter referred to as "the backup system").

b. Until the backup system becomes available, administer dosimeters with an administrative list form written by hand, using the central registration number for each worker's radiation passbook or driver's license number (if it is difficult to use them, a combination of date of birth and name) as a temporary ID number (hereinafter referred to as "the temporary ID number").

c. Once the backup system is up and running, issue access permits upon verification of individuals with official documents such as a driver's license, lend dosimeters based on the ID number, and record exposure dose.

(4) Notification of workers of their exposure doses

a. Make a backup system operable, and issue receipts of recorded exposure doses to workers.

b. When the backup system is unavailable, issue a written notice of exposure dose to workers at the time of returning dosimeters (hand-written memos are acceptable).

c. Immediately inform the primary contractor of the input exposure dose data.

(5) Measurement of internal exposure dose

a. When the conventionally used whole body counters (hereinafter referred to as "WBCs") become unavailable, request transportable WBCs from other nuclear facilities pursuant to the agreement made in advance, \and install them at a proper location.

b. Establish immediately an evaluation model that matches with released nuclides in cooperation with the Japan Atomic Energy Agency and National Institute of Radiological Sciences (hereinafter referred to as "the advanced radiation institutions").

c. Immediately identify the nuclides and the date of ingestion or inhalation for the workers who may exceed their normal exposure dose limits, by making use of WBCs in the advanced radiation institutions to determine committed doses.

d. Immediately collect and consolidate the committed doses and external exposure doses by name (ID number), and calculate the sums to manage workers so that they do not exceed the dose limits.

(6) Actions for workers whose contact information is missing

a. Conduct the dosimeter lending administration for emergency situations in the manner specified in advance (Repeated notice).

b. In case that any individuals whose contact information is missing are found, immediately check for overlap of similar names and ask the involved subcontractors for confirmation in cooperation with the primary contractor.

2. Protective equipment and clothing

Provide instructions to the head of the nuclear facility to take the following actions and check

for their implementation.

(1) Prevention of radiation exposure from indoor airborne radioactive materials

a. Make all the workers wear charcoal filter respirators who work on a regular basis or wait in areas in the nuclear facility (including the areas considered to have no air contamination; hereinafter referred to as "the stand-by areas"), immediately after an accident occurs, until it is verified by measuring the concentration of airborne radioactive materials that air is not contaminated in excess of the limit specified by the Minister of Health, Labour and Welfare, pursuant to Article 3 Paragraph 3 of the Ionizing Radiation Ordinance (hereinafter referred to as "airborne concentration limit").

b. Distribute a sufficient number of charcoal filters to every stand-by-area, considering the breakthrough time.

c. In the case that workers need to stand by in workplaces where it is uncertain whether air contamination exceeds the airborne concentration limit, give them some rest at a proper interval in a stand-by-area where it has been verified that air is not contaminated in excess of the airborne concentration limit.

d. Measure the concentrations of airborne radioactive materials and ambient dose rates in the stand-by-areas continuously.

e. Immediately measure internal exposure dose for all the workers waiting in the stand-by-areas where it is uncertain whether air contamination exceeds the airborne concentration limit.

f. Measure the concentrations of airborne radioactive materials and ambient dose rates in the stand-by-areas continuously, putting a higher priority on those where female workers are present. Evacuate female workers immediately if there are any possibilities that the doses may exceed dose limits.

(2) Ensuring proper fitting of respiratory protective equipment

Provide education to new workers immediately regarding the performance and usage of respiratory protective equipment focusing on the following points.

- Confirmation of proper fitting using a fitting tester
- Preventive measures against leakage using seal pieces for those wearing eyeglasses
- Procedures for putting on and taking off masks, and confirmation of installation of filters
- Proper handling of masks to prevent contamination inside the masks

(3) Prevention of contamination by contaminated water

a. Prepare a sufficient number of protective clothing sets and ensure workers wear in them in an appropriate manner.

b. Develop work procedures for the activities handling contaminated water, and provide appropriate training using the procedures.

(4) Proper implementation of education of workers

a. Provide education to emergency workers who need the education for new workers, using materials and a curriculum prepared in advance.

b. Check if the space, materials and numbers of instructors are sufficient, and ask the head offices for support otherwise.

3. Health care

(1) Establishment of a medical care system in nuclear facilities

Provide instructions to the head of the nuclear facility to take following actions and check for their implementation.

a. Request the dispatch of medical care workers commensurate to the number of emergency workers according to the medical care system developed in advance.

b. Establish an emergency clinic facility at the predetermined location in case the conventionally used clinic becomes unavailable.

c. Immediately establish a system necessary to ensure mental and physical health of workers engaged in emergency works.

(2) Preventive measures against heat stroke

Provide instructions to the head of the nuclear facility to take following actions and check for the implementation.

a. Properly implement the prearranged measures against heat stroke (including determining where to purchase cool vests (including cooling boxes); building rest areas equipped with necessary functions; develop in-house procedures for taking actions when heat stroke occurs; forecasting temperature of the day to prevent heat stroke using Wet-Bulb Globe Temperature; and preparing educational materials regarding heat stroke) when workers are engaged in works in a hot and humid area.

b. Check physical conditions thoroughly, making use of medical questionnaires.

c. Analyze causes and utilize the results to prevent recurrence, and share them through the council consisting of the primary contractors when heat stroke occurs.

(3) Instruction to implement special medical examinations

Based on the exposure level of workers engaged in emergency works and if necessary, the Directors of the District Labour Bureaus shall, noting the following actions, provide instructions to the head of the nuclear facility and primary contractor to implement the special medical examinations in accordance with Article 66 Paragraph 4 of Industrial Safety and Health Act (Act No. 57, 1972) after consulting with the Industrial Health Division of the MHLW.

a. Special medical examinations shall be provided after determining the details of the work and health impairment that may be caused by the work, considering the restrictions of equipment in the area, and deliberately selecting the minimum workers and tests.
b. Consideration shall be given to the methods for checking physical conditions thoroughly by medical questionnaires and making medical doctors available at any time, in addition to providing uniform tests conducted by a medical doctor at limited times, in light of the necessity of measures against heat stroke.
c. Identify primary contractors correctly to instruct them without fail.
d. Give a specific deadline and request submission of an implementation status report when providing the instructions to implement the special medical examinations.

Additionally, to the head of the nuclear facility, instruction needs to be provided to take the following actions.

a. Conduct the special medical examinations in accordance with the test items specified in the instruction.
b. Identify primary contractors to ensure they provide the special medical examinations in an appropriate manner to workers employed by the involved subcontractors.
c. Check for the implementation of the special medical examinations provided by the primary contractors.

(4) Establishing a system for transporting patients from the nuclear facility

Provide instructions to the head of the nuclear facility to take the following actions and check for their implementation.

a. Request establishing an emergency transport system based on the consensus in the council for the medical care system.
b. Prepare a pre-arranged heliport for air ambulances and request their operation in accordance with the agreement in the council for medical care system, depending on severity of the accident.

4. Work notification, identification of contracting structure, etc.

(1) Establishment of an organizational system for preparation and review of work notifications

Work notification for emergency works shall be reviewed in cooperation with the MHLW that may review them as necessary (instruction on this will be given separately).

Provide instruction to the head of the nuclear facility regarding the following actions.

a. Establish an organizational structure that allows planning and reviewing of the details of emergency works, and allows preparing work notifications with appropriate exposure

dose reduction measures in accordance with the predetermined plan.

b. Plan and review details of the emergency works and the preparation of the work notifications with appropriate exposure dose reduction measures, based on the findings indicated in advance.

(2) Identification of the contracting structure

a. Obtain information on the primary employers from the nuclear facility by way of the responsible Labour Standards Inspection Office, and contact the primary employers directly to obtain information on the contracting structure.

b. Provide instruction to the nuclear facility to collect the information on the contracting status through the primary employers and check if education and medical examinations are provided in an appropriate manner.

(3) Preparation for accommodation, food and drink

a. Check for the conditions of food, clothing, and accommodation of workers in cooperation with the relevant ministries and agencies to provide instructions to the site as appropriate from the perspective of ensuring health of the workers.

b. Provide instructions to nuclear facilities to make temporary sleep areas available and provide meals based on the predetermined plan.

Annex 2-2

Instructions to nuclear facility employers, etc. for actions to be taken when the “Declaration of a Nuclear Emergency Situation” is issued (Head offices)

In the case that an accident occurs that falls under any item of Article 42 Paragraph 1 of the Ordinance on Prevention of Ionizing Radiation Hazards (Ministry of Labour Ordinance No. 41, 1972; hereinafter referred to as "the Ionizing Radiation Ordinance"), or that an event occurs such that the Declaration of a Nuclear Emergency Situation is issued by the Nuclear Emergency Response Headquarters and emergency works are conducted as an emergency action to respond to the accident or event, instructions should be provided to the head of the nuclear facility, upon noting the following actions in order to reduce the exposure dose of workers engaged in the emergency works to the level as low as reasonably achievable.

1. Radiation management

Provide instructions to the head offices of the nuclear facility to take the following actions and check for their implementation.

(1) Construction of an organizational system to manage exposure dose

a. Check for the system for managing exposure dose at the nuclear facility, and provide support as appropriate by such actions as dispatching persons from the head offices.

b. Check for the progress in exposure dose data input at the nuclear facility, and if there are any problems in the system for exposure dose management, obtain the administrative documents from the power plant, and conduct exposure management including the exposure data input and collection and consolation by worker name (ID number) directly in the head offices.

(2) Preparation of personal dosimeters

Check that a sufficient number of personal alarm dosimeters (including battery chargers and emergency power generators, if not battery-powered; hereinafter referred to as "PADs") are available at the nuclear facility, and if required, provide support to allow the nuclear facility to obtain the PADs from other nuclear facilities.

(3) Dosimeter lending management

Check for the status at the nuclear facility with respect to the dosimeter lending administration, and provide support by such actions as making a backup system in the head offices operable, if required.

(4) Notification of workers of their exposure dose

a. Check the progress in dose data input and notification of the employer at the nuclear facility, and if necessary, perform the tasks such as data input in the head offices.

b. If the data input is performed in the head offices, send the input data to the nuclear facility immediately.

(5) Measurement of internal exposure dose

a. Check for the progress of internal exposure measurement at the nuclear facility, and if the conventionally used whole body counters (hereinafter referred to as "WBCs") become unavailable, provide the support necessary to obtain transportable WBCs from other nuclear facilities and to measure internal exposure at other relevant nuclear institutions.

b. Provide technical support to identify specific nuclides causing internal exposure, develop an exposure model, and identify the date of ingestion or inhalation, in cooperation with the Japan Atomic Energy Agency and National Institute of Radiological Sciences.

(6) Actions for workers whose contact information is missing

Check for the dosimeter lending procedure at the nuclear facility, and if any individuals whose contact information is missing are found, confirm the dose records at the head offices

as required.

2. Protective equipment and clothing

Provide instructions to the head offices to take the following actions and check for their implementation.

(1) Prevention of radiation exposure from indoor airborne radioactive materials

a. Check the progress of dose measurement in the stand-by-areas of the nuclear facility and provide support by such actions as dispatching persons to help from the radiation management department of other nuclear plants, as required.

b. Check the progress of measurement in stand-by-areas of the nuclear facility and provide support regarding the management of female workers.

(2) Ensuring proper fitting of respiratory protective equipment

Check the progress of education for new workers in the nuclear facility and provide support by such actions as dispatching instructors to help and providing education materials.

(3) Prevention of contamination by contaminated water

Check the status of wearing protective clothing in the nuclear facility and provide support.

(4) Proper implementation of education of workers

Check for the progress of education of workers in the nuclear facility and provide support by such actions as dispatching instructors for help and providing education materials.

3. Health care

Provide instructions to the head offices to take the following actions and check for their implementation.

(1) Development of the medical care system

Check the status of the medical care system in the nuclear facility and provide support.

(2) Preventive measures against heat stroke

Check the status of taking preventive measures against heat stroke in the nuclear facility and provide support.

(3) Instruction to implement special medical examinations

Check the progress in implementation of the special medical examinations in the nuclear facility and provide support by such actions as dispatching medical care workers to help as required.

(4) Establishing the patient transport system from the nuclear power plant

Check the transport system in the nuclear facility and provide support by such actions as consulting with medical care institutions, fire authorities and aviation authorities.

4. Work notification, identification of contracting structure, etc.

Provide instructions to the head offices to take the following actions and check for their implementation.

(1) Establishment of an organizational system for preparation and review of work notifications

Check the progress of preparing work plans at the nuclear facility and provide support by such actions as reviewing the documents by the head offices and dispatching persons to help.

(2) Identification of the contracting structure

Check the contracting status at the nuclear facility and provide support.

(3) Preparation for accommodation, food and drink

Check for the status of temporary sleep area and meal in the nuclear facility, and provide support for them.

Annex 2-3

Instructions to nuclear facility employers, etc. for actions when the “Declaration of a Nuclear Emergency Situation” is issued
(Primary contractors)

In the case that an accident occurs that falls under any item of Article 42 Paragraph 1 of the Ordinance on Prevention of Ionizing Radiation Hazards (Ministry of Labour Ordinance No. 41, 1972) or that an event occurs such that the Declaration of a Nuclear Emergency Situation is issued by the Nuclear Emergency Response Headquarters and emergency works are conducted as an emergency action to respond to the accident or event, instructions should be provided to the primary contractors, upon noting the following actions in order to reduce the exposure doses of workers engaged in the emergency works to the level as low as reasonably achievable.

(ア)Radiation management

Provide instructions to the primary contractors of the nuclear facility to take the following actions and check for their implementation.

(1) Construction of an organizational system to manage exposure dose

Ensure that an exposure dose management system is constructed by such actions as temporarily increasing the number of persons in charge of radiation management in each primary contractor; this allows consolidated exposure dose management of workers employed by all the involved subcontractors.

(2) Dosimeter lending management

Ensure proper management of the access permits issued by the nuclear facility so that they will not be used by anyone except the named persons.

(3) Notification to workers of their exposure dose

Immediately notify all the workers employed by the involved subcontractors through the involved subcontractors of the dose data obtained from the nuclear facility.

(4) Measurement of internal exposure dose

Check the progress of internal exposure measurement provided by the involved subcontractors. Provide them instruction or support so that the internal exposure dose of all their workers is measured.

(5) Actions for workers whose contact information is missing

In the case that any individuals whose contact information is missing are found, immediately check for overlap of similar names and ask the involved subcontractors for

confirmation.

(6) Proper implementation of education of workers

Provide instruction or support in cooperation with the nuclear facility to ensure the education for new workers is provided to all the workers employed by the involved subcontractors.

2. Health care

Provide instruction to the primary contractors to take the following actions and check for their implementation.

(1) Preventive measures against heat stroke

Provide necessary instruction or support in cooperation with the nuclear facility to ensure that the involved subcontractors can take proper preventive measures against heat stroke.

(2) Implementation of special medical examinations

a. Provide necessary instruction or support to ensure that the involved subcontractors obtain proper information on all of the workers that they employed and offer them the special medical examinations.

b. Check the progress of the special medical examinations conducted by the involved subcontractors.

(3) Identification of the contracting structure

Be sure to obtain the information on workers employed by the involved subcontractors who are engaged in emergency works and provide necessary instruction or support to ensure that education and medical examination are provided.

Form No.1

Radiation Work Notification

<table>
<tr><td>Business type</td><td colspan="2">Name of the primary contractor's site</td><td colspan="2">Address of the site</td></tr>
<tr><td></td><td colspan="2"></td><td colspan="2"></td></tr>
<tr><td>Name of the work</td><td colspan="4"></td></tr>
<tr><td>Title and name of the operation leader</td><td colspan="4"></td></tr>
<tr><td>Name and address of the involved subcontractor</td><td colspan="4"></td></tr>
<tr><td>Workplace</td><td colspan="4"></td></tr>
<tr><td rowspan="2">Work duration (Entire work period)</td><td rowspan="2">(　　)</td><td colspan="3">Number of workers</td></tr>
<tr><td>Primary contractor's site</td><td>Involved subcontractor</td><td>Total</td></tr>
<tr><td>Description of work</td><td colspan="4">(Work scale:　　)</td></tr>
<tr><td rowspan="3">Radiation environment</td><td colspan="2">Dose equivalent rate from external radiation (mSv/h)</td><td colspan="2"></td></tr>
<tr><td colspan="2">Surface contamination (Bq/cm^2)</td><td colspan="2"></td></tr>
<tr><td colspan="2">Airborne concentration (Bq/cm^3)</td><td colspan="2"></td></tr>
<tr><td>Preventive measures against exposure (e.g., radiation shielding, remote handling)</td><td colspan="4"></td></tr>
<tr><td>Preventive measures against contamination</td><td colspan="4"></td></tr>
<tr><td>Protective clothing and equipment</td><td colspan="4"></td></tr>
<tr><td>Radiation measurement instrument</td><td colspan="2"></td><td>Alarm meter (alarm set value)</td><td>(　　)</td></tr>
<tr><td>Preventive measures against heat stroke</td><td colspan="4"></td></tr>
<tr><td>Evacuation actions for an accident</td><td colspan="4"></td></tr>
<tr><td>Method for monitoring</td><td colspan="2">Dose equivalent rate from external radiation (mSv/h)</td><td colspan="2"></td></tr>
</table>

radiation environment	Surface contamination (Bq/cm^2)			
	Airborne concentration (Bq/cm^3)			
Estimated effective dose	Average effective dose (mSv)		Remarks	
	Highest effective dose (mSv)			
	Total effective dose (person・mSv)			

Date (Day, Month, Year):

Name and Title of Employer

_____ (Seal)

I, as the orderer, verified the work notification above.

Name and Title of Nuclear Employer in charge

_____ (Seal)

Attn: Director, Labour Standards Inspection Office

Remarks

1. In the "Business type" field, select the appropriate one from the middle classification of the Japan Standard Industrial Classification.
2. In the "Name of the primary contractor's site", fill in the name of the nuclear facility employer's site (e.g., company name, plant name) if the work is done by the nuclear facility employer, and the name of the employer who was granted a contract directly by the nuclear facility employer if the nuclear facility employer only orders and provides design supervision.

   If the organization of the primary contractor's site differs from the nuclear facility employer, the responsible person in the department that supervises the work for the nuclear facility employer shall fill in his/her name and title after verifying that the descriptions in the work notification are valid.
3. In the "Title and name of the operation leader" field, fill in the name of the person who is employed by the primary contractor's site and actually supervises the work.
4. In the "Name of the work" field, fill in the name of the project. If the organization of the primary contractor's site is not a nuclear facility employer, fill in the name of the project which the organization received a contract to do from a nuclear facility employer.
5. In the "Name and address of the involved subcontractor", fill in the names of all of the involved subcontractors.
6. The "Work duration" shall not exceed approximately a month except for routine work such as decontamination and cleaning. When the contracted work period exceeds a month, submit a work notification for each of the divided periods within a month. If it is submitted in that manner, fill in the entire work period in the parentheses.
7. In the "Work description" field, describe as specifically as possible and attach written documents that summarize the work process and drawings that indicate the actual workplaces. Describe the work scale (the number of workers per day x working hours per day x the number of working days) in the parentheses. When the nuclear facility employer submits a work notification as the organization to supervise the work that it ordered, it shall attach a document that includes the name of the work subject to the supervision (the name of the work that it ordered), the organization from which it is ordered and the submission status of the work notice, or the receipt number if the work notification has been submitted.
8. In the "Preventive measures against exposure (e.g., radiation shielding, remote handling)" field, describe as specifically as possible, actions such as: wearing of effective radiation protective clothing, work process for reducing exposure, investigation of the transport method to the work area, working hours setting, and schedules for mockup training.
9. In the "Preventive measures against contamination" field, describe as specifically as possible methods for removing contaminated water, air, and waste in advance and for decontamination,

and actions to be taken in case of worker contamination.

10. For the "Radiation environment" field, attach a map of the latest measurement results of the effective dose from external radiation (the drawing indicating the work area is acceptable).
11. In the "Preventive measures against contamination" field, describe as specifically as possible preventive measures against spread of contamination, and methods for handling and treating contaminated objects.
12. In the "Preventive measures against heat stroke" field, describe the major heat stroke measures such as wearing work clothing with a cold pack and the schedule for implementing occupational health education regarding heat stroke, in addition to the frequency of breaks, duration of breaks, and distance to the rest area if the work is undertaken in hot weather. Also, describe the frequency of breaks, duration of breaks, and distance to the rest area for seasons other than summer. Attach a checklist prepared in any form for the measures against heat stroke.
13. In the "Evacuation actions for an accident" field, describe alarm methods, emergency actions that require immediate response, evacuation routes, methods for emergency transportation of accident victims, and others. Attach a drawing that indicates evacuation areas and routes.
14. In the "Method for monitoring radiation environment" field, fill in the name of the instrument, measurement method, measurement frequency, etc.
15. Provide any other special notes or reference information in the "Remarks" field.
16. The signature in the "Name and Title of Employer" field can be replaced by typing his/her name and affixing his/her seal.

Form No.2

20__ the __ Quarterly Status Report on Occupational Safety and Health Management

Date (Day, Month, Year):

Attn: Director of Labour Standards Inspection Office

Name and Title of Employer

_____ (Seal)

The report included herein is the status of occupational safety and health management for the period from (Day, Month, Year) to (Day, Month, Year) (the __ quarter).

1. General Information

Name of the site			
Address of the site			
Category of the permission under the Nuclear Reactor Regulation Law	Fuel / Reprocessing / Using / Reactor (for power generation / test and research)		
Summary of the activity and name of the nuclear fuel materials to be handled		number of involved subcontractor	

2. Organizational structure for occupational safety and health management

(1) Name and Title of General Safety and Health Manager

(2) Name and Title of Radiation Administrator

(3) Organizational structure for occupational safety and health management

Responsible for	Organization name	Number of persons
Radiation management		Exclusively posted: , Additionally posted:
Occupational safety and health committee		Exclusively posted: , Additionally posted:
Occupational safety and health education		Exclusively posted: , Additionally posted:
Work plan review		Exclusively posted: , Additionally posted:
Measures against heat stroke		Exclusively posted: , Additionally posted:
Safety and health council		Exclusively posted: , Additionally posted:

(4) Organizational structure for health care

	Medical doctors	Nurses, etc.
Number of medical doctors and nurses, etc.	(including psychiatrists)	
Work hours of medical doctors and nurses, etc.		

3. Actions implemented by the nuclear facility employer for occupational safety and health management of its workers

(1) Sessions of the Safety and Health Committee

Date	Exposure management issues investigated and reviewed	Status of improvement	Date of improvement

(2) Development of work rules or work plans

Number of newly developed work rules and work plans		
Modification of important parts for exposure management in the work rules or work plans, or the name of the activity	Modified description	Date modified

(3) Implementation of special education, etc.

No. of site-registered radiation workers who took the special education	(No. of registered workers)
No. of site-registered radiation workers who took the education for managers	(No. of registered workers)

(4) Implementation of working environment measurement, etc.

a. Measurement of dose equivalent rate from external radiation

Measurement date			
Measurement results, the number of locations requiring improvement			
Names of the location requiring improvement	Status of improvement	Date of improvement	

b. Measurement of concentration of airborne radioactive materials

Measurement date			
Measurement results, the number of locations requiring improvement			
Names of the location requiring improvement	Status of improvement	Date of improvement	

c. Inspection of surface contamination (excluding activation)

Measurement date			
Measurement results, the number of locations requiring improvement			
Names of the location requiring improvement	Status of improvement	Date of improvement	

(5) Implementation of actions falling under Article 59 of the Ionizing Radiation Ordinance based on the ionizing radiation medical examination results

Description of actions	Number of workers involved in the action	Date implemented

(6) Implementation of measures for mental health

Description of actions	Number of workers involved in the action	Date implemented
Verification of symptoms and illness condition due to stress (e.g., distribution of medical questionnaires)		
Implementation of mental health consultation and interview		
Implementation of follow-up actions (e.g., diagnosis by a medical specialist)		

(7) Implementation of measures for heat stroke

Description of actions	Description of implementation	Date implemented
Measure WBGT value		
Build rest areas		
Restrict working hours and specify break times		
Check physical condition, and water and salt ingestion of the day		
Distribute work clothing with a cold pack		
Occupational health education regarding heat stroke		

4. Actions for involved subcontractors

(1) Safety and health coordinating meeting

Date	Exposure management issues discussed	Description of improvement	Date of improvement

(2) Survey on violation for involved subcontractors' radiation workers registered at nuclear facilities

Number of radiation workers registered at nuclear facilities			
	No. of workers	Description of improvement	Date of improvement
Not possessing radiation passbook			
Not undertaking the medical examination			
Not participating in special education or having insufficient understanding			
Not participating in education for managers or having insufficient understanding			

(3) Provision of instruction on work rules or work plans prepared by subcontractors

Name of the work rule or work plan	Description of work	Description of the provided instruction or support regarding important exposure management issues	Date provided

(4) Provision of instructions on safety and health education conducted by subcontractors

Name of the education (No. of involved subcontractors)	Description of the education	Description of the provided instruction or support regarding important exposure management issues	Date provided

(5) Provision of instructions on health care conducted by subcontractors

a. Instruction regarding implementation of ionizing radiation medical examinations

Description of the instruction or support	No. of involved subcontractors (no. of workers)	Date provided

b. Instruction on the actions that fall under Article 59 of the Ionizing Radiation Ordinance for workers employed by the involved subcontractors

Description of the action	Description of the instruction or support	No. of involved subcontractors (No. of workers)	Date provided

(6) Provision of instruction on measures for mental health conducted by subcontractors

Description of the action	Number of subcontractors (workers) conducting the action	Date provided
Verification of symptoms and illness conditions due to stress (e.g., distribution of medical questionnaires)		
Mental health consultation and interview		
Follow-up actions (e.g., diagnosis by a medical specialist)		

(7) Provision of instruction on measures against heat stroke conducted by subcontractors

Description of actions	Description of implementation	Date implemented
Build rest area		
Specify break times		
Distribute work clothing with a cold pack		
Occupational health education regarding heat stroke		

Remarks

1. The status report shall be submitted for each quarterly period specified below by each corresponding deadline. If the deadline is a holiday, the report shall be submitted by the next weekday after the holiday.
   (1) The implementation status during the period from 1 April to 30 June: by 15 August
   (2) The implementation status during the period from 1 July to 30 September: by 15 November
   (3) The implementation status during the period from 1 October to 31 December: by 15 February of the following year
   (4) The implementation status during the period from 1 January to 31 March: by 15 May
2. Use attachments for each field in the report as required.
3. In addition to this form, attach a list of the involved subcontractors, occupational safety and health management rules, safety regulations and any other regulations that prescribe necessary articles to ensure safety and health of workers, and a document that includes an overview of the activity (a leaflet is acceptable) as of the date at the end of the reporting period.

4. The attachments stated in 3 above shall not be required unless they are changed from the previous report.
5. As for Section 3 of this form, describe in as much detail as possible the actions that the primary contractor conducted for the involved subcontractors, as well as the actions that the nuclear facility employer conducted for the involved subcontractors.
6. The signature in the "Name and Title of Employer" field can be replaced by typing his/her name and affixing his/her seal.

Form No.3

Fiscal year ___ the ___ Quarterly Report

on the Number of Workers as per the Zone of Effective Dose

(Unit: person)

Employer / Effective dose	Nuclear facility employer	Involved subcontractor	Total
1.3 mSv or less			
Greater than 1.3 mSv to 4m Sv			
Greater than 4 mSv to 13 mSv			
Greater than 13 mSv to 25 mSv			
Greater than 25 mSv			
Total			
Average effective dose (mSv)			
Highest effective dose (mSv)			
Total effective dose (person・mSv)			

Date (Day, Month, Year):

Name and Title of Employer

_____ (Seal)

Attn: Director, Labour Standards Inspection Office

Remarks

1. This report shall include the effective dose of radiation workers for each quarterly period specified in remark 1 of Form No.2 (the effective dose that workers who have been engaged in radiation works at the reporting site for the quarterly period received at said site), and be submitted together with Form No.2.
2. The signature in the "Name and Title of Employer" field can be replaced by typing his/her name and affixing his/her seal.

Form No.4

Fiscal year ___ Report on the Number of Workers as per the Zone of Effective Dose

(Unit: person)

Employer / Effective dose	Nuclear employer	Involved subcontractor					Total
		Category	Full time	Regular Inspection Work only	Others	Subtotal	
		No. of sites					
5mSv or less		No. of workers					
Greater than 5 mSv to 15 mSv							
Greater than 15 mSv to 20 mSv							
Greater than 20 mSv to 50 mSv							
Greater than 50 mSv							
Total							
Average effective dose (mSv)							
Highest effective dose (mSv)							
Total effective dose (person・mSv)							

Date (Day, Month, Year):

Name and Title of Employer _____ (Seal)

Attn: Director, Labour Standards Inspection Office

Remarks

1. This report shall include the annual effective dose of radiation workers (the effective dose that workers who have been engaged in radiation works at the reporting site for the year received at the said site), and be submitted together with Forms No.2 and No.3 at the completion of the fourth quarter.
2. The signature in the "Name and Title of Employer" field can be replaced by typing his/her name and affixing his/her seal.