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30 January 2018

To:
Directors, Prefectural Labour Bureau

From:
Director,
Labour Standards Bureau,
Ministry of Health, Labour and Welfare
(Official Seal Omitted)

Revision of the Guidelines on Prevention of Radiation Hazards for Workers Engaged in Decontamination Works

To prevent radiation hazards for workers engaged in decontamination works, works under the designated dose rates and works for disposal of accident-derived wastes associated with radioactive materials discharged by the accident of Fukushima Daiichi Nuclear Power Plant of Tokyo Electric Power Company caused by the Tohoku District off the Pacific Ocean Earthquake that occurred on 11 March 2011, the Ministry of Health, Labour and Welfare has enforced the Ordinance on Prevention of Ionizing Radiation Hazards at Works to Decontaminate Soil and Wastes Contaminated by Radioactive Materials Resulting from the Great East Japan Earthquake and Related Works (Ordinance of Ministry of Health, Labour and Welfare No. 152 of 2011; hereinafter referred to as the "Ionizing Radiation Ordinance for Decontamination"), the Ordinance on Prevention of Ionizing Radiation Hazards (Ordinance of Ministry of Labour No.41 of 1972; hereinafter referred to as the "Ionizing Radiation Ordinance") and others, and has also established the Guidelines on Prevention of Radiation Hazards for Workers Engaged in Decontamination Works (Labour Standards Bureau Notification No. 1222-6, dated 22 December 2011),

Guidelines on Prevention of Radiation Hazards for Workers Engaged in Works under a Designated Dose Rate (Labour Standards Bureau Notification No. 0615-6, dated 15 June 2012), and the Guidelines on Prevention of Radiation Hazards for Workers Engaged in (Nuclear) Accident-derived Waste Disposal (Labour Standards Bureau Notification No.0412-2, dated 12 April 2013), and is instructing all parties concerned to implement these ordinances and proper guidelines.

Revisions have recently been made on the guidelines, such as addition of factors to be used in simplified methods for measurement of radioactivity concentration of soil and wastes for every three-month period from February 2018 to January 2022. Therefore, the Labour Bureau of each prefecture and municipality is hereby requested to pay attention to the description of revisions mentioned in the Note below and to familiarize all the affected employers, prefectures and municipalities with the revisions to facilitate precise implementation of preventive measures for radiation hazards in decontamination works, etc.

In relation to this, please be informed that requests have been made as per Attachment 1 to the Director General, Environmental Restoration and Resources Recycling Bureau, Ministry of the Environment; the

Director General, Policy Bureau, Ministry of Land, Infrastructure, Transport and Tourism; Chief of the Secretariat, Agriculture, Forestry and Fisheries Research Council, Ministry of Agriculture, Forestry and Fisheries; the Director General, Reconstruction Agency; and the Deputy Chief of the Secretariat, Team in Charge of Assisting the Lives of Disaster Victims, Office for the Nuclear Emergency Preparedness, Cabinet Office; as per Attachment 2 to each prefectural governor of Iwate, Miyagi, Fukushima, Ibaraki, Tochigi, Gunma, Chiba, Tokyo, Kanagawa, Niigata and Shizuoka; and as per Attachment 3 to associations and/or organizations of the related employers.

In addition, reference materials are attached hereto for further details of the revised points.

Note:

1. “Guidelines on Prevention of Radiation Hazards for Workers Engaged in Decontamination Works” has been revised as per Attachment 1
2. “Guidelines on Prevention of Radiation Hazards for Workers Engaged in Works under a Designated Dose Rate” has been revised as per Attachment 2.
3. “Guidelines on Prevention of Radiation Hazards for Workers Engaged in (Nuclear) Accident-derived Waste Disposal” has been revised as per Attachment 3.

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

(Enactment: Labour Standards Bureau Notification No. 1222-6, 22 December 2011)
(Amendment: Labour Standards Bureau Notification No. 0615-6, 15 June 2012)
(Amendment: Labour Standards Bureau Notification No.0412-6, 12 April 2013)
(Amendment: Labour Standards Bureau Notification No.1226-21, 26 December 2013)
(Amendment: Labour Standards Bureau Notification No.1118-6, 18 November 2014)
(Amendment: Labour Standards Bureau Notification No. 0130-2 of January 30, 2018)

Section 1 Objectives

These guidelines are established for the purpose of preventing radiation-related health hazards to workers engaged in decontamination works of objects contaminated with radioactive materials discharged by the accident of the Fukushima Daiichi Nuclear Power Plant of Tokyo Electric Power Company (TEPCO) associated with the Great East Japan Earthquake on 11 March 2011, in conjunction with the enforcement of the "Ordinance on Prevention of Ionizing Radiation Hazards at Works to Decontaminate Soil and Wastes Contaminated by Radioactive Materials Resulting from the Great East Japan Earthquake and Related Works" (Ordinance of the Ministry of Health, Labour and Welfare No. 152 of 2011; hereinafter referred to as the "Ionizing Radiation Ordinance for Decontamination")

Together with the Ionizing Radiation Ordinance for Decontamination, these guidelines aim at a proper effort to help further promote the measures for the prevention of radiation hazards during the decontamination works and a collective provision of the essence of the actions that employers should take including the provisions specified in the Industrial Safety and Health Act (Act No. 57, 1972) and other relevant laws and regulations, in addition to the provisions specified in the Ionizing Radiation Ordinance for Decontamination.

The intention of these guidelines is to protect workers from radiation hazards. However, it also has the purpose of being used for individual proprietors, self-employed workers and volunteers.

The employers should make efforts to implement the matters described in these guidelines appropriately and take measures to prevent the radiation hazards corresponding to actual situations in their workplaces.

Section 2 Scope

1 These guidelines shall be applied to employers engaged in the operation of decontamination

related works (hereinafter referred to as the “employers of decontamination works, etc.”) in the special decontamination areas specified in Article 25, paragraph (1) of the "Act on Special Measures Concerning the Handling of Environmental Pollution by Radioactive Materials Discharged by the Nuclear Power Station Accident Associated with the Tohoku District - Off the Pacific Ocean Earthquake That Occurred on 11 March 2011 " (Act No. 110 of 2011) or in the intensive contamination survey areas specified in Article 32, paragraph (1) of the same Act (hereinafter referred to as the "special decontamination areas, etc."; refer to Attachment 1), with due attention being paid to the following:

(1) “Decontamination works” refers to the work to perform decontamination of soil, etc., handling of designated contaminated soil and wastes. and collecting waste, etc.

However in the case of works, other than the decontamination works in the special decontamination areas, etc. where the average ambient dose rate exceeds 2.5μSv/h, (hereinafter referred to as the “works under a designated dose rate”) being carried out, relevant provisions in the Ionizing Radiation Ordinance for Decontamination and “Guidelines on Prevention of Radiation Hazards for Workers Engaged in Works under a Designated Dose Rate” (Labour Standards Bureau Notification No. 0615-6 of 15 June 2012) shall be applied.

(2) The “work for decontamination, etc.” refers to the work to remove soil, grass and trees, soil generated in association with the decontamination of structures, etc., fallen leaves and branches and sludge, etc. deposited in dikes, etc. (hereinafter referred to as “contaminated soil, etc.)” contaminated with the radioactive materials released from the accident of the nuclear power plant (hereinafter referred to as the “radioactive materials discharged by the accident” as defined under provisions of Article 2, paragraph 2 in the Ordinance on Prevention of Ionizing Radiation Hazards (Ministry of Labour Ordinance No. 41 of 1972; hereinafter referred to as the “Ionizing Radiation Ordinance”) and to prevent the contamination from spreading, and to take other measures.

(3) The “works for handling of designated contaminated soil and wastes” refer to the works to handle contaminated soil, etc. whose radioactivity concentration of Cs-134 and Cs-137, among radioactive materials discharged by the accident, exceed 10,000Bq/kg (hereinafter referred to as the “designated contaminated soil and wastes”), but exclude the works for decontaminating soil, etc. and collecting wastes, etc.

It should be noted that the “works for handling of designated contaminated soil and wastes” include those works in the special decontamination areas, etc., of construction works for restoring local infrastructures (construction preparation, excavation and transportation, banking and compaction, leveling and shaping of land and slope protection), and relevant works such as foundation work, temporary construction, road construction, water supply and sewage construction, service water and drainage construction, and earth works associated with farmland maintenance works, works involving soil such as turning and plowing the soil, weeding, digging the soil, etc. for commercial farming and forestry, etc., and works handling soil, etc. associated with fertilization (mixing into the soil), rice planting, seeding, raising and harvesting, etc. of root crops. It should be noted, however,

that such works mentioned above that could be finished in a short time as temporary works should be excluded from the “works for handling of designated contaminated soil and wastes”.

(4) The “work for collecting waste, etc.” refers to the works to collect, transport or store removed soil or waste contaminated with the radioactive materials discharged by the accident (limited to waste which contains radioactivity concentration of Cs-134 and Cs-137, among radioactive materials discharged by the accident, exceeding 10,000Bq/kg; hereinafter referred to as “contaminated waste”). It should be noted that, for the disposal works of removed soil or contaminated waste such as works at water/sewage facilities, incineration facilities, intermediate treatment facilities and landfill facilities, etc. in the special decontamination areas, etc., significant radiation exposure from the administrated radiation source such as sludge from sewage or incineration ash, etc. is expected, and therefore the Ionizing Radiation Ordinance should be applied to those works instead of the Ionizing Radiation Ordinance for Decontamination or these guidelines.

(5) The “works for handling designated contaminated soil and waste” refers to the works to handle contaminated soil, etc. whose radioactivity concentration of Cs-134 and Cs-137, among radioactive materials discharged by the accident, exceeds 10,000Bq/kg (hereinafter referred to as the “designated contaminated soil and wastes”), but excludes the works for decontaminating soil, etc. and collecting waste, etc. In addition, the “works for handling designated contaminated soil and wastes” includes construction works for restoring local infrastructures (construction preparation, excavation and transportation, banking and compaction, leveling and shaping of land and slope protection), and relevant works such as foundation work, temporary construction, road construction, water supply and sewage construction, service water and drainage construction, and earth work associated with farmland maintenance work, works involving soil such as turning and plowing the soil, weeding, digging the soil, etc. for commercial farming and forestry, etc., and works handling soil, etc. associated with fertilization (mixing into the soil), rice planting, seedling, raising and harvesting, etc. of root crops in the special decontamination areas, etc. It should be noted, however, that such works mentioned above that could be finished in a short time as temporary work should be excluded from the “works for handling of designated contaminated soil and wastes.”

(6) For decontamination work conducted under the Ionizing Radiation Ordinance in the radiation control area (solely limited to the nuclear reactor facilities and facilities belonging to the steam turbine or those surrounding areas where dose rate might exceed 0.1mSv/h (hereinafter referred to as the “designated facility, etc.”) of TEPCO Fukushima Daiichi Nuclear Power Plant) under the provisions of Article 3, Paragraph 1 in the Ionizing Radiation Ordinance at the time of enforcement of the Ionizing Radiation Ordinance for Decontamination, the Ionizing Radiation Ordinance should be applied in succession instead of the Ionizing Radiation Ordinance for Decontamination or these guidelines. The work handling unsealed radioactive materials in the designated facilities is subject to the

contamination screening described in Section 5-3 in these guidelines.

(7) Since decontamination works fall under Article 8, item 35 in the Ordinance on Child Labour Standard (Ministry of Labour Ordinance No. 13 of 1954), employers should not engage persons who are under 18 years old in such decontamination works.

2. Employers other than “employers of decontamination related workers, etc.” who carry out decontamination works, etc. in their own site or facilities, etc. should implement applicable matters from Section 3 “Targets and Methods for Radiation Exposure Dose Control”, Section 5 “Measures for Preventions of Contamination Spreading and Internal Exposure” and Section 6 “Education for Workers”, as needed. It is also recommended that self-employed workers, residents and volunteers who perform decontamination works follow the said matters.

Section 3 Targets and Methods for Radiation Exposure Dose Control

1 General Principles

(1) Employers of decontamination works, etc. should make efforts to minimize exposure to ionizing radiation for the workers to the fullest extent possible.

(2) When employers of decontamination works, etc. implement works for handling designated contaminated soils and wastes, they should prioritize minimizing the radiation exposure received by the workers engaged in handling designated contaminated soil and wastes (hereinafter referred to as the “workers engaged in handling designated contaminated soil and wastes”), and they also should make efforts to take measures such as decontamination of workplaces in advance.

(a) Principle (1) above states that employers should keep radiation exposure of their workers as low as reasonably achievable based on the principles of optimization by the International Commission on Radiological Protection (ICRP) when they perform their work.

(b) Principle (2) above states that, when work is expected to have a certain level of radiation exposure, it is necessary to prioritize in minimizing such a dose received by the workers engaged in handling designated contaminated soil and wastes, and make efforts to implement decontamination measures, prior to starting the work, based on the ICRP principle of justification (hereinafter referred to as “the principle of justification”). This is because the public interest and the necessity of the work should outweigh its demerits.

(c) However, among works for handling designated contaminated soil and wastes, it may not be possible to implement measures of decontamination, etc. in advance for the minimum requirements such as restoration of roads and the water supply, etc., in light of the high public interest and necessity. In addition, works such as soil covering, paving roads, turning and plowing of farmland, etc. are expected to have equal to or greater effects than the measures of decontamination, etc. for reducing radiation dose, and therefore such works may be regarded as being implemented concurrently with

decontamination.

(d) In light of the principle of justification, farming employers, etc. are required to decontaminate working areas in advance to reduce radiation exposure to the lowest level as possible, and in principle, assign the workers in the area where the average ambient dose rate is less than 2.5μSv/h, so that there is no need to control exposure dose, since the workers in these types of businesses tend to have higher exposure doses associated with long hours of work and the work is considered not necessarily urgently needed.

2 Measurement of radiation exposure doses

(1) Employers of decontamination works, etc. should conduct effective exposure dose measuring during decontamination works in each case described in the following (a) and (b) by the pre-defined methods of measuring the equivalent exposure doses for workers (including fixed-term contract workers and temporary workers, hereinafter referred to as "workers engaged in decontamination works, etc.") who are engaged in decontamination related works in the special decontamination areas, etc. (The works among decontamination works which temporary workers are not allowed to engage in are listed in Attachment 2.)

(a) In the case where the employer has workers engage in any works for decontamination and related works in a workplace for which the average ambient dose rate exceeds 2.5μSv/h (equivalent to 5mSv/year based on 40 h/week and 52 weeks/year), such employers shall conduct internal exposure dose measurements, which shall be appropriate according to the specifics of the works and concentration of radioactive materials contained in contaminated soil, etc. to be handled, in addition to external exposure dose measurements by personal dosimeters. Among the works related to designated contaminated soil and wastes, the restoration works, etc. of local infrastructures, for which workplaces cannot be confined by the nature of the works, shall require the measurements of both external and internal exposure doses, only when workers are expected to perform such works in a place of which average ambient dose rate exceeds 2.5μSv/h.

(b) In the case where workers are engaged in any works for decontamination and related works (except any works that involve handling of designated contaminated soil and wastes) in a workplace for which the average ambient dose rate is 2.5μSv/h or less, either of the following may also be deemed as the external exposure dose, as well as the external exposure dose measured by personal dosimeters:

- The "average ambient dose rate" multiplied by "daily working hours of each worker engaged in decontamination related works", or
- The measurement result on a typical individual assumed to represent the average external exposure dose from decontamination related works.

(2) In the case that employers other than "those of decontamination works, etc." who conduct works of decontamination, etc. of their own premises or facilities, etc., they should make sure that effective dose due to the work should not exceed 1mSv/y, by assigning their workers to

conduct decontamination, etc. in workplaces with the average ambient dose rate of 2.5μSv/h or less as well as frequency of work being within dozens of times (days) per year. Self-employed workers, residents and volunteers who conduct works of decontamination, etc., should also do likewise, by taking note of the following matters.

(a) The residents and self-employed workers are expected to conduct works of decontamination, etc. as a community unit when they need to decontaminate soil of their own residences, offices, farmlands and so forth in the area where the average ambient dose rate might exceed 2.5μSv/h. In such cases, frequency of the works should be less than dozens of times (days) per year, to prevent them from receiving effective doses higher than 1mSv/y through the works.

(b) In the case of recruiting volunteers in an area not classified as the special decontamination areas, the volunteer organizers should note that the exposure dose limit of the public to radiation sources is specified as 1mSv/y as recommended by the ICRP under the planned exposure situation.

(3) Since it is difficult for self-employed and individual proprietors to manage their exposure doses, etc. by themselves, it is desirable not to conduct works for handling designated contaminated soil and wastes by taking appropriate measures in advance such as decontamination of workplaces.

(a) In the case that individual proprietors and self-employed workers need to do works for handling designated contaminated soil and wastes, they should be regarded as employers of workers for handling designated contaminated soil and wastes, thus these guidelines should be applied to them.

(b) For volunteers, it is necessary to make sure that the average ambient dose rate at the workplaces does not exceed 2.5μSv/h (equivalent to 5mSv/y calculated on the basis of 40 hours/week and 52 weeks/y) and frequency of work should be less than dozens of times (days) per year so that they do not get an effective exposure dose greater than 1mSv/y.

(4) For the measuring of internal exposure doses stated in (1)-(a) above, it should be carried out by the methods given in the table below according to the concentration of radioactive materials discharged by the accident in contaminated soil, etc. to handle and to dust concentration during the decontamination related work. In the case that no highly radioactive contaminated soil and wastes is handled and dust concentration is not high, it is enough to conduct screening tests only when incidentally exposed to a high concentration of dust.

	Concentration of radioactive materials in contaminated soil, etc. exceeding 500,000Bq/kg (highly radioactive contaminated soil and wastes)	Other than highly radioactive contaminated soil and wastes

Work under dust concentration greater than 10mg/m3 (work under high dust concentration)	Measurement of internal exposure dose once every three months	Screening test
Work other than under high dust concentration	Screening test	Screening test (only when incidentally exposed to high concentration of dust)

(5) To determine whether the work falls under high dust concentration or not, the following matters should be referred to:

(a) Such works like stripping of soil, etc., surface grinding or chipping of asphalt or concrete, weeding, collection and packing of removed soil, etc., dismantling of buildings or structures, etc. in a dry condition are considered as works under dust concentration greater than 10mg/m^3, and measures should be taken as defined in Paragraph 2, Item (4) above and Section 5, Paragraph 5.

(b) When dust concentration is measured during the work regardless of the definition in (a) above, it should be judged whether or not the work falls under high dust concentration according to the measurement results. Refer to Attachment 3 for judgment by the measurement results.

(6) The screening test method of internal exposure shall follow the method shown in Attachment 4.

The calculation method of internal exposure dose shall be in accordance with the stipulations of Article 6 of the “Methods, standards and classification defined by the Minister of Health, Labour and Welfare as specified pursuant to Article 2 , Paragraph 7, etc. of the Ordinance on Prevention of Ionizing Radiation Hazards at Works to Decontaminate Soil and Wastes Contaminated by Radioactive Materials Resulting from the Great East Japan Earthquake and Related Works” (Ministry of Health, Labour and Welfare Notification No. 468 of 2011).

3 Exposure dose limits

(1) Employers of decontamination works, etc. should measure the effective dose by the methods defined in 2-(1) (a) and (1) (b) above respectively, and ensure that the individual total effective dose which a worker may receive during engaging in the decontamination work, etc. does not exceed the following limits:

(a) For male workers and female workers who will not become pregnant: Effective doses as 100mSv per five years and 50mSv per one year.

(b) For female workers (except those who will not become pregnant, or those who fall into category (c) below): Effective doses as 5mSv per three months.

(c) For pregnant female workers: Effective doses by internal exposure as 1mSv and equivalent doses as 2mSv on the abdominal surface for the period from when confirmed as pregnant to the delivery (hereinafter referred to as “during pregnancy).

(2) When employers of decontamination works, etc. assign their workers to decontamination works who have engaged in radiation works in the radiation control area defined in Article 3 of the Ionizing Radiation Ordinance or who engaged in the works under a designated dose rate, it is necessary to ensure that the sum of effective dose for individual workers during radiation works or works under a designated dose rate and the effective dose measured according to 2-(1) above should not exceed the limits specified in (1) above.

(3) To properly control the radiation exposure doses of workers engaged in decontamination and related works in multiple different workplaces, the period of "five years" prescribed in (1) (a) above shall be quinquennial periods of which the first period starts on 1 January 2012 uniformly for all workplaces where decontamination works, etc. are performed. The same shall apply to employers that newly start decontamination and related works as their business in the middle of any of such quinquennial periods. In such cases, the value of 20mSv multiplied by the number of years from the commencement date of such decontamination works till the end of the corresponding quinquennial period shall be deemed as the exposure dose limit for the period ending at the end of such a quinquennial period and shall be used for application of relevant regulations.

(4) The periods of "one year" prescribed in (1) (a) above shall be yearly periods of which the first period starts on the first date of “five years”. The radiation dose received during the period from 11 March 2011 till 31 December 2011 shall be deemed as the dose received on 1 January 2012 and shall be included therein.

(5) For the works for handling of designated contaminated soil and wastes, the exposure doses received during the period from 1 January 2012 to 30 June 2012, if known, should be added on the dose on or after 1 July 2012 for the exposure dose control purpose.

(6) If an employer of decontamination works, etc. newly employs workers for engaging in decontamination works in the midst of the period of “one year” or “five years”, they should check the exposure dose history of each worker, at a special medical examination at the time of employment, received from the corresponding first date of the “one year” or the “five years” till the date prior to engaging in the decontamination works by using his/her record issued by his/her previous employer (if no records are available, records should be reissued by the previous duty station).

(7) The starting dates described in (3) and (4) should be known to the workers for decontamination works.

(8) The starting dates should be made known to the workers for decontamination and related works .

4 Records of dose measurements, etc.

(1) Employers of decontamination works, etc. should determine the exposure dose of workers for decontamination works as described below based on measurements made or by calculations according to the description in 2 above, record the results and keep those records for 30 years. However, this provision shall not be applicable to the records that are transferred to the organization designated by the Minister of Health, Labour and Welfare (Radiation Effects

Association, a public interest incorporated foundation) after such records have been kept for five years or after the workers for decontamination works recorded therein have left the job. In these cases, Form 1 (as an example) may be filled in for recording.

Among the workers for decontamination works, those who were radiation workers specified in Article 4, Paragraph 1 of the Ionizing Radiation Ordinance or those who engaged in works under a designated dose rate, the exposure doses received during the period of engaging in radiation work or the period of engaging in works under a designated dose rate should be added onto those received during engaging in decontamination works and the results should be recorded and kept accordingly.

(a) For male workers and female workers who will not become pregnant, the effective dose should be summed up for every three months, for every one year and for every five years. (For those whose effective dose has never exceeded 20mSv/y for five years, the effective dose to be summed up for every three months and for every one year.)

(b) For female workers who may become pregnant, the effective dose should be summed up for every month, for every three months and for one year. (For those who expect not to receive effective dose higher than 1.7mSv/month, the effective dose should be summed up for every three months and for one year.)

(c) For pregnant female workers, the effective dose of internal exposure and equivalent dose received on their abdominal surface should be summed up for one month and during pregnancy.

(2) Employers of decontamination works, etc. should notify the workers for decontamination works of the record of the exposure dose defined (1) above without delay.

(3) When any employer of decontamination works, etc. intends to discontinue its operation, the employer shall transfer the records referred to in (1) above to the organization designated by the Minister of Health, Labour and Welfare (Radiation Effects Association, a public interest incorporated foundation).

(4) Employers of decontamination works, etc. should issue copies of the records defined in (1) above to the worker who is going to leave the job or to all of the workers if they terminate their business.

(5) When employers of decontamination works, etc. employ fixed-term contract workers or temporary workers, they should take note of the following matters in order to control their exposure doses appropriately.

(a) When employing fixed-term contract workers or temporary workers for a pre-defined period of less than three months, the exposure dose should be determined and recorded every month.

(b) At the end of the contract period, the employer should sum up the effective dose which the contractor received during the contract period and determine the exposure dose from the results, record them and issue a copy of the records to that person.

Section 4 Measures to Reduce Radiation Exposure

1 Prior radiological evaluation

(1) When employers of decontamination works, etc. carry out decontamination works, they should make surveys of workplaces in advance with respect to the items described below and record the results.

When the works for handling designated contaminated soil and wastes are conducted continuously in one area, the survey at the said area is to be conducted with respect to the items described below once every two weeks during the period of the work and the results are to be recorded. However, if the results show the average ambient dose rate and the concentration of radioactive material are consistently lower than 2.5μSv/h and 10,000Bq/kg, respectively, there is no need for further routine survey.

(a) Conditions of the area for decontamination related works

(b) Average ambient dose rate (μSv/h) for the area for decontamination related works

(c) Radioactivity concentration (Bq/kg) of Cs-134 and Cs-137 in contaminated soil and wastes, removed soil or contaminated waste.

(2) Employers of decontamination works, etc. should clearly disclose in advance the date of the survey completion in (1) above, methods of the survey and the summary of results in a written form, etc. to the workers who will be engaged in the decontamination works.

(3) When measuring average ambient dose rates, the following matters should be noted:

(a) Average ambient dose rates should be measured and evaluated in accordance with Attachment 5.

(b) The purpose of the prior radiological evaluation for the average ambient dose rate regarding the works for handling of designated contaminated soil and wastes is to determine if the average ambient dose rate at the workplace exceeds 2.5μSv/h, and accordingly to judge whether or not the exposure dose control is required. Therefore, if the employer judges that the average ambient dose rate at the workplace clearly exceeds 2.5μSv/h based on the results of the air-borne monitoring survey, etc. published by the Nuclear Regulation Authority, the results of the air-borne monitoring survey, etc. for the specific workplace concerned may be used instead of actual measurements of average ambient dose rates in those individual workplaces.

(4) When measuring concentration of radioactive materials, the following matters should be noted:

(a) Concentration of radioactive materials discharged by the accident in contaminated soil and wastes, removed soil or contaminated waste should be measured in accordance with the procedures shown in Attachment 6.

(b) Measurement of radioactivity of soil in farmlands, fallen leaf layers and soil in forests which are deemed to be an objective of the works for handling of designated contaminated soil and wastes in areas where the average ambient dose rate is 2.5μSv/h or less, may be substituted by estimation of radioactivity of contaminated soil and wastes from the average ambient dose rate shown in Attachments 6-2 and 6-3. If the estimates are less than 10,000Bq/kg, the works there may be regarded as those that do not fall under the

works for handling designated contaminated soil and wastes.

However, when handling only soil near the surface of unplowed farmlands, or handling the fallen leaf layer or soil near the surface in forests, it is necessary to use a simple measurement method to determine concentration of radioactive materials in accordance with the procedures shown in Attachment 6-1 in order to determine whether or not the works fall under the works for handling designated contaminated soils and wastes.

(c) The works in living zones (around buildings, structures and roads, etc.) may be regarded as not falling under the works for handling designated contaminated soil and wastes, regardless of the concentration of radioactive material in the soil near the surface, if the simple measurement by the procedures shown in Attachment 6-1 shows the concentration of radioactive material in the soil to be handled down to the digging depth is less than 10,000Bq/kg.

However, in case the work handles soil near the surface only without digging, it is necessary to determine, based on the measurement of the radioactivity concentration of soil near the surface, whether or not the work falls under the works for handling designated contaminated soil and wastes.

(d) The purpose of prior radiological evaluation for the concentration measurement of radioactive materials in contaminated soil and wastes regarding the works for handling of designated contaminated soil and wastes is to determine whether the concentration of radioactive materials in the contaminated soil and wastes to be handled exceeds 10,000Bq/kg or 500,000Bq/kg. Therefore, if the employer of decontamination works, etc. judges that the concentration of radioactive materials in the contaminated soil and wastes to be handled clearly exceeds 10,000Bq/kg based on the results of the air-borne monitoring survey, etc. published by the Nuclear Regulation Authority, the results of the air-borne monitoring survey, etc. may be used instead of actual measurement of radioactivity concentration of the contaminated soil and wastes at the workplace. Furthermore, the measurement of concentration of radioactive materials is not required if that of the contaminated soil and wastes to be handled is clearly known as less than 10,000Bq/kg and therefore not subject to the works for handling designated contaminated soil and wastes, based on the lookup table in Attachment 6-2 or 6-3 and other information as well as considering the digging depth of soil and average ambient dose rate at the workplace

2 Formulation of the working plan and works based on the plan

(1) When carrying our decontamination works, the employers of decontamination works, etc. should formulate a work plan based on the information from the preparatory survey, and the works should be conducted based on the plan (when handling designated contaminated soil and wastes, the works are limited to those in the workplaces where the average ambient dose rate exceeds 2.5μSv/h).

(2) The following items should be defined in the work plan.

(a) Workplaces of decontamination related works

(b) Methods of decontamination related works
(c) Monitoring methods of exposure dose of workers for decontamination works
(d) Measures for reducing radiation exposure of workers for decontamination works
(e) Types and performance of machines, instruments and other equipment (hereafter referred to as “machinery”) to be used for the decontamination related works
(f) Emergency measures when work-related accidents occur

(3) Employers of decontamination works, etc. should inform relevant workers of the details of the plan when the work plan has been established.

(4) Employers of decontamination works, etc. should take note of the following matters when establishing the work plan.
(a) The workplace should include the description of:
1) Resting areas where eating, drinking or smoking is allowed.
2) Contamination screening areas for a person leaving the area and for objects to take out.
(b) Methods of work should include the description of:-
Organization of workers, instructions to handle machinery, work procedures, working environment, etc.
(c) Measures for reducing radiation exposure should include the description of:
1) Methods for measuring average ambient dose rate.
2) Methods for reducing radiation exposure such as reduction of working hours, etc.
3) Setting target values for exposure dose control based on the estimates of the exposure dose.

(5) Principles for establishing resting areas where eating, drinking or smoking is allowed
(a) The areas for eating and drinking should be basically isolated from the open air such as inside of vehicles, etc. If it is difficult to find such a place, eating and drinking should be allowed in the area where the following requirements are met. Smoking should also be allowed outside where the following requirements are met:
1) Soil of high radioactivity does not exist in the vicinity.
2) All workers should take a break simultaneously to prevent the inhalation of dust, and wait for about 20 min after interruption of the work, before eating, drinking, or smoking.
3) Workers should stay on the windward side of the workplace. If that is not possible, at least workers should not stay in the downwind direction of the workplace.
(b) All workers should remove contaminated gear such as gloves, dust masks, etc. before eating, drinking or smoking, and decontaminate their hands by washing, etc. Workers should check for their own contamination before eating and drinking when they have handled highly radioactive contaminated soil and wastes.
(c) Used dust masks should be stored properly so that radioactive particles do not migrate to the inner side of the masks or they should be discarded (in the case of a screening test, the surface density of radioactive materials discharged by the accident on the surface of the mask should be measured before discarding it).
(d) Drinking of water is allowed only in an unavoidable case to prevent heat stroke, etc. It is

necessary to move to the windward side of the workplace and to take preventive measures for contamination before drinking by taking off gloves, etc.

(6) Principles for setting contamination screening areas

(a) Employers of decontamination works, etc. should set a contamination screening area in the workplace or nearby for decontamination. The location of the contamination screening area should be on the boundary of the workplace, where they are responsible for decontamination. However, in case it is difficult to choose such a place for geographical or other reasons, it should be near the boundary.

(b) Regardless of the above, it is allowed to place, at a certain location, a unified contamination screening area for multiple workplaces, if one employer of decontamination works, etc. undertakes decontamination works in several workplaces, and takes measures to prevent contamination by potentially contaminated workers or goods from spreading during moving from workplaces to the contamination screening area such as moving using air-tight vehicles, etc. This applies to the case that several employers of decontamination works, etc. set and use a unified contamination screening area collectively, or that the contamination screening area is set by the contractee.

(c) The contamination screening area should be equipped with radiation measurement equipment, facilities for decontamination such as cleaning and washing, installation of temporary storage for contaminated soil and wastes, or removed soil or contaminated waste. The screening area can be outside as long as preventive measures are taken for contamination spreading, for example, covering the spot with a tent, etc.

3 Operation leaders

(1) When carrying out decontamination works, employers of decontamination works, etc. should appoint an operation leader among workers who is recognized to be competent to direct the work, and delegate him/her to direct the work according to the work plan (when handling designated contaminated soil and wastes, the works are limited to those in the workplaces where the average ambient dose rate exceeds 2.5μSv/h). The operation leader should conduct the following matters, too.

(a) To determine the work procedures appropriate for the work plan and distribute decontamination workers accordingly.

(b) To arrange a meeting on the work procedures with workers for decontamination works prior to undertaking the works.

(c) To check the machinery and equipment and remove defective pieces before starting the works.

(d) To supervise how radiation detectors and protective equipment are used.

(e) Prevent the unauthorized people from entering the workplace.

(2) The work procedure should include the description of:

(a) The method of each task in the work procedure.

(b) The workplace, waiting area and resting area.

(c) The working hour control method.

4 Submission of work notice

(1) The employer of decontamination works, etc. who has received an order directly from a contractee (hereinafter referred to as "the primary contractor") should, when starting operation of works for decontamination, etc. or handling of designated contaminated soil and wastes at the workplace where the average ambient dose rate exceeds 2.5μSv/h, submit a “Notice for Works of Decontamination, etc. / Works for Handling Designated Contaminated Soil and Wastes” (Form 2) in advance, to the Labour Standard Inspection Office within the jurisdiction of the workplace of the primary contractor (hereinafter referred to as “the Head of the relevant Labour Standard Inspection Office”).

The work notice should be submitted basically for each contract of the work. However, in case several discrete workplaces are included in one work contract, the work notice needs to be submitted for each workplace.

(2) The work notice should include the description of:

(a) Title of the work (Title of the contract of the work).

(b) Location of the workplace.

(c) Name and address of the Primary contractor.

(d) Name and address of the contractee.

(e) Duration of the work.

(f) Full name of the work leader of the work.

(g) Average ambient dose rate at the workplace.

(h) List of relevant subcontractors and approximate number of workers for decontamination works.

5 Medical examination by medical doctors

(1) Employers of decontamination works, etc. should promptly provide workers for decontamination works with medical examination or treatment in any of the following cases:

(a) When workers received effective doses higher than the exposure dose limit.

(b) When workers inhaled or ingested radioactive materials discharged by the accident by mistake.

(c) When workers cannot decontaminate themselves to the level of less than 40Bq/cm2 by washing and cleaning after being contaminated by radioactive materials discharged by the accident.

(d) When a wound is contaminated with radioactive materials discharged by the accident.

(2) Application of the above (1)-(b) is limited only to the cases in which a certain degree of internal exposure is envisaged. For example, if workers are buried in a large amount of soil and sand, etc. in an accident, etc., and the results of their nasal smear test, etc. show a contamination level over the criterion, or if workers swallow a large amount of soil, sand or contaminated water, etc.

Section 5 Measures for Preventions of Contamination Spreading and Internal Exposure

1 Restriction of dust dispersion

When employers of decontamination works, etc. carry out decontamination works (excluding works for handling designated contaminated soil and wastes), they should take measures to control generation of dust by wetting soil, etc. in advance if the works will be stripping soil, etc. This does not apply when the works are in the category “other than highly radioactive contaminated soil and wastes” or “other than high dust concentration” in the table in Section 3 2-(4).

In order to wet the objects, they should not be dampened using water applied by hoses, etc., but by spraying a mist in order to control generation of contaminated water.

2 Use of containers for collecting waste, etc. and measures for storage

(1) When employers of decontamination works, etc. collect, transport and store removed soil or contaminated waste as the work for collecting waste, etc., they should use containers with the structure defined below to prevent removed soil or contaminated waste from dispersing or leaking, and post a sign on the surface of the containers indicating that that removed soil or contaminated waste is inside.

However, provisions described above do not apply as long as measures such as covering them with waterproof sheets are taken to prevent removed soil or contaminated waste from dispersing or leaking, if the objects are extremely difficult to place in a container such as large size machines, logs or dismantled objects bigger than the container, or are a large volume of contaminated soil, etc. which could result in causing a high external radiation exposure or exposure to dust by additional work to subdivide them into containers.

It should be noted that the “work for collecting waste, etc.” does not include the work for moving, back filling and temporary storing of soil generated at the workplace as part of the work for decontaminating soil, etc. or handling designated contaminated soil and wastes.

(a) Containers to be used for collecting or storing removed soil or contaminated waste

1) Containers should be free from a risk of removed soil or contaminated waste being dispersed or leaked.

(b) Containers for transporting removed soil or contaminated waste

1) Containers should be free from a risk of removed soil or contaminated waste being dispersed or leaked.

2) Dose rate (1 cm dose equivalent rate) at the distance of 1 meter from the container surface (from the surface of the package in the case that the container is packed) should not exceed 0.1mSv/h.

In the case of transporting containers by a loading vehicle only, however, the provisions mentioned above do not apply, if the maximum dose rate (1 cm dose equivalent rate) at the distance of 1 meter from the front, rear and both sides of the vehicle (or from the outermost surface of the tire in the case the vehicle is an open type) does not exceed 0.1mSv/h.

(2) Employers of decontamination works, etc. should take the following measures as well as the measures described in (1) above when storing removed soil or contaminated waste as part of their decontamination works.

(a) Post signs to clearly indicate that removed soil or contaminated waste is stored in the area.

(b) Install a simple fence using colored pylons, etc. to keep the unauthorized people from the storage area.

(3) When employers of decontamination works, etc. carry out the works for handling designated contaminated soil and wastes, they should make efforts to remove in advance highly radioactive contaminated soil and wastes in areas where works are to be done, except when reduction of exposure dose is expected to be equal to or better than the removal of contaminated soil and wastes, such as soil covering, paving roads, turning and plowing in farmlands, etc. However the provisions described above should not apply to works to recover local infrastructures that are the minimum required for implementing decontamination such as restoration of water supplies, electricity and roads, etc.

3 Implementation of contamination screening

(1) Contamination limit

The contamination limit should be set as 40Bq/cm^2 (13,000cpm as a GM counter reading). In case it is difficult to conduct radiation measurement for inspecting contamination due to a high ambient dose rate around the area, the unified contamination screening area in accordance with the provision in Section 4 2-(6) (b) should be set where the ambient dose rate is low enough.

(2) Contamination screening for a person who is leaving the controlled area

(a) Employers of decontamination works, etc. should check the body contamination of workers and equipment worn by the workers such as clothing, footwear, working clothing, and protection equipment at the contamination screening area when they leave the workplace after being engaged in the decontamination work.

(b) When employers of decontamination works, etc. should find, by the screening, that a worker is contaminated higher than the contamination limit, the employer should not allow the person to leave the workplace until the measures listed below are taken.

1) If the body surface is contaminated, let the person wash his/her body until the contamination level drops to the surface contamination limit or below.

2) If equipment, etc. is contaminated, let the person remove it from his/her body.

(3) Contamination screening of objects to be taken from the workplace

(a) Employers of decontamination works, etc. should check the contamination of objects to be taken from the workplace at the contamination screening area. However this provision should not apply if those objects are encased in containers or covered with plastic sheets to prevent removed soil or contaminated waste inside from dispersing or leaking, for transfer to another workplace for decontamination.

(b) When employers of decontamination works, etc. find, by screening, that objects are being contaminated at higher than the contamination limit, these objects should not be allowed

to be taken from the workplace. However, this provision does not apply if the object is to be transferred to other facilities such as facilities for decontamination works, storage or disposal or to other decontamination workplaces after necessary measures are taken such as encasement in containers or covering with plastic sheets to prevent the removed soil or contaminated waste from dispersing or leaking.

(c) Contamination screening for vehicles should be conducted after washing off contaminated soil, etc. from the body of the vehicles, by taking note of the following matters:

1) Contamination screening is not necessary for the parts such as tires which directly touch the ground, because they can be contaminated again on the driving route even after decontamination to below the contamination limit at the contamination screening area.

2) Decontamination is required for the inside and cargo carrier areas, etc. of vehicles other than tires, etc., if the areas are contaminated above the contamination limit.

3) It is desirable to decontaminate, and check the contamination, at the unloading place, of the cargo carrier areas, etc. for trucks, etc. which have transported removed soil or contaminated waste. However, if that is difficult, they may be driven back to the contamination screening area again for inspection and decontamination, by covering the carrier areas, etc. with plastic sheets, etc. in order to prevent removed soil or contaminated waste from dispersing or leaking.

4 Measures to prevent contamination

Employers of decontamination works, etc. should take effective measures including those listed below to prevent bodies, equipment or objects from being contaminated beyond the limit;

(a) Changing shoes, and changing or disposing of clothing, gloves and protection equipment.

(b) Pre-treating machinery to prevent its contamination, and decontaminating machinery after work.

(c) Handling treatment for transportation of removed soil, etc.

(d) Maintaining cleanliness of the workplace.

5 Prevention of body surface and internal contamination

(1) Employers of decontamination works, etc. should provide dust masks with collection efficiencies as given in the table below according to the work categories and radioactivity concentration of soil and wastes or should provide respiratory protective equipment with higher effectiveness, and should direct decontamination workers to wear them when engaged in the works. Decontamination workers should wear the respiratory protective equipment.

	Contaminated soil and wastes with radioactivity concentration higher than 500,000Bq/kg (Highly radioactive contaminated soil and wastes)	Those other than highly radioactive contaminated soil and wastes

Work under dust concentration higher than 10mg/m^3 (work under a high dust concentration)	Dust collection efficiency: equal to or higher than 95%	Dust collection efficiency: equal to or higher than 80%
Work other than that under a high dust concentration	Dust collection efficiency: equal to or higher than 80%	Dust collection efficiency: equal to or higher than 80%

It should be noted that non-woven fabric masks (that is, masks other than the dust masks certified by the national test, made of non-woven fabric material, and commonly used to prevent colds or pollen allergies, known as surgical masks, pleated masks, and face masks, but excluding gauze masks) may be used instead of dust masks if the work does not involve highly radioactive contaminated soil and wastes nor is it conducted under high dust concentration, and also the work does not fall under Articles 27 (Use of respiratory protective equipment) of the "Ordinance on Prevention of Hazards Due to Dust" (Ministry of Labour Ordinance No.18 of 1979) such as handling grass and trees or leaf mold, etc.

(2) When decontamination and related works may result in workers becoming contaminated above the contamination limit, the employers of said workers shall keep the following matters in mind and shall instruct their workers in performing such decontamination works to wear appropriate protective clothing, gloves, or shoes, for preventing contamination, according to work categories and radioactivity concentration of soil and wastes given in the table below. The workers so instructed shall wear such protective gear.

(a) Gloves made of material less likely to cause allergies should be prepared if needed, because some types of rubber glove material may cause allergic symptoms.

(b) Measures such as shoes covered by plastic, etc. may be required in the case that wearing rubber boots is difficult to use due to the nature of the work.

(c) Waterproof clothing such as raincoats, etc. should be worn as appropriate when using water for high-pressure cleaning, etc.

	Contaminated soil and wastes with radioactivity concentration higher than 500,000Bq/kg (Highly radioactive contaminated soil and wastes)	Those other than highly radioactive contaminated soil and wastes
Work under dust concentration higher than 10mg/m^3 (work under a high dust concentration)	Whole body chemical protective clothing to cover long sleeve shirts (for example, air-tight Tyvek suits), rubber gloves (over cotton gloves), rubber boots	Long sleeve shirts, cotton gloves, rubber boots
Work other than under a high dust concentration	Long sleeve shirts, rubber gloves (over cotton gloves), rubber boots	Long sleeve shirts, cotton gloves, rubber boots

(3) When the protective gear to be used by workers for decontamination and related works is

contaminated above the contamination limit (40Bq/cm2 (13,000 cpm as a GM counter reading)), employers of said decontamination related workers shall not allow the workers to use such protective gear, unless it is decontaminated by washing or cleaning to the level of or lower than the said contamination limit.

Disposable type dust masks or non-woven masks should be discarded at the end of work each day. If a mask is taken off during a break in the day, the mask should be stored properly so that the inner side of the mask will not be contaminated with dust or soil, etc. or it should be discarded. If a dust mask is an exchangeable type, the filter should be discarded at the end of work each day and the mask face piece should be cleaned according to the instructions by the manufacturer. During cleaning, dust and sweat should not be left on the surface of the face piece, and replaceable parts such as exhaust and intake valves and lacing should be checked for any dirt or damage. If required, they should be replaced with new parts before the next use.

(4) Employers of decontamination works, etc. should prohibit workers from smoking, eating and drinking in areas other than the area designated in Section 4 2-(5) and they should inform workers about this in writing such as by a letter or posting a notice. Workers should not smoke or eat and drink in the non-designated areas.

Section 6 Education for Workers

1 Education for operation leaders

(1) When employers of decontamination works, etc. appoint an operation leader for the decontamination works (for the works for handling designated contaminated soil and wastes, they are limited to those in the workplaces where average ambient dose rate exceeds 2.5μSv/h), they should provide education to the operation leader with the following courses:

(a) How to determine work procedures and arrange workers engaged in decontamination works.

(b) How to direct workers engaged in decontamination works.

(c) Measures in case of abnormal events.

(2) See the Attachment 7 for details in implementing the education.

2 Special education for the workers engaged in decontamination works

(1) Employers of decontamination works, etc. should provide special education consisting of lectures and practical training with respect to the following courses to the workers engaged in decontamination works before assigning them to decontamination works.

(a) Lectures

1) Knowledge about the effects of ionizing radiation on human body and exposure dose control methods

2) Knowledge about the methods of decontamination related works

3) Knowledge about the structure and handling of the machinery, etc. used for

decontamination related works (except for the works for handling designated contaminated soil and wastes)

4) Names and intended use of the machinery, etc. used for decontamination related works (limited only to the works for handling designated contaminated soil and wastes)

5) Relevant laws and regulations

(b) Practical training

1) Methods of decontamination and handling machinery, etc. used for decontamination related works (except for the works for handling designated contaminated soil and wastes)

2) Methods of decontamination related works (limited only to the works for handling designated contaminated soil and wastes.)

(2) See Attachment 8 for details in implementing the special education.

3 Education, etc. for other workers who require education

(1) Employers other than employers of decontamination works, etc. who conduct decontamination related works of their own sites or facilities, etc., or employers who conduct decontamination related works in other than the special decontamination areas, etc. should provide education to workers necessary for conducting decontamination related works. It is desirable to provide education as well to those who are not employed by the employers of decontamination works, etc. themselves such as individual proprietors, self-employed workers and volunteers, etc.

(2) It is desirable that the ordering parties place an order for decontamination works only after confirming that employers of decontamination works, etc. have established a system to secure the required number of educated operation leaders and workers sufficient to conduct the work.

Section 7 Measures for Health Care

1 Special medical examination

(1) Employers of decontamination works, etc. should provide the workers regularly engaged in decontamination works (for the works for handling designated contaminated soil and wastes., they are limited to those in the workplaces with the average ambient dose rate exceeding 2.5μSv/h) with the following medical examinations by medical doctors at the time of employment or of being transferred to the work, and once within every 6 months thereafter on a regular basis.

It should be noted that for workers with less than a 6-month-contract or a dispatched contract or dispatched workers, the medical examinations should be also provided at the time of employment in order to acquire their exposure history and health condition.

(a) Inquiry and assessment of their exposure history (their work location, work descriptions and durations, whether they have subjective symptoms or not, and other relevant matters regarding radiation exposure for workers who have an exposure history)

(b) White blood cell count and differential white blood cell count
(c) Red blood cell count and hemoglobin or hematocrit value
(d) Eye inspection for cataracts
(e) Skin inspection

(2) Regardless of the definition in (1) above, the tests (b) to (e) in (1) are not required, if a medical doctor considers so, for a worker whose medical examination (provided on a regular basis) of the previous year show that the effective dose was less than 5mSv, and whose medical examination of the present year shows that effective dose will unlikely exceed 5mSv.

(3) Employers of decontamination works, etc. should prepare the "ionizing radiation medical examination cards for decontamination, etc." (Form 3) based on the results of medical examinations in (1) above and keep them for 30 years. It should be noted, however, that this shall not be applicable if the records are transferred to the organization designated by the Minister of Health, Labour and Welfare (Radiation Effects Association, a public interest incorporated foundation) after the records have been kept for five years or the workers engaged in decontamination works recorded therein have left the job.

2 General medical examinations

(1) Employers of decontamination works, etc. (for dispatched workers, their employer should provide a general medical examination and the same should apply hereafter) should provide the workers engaged in decontamination works who will be regularly engaged in decontamination works (for the works for handling designated contaminated soil and wastes, they are limited to those in the workplaces where average ambient dose rate exceeds 2.5μSv/h) with the following medical examinations by medical doctors at the time of employment or of being transferred to the work, and once within every 6 months thereafter on a regular basis.

(a) Inquiry for medical history and work history
(b) Inquiry for subjective and objective symptoms
(c) Measurement of height, weight and waist and visual and hearing acuity tests
(d) Thoracic spine X-ray examination and sputum test
(e) Measurement of blood pressure
(f) Anemia test
(g) Liver function tests
(h) Lipid blood tests
(i) Glucose test
(j) Urine test
(k) Electrocardiography

(2) Employers of decontamination works, etc. should provide decontamination workers who will be regularly engaged in the works for handling designated contaminated soil and wastes except for (1) above, with the medical examination for the tests (a) to (k) in (1) by a medical doctor at the time of employment or of being transferred to the work, and once within every one year thereafter on a regular basis.

(3) Regarding medical examinations for (1) or (2) above (limited to those on a regular basis), workers who were examined for items (f) through (i) and (k) of the above (1) at the previous medical examination may be exempted from all or part of such items, if the occupational physician considers them unnecessary.

(4) As for items (c), (d), (f) through (i) and (k) of the above (1), they may be omitted if the occupational physician considers them unnecessary based on the criteria set by the Minister of Health, Labour and Welfare.

(5) The hearing test of item (c) of the above (1) (limited to tests conducted during regular medical examinations) may be substituted by hearing tests that the occupational physician considers appropriate (excluding tests for hearing ability for 1000 Hz and 4000 Hz sounds), for workers who were examined for the said items during the previous medical examination, or who are younger than 45 years (except those aged35 and 40 years old).

(6) Employers of decontamination works, etc. should prepare the medical examination card, based on the results of the medical examination in (1) or (2) and keep them for 5 years.

3 Subsequent actions on the results of the medical examination

(1) Employers of decontamination works, etc. should seek opinions from the medical doctor about the results of the medical examination described in 1 or 2 above (limited to workers who were diagnosed as abnormal in the said medical examinations items) in the following manner.

(a) A medical doctor’s opinion should be sought within three months from the date of a medical examination.

(b) The opinions and observations of the medical doctor should be recorded in each employee’s personal medical examination card.

(2) Employers of workers engaged in decontamination works, etc. should inform those workers for decontamination and related works who had the said examinations of their medical examination results without delay.

(3) Employers of workers engaged in decontamination works, etc., when the medical examinations described in 1 above (limited to those conducted regularly) have been conducted, should submit the "Report of results on the ionizing radiation medical examinations for decontamination, etc." to the relevant Head of the Labour Standards Inspection Office without delay.

(4) When a worker has, or is suspected to have, or may have a radiation hazard ailment based on the results of the medical examinations described in 1 or 2 above , the employers of the workers engaged in decontamination works, etc. should take the necessary measures to maintain the health of the worker including transferring him/her to another workplace or changing the specific work, minimizing the radiation exposure time and changing the method of work and so forth, until there are no doubts about the worker’s radiation hazard ailment or its possibility.

4 Transfer of the records

(1) When any employer of decontamination works, etc. intends to discontinue its operation, the ionizing radiation medical examination cards for decontamination, etc. defined in 1-(3) above should be transferred to the organization designated by the Minister of Health, Labour and Welfare (Radiation Effects Association, a public interest incorporated foundation).

(2) Employers of decontamination works, etc. should issue copies of the ionizing radiation medical examination card for decontamination, etc. defined in 1-(3) above to the worker who is going to leave the job or to all of the workers when the business is terminated.

Section 8 Safety and Health Management System

1 Establishment of the safety and health management system by the primary contractors

(1) Appointing a general safety and health manager

The primary contractors should appoint a general safety and health manager among the individuals who supervise and manage the decontamination works, and assign him/her to conduct tasks (2) to (4) shown below in order to ensure appropriate safety and health management for the decontamination works.

(2) Appointing a person responsible for safety and health control in relevant subcontractors

The primary contractor should require the relevant subcontractors to assign a person responsible for safety and health control to conduct the following tasks.

(a) Communication with the general safety and health manager.

(b) Coordination with the general safety and health manager to ensure the following matters are conducted smoothly among the relevant subcontractors.

(c) Communication and coordination with all of the relevant subcontractors when the relevant subcontractors assign part of their work to other subcontractors.

(3) Holding the safety and health coordinating meeting consisting of all relevant subcontractors, etc.

(a) The safety and health coordinating meeting consisting of all relevant subcontractors should be established and the meetings should be held once within a month on a regular basis.

(b) The following matters should be discussed at the safety and health coordinating meeting:

1) Implementation of education necessary for safety and health management such as special educations for workers who are newly engaged in the decontamination works.

2) Implementation of preliminary surveys, and preparation and improvement of work plans.

3) Setting of contamination inspection areas and implementation of contamination inspections.

4) Emergency communications and actions in case of abnormal events including occurrence of occupational hazards.

(4) Guidance and support for preparing work plans, etc.

(a) The general safety and health manager should guide, or support the relevant

subcontractors as appropriate to ensure that the relevant subcontractors conduct a preliminary survey, and prepare work plans appropriately.

(b) The general safety and health manager should guide, or support the relevant subcontractors as appropriate to ensure that the relevant subcontractors inform their workers about the results of the preliminary survey and details of the work plans appropriately.

2 Consolidated management of radiation exposures by the primary contractor

The primary contractor should assign a radiation administrator to conduct radiation dose control specified in Sections 3-2 through 3-4 and assign the radiation administrator to consolidate radiation exposure management for all workers from the relevant subcontractors under the direction of the general safety and health manager in the paragraph1-(1) by taking into account the following matters, in order to ensure that radiation exposure is controlled appropriately.

It is recommended that the radiation administrator be selected from among those who have radiation-related national qualifications, or those who have been trained through courses regarding radiation management at professional educational institutions.

(1) Implement setting of the contamination inspection area and contamination inspections appropriately upon consulting with the ordering party.

(2) Guide or support the persons in charge of radiation administration from the relevant subcontractors to ensure that the relevant subcontractors take measures stated in Sections 3-2 through 3-4 and Section 8-4 appropriately.

(3) Take part in the Organization for Registration Control of Radiation Exposure Doses for Decontamination and Related Works in ord s er to properly determine the accumulated exposure doses of workers and to prevent exposure dose records from getting scattered or lost.

(4) Implement any other tasks necessary for radiation control.

3 Safety and health management system by employers of decontamination works, etc

(1) Employers of decontamination works, etc. should appoint health managers or safety and health promoters to assign administration of technical matters stated in Sections 3-2 and 3-4 (Dose measurement and records of dose measurement, etc.), Section 5-3 (Contamination inspection, etc.), Sections 5-4 and 5-5 (Prevention for body and internal contamination), Section 6 (Education for workers) and Section 7 (Measures for health care).

It is desirable to appoint a safety and health promoter even if the number of workers is less than 10.

(2) Employers of decontamination works, etc. should appoint a person in charge of radiation administration regardless of the size of workplaces to assign him/her to conduct those tasks stated in Sections 3-2 and 3-4 (Dose measurement and records of dose measurement results, etc.), Section 5-3 (Contamination inspection, etc.), Sections 5-4 and 5-5 (Prevention for body and internal contamination).

4 Measures for maintaining and promoting the health of emergency workers at the TEPCO Fukushima Daiichi Nuclear Power Plant

Employers of decontamination works, etc. should implement the following matters, when they assign the workers who had been engaged in the emergency work at the TEPCO Fukushima Daiichi Nuclear Power Plant to the decontamination works.

(1) A report pursuant to Article 59, Paragraph 2 of the Ionizing Radiation Ordinance should be submitted to the Minister of Health, Labour and Welfare (c/o Office of Workers Health Planning for Ionizing Radiation, Industrial Health Division, Industrial Safety and Health Department, Labour Standards Bureau, Ministry of Health, Labour and Welfare).

(a) Copies of the medical examination card stated in Sections 7-1-(3) and 7-2-(4) should be submitted after medical examination without delay.

(b) The “status report on radiation dose control, etc. for designated emergency workers” (the Ionizing Radiation Ordinance Form No.3) shall be submitted at the end of every three months. The submission shall, in principle, be in an electromagnetic form as CSV file format.

(2) Health guidance should be provided to workers generally and inspections required by the guideline should be implemented for workers having received exposure dose greater than 50mSv during the period of the emergency operation in accordance with the “Guideline for Maintaining and Promoting the Health of Emergency Workers at the TEPCO Fukushima Daiichi Nuclear Power Plant” (Bulletin No. 5 of 2011).

Attachment 1. List of special decontamination areas ,etc.

1. Special decontamination areas

- Designated areas

  Areas, etc. included in Former Restricted Areas and Deliberate Evacuation Areas

	Number of municipalities	Designated areas
Fukushima Prefecture	11	All areas in Naraha-town, Tomioka-town, Okuma-town, Futaba-town, Namie-town, Katsurao-village and Iitate-village. And areas that used to be designated as Warning Zones or Planned Evacuation Zones in Tamura-city, Minamisoma-city, Kawamata-town and Kawauchi-village.

2. Intensive contamination survey areas

- Designated areas

  Areas for which the radiation dose rate is 0.23μSv/h or above

	Number of municipalities	Designated areas
Iwate Prefecture	3	All areas in Ichinoseki-city, Oshu-city, and Hiraizumi-town
Miyagi Prefecture	8	All area of Shiroishi-city, Kakuda-city, Kurihara-city, Shichikashuku-town, Ogawara-town, Marumori-town, Watari-town, and Yamamoto-town
Fukushima Prefecture	36	All areas in Fukushima-city, Koriyama-city, Iwaki-city, Shirakawa-city, Sukagawa-city, Soma-city, Nihonmatsu-city, Date-city, Motomiya-city, Koori-town, Kunimi-town, Otama-village, Kagamiishi-town, Tenei-village, Aizubange-town, Yugawa-village, Aizumisato-town, Nishigo-village, Izumizaki-village, Nakajima-village, Yabuki-town, Tanagura-town, Samegawa-village, Ishikawa-town, Tamakawa-village, Hirata-village, Asakawa-town, Furudono-town, Miharu-town, Ono-town, Hirono-town and Shinchi-town; and areas excluding the restricted and designated areas in Tamura-city, Minamisoma-city, Kawamata-town, and Kawauchi-village
Ibaraki Prefecture	19	All areas in Hitachi-city, Tsuchiura-city, Ryugasaki-city, Joso-city, Hitachiota-city, Takahagi-city, Kitaibaraki-city, Toride-city, Ushiku-city,Tsukuba-city, Hitachinaka-city, Kashima-city, Moriya-city, Inashiki-city, Hokota-city, Tsukubamirai-city, Tokai-village, Miho-village, Ami-town, and Tone-town
Tochigi Prefecture	7	All areas in Kanuma-city, Nikko-city, Ohtawara-city, Yaita-city, Nasushiobara-city, Shioya-town, and Nasu-town
Gunma Prefecture	8	All areas in Kiryu-city, Numata-city, Shibukawa-city, Midori-city, Shimonita-town, Takayama-village, Higashiagatsuma-town, Kawaba-village
Saitama Prefecture	2	All areas in Misato-city and Yoshikawa-city

Chiba Prefecture	9	All areas in Matsudo-city, Noda-city, Sakura-city, Kashiwa-city, Nagareyama-city, Abiko-city, Kamagaya-city, Inzai-city, and Shiroi-city
Total	92	

* Prepared by Division of Environmental Restoration, Environmental Restoration and Resources Recycling Bureau, Ministry of the Environment (January 2018)

Attachment 2. Specific activities (works) prohibited for dispatched workers among decontamination works

No person should be allowed to carry out a Worker Dispatching Undertaking with regard to services falling under construction work (which refers to work relating to civil engineering, and construction, remodeling, maintenance, repairing, modification, wrecking or dismantling of buildings and other structures, or preparation for any of these ; hereinafter referred to as “civil engineering/construction work”) pursuant to the provisions of Article 4, Paragraph 1 of the “Act for Securing the Proper Operation of Worker Dispatching Undertakings and Improved Working Conditions for Dispatched Workers.” Thus among decontamination works, those that fall under construction work of any of the above items, are not allowed to engage dispatched workers.

Therefore generally, if dispatched workers are employed at the construction site, their works are mainly considered as preparation for civil engineering/construction works. Thus they are, in most cases, prohibited although the work may not be defined as construction work when conducted independently.

For reference, several examples are shown in the following, but in principle, it should be judged whether or not decontamination works fall under construction work in line with the actual situation. In addition, it should be noted that even though the work may not be defined as civil engineering/construction work when conducted independently, they fall under civil engineering/construction work, and accordingly are prohibited because they are considered as preparation for the civil engineering/construction work.

Description of works (Machinery used, etc.)	Whether or not allowed
Decontamination of forests (removal of fallen leaves, branches and leaves, etc. and pruning of trees) (Electric saws)	Generally, the work on the left is allowed. However, when it is practically conducted as preparation for civil engineering or construction, etc., it falls under construction services, and accordingly is not allowed.
Watering of soil, etc. (Hoses, etc.)	Generally, the work is allowed as long as it is completed independently. However, when it is practically conducted as preparation for civil engineering or construction, etc., it falls under construction services, and accordingly is not allowed.
Mowing, stripping of topsoil, removal of soil, grass, moss, fallen branches and leaves, and garbage (Mowers, shovels, brooms, rakes, and sandbags)	Generally, mowing and removal of grass, moss, and fallen branches are allowed. However, when they are practically conducted as preparation for civil engineering or construction, etc. they fall under construction services, accordingly are not allowed. In addition, stripping of topsoil and removal of soil are considered as construction services themselves, and accordingly are not allowed.

Stripping of topsoil, etc., removal of soil, grass, moss, fallen branches and leaves, and garbage (Heavy machines, such as backhoes, and sandbags)	They are not allowed because they are considered as construction services themselves.
Removal of sludge in gutters, etc. (Shovels, brooms, rakes, and sandbags)	Generally, the work is allowed as long as it is completed independently. However, when it is practically conducted as preparation for civil engineering or construction, etc., it falls under construction services, and accordingly is not allowed.
Cleaning of roofs, walls, roads and gutters, etc. (High-pressure washing machines, brushes, buckets, and rags)	Generally, the work is allowed as long as it is completed independently. However, when it is practically conducted as preparation for civil engineering or construction, etc., it falls under construction services, and accordingly is not allowed.
Temporary storage and burial of removed soil, etc. (Shovels, sandbags, impermeable sheets, and shields)	Burial of removed soil, etc. on the left is not allowed because it is considered as a construction service itself. For temporary storage of removed soil, etc., it is generally allowed as long as the work is simply transferring removed and accumulated soil. However, in most cases, it is practically conducted as preparation for civil engineering or construction, etc., therefore it falls under construction services.
Transfer of removed soil, etc. to temporary storage places, etc. (Backhoes)	It is not allowed because it is considered as a construction service itself.
Transport of removed soil, etc. (Transportation vehicles)	It is not allowed when the work on the left is to transport removed soil, etc. directly from areas where the soil is because it is practically conducted as preparation for civil engineering or construction, etc. in most cases, and therefore it falls under construction services. On the other hand, it is allowed to transport removed soil from a temporary storage yard as a secondary purpose.
Stripping of roof tiles and side walls of buildings (Various tools)	It is not allowed because it is considered as a construction service itself.
Stripping of asphalt (Electric cutters)	It is not allowed because it is considered as a construction service itself.
Removal and transportation of debris	These are allowed when they refer to removal by manual labour of: debris which is not fixed firmly; sediment that flowed into residences; or sediment and debris left behind on the ground or on roads. However, when these are conducted by using heavy work machines or as preparation for civil engineering or construction, etc., they fall under construction services, and accordingly are not allowed.

Attachment 3. Determination on whether or not the work falls under the category of work under high dust concentration

1 Objectives

The purpose of the determination on whether or not the work falls under the category of work under high dust concentration is for employers to find out if a high concentration of dust that exceeds the lower limit of 10 mg/m^3 is generated during the work, and accordingly to determine the measurement method to control internal exposure.

2 Basic Policy

(1) A simplified measurement instead of an accurate one is acceptable so long as it can determine whether or not the dust concentration exceeds the lower limit of 10 mg/m^3 as a high dust concentration.
(2) It is desirable that carrying out the measurement be commissioned to experts.

3 Measurement method

(1) A personal sampler should be used during the work in order to determine whether or not the work falls under the work under high dust concentration; the measurement should be based on the relative concentration indication method using a digital dust meter, in principle, measured near workers during the work that generates dust.
(2) Measurement should follow the procedures described below:
    (a) Relative concentration (cpm) should be measured for 2 - 3 minutes using a digital dust meter (e.g., LD-5) in the vicinity of workers (downwind), to the extent that it does not disturb the workers engaged in the dust generating work.
    (b) It is desirable to conduct the measurement of the relative concentration described in (a) for all of the workers engaged in the work. However, when several workers are engaged in similar tasks within a distance of several meters, it may be sufficient to measure for a representative worker of the group.
    (c) Both a digital dust meter and an inhalable dust concentration measurement device should be set in parallel in the vicinity (downwind), to the extent that they do not disturb the work, of the worker for whom the simplified measurement in (a) showed the highest relative concentration (cpm), and the concentration should be measured for 10 minutes or longer continuously to obtain a mass-concentration conversion factor.
        1) The concerned particles for the dust concentration measurement should be airborne inhalable dust (respiratory dust, particle diameter 100 μm, 50% cut) that could be inhaled through a person’s nose or mouth.
        2) The concentration of the inhalable dust should be measured using an open-face type of sampler at the face-velocity of 19 (cm/s) on a sampling filter paper.
        3) Article 2 of the Working Environment Measurement Standards (Ministry of Labour Notification No. 46 of 1976) should be followed, except for the specifications of dust particle diameters of the dust particle separators and the measurement positions.

(3) Dust particle concentrations (mg/m^3) should be calculated from the relative concentration measurements (a) using a mass-concentration conversion factor obtained from the result in (c). In the case that the highest value of the measurements exceeds 10 mg/m^3, the concentration in the environment for all other workers engaged in the same task should be considered as exceeding 10 mg/m^3.

4 Measurement method (when using the specified mass-concentration conversion factor)

(1) Applied conditions

This measurement method should be applied only for handling soil mainly. Items which contain a large quantity of organic matters, including fallen leaves and branches, paddy straws, grasses, supply/sewage water sludge and items such as rubble, construction waste, etc. which contain a large amount of dust other than soil should be handled in accordance with the measurement method set forth in Section 3.

(2) Setting of measuring points

(a) The measurement during works under high dust concentration should be conducted in principle by the relative concentration indication method using a digital dust meter in the vicinity of workers engaged in dust generating work. The measuring positions should be the spots where the dust concentration is assumed to be the highest, in the downwind of dust generating source, and where the exhaust gas from heavy machines, etc. is less likely to affect the measurement. The concentration should be measured for all works during which dust is expected to be generated.

(b) When several workers are engaged in the same task, the measurement should be performed for a representative worker of the group.

(c) The measurement should be conducted as closely as possible to workers to an extent that it does not disturb the works and the safety of a measurer be ensured. If possible, it is desirable that the measurer take a digital dust meter with him and conduct the measurement as closest position as possible to the workers. If there should be no safety problems concerning the work, it is also possible that the workers themselves conduct measurement carrying the LD-6N on them.

(3) Measuring time

(a) The measuring time should be continuously for 10 minutes or longer during work at which the concentration is estimated to be the highest. If works are repeatedly carried out for short cycles of a few minutes each, the measurement should be made for a period of at least 10 minutes including the time which the works are being underway.

(b) If one work cycle is somewhere between 10 minutes and one hour, the measurement should be made for the entire cycle. If a work is continued longer than that, the concentration should be measured several times for about a period of 10 minutes during the work and the highest value should be recorded.

(4) Evaluation

(a) The relative concentration value indicated by the digital dust meter (the number counted per minute: cpm) is multiplied by the mass-concentration conversion factor to obtain the

mass concentration and whether or not the value is exceeding 10 mg/m^3 should be determined.

(b) The mass-concentration conversion factor

The mass concentration conversion factor in this measurement method should be set to 0.15mg/m^3/cpm. However, note the following items when using the factor.

1) Because the factor is set based on the results of limited measurements, it should be reviewed appropriately in step with the advancement of future research.

2) It is assumed that this factor will be applied to the digital dust meter of light scattering method, the LD-5 and LD-6.

Attachment 4. Internal exposure screening test method

1 Objectives

Screening tests are conducted by employers of decontamination works, etc to judge if they are required to provide workers with measurement of internal exposure.

2 Basic policy

(1) For works under a high dust concentration (10mg/m^3) environment and involving handling of highly radioactive contaminated soil (500,000Bq/kg), internal exposures exceeding the effective dose of 1mSv/y could be expected assuming that works were conducted under an unprotected situation condition without wearing a dust mask. Therefore measurement of internal exposure should be conducted once within every three months for the workers engaged in such works.

(2) For other workers other than the above, the screening test should be conducted when the work of the day is finished, and if the screening test result suggests a higher dose than the limit, measurement of internal exposure should be conducted once within every three months.

In the case that the works are not conducted under a high dust concentration (10mg/m^3) environment or involving handling of highly radioactive contaminated soil (500,000Bq/kg), the maximum value of internal exposure is estimated not to exceed 0.153mSv/y, so internal exposure measurement should be conducted only when incidentally exposed to high dust concentration .

3 Screening test methods

(1) Screening tests should be conducted as follows:
   (a) Radioactivity density on the surface of the mask should be measured with a radiation counter when the work of the day is completed.
   (b) Radioactivity density in the intranasal area should be measured (nasal smear test) with a radiation counter when the work of the day is completed.

(2) The criteria for the screening tests should be that the radioactivity density on the surface of the mask and in the intranasal area should be low enough to ensure that the internal exposure of the workers engaged in decontamination works is well below 1mSv per three-month. Reference values are as follows:
   (a) 10,000 cpm on the surface of a mask for the screening test (this is equivalent to 0.01mSv based on the calculation using a protection coefficient of 2 instead of 3 which is normally used (with severer assumption), and assuming that 50 % of the radioactive materials were attached on the mask surface, and the other 50 % were inhaled).
   (b) 1,000 cpm (equivalent to approximately 0.03mSv of internal effective dose) and 10,000 cpm (equivalent to approximately 0.3mSv of internal effective dose) for the nasal smear test which is assumed to be conducted as a secondary screening test.

(3) Actions after the screening tests
   (a) In the case that the result of the test for a dust mask exceeds the criterion, the nasal smear test should be conducted.

1) In the case that nasal smear test exceeds 10,000cpm, internal exposure should be measured once within every three months. For female workers who have been clinically confirmed as having a capability to become pregnant, internal exposure should be measured immediately when the nasal smear test exceeds the criterion.

2) In the case that the nasal smear test result exceeds 1,000cpm but is equal to 10,000cpm or less, the results are recorded. In case that the nasal smear test result exceeds 1,000cpm several times, then the internal exposure should be measured once within every three months.

(b) In the measurement of the dose rate on the surface of a dust mask as specified in (1)-b, when the surface radioactivity density of a specific worker shows a drastically lower value than that of other workers who do the same work, instruction on how to properly wear a dust mask should be provided to the worker, because the surface radioactivity density tends to show lower values due to improper wearing of the dust mask.

Attachment 5. Methods of measurement and evaluation of average ambient dose rate

1 Objectives

The purposes of measurement and evaluation of average ambient dose rates are for employers of decontamination works, etc. to measure and evaluate whether or not the average ambient dose rate at a workplace exceeds 2.5μSv/h, and accordingly to determine the details of radiation dose control to be implemented when employers assign workers to the decontamination works.

2 Basic policy

(1) Average ambient dose rate should be measured prior to commencing the work.

(2) When conducting the works for handling designated contaminated soil and wastes and work that is on-going at the same place, the dose rate should be measured once every two weeks as well as prior to commencing the work. Even when the measured dose rate is equal to 2.5μSv/h or less, the measurements should be continued until the dose rate falls below approximately 90% of 2.5μSv/h (2.2μSv/h). Also, the dose rate should be measured when there are significant changes in the surrounding environment due to typhoons, flooding or land slippage.

(3) The measurement should appropriately reflect the actual exposure situation of workers.

3 Measurement and evaluation of average ambient dose rate

(1) Common subjects

(a) Average ambient dose rate should be measured at a point 1m above the ground.

(b) The measuring device should comply with Article 8 of the Working Environmental Measurement Standards.

(2) When small scattering of ambient dose rate is expected (except for the works for handling designated contaminated soil and wastes.)

(a) When the working area is a rectangular shape, ambient dose rate should be measured at the four corners and at the intersection of the two diagonal lines of the rectangle. (Working area refers to each of the sub-divisions of the original working area, which are less than 1,000 m^2, if the size of the working area is greater than 1,000m^2.) Average ambient dose rate is derived by averaging the measurements from these five points.

(b) When the working area is not rectangular in shape, the ambient dose rates should be measured at four points set at almost equal distances along the outer periphery and one intersection point of the two diagonal lines from facing points. The average ambient dose rate is derived by averaging the measurements at these five points.

(3) When small scattering of the ambient dose rate is expected (except for the works for handling designated contaminated soil and wastes.)

(a) Ambient dose rate should be measured at three different points at least where the dose rate is likely to be the highest in the working area. Average ambient dose rate is derived by averaging the measurements from three points.

(b) In the case the area was decontaminated in advance and contaminated soil etc. with high

concentration of radioactive materials has been removed, this is basically considered as the case with small scattering of ambient dose rate

(4) When large scattering of ambient dose rate is expected:

(a) Average dose rate should be calculated according to the formula shown below regardless of the provision in (2) when radioactive materials are concentrated at a certain place in the work area resulting in a significant difference in the ambient dose rate from that in other work areas.

(b) The following matters should be noted:

(i) Ambient dose rate should be measured at several points every 1,000 m^2 around the points where a higher dose rate is expected (hereafter referred to as “specified measuring points”).

(ii) Exposure dose should be calculated for a representative individual for whom the highest dose is expected.

(iii) When the work continues several days at the same place, the calculation should be done assuming the day when the work is conducted is the day with the highest exposure dose:,

$$R = \left(\sum_{i=1}^{n} \left(B^{\mathrm{i}} \times \mathrm{WH}^{\mathrm{i}} \right) + \mathrm{A} \times \left(\mathrm{WH} - \sum_{i=1}^{n} \left(\mathrm{WH}^{\mathrm{i}} \right) \right) \right) \div \mathrm{WH}$$

where,

R: average ambient dose rate (μSv/h);

n: number of specified measuring points;

A: average ambient dose rate (μSv/h) calculated according to (2);

B^i: ambient dose rate values at each specified measuring point (μSv/h); to be put in the formula to obtain R;

WH^i: working hours (h) at the place of concern of a worker whose exposure dose is expected to be the highest among the workers engaged in decontamination works who carry out the decontamination works at the place near each specified measuring point;

WH: working hours (h) in a day for the concerned decontamination works.

Attachment 6. Measurement methods for radioactivity concentration in the contaminated soil and wastes.

1 Objectives

The objectives of measuring radioactivity concentration of contaminated soil and wastes, removed soil or contaminated waste are to assist employers in determining whether the contaminated soil and wastes exceeds the reference value (10,000Bq/kg or 500,000Bq/kg) and in deciding the necessary radiation protection measures for assigning their workers to the decontamination works.

2 Basic policy

(1) Radioactivity concentration should be measured prior to commencing the works.
(2) When conducting the works for handling designated contaminated soil and wastes and work that is on-going at the same place, the radioactivity concentration should be measured once every two weeks as well as prior to commencing the works. When the measured radioactivity concentration is below 10,000Bq/kg, the measurements should be continued until consistent low measurements can be obtained (approximately 10 weeks) considering the fluctuation of the measurements, except in the case that the measurement is clearly lower than 10,000Bq/kg. Also, the radioactivity concentration should be measured when there are significant changes in the surrounding environment due to typhoons, flooding or land slippage.
(3) It is desirable that the measurement be commissioned to experts.
(4) The radioactivity concentration should be measured for soil, etc. to be actually handled in the works.
(5) The highest value among measurements should be selected as a representative one considering the large variability of radioactivity concentration.
(6) The measurement before commencing the works should be based on the methods shown in Attachment 6-2 or the lookup table in Attachment 6-3, or other knowledge. The provision here does not require the measurement of radioactivity concentration when it can be clearly determined that the radioactivity concentration of contaminated soil and wastes involved in the work is significantly lower than 10,000Bq/kg, and the works do not fall under those for handling designated contaminated soil and wastes.

3 Sampling

(1) Principles for sampling
  (a) Either one of following materials should be sampled:
    (i) Contaminated soil, removed soil or contaminated waste in the location where the highest ambient dose rate was observed among air dose measurement points of the workplace; or
    (ii) Those samples considered to have the highest radioactivity concentrations, among contaminated soil, removed soil or contaminated waste to be handled during the works.
  (b) Several materials should be sampled from each workplace (every 1,000 m^2 when the size

of the workplace is larger than 1,000m^2). For the workplace whose size is significantly larger than 1,000m^2 and where radioactivity concentrations are relatively consistent for farmland, contaminated soil and wastes, removed soil or contaminated waste, the number of materials to be sampled may be considered as at least one for every 1,000m^2.

(c) Average radioactivity concentration should be determined for sampled materials when soil is sampled at different depths up to a certain depth from the surface.

(2) Location of sampling (except works for handling specified contaminated soil and wastes.)

Areas to be decontaminated with potentially high radioactivity concentration include the following:

(a) Farmland

Soil in the zone up to 5 cm in depth from the surface

(b) Forest

(i) Representative leaves and bark of trees , and fallen leaves and branches

(ii) Leaf mold in the zone up to 3cm in depth in the fallen leaf layer (leaf mold)

(c) Living environment (Areas around structures such as buildings or roads)

The area where rain water is collected and where the collected rain water exits, plants and their roots, locations where rainwater, mud or soil tend to be accumulated, and removed objects such as sludge near the structures to which small particles tend to be attached

(3) Location of sampling (limited to the works for handling specified contaminated soil and wastes)

(a) Farmland

Soil in the zone up to 15cm in depth from the surface.

(b) Forest

Leaves of trees, bark, and fallen leaves and branches whose potential radioactivity concentration is expected to be the highest. (When measuring the fallen leaf layer (leaf mold), soil up to 15cm in depth including the soil beneath the layer should be measured.)

(c) Living environment (Areas around the structures such as buildings or roads)

The soil, etc. among those items to be handled in the works, accumulated in the places, where rain water flows in and out, where there are plants and their roots, and where rain water, mud and soil tend to pool, and those of the places near structures to which particles easily attach (soil, etc. from the ground surface down to the depth of actual handling of soil, etc.; the depth should vary depending on the excavation depths in the actual decontamination works).

4 Analysis methods

Either method below should be used for analysis.

(1) The total gamma ray measurement or gamma spectrum analysis, as specified in Article 9, Paragraph 1-2 of the Working Environment Measurement Standards.

(2) Simplified measurement method

(a) The radioactivity concentration should be calculated using the following method if the correlation between the dose rate on the sample surface and the sum of the concentrations

of Cs-134 and Cs-137 is known. (See Attachment 6-1 for details.)

(i) Place the sample in a container and measure the weight.

(ii) Measure the maximum dose rate on the surface of the container.

(iii) Use the measured weight and the dose rate to calculate the sum of the concentrations of Cs-134 and Cs-137 in the sample.

(b) It is difficult to measure radioactivity concentrations equal to 300,000Bq/kg or more with the simplified method even when using the V5-type container because the upper measurement limit of the typical NaI scintillation counter is as low as 30μSv/h. Therefore, when the pointer on the scintillation counter goes past 30μSv/h, the relevant regulations should be applied under the assumption that the concentration of the measured object exceeds 500,000Bq/kg, or an analysis should be carried out using the method of (1) above.

(c) When measuring specimens for which radioactivity concentration is expected to be around 10,000Bq/kg, the surface dose rate should be measured while placing a sandbag at the area with low ambient dose rate because the measured surface dose rate could be lower than the ambient dose rate in the area.

(3) Simplified measurement based on the relationship between ambient dose rate and radioactivity concentration

(a) In the area where the average ambient dose rate is equal to 2.5μSv/h or less, the radioactivity concentration may be calculated using the following method if the correlation between the ambient dose rate at a height of 1 m and the sum of the concentrations of Cs-134 and Cs-137 in the soil (the average from the ground surface to the depth of 15 cm) is known. (See Attachments 6-2 and 6-3 for details.)

It should be noted that the simplified method shall not be applied to the works to handle soil near the ground surface of unplowed farmlands only or to handle fallen leaf layers or soil near the ground surface only, because data have indicated that approximately 50% of radioactive materials (for unplowed farmlands) or 60% of radioactive materials (for school yards) are accumulated in the zone from the ground surface to 1 cm in depth, and that radioactivity in the forest is mainly accumulated in fallen leaves.

(b) For the contaminated soil in the living environment (areas around buildings, structures and roads), the simplified measurement described in (2) should be applied to soil etc. to be actually handled in the works, because applying the estimation result uniformly is not practical due to variation in the properties of buildings, structures, roads, rivers, and soils, etc.

(c) Measurement methods

(i) Agricultural soils

- Measure average ambient dose rate at 1m in height from the ground surface (according to Attachment 5)
- Select the estimation equation and conversion factor depending on the type of farmland and type of soil.
- Use the estimation equation to estimate the sum of the concentrations of Cs-134 and Cs-137 in the soil, etc.

(ii) Fallen leaf layer in a forest

- Measure average ambient dose rate at 1m in height from the ground surface (according to Attachment 5)
- Use the estimation equation to estimate the sum of the concentrations of Cs-134 and Cs-137 in the soil, etc.

Attachment 6-1. Simplified measurement procedures for radioactivity concentration

1 Type of usable containers

(1) Round V-series containers (plastic containers of 128mmφ x 56mmH. Hereinafter referred to as “the V5 container”.)
(2) Sandbags
(3) Flexible containers
(4) 200L (liter) drum cans
(5) 2L (liter) polyethylene bottles

2. The following is the method for determining whether the radioactivity concentration of a container containing accident-derived waste is below 10,000Bq/kg or 500,000Bq/kg.

1) Measure the radiation dose rate on the surfaces of containers containing accident-derived waste, and define the largest value as A (μSv/h).
2) Determine the radioactivity B (Bq) of the containers containing accident-derived waste by putting the factor X depending on the measurement date and the measured radiation dose rate A (μSv/h) into the following formula. Table 1 lists the values of the factor X by the measurement date and container type.

   [A] x [Factor X] = B

3) Measure the weight of the containers containing accident-derived waste. Set this as C (kg).
4) To determine the radioactivity concentration D (Bq) of the containers containing accident-derived waste, substitute the radioactivity of the containers containing accident-derived waste for B (Bq) and the weight for C (kg) in the following formula.

   [B] ÷ [C] = D

Thus, it can be determined whether the radioactivity concentration D of the containers containing accident-derived waste is below 10,000Bq/kg, 500,000Bq/kg or 2,000,000Bq/kg.

Table 1 Values of the factor X listed by the measurement date and container types

Measurement date	Values of the factor X				
	V5 containers	Sandbag	Flexible containers	200L drum cans	2L polyethylene bottles
Until January 2018	4.4E+04	9.9E+05	1.3E+07	3.5E+06	1.3E+05
Until April 2018	4.4E+04	1.0E+06	1.3E+07	3.5E+06	1.3E+05
Until July 2018	4.5E+04	1.0E+06	1.3E+07	3.5E+06	1.3E+05
Until October 2018	4.5E+04	1.0E+06	1.4E+07	3.5E+06	1.3E+05
Until January 2019	4.5E+04	1.0E+06	1.4E+07	3.6E+06	1.3E+05
Until April 2019	4.6E+04	1.0E+06	1.4E+07	3.6E+06	1.3E+05
Until July 2019	4.6E+04	1.0E+06	1.4E+07	3.6E+06	1.3E+05
Until October 2019	4.6E+04	1.0E+06	1.4E+07	3.7E+06	1.3E+05
Until January 2020	4.7E+04	1.1E+06	1.4E+07	3.7E+06	1.3E+05
Until April 2020	4.7E+04	1.1E+06	1.4E+07	3.7E+06	1.4E+05
Until July 2020	4.7E+04	1.1E+06	1.4E+07	3.7E+06	1.4E+05
Until October 2020	4.7E+04	1.1E+06	1.4E+07	3.7E+06	1.4E+05
Until January 2021	4.8E+04	1.1E+06	1.4E+07	3.8E+06	1.4E+05
Until April 2021	4.8E+04	1.1E+06	1.4E+07	3.8E+06	1.4E+05
Until July 2021	4.8E+04	1.1E+06	1.5E+07	3.8E+06	1.4E+05
Until October 2021	4.8E+04	1.1E+06	1.5E+07	3.8E+06	1.4E+05
Until January 2022	4.8E+04	1.1E+06	1.5E+07	3.8E+06	1.4E+05

* Prepared by the Office of Workers Health Planning for Ionizing Radiation, Industrial Health Division, Industrial Safety and Health Department, Labour Standards Bureau, Ministry of Health, Labour and Welfare with the cooperation of the Japan Atomic Energy Agency

Attachment 6-2. Simplified procedures for measurement of radioactivity concentration of agricultural soil

1 Method to determine that the radioactivity (total radioactivity of Cs-134 and Cs-137) in agricultural soil is lower than 10,000Bq/kg based on the average ambient dose rate at the height of 1m from the ground surface

1) Measure the average ambient dose rate A (μSv/h) at the workplace (farmland) before starting the work (See Attachment 5 for the measurement method)

2) Select the estimation formula depending on the type of farmland and type of soil[*1] as summarized in Table 1.

3) Estimate the radioactivity concentration of Cs in the agricultural soil (15cm in depth), by substituting the measurement A (μSv/h) into the formula selected in Step 2).

Ambient dose rate A (μSv/h) x Factor X – Factor Y
= Radioactivity concentration (total of Cs-134 and Cs-137) (Bq/kg)

(Example)
Radioactivity concentration of Cs in Andosols for a “rice paddy in other areas” when the average ambient dose rate is 0.2μSv/h (Estimation formula: C)[*2]

$$0.2 \times \underline{7{,}800} - \underline{321} = \underline{1{,}239}\text{Bq/kg (Estimated)}$$

Table 1: Selection of estimation formula

Zone	Type of farmland	Type of soil	Formula	Factor X	Factor Y
Evacuation area	Non-decontaminated farmland		A	5,370	0
	Decontaminated farmland [*4]		B	4,080	0
Other areas	Rice paddy	Andosol	C	7,800	321
		Non-Andosol	D	6,410	186
	Agricultural field	Andosol	E	5,830	184
		Non-Andosol	F	5,720	183
	Orchard・Pasture		G	3,490	0

*1 Whether or not the soil of the farmland is an Andosol type can be checked by using the soil distribution map in the “Japan Soil Inventory” on the webpage of the Institute for Agro-Environmental Science, National Agriculture and Food Research Organization [URL:

http://soil-inventory.dc.affrc.go.jp/]

*2 The conversion factors will change due to radioactivity decay with time. The estimation formula will be revised before the change becomes too large to be negligible.

*3 Prepared by the Institute for Agro-Environmental Science, National Agriculture and Food Research Organization (January 2018)

*4 Farmlands which have been deeply plowed or whose topsoil has been stripped.

Table 2: Correspondence between radioactive Cs concentration and averaged ambient dose rates in non-decontaminated farmland in the emergency evacuation areas

Ambient Dose Rate (μSv/h)	Cs Concentration (Bq/kg)	Ambient Dose Rate (μSv/h)	Cs Concentration (Bq/kg)	Ambient Dose Rate (μSv/h)	Cs Concentration (Bq/kg)
0.1	537	1.1	5,907	2.1	11,277
0.2	1,074	1.2	6,444	2.2	11,814
0.3	1,611	1.3	6,981	2.3	12,351
0.4	2,148	1.4	7,518	2.4	12,888
0.5	2,685	1.5	8,055	2.5	13,425
0.6	3,222	1.6	8,592	2.6	13,962
0.7	3,759	1.7	9,129	2.7	14,499
0.8	4,296	1.8	9,666	2.8	15,036
0.9	4,833	1.9	10,203	2.9	15,573
1.0	5,370	2.0	10,740	3.0	16,110

* Prepared by the Institute for Agro-Environmental Science, National Agriculture and Food Research Organization (January 2018)

Attachment 6-3. Simplified measurement method for radioactivity concentration of forest soil, etc.

1 Method to determine that the radioactivity (total of Cs-134 and Cs-137) in the fallen leaf layer and soil in forest (hereafter referred to as “forest soil, etc.”) is lower than 10,000Bq/kg based on the average ambient dose rate at the height of 1 m from the ground surface

1) Measure the average ambient dose rate A (μSv/h) at the workplace (forest) before starting the work (See Attachment 5 for the measurement method)

2) To estimate the radioactivity concentration of Cs in the forest soil, etc. (15 cm in depth), substitute the measurement A (μSv/h) into the formula.*

(A (μSv/h) x 10,580) – 590 = Radioactivity concentration (total of Cs-134 and Cs-137) (Bq/kg) (*1, 2)

Example

The radioactivity concentration of Cs when the average ambient dose rate is 1.0μSv/h

(1.0 (μSv/h) x 10,580) – 590 = 9,990Bq/kg (Estimated)

Lookup table for radioactive Cs concentrations in forest soil as a function of ambient dose rates*3

Average ambient dose rate (μSv/h)	Cs concentration (Bq/kg)	Average ambient dose rate (μSv/h)	Cs concentration (Bq / kg)	Average ambient dose rate (μSv/h)	Cs concentration (Bq/kg)
0.1	468	1.1	11,048	2.1	21,628
0.2	1,526	1.2	12,106	2.2	22,686
0.3	2,584	1.3	13,164	2.3	23,744
0.4	3,642	1.4	14,222	2.4	24,802
0.5	4,700	1.5	15,280	2.5	25,860
0.6	5,758	1.6	16,338		
0.7	6,816	1.7	17,396		
0.8	7,874	1.8	18,454		
0.9	8,932	1.9	19,512		
1.0	9,990	2.0	20,570		

*1 Source: Dr. Shinji Kaneko, “Aging of Radioactive Cesium Amount and Air Dose Rate in Forest”, Abstracts of the Annual Meeting, Japanese Society of Soil Science and Plant Nutrition No. 63 September 2017, P.15

*2 The conversion factors will vary due to radioactivity decay over time. The estimation formula will be revised before the variation becomes too large to ignore.

*3 Prepared by Forestry Labor Office, Forestry Management Improvement Division, Forest

Policy Planning Department, Forestry Agency with the cooperation of Forest and Forest Products Research Institute, Forest Research and Management Organization (January 2018)

Attachment 7. Special education for operation leaders

Education for operation leaders who direct the decontamination works (for the works for handling designated contaminated soil and wastes, they are limited to those in the workplaces where the average ambient dose rate exceeds 2.5μSv/h.) should be provided by lectures according to the table below, which shows general subject areas in the left column with specific topics in the middle column. Hours for each subject should be more than that in the right column.

Subject areas	Topics	Minimum duration
How to determine work procedures and arrange the workers engaged in decontamination works	1) Structure and handling of radiation detectors 2) Methods for preliminary survey 3) Establishment of work plans 4) Determination of work procedures	2.5 hours
How to direct the workers engaged in decontamination works	1) Methods for directing inspections, including before work, etc. and education 2) Methods of instruction during works 3) Methods to instruct workers in appropriate usage of protective equipment	2 hours
How to take actions in case of abnormal events	1) Emergency actions in case of occupational hazards 2) Methods of transport to the hospital, etc.	1 hour

Attachment 8. Special education for workers

Special education for the workers engaged in decontamination works should be provided by lectures and practical training.

The theoretical education by lectures should follow the table below showing general subject areas in the left column with specific topics in the middle column. Hours for each subject should be more than that in the right column.

Subject areas	Topics	Minimum duration
Knowledge about effects of ionizing radiation on living bodies and exposure dose control methods	For the workers engaged in the decontamination works (except for those who handle designated contaminated soil and wastes., only at the workplace where the average ambient dose rate is equal to 2.5μSv/h or less): 1) Types and nature of ionizing radiation 2) Effects of ionizing radiation on cells, tissues, organs and the whole body 3) Exposure dose limit and methods of dosemeasurements 4) Method for confirming and recording the result ofdose measurements	1 hour
	For the workers engaged in works for handling designated contaminated soil and wastes., only at the workplace where the average ambient dose rate is equal to 2.5μSv/h or less: 1) Types and nature of ionizing radiation 2) Effects of ionizing radiation on cells, tissues, organs and the whole body 3) Exposure dose limit	1 hour
Knowledge about the methods for decontamination related works	For the workers engaged in decontamination, etc.: 1) Methods and procedures of works fordecontamination, etc. 2) Methods for radiation measurement 3) Methods for monitoring of dose equivalent ratefrom external radiation 4) Methods for preventing spread of contamination 5) Methods for inspection of contamination on thebody surface, etc. and for decontamination 6) Functions and use of protective equipment 7) Emergency actions in case of abnormal events	1 hour
	For the workers engaged in collecting, transporting or storing removed soil (hereinafter as “work for collecting removed soil, etc.”): 1) Methods and procedures of works for collecting removed soil, etc. 2) Methods for radiation measurement 3) Methods for monitoring of dose equivalent rate from external radiation 4) Methods for preventing spread of contamination 5) Methods for inspection of contamination on the	1 hour

	body surface, etc. and for decontamination 6) Functions and use of protective equipment 7) Emergency actions in case of abnormal events	
	For the workers engaged in collecting, transporting or storing contaminated waste (hereinafter as “work for collecting contaminated waste, etc.”): 1) Methods and procedures of works for collecting contaminated waste, etc. 2) Methods for radiation measurement 3) Methods for monitoring of dose equivalent rate from external radiation 4) Methods for preventing spread of contamination 5) Methods for inspection of contamination on the body surface, etc. and for decontamination 6) Functions and use of protective equipment 7) Emergency actions in case of abnormal events	1 hour
	For the workers engaged in the works for handling designated contaminated soil and wastes., at the workplace where average ambient dose rate is greater than 2.5μSv/h (hereinafter as “the works for handling designated contaminated soil and wastes.’): 1) Methods and procedures of works for handling designated contaminated soil and wastes. 2) Methods for radiation measurement 3) Methods for monitoring of dose equivalent rate from external radiation 4) Methods for preventing spread of contamination 5) Methods for inspection of contamination the on the body surface, etc. and for decontamination 6) Functions and use of protective equipment 7) Emergency actions in case of abnormal events	1 hour
	For the workers engaged in the works for handling designated contaminated soil and wastes., only at the workplace where average ambient dose rate is equal to 2.5 μSv/h or less): 1) Methods and procedures of work handling designated contaminated soil and wastes. 2) Methods for radiation measurement 3) Methods for preventing spread of contamination 4) Methods for inspection of contamination on the body surface, etc. and for decontamination 5) Functions and use of protective equipment 6) Emergency actions in case of abnormal events	1 hour
Knowledge about structure and handling of the machinery, etc. used for decontamination related works (limited to the name and usage of the machinery in the case for workers engaged in handling designated	For the workers engaged in decontaminating soil, etc.: The structure and handling of the machinery, etc. used for decontamination work	1 hour
	For the workers engaged in collecting removed soil, etc.: The structure and handling of the machinery, etc. used for the work collecting removed soil, etc.	1 hour
	For the workers engaged in collecting waste, etc.: The structure and handling of the machinery, etc. used for the work collecting waste, etc.	1 hour

contaminated soil and wastes.,)	For the workers engaged in handling designated contaminated soil and wastes. The name and use of machinery for the works for handling designated contaminated soil and wastes.	30 minutes
Relevant laws and regulations	Relevant provisions stipulated in the Industrial Safety and Health Act, the Order for Enforcement of the Industrial Safety and Health Act, the Ordinance on Industrial Safety and Health, and the Ionizing Radiation Ordinance for Decontamination	1 hour

Training should provide the education topics described in the middle column of the following table according to each subject area listed in the left column. Hours for each subject should be more than that in the right column.

Subject areas	Topics	Minimum duration
How to conduct decontamination related works and how to handle the machinery, etc. (limited to the practice on how to conduct decontamination related works in the case for the workers engaged in handling designated contaminated soil and wastes)	For the workers engaged in decontamination, etc.: 1) ractice of work for decontamination, etc. 2) Handling of radiation detectors 3) Monitoring of dose equivalent rate from external radiation 4) Measures for preventing spread of contamination 5) Inspection of contamination on the body surface, etc. and decontamination 6) Handling and use of protective equipment 7) Handling of the machinery used for decontaminating soil, etc.	1.5 hours
	For the workers engaged in collecting removed soil etc. : 1) Practice of work for collecting removed soil, etc. 2) Handling of radiation detectors 3) Monitoring of dose equivalent rate from external radiation 4) Measures for preventing spread of contamination 5) Inspection of contamination on the body surface, etc. and decontamination 6) Handling and use of protective equipment 7) Handling of the machinery used for collecting removed soil, etc.	1.5 hours
	For the workers engaged in collecting contaminated waste, etc.: 1) Practice of work for collecting contaminated waste, etc. 2) Handling of radiation detectors 3) Monitoring of dose equivalent rate from external radiation 4) Measures for preventing spread of contamination 5) Inspection of contamination on the body surface, etc. and decontamination 6) Handling and use of protective equipment 7) Handling of the machinery used for collecting contaminated waste, etc.	1.5 hours

	For the workers engaged in the works for handling designated contaminated soil and wastes, at the workplace where average ambient dose rate is greater than 2.5μSv/h: 1) Practice of the works for handling designated contaminated soil and wastes. 2) Handling of radiation detectors 3) Monitoring of dose equivalent rate from external radiation 4) Measures for preventing spread of contamination 5) Inspection of contamination on the body surface, etc. and decontamination 6) Handling and use of protective equipment	1 hour
	For the workers engaged in the works for handling designated contaminated soil and wastes, only at the workplace where average ambient dose rate is equal to 2.5μSv/h or less: 1) Practice of the works for handling designated contaminated soil and wastes 2) Handling of radiation detectors 3) Measures for preventing spread of contamination 4) Inspection of contamination on the body surface, etc. and decontamination 5) Handling and use of protective equipment	1 hour

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

(Enactment: Labour Standards Bureau Notification No. 0615-6 of June 15, 2012)
(Amendment: Labour Standards Bureau Notification No. 1226-21 of December 26, 2013)
(Amendment: Labour Standards Bureau Notification No. 1118-6 of November 18, 2014)
(Amendment: Labour Standards Bureau Notification No. 0130-2 of January 30, 2018)

Section 1 Objectives

The "Guidelines on Prevention of Radiation Hazards to Workers Engaged in Decontamination Works" (Labour Standards Bureau Notification No. 1222-6 of 22 December 2011; hereinafter referred to as the "Guidelines on Decontamination Works") are established for the purpose of preventing radiation-related health hazards to workers engaged in decontamination and related works of materials contaminated by radiation from the accident of Fukushima Daiichi Nuclear Power Plant of Tokyo Electric Power Company (TEPCO) caused by the Great East Japan Earthquake on 11 March 2011, in conjunction with the enforcement of "Ordinance on Prevention of Ionizing Radiation Hazards Related to Work for Decontamination of Soil and Wastes Contaminated by Radioactive Materials Resulting from the Great East Japan Earthquake and Related Works" (Ordinance of the Ministry of Health, Labour and Welfare No. 152 of 2011; hereinafter referred to as the "Ionizing Radiation Ordinance for Decontamination").

The purpose of these guidelines is to comprehensively present matters provided for in the Ionizing Radiation Ordinance for Decontamination, as well as actions an employer is obligated to carry out and important matters among those provided for in the Industrial Safety and Health Act (Act No. 57 of 1972) and relevant laws and ordinances, in order to prevent radiation hazards more appropriately in restoration and reconstruction works in combination with the Ionizing Radiation Ordinance for Decontamination..

These Guidelines aim not only to prevent radiation hazards to workers, needless to say, but also to be available to self-employed workers, individual proprietors, volunteers, etc.

An employer shall endeavor to appropriately implement the matters described in these Guidelines and take measures fit for the situations of actual work sites to prevent radiation hazards.

Section 2 Application

1 These Guidelines shall apply to employers who engage in work other than the work for decontamination, etc. in places where the average air dose rate exceeds 2.5μSv/h (hereinafter

referred to as "works under designated dose rates") due to radioactive materials released from the accident of the nuclear power plant (hereinafter referred to as "accident-derived radioactive materials") (provided for in Article 2, paragraph (2) of the Ordinance on Prevention of Ionizing Radiation Hazards (Ordinance of the Ministry of Labor No. 41 of 1972; hereinafter referred to as the "Ionizing Radiation Ordinance") in the special decontamination areas, etc. (hereinafter referred to as the "employers of workers under a designated dose rate"). The “special decontamination areas, etc.” mentioned in the preceding sentence (hereinafter referred to as "special decontamination areas, etc."; refer to Attachment 1) means the special decontamination areas provided for in Article 25, paragraph (1) of the "Act on Special Measures Concerning the Handling of Environmental Pollution by Radioactive Materials Discharged by the Nuclear Power Station Accident Associated with the Tohoku District Off the Pacific Ocean Earthquake That Occurred on March 11, 2011" (Act No. 110 of 2011; hereinafter referred to as the "Act on Special Measures Concerning the Handling of Radioactive Pollution") or the intensive contamination survey areas provided for in Article 32, paragraph (1) of the same Act. The matters described below shall be considered when applying these Guidelines.

Underwater operations, etc. in the sea areas close to the Fukushima Daiichi Nuclear Power Plant of Tokyo Electric Power Company are not included in the scope of application of these Guidelines. An employer who engages in underwater operations, etc., however, shall take measures, such as measurement of external exposure doses and recording of the results, for workers engaging in underwater operations, etc.

(1) "Operations for decontamination, etc." means operations of decontamination of soil, etc., operations of waste collection, etc. or operations of handling of designated contaminated soil, etc. When performing operations of decontamination, etc., the relevant provisions of the Ionizing Radiation Ordinance for Decontamination and the Guidelines on Prevention of Radiation Hazards to Workers Engaged in Decontamination Works shall apply.

(2) Considerations for "operations under designated doses"

(a) Indoor works, such as manufacturing, shall not fall under operations under designated dose rates when the average air dose rate in the indoor workplace is 2.5μSv/h or below even if the outdoor average air dose rate exceeds 2.5μSv/h.

(b) Driving vehicles and incidental load handling work, etc. shall fall under operations under designated doses only when (1) the unloading or loading site (excluding operations associated with restoration work of local infrastructure) is situated in a place where the average air dose rate exceeds 2.5μSv/h, and workers engage in work by which they are expected to stay in the place for 40 hours or longer per month, or (2) workers engage in conveyance of loads (construction machinery, construction materials, soil, gravel, etc.) associated with restoration work of local infrastructure in a place where the average air dose rate exceeds 2.5μSv/h.

Only passing through an area where the average air dose rate exceeds 2.5μSv/h shall not

fall under operations under designated doses because the time of stay there is limited.

(c) Places where the average air dose rate exceeds 2.5μSv/h due to a controlled radiation source, such as an X-ray device, shall also be handled as controlled areas as provided for in Article 3, paragraph (1) of the Ionizing Radiation Ordinance because "operations under designated doses" are limited to operations to be performed in places with an average air dose rate in excess of 2.5μSv/h due to accident-derived radioactive materials.

2 It is preferred that self-employed workers, individual proprietors and volunteers, etc. should perform necessary matters among those mentioned in Section 3 “Subjects and Methods of Radiation Exposure Dose Control”, Section 4 “Measures to Reduce Radiation Exposure” and Section 5 “Worker Education” and others.

Section 3 Subjects and Methods of Radiation Exposure Dose Control

1 Basic principles

(1) An employer engaging in a business under designated doses shall endeavor to minimize the exposure to ionizing radiation of workers who engage in operations under designated doses (hereinafter referred to as "workers engaging in operations under designated doses") or other workers.

(2) When performing operations under designated doses, the employer shall give the highest priority to the reduction of the exposure to ionizing radiation of workers engaging in operations under designated doses, and endeavor to ensure that measures, such as decontamination, are taken in advance in workplaces.

(a) The provision of (1) above states that employers should keep exposure to radiation durinwork as low as reasonably achievable based on the principles of optimization of the International Commission on Radiological Protection (ICRP).

(b) The provision of (2) above states that when performing work that is expected to cause a certain level of radiation exposure, it is necessary to give the highest priority to the reduction of the exposure of workers engaging in operations under designated doses to radiation and endeavor to take measures, such as decontamination, before performing the work, in view of the principles of justification set by ICRP (hereinafter referred to as the "principles of justification") which requires public benefits and needs outweighing the demerits of radiation exposure in performing said work.

(c) In light of the principles of justification and considering the fact that radiation exposure doses tend to increase in proportion to working hours and that the urgency of work in manufacturing or commercial businesses, etc. is not necessarily high, an employer engaged in such a business shall be required to take measures, such as decontamination, in and around the workplace in advance to minimize doses and, in principle, enable these workers to work under an average air dose rate that does not require radiation exposure dose control (2.5μSv/h or below).

Since it is assumed that in areas where the average air dose rate set by the Nuclear Emergency Response Headquarters to control the resumption of manufacturing businesses, etc. is 3.8μSv/h or below, the indoor air dose rate is approximately 40% of this value, or approximately 1.5μSv/h or below, due to the shielding effect of buildings, indoor work in manufacturing businesses, etc. is not expected to fall under operations under designated doses if measures, such as decontamination, are appropriately taken before starting work.

2 Measurement of doses

(1) When an employer engaging in a business under designated doses directs workers to perform operations under designated doses in workplaces where the average air dose rate exceeds 2.5μSv/h, the employer shall measure the external radiation exposure doses of the workers by means of personal dosimeters.

(2) Given the difficulty for self-employed workers and individual proprietors in controlling radiation exposure doses, it is desirable that they avoid engaging in work falling under operations under designated doses by appropriately taking measures, such as decontamination, in advance.

(a) Self-employed workers and individual proprietors who inevitably have to perform operations under designated doses shall be deemed as employers engaging in a business under designated doses, and these Guidelines shall apply to them.

(b) Volunteers shall be permitted to work in workplaces where the average air dose rate is 2.5μSv/h (equivalent to approximately 5mSv/year when working 40 hours per week for 52 weeks) or below, and within several dozen times (days) in a year so that the effective dose caused by the work will not exceed 1 mSv/year.

3 Radiation exposure dose limits

(1) An employer engaging in a business under designated doses shall endeavor to keep the total of the effective doses of workers as measured in 2 (1) below the limits listed in (a) to (c) below.

(a) Male workers and female workers diagnosed as having no possibility of pregnancy: 100mSv per five years and 50mSv per year

(b) Female workers (excluding those diagnosed as having no possibility of pregnancy and those stated in (c) below): 5mSv per three months

(c) Pregnant female workers: 2mSv in equivalent dose on the abdominal surface during the pregnancy period

(2) When an employer engaging in a business under designated doses directs workers who engaged in radiation work in controlled areas provided for in Article 3 of the Ionizing Radiation Ordinance or workers who engaged in operations for decontamination, etc. to engage in operations under designated doses, the employer shall keep the total of the effective dose said workers were exposed to during the radiation work or decontamination work and the effective dose as measured in 2 (1) at or below the limits specified in (1).

(3) To perform radiation exposure control provided for in (1) and (2), an employer engaging in a

business under designated doses shall investigate whether workers engaging in operations under designated doses have a radiation exposure history (for those who have a radiation exposure history, the place, type, and period of work and other matters relating to radiation exposure shall be made known to the employer) at the time of employment or transfer to operations under designated doses based on the dose records issued to said workers from the previous employers (if workers do not have a dose record, the employer shall ask them to have the dose record reissued by the previous employers).

(4) To properly control the radiation exposure doses of workers engaged in works under designated dose rates in multiple different workplaces, the period of "five years" prescribed in (1) (a) above should be quinquennial periods of which the first period commences on 1 January 2012 uniformly for all workplaces where works under designated dose rates are performed. The same shall apply to employers that newly start works under designated doses as their businesses during any of the quinquennial periods. In such cases, the value of 20 mSv multiplied by the number of years from the commencement date of the works till the end of the corresponding quinquennial period shall be deemed as the exposure dose limit for the period by the end of such a quinquennial period and shall be used for application of relevant regulations. The time period of "one year" prescribed in (1) (a) above shall mean each one-year period in five years commencing on the initial day of the "five years".

(5) When the dose received from 1 January 2012 until 30 June 2012 is ascertained, radiation exposure control shall be performed by adding such value of dose to the exposure dose on or after 1 July 2012.

(6) When any worker of an employer engaging in a business under designated doses newly engages in operations under designated doses in the employer's place of business at any point in "one year" or "five years," the employer shall confirm the radiation exposure dose from the start of said "one year" or "five years" until the day the worker starts engaging in said operations under designated doses, based on the dose record issued to said worker from the previous employer (if the worker does not have a dose record, the employer shall ask the worker to have the dose record reissued by the previous employer).

(7) Notwithstanding the provisions of (4) and (5), an employer who primarily engages in radiation works may commence radiation exposure dose control from a different timing that is uniformly applied in the workplaces for all employers.

(8) An employer engaging in a business under designated doses shall inform those workers engaging in operations under designated dose rates of the start of timing for exposure dose control.

4 Records, etc. of measurement results of doses

(1) An employer engaging in a business under designated dose rates shall calculate the radiation exposure doses of the workers engaging in operations under designated dose rates listed in the following items based on the measurement or calculation results referred to in 2 above, record the calculated results, and keep the records for 30 years. This provision shall also apply to investigation records referred to in 3 (3). However, this provision shall not be

applicable in the case where the employer transfers the said records to the organization designated by the Minister of Health, Labour and Welfare (Radiation Effects Association, a public interest incorporated foundation) after these records have been kept for five years or after the workers recorded therein have terminated work under the designated dose rates. Form 1 is available as an example of the recording form for such a case.

With regard to workers engaging in operations under designated doses who were radiation workers provided for in Article 4, paragraph (1) of the Ionizing Radiation Ordinance or workers engaging in operations for decontamination, etc. in special decontamination areas, etc., the doses said workers were exposed to in radiation work or operations for decontamination, etc. shall be added to the doses they are exposed to in operations under designated doses, recorded, and stored.

(a) Totals of the effective dose of male workers or female workers diagnosed as having no possibility of pregnancy for each three-month period, one-year period and five-year period (or totals for each three-month period and one-year period for those whose effective dose for five years has not exceeded 20mSv per year)

(b) Totals of the effective dose of female workers having the possibility of becoming pregnant for each one-month period, three-month period and one-year period (or totals for each three-month period and one-year period for those whose effective dose will not exceed 1.7mSv per month)

(c) Totals of the effective dose to which the abdominal surfaces of pregnant female workers were exposed for each one-month period.

(2) An employer engaging in a business under designated doses shall notify workers engaging in operations under designated doses of the records referred to in (1).

(3) When an employer of decontamination related workers engaged in work under the designated dose rates intends to discontinue business, the employer shall transfer the records referred to in (1) to the organization designated by the Minister of Health, Labour and Welfare (Radiation Effects Association, a public interest incorporated foundation).

(4) When any e or an employer engaging in a business under designated doses intends to terminate its business, the employer engaging in a business under designated doses shall issue a copy of the records referred to in (1) to the worker engaging in operations under designated dosesworker engaging in operations under designated doses is terminated from servic.

(5) When an employer engaging in a business under designated doses employs a fixed-term contract worker or temporary worker, the employer shall keep the following in mind to appropriately perform radiation exposure dose control.

(a) When an employer engaging in a business under designated doses employs a worker under an employment contract or dispatch contract with a fixed term shorter than three months, the radiation exposure dose shall be calculated for each one-month period and recorded.

(b) At the end of the contract term, the employer shall total the effective dose the worker was exposed to during said contract term, calculate and record the radiation exposure dose, and issue a copy of the record to said worker engaging in operations under designated doses.

Section 4 Measures to Reduce Radiation Exposure

1 Preliminary survey, etc.

(1) When an employer performs operations under designated doses, the employer shall investigate the average air dose rate (μSv/h) in the workplace before the start of said operations and every two weeks thereafter as long as said operations are performed in the same workplace, and record the results.

However, when the measurement results of the average air dose rate are constantly below 2.5μSv/h, the employer shall not need to measure the average air dose rate thereafter.

(2) The method for measuring and evaluating the average air dose rate shall conform to Attachment 2. A prior evaluation is performed to determine whether the average air dose rate exceeds 2.5μSv/h to require radiation exposure dose control. Therefore, if the employer determines that the average air dose rate is higher than 2.5μSv/h in the workplace in consideration of the results of the airborne monitoring survey, etc. published by the Nuclear Regulation Authority, the results of the airborne monitoring survey, etc. in an individual workplace may be used in place of measurement of the average air dose rate. In addition, it is not intended that the measurement is required even if the average air dose rate in the workplace is far below 2.5μSv/h and it can be clearly determined that the work does not fall under works under designated doses.

(3) An employer engaging in a business under designated doses shall clearly present the date on which the survey referred to in (1) or (2) was completed, the method of the survey, and a summary of the results to workers engaging in operations under designated doses by issuing a document showing said items.

2 Medical examinations, etc. by physicians

(1) An employer engaging in a business under designated doses shall direct workers who fall into any of the situations of the following items to immediately consult a doctor or receive medical treatment:

(a) when workers are exposed to an effective dose in excess of the radiation exposure dose limit;

(b) when workers accidently inhale or ingest accident-derived radioactive materials;

(c) when contamination of workers cannot be reduced to or below 40Bq/cm^2 by body washing, etc. after they were contaminated by accident-derived radioactive materials; or

(d) when wounds are contaminated by accident-derived radioactive materials.

(2) The situation of (1) (b) shall be limited to cases in which a certain degree of internal exposure is expected; for example, when a worker was buried in a large volume of earth and sand, etc. in an accident and the result of a nasal smear test exceeded the criterion, or when a worker ingested a large volume of earth and sand or contaminated water.

Section 5 Education for Workers

1 Special education for workers engaging in operations under designated doses

(1) When an employer engaging in a business under designated doses directs workers to engage in operations under designated doses, the employer shall conduct special education for said workers in the following subjects in the form of lectures in advance:

(a) effects of ionizing radiation on organisms and knowledge about methods for controlling doses;

(b) knowledge about methods for measuring radiation, etc.; and

(c) related laws and ordinances.

(2) Other details of the implementation of special education shall conform to Attachment 3.

2 Education for other persons in need of it and other matters

(1) It is desirable that similar education should be conducted also for self-employed workers, individual proprietors and other persons not employed by any person or entity.

(2) It is desirable that a party who places an order for operations under designated doses should ensure in advance that a system capable of securing the required number of workers to perform the operations by the start of the operations has been established.

Section 6 Healthcare Measures

1 Medical examinations

(1) An employer engaging in a business under designated doses (or a dispatching employer in the case of medical examinations of temporary workers; the same applies hereinafter) shall conduct medical examinations of the following items by a physician for full-time workers engaging in operations under designated doses at the time of employment and once every period within a year thereafter:

(a) investigation of the medical history and work history;

(b) examinations of whether there are objective and subjective symptoms;

(c) measurement of height, weight, abdominal circumference, vision and hearing;

(d) chest X-ray and sputum examinations;

(e) blood pressure measurement;

(f) examination for anemia;

(g) liver function test;

(h) examination of blood lipid levels;

(i) blood sugar test;

(j) urine analysis; and

(k) electrocardiography.

(2) With regard to workers who were examined for items listed in (f) through (i) and (k) of the

above (1) at the preceding medical examination (limited to regular medical examinations), all or some of the said items may be omitted if the occupational physician considers them unnecessary.

(3) Items (c), (d), (f) through (i) and (k) of the above (1) may be omitted if the occupational physician considers them unnecessary based on the criteria set by the Minister of Health, Labour and Welfare.

(4) The hearing test of item (c) of the above (1) (limited to tests conducted during regular medical examinations) may be substituted by hearing tests (excluding tests for hearing ability for 1000Hz and 4000Hz sounds), which the occupational physician considers appropriate, for workers who were examined for the said item during the preceding medical examination, or who are younger than 45 years (except those aged 35 and 40 years old).

(5) An employer engaging in a business under designated doses shall prepare individual medical examination cards based on the results of the medical examinations set forth in (1) and keep them for five years.

2 Follow-ups, etc. on the results of medical examinations

(1) An employer engaging in a business under designated doses shall ask opinions from the physician based on the results of the medical examinations set forth in 1 (limited to those in which workers were diagnosed as being abnormal with respect to any of the items of said medical examinations) according to the following provisions:

(a) the employer shall ask opinions from the doctor within three months from the date of a medical examination; and

(b) the employer shall record the opinions of the physician on the individual worker's medical examination card.

(2) An employer engaging in a business under designated doses shall notify workers engaging in operations under designated doses, who received the medical examinations set forth in 1, of the results of the medical examinations without delay.

(3) As a result of the medical examinations set forth in 1, if an employer engaging in a business under designated doses finds that any worker is suffering or suspected of suffering from a radiation-derived hazard, or has a risk of suffering from a radiation-derived hazard, the employer shall take necessary measures to maintain his/her health, such as changing his/her workplace, assigning another operation to him/her, reducing exposure time or changing the work method, until the hazard, suspicion or risk ceases to exist.

Section 7 Safety and Health Control System

1 Integrated management of radiation exposure statuses by principal employers

A principal employer engaging in operations under designated doses shall appoint a radiation administrator to perform integrated management including radiation exposure management of workers of related contractors, and such management shall include the matters prescribed in the

following. It is desirable that the radiation administrator should be selected from among those having a national qualification in radiation or those who received a radiation management training program provided by a professional education institute, etc.

(1) to participate in the "System of Registration and Management of Radiation Exposure Doses for Decontamination and Related Works" in order to accurately ascertain past accumulated exposure doses of workers and to prevent the leakage or loss of exposure dose records, etc.; and

(2) to provide necessary guidance and support to ensure that the measures provided for in 3 of Section 7 are appropriately taken by related contractors.

2 Safety and health management systems by employers

(1) An employer engaging in a business under designated doses shall appoint a health supervisor or safety and health promoter according to the size of the place of business to manage technical matters relating to such measures as measurement of doses and recording of measurement results.

It is desirable that a safety and health promoter should be appointed even if the number of workers of the place of business is fewer than ten.

(2) An employer engaging in a business under designated doses shall appoint a person in charge of radiation management, regardless of the size of the place of business, to perform operations relating to such operations as measurement of doses and recording of measurement results.

3 Measures, etc. to maintain and promote the health of emergency workers at the Fukushima Daiichi Nuclear Power Plant of Tokyo Electric Power Company

When an employer engaging in a business under designated doses directs workers who engaged in emergency work at the Fukushima Daiichi Nuclear Power Plant of Tokyo Electric Power Company to engage in operations under designated doses, the employer shall implement the matters described in the following items:

(1) to submit a "Control Implementation Status Report on Dose, etc. of Designated Emergency Workers, etc." (Form 3 of the Ionizing Radiation Ordinance) to the Minister of the Health, Labour and Welfare (c/o Office of Workers Health Planning for Ionizing Radiation, Industrial Health Division, Industrial Safety and Health Department of the Labour Standards Bureau, Ministry of Health, Labour and Welfare) on the last day of every three months based on Article 59-2 of the Ionizing Radiation Ordinance. This report shall be submitted, in principle, in an electromagnetic form as CSV file format.

(2) to provide health guidance, etc. based on the "Guidelines on Maintaining and Promoting Health of Emergency Workers, etc. at the Fukushima Daiichi Nuclear Power Plant of Tokyo Electric Power Company" (Public Notice No. 5 of 2011 Guidelines on Maintaining and Promoting Health of Emergency Workers, etc. at the Fukushima Daiichi Nuclear Power Plant of Tokyo Electric Power Company) and also conduct necessary inspections, etc. for those whose radiation exposure exceeds 50 mSv during the period of emergency work.

Attachment 1 List of special decontamination areas, etc.

1 Special decontamination areas

- Subject of designation
  Restricted areas or planned evacuation areas, etc.

	Number of municipalities	Designated areas
Fukushima Prefecture	11	All areas in Naraha-town, Tomioka-town, Okuma-town, Futaba-town, Namie-town, Katsurao-village and Iitate-village. And areas that used to be designated as Warning Zones or Planned Evacuation Zones in Tamura-city, Minamisoma-city, Kawamata-town and Kawauchi-village

2 Intensive contamination survey areas

- Subject of designation
  Areas, etc. for which the radiation dose is 0.23μSv/h or more

	Number of municipalities	Designated areas
Iwate Prefecture	3	All areas in Ichinoseki-city, Oshu-city, and Hiraizumi-town
Miyagi Prefecture	8	All areas in Shiroishi-city, Kakuda-city, Kurihara-city, Shichikashuku-town, Ogawara-town, Marumori-town, Watari-town, and Yamamoto-town
Fukushima Prefecture	36	All areas in Fukushima-city, Koriyama-city, Iwaki-city, Shirakawa-city, Sukagawa-city, Soma-city, Nihonmatsu-city, Date-city, Motomiya-city, Koori-town, Kunimi-town, Otama-village, Kagamiishi-town, Tenei-village, Aizubange-town, Yugawa-village, Aizumisato-town, Nishigo-village, Izumizaki-village, Nakajima-village, Yabuki-town, Tanagura-town, Samegawa-village, Ishikawa-town, Tamakawa-village, Hirata-village, Asakawa-town, Furudono-town, Miharu-town, Ono-town, Hirono-town and Shinchi-town; and areas excluding the restricted and designated areas in Tamura-city, Minamisoma-city, Kawamata-town, and Kawauchi-village
Ibaraki Prefecture	19	All areas in Hitachi-city, Tsuchiura-city, Ryugasaki-city, Joso-city, Hitachiota-city, Takahagi-city, Kitaibaraki-city, Toride-city, Ushiku-city, Tsukuba-city, Hitachinaka-city, Kashima-city, Moriya-city, Inashiki-city, Hokota-city, Tsukubamirai-city, Tokai-village, Miho-village, Ami-town, and Tone-town

Tochigi Prefecture	7	All areas in Kanuma-city, Nikko-city, Ohtawara-city, Yaita-city, Nasushiobara-city, Shioya-town, and Nasu-town
Gunma Prefecture	8	All areas in Kiryu-city, Numata-city, Shibukawa-city, Midori-city, Shimonita-town, Takayama-village, Higashiagatsuma-town, Kawaba-village
Saitama Prefecture	2	All areas in Misato-city and Yoshikawa-city
Chiba Prefecture	9	All areas in Matsudo-city, Noda-city, Sakura-city, Kashiwa-city, Nagareyama-city, Abiko-city, Kamagaya-city, Inzai-city, and Shiroi-city
Total	92	

* Prepared by Division of Environmental Restoration, Environmental Restoration and Resources Recycling Bureau, Ministry of the Environment（January 2018）

Attachment 2 Methods for Measuring and Evaluating Average Air Dose Rates

1 Objectives

The measurement and evaluation of average air dose rates is conducted by an employer when said employer directs workers to engage in operations under designated doses in order to measure and evaluate whether the average air dose rates in workplaces exceed 2.5μSv/h and thereby determine details of dose control to be performed.

2 Basic concepts

(1) An employer shall measure average air dose rates before starting work.

(2) When an employer continuously performs operations at the same place, the employer shall measure the average air dose rate every two weeks. Even if the measured value is below 2.5μSv/h, it may vary depending on weather, etc., and measurement shall, therefore, need to be continued until the measured value drops below 90% of 2.5μSv/h (2.2μSv/h). The average air dose rate shall also be measured whenever the ambient environment has significantly changed due to a typhoon, flooding, landslide, etc.

(3) The measurement shall be conducted in a manner that can accurately reflect the actual situation of radiation exposure of workers.

(4) It is not intended that measurement before starting work is required even if the employer can determine that the average air dose rate in the subject workplace is far below 2.5μSv/h and the work performed there does not fall under operations under designated doses, based on the air dose rates officially announced by the Nuclear Regulation Authority.

3 Measurement and evaluation of average air dose rates

(1) Common matters

(a) The air dose rate shall be measured at a height of 1 m from the ground surface.

(b) The measuring instrument, etc. shall conform to Article 8 of the Working Environment Measurement Standards.

(2) Measurements

The air dose rate shall be measured at points where the dose rate is expected to be the highest in the area of the workplace where operations are to be performed (if the total area of said workplace exceeds 1,000m^2, each divided area of 1,000m^2 or less), at three points at a minimum, and the average of the measured results shall be adopted as the average air dose rate.

Attachment 3 Special Education for Workers

Special education for workers engaging in operations under designated doses shall be provided by lectures.
Lectures shall be provided in the subjects listed in the left column of the table shown below, in the scopes defined in the middle column, and for at least the times prescribed in the right column.

Subject	Coverage	Duration
The impact of ionizing radiation on living organisms and the exposure dose control method.	(i) Types and properties of ionizing radiation (ii) The impact of ionizing radiation on cells, tissues, organs and entire bodies of living organisms (iii) Exposure dose limits and methods for measuring exposure doses (iv) Methods for checking and recording the exposure dose measurement results	1 hour
Knowledge about methods for measuring radiation, etc.	(i) Methods for measuring radiation (ii) Methods for monitoring of dose equivalent rate from external radiation (iii) Emergency actions in case of an abnormal event	30 minutes
Relevant laws and regulations	Relevant provisions of the Industrial Safety and Health Act, Enforcement Order of the Industrial Safety and Health Act, Ordinance on Industrial Safety and Health, and Ionizing Radiation Ordinance for Decontamination".	1 hour

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

(Enactment: Labour Standards Bureau Notification No.0412-2, as of 12 April 2013)
(Amendment: Labour Standards Bureau Notification No.1226-21, 26 December 2013)
(Amendment: Labour Standards Bureau Notification No.1118-6, 18 November 2014)
(Amendment: Labour Standards Bureau Notification No.0130-2, January 30, 2018)

Section 1 Objectives

These guidelines are established for the purpose to prevent radiation-related health hazards to workers engaged in disposal of objects contaminated with radioactive materials discharged by the accident of Fukushima Daiichi Nuclear Power Plant of Tokyo Electric Power Company (hereinafter the objects is referred to as the “accident-derived waste” and the radioactive material is referred to as the “radioactive materials discharged by the accident”) associated with the Great East Japan Earthquake on 11 March 2011 in conjunction with the Ordinance on Prevention of Ionizing Radiation Hazards (Ministry of Labour Ordinance No. 41, 1972, hereinafter referred to as the "Ionizing Radiation Ordinance") which stipulates provisions for the disposal of accident-derived waste.

Aiming to facilitate precise implementation of preventive measures for radiation hazards during works for the accident-derived waste disposal, these guidelines together with the Ionizing Radiation Ordinance are intended to describe important matters among the following in an integrated manner:

- actions which an employer is obligated to carry out
- matters which are stipulated in the Industrial Safety and Health Act (Act No. 57, 1972) and other applicable laws and regulations, and
- in addition to the above, matters which are stipulated in the Ionizing Radiation Ordinance.

As much as possible, the employer should strive to take measures for the prevention of radiation hazards based on the actual situation of the sites, in addition to properly carry out the actions described in the guidelines.

Section 2 Scope

1 Scope

(1) These guidelines should be applied to the employers engaged in the operation involving disposal of accident-derived waste, etc. as defined in a to c below (hereinafter the employer and operation are referred to as the "disposal operator" and "accident-derived waste disposal" respectively).

a. Soil generated from actions including decontamination (removal of soil, grass and trees, soil attached to structures, fallen leaves and branches, and sludge accumulated in waterways contaminated with radioactive materials discharged by the accident, actions necessary to prevent spread of contamination, or other measures to mitigate the impact of the contamination) and soil generated associated with other actions to handle contaminated soil and waste (whose radioactivity concentrations of Cesium 134 and Cesium 137 exceed 10,000 Bq/kg. Hereinafter referred to as "removed soil").

b. Waste contaminated with radioactive materials discharged by the accident (whose radioactivity concentrations of Cesium 134 and Cesium 137 exceed 10,000 Bq/kg. Hereinafter referred to as "contaminated waste")

c. In addition to those listed in (a) and (b), any other objects whose quantity or concentration of radioisotopes other than radioactive cesium is larger than the values specified in Article 2, paragraph 2, of the Ionizing Radiation Ordinance due to concentration, etc. through processes toward disposal.

(2) The following statements should be noted when these guidelines are applied:

a. "Radioactive material" should refer to radioactive material defined in Article 2, paragraph 2, of the Ionizing Radiation Ordinance

b. "Disposal" should include final disposal (landfill), interim storage, interim processing (classification, crushing, compression, concentration, incineration, etc.), and the maintenance, inspection and repair of the relevant facilities or systems.

2 Relation to the Ionizing Radiation Ordinance for Decontamination

(1) The guidelines exclude works falling under "decontamination works" or "works under a designated dose rate" defined by the Ordinance on Prevention of Ionizing Radiation Hazards at Works to Decontaminate Soil and Wastes Contaminated by Radioactive Materials Resulting from the Great East Japan Earthquake and Related works (Ministry of Health, Labour and Welfare Ordinance No.152, 2011. Hereinafter referred to as "the Ionizing Radiation Ordinance for Decontamination"). For the former, "Guidelines on the Prevention of Radiation Hazards for Workers Engaged in Decontamination Works" (Labour Standards Bureau Notification No.1222-6, as of 22 December 2011, hereinafter referred to as "the guidelines on decontamination works"), should be applied. For the latter, "Guidelines on the Prevention of Radiation Hazards for Workers Engaged in Works under a Designated Dose Rate" (Labour Standards Bureau Notification No.0615-6, as of 15 June 2012, hereinafter referred to as "the guidelines on works under a designated dose rate") should be applied.

(2) The Ionizing Radiation Ordinance for Decontamination and the guidelines on decontamination works (hereinafter referred to as the "Ionizing Radiation Ordinance for Decontamination, etc.") cover certain works in special decontamination areas specified in Article 25, paragraph 1, of the “Act on Special Measures Concerning the Handling of Environmental Pollution by Radioactive Materials Discharged by the Nuclear Power Station Accident Associated with the Tohoku District of the Pacific Ocean Earthquake That Occurred

on 11 March 2011" (Act No.110, 2011) or intensive contamination survey areas specified in Article 32, paragraph 1, of the same act (hereinafter referred to as the "special decontamination areas, etc.") where radiation sources cannot be controlled (i.e., existing exposure situation). These guidelines should be for works involving the disposal of accident-derived waste, etc. that can be handled as a controlled radiation source, and when exposure from the source is dominant (i.e., a planned exposure situation).

a. Disposal of controlled radiation sources is not the objective of the works for simply storing incineration ashes of municipal or industrial waste (including the works for packing sludge into containers with a method that workers do not touch directly, such as by remote handling), or sludge falling under the accident-derived waste generated at water supply and sewerage facilities (which turned out to exceed 10,000 Bq/kg). Therefore, these works are excluded from those for accident-derived waste disposal, and should be subject to the regulations for storing radioactive material other than accident-derived waste. Also, the works for storing removed soil generated from decontamination or contaminated waste at a decontamination site should be governed by the Ionizing Radiation Ordinance for Decontamination, and others as decontamination works（waste collection works).

b. Collecting, transporting, and storing accident-derived waste at the sites used for the accident-derived waste disposal (hereinafter referred to as "disposal site") should be subject to these guidelines as "the accident-derived waste disposal", and should not be governed by the Ionizing Radiation Ordinance for Decontamination.

c. Crushing and classification of accident-derived waste outside of a disposal site is not included in "the accident-derived waste disposal". If these works fall under "works for decontamination of soil and wastes" or "works for handling designated contaminated soil and wastes", they should be governed by the Ionizing Radiation Ordinance for Decontamination.

Section 3　Methodology for setting radiation controlled areas and radiation dose control

1 General Principles

(1) The disposal operator should strive to minimize the ionizing radiation exposure that workers may receive.

(2) Therefore, when constructing a disposal site in special decontamination areas, etc., the disposal operator should be required to decontaminate the area around the site in advance in order to reduce radiation dose in the area and assign workers to the works after reducing dose rate as low as possible.

2 Clear indication of radiation controlled areas

(1) The disposal operator should post signs to clearly indicate the areas that fall under any of the following criteria (hereinafter referred to as "radiation controlled areas"):

a. The area where the sum of effective doses from external radiation and radioactive material

in air may exceed 1.3 mSv per three months.

b. The area where the surface density of radioactive material may exceed one-tenth (4 Bq/cm^2) of the surface contamination limit specified in the attached Table 3 of the Ionizing Radiation Ordinance (hereinafter referred to as "surface contamination limit").

(2) The disposal operator should prohibit all personnel except those required from entering into the radiation controlled areas.

(3) The statements below should be taken into consideration when the radiation controlled areas are set:

a. The area where the dose may exceed 1.3 mSv per three months should be determined by whether effective doses may exceed 2.5 μSv/h based on the assumption that working hours are 2,000 hours per year.

b. The effective dose from external radiation should include that from the environment other than accident-derived waste, etc.

c. Details for specifying radiation controlled areas should be subject to the provisions in Article 3 of the Ionizing Radiation Ordinance and the “Enforcement, etc. of Ordinance for Partial Revision of the Industrial Safety and Health Act and the Ordinance on Prevention of Ionizing Radiation Hazards” (the Labour Standards Bureau Notification No.253, as of 30 March 2001, hereinafter referred to as the “Labour Standards Bureau Notification No.253 Circular Notice”)

3 Measurement of radiation exposure doses

(1) The disposal operator should measure the radiation dose of external and internal exposure that workers engaged in accident-derived waste disposal (hereinafter referred to as “workers for accident-derived waste disposal”) receive in a radiation controlled area, while giving due consideration to following statements:

(2) The radiation dose from external exposure should be measured according to the methods described below.

a. The radiation dose from external exposure should be measured by the methods described below.

(i) Measure the radiation dose by attaching a measurement instrument on the chest for men or women who were diagnosed with no possibility of pregnancy, and on the abdomen for other women.

(ii) The measurement instrument should be able to measure 1cm dose equivalent.

b. If beta ray exposure is more than 10 times higher than gamma ray exposure in such a case as handling a processed waste solution after removing radioactive cesium out of accident-derived waste, the radiation dose should be measured by using the following methods (in addition to the measurement by the methods stated in a):

(i) The measurement instrument to be attached in a. (i) above should be able to measure 1cm dose equivalent and 70 um dose equivalent.

(ii) Measure the radiation dose with the instrument attached on the body part that may have the highest exposure. The measurement instrument should be able to measure 70 um

dose equivalent.

c. The disposal operator should provide measurement instruments such as electronic dosimeters that allow measurement of radiation dose per day for workers whose daily external exposure dose may exceed 1 mSv.

(3) The radiation dose from internal exposure should be measured according to the methods described below.

a. Measure internal exposure dose once every three months for those who access to the places in radiation controlled areas where they may intake radioactive materials by inhalation or ingestion.

Measure it once a month for women (except those who were diagnosed with no possibility of pregnancy) whose effective dose in a month may exceed 1.7 mSv and pregnant women.

It should be noted that, when workers intake radioactive materials by inhalation or ingestion by accident, the dose should be measured immediately after the intake.

b. The method for calculating internal exposure dose should be subject to the provisions in Article 2 of the "Limit and Method Determined by Minister of Health, Labour and Welfare, pursuant to the regulations including Article 3, paragraph 3, of the Ordinance on Prevention of Ionizing Radiation Hazards (Notification of Ministry of Labour No.93, 1988, hereinafter referred to as the "measurement notification").

(4) The disposal operator should give due consideration to the following statements when measuring radiation dosages:

a. Exposure in radiation controlled areas should be evaluated by adding the exposure from accident-derived waste, and other sources altogether.

b. "The places where one may intake radioactive materials by inhalation or ingestion" in which internal exposure is measured should mean the places where the surface density of radioactive materials may exceed one-tenth (4 Bq/cm^2) of the surface contamination limit , or the places where the concentration of radioactive material in the air may exceed one-tenth (correspond to approx. 5mSv/y) of the concentration limit in the air specified in Article 1 of the measurement notification (hereinafter referred to as "the air concentration limit").

c. The disposal operator should be required to give due consideration that a sufficient number of whole-body counters are prepared, according to the number of the target individuals for measuring internal exposure.

4 Exposure dose limit

(1) The disposal operator should prevent the total radiation dose that a worker engaged in accident-derived waste disposal receives from exceeding the following limits:

a. For men, or women who were diagnosed with no possibility of pregnancy, the effective dose should not exceed 100mSv in 5 years and 50mSv in a year.

b. For women except those who were diagnosed with no possibility of pregnancy and women in c., the effective dose should not exceed 5 mSv per three months.

c. For women who were diagnosed with pregnancy, the effective dose from internal exposure should not exceed 1 mSv, and the equivalent dose received on the surface of her abdomen should not exceed 2 mSv during pregnancy.

(2) The disposal operator should prevent the equivalent dose that a worker engaged in accident-derived waste disposal receives from exceeding each limit specified for each of the following categories:

a. Eye lens: 150mSv/y

b. Skin: 500mSv/y

(3) When conducting emergency work to protect workers from health impairment by radiation in case of an accident (hereinafter referred to as "emergency work"), the disposal operator should prevent men, or women who were diagnosed with no possibility of pregnancy from exceeding each limit specified for each of the following categories:

a. Effective dose: 100mSv

b. Equivalent dose received on eye lens: 300mSv

c. Equivalent dose received on skin: 1Sv

(4) The disposal operator should control exposure dose to ensure that it will not exceed the exposure dose limit by adding the exposure dose received during the accident-derived waste disposal and those received during decontamination works, works under a designated dose rate, and other radiation works that are subject to the Ionizing Radiation Ordinance.

5 Recording dose measurement results

(1) On a daily basis, the disposal operator should check and record the measurement results of external exposure described in 4, for workers whose daily external exposure dose may exceed 1mSv.

(2) The disposal operator should use the measurement results in 4 to calculate the following exposure dose by using the method specified in Article 3 of the measurement notification, and record and keep them for thirty years. It should be noted, however, that this should not apply when the records are transferred to the organization designated by Minister of Health, Labour and Welfare (Radiation Effects Association) after keeping them for five years. In this case, Form 1 should be available as an example of the record form.

a. The sum of every three months, every year, and every five years of the effective doses for men, or women who were diagnosed with no possibility of pregnancy (the sum of every three months and every year for those whose annual effective doses have not exceeded 20mSv for five years)

b. The sum of every month and every three months of the effective doses for women (except those who were diagnosed with no possibility of pregnancy) (the sum of every three months and every year for those whose monthly effective doses have not exceeded 1.7mSv for a month)

c. The sum of every three months and every year of the equivalent doses per body organ

d. The sums of effective dose from internal exposure and equivalent dose that a pregnant woman receives on the surface of her abdomen every month, and during pregnancy

(3) The disposal operator should notify workers of the records regarding (1) and (2) without delay.
(4) The disposal operator should transfer the records stated in (2) to the institution designated by Minister of Health, Labour and Welfare (Radiation Effects Association) when terminating its business.

Section 4 Dose limits at facilities

1 Dose limits at facilities

(1) The disposal operator should ensure that the sum of the effective dose from external radiation and the effective dose from radioactive material in the air at places where workers constantly access, will not exceed 1 mSv per week, by setting up shielding, a local ventilation system, and air-tight system at the facilities dedicated to handle unsealed accident-derived waste (hereinafter referred to as "accident-derived waste handling facilities"), storing accident-derived waste (hereinafter referred to as "storage facilities"), and burying accident-derived waste (hereinafter referred to as "landfill facilities").
(2) The disposal operator should give due consideration to the following statements regarding radiation dose limits.
   a. 1 mSv per week should mean 25 μSv/h under the assumption that work hours are 40 per week. In order not to exceed 1 mSv per week, at least the concentration of radioactive material in the air should be required to equal to or less than the concentration limit in the air (correspond to approx. 50mSv/y).
   b. In the case of constructing a disposal site in a special decontamination areas, etc., measures should be required not to exceed 1 mSv per week at the places where workers constantly access, such as by setting up shielding and using remotely operated construction vehicles and vehicles with shielding, if the effective dose may exceed the limit at such places in facilities, except stated in (1).
   c. The radiation dose limit stated in (1) should be applied to the places where workers constantly access. This limit should not be applied when workers enter an incinerator and/or crushing, classification, compression, and concentration systems to conduct non-routine work including maintenance and inspection.

2 Surface contamination limits at accident-derived waste handling facilities

(1) The disposal operator should measure the surface concentration of ceilings, floors, walls and equipment (only where workers may touch) in accident-derived waste handling facilities once every month. If there is contamination exceeding the surface contamination limit (40Bq/cm^2), remove it to the limit level, or less.
(2) In case contamination occurs due to reasons such as spillage of radioactive materials discharged by the accident in an accident-derived waste handling facility, the disposal operator should take measures immediately to prevent spread of contamination, clearly

indicate the contaminated zone, and remove it to the surface contamination limit (40Bq/cm^2) or below.

(3) The disposal operator should give due consideration to the following statements regarding measurement of the contamination stated in (1).

a. No contamination measurement should be required for the parts workers are unlikely to touch during their regular work, including ceilings and walls that are too high to touch.

b. One or two portions which may be possibly contaminated most should be selected for each wall face or equipment for the measurement.

c. The limit of radioisotopes that do not emit alpha rays (40Bq/cm^2) should be applied to the surface contamination limit related to accident-derived waste. This is because radioactive cesium is the major exposure source during the accident-derived waste disposal.

3 Surface contamination limits at facilities except accident-derived waste handling facilities

(1) Actions in case of accident-derived waste spillage

In case contamination occurs due to reasons such as spillage of accident-derived waste,, the disposal operator should take measures immediately to prevent spread of contamination, clearly indicate the contaminated zone, and remove it to the level one-tenth (4Bq/cm^2) of the surface contamination limit or below.

(2) Concentration of radioactive material in air

The disposal operator should retain the average of every three months of the weekly average concentration to the level one-tenth (approx. 5mSv/y) of the concentration limit in the air or below at disposal sites, except accident-derived waste handling facilities.

4 Measurement of working environment

(1) The disposal operator should measure the following items in radiation controlled areas and accident-derived waste handling facilities, using radiation measurement devices once every month on a regular basis.

a. Radiation controlled area: dose equivalent rate or dose equivalent from external radiation

b. Accident-derived waste handling facilities: concentration of radioactive material in air

(2) The disposal operator should record the following items during each measurement in (1), and save the records for five years.

a. Measurement date and time

b. Measurement method

c. Type, model, and performance of radiation measurement devices

d. Measurement location

e. Measurement conditions

f. Measurement results

g. Name of the person who carried out the measurements

h. Outline of the actions carried out based on the measurement results

(3) The disposal operator should inform workers who access radiation controlled areas of the measurement results of dose equivalent, or dose equivalent rate from external radiation in the

areas, by putting notices in an easily visible place.

(4) The disposal operator should give due consideration to the following statements when carrying out the measurement.

a. Dose equivalent rate or dose equivalent in radiation controlled areas should be measured by using the methods specified in Articles 7 and 8 of the Working Environment Measurement Standards (Notification of Ministry of Labour No.46, 1976) and Labour Standards Bureau Notification No.253 Circular Notice.

b. The concentration of radioactive material in the air at accident-derived waste handling facilities should be measured by a working environment measurement expert using the method specified in Articles 7 and 9 of the Working Environment Measurement Standards.

Section 5 Requirements that should be met by accident-derived waste disposal facilities

1 Clear indication of the border of the disposal site

(1) The disposal operator should clearly indicate the border of the disposal site with signs and set up fences and others.

(2) The disposal operator should give due consideration to the following statements when posting the signs.

a. A narrower border of a disposal site than the actual site border should be allowed to confine the area necessary to conduct accident-derived waste disposal.

b. "Fences and others" should not be limited to fences and the like, but include simple objects such as safety cones.

2 Accident-derived waste handling facilities

(1) The disposal operator should set up a facility dedicated for handling accident-derived waste when handling unsealed waste, and the handling should be conducted within the facility.

(2) The disposal operator should conform to the following regulations regarding ceilings, walls, floors, and other parts that may potentially be contaminated inside the accident-derived waste handling facilities.

a. The parts should be made of material impermeable to gas or liquid, and corrosion resistant.

b. Surfaces should be finished smoothly.

c. The structure should have few protrusions, dents, or gaps.

(3) In addition to (2), the disposal operator should take the following actions, depending on the properties of accident-derived waste to be handled:

a. Accident-derived waste that may generate liquid should be handled in a facility with a leakage resistant structure.

b. Measures should be taken to control dust dispersion when handling accident-derived waste that may generate dust.

(4) The disposal operator should take measures to prevent spread of contamination, such as by making a double-entry door available at the entrance and exit of the accident-derived waste

handling facilities.

(5) The disposal operator should post a sign indicating the accident-derived waste handling facilities outside the facility in an easily visible place, and prohibit all personnel except those required from entering.

(6) The disposal operator should give due consideration to the following statements regarding the accident-derived waste handling facilities:

a. Materials, finishes, and structures stated in (2) should be durable to withstand operation with trucks and construction vehicles.

b. "Measures to control dust dispersion" should include measures to confine facilities, ensure that the structure has less gaps in ceilings and walls, set up local ventilation system (with a dust collector), and spray a small amount of water to the extent without the need of discharge.

c. "Setting up double-entry doors and others" should include setting items which are made of material effective to prevent spread of contamination, such as an impermeable liner, and which can be opened or closed in temporary tents connected to an accident-derived waste handling facility, and setting ventilation systems that can maintain airflow from outside to inside of the facility when openings are released.

3 Crushing processes and other treatments of accident-derived waste

(1) When crushing, classifying, compressing, and concentrating accident-derived waste or contaminated objects exceeding one-tenth ($4Bq/cm^2$) of the surface contamination limit (hereinafter referred to as "contaminated objects") outside an accident-derived waste handling facility, the disposal operator should use the processes that conform to the following regulations (hereinafter referred to as "crushing equipment, etc.") according to the properties of such waste to be handled.

a. For the case that gas may be generated, the equipment should have a structure resistant to gas leakage and corrosion, and should be made of material with low gas permeability.

b. In cases which that liquid may be generated, the equipment should have a structure resistant to liquid leakage and corrosion, and should be made of material with low liquid permeability.

c. In cases which dust may cause contamination, equipment with no possible dust dispersion should be used.

(2) The disposal operator should post a crushing equipment sign in an easily visible place outside the equipment.

(3) The disposal operator should give due consideration to the following statements regarding crushing equipment:

a. The purpose of the requirements for the crushing equipment should be to maintain its sealability to prevent workers from being exposed to debris of accident-derived waste. Therefore, for the case that the equipment does not have sealability, and that dust may be dispersed into the vicinity of the equipment, the crushing equipment should be required to be placed in an accident-derived waste handling facility.

b. "Crushing equipment, etc." should include accessory pipes and joints.

c. "No possible gas leakage" and "no possible dust dispersion" should mean that the equipment is required to have no possibility of gas leakage or dust dispersion from the parts other than its supply and exhaust ventilation system. "No possible liquid leakage" should mean that it is required to have no possibility of liquid leakage from the parts other than its water supply and drain system.

4 Incinerators for accident-derived waste

(1) The disposal operator should incinerate accident-derived waste or contaminated objects using an incinerator with a structure that has no possibility of gas leakage or ash dispersion.

(2) The disposal operator should post an incinerator sign in an easily visible place outside the incinerator.

(3) The disposal operator should give due consideration to the following statements regarding incinerators:

a. "Incinerator" should include the transportation system, supply and exhaust ventilation system, and accessory pipes that are integrated with the incinerator.

b. "No possible gas leakage" should mean that the incinerator is required to have no possibility of gas leakage from the parts other than its supply and exhaust ventilation system.

5 Facilities for burying accident-derived waste

(1) The disposal operator should bury accident-derived waste or contaminated objects at a landfill facility which is separated from the surrounding environment and which has keys and other systems or devices to shut doors, lids and other parts connected to the surrounding environment.

(2) The disposal operator should landfill unsealed accident-derived waste at a facility that meets the requirement of accident-derived waste handling facilities.

(3) The disposal operator should post a sign indicating the landfill facility outside the facility in an easily visible place, set up fences and the like, and prohibit all persons, except those required, from entering.

(4) The disposal operator should give due consideration to the following statements regarding landfill facilities:

a. The provisions concerning landfill in the guidelines should apply to interim storage based on burial of removed soil or contaminated waste.

b. When removed soil without being sealed is landfilled, dumping should be conducted in temporary tents and other locations surrounded by walls and ceilings. Once it is covered by uncontaminated soil, the temporary tents may be removed or transferred to other place. This case should require a concrete pit, or a water shielding lining, to prevent spread of contamination.

6 Facilities for storing accident-derived waste

(1) The disposal operator should store accident-derived waste at a storage facility which is separated from the surrounding environment and which has keys and other systems or devices to shut doors, lids and other parts connected to outside.
(2) The disposal operator should post a sign indicating the storage facility outside the facility in an easily visible place, and prohibit all persons, except those required, from entering.

7 Ventilation and effluent facilities regarding accident-derived waste

(1) When leading, storing, or purifying waste gas or liquid from accident-derived waste handling facilities, crushing equipment, or belt conveyors and other transportation equipment, the disposal operator should use a facility whose structure has no possible leakage of waste gas or liquid, and which is made of corrosion-resistant material with low liquid permeability.
(2) The disposal operator should post a sign of the facility in an easily visible place outside the facility.
(3) The disposal operator should give due consideration to the following statements regarding ventilation and liquid discharging facilities:
   a. Facilities associated with ventilation should include local ventilation systems, dust collectors (bag filter), and accessory pipes.
   b. Facilities associated with waste liquid should include waste liquid tank, waste liquid treatment equipment, and accessory pipes.

8 Systems for transporting accident-derived waste

(1) When transporting unsealed accident-derived waste or contaminated objects outside an accident-derived waste handling facility, the disposal operator should use belt conveyors and other transportation equipment that conform to the regulations below, according to the properties of such waste to be transported. It should be noted, however, that this should not be applied when effective measures were taken to shield external radiation, or prevent spread of contamination or the containers stated in the 1Countainers of Section 6 are used.
   a. For the case that gas may be generated, the equipment should have a structure resistant to gas leakage and corrosion, and should be made of material with low gas permeability.
   b. For the case that liquid may be generated, the equipment should have a structure resistant to liquid leakage and corrosion, and should be made of material with low liquid permeability.
   c. For the case that dust may be dispersed, equipment with no possible dust dispersion should be used.
(2) The disposal operator should post a sign of belt conveyors and other transportation equipment in an easily visible place outside the equipment.
(3) The "belt conveyors and other transportation equipment" should include bridge cranes.

Section 6　Measures for preventing contamination

1 Containers

(1) The disposal operator should use containers when temporarily storing accident-derived waste in order to keep, store, transport, dispose, or bury it. These containers should also be used when contaminated objects are transported, temporarily stored for disposal, or landfilled. It should be noted, however, that this should not be applied when effective measures were taken to shield external radiation or prevent spread of contamination from waste which is extremely difficult to put in containers, when such waste is handled within an accident-derived waste handling facility, or when such waste is transported using belt conveyors and other transportation equipment.

(2) When using the containers stated in (1) for the following purposes listed in the left column in the table below, the disposal operator should use those with structure described in the right column of the table, according to the corresponding purpose.

Purpose of use	Structure
To contain accident-derived waste or contaminated objects that may cause air contamination.	Containers should be made of corrosion-resistant material and have no possibilities of gas leakage.
To contain liquid accident-derived waste or wet contaminated objects due to the liquid waste.	Containers should be made of corrosion-resistant material with low liquid permeability, and have structure with low possibility of liquid leakage or spillage.
To transport accident-derived waste or contaminated objects outside of radiation controlled areas.	a. 1cm dose equivalent rate on the container surface (i.e. on the package surface when container is packed) should not exceed 2mSv per hour. b. 1cm dose equivalent rate at the distance of 1 meter from the container surface should not exceed 0.1mSv per hour.

(3) The disposal operator should label the container indicating that it is used to contain accident-derived waste or contaminated objects.

(4) The disposal operator should give due consideration to the following statements regarding containers:

a. "Waste which is extremely difficult to put in containers" should include large machines, and cut trees, dismantled structures, or debris larger than container capacity.

b. "Effective measures to prevent spread of contamination" should include transportation using a truck whose cargo bed is sealed, or whose cargo bed is entirely covered by a waterproof sheet.

2 Tools for handling accident-derived waste

The disposal operator should put labels on scoops and other tools indicating that they are used to handle accident-derived waste, and also should not use them for other purposes. These tools should be stored using hooks and/or shelves with structures and materials from which contamination can be easily removed.

3 Contamination Inspection

(1) The disposal operator should make a contamination inspection area available at the exit of the radiation controlled area (i.e. where workers' bodies, wearable equipment, or items may be contaminated exceeding one-tenth (4Bq/cm^2) of the surface contamination limit) and check the contamination levels of workers' bodies and their wearable equipment.

(2) When the inspection result shows that a worker's contamination level exceeds one-tenth (4 Bq/cm^2) of the surface contamination limit, the disposal operator should make him or her stay in the radiation controlled area until the following actions are taken:

a. Contaminated body should be washed until the contamination level falls to one-tenth (4Bq/cm^2) of the surface contamination limit, or below.

b. Contaminated wearable equipment should be taken off or detached.

(3) Before items are taken out of the radiation controlled areas, the disposal operator should inspect the contamination levels of these items at the contamination inspection area stated in (1). It should be noted, however, that this should not be applied when such items are transported using belt conveyors and other transportation equipment.

(4) When the inspection result shows that the contamination level of an item exceeds one-tenth (4Bq/cm^2) of the surface contamination limit, the item should not be taken out of the radiation controlled area. It should be noted, however, that this should not be applied when such items are transported using belt conveyors and other transportation equipment, and when such items are transported to the facilities for removing contamination, and for disposing of or discarding accident-derived waste, etc. after measures such as putting them in a container were taken to prevent spread of contamination.

(5) The disposal operator should give due consideration to the following statements when conducting contamination inspection:

a. The "contamination inspection area" stated in (1) should be equipped with radiation measurement instruments used for the inspection, a cleaning system to remove contamination, and facilities for temporary storage of contaminated waste such as dust masks.

b. The provisions in Section 7 (5) require the disposal operator to conduct medical examinations for workers whose contamination levels cannot be reduced to one-tenth (4Bq/cm^2) of the surface contamination limit, or below, even after washing. In this case, the disposal operator may make these workers leave the radiation controlled area.

c. As for vehicles transporting removed soil or contaminated waste, it is recommended that contamination on their cargo beds and other contaminated areas be removed and inspected in unloading areas. If this is difficult, such vehicles should return to a contamination inspection area, and be inspected after measures to prevent dispersion were taken as specified in the note of 1 (1) of Section 6.

(6) The disposal operator should prepare equipment for removing contamination such as equipment for washing eyes and bodies, and for gargling, locker rooms, and laundry facilities at the disposal site. It should be noted that equipment for washing bodies should include

bathing facilities and shower.

4 Protective equipment

(1) Respiratory protective equipment

a. The disposal operator should prepare effective respiratory protective equipment to be used by workers engaged in the works that may cause them to inhale air exceeding the concentration limit in air (approx. 50mSv/y).

b. The effective respiratory protective equipment should have capability with dust collection efficiencies corresponding to the following categories for works and radioactivity concentrations of accident-derived waste, or those with equivalent or better dust collection efficiencies.

	Radioactivity Concentration above 2,000,000Bq/kg	Radioactivity Concentration above 500,000Bq/kg 2,000,000Bq/kg or below	Radioactivity Concentration 500,000Bq/kg or below
Work under high dust concentration environment (Dust concentration: higher than 10mg/m^3)	Dust collection efficiency: ≥ 99.9% (full face)	Dust collection efficiency: ≥ 95%	Dust collection efficiency: ≥ 80%
Work other than that under high dust concentration environment (Dust concentration: 10mg/m^3 or below)	Dust collection efficiency: ≥95%	Dust collection efficiency: ≥ 80%	Dust collection efficiency: ≥ 80%

c. Workers engaged in the works stated in a. should use the respiratory protective equipment specified in b.

d. The disposal operator should give due consideration to the following statements regarding respiratory protective equipment:

(i) Dust masks should have three types of dust collection efficiencies: 99.9% or above (RS3/RL3, full face), 95% or above (RS2/RL2 or DS2/DL2), and 80% or above (RS1/RL1 or DS1/DL1).

(ii) Use RL or DL as a filter for dust masks when handling accident-derived waste, etc. in a liquid state.

(iii) Use a cartridge with dust proof function along the gas type when handling accident-derived waste, etc. in a gas state.

(iv) It should be noted that non-woven fabric masks (*) may be used instead of dust masks if the works occuring will not handle accident-derived waste, etc. exceeding 500,000Bq/kg and if the works are associated with work other than that under high dust concentration, and if those works (handling grass, tree or leaf mold) do not fall under

Articles 7 or 27 of the "Ordinance on Prevention of Hazards Due to Dust" (Ministry of Labour Ordinance No.18, 1979). (*: Masks except dust masks certified by the national test. Made of non-woven fabric material, and commonly used to prevent cold and/or used as measures against pollinosis. Also known as surgical masks, pleated masks, and face masks. Gauze masks are not included.)

(2) Protective clothing

a. For the prevention of contamination, the disposal operators should prepare effective protective clothing, gloves, or shoes to be used by their workers engaged in the works that may handle such objects exceeding one-tenth (4Bq/cm2) of the surface contamination limit.

b. The disposal operators should provide effective protective clothing, gloves, or shoes, which effectively prevent contamination, to their workers handling accident-derived waste who may be exposed to splashing or flying powder that comes from such waste.

c. The disposal operator should prepare dedicated work clothes to be used by workers engaged in the works at accident-derived waste handling facilities.

d. The effective protective clothing, gloves, or shoes should include those corresponding to the categories below for works and radioactivity concentrations of accident-derived waste, or the equivalent or better.

	Radioactivity Concentration Higher than 2,000,000Bq/kg	Radioactivity Concentration Higher than 500,000Bq/kg to 2,000,000Bq/kg	Radioactivity Concentration 500,000Bq/kg or less
Work under high dust concentration environment (Dust concentration: higher than 10mg/m^3)	Double air-tight chemical protective suits on a long sleeve shirt, double pairs of rubber gloves on cotton gloves, rubber boots	Air-tight chemical protective suit on a long sleeve shirt, rubber gloves on cotton gloves, rubber boots	A long sleeve shirt, cotton gloves, and rubber boots
Work other than that under high dust concentration environment (Dust concentration: 10mg/m^3 or below)	Air-tight chemical protective suit on a long sleeve shirt, rubber gloves on cotton gloves, rubber boots	A long sleeve shirt, rubber gloves on cotton gloves, and rubber boots	A long sleeve shirt, cotton gloves, and rubber boots

e. Workers engaged in the works stated in a. should use the protective equipment specified in d.

f. The disposal operator should give due consideration to the following statements regarding protective equipment:

(i) When it is expected that, during maintenance work inside the facility, the entire body will be contaminated with accident-derived waste, etc. exceeding the radioactivity concentration of 2,000,000Bq/kg, it should be recommended that positive-pressure type or airtight full body chemical protective clothing (e.g., airline suit) be used.

(ii) When handling liquid contaminated with radioactive materials discharged by the accident such as treatment of contaminated water, workers should wear waterproof clothing with hood, which separates into upper and lower parts, on protective clothing.

(3) The statements below should be noted when determining radioactivity concentration and dust concentration of accident-derived waste.

a. See Attachment 1 to determine which category radioactivity concentration falls under.

b. See below to determine whether work falls under the work under high dust concentration.

(i) The works handling dried accident-derived waste that is not sealed in containers and the works that require workers to enter inside equipment for crushing, classification, compression, concentration, and incineration of accident-derived waste should be considered as the work exceeding a dust concentration of 10mg/m^3, and fall under the category of work under high dust concentration.

(ii) Regardless of (1), when measuring dust concentration during work, determine whether it falls under the work under high dust concentration environment based on the measurement results. See Annex 2 for the method for dust concentration measurement.

(4) When it was found that the respiratory protective equipment or protective clothing planned to be used by workers were contaminated in excess of the surface contamination limit (40Bq/cm^2) (one-tenth (4Bq/cm^2) for the portion that will come in contact with workers), the disposal operator should not provide workers with such equipment unless the contamination is washed off in advance to reduce the contamination level to the limit, or below.

5. Prohibition of Smoking and others

(1) The disposal operator should prohibit workers from smoking, drinking or eating in an accident-derived waste handling facility and any other workplaces where they may inhale or ingest accident-derived waste, and put notices of the prohibition in visible locations.

(2) Workers should not smoke, drink or eat in the workplaces specified in (1).

Section 7 Work management

1 Work rules for accident-derived waste disposal

(1) The disposal operator should define the rules concerning the items below related to the works of accident-derived waste disposal, follow them in conducting the works, and disseminate them to the workers involved.

a. Operation of each piece of equipment used in accident-derived waste disposal

b. Adjustment of safety equipment and automatic alarming equipment

c. Method and procedures of works

d. Actions for monitoring external radiation and radioactive material in air

e. Actions related to measurement of the surfaces of ceilings, floors, walls and equipment, and removal of contamination.

f. Emergency actions in case of abnormal events

g. Other actions for protecting workers from radiation hazards

(2) The disposal operator should give due consideration to the following statements regarding work rules.

a. The operation stated in (1)-a. should include, for each piece of equipment, timing of the operation, operation procedures, and necessary information such as for maintaining proper operational state and for maintenance and inspection. "Each piece of equipment" should include equipment associated with accident-derived waste handling facilities, storage facilities, incinerator and landfill facilities, crushing equipment, belt conveyors, and other transportation equipment.

b. The statement (1)-b should include when to adjust safety equipment and auto alarm equipment, and the operation tests. "Safety equipment" should include the interlock of crushing equipment. "Auto alarm equipment" should include the systems that automatically notify of leaks at Ventilation and effluent facilities, and abnormal events in incinerators and other equipment.

c. (1)-c should include: the procedures for entering and exiting radiation controlled areas, the methods and procedures for handling unsealed accident-derived waste, the methods and steps for classification, crushing, compression/concentration, storage, incineration and burial of accident-derived waste, the methods and steps for maintenance and inspection work on equipment contaminated with accident-derived waste, the methods for inspecting contamination state on bodies and removing contamination, the performance and usage of protective equipment, the measures to prevent exposure such as by setting shielding bodies and selecting remote operation, exposure dose limits and the methods for measuring exposure doses, and the methods for checking and recording the exposure dose measurement results.

d. Actions described in (1)-d should include: the method for measuring the dose equivalent rate from external radiation and the concentration of radioactive material in the air, the frequency and implementation system, and measures when these measurement results exceed the limit specified in parts 1 and 3 of Section 4.

e. Actions described in (1)-e should include: the methods for measurement of the contaminated surfaces of ceilings, floors, walls and equipment, the frequency and implementation system, and the methods for removing contamination when the inspection results exceed the limit specified in parts 2 and 3 of Section 4.

f. Actions described in 1)-f should include: for each facility and equipment, emergency calls regarding each facility or equipment to a department dealing with abnormal events, personnel assignment for maintaining safety, instructions on how to use necessary equipment, and procedures for emergency works. Additionally, emergency action training should be provided regularly based on the work rules.

2 Measures relevant to maintenance and inspection of equipment or facilities

(1) Before keeping inspection access doors open while maintaining and inspecting equipment or facilities, the disposal operator should take measures to prevent spread of contamination such as by using water shielding sheets for covering. Before conducting works that may cause spread of contaminated dust over a wide area, such as replacement of ventilation filter, the disposal operator should take measures to prevent spread of contamination such as by setting temporary tents and/or local ventilation systems.

(2) Prior to maintenance and inspection work, the disposal operator should measure the dose equivalent rate at the work area, develop work rules that include radiation protective measures conforming to ambient dose rate, designate a work manager, and allow workers do their jobs according to the work rules.

(3) The disposal operator should make workers engaged in maintenance and inspection use the protective equipment specified in part 4 of Section 6.

(4) The disposal operator should measure contamination near the opening sections after the work, and remove it to below one-tenth ($4Bq/cm^2$) of the surface contamination limit.

3 Submission of work request

(1) The disposal operator (limited to the primary contractor, if there is any entity that falls under the operator assigned work directly, hereinafter referred to as "the primary contractor") should submit a "work request" in Form 2 to the Head of the relevant Labour Standard Inspection Office of the disposal site (hereinafter referred to as the Head of the relevant Labour Standard Inspection Office), before undertaking the works below.

a. Disassembly work or requiring entry into the system contaminated with accident-derived waste in order to dismantle, remodel, repair, clean, and inspect the system.

b. Work that may cause the sum of effective doses from external radiation and radioactive material in the air to exceed 1mSv per week.

(2) Work requests should include the following items:

a. Name and address of the site

b. Description of the work

c. Name of the facility or system and its owner

d. Overview of the work

(i) Primary Contractor

(ii) Address of the work site

(iii) Duration of the work

(iv) Name of the manager responsible for the work

(v) Dose equivalent rate in work area

(vi) Work category (dismantling work, work requiring entry into the systems, the work stated in (1)-b.)

e. List of relevant subcontractors and estimation of number of workers

(3) The disposal operator should give due consideration to the following statements regarding work request:

a. "Inspection" stated in (1)-a. should include non-destructive testing and painting.

b. The dismantling work stated in (1)-a. should not include the work dismantling uncontaminated parts.

c. A work request should be submitted per facility or equipment.

4 Evacuation in case of accidents

(1) In case of accidents that fall under any of the events below, the disposal operator should use signs to clearly indicate the area where the effective dose due to the accident may exceed 15mSv, prohibit access except emergency workers, and immediately report it to the Head of the relevant Labour Standard Inspection Office.

a. In case shielding objects were damaged.

b. In case of failure or damage of local exhaust ventilation, or equipment sealing the source of scattering leading to loss of functions.

c. In case a large volume of radioactive material leaked, spilled, or scattered.

d. In case any other unexpected events occurred

(2) The disposal operator should record the items below and save them for five years if any of the accidents stated in (1) occurred, and the areas stated in (1) were specified.

a. Equivalent doses to eye lenses and skin of the workers, or emergency workers, in the zone described in (1).

b. Date, time, and location of the accident occurrence

c. Cause and status of the accident

d. Status of radiation-induced disorder emergence

e. Description of the emergency actions

5 Medical examination by medical doctors

(1) The disposal operator should immediately provide a worker who falls under any of the categories below with a medical doctor's medical examination or treatment, and immediately report it to the Head of the relevant Labour Standard Inspection Office

a. Workers who were in the area stated in 4 (1) when any of the accidents stated in 4 (1) occurred.

b. Workers whose radiation dose exceeded his/her exposure limit.

c. Workers who inhaled or ingested radioactive material by accident.

d. Workers whose contamination was unable to be reduced to one-tenth ($4Bq/cm^2$) of the surface contamination limit or below by washing his/her body.

e. Workers whose injured part was contaminated.

(2) Case c. should be limited to the cases expected to receive a certain level of internal exposure, such as when a worker was buried under a large volume of accident-derived waste due to an accident, or when a large volume of accident-derived waste or other objects contaminated with the waste was ingested orally.

Section 8 Education for workers

1 The disposal operator should train workers by using the following courses before assigning any works for accident-derived waste disposal:

(1) Accident-derived waste (30 minute lecture)

(2) How to dispose of accident-derived waste, etc. (90 minute lecture)

(3) The structure of and how to handle the equipment used for accident-derived waste disposal (1 hour lecture)

(4) The impact of ionizing radiation on living organisms and the exposure dose control method (1 hour lecture)

(5) Relevant laws and regulations (1 hour lecture)

(6) How to dispose of accident-derived waste and handle the equipment used for the work (2 hour training)

2 See Attachment 3 for details on the implementation of education.

Section 9 Actions for health care

1 Special medical examination

(1) The disposal operator should provide full-time workers engaged in accident-derived waste disposal who enter radiation controlled areas with medical examinations on the tests stated below by medical doctors at the time of employment, or being transferred to the work, and once every 6 months thereafter on a regular basis.

It should be noted that the disposal operator should provide a medical examination at the time of employment for a (dispatched) worker who signed a (dispatch) labour contract with a duration of less than six months. This is required in order to know his or her health condition, and if he or she has any exposure history.

a. Investigation and evaluation on whether he or she has exposure history (for those with exposure history, work locations, work descriptions and durations, if he/she has radiation impairment or subjective symptoms, and others relevant to radiation exposure)

b. White blood cell count and differential

c. Red blood cell count and hemoglobin content test or hematocrit test

d. Cataract eye test

e. Skin test

(2) Of the medical examination stated in (1), which is provided on a regular basis, a worker should be able to skip all or part of the tests stated in (1) b. to e., if a medical doctor considers that they are unnecessary.

(3) Regardless of (1), the tests stated in (1) b. to e. should not be required, if a medical doctor agrees, for a worker whose effective dose of the previous year of medical examination (provided on a regular basis) was below 5mSv and whose effective dose of the present year is unlikely to exceed 5mSv.

(4) At the time of the medical examination stated in (1), the disposal operator should inform the medical doctor of the dose that workers received after the previous medical examination.

(5) The disposal operator should prepare the "ionizing radiation medical examination card (Form 3)" based on the results of the medical examination in (1) and keep them for 30 years. It should be noted, however, that this should not apply when the records are transferred to the organization designated by Minister of Health, Labour and Welfare (Radiation Effects Association) after keeping them for five years.

2 General medical examination

(1) The disposal operator (the employer of dispatched workers, for the general medical examination provided to dispatched workers, the same hereinafter.) should provide full-time workers engaged in accident-derived waste disposal who enter radiation controlled areas with medical examination specified below by a medical doctor at the time of employment or being transferred to the work, and once every 6 months thereafter on a regular basis.

It should be noted, however, that it should be sufficient to provide test d. once a year on a regular basis.

a. Survey of medical history and work history
b. Check for subjective and objective symptoms
c. Measurement of height, weight, and abdominal circumference, and visual and hearing acuity tests
d. Thoracic spine X-ray and sputum tests
e. Measurement of blood pressure
f. Anemia test
g. Liver function tests
h. Lipid blood tests
i. Glucose test
j. Urine test
k. Electrocardiography

(2) Those who previously underwent the medical examination with respect to the tests listed in f. to i and k. should be able to skip all or part of them in the medical examination (provided on a regular basis only) stated in (1) if a medical doctor considers it is unnecessary.

(3) A worker should be able to skip the measurement and tests of c., d., k., and f. to i. in (1) if a medical doctor considers it is unnecessary, based on the standards specified by the Minister of Health, Labour and Welfare.

(4) Workers who underwent the hearing acuity test stated in (1)-c. in the previous medical examination (limited to that provided on a regular basis), or under age 45 (except ages 35 and 40) should be able to substitute other hearing acuity test that a medical doctor considers as appropriate (except hearing acuity as to a sound at 1,000Hz or 4,000Hz).

(5) The disposal operator should prepare "medical examination card" based on the results of the medical examination in (1) and save them for 5 years.

3 Follow-up actions regarding medical examination results

(1) The disposal operator should seek advice from a medical doctor about the medical examination results in 1 or 2 above (limited to workers who were diagnosed as abnormal in the said medical examination items) in accordance with the provisions below:
   a. A medical doctor’s opinion should be sought within three months from the date of a medical examination.
   b. The doctor's opinion should be recorded in the ionizing radiation medical examination card or medical examination card.

(2) Disposal operator should inform workers engaged in accident-derived waste disposal who had the said examinations of the results of their medical examinations without delay.

(3) Disposal operator, when the medical examinations described in 1 above (limited to those conducted regularly) have been conducted, should submit the "Report on the ionizing radiation medical examination results" to the Head of the relevant Labour Standard Inspection Office without delay.

(4) When a worker has, or is suspected to have, or may have a radiation hazard ailment based on the results of the medical examinations, the disposal operator should take the necessary measures to maintain the health of the worker including transferring him/her to another workplace or changing the specific work, minimizing the radiation exposure time and changing the method of work and so forth, until there are no doubts about the worker’s radiation hazard ailment or its possibility.

4 Transfer of records

When terminating its business, the disposal operator should transfer the ionizing radiation medical examination cards to an organization designated by the Minister of Health, Labour and Welfare (Radiation Effects Association).

Section 10 Safety and health management system

1 Tasks of facility maintenance operator

(1) The facility maintenance operator (facility owner) should implement the following tasks:
   a. Establishing councils for involved operators
   b. Management of systems for their maintenance and repair.
   c. Tasks described in 2 and 3, for establishing safety and health management system of relevant subcontractors (contracted operators) including workers when the primary contractor is the facility maintenance operator during normal operations.
   d. Tasks described in 4, for establishing a safety and health management system of its own workers.

(2) The facility operator (e.g., contractor commissioned to conduct all or part of the operations management in the facility) and the facility maintenance operator (e.g., contractor commissioned to conduct all or part of the maintenance management in the facility) should

implement the following tasks:

a. Tasks described in 2 and 3, for establishing the safety and health management system of relevant subcontractors (contracted operators), including workers when the primary contractor is the facility operator during normal operations.

b. Tasks described in 2 and 3, for establishing a safety and health management system for relevant subcontractors (contracted operators), including workers, when the primary contractor is the facility maintenance operator during maintenance and inspection.

c. Tasks described in 4, for establishing safety and health management system of its own workers.

2 Establishment of a safety and health management system by the primary contractor

(1) Assigning a general safety and health manager

The primary contractor involved in accident-derived waste disposal should assign a general safety and health manager for the individuals who supervise the works of accident-derived waste disposal to perform tasks (2) to (4) below, in order to ensure that the safety and health management relevant to the work is implemented in an appropriate manner.

(2) Assigning a responsible person for safety and health management by relevant subcontractors

The primary contractor should let the relevant subcontractors assign a responsible person for safety and health management and let him/her perform the following tasks:

a. Contacting the general safety and health manager

b. Coordination with the general safety and health manager to facilitate the following tasks related to the relevant subcontractors.

c. Contacting and coordinating tasks with all of the other relevant subcontractors when the subcontractors assign part of its work to other subcontractors.

(3) Holding safety and health coordinating meeting consisting all of the relevant subcontractors

a. Establish a safety and health coordinating meeting consisting of all of the relevant subcontractors, and hold meetings once a month on a regular basis.

b. The meeting should discuss the following matters.

(i) Implementation of necessary safety and health education, including special education for workers who will be newly engaged in the works for accident-derived waste disposal.

(ii) Development and improvement of work rules

(iii) Establishing contamination measurement areas and its implementation

(iv) Communication and emergency actions in case of abnormal events including occupational hazards

(4) Guidance and support for developing work rules

a. The primary contractor should guide or support the relevant subcontractors as necessary to ensure that the contents of work rules developed are appropriate.

b. The primary contractor should guide or support relevant subcontractors to ensure that the relevant subcontractors inform its workers of the contents of the work rules in an appropriate manner.

3 Consolidated management of exposure status by primary contractor

The primary contractor engaged in the works for accident-derived waste disposal should assign a radiation administrator to consolidate management including worker exposure doses of relevant subcontractors under the direction of the general safety and health manager, to ensure that exposure is controlled in an appropriate manner.

It is recommended that a radiation administrator be selected among those with radiation-related national qualifications, or those trained through courses regarding radiation control at professional education institutions.

(1) The radiation administrator should construct contamination measurement areas and measure contamination in an appropriate manner upon consulting with the primary contractor.
(2) The radiation administrator should guide or support the relevant subcontractors' radiation administrator to ensure that the relevant subcontractors takes the measures stated in parts 3 to 5 of Section 3 in an appropriate manner.
(3) Take part in the Organization for Registration Control of Radiation Exposure Doses for Decontamination and Related Works in order to properly determine the accumulated exposure doses of workers and to prevent exposure dose records from getting scattered or lost.
(4) The radiation administrator should implement any other tasks necessary for radiation control.

4 Safety and health management system by disposal operator

(1) The disposal operator should assign a health officer or safety and health promoter according to the site scale to manage technical matters regarding: dose measurement and recording, contamination inspection, prevention of body/internal contamination, education for workers, and actions for health management.

    It is advisable that a safety and health promoter be assigned even at a site where the number of workers is less than ten.
(2) The disposal operator should assign a radiation administrator regardless of the site scale to perform works regarding dose measurement and recording, contamination inspection, and prevention of body/internal contamination.

Section 11 Exemption for special decontamination areas, etc.

1 Exemption in case of constructing disposal sites in special decontamination areas, etc. (refer to Attachment 4)

(1) Measures against spillage of accident-derived waste outside an accident-derived waste handling facility

    In case of spillage of accident-derived waste at a disposal site established in special decontamination areas, etc., regardless of the provision in part 3 of Section 4, the disposal operator should take immediate actions to prevent spread of contamination. Also, upon clearly indicating the contaminated area, the disposal operator will remove the contamination to whichever is higher of the surface contamination limit (40Bq/cm^2) or average surface

contamination around the disposal site (background) if outdoors, and to the surface contamination limit (40Bq/cm^2) if indoors.

(2) Contamination measurement and acceptable contamination limits

a. Regardless of the provision in part 3 of Section 6, it should be sufficient to locate one contamination measurement area at the exit of the disposal site in a special decontamination areas, etc., and it should be acceptable to define the surface contamination limit (40Bq/cm^2) as the contamination reference level that prohibits workers from leaving and taking items out of the area.

b. Regardless of the provision in part 3 of Section 5, only items contaminated with accident-derived waste exceeding the surface contamination limit (40Bq/cm^2) may be handled as the contaminated object.

c. The contamination density of 40Bq/cm^2 may be defined as the equivalent to a count value of 13,000cpm from GM counters. If measuring the contamination is difficult due to high ambient dose rates in the surrounding area, the contamination measurement area should be set at a place where the ambient dose rate is sufficiently low.

2 Exemption in the case of burying removed soil at disposal sites built in special decontamination areas, etc.

(1) Containers

When the disposal operator took the measures a-d below, in the case of burying removed soil at its disposal site built in a special decontamination areas, etc., it should be acceptable not to use containers regardless of provisions in part 1 of Section 6.

a. Measures for preventing workers body contamination from removed soil by methods such as by handling removed soil using remotely operated machines

b. Measures for controlling dust dispersion by methods such as by keeping the removed soil in a wet state.

c. Measures for controlling dust dispersion by methods such as by working at a place as far away from the border of the landfill facility as possible.

d. Measuring the surface contamination of radioactive materials discharged by the accident at the border of the landfill facility on a regular basis within a period not exceeding a month, and measures to reduce the surface contamination to whichever is higher of the surface contamination limit (40Bq/cm^2) or the average surface contamination around the landfill facility (background)

(2) Accident-derived waste handling facilities

When burying removed soil without packaging in containers in accordance with (1), the disposal operator may decide not to take any measures listed in (2) to (4) in part 2, Section 5.

(3) The disposal operator should give due consideration to the following statements when conducting works under the provision of exemption:

a. Workers may enter the facility for a short period of time in order to handle removed soil using remotely operated machines, troubleshoot failed components, investigate the state of

contamination, or perform maintenance and inspection on the facility or equipment. In this case, however, such workers should be required to interrupt the operation in advance to control dust dispersion and, at the time of entry, use effective respiratory protective equipment and protective clothing stated in part 4, Section 6.

b. The "methods such as by handling removed soil using remotely operated machines" stated in (1)-a. includes the works by using specially customized vehicles with higher sealability. In this case, however, based on provisions in parts 1 and 2 of Section 4, and part 2 of Section 5, it should be required that the sum of the effective dose from external radiation inside the said vehicles and the effective dose from radioactive material in the air does not exceed 1mSv per week, that measures be taken to easily remove surface contamination, that surface contamination be measured once a month, and that contamination be removed if it exceeds the surface contamination limit (40Bq/cm^2).

c. The "methods such as by maintaining removed soil in a wet state" stated in (1)-b should include the works spraying chemicals that are effective to control dispersion of dust.

d. The "methods such as by working at a place as far away from the border of the landfill facility as possible" stated in c should include setting wind shielding walls at the border of the landfill facility that help prevent dispersion of dust.

e. "Measures to reduce the surface contamination to whichever is higher of the surface contamination limit (40Bq/cm^2), or the average surface contamination around the landfill facility (background)" stated in d should include covering with material such as concrete and iron, which have a shielding effect as well as removing contaminated soil.

Attachment 1. Measurement method of radioactivity concentration of accident-derived waste

1 Objectives

The objectives of measuring radioactivity concentration of accident-derived waste is to help the disposal operator determine whether the accident-derived waste exceeds the reference value (10,000Bq/kg, 500,000Bq/kg or 2,000,000Bq/kg) and decide necessary radiation protection measures in assigning their workers accident-derived waste disposal.

2 Basic policy

(1) The disposal operator is not required to re-measure the radioactivity concentration when receiving the waste at its disposal site, provided that a collecting/transporting operator provides a written form of radioactivity concentration already measured for each waste container containing the said accident-derived waste (or each truck, if the waste is not in containers).
(2) The disposal operator is not required to measure the radioactivity concentration at the time of reception, provided that actions specified in the relevant laws and regulations have been taken under the assumption that the concentration of the received waste exceeds 10,000Bq/kg, based on the radioactivity concentration measurements provided by the collecting/transporting operator, and that the accident-derived waste will be handled is sealed in a container.
(3) It is advisable that radioactivity concentration be measured by commissioned experts.

3 Sampling

(1) Principles for sampling
    a. Take one sample from each container.
    b. It is acceptable to measure the whole container as a sample when the simplified measurement in 4 (2) is selected.

4 Analysis methods

Either method below should be used for analysis.

(1) The gross gamma ray measurement or gamma spectrum analysis, as specified in Paragraph 1-2 of Article 9 of the Working Environment Measurement Standards.
(2) Simplified measurement method
    a. The radioactivity concentration should be calculated using the method below if the correlation between the dose rate on the sample surface and the sum of the concentrations of Cesium 134 and 137 is known. (See Attachment 1-1 for details.)
        (i) Place the sample in a container and measure the weight.
        (ii) Measure the maximum dose rate on the surface of the container.
        (iii) Use the measured weight and dose rate to calculate the sum of the concentrations of Cesium 134 and 137 of the sample in the container.
    b. It is difficult to measure radioactivity concentration equal to 300,000Bq/kg or above with

the simplified method even when using Round V-series Container (plastic containers of 128mmφ x 56mmH) because the upper measurement limit of the typical NaI Scintillation Survey Meter is as low as 30μSv/h. Therefore, when the needle on the indicator of the survey meter passes 30μSv/h, the relevant regulations should be applied under the assumption that the concentration of the measured object exceeds 2,000,000Bq/kg, or analysis should be carried out using the method (1).

Attachment 1-1. Simplified measurement procedures of radioactivity concentration

1 Types of containers to be used

(1) Round V-series Container (plastic containers of 128mmφ x 56mmH, hereinafter referred to as "V5 Container")
(2) Sandbags
(3) Flexible containers
(4) 200L drum cans
(5) 2L polyethylene bottles

2. Below are the criteria for determining whether the radioactivity concentration of a container containing accident-derived waste is below 10,000Bq/kg, 500,000Bq/kg or 2,000,000Bq/kg.

1) Measure the radiation dose rate on the surfaces of containers containing accident-derived waste, and define the largest value as A (μSv/h).
2) Determine the radioactivity B (Bq) of the containers containing accident-derived waste by substituting factor X, depending on the measurement date and the measured radiation dose rate A (μSv/h) by the formula below. Table 1 lists the factor X by measurement date and container type.

   A x Factor X = B
3) Measure weight of the containers containing accident-derived waste. Set this as C (kg).
4) To determine the radioactivity concentration D (Bq) of the containers containing accident-derived waste, substitute the radioactivity of bags containing accident-derived waste for B (Bq) and the weight for C (kg) in the following formula:

   B ÷ *C* = *D*

Thus, it can be determined whether the radioactivity concentration D of the containers containing accident-derived waste is below 10,000Bq/kg, 500,000Bq/kg or 2,000,000Bq/kg.

Table 1 Values of the factor X listed by the measurement date and container types

Measurement date	Values of the factor X				
	V5 containers	Sandbag	Flexible containers	200L drum cans	2L polyethylene bottles
Until January 2018	4.4E+04	9.9E+05	1.3E+0	3.5E+06	1.3E+05
Until April 2018	4.4E+04	1.0E+06	1.3E+07	3.5E+06	1.3E+05
Until July 2018	4.5E+04	1.0E+06	1.3E+07	3.5E+06	1.3E+05
Until October 2018	4.5E+04	1.0E+06	1.4E+07	3.5E+06	1.3E+05
Until January 2019	4.5E+04	1.0E+06	1.4E+07	3.6E+06	1.3E+05
Until April 2019	4.6E+04	1.0E+06	1.4E+07	3.6E+06	1.3E+05
Until July 2019	4.6E+04	1.0E+06	1.4E+07	3.6E+06	1.3E+05
Until October 2019	4.6E+04	1.0E+06	1.4E+07	3.7E+06	1.3E+05
Until January 2020	4.7E+04	1.1E+06	1.4E+07	3.7E+06	1.3E+05
Until April 2020	4.7E+04	1.1E+06	1.4E+07	3.7E+06	1.4E+05
Until July 2020	4.7E+04	1.1E+06	1.4E+07	3.7E+06	1.4E+05
Until October 2020	4.7E+04	1.1E+06	1.4E+07	3.7E+06	1.4E+05
Until January 2021	4.8E+04	1.1E+06	1.4E+07	3.8E+06	1.4E+05
Until April 2021	4.8E+04	1.1E+06	1.4E+07	3.8E+06	1.4E+05
Until July 2021	4.8E+04	1.1E+06	1.5E+07	3.8E+06	1.4E+05
Until October 2021	4.8E+04	1.1E+06	1.5E+07	3.8E+06	1.4E+05
Until January 2022	4.8E+04	1.1E+06	1.5E+07	3.8E+06	1.4E+05

* Prepared by the Office of Workers Health Planning for Ionizing Radiation, Industrial Health Division, Industrial Safety and Health Department, Labour Standards Bureau, Ministry of Health, Labour and Welfare with the cooperation of Japan Atomic Energy Agency

Attachment 2. Criteria to determine whether or not a work is considered work under a high dust concentration

1 Objectives

The criteria to determine whether or not a work is work under a high dust concentration should be used for the disposal operator to understand whether dust concentration exceeded the lower limit of high-level dust concentration of 10mg/m^3 during the work, and determine the measurement methods necessary to control internal exposure doses.

2 Basic policy

(1) A simplified measurement instead of an accurate one can be accepted so long as one can determine whether the dust concentration exceeds the lower limit of high-level dust concentration of 10mg/m^3.
(2) It is advisable that the measurement be performed by commissioned experts.

3 Measurement method (with parallel measurement)

(1) In order to determine whether the work is considered work under a high dust concentration, use a personal sampler during the work, or follow the relative concentration indication method basically using a digital dust meter to measure concentration near workers during the work that generates dust.
(2) The measurement method should be as follows:
    a. During the work that generates dust, measure the relative concentration (cpm) for 2 - 3 minutes using a digital dust meter (e.g., LD-5) in the vicinity, to the extent that it does not disturb workers engaged in the works.
    b. It is desirable to collect the relative concentration measurements stated in a. from all of the workers engaged in the work. However, when several workers do similar tasks within a distance of several meters, it is sufficient to measure one worker of the group.
    c. Set a digital dust meter and inhalable dust concentration measurement instrument in parallel in the vicinity (downwind), to the extent that it does not disturb the work, of the worker with the highest relative concentration (cpm) from the simplified measurement in a., and measure the concentration continuously for 10 minutes or more to calculate a mass-concentration conversion factor.
        (i) The target particle diameter for dust concentration measurement should be airborne inhalable dust (respiratory dust, particle diameter 100μm, 50% cut) that is inhaled through one’s nose or mouth
        (ii) Use an open-face type of sampler to measure inhalable dust at the surface velocity of 18 (cm/s) on a sampling filter paper.
        (iii) Follow Article 2 of the Working Environment Measurement Standards except for the particle diameters of a dust particle separator and measurement positions.
(3) Calculate dust concentrations (mg/m^3) from the relative concentration measurements a., using a mass-concentration conversion factor determined by result c. If the highest value of the

measurements exceeds 10mg/m^3, the concentrations of all the other workers involved in the same task should be considered as higher than 10mg/m^3.

4 Measurement method (the case where a given mass-concentration conversion factor is used)

(1) Applicable conditions

The measurement method should be applied only when soil is the main target. The measurement method specified in 3 should be used when handling dust largely containing organic matters such as fallen leaves and branches, rice straws, grass, water supply and sewage sludge, and when handling dust that consists mainly of other things, except that come from debris and soil of construction scrap wood.

(2) Setting measurement points

a. Follow the relative concentration indication method basically using a digital dust meter to measure high levels of dust concentration near workers during the work that generates dust. The measurement point should be set at a location on the downwind side of the dust source where may be considered as having the highest dust concentration, and which has less impact on exhaust gas from heavy machines. Measure the concentration for every work which may generate dust.

b. When several workers do the same task, select one worker from the group to measure.

c. Measure the concentration as closely to workers as possible, to the extent that it may not disturb their works and that safety for the measurer is secured. It is desirable that the measurer should measure at a close position to workers, carrying a digital meter if possible. In addition, there should be another measurement method, such that a worker wears LD-6N to measure the concentration if no safety problems arise.

(3) Measurement duration

a. Measure for 10 minutes or more continuously during the work which may generate the highest concentration. When a cycle of the task taking only a few minutes is repeated, measure the concentration for 10 minutes or longer including the period in which the task is performed.

b. When a cycle of the task takes time in the range from 10 minutes to an hour, measure the concentration for one cycle. If the task continues longer than that, measure for approximately 10 minutes several times throughout the task, and determine the highest value among the measurements.

(4) Evaluation

a. Multiply the relative concentration indication value (count/minute, cpm) measured using a digital dust meter by the mass-concentration conversion factor, to determine the mass concentration and whether it exceeds 10mg/m^3.

b. Mass-concentration conversion factor

Specify 0.15mg/m^3/cpm as the mass-concentration conversion factor for this measurement method. It should be noted, however, that the following statements should be taken into consideration when this factor is used:

(i) This factor is defined based on the limited measurements, and requires an occasional

review as further studies progress.

(ii) This factor is supposed to be used for LD-5 and LD-6, the light-scattering type of digital dust meters.

Attachment 3. Special Education for workers

Workers engaged in works for accident-derived waste disposal should be educated through lectures and practical trainings.

1 Lectures should provide the education described in the middle column of the table below according to each subject listed in the left column, for at least the time period specified in the right column.

Subject	Coverage	Duration
Accident-derived waste	(i) Types and properties of accident-derived waste, etc.	30 minutes
Works involved in accident-derived waste disposal	Workers engaged in crushing, classification, compression/concentration (hereinafter referred to as "Crushing and other work) of accident-derived waste should learn the following contents: (i) Radiation controlled areas (ii) Method and steps for crushing and other work, transportation and storage of accident-derived waste (iii) Method and steps for maintenance and inspection of the equipment contaminated with accident-derived waste (iv) Method for measuring radiation (v) Method for monitoring of dose equivalent rate from external radiation and the concentration of radioactive material in air (vi) Methods for measurement of the contaminated surfaces of ceilings, floors, walls and equipment, and removal of the contamination. (vii) Method for inspection and removal of the contaminated bodies, and performance and usage of protective equipment (viii) Emergency actions in case of an abnormal event	1.5 hours
	Workers engaged in incineration of accident-derived waste should learn the following contents: (i) Radiation controlled areas (ii) Method and steps for incineration, transportation, and storage of accident-derived waste (iii) Method and steps for maintenance and inspection of the equipment contaminated with accident-derived waste (iv) Method for measuring radiation (v) Method for monitoring of dose equivalent rate from external radiation and the concentration of radioactive material in air (vi) Method for measurement of the contaminated surfaces of ceilings, floors, walls and equipment, and removal of the contamination. (vii) Method for inspection and removal of the contaminated bodies, and performance and usage of protective equipment (viii) Emergency actions in case of an abnormal event	1.5 hours
	Workers engaged in landfill of accident-derived waste should	1.5 hours

	learn the following contents: (i) Radiation controlled areas (ii) Method and steps for transportation, storage, and landfill of accident-derived waste (iii) Method and steps for maintenance and inspection of the equipment contaminated with accident-derived waste (iv) Method for measuring radiation (v) Method for monitoring of dose equivalent rate from external radiation and the concentration of radioactive material in air (vi) Method for measurement of the contaminated surfaces of ceilings, floors, walls and equipment, and removal of the contamination. (vii) Method for inspection and removal of the contaminated bodies, and performance and usage of protective equipment (viii) Emergency actions in case of an abnormal event	
The structure of and how to handle the equipment used for accident-derived waste disposal	Workers engaged in crushing and other work of accident-derived waste should learn the following contents: Structure and handling of crushing equipment, equipment in accident-derived waste handling facilities, and other equipment	1 hour
	Workers engaged in incineration of accident-derived waste should learn the following contents: Structure and handling of incinerators and other equipment	1 hour
	Workers engaged in landfill of accident-derived waste should learn the following contents: Structure and handling of water collection and drainage system, sealing coat and other equipment	1 hour
The impact of ionizing radiation on living organisms and the exposure dose control method.	(i) Types and properties of ionizing radiation (ii) The impact of ionizing radiation on cells, tissues, organs and entire bodies of living organisms (iii) Exposure dose limits and methods for measuring exposure doses (iv) Methods for checking and recording the exposure dose measurement results	1 hour
Relevant laws and regulations	Relevant provisions of the Industrial Safety and Health Act, Enforcement Order of the Industrial Safety and Health Act, Ordinance on Industrial Safety and Health, and Ionizing Radiation Ordinance.	1 hour

2 Training should provide the education described in the middle column of the following table according to each subject listed in the left column, for at least the time period specified in the right column.

How to dispose of accident-derived waste and handle the equipment to be used for the work	Workers engaged in crushing and other work of accident-derived waste should learn the following contents: (i) Procedure for entering and exiting radiation controlled area (ii) Crushing, transportation, and storage of accident-derived waste	2 hours

	(iii) Maintenance and inspection of the equipment contaminated with accident-derived waste (iv) Handling of radiation measurement instrument (v) Monitoring of dose equivalent rate from external radiation and the concentration of radioactive material in air (vi) Measurement and removal of the contaminated surfaces of ceilings, floors, walls and equipment (vii) Inspection and removal of the contaminated bodies (viii) Handling of protective equipment (ix) Handling of crushing equipment, equipment in accident-derived waste handling facilities, and other equipment (x) Emergency actions in case of an abnormal event	
	Workers engaged in incineration of accident-derived waste should learn the following contents: (i) Procedure for entering and exiting radiation controlled area (ii) Incineration, transportation, and storage of accident-derived waste (iii) Maintenance and inspection of the equipment contaminated with accident-derived waste (iv) Handling of radiation measurement instrument (v) Monitoring of dose equivalent rate from external radiation and the concentration of radioactive material in air (vi) Measurement and removal of the contaminated surfaces of ceilings, floors, walls and equipment (vii) Inspection and removal of the contaminated bodies (viii) Handling of protective equipment (ix) Handling of incinerator and other equipment (x) Emergency actions in case of an abnormal event	2 hours
	Workers engaged in landfill of accident-derived waste should learn the following contents: (i) Procedure for entering and exiting radiation controlled area (ii) Transportation, storage, and landfill of accident-derived waste (iii) Maintenance and inspection of the equipment contaminated with accident-derived waste (iv) Handling of radiation measurement instrument (v) Measurement of dose equivalent rate from external radiation and the concentration of radioactive material in air (vi) Measurement and removal of the contaminated surfaces of ceilings, floors, walls and equipment (vii) Measurement and removal of the contaminated bodies (viii) Handling of protective equipment (ix) Handling of collection and drainage system, sealing coat and other equipment (x) Emergency actions in case of an abnormal event	2 hours

Attachment 4　List of Special Decontamination Areas, etc.

1 Special Decontamination Areas

- Applicable Areas

  Areas, etc. included in former restricted areas and planned evacuation areas

	Number of Municipalities	Designated Zone
Fukushima Prefecture	11	Naraha-town, Tomioka-town, Ohkuma-town, Futaba-town, Namie-town, Katsurao-village, Iitate-village. And areas that used to be designated as restricted and planned evacuation areas in Tamura-city, Minamisoma-city, Kawamata-town and Kawauchi-village

2 Special Decontamination Areas

- Applicable Areas

  Areas, etc. of which radiation dose is 0.23μSv/h or more

	Number of Municipalities	Designated Area
Iwate Prefecture	3	All areas in Ichinoseki-city, Ohshu-city and Hiraizumi-town
Miyagi Prefecture	8	All areas in Shiroishi-city, Kakuda-city, Kurihara-city, Shichikashuku-town, Ohgawara-town, Marumori-town, Watari-town and Yamamoto-town
Fukushima Prefecture	36	All areas in Fukushima-city, Koriyama-city, Iwaki-city, Shirakawa-city, Sukagawa-city, Soma-city, Nihonmatsu-city, Date-city, Motomiya-city, Koori-town, Kunimi-town, Ohtama-village, Kagamiishi-town, Ten-ei-village, Aizubange-town, Yugawa-village, Aizumisato-town, Nishigo-village, Izumizaki-village, Nakajima-village, Yabuki-town, Tanagura-town, Samegawa-village, Ishikawa-town, Tamakawa-village, Hirata-village, Asakawa-town, Furudono-town, Miharu-town, Ono-town, Hirono-town and Shinchi-town, and areas other than those that used to be designated as restricted areas or planned evacuation areas in Tamura-city, Minamisoma-city, Kawamata-town and Kawauchi-village
Ibaraki Prefecture	19	All areas in Hitachi-city, Tsuchiura-city, Ryugasaki-city, Josho-city, Hitachiohta-city, Takahagi-city, Kitaibaraki-city, Toride-city, Ushiku-city, Tsukuba-city, Hitachinaka-city, Kashima-city, Moriya-city, Inashiki-city, Tsukubamirai-city, Tokai-village, Miho-village, Ami-town and Tone-town
Tochigi Prefecture	7	All areas in Kanuma-city, Nikko-city, Otawara-city, Yaita -city, Nasushiobara-city, Shioya-town and Nasu-town
Gunma Prefecture	8	All areas in Kiryu-city, Numata-city, Shibukawa-city, Midori-city, Shimonita-town, Takayama-village, Higasiagatsuma-town

		and Kawaba-village
Saitama Prefecture	2	All areas in Misato-city and Yoshikawa-city
Chiba Prefecture	9	All areas in Matsudo-city, Noda-city, Sakura-city, Kashiwa-city, Nagareyama-city, Abiko-city, Kamagaya-city Inzai-city and Shirai-city
Total	92	

* Prepared by the Division of Environmental Restoration, Environmental Restoration and Resources Recycling Bureau, Ministry of the Environment (January 2018)

Labor Standards Bureau Notification No.0130-3
January 30, 2018

To:
Director-General, Environmental Regeneration and Material Cycles Bureau, Ministry of the Environment;
Director-General, Policy Bureau, Ministry of Land, Infrastructure, Transport and Tourism;
Director-General, Agriculture, Forestry and Fisheries Research Council's Secretariat,
Ministry of Agriculture, Forestry and Fisheries;
Director General, Reconstruction Agency;
Vice-Secretary General of the Team in Charge of Assisting the Lives of Disaster Victims of the Nuclear Emergency Response Headquarters of the Cabinet Office

From:
Director,
Labour Standards Bureau,
Ministry of Health, Labour and Welfare

Revision of the Guidelines on Prevention of Radiation Hazards for Workers Engaged in Decontamination Works

I am always grateful for your continued understanding of the Bureau's management of labour safety and health administration and your cooperation.

To prevent radiation hazards for workers engaged in decontamination works, works under the designated dose rate and works for disposal of accident-derived wastes associated with radioactive materials discharged by the accident of the Fukushima Daiichi Nuclear Power Plant of Tokyo Electric Power Company caused by the Tohoku District off the Pacific Ocean Earthquake that occurred on 11 March 2011, the Ministry of Health, Labour and Welfare has enforced the Ordinance on Prevention of Ionizing Radiation Hazards at Works to Decontaminate Soil and Wastes Contaminated by Radioactive Materials Resulting from the Great East Japan Earthquake and Related Works (Ordinance of Ministry of Health, Labour and Welfare No. 152 of 2011; hereinafter referred to as "Ionizing Radiation Ordinance for Decontamination"), the Ordinance on Prevention of Ionizing Radiation Hazards (Ordinance of Ministry of Labour No. 41 of 1972; hereinafter referred to as "Ionizing Radiation Ordinance") and others, and has also established the Guidelines on Prevention of Radiation Hazards for Workers Engaged in Decontamination Works (Labour Standards Bureaus Notification No. 1222-6, dated 22 December 2011), the Guidelines on Prevention of Radiation Hazards for Workers Engaged in Works under a Designated Dose Rate (Labour Standards Bureau Notification No. 0615-6, dated 15 June 2012), and the Guidelines on Prevention of Radiation Hazards for Workers Engaged in (Nuclear) Accident-derived Waste Disposal (Labour Standards Bureau Notification No. 0412-2, dated 12 April 2013). All parties concerned are being instructed to implement these ordinances and guidelines properly.

Revisions have recently been made on the guidelines, such as addition of factors to be used in simplified

methods for measurement of radioactivity concentration of soil and wastes for every three-month period from February 2018 to January 2022.

In this relation, I would like to ask you to make sure that related business operators and others under your jurisdiction are informed of revisions mentioned in the Note below. I also want to inform you that the Guidelines on Prevention of Radiation Hazards for Workers Engaged in Decontamination Works and the Guidelines on Prevention of Radiation Hazards to Workers Engaged in Operations under Designated Doses can be used for those who are not subject to the Ionizing Radiation Ordinance for Decontamination, including self-employed people, residents and volunteers.

In addition, reference materials are attached hereto for further details of the revised points.

Note:

1. “Guidelines on Prevention of Radiation Hazards for Workers Engaged in Decontamination Works” has been revised as per Attachment 1.
2. “Guidelines on Prevention of Radiation Hazards for Workers Engaged in Works under a Designated Dose Rate” has been revised as per Attachment 2.
3. “Guidelines on Prevention of Radiation Hazards for Workers Engaged in (Nuclear) Accident-derived Waste Disposal” has been revised as per Attachment 3.

Labor Standards Bureau Notification No.0130-4
January 30, 2018

To:
Governors of those prefectures mentioned in the Addendum

From:
Director, Labour Standards Bureau,
Ministry of Health, Labour and Welfare

Revision of the Guidelines on Prevention of Radiation Hazards for Workers Engaged in Decontamination Works.

I am always grateful for your continued understanding of the Bureau's management of labour safety and health administration and your cooperation.

To prevent radiation hazards for workers engaged in decontamination works, works under the designated dose rate and works for disposal of accident-derived wastes associated with radioactive materials discharged by the accident of Fukushima Daiichi Nuclear Power Plant of Tokyo Electric Power Company caused by the Tohoku District off the Pacific Ocean Earthquake that occurred on 11 March 2011, the Ministry of Health, Labour and Welfare has enforced the Ordinance on Prevention of Ionizing Radiation Hazards at Works to Decontaminate Soil and Wastes Contaminated by Radioactive Materials Resulting from the Great East Japan Earthquake and Related Works (Ordinance of Ministry of Health, Labour and Welfare No. 152 of 2011; hereinafter referred to as "Ionizing Radiation Ordinance for Decontamination"), the Ordinance on Prevention of Ionizing Radiation Hazards (Ordinance of Ministry of Labour No. 41 of 1972; hereinafter referred to as "Ionizing Radiation Ordinance") and others, and has also established Guidelines on Prevention of Radiation Hazards for Workers Engaged in Decontamination Works (Labour Standards Bureaus Notification No. 1222-6, dated 22 December 2011), the Guidelines on Prevention of Radiation Hazards for Workers Engaged in Works under a Designated Dose Rate (Labour Standards Bureau Notification No.0615-6, dated 15 June 2012), and Guidelines on Prevention of Radiation Hazards for Workers Engaged in (Nuclear) Accident-derived Waste Disposal (Labour Standards Bureau Notification No. 0412-2, dated 12 April 2013). All parties concerned are being instructed to implement these ordinances and guidelines properly.

Revisions have recently been made on the guidelines, such as addition of factors to be used in simplified methods for measurement of radioactivity concentration of soil and wastes for every three-month period from February 2018 to January 2022.

In this relation, I would like you to review the revisions mentioned in the Note below, and to make sure that all municipalities within your jurisdiction are informed of them.

In addition, reference materials are attached hereto for further details of the revised points.

Note:

1. “Guidelines on Prevention of Radiation Hazards for Workers Engaged in Decontamination Works” has been revised as per Attachment 1.
2. “Guidelines on Prevention of Radiation Hazards for Workers Engaged in Works under a Designated Dose Rate” has been revised as per Attachment 2.
3. “Guidelines on Prevention of Radiation Hazards for Workers Engaged in (Nuclear) Accident-derived Waste Disposal” has been revised as per Attachment 3.

Addendum

Prefectures Concerned:

Iwate

Miyagi

Fukushima

Ibaraki

Tochigi

Gunma

Chiba

Tokyo

Kanagawa

Niigata

Shizuoka

Labor Standards Bureau Notification No.0130-5
January 30, 2018

To:
Heads of relevant business associations mentioned in the Addendum

From:
Director,
Labour Standards Bureau,
Ministry of Health, Labour and Welfare

Revision of the Guidelines on Prevention of Radiation Hazards for Workers Engaged in Decontamination Works.

I am always grateful for your continued understanding of the Bureau's management of labour safety and health administration and your cooperation.

To prevent radiation hazards for workers engaged in decontamination works, works under the designated dose rate and works for disposal of accident-derived wastes associated with radioactive materials discharged by the accident of the Fukushima Daiichi Nuclear Power Plant of Tokyo Electric Power Company caused by the Tohoku District off the Pacific Ocean Earthquake that occurred on 11 March 2011, the Ministry of Health, Labour and Welfare has enforced the Ordinance on Prevention of Ionizing Radiation Hazards at Works to Decontaminate Soil and Wastes Contaminated by Radioactive Materials Resulting from the Great East Japan Earthquake and Related Works (Ordinance of Ministry of Health, Labour and Welfare No. 152 of 2011; hereinafter referred to as "Ionizing Radiation Ordinance for Decontamination"), the Ordinance on Prevention of Ionizing Radiation Hazards (Ordinance of Ministry of Labour No. 41 of 1972; hereinafter referred to as "Ionizing Radiation Ordinance") and others, and has also established the Guidelines on Prevention of Radiation Hazards for Workers Engaged in Decontamination Works (Labour Standards Bureaus Notification No. 1222-6, dated 22 December 2011), the Guidelines on Prevention of Radiation Hazards for Workers Engaged in Works under a Designated Dose Rate (Labour Standards Bureau Notification No. 0615-6, dated 15 June 2012), and the Guidelines on Prevention of Radiation Hazards for Workers Engaged in (Nuclear) Accident-derived Waste Disposal (Labour Standards Bureau Notification No. 0412-2, dated 12 April 2013). All parties concerned are being instructed to implement these ordinances and guidelines properly.

Revisions have recently been made on the guidelines, such as addition of factors to be used in simplified methods for measurement of radioactivity concentration of soil and wastes for every three-month period from February 2018 to January 2022.

In this relation, I would like to ask you to pay attention to the description of the revisions mentioned in the Note below, to make sure that all members of your association are informed of them, and to further promote measures to prevent radiation hazards in decontamination works.

In addition, reference materials are attached hereto for further details of the revised points.

Note:

1. “Guidelines on Prevention of Radiation Hazards for Workers Engaged in Decontamination Works” has been revised as per Attachment 1.
2. “Guidelines on Prevention of Radiation Hazards for Workers Engaged in Works under a Designated Dose Rate” has been revised as per Attachment 2.
3. “Guidelines on Prevention of Radiation Hazards for Workers Engaged in (Nuclear) Accident-derived Waste Disposal” has been revised as per Attachment 3.

Addendum

Business Associations Concerned:
Japan Industrial Safety & Health Association
Japan Construction Occupational Safety and Health Association
Land Transportation Industry Safety & Health Association
Japan Port Transportation Industry Safety & Health Association
Forestry and Timber Manufacturing Safety & Health Association
National General Contractors Association of Japan
Japan Federation of Construction Contractors
National Federation of Industrial Waste Management Associations
National Federation of Forest Owners' Co-operative Associations
Central Union of Agricultural Co-operatives
Japan Trucking Association
The Federation of Electric Power Companies of Japan
Radiation Effects Association
Technical Advisory Council on Remediation and Waste Management

Guidelines on Prevention of Radiation Hazards for Workers Engaged in Decontamination Works
Comparison Table

Old	New
Section 1 Objectives	Section 1 Objectives
The “Ordinance on Prevention of Ionizing Radiation Hazards at Works to Decontaminate Soil and Wastes Contaminated by Radioactive Materials Resulting from the Great East Japan Earthquake and Related Works” (Ministry of Health, Labour and Welfare Ordinance No. 152 of 2011, hereinafter referred to as the “Ionizing Radiation Ordinance for Decontamination”) was promulgated on 22 December 2011, and came into effect on 1 January 2012 for the prevention of radioactive hazards for workers engaging in works of decontamination, etc. or work for collecting waste, etc. that are contaminated with radioactive materials discharged by the accident at the Tokyo Electric Power Company Fukushima Daiichi Nuclear Power Plant associated with the Great East Japan Earthquake on 11 March 2011. These guidelines were established together with the promulgation of the said Ordinance.	These guidelines are established for the purpose of preventing radiation-related health hazards to workers engaged in decontamination works of objects contaminated with radioactive materials discharged by the accident of the Fukushima Daiichi Nuclear Power Plant of Tokyo Electric Power Company (TEPCO) associated with the Great East Japan Earthquake on 11 March 2011, in conjunction with the enforcement of the "Ordinance on Prevention of Ionizing Radiation Hazards at Works to Decontaminate Soil and Wastes Contaminated by Radioactive Materials Resulting from the Great East Japan Earthquake and Related Works" (Ordinance of the Ministry of Health, Labour and Welfare No. 152 of 2011; hereinafter referred to as the "Ionizing Radiation Ordinance for Decontamination")
Associated with the changes to the demarcation of evacuation areas, restoration of local infrastructures, manufacturing, hospital/welfare facility operations, farming and forestry work, intermediate processing of waste, repairs and maintenance work, transportation work and other works are expected to be commenced at special decontamination areas specified pursuant to Article 25, Paragraph 1 in the “Act on Special Measures Concerning the Handling of Environmental Pollution by Radioactive Materials Discharged by the Nuclear Power Station Accident Associated with the Tohoku District - Off the Pacific Ocean Earthquake That Occurred on 11 March 2011” (Act No. 110 of 2011, hereinafter referred to as “Act on Special Measures Concerning the Handling of Radioactive Pollution”), or at the intensive contamination survey areas specified pursuant to the provision of Article 32, Paragraph 1 in the said Act (hereinafter referred to as “special decontamination areas, etc.”). Therefore it has become necessary to implement measures for protecting workers in these activities from radiation hazards.	[Deleted]
Concerning the above, employers for whom the old version of the Ionizing Radiation Ordinance for Decontamination is applicable were defined as “employers who provide works of decontamination, etc. or collecting waste, etc.” at the special decontamination areas, etc., but to employers engaged in restoration, and reconstruction works other than the decontamination work, the said Ordinance was not applicable. Therefore, the Ionizing Radiation Ordinance for Decontamination was partially	

revised to include provision-defining measures to appropriately protect workers from health hazards due to radiation, according to the types of restoration and reconstruction work. The revised ordinance will become into effect on 1 July 2012, and accordingly this guideline is revised.	
Together with the revised Ionizing Radiation Ordinance for Decontamination, in a proper effort to help further promote the measures for the prevention of radiation hazards during the decontamination works, these guidelines aim at collectively providing the essence of the actions that employers should take and the provisions specified in the Industrial Safety and Health Act (Act No. 57, 1972) and other relevant laws and regulations, in addition to the provisions specified in the revised Ionizing Radiation Ordinance for Decontamination.	Together with the Ionizing Radiation Ordinance for Decontamination, these guidelines aim at a proper effort to help further promote the measures for the prevention of radiation hazards during the decontamination works and a collective provision of the essence of the actions that employers should take including the provisions specified in the Industrial Safety and Health Act (Act No. 57, 1972) and other relevant laws and regulations, in addition to the provisions specified in the Ionizing Radiation Ordinance for Decontamination.
(Abbreviated)	(Abbreviated)
Section 2 Scope	Section 2 Scope
1 These guidelines should be applied, by considering the following matters, to employers who operate decontamination works (hereinafter referred to as “employers of decontamination works, etc.”) in the special decontamination areas under the provisions of Article 25, Paragraph 1 in the Act on Special Measures for Decontamination, or in the intensive contamination survey areas under the provisions of Article 32, Paragraph 1 of the said Act (hereinafter referred as “the decontamination designated areas, etc.”). (See Attachment 1 for special decontamination areas, etc. specified by the Ministry of the Environment.)	1 These guidelines shall be applied to employers engaged in the operation of decontamination related works (hereinafter referred to as the “employers of decontamination works, etc.”) in the special decontamination areas specified in Article 25, paragraph (1) of the "Act on Special Measures Concerning the Handling of Environmental Pollution by Radioactive Materials Discharged by the Nuclear Power Station Accident Associated with the Tohoku District - Off the Pacific Ocean Earthquake That Occurred on 11 March 2011" (Act No. 110 of 2011) or in the intensive contamination survey areas specified in Article 32, paragraph (1) of the same Act (hereinafter referred to as the "special decontamination areas, etc."; refer to Attachment 1), with due attention being paid to the following:
(1) (Abbreviated) However in the case works other than the decontamination works in the special decontamination areas, etc. under the provisions in the Act on Special Measures for Decontamination where the average ambient dose rate exceeds 2.5μSv/h (hereinafter referred to as “the works under a designated dose rate”) are carried out, relevant provisions in the Ionizing Radiation Ordinance for Decontamination and “Guidelines on Prevention of Radiation Hazards for Workers Engaged in Works under a Designated Dose Rate” (Labour Standards Bureau Notification No. 0615-6 of 15 June 2012) should be applied.	(1) (Abbreviated) However in the case of works, other than the decontamination works in the special decontamination areas, etc. where the average ambient dose rate exceeds 2.5μSv/h, (hereinafter referred to as the “works under a designated dose rate”) being carried out, relevant provisions in the Ionizing Radiation Ordinance for Decontamination and “Guidelines on Prevention of Radiation Hazards for Workers Engaged in Works under a Designated Dose Rate” (Labour Standards Bureau Notification No. 0615-6 of 15 June 2012) shall be applied.

(2) (Abbreviated)	(2) (Abbreviated)
[New]	(3) The “works for handling of designated contaminated soil and wastes” refer to the works to handle contaminated soil, etc. whose radioactivity concentration of Cs-134 and Cs-137, among radioactive materials discharged by the accident, exceed 10,000Bq/kg (hereinafter referred to as the “designated contaminated soil and wastes”), but exclude the works for decontaminating soil, etc. and collecting wastes, etc. It should be noted that the “works for handling of designated contaminated soil and wastes” include those works in the special decontamination areas, etc., of construction works for restoring local infrastructures (construction preparation, excavation and transportation, banking and compaction, leveling and shaping of land and slope protection), and relevant works such as foundation work, temporary construction, road construction, water supply and sewage construction, service water and drainage construction, and earth works associated with farmland maintenance works, works involving soil such as turning and plowing the soil, weeding, digging the soil, etc. for commercial farming and forestry, etc., and works handling soil, etc. associated with fertilization (mixing into the soil), rice planting, seeding, raising and harvesting, etc. of root crops. It should be noted, however, that such works mentioned above that could be finished in a short time as temporary works should be excluded from the “works for handling of designated contaminated soil and wastes”.
(3) (Abbreviated)	(4) (Abbreviated)
(4) (Abbreviated)	(5) (Abbreviated)
(5) The “works for handling designated contaminated soil and waste” refers to the works to handle contaminated soil, etc. whose radioactivity concentration of Cs-134 and Cs-137, among radioactive materials discharged by the accident, exceeds 10,000Bq/kg (hereinafter referred to as the “designated contaminated soil and wastes”), but excludes the works for decontaminating soil, etc. and collecting waste, etc. In addition, the “works for handling designated contaminated soil and wastes” includes construction works for restoring local infrastructures (construction preparation, excavation and transportation, banking and compaction, leveling and shaping of land and slope protection), and relevant works such as foundation	[Deleted]

work, temporary construction, road construction, water supply and sewage construction, service water and drainage construction, and earth work associated with farmland maintenance work, works involving soil such as turning and plowing the soil, weeding, digging the soil, etc. for commercial farming and forestry, etc., and works handling soil, etc. associated with fertilization (mixing into the soil), rice planting, seedling, raising and harvesting, etc. of root crops in the special decontamination areas, etc. It should be noted, however, that such works mentioned above that could be finished in a short time as temporary work should be excluded from the "works for handling of designated contaminated soil and wastes."	
(6), (7) (Abbreviated)	(6), (7) (Abbreviated)
2 Employers other than "employers of decontamination works, etc." who carry out decontamination works, etc. in their own site or facilities, etc. should follow applicable matters from among the Exposure Dose Control in Section 3, Preventions for Spread of Contamination and Internal Exposure in Section 5, and Education for Workers in Section 6, as needed.	2 Employers other than "employers of decontamination related workers, etc." who carry out decontamination works, etc. in their own site or facilities, etc. should implement applicable matters from Section 3 "Targets and Methods for Radiation Exposure Dose Control", Section 5 "Measures for Preventions of Contamination Spreading and Internal Exposure" and Section 6 "Education for Workers", as needed.
Section 3 Targets and Methods for Radiation Exposure Dose Control	Section 3 Targets and Methods for Radiation Exposure Dose Control
1 General Principles	1 General Principles
(1) (Abbreviated)	(1) (Abbreviated)
(2) (Abbreviated)	(2) (Abbreviated)
(a)-(c) (Abbreviated)	(a)-(c) (Abbreviated)
(d) In light of the principle of justification, farming employers, etc. are required to decontaminate working areas in advance to reduce radiation exposure to the lowest level as possible, and in principle, assign the workers in the area where the ambient dose rate is less than 2.5μSv/h, so that there is no need to control exposure dose, since the workers in these types of businesses tend to have higher exposure dose associated with long hours of work and the work is considered not necessarily urgently needed.	(d) In light of the principle of justification, farming employers, etc. are required to decontaminate working areas in advance to reduce radiation exposure to the lowest level as possible, and in principle, assign the workers in the area where the average ambient dose rate is less than 2.5μSv/h, so that there is no need to control exposure dose, since the workers in these types of businesses tend to have higher exposure doses associated with long hours of work and the work is considered not necessarily urgently needed.
2 Measurement of radiation exposure doses	2 Measurement of radiation exposure doses
(1) (Abbreviated)	(1) (Abbreviated)
(a) In the case that workers are engaged in	(a) In the case where the employer has workers

decontamination related works at the workplace with an average ambient dose rate exceeding 2.5μSv/h (equivalent to 5mSv/y calculated on the basis of 40 hours/week and 52 weeks/y). • External exposure dose: measurement made by personal dosimeters • Measurement for internal exposure dose: measurements should be made according to the specific works and concentration of radioactive materials in the contaminated soil, etc. to handle.	engage in any works for decontamination and related works in a workplace for which the average ambient dose rate exceeds 2.5 μSv/h (equivalent to 5mSv/year based on 40 h/week and 52 weeks/year), such employers shall conduct internal exposure dose measurements, which shall be appropriate according to the specifics of the works and concentration of radioactive materials contained in contaminated soil, etc. to be handled, in addition to external exposure dose measurements by personal dosimeters. Among the works related to designated contaminated soil and wastes, the restoration works, etc. of local infrastructures, for which workplaces cannot be confined by the nature of the works, shall require the measurements of both external and internal exposure doses, only when workers are expected to perform such works in a place of which average ambient dose rate exceeds 2.5μSv/h.
(b) In the case that workers are engaged in decontamination related works at the workplace with the average ambient dose rate of 2.5μSv/h or less (limited to the works for handling designated contaminated soil and wastes are limited to those for which it is difficult to limit the area of the workplace due to its nature including such works like restoring local infrastructures, and the works for which workers are expected to be engaged in at the workplace with an average ambient dose rate greater than 2.5μSv/h). • Either should be accepted: measurement of external exposure doses by personal dosimeters, evaluation based on the ambient dose rate or the external exposure dose measurement by a representative person whose external exposure dose by the decontamination related works can be considered as average.	(b) In the case where workers are engaged in any works for decontamination and related works (except any works that involve handling of designated contaminated soil and wastes) in a workplace for which the average ambient dose rate is 2.5 μSv/h or less, either of the following may also be deemed as the external exposure dose, as well as the external exposure dose measured by personal dosimeters: • The “average ambient dose rate” multiplied by “daily working hours of each worker engaged in decontamination related works”, or • The measurement result on a typical individual assumed to represent the average external exposure dose from decontamination related works.
(2) (Abbreviated)	(2) (Abbreviated)
(a) The residents and self-employed workers are expected to conduct works of decontamination, etc. as a community unit when they need to decontaminate soil of their own residences, offices, farmland and so forth in the area where the average ambient dose rate might exceed 2.5μSv/h. In such cases, frequency of the work should be less than dozens of times (days) per year, to prevent them from receiving effective doses higher than 1mSv/y through the work.	(a) The residents and self-employed workers are expected to conduct works of decontamination, etc. as a community unit when they need to decontaminate soil of their own residences, offices, farmlands and so forth in the area where the average ambient dose rate might exceed 2.5 μSv/h. In such cases, frequency of the works should be less than dozens of times (days) per year, to prevent them from receiving effective doses higher than 1mSv/y through the works.
(b) In the case of recruiting volunteers from outside of the special decontamination areas, the volunteer organizers should note that the exposure	(b) In the case of recruiting volunteers in an area not classified as the special decontamination areas, the volunteer organizers should note that the

dose limit to the public from the radiation source is specified as 1mSv/y under the planned exposure situation defined by the ICRP.	exposure dose limit of the public to radiation sources is specified as 1mSv/y as recommended by the ICRP under the planned exposure situation.
(3)-(5) (Abbreviated)	(3)-(5) (Abbreviated)
(6) Measurement of internal exposure doses should be conducted by the method specified in Articles 3 and 4 of the “Methods, standards and classification defined by the Minister of Health, Labour and Welfare as specified pursuant to Article 2 , Paragraph 7, etc. of the Ordinance on Prevention of Ionizing Radiation Hazards at Works to Decontaminate Soil and Wastes Contaminated by Radioactive Materials Resulting from the Great East Japan Earthquake and Related Works” (Ministry of Health, Labour and Welfare Notification No.468 of 2011), and the screening test method should follow the method shown in Attachment 4.	(6) The screening test method of internal exposure shall follow the method shown in Attachment 4. The calculation method of internal exposure dose shall be in accordance with the stipulations of Article 6 of the “Methods, standards and classification defined by the Minister of Health, Labour and Welfare as specified pursuant to Article 2 , Paragraph 7, etc. of the Ordinance on Prevention of Ionizing Radiation Hazards at Works to Decontaminate Soil and Wastes Contaminated by Radioactive Materials Resulting from the Great East Japan Earthquake and Related Works” (Ministry of Health, Labour and Welfare Notification No. 468 of 2011).
3 Exposure dose limit	3 Exposure dose limits
(1), (2) (Abbreviated)	(1), (2) (Abbreviated)
(3) Regarding the term “five years” in (1)-(a) above, in order to control the exposure doses appropriately for the workers at multiple workplaces with decontamination works, the initial date of the five-year period should be established on 1 January 2012 and the exposure dose should be controlled during the period “from 1 January 2012 to 31 December 2016” uniformly for all relevant workplaces which conduct decontamination works. This rule applies to the employers of decontamination works, etc. who start the business between 1 January 2012 and 31 December 2016. In this case, the number of years from when the business commenced till 31 December 2016, multiplied by 20mSv is deemed as the exposure dose limit by 31 December 2016, and relevant regulations should apply accordingly.	(3) To properly control the radiation exposure doses of workers engaged in decontamination and related works in multiple different workplaces, the period of "five years" prescribed in (1) (a) above shall be quinquennial periods of which the first period starts on 1 January 2012 uniformly for all workplaces where decontamination works, etc. are performed. The same shall apply to employers that newly start decontamination and related works as their business in the middle of any of such quinquennial periods. In such cases, the value of 20 mSv multiplied by the number of years from the commencement date of such decontamination works till the end of the corresponding quinquennial period shall be deemed as the exposure dose limit for the period ending at the end of such a quinquennial period and shall be used for application of relevant regulations.
(4) Regarding the term “one year” in (1)-(a) above, the initial date should be established on 1 January 2012 the same as the “five years”, therefore the first monitoring duration should be “from 1 January 2012 to 31 December 2012”. Exposure doses received after 11 March 2011 are considered as the exposure dose received on 1 January 2012, and thus this amount should be added on the exposure dose actually received during the period from 1 January 2012 to 31 December 2012.	(4) The periods of "one year" prescribed in (1) (a) above shall be yearly periods of which the first period starts on the first date of “five years”. The radiation dose received during the period from 11 March 2011 till 31 December 2011 shall be deemed as the dose received on 1 January 2012 and shall be included therein.
For the works for handling designated	(5) For the works for handling of designated

contaminated soil and wastes, the exposure doses received during the period from 1 January 2012 to 30 June 2012, if known, should be added on the one after 1 July 2012 for exposure dose control purpose.	contaminated soil and wastes, the exposure doses received during the period from 1 January 2012 to 30 June 2012, if known, should be added on the dose on or after 1 July 2012 for the exposure dose control purpose.
(5) (Abbreviated)	(6) (Abbreviated)
(6) (Abbreviated)	(7) (Abbreviated)
(7) The starting dates described in (3) and (4) should be known to the workers for decontamination works.	(8) The starting dates should be made known to the workers for decontamination and related works.
4 Records of dose measurements, etc.	4 Records of dose measurements, etc.
(1) Employers of decontamination works, etc. should determine the exposure dose of workers for decontamination works as described below based on measurements made or by calculation according to the description in 2 above, record the results and keep those records for 30 years. However, this may not be applied if the records which have been kept for five years or the records of the workers for decontamination works who left the job are transferred to the organization designated by the Minister of Health, Labour and Welfare. In these cases, Form 1 (a sample) may be filled in for recording. (Abbreviated)	(1) Employers of decontamination works, etc. should determine the exposure dose of workers for decontamination works as described below based on measurements made or by calculations according to the description in 2 above, record the results and keep those records for 30 years. However, this provision shall not be applicable to the records that are transferred to the organization designated by the Minister of Health, Labour and Welfare (Radiation Effects Association, a public interest incorporated foundation) after such records have been kept for five years or after the workers for decontamination works recorded therein have left the job. In these cases, Form 1 (as an example) may be filled in for recording. (Abbreviated)
(2) (Abbreviated)	(2) (Abbreviated)
(3) Any employer of decontamination works, etc. who terminates its business should transfer the records defined in (1) above to the organization designated by the Minister of Health, Labour and Welfare.	(3) When any employer of decontamination works, etc. intends to discontinue its operation, the employer shall transfer the records referred to in (1) above to the organization designated by the Minister of Health, Labour and Welfare (Radiation Effects Association, a public interest incorporated foundation).
(4), (5) (Abbreviated)	(4), (5) (Abbreviated)
Section 4 Measures to Reduce Radiation Exposure	Section 4 Measures to Reduce Radiation Exposure
1 Preliminary survey	1 Prior radiological evaluation
(1), (2) (Abbreviated)	(1), (2) (Abbreviated)
(3) When measuring average ambient dose rates, the following matters should be noted:	(3) When measuring average ambient dose rates, the following matters should be noted:
(a) (Abbreviated)	(a) (Abbreviated)
(b) The purpose of the preparatory survey is to judge if the average ambient dose rate at the workplace	(b) The purpose of the prior radiological evaluation for the average ambient dose rate regarding the

exceeds 2.5μSv/h, and accordingly to determine whether or not the exposure dose control is required. Therefore, if the employers judge that the average ambient dose rate at the workplace clearly exceeds 2.5μSv/h based on the results of the air-borne survey, etc. published by the Ministry of Education, Culture, Sports, Science and Technology, the results of the air-borne survey, etc. for the specific workplace of concern may be used instead of actually measuring the average ambient dose rates in those individual workplaces.	works for handling of designated contaminated soil and wastes is to determine if the average ambient dose rate at the workplace exceeds 2.5μSv/h, and accordingly to judge whether or not the exposure dose control is required. Therefore, if the employer judges that the average ambient dose rate at the workplace clearly exceeds 2.5μSv/h based on the results of the air-borne monitoring survey, etc. published by the Nuclear Regulation Authority, the results of the air-borne monitoring survey, etc. for the specific workplace concerned may be used instead of actual measurements of average ambient dose rates in those individual workplaces.
(4) (Abbreviated)	(4) (Abbreviated)
(a) (Abbreviated)	(a) (Abbreviated)
(b) Regarding measurement of radioactivity in soil in farmlands and in the fallen leaf layer and soil in forests which are subject to the works for handling designated contaminated soil and wastes in areas where the average ambient dose rate is less than 2.5μSv/h, radioactivity in contaminated soil and wastes may be estimated from the average ambient dose rate there in accordance with the procedures shown in Attachment 6-2 and 6-3. If the estimates are less than 10,000Bq/kg, the works there may be regarded as those that do not fall under the works for handling designated contaminated soil and wastes. (Abbreviated)	(b) Measurement of radioactivity of soil in farmlands, fallen leaf layers and soil in forests which are deemed to be an objective of the works for handling of designated contaminated soil and wastes in areas where the average ambient dose rate is 2.5μSv/h or less, may be substituted by estimation of radioactivity of contaminated soil and wastes from the average ambient dose rate shown in Attachments 6-2 and 6-3. If the estimates are less than 10,000Bq/kg, the works there may be regarded as those that do not fall under the works for handling designated contaminated soil and wastes. (Abbreviated)
(c) (Abbreviated)	(c) (Abbreviated)
(d) The purpose of the preparatory survey is to judge whether the concentration of radioactive materials in the contaminated soil and wastes to be handled exceeds 10,000Bq/kg or 500,000Bq/kg. Therefore, if employers of decontamination works, etc. judge that the concentration of radioactive material in the contaminated soil and wastes to be handled clearly exceeds 10,000Bq/kg, based on the results of the air-borne survey, etc. published by the Ministry of Education, Culture, Sports, Science and Technology, the results of the air-borne survey, etc. may be used instead of actually measuring radioactivity concentration of the contaminated soil and wastes at the workplace. Furthermore, the measurement of concentration of radioactive materials is not required if that of the contaminated soil and wastes to be handled is clearly known as less than 10,000Bq/kg and therefore not subject to the works for handling	(d) The purpose of prior radiological evaluation for the concentration measurement of radioactive materials in contaminated soil and wastes regarding the works for handling of designated contaminated soil and wastes is to determine whether the concentration of radioactive materials in the contaminated soil and wastes to be handled exceeds 10,000Bq/kg or 500,000Bq/kg. Therefore, if the employer of decontamination works, etc. judges that the concentration of radioactive materials in the contaminated soil and wastes to be handled clearly exceeds 10,000Bq/kg based on the results of the air-borne monitoring survey, etc. published by the Nuclear Regulation Authority, the results of the air-borne monitoring survey, etc. may be used instead of actual measurement of radioactivity concentration of the contaminated soil and wastes at the workplace. Furthermore, the measurement of concentration of radioactive materials is not required if that of the

designated contaminated soil and wastes, based on the lookup table in Attachment 6-2 or 6-3 and other information as well as considering the digging depth of soil and average ambient dose rate at the workplace.	contaminated soil and wastes to be handled is clearly known as less than 10,000Bq/kg and therefore not subject to the works for handling designated contaminated soil and wastes, based on the lookup table in Attachment 6-2 or 6-3 and other information as well as considering the digging depth of soil and average ambient dose rate at the workplace.
2 Formulation of the working plan and works based on the plan (1)-(3) (Abbreviated) (4) (Abbreviated) (c) (Abbreviated) 1) (Abbreviated) 2) Methods for reducing radiation exposure such as reduction of working hours, etc. 3) (Abbreviated) (5) (Abbreviated) (a) (Abbreviated) (b) All workers should take off contaminated equipment such as gloves, dust masks, etc. before eating, drinking or smoking, and decontaminate their hands by washing, etc. Workers should check for contamination before eating and drinking when they handled highly radioactive contaminated soil and wastes. (c), (e) (Abbreviated) (6) (Abbreviated)	2 Formulation of the working plan and works based on the plan (1)-(3) (Abbreviated) (4) (Abbreviated) (c) (Abbreviated) 1) (Abbreviated) 2) Methods for reducing radiation exposure such as reduction of working hours, etc. 3) (Abbreviated) (5) (Abbreviated) (a) (Abbreviated) (b) All workers should remove contaminated gear such as gloves, dust masks, etc. before eating, drinking or smoking, and decontaminate their hands by washing, etc. Workers should check for their own contamination before eating and drinking when they have handled highly radioactive contaminated soil and wastes. (c), (e) (Abbreviated) (6) (Abbreviated)
3, 4 (Abbreviated)	3, 4 (Abbreviated)
5 Medical examination by medical doctors (1) (Abbreviated) (2) The above (1)-(b) is limited only to the cases in which a certain degree of internal exposure is envisaged. For example, if workers are buried in a large amount of soil and sand, etc. by accident, etc., and the results of their nasal smear test, etc. show a contamination level over the criterion, or if workers swallow a large amount of soil, sand or contaminated water, etc.	5 Medical examination by medical doctors (1) (Abbreviated) (2) Application of the above (1)-(b) is limited only to the cases in which a certain degree of internal exposure is envisaged. For example, if workers are buried in a large amount of soil and sand, etc. in an accident, etc., and the results of their nasal smear test, etc. show a contamination level over the criterion, or if workers swallow a large amount of soil, sand or contaminated water, etc.
Section 5 Measures for Preventions of Contamination Spreading and Internal Exposure	Section 5 Measures for Preventions of Contamination Spreading and Internal Exposure

1, 2 (Abbreviated)	1, 2 (Abbreviated)
3 Implementation of contamination screening (1), (2) (Abbreviated) (3) Contamination screening of objects to be taken out (a) (Abbreviated) (b) When employers of decontamination works, etc. find, by screening, objects being contaminated at higher than the contamination limit, the objects should not be allowed to be taken out. However, this provision does not apply if the object is encased in containers or covered with plastic sheets to prevent removed soil or contaminated waste from dispersing or leaking, for transfer to other facilities such as decontamination facilities, storage or disposal facilities for contaminated waste or removed soil or other decontamination workplaces. (c) (Abbreviated)	3 Implementation of contamination screening (1), (2) (Abbreviated) (3) Contamination screening of objects to be taken from the workplace (a) (Abbreviated) (b) When employers of decontamination works, etc. find, by screening, that objects are being contaminated at higher than the contamination limit, these objects should not be allowed to be taken from the workplace. However, this provision does not apply if the object is to be transferred to other facilities such as facilities for decontamination works, storage or disposal or to other decontamination workplaces after necessary measures are taken such as encasement in containers or covering with plastic sheets to prevent the removed soil or contaminated waste from dispersing or leaking. (c) (Abbreviated)
4 (Abbreviated)	4 (Abbreviated)
5 Prevention of body surface and internal contamination (1) (Abbreviated) (2) When decontamination related works may result in workers becoming contaminated above the contamination limit, employers of decontamination works, etc. should provide effective protective clothing, gloves, or shoes according to the work categories and radioactivity concentration of soil and wastes given in the table below by noting the following matters, and tell the workers for decontamination works to wear them for the work. Workers for decontamination works should wear such protective equipment. (3) Employers of decontamination works, etc. should prohibit protective equipment or protective clothing being used by workers for decontamination works when those items are contaminated above the contamination limit (40Bq/cm^2 (13,000cpm as a GM counter reading)), before decontaminating them by washing or cleaning to reduce the contamination level to the contamination limit or lower.	5 Prevention of body surface and internal contamination (1) (Abbreviated) (2) When decontamination and related works may result in workers becoming contaminated above the contamination limit, the employers of said workers shall keep the following matters in mind and shall instruct their workers in performing such decontamination works to wear appropriate protective clothing, gloves, or shoes, for preventing contamination, according to work categories and radioactivity concentration of soil and wastes given in the table below. The workers so instructed shall wear such protective gear. (3) When the protective gear to be used by workers for decontamination and related works is contaminated above the contamination limit (40Bq/cm^2 (13,000cpm as a GM counter reading)), employers of said decontamination related workers shall not allow the workers to use such protective gear, unless it is decontaminated by washing or cleaning to the level of or lower than the said contamination limit.

(4) (Abbreviated)	(4) (Abbreviated)
Section 6 (Abbreviated)	Section 6 (Abbreviated)
Section 7 Measures for Health Care	Section 7 Measures for Health Care
1 Special medical examination	1 Special medical examination
(1), (2) (Abbreviated)	(1), (2) (Abbreviated)
(3) Employers of decontamination works, etc. should prepare the "ionizing radiation medical examination card for decontamination, etc."(Form 3) based on the results of the medical examinations in (1) above and keep them for 30 years. It should be noted, however, that this does not apply if the records which have been kept for five years or the records of the workers engaged in decontamination works who left the job are transferred to the organization designated by the Minister of Health, Labour and Welfare.	(3) Employers of decontamination works, etc. should prepare the "ionizing radiation medical examination cards for decontamination, etc." (Form 3) based on the results of medical examinations in (1) above and keep them for 30 years. It should be noted, however, that this shall not be applicable if the records are transferred to the organization designated by the Minister of Health, Labour and Welfare (Radiation Effects Association, a public interest incorporated foundation) after the records have been kept for five years or the workers engaged in decontamination works recorded therein have left the job.
2 General medical examinations	2 General medical examinations
(1), (2) (Abbreviated)	(1), (2) (Abbreviated)
(3) Regarding medical examinations for (1) or (2) above (limited to those on a regular basis), all of or part of the tests (f) to (i) in (1) above can be omitted, if a medical doctor considers so, based on the previous medical examination results.	(3) Regarding medical examinations for (1) or (2) above (limited to those on a regular basis), workers who were examined for items (f) through (i) and (k) of the above (1) at the previous medical examination may be exempted from all or part of such items, if the occupational physician considers them unnecessary.
The tests (c) and (d) in (1) may also be omitted if a medical doctor considers so, based on the standard specified by Minister of Health, Labour and Welfare.	(4) As for items (c), (d), (f) through (i) and (k) of the above (1), they may be omitted if the occupational physician considers them unnecessary based on the criteria set by the Minister of Health, Labour and Welfare.
[New]	(5) The hearing test of item (c) of the above (1) (limited to tests conducted during regular medical examinations) may be substituted by hearing tests that the occupational physician considers appropriate (excluding tests for hearing ability for 1000Hz and 4000Hz sounds), for workers who were examined for the said items during the previous medical examination, or who are younger than 45 years (except those aged 35 and 40 years old).
(4) (Abbreviated)	(6) (Abbreviated)

3 (Abbreviated)	3 (Abbreviated)
4 Transfer of the records (1) When a decontamination employer intends to terminate its business, the ionizing radiation medical examination card for decontamination, etc. defined in 1-(3) above should be transferred to the organization designated by the Minister of Health, Labour and Welfare. (2) (Abbreviated)	4 Transfer of the records (1) When any employer of decontamination works, etc. intends to discontinue its operation, the ionizing radiation medical examination cards for decontamination, etc. defined in 1-(3) above should be transferred to the organization designated by the Minister of Health, Labour and Welfare (Radiation Effects Association, a public interest incorporated foundation). (2) (Abbreviated)
Section 8 Safety and Health Management System 1-3 (Abbreviated)	Section 8 Safety and Health Management System 1-3 (Abbreviated)
4 Measures for maintaining and promoting the health of emergency workers at the TEPCO Fukushima Daiichi Nuclear Power Plant (1) A report pursuant to Article 59, Paragraph 2 of the Ionizing Radiation Ordinance should be submitted to the Minister of Health, Labour and Welfare (addressed to the Industrial Health Division, Ministry of Health, Labour and Welfare) (a) (Abbreviated) (b) The “status report on radiation dose control, etc. for designated emergency workers” (the Ionizing Radiation Ordinance Form No.3) at the end of every three months. (2) (Abbreviated)	4 Measures for maintaining and promoting the health of emergency workers at the TEPCO Fukushima Daiichi Nuclear Power Plant (1) A report pursuant to Article 59, Paragraph 2 of the Ionizing Radiation Ordinance should be submitted to the Minister of Health, Labour and Welfare (c/o Office of Workers Health Planning for Ionizing Radiation, Industrial Health Division, Industrial Safety and Health Department, Labour Standards Bureau, Ministry of Health, Labour and Welfare). (a) (Abbreviated) (b) The “status report on radiation dose control, etc. for designated emergency workers” (the Ionizing Radiation Ordinance Form No.3) shall be submitted at the end of every three months. The submission shall, in principle, be in an electromagnetic form as CSV file format. (2) (Abbreviated)
Attachment 1. List of special decontamination areas ,etc. 1 Special decontamination areas • Designated areas Restricted areas or deliberate evacuation areas	Attachment 1. List of special decontamination areas, etc. 1 Special decontamination areas • Designated areas Areas, etc. included in Former Restricted Areas and Deliberate Evacuation Areas

	Number of municipalities	Designated areas
Fukushima Prefecture	11	All areas in Naraha-town, Tomioka-town, Okuma-town, Namie-town, Katsurao-village, and Iitate-village; The restricted areas or deliberated evacuation areas in Tamura-city,

	Number of municipalities	Designated areas
Fukushima Prefecture	11	All areas in Naraha-town, Tomioka-town, Okuma-town, Futaba-town, Namie-town, Katsurao-village and Iitate-village. And areas that used to be designated as Warning Zones or

		Minamisoma-city, Kawamata-town, and Kawauchi-village

2 Intensive contamination survey areas

- Designated areas

  Areas with the radiation dose rate of 0.23μSv/h or above

	Number of municipalities	Designated areas
Iwate Prefecture	3	(Abbreviated)
Miyagi Prefecture	8	All areas in Shiroishi-city, Kakuda-city, Kurihara-city, Shichikashuku-town, Ogawara-town, Marumori-town, Yamamoto-town, and Watari-town
Fukushima Prefecture	40	All areas in Fukushima-city, Koriyama-city, Iwaki-city, Shirakawa-city, Sukagawa-city, Soma-city, Nihonmatsu-city, Date-city, Motomiya-city, Koori-town, Kunimi-town, Otama-village, Kagamiishi-town, Tenei-village, Aizubange-town, Yugawa-village, Mishima-town, Aizumisato-town, Nishigo-village, Izumizaki-village, Nakajima-village, Yabuki-town, Tanagura-town, Yamatsuri-town, Hanawa-town, Samegawa-village, Ishikawa-town, Tamakawa-village, Hirata-village, Asakawa-town, Furudono-town, Miharu-town, Ono-town, Hirono-town, Shinchi-town and Yanaizu-town; and areas excluding the restricted and planned evacuation areas in Tamura-city, Minamisoma-city, Kawamata-town, and Kawauchi-village
Ibaraki Prefecture	20	All areas in Hitachi-city, Tsuchiura-city, Ryugasaki-city, Joso-city, Hitachiota-city, Takahagi-city, Kitaibaraki-city, Toride-city, Ushiku-city, Tsukuba-city, Hitachinaka-city, Kashima-city, Moriya-city, Inashiki-city, Hokota-city, Tsukubamirai-city, Tokai-village, Miho-village, Ami-town, and Tone-town
Tochigi Prefecture	8	All areas in Sano-city, Kanuma-city, Nikko-city, Ohtawara-city, Yaita-city, Nasushiobara-city, Shioya-town, and Nasu-town
Gunma Prefecture	10	All areas in Kiryu-city, Numata-city, Shibukawa-city, Annaka-city, Midori-city, Shimonita-town, Nakanojo-town, Takayama-village, Higashiagatsuma-town, Kawaba-village
Saitama Prefecture	2	All areas in Misato-city and Yoshikawa-city
Chiba Prefecture	9	All areas in Matsudo-city, Noda-city, Sakura-city, Kashiwa-city, Nagareyama-city, Abiko-city, Kamagaya-city, Inzai-city, and Shiroi-city
Total	100	

Attachment 3. Determination on whether or not the work falls under the category of work under high dust concentration

1, 2 (Abbreviated)

		Planned Evacuation Zones in Tamura-city, Minamisoma-city, Kawamata-town and Kawauchi-village

2 Intensive contamination survey areas

- Designated areas

  Areas for which the radiation dose rate is 0.23μSv/h or above

	Number of municipalities	Designated areas
Iwate Prefecture	3	(Abbreviated)
Miyagi Prefecture	8	All areas in Shiroishi-city, Kakuda-city, Kurihara-city, Shichikashuku-town, Ogawara-town, Marumori-town, Watari-town, and Yamamoto-town
Fukushima Prefecture	36	All areas in Fukushima-city, Koriyama-city, Iwaki-city, Shirakawa-city, Sukagawa-city, Soma-city, Nihonmatsu-city, Date-city, Motomiya-city, Koori-town, Kunimi-town, Otama-village, Kagamiishi-town, Tenei-village, Aizubange-town, Yugawa-village, Aizumisato-town, Nishigo-village, Izumizaki-village, Nakajima-village, Yabuki-town, Tanagura-town, Samegawa-village, Ishikawa-town, Tamakawa-village, Hirata-village, Asakawa-town, Furudono-town, Miharu-town, Ono-town, Hirono-town and Shinchi-town; and areas excluding the restricted and designated areas in Tamura-city, Minamisoma-city, Kawamata-town, and Kawauchi-village
Ibaraki Prefecture	19	All areas in Hitachi-city, Tsuchiura-city, Ryugasaki-city, Joso-city, Hitachiota-city, Takahagi-city, Kitaibaraki-city, Toride-city, Ushiku-city, Tsukuba-city, Hitachinaka-city, Kashima-city, Moriya-city, Inashiki-city, Hokota-city, Tsukubamirai-city, Tokai-village, Miho-village, Ami-town, and Tone-town
Tochigi Prefecture	7	All areas in Kanuma-city, Nikko-city, Ohtawara-city, Yaita-city, Nasushiobara-city, Shioya-town, and Nasu-town
Gunma Prefecture	8	All areas in Kiryu-city, Numata-city, Shibukawa-city, Midori-city, Shimonita-town, Takayama-village, Higashiagatsuma-town, Kawaba-village
Saitama Prefecture	2	All areas in Misato-city and Yoshikawa-city
Chiba Prefecture	9	All areas in Matsudo-city, Noda-city, Sakura-city, Kashiwa-city, Nagareyama-city, Abiko-city, Kamagaya-city, Inzai-city, and Shiroi-city
Total	92	

* Prepared by the Division of Environmental Restoration, Environmental Restoration and Resources Recycling Bureau, Ministry of the Environment (January 2018)

Attachment 3. Determination on whether or not the work falls under the category of work under high dust concentration

1, 2 (Abbreviated)

3 Measurement method (1) (Abbreviated) (a), (b) (Abbreviated) (c) (Abbreviated) 1) (Abbreviated) 2) (Abbreviated) 3) Article 2 of the Working Environment Measurement Standards should be followed, except for the specifications of the dust particle diameters of the dust particle separator and the measurement positions. 4 (Abbreviated)	3 Measurement method (1) (Abbreviated) (a), (b) (Abbreviated) (c) (Abbreviated) 1) (Abbreviated) 2) (Abbreviated) 3) Article 2 of the Working Environment Measurement Standards (Ministry of Labour Notification No. 46 of 1976) should be followed, except for the specifications of dust particle diameters of the dust particle separators and the measurement positions. 4 (Abbreviated)
Attachment 5. Methods of measurement and evaluation of average ambient dose rate 1 Objectives The purposes of measurement and evaluation of average ambient dose rate are for employers of decontamination works, etc. to measure and evaluate whether or not the average ambient dose rate at a workplace exceeds 2.5μSv/h, and accordingly to determine how to control radiation exposures to be implemented when employers assign workers to the decontamination works. 2 (Abbreviated) 3 Measurement and evaluation of average ambient dose rate (1) (Abbreviated) (2) (Abbreviated) (a) (Abbreviated) (b) When the working area is not a rectangular shape, the ambient dose rate should be measured at four points set at an even distance along the outer periphery, and one point at the intersection of the diagonal lines from two facing points. Average ambient dose rate is derived by averaging the measurements from these five points. (3) (Abbreviated) (4) (Abbreviated)	Attachment 5. Methods of measurement and evaluation of average ambient dose rate 1 Objectives The purposes of measurement and evaluation of average ambient dose rates are for employers of decontamination works, etc. to measure and evaluate whether or not the average ambient dose rate at a workplace exceeds 2.5μSv/h, and accordingly to determine the details of radiation dose control to be implemented when employers assign workers to the decontamination works. 2 (Abbreviated) 3 Measurement and evaluation of average ambient dose rate (1) (Abbreviated) (2) (Abbreviated) (a) (Abbreviated) (b) When the working area is not rectangular in shape, the ambient dose rates should be measured at four points set at almost equal distances along the outer periphery and one intersection point of the two diagonal lines from facing points. The average ambient dose rate is derived by averaging the measurements at these five points. (3) (Abbreviated) (4) (Abbreviated)
Attachment 6. Measurement methods for radioactivity concentration in the contaminated soil and wastes. 1, 2 (Abbreviated) 3 Sampling (1) Principles for sampling (a) (Abbreviated)	Attachment 6. Measurement methods for radioactivity concentration in the contaminated soil and wastes. 1, 2 (Abbreviated) 3 Sampling (1) Principles for sampling (a) (Abbreviated)

1) (Abbreviated)	1) (Abbreviated)
2) Contaminated soil, removed soil or contaminated waste to be handled with the highest expected radioactivity concentration.	2) Those samples considered to have the highest radioactivity concentrations, among contaminated soil, removed soil or contaminated waste to be handled during the works.
(b), (c) (Abbreviated)	(b), (c) (Abbreviated)
(2) (Abbreviated)	(2) (Abbreviated)
(3) (Abbreviated)	(3) (Abbreviated)
(a), (b) (Abbreviated)	(a), (b) (Abbreviated)
(c) Living environment (Areas around the structures such as buildings or roads) Among soil handled in the works, that in the area where rain water is collected and where the collected rain water exits, plants and their roots, locations where rainwater, mud or soil tend to be accumulated, and removed objects such as sludge near the structures to which small particles tend to be attached (soil in the zone from the surface to the depth where actual decontamination is involved; the depth should vary depending on the excavation depth in the actual decontamination).	(c) Living environment (Areas around the structures such as buildings or roads) The soil, etc. among those items to be handled in the works, accumulated in the places, where rain water flows in and out, where there are plants and their roots, and where rain water, mud and soil tend to pool, and those of the places near structures to which particles easily attach (soil, etc. from the ground surface down to the depth of actual handling of soil, etc.; the depth should vary depending on the excavation depths in the actual decontamination works).
4 Analysis methods	4 Analysis methods
(1), (2) (Abbreviated)	(1), (2) (Abbreviated)
(3) (Abbreviated)	(3) (Abbreviated)
(a) In the area where the average ambient dose rate is equal to 2.5μSv/h or less, the radioactivity concentration may be calculated using the following method if the correlation between the ambient dose rate at a height of 15cm from the ground surface and the sum of the concentrations of Cs-134 and Cs-137 is known. (See Attachments 6-2 and 6-3 for details.) It should be noted that the simplified method may not apply to the works involving soil near the ground surface of unplowed farmland, or the fallen leaf layer, or soil near the ground surface only, because data have indicated that approximately 50% of radioactive materials (for unplowed farmland) or 60% of radioactive materials (for school yards) are accumulated in the zone from the ground surface to 1 cm in depth, and that radioactivity is concentrated on fallen leaves in the forest.	(a) In the area where the average ambient dose rate is equal to 2.5μSv/h or less, the radioactivity concentration may be calculated using the following method if the correlation between the ambient dose rate at a height of 1 m and the sum of the concentrations of Cs-134 and Cs-137 in the soil (the average from the ground surface to the depth of 15 cm) is known. (See Attachments 6-2 and 6-3 for details.) It should be noted that the simplified method shall not be applied to the works to handle soil near the ground surface of unplowed farmlands only or to handle fallen leaf layers or soil near the ground surface only, because data have indicated that approximately 50% of radioactive materials (for unplowed farmlands) or 60% of radioactive materials (for school yards) are accumulated in the zone from the ground surface to 1 cm in depth, and that radioactivity in the forest is mainly accumulated in fallen leaves.
(b), (c) (Abbreviated)	(b), (c) (Abbreviated)
Attachment 6-1. Simplified measurement procedures for radioactivity concentration	Attachment 6-1. Simplified measurement procedures for radioactivity concentration

1, 2 (Abbreviated)

Table 1 Values of the factor X listed by the measurement date and container types

Measurement date	Values of the factor X				
	V5 containers	Sandbag	Flexible containers	200L drum cans	2L polyethylene bottles
Until October 2014	3.7E+04	8.3E+0E	1.1E+07	2.9E+06	1.1E+05
Until January 2015	3.8E+04	8.5E+05	1.1E+07	2.9E+06	1.1E+05
Until April 2015	3.8E+04	8.6E+05	1.1E+07	3.0E+06	1.1E+05
Until July 2015	3.9E+04	8.8E+05	1.2E+07	3.0E+06	1.1E+05
Until October 2015	3.9E+04	8.9E+05	1.2E+07	3.1E+06	1.1E+05
Until January 2016	4.0E+04	9.0E+05	1.2E+07	3.1E+06	1.2E+05
Until April 2016	4.0E+04	9.1E+05	1.2E+07	3.2E+06	1.2E+05
Until July 2016	4.1E+04	9.3E+05	1.2E+07	3.2E+06	1.2E+05
Until October 2016	4.2E+04	9.4E+05	1.2E+07	3.3E+06	1.2E+05
Until January 2017	4.2E+04	9.5E+05	1.3E+07	3.3E+06	1.2E+05
Until April 2017	4.3E+04	9.6E+05	1.3E+07	3.3E+06	1.2E+05
Until July 2017	4.3E+04	9.7E+05	1.3E+07	3.4E+06	1.2E+05
Until October 2017	4.3E+04	9.8E+05	1.3E+07	3.4E+06	1.3E+05
Until January 2018	4.4E+04	9.9E+05	1.3E+07	3.5E+06	1.3E+05

1, 2 (Abbreviated)

Table 1 Values of the factor X listed by the measurement date and container types

Measurement date	Values of the factor X				
	V5 containers	Sandbags	Flexible containers	200L drum cans	2L polyethylene bottles
Until January 2018	4.4E+04	9.9E+05	1.3E+07	3.5E+06	1.3E+05
Until April 2018	4.4E+04	1.0E+06	1.3E+07	3.5E+06	1.3E+05
Until July 2018	4.5E+04	1.0E+06	1.3E+07	3.5E+06	1.3E+05
Until October 2018	4.5E+04	1.0E+06	1.4E+07	3.5E+06	1.3E+05
Until January 2019	4.5E+04	1.0E+06	1.4E+07	3.6E+06	1.3E+05
Until April 2019	4.6E+04	1.0E+06	1.4E+07	3.6E+06	1.3E+05
Until July 2019	4.6E+04	1.0E+06	1.4E+07	3.6E+06	1.3E+05
Until October 2019	4.6E+04	1.0E+06	1.4E+07	3.7E+06	1.3E+05
Until January 2020	4.7E+04	1.1E+06	1.4E+07	3.7E+06	1.3E+05
Until April 2020	4.7E+04	1.1E+06	1.4E+07	3.7E+06	1.4E+05
Until July 2020	4.7E+04	1.1E+06	1.4E+07	3.7E+06	1.4E+05
Until October 2020	4.7E+04	1.1E+06	1.4E+07	3.7E+06	1.4E+05
Until January 2021	4.8E+04	1.1E+06	1.4E+07	3.8E+06	1.4E+05
Until April 2021	4.8E+04	1.1E+06	1.4E+07	3.8E+06	1.4E+05
Until July 2021	4.8E+04	1.1E+06	1.5E+07	3.8E+06	1.4E+05
Until October 2021	4.8E+04	1.1E+06	1.5E+07	3.8E+06	1.4E+05
Until January 2022	4.8E+04	1.1E+06	1.5E+07	3.8E+06	1.4E+05

* Prepared by the Office of Workers Health Planning for Ionizing Radiation, Industrial Health Division, Industrial Safety and Health Department, Labour Standards Bureau, Ministry of Health, Labour and Welfare with the cooperation of the Japan Atomic Energy Agency

Attachment 6-2. Simplified procedures for measurement of radioactivity concentration of agricultural soil

1 (Abbreviated)

1), 2) (Abbreviated)

3) (Abbreviated)

(Example)

Radioactivity concentration of Cs in Andosols for a

Attachment 6-2. Simplified procedures for measurement of radioactivity concentration of agricultural soil

1 (Abbreviated)

1), 2) (Abbreviated)

3) (Abbreviated)

(Example)

Radioactivity concentration of Cs in Andosols for a

"rice paddy in other areas" when the average ambient dose rate is 0.2μSv/h (Estimation formula: C)[*2]

0.2 x 6,260 – 327 = 925Bq/kg (Estimated)

Table 1: Selection of estimation formula

Zone	Type of farmland	Type of soil	Formula	Factor X	Factor Y
Evacuation area	Non-decontaminated farmland		A	4,010	0
	Decontaminated farmland [*3]		B	3,590	0
Other areas	Rice paddy	Andosol	C	6,260	327
		Non-Andosol	D	5,040	148
	Agricultural field	Andosol	E	4,720	185
		Non-Andosol	F	3,960	135
	Orchard · Pasture		G	3,060	0

*1 Whether or not the soil of the farmland is an Andosol type can be checked using the soil distribution map on the webpage of the National Institute for Agro-Environmental Science (http://agrimesh.dc.affrc.go.jp/soil_db/).

*2 The conversion factors will change due to radioactivity decay with time. The estimation formula will be revised before the change becomes so large as not to be negligible.

*3 Farmland which has been deeply plowed or from which topsoil has been stripped.

Table 2: Correspondence between radioactive Cs concentration and averaged ambient dose rates in non-decontaminated farmland in the emergency evacuation areas.

Ambient Dose Rate (μSv/h)	Cs Concentration (Bq/kg)	Ambient Dose Rate (μSv/h)	Cs Concentration (Bq/kg)	Ambient Dose Rate (μSv/h)	Cs Concentration (Bq/kg)
0.1	401	1.1	4,411	2.1	8,421
0.2	802	1.2	4,812	2.2	8,822
0.3	1,203	1.3	5,213	2.3	9,223
0.4	1,604	1.4	5,614	2.4	9,624
0.5	2,005	1.5	6,015	2.5	10,025
0.6	2.406	1.6	6,416	2.6	10,426
0.7	2,807	1.7	6,817	2.7	10,827
0.8	3,208	1.8	7,218	2.8	11,228
0.9	3,609	1.9	7,619	2.9	11,629

"rice paddy in other areas" when the average ambient dose rate is 0.2μSv/h (Estimation formula: C)[*2]

0.2 x 7,800 – 321 = 1,239Bq/kg (Estimated)

Table 1: Selection of estimation formula[*3]

Zone	Type of farmland	Type of soil	Formula	Factor X	Factor Y
Evacuation area	Non-decontaminated farmland		A	5,370	0
	Decontaminated farmland [*4]		B	4,080	0
Other areas	Rice paddy	Andosol	C	7,800	321
		Non-Andosol	D	6,410	186
	Agricultural field	Andosol	E	5,830	184
		Non-Andosol	F	5,720	183
	Orchard · Pasture		G	3,490	0

*1 Whether or not the soil of the farmland is an Andosol type can be checked by using the soil distribution map in the "Japan Soil Inventory" on the webpage of the Institute for Agro-Environmental Science, National Agriculture and Food Research Organization [URL: http://soil-inventory.dc.affrc.go.jp/]

*2 The conversion factors will change due to radioactivity decay with time. The estimation formula will be revised before the change becomes too large to be negligible.

*3 Prepared by the Institute for Agro-Environmental Science, National Agriculture and Food Research Organization (January 2018)

*4 Farmlands which have been deeply plowed or whose topsoil has been stripped.

Table 2: Correspondence between radioactive Cs concentration and averaged ambient dose rates in non-decontaminated farmland in the emergency evacuation areas.*

Ambient Dose Rate (μSv/h)	Cs Concentration (Bq/kg)	Ambient Dose Rate (μSv/h)	Cs Concentration (Bq/kg)	Ambient Dose Rate (μSv/h)	Cs Concentration (Bq/kg)
0.1	537	1.1	5,907	2.1	11,277
0.2	1,074	1.2	6,444	2.2	11,814
0.3	1,611	1.3	6,981	2.3	12,351
0.4	2,148	1.4	7,518	2.4	12,888
0.5	2,685	1.5	8,055	2.5	13,425
0.6	3,222	1.6	8,592	2.6	13,962
0.7	3,759	1.7	9,129	2.7	14,499
0.8	4,296	1.8	9,666	2.8	15,036
0.9	4,833	1.9	10,203	2.9	15,573

1.0	4,010	2.0	8,020	3.0	12,030

1.0	5,370	2.0	10,740	3.0	16,110

* Prepared by the Institute for Agro-Environmental Science, National Agriculture and Food Research Organization (January 2018)

Attachment 6-3. Simplified measurement method for radioactivity concentration of forest soil, etc.

1 (Abbreviated)

1) (Abbreviated)

2) To estimate the radioactivity concentration of Cs in the forest soil, etc. (15cm in depth), substitute the measurement A (μSv/h) into the formula.*

(A (μSv/h) x 3.380) – 190 = Radioactivity concentration (total of Cs-134 and Cs-137) (Bq/kg)

Example
Radioactivity concentration of Cs when the average ambient dose rate is 2.5μSv/h

2.5 (μSv/h) x 3,380) – 190 = 8,260 ≈ 8,250Bq/kg (Estimated)

Lookup table for radioactive Cs concentrations in forest soil as a function of ambient dose rates

Ambient dose rate (μSv/h)	Cs concentration (Bq/kg)	Ambient dose rate (μSv/h)	Cs concentration (Bq / kg)	Ambient dose rate (μSv/h)	Cs concentration (Bq/kg)
0.1	150	1.1	3,500	2.1	6,900
0.2	500	1.2	3,900	2.2	7,250
0.3	800	1.3	4,200	2.3	7,600
0.4	1,200	1.4	4,550	2.4	7,900
0.5	1,500	1.5	4,900	2.5	8,250
0.6	1,800	1.6	5,200	2.6	8.600
0.7	2,200	1.7	5,550	2.7	8,950
0.8	2,500	1.8	5,900	2.8	9,250
0.9	2,850	1.9	6,250	2.9	9,600
1.0	3,200	2.0	6,550	3.0	9,950

Attachment 6-3. Simplified measurement method for radioactivity concentration of forest soil, etc.

1 (Abbreviated)

1) (Abbreviated)

2) To estimate the radioactivity concentration of Cs in the forest soil, etc. (15cm in depth), substitute the measurement A (μSv/h) into the formula. (*[1], *[2])

(A (μSv/h) x 10,580) – 590 = Radioactivity concentration (total of Cs-134 and Cs-137) (Bq/kg)

Example
The radioactivity concentration of Cs when the average ambient dose rate is 1.0μSv/h

1.0 (μSv/h) x 10,580) – 590 = 9,990Bq/kg (Estimated)

Lookup table for radioactive Cs concentrations in forest soil as a function of ambient dose rates*[3]

Average ambient dose rate (μSv/h)	Cs concentration (Bq/kg)	Average ambient dose rate (μSv/h)	Cs concentration (Bq / kg)	Average ambient dose rate (μSv/h)	Cs concentration (Bq/kg)
0.1	468	1.1	11,048	2.1	21,628
0.2	1,526	1.2	12,106	2.2	22,686
0.3	2,584	1.3	13,164	2.3	23,744
0.4	3,642	1.4	14,222	2.4	24,802
0.5	4,700	1.5	15,280	2.5	25,860
0.6	5,758	1.6	16,338		
0.7	6,816	1.7	17,396		
0.8	7,874	1.8	18,454		
0.9	8,932	1.9	19,512		
1.0	9,990	2.0	20,570		

*[1] Source: Dr. Shinji Kaneko, "Aging of Radioactive Cesium Amount and Air Dose Rate in Forest", *Abstracts of the Annual Meeting, Japanese Society of Soil Science and Plant Nutrition* No. 63 September 2017, P.15

*[2] The conversion factors will vary due to radioactivity

	decay over time. The estimation formula will be revised before the variation becomes too large to ignore. *3 Prepared by Forestry Labor Office, Forestry Management Improvement Division, Forest Policy Planning Department, Forestry Agency with the cooperation of Forest and Forest Products Research Institute, Forest Research and Management Organization (January 2018)

Guidelines on Prevention of Radiation Hazards for Workers Engaged in Works under a Designated Dose Rate Comparison Table

Old	New
Section 1 Objectives	Section 1 Objectives
The "Ordinance on Prevention of Ionizing Radiation Hazards Related to Operations for Decontamination of Soil and Wastes Contaminated by Radioactive Materials Resulting from the Great East Japan Earthquake and Related Works" (Ordinance of the Ministry of Health, Labour and Welfare No. 152 of 2011; hereinafter referred to as the "Ionizing Radiation Ordinance for Decontamination") was promulgated on December 22, 2011 and came into effect on January 1, 2012 for the prevention of radiation hazards to workers engaging in such operations as decontamination of soil, etc. or collection of wastes contaminated by radioactive materials generated by the accident at the Fukushima Daiichi Nuclear Power Plant of Tokyo Electric Power Company caused by the Great East Japan Earthquake on March 11, 2011. In addition, the "Guidelines on Prevention of Radiation Hazards to Workers Engaged in Decontamination Works" (Labour Standards Bureau Notification No. 1222-6 of December 22, 2011; hereinafter referred to as the "Guidelines on Decontamination Operations, etc.") were established together with the promulgation of said Ordinance.	The "Guidelines on Prevention of Radiation Hazards to Workers Engaged in Decontamination Works" (Labour Standards Bureau Notification No. 1222-6 of 22 December 2011; hereinafter referred to as the "Guidelines on Decontamination Works") are established for the purpose of preventing radiation-related health hazards to workers engaged in decontamination and related works of materials contaminated by radiation from the accident of Fukushima Daiichi Nuclear Power Plant of Tokyo Electric Power Company (TEPCO) caused by the Great East Japan Earthquake on 11 March 2011, in conjunction with the enforcement of "Ordinance on Prevention of Ionizing Radiation Hazards Related to Work for Decontamination of Soil and Wastes Contaminated by Radioactive Materials Resulting from the Great East Japan Earthquake and Related Works" (Ordinance of the Ministry of Health, Labour and Welfare No. 152 of 2011; hereinafter referred to as the "Ionizing Radiation Ordinance for Decontamination").
In association with the recent redefinition of the demarcation of evacuation areas, local infrastructure restoration work, manufacturing and other businesses, operations of hospitals, welfare facilities, etc., agriculture and forestry activities, intermediate processing of waste, maintenance and repair work, transportation services, etc. are expected to begin in sequence in the special decontamination areas provided for in Article 25, paragraph (1) of the "Act on Special Measures Concerning the Handling of Environmental Pollution by Radioactive Materials Discharged by the Nuclear Power Station Accident Associated with the Tohoku District Off the Pacific Ocean Earthquake That Occurred on March 11, 2011" (Act No. 110 of 2011; hereinafter referred to as the "Act on Special Measures Concerning the Handling of Radioactive Pollution") or in the intensive contamination survey areas provided for in Article 32, paragraph (1) of the same Act (hereinafter referred to as "special decontamination areas, etc."). Under this circumstance, it is necessary to take measures to prevent radiation hazards to workers engaging in these operations. In this regard, employers subjected to the application of the Ionizing Radiation Ordinance for Decontamination before amendment were defined as "employers who engage in	[Deleted]

such operations as decontamination of soil, etc. or collection of wastes" in special decontamination areas, etc., but other employers engaging in restoration and reconstruction works were excluded from the application of the Ionizing Radiation Ordinance for Decontamination. For this reason, the Ionizing Radiation Ordinance for Decontamination was partially amended to prescribe measures to appropriately protect workers from health hazards caused by radiation according to the types of restoration and reconstruction works, and will come into effect as of July 1, 2012.	
The purpose of these Guidelines is to comprehensively present matters provided for in the amended Ionizing Radiation Ordinance for Decontamination, as well as the matters an employer is obligated to perform and important matters among those provided for in the Industrial Safety and Health Act (Act No. 57 of 1972) and relevant laws and ordinances, in order to prevent radiation hazards more appropriately in restoration and reconstruction works in combination with the amended Ionizing Radiation Ordinance for Decontamination.	The purpose of these guidelines is to comprehensively present matters provided for in the Ionizing Radiation Ordinance for Decontamination, as well as actions an employer is obligated to carry out and important matters among those provided for in the Industrial Safety and Health Act (Act No. 57 of 1972) and relevant laws and ordinances, in order to prevent radiation hazards more appropriately in restoration and reconstruction works in combination with the Ionizing Radiation Ordinance for Decontamination.
(Abbreviated)	(Abbreviated)
Section 2 Application	Section 2 Application
These Guidelines shall apply to employers who engage in an operation other than operations for decontamination, etc. in places where the average air dose rate exceeds 2.5μSv/h due to radioactive materials released from the accident of the nuclear power plant (limited to radioactive materials provided for in Article 2, paragraph (2) of the Ordinance on Prevention of Ionizing Radiation Hazards (Ordinance of the Ministry of Labour No. 41 of 1972; hereinafter referred to as the "Ionizing Radiation Ordinance"); hereinafter referred to as "accident-derived radioactive materials") (hereinafter referred to as "operations under designated doses") in the special decontamination areas, etc. provided for in the Act on Special Measures Concerning the Handling of Radioactive Pollution (hereinafter referred to as "employers engaging in a business under designated doses"). The matters described below shall be considered when applying these Guidelines. (Abbreviated)	1 These guidelines shall apply to employers who engage in works other than the works for decontamination, etc. in places where the average air dose rate exceeds 2.5μSv/h (hereinafter referred to as "works under designated dose rates") due to radioactive materials released from the accident of the nuclear power plant (hereinafter referred to as "accident-derived radioactive materials") (provided for in Article 2, paragraph (2) of the Ordinance on Prevention of Ionizing Radiation Hazards (Ordinance of the Ministry of Labor No. 41 of 1972; hereinafter referred to as the "Ionizing Radiation Ordinance") in the special decontamination areas, etc. (hereinafter referred to as the "employers of workers under a designated dose rate"). The “special decontamination areas, etc.” mentioned in the preceding sentence (hereinafter referred to as "special decontamination areas, etc."; refer to Attachment 1) mean the special decontamination areas provided for in Article 25, paragraph (1) of the "Act on Special Measures Concerning the Handling of Environmental Pollution by Radioactive Materials Discharged by the Nuclear Power Station Accident Associated with the Tohoku District Off the Pacific Ocean Earthquake That Occurred on 11 March 2011" (Act No. 110 of 2011; hereinafter referred to as the "Act on Special Measures

	Concerning the Handling of Radioactive Pollution") or the intensive contamination survey areas provided for in Article 32, paragraph (1) of the same Act.
(1) (Abbreviated)	(1) (Abbreviated)
(2) Considerations for "operations under designated doses"	(2) Considerations for "operations under designated dose rates"
(a) Indoor work, such as manufacturing, shall not fall under operations under designated doses when the average air dose rate in the place of indoor work is 2.5μSv/h or below even if the outdoor average air dose exceeds 2.5μSv/h.	(a) Indoor works, such as manufacturing, shall not fall under operations under designated dose rates when the average air dose rate in the indoor workplace is 2.5μSv/h or below even if the outdoor average air dose rate exceeds 2.5μSv/h.
(b), (c) (Abbreviated)	(b), (c) (Abbreviated)
[New]	2 It is preferred that self-employed workers, individual proprietors and volunteers, etc. should perform necessary matters among those mentioned in Section 3 “Subjects and Methods of Radiation Exposure Dose Control”, Section 4 “Measures to Reduce Radiation Exposure” and Section 5 “Worker Education” and others.
Section 3 Subjects and Methods of Radiation Exposure Dose Control	Section 3 Subjects and Methods of Radiation Exposure Dose Control
1. Basic principles	1. Basic principles
(1) (Abbreviated)	(1) (Abbreviated)
(2) (Abbreviated)	(2) (Abbreviated)
(a), (b) (Abbreviated)	(a), (b) (Abbreviated)
(c) In light of the principles of justification and considering the fact that radiation exposure doses tend to increase in proportion to working hours and that the urgency of work in a manufacturing or commercial business, etc. is not necessarily high, an employer engaging in such a business shall be required to take measures, such as decontamination, in and around workplaces in advance to minimize doses and, in principle, enable workers to work under an air dose rate that does not require radiation exposure dose control (2.5μSv/h or below). (Abbreviated)	(c) In light of the principles of justification and considering the fact that radiation exposure doses tend to increase in proportion to working hours and that the urgency of work in manufacturing or commercial businesses, etc. is not necessarily high, an employer engaged in such a business shall be required to take measures, such as decontamination, in and around the workplace in advance to minimize doses and, in principle, enable these workers to work under an average air dose rate that does not require radiation exposure dose control (2.5μSv/h or below). (Abbreviated)
2 (Abbreviated)	2 (Abbreviated)
3 Radiation exposure dose limits	3 Radiation exposure dose limits
(1), (2), (3) (Abbreviated)	(1), (2), (3) (Abbreviated)
(4) To properly control the radiation exposure doses of	(4) To properly control the radiation exposure doses of

workers engaging in operations under designated doses in multiple different places of businesses, the initial date of the period of "five years" prescribed in (1) (a) above should be January 1, 2012 uniformly for all relevant places of businesses performing operations under designated doses, and the exposure dose should be controlled during the period "from January 1, 2012 to December 31, 2016". This rule also applies to employers who started or will start a new operation under designated doses as a business between January 1, 2012 and December 31, 2016. In this case, the number of years from the day the business commenced till December 31, 2016, multiplied by 20mSv is deemed as the exposure dose limit until December 31, 2016, and relevant regulations should apply accordingly. The time period of "one year" prescribed in (1) (a) above means the one-year period commencing on the initial day of "five years" and the period shall be "from January 1, to December 31, 2012".	workers engaged in works under designated dose rates in multiple different workplaces, the period of "five years" prescribed in (1) (a) above should be quinquennial periods of which the first period commences on 1 January 2012 uniformly for all workplaces where works under designated dose rates are performed. The same shall apply to employers that newly start works under designated doses as their businesses during any of the quinquennial periods. In such cases, the value of 20mSv multiplied by the number of years from the commencement date of the works till the end of the corresponding quinquennial period shall be deemed as the exposure dose limit for the period by the end of such a quinquennial period and shall be used for application of relevant regulations. The time period of "one year" prescribed in (1) (a) above shall mean each one-year period in five years commencing on the initial day of the "five years".
(5) When the dose received from January 1, 2012 until June 30, 2012 is ascertained, radiation exposure control shall be performed by adding the dose to the exposure dose from July 1, 2012.	(5) When the dose received from 1 January 2012 until 30 June 2012 is ascertained, radiation exposure control shall be performed by adding such value of dose to the exposure dose on or after 1 July 2012.
(6) (Abbreviated)	(6) (Abbreviated)
(7) Notwithstanding the provisions of (3) and (4), an employer who primarily engages in radiation work may perform radiation exposure dose control from another timing of the start that is uniformly applied in the employer's place of business.	(7) Notwithstanding the provisions of (4) and (5), an employer who primarily engages in radiation works may commence radiation exposure dose control from a different timing that is uniformly applied in the workplaces for all employers.
(8) An employer engaging in a business under designated doses shall inform workers engaging in operations under designated doses of the start of timing prescribed in (4) and (5).	(8) An employer engaging in a business under designated doses shall inform those workers engaging in operations under designated dose rates of the start of timing for exposure dose control.
4 Records, etc. of measurement results of doses	4 Records, etc. of measurement results of doses
(1) An employer engaging in a business under designated doses shall calculate the radiation exposure doses of the workers engaging in operations under designated doses listed in the following items based on the measurement or calculation results referred to in 2 above, record the calculated results, and store the records for 30 years. This provision shall also apply to investigation records referred to in 3 (3). However, this provision does not apply in the case where the employer hands over said records to the organization designated by the Minister of Health, Labour and Welfare after these records are stored	(1) An employer engaging in a business under designated dose rates shall calculate the radiation exposure doses of the workers engaging in operations under designated dose rates listed in the following items based on the measurement or calculation results referred to in 2 above, record the calculated results, and keep the records for 30 years. This provision shall also apply to investigation records referred to in 3 (3). However, this provision shall not be applicable in the case where the employer transfers the said records to the organization designated by the Minister of Health, Labour and Welfare (Radiation Effects Association,

for five years or after said workers engaging in operations under designated doses are terminated. Form 1 is available as an example of the recording form for such a case.	a public interest incorporated foundation) after these records have been kept for five years or after the workers recorded therein have terminated work under the designated dose rates. Form 1 is available as an example of the recording form for such a case.
(2) (Abbreviated)	(2) (Abbreviated)
(3) When an employer engaging in a business under designated doses intends to terminate its business, the employer shall hand over the records referred to in (1) to the organization designated by the Minister of Health, Labour and Welfare.	(3) When an employer of decontamination related workers engaged in work under the designated dose rates intends to discontinue business, the employer shall transfer the records referred to in (1) to the organization designated by the Minister of Health, Labour and Welfare (Radiation Effects Association, a public interest incorporated foundation).
(4), (5) (Abbreviated)	(4), (5) (Abbreviated)
Section 4 Measures to Reduce Radiation Exposure	Section 4 Measures to Reduce Radiation Exposure
1 Preliminary survey, etc.	1 Prior evaluation, etc.
(1) (Abbreviated)	(1) (Abbreviated)
(2) The method for measuring and evaluating the average air dose rate shall conform to Attachment 2. A preliminary survey is performed with the aim of determining whether the average air dose rate exceeds 2.5μSv/h and radiation exposure dose control is required, and thus, if an employer determines that the average air dose rate is higher than 2.5μSv/h in the workplace in consideration of the results of airborne monitoring, etc. published by the Ministry of Education, Culture, Sports, Science and Technology, the results of airborne monitoring, etc. in individual workplaces may be used in place of measurement of the average air dose rate. In addition, it is not intended that the measurement is required even if the average air dose rate in the place of the work is far below 2.5μSv/h and it can be clearly determined that the work does not fall under operations under designated doses.	(2) The method for measuring and evaluating the average air dose rate shall conform to Attachment 2. A prior evaluation is performed to determine whether the average air dose rate exceeds 2.5μSv/h to require radiation exposure dose control. Therefore, if the employer determines that the average air dose rate is higher than 2.5μSv/h in the workplace in consideration of the results of the airborne monitoring survey, etc. published by the Nuclear Regulation Authority, the results of the airborne monitoring survey, etc. in an individual workplace may be used in place of measurement of the average air dose rate. In addition, it is not intended that the measurement is required even if the average air dose rate in the workplace is far below 2.5μSv/h and it can be clearly determined that the work does not fall under works under designated doses.
(3) (Abbreviated)	(3) (Abbreviated)
2 (Abbreviated)	2 (Abbreviated)
Section 5 Worker Education	Section 5 Education <u>for</u> Workers
1, 2 (Abbreviated)	1, 2 (Abbreviated)
Section 6 Healthcare Measures	Section 6 Healthcare Measures

1 Medical examinations	1 Medical examinations
(1) (Abbreviated)	(1) (Abbreviated)
(2) With regard to workers who were examined for the items listed in (f) to (i) and (k) in the preceding medical examination (limited to regular medical examinations), all or some of the said items may be omitted if the physician considers them unnecessary The items listed in (c) and (d) may also be omitted if the physician considers them unnecessary based on the criteria set by the Minister of Health, Labour and Welfare.	(2) With regard to workers who were examined for items listed in (f) through (i) and (k) of the above (1) at the preceding medical examination (limited to regular medical examinations), all or some of the said items may be omitted if the occupational physician considers them unnecessary. (3) Items (c), (d), (f) through (i) and (k) of the above (1) may be omitted if the occupational physician considers them unnecessary based on the criteria set by the Minister of Health, Labour and Welfare.
[New]	(4) The hearing test of item (c) of the above (1) (limited to tests conducted during regular medical examinations) may be substituted by hearing tests (excluding tests for hearing ability for 1000Hz and 4000Hz sounds), which the occupational physician considers appropriate, for workers who were examined for the said item during the preceding medical examination, or who are younger than 45 years (except those aged 35 and 40 years old).
(3) An employer engaging in a business under designated doses shall prepare medical examination personal cards based on the results of the medical examinations set forth in (1) and store them for five years.	(5) An employer engaging in a business under designated doses shall prepare individual medical examination cards based on the results of the medical examinations set forth in (1) and keep them for five years.
2 (Abbreviated)	2 (Abbreviated)
Section 7 Safety and Health Control System	Section 7 Safety and Health Control System
1, 2 (Abbreviated)	1, 2 (Abbreviated)
3 Measures, etc. to maintain and promote the health of emergency workers at the Fukushima Daiichi Nuclear Power Plant of Tokyo Electric Power Company	3 Measures, etc. to maintain and promote the health of emergency workers at the Fukushima Daiichi Nuclear Power Plant of Tokyo Electric Power Company
(1) to submit a "Control Implementation Status Report on Dose, etc. of Designated Emergency Workers, etc." (Form 3 of the Ionizing Radiation Ordinance) to the Minister of the Health, Labour and Welfare (c/o Industrial Health Division of the Ministry of Health, Labour and Welfare) on the last day of every three months based on Article 59-2 of the Ionizing Radiation Ordinance;	(1) to submit a "Control Implementation Status Report on Dose, etc. of Designated Emergency Workers, etc." (Form 3 of the Ionizing Radiation Ordinance) to the Minister of the Health, Labour and Welfare (c/o Office of Workers Health Planning for Ionizing Radiation, Industrial Health Division, Industrial Safety and Health Department of the Labour Standards Bureau, Ministry of Health, Labour and Welfare) on the last day of every three months based on Article 59-2 of the Ionizing Radiation

(2) (Abbreviated)	Ordinance. This report shall be submitted, in principle, in an electromagnetic form as CSV file format. (2) (Abbreviated)

Attachment 1 List of special decontamination areas, etc.

1 Special decontamination areas

• Subject of designation

Restricted areas or planned evacuation areas, etc.

	Number of municipalities	Designated areas
Fukushima Prefecture	11	All areas in Naraha Town, Tomioka Town, Okuma Town, Futaba Town, Namie Town, Katsurao Village, and Iitate Village; restricted areas or planned evacuation areas in Tamura City, Minamisoma City, Kawamata Town, and Kawauchi Village

2 Intensive contamination survey areas

• Subject of designation

Areas where the radiation dose is 0.23 mSv/h or above

	Number of municipalities	Designated areas
Iwate Prefecture	3	(Abbreviated)
Miyagi Prefecture	8	All areas in Shiroishi City, Kakuda City, Kurihara City, Shichikashuku Town, Ogawara Town, Marumori Town, Yamamoto Town and Watari Town
Fukushima Prefecture	40	All areas in Fukushima City, Koriyama City, Iwaki City, Shirakawa City, Sukagawa City, Soma City, Nihonmatsu City, Date City, Motomiya City, Koori Town, Kunimi Town, Otama Village, Kagamiishi Town, Tenei Village, Aizubange Town, Yugawa Village, Mishima Town, Aizumisato Town, Nishigo Village, Izumizaki Village, Nakajima Village, Yabuki Town, Tanagura Town, Yamatsuri Town, Hanawa Town, Samegawa Village, Ishikawa Town, Tamakawa Village, Hirata Village, Asakawa Town, Furudono Town, Miharu Town, Ono Town, Hirono Town, Shinchi Town and Yanaizu Town; and areas excluding restricted areas or planned evacuation areas in Tamura City, Minamisoma City, Kawamata Town, and Kawauchi Village
Ibaraki Prefecture	20	All areas in Hitachi City, Tsuchiura City, Ryugasaki City, Joso City, Hitachiota City, Takahagi City, Kitaibaraki City, Toride City, Ushiku City, Tsukuba City, Hitachinaka City, Kashima City, Moriya City, Inashiki City, Hokota City, Tsukubamirai City, Tokai Village, Miho Village, Ami Town, and Tone Town
Tochigi Prefecture	8	All areas in Sano City, Kanuma City, Nikko City, Ohtawara City, Yaita City, Nasushiobara City, Shioya Town, and Nasu Town

Attachment 1 List of special decontamination areas, etc.

1 Special decontamination areas

• Subject of designation

Restricted areas or planned evacuation areas, etc.

	Number of municipalities	Designated areas
Fukushima Prefecture	11	Naraha-town, Tomioka-town, Okuma-town, Futaba-town, Namie-town, Katsurao-village, Iitate-village. And areas that used to be designated as restricted areas or planned evacuation areas in Tamura-city, Minamisoma-city, Kawamata-town and Kawauchi-village.

2 Intensive contamination survey areas

• Subject of designation

Areas, etc. for which the radiation dose is 0.23μSv/h or more

	Number of municipalities	Designated areas
Iwate Prefecture	3	(Abbreviated)
Miyagi Prefecture	8	All areas in Shiroishi-city, Kakuda-city, Kurihara-city, Shichikashuku-town, Ogawara-town, Marumori-town, Watari-town and Yamamoto-town
Fukushima Prefecture	36	All areas in Fukushima-city, Koriyama-city, Iwaki-city, Shirakawa-city, Sukagawa-city, Soma-city, Nihonmatsu-city, Date-city, Motomiya-city, Koori-town, Kunimi-town, Ohtama-village, Kagamiishi-town, Ten-ei-village, Aizubange-town, Yugawa-village, Aizumisato-town, Nishigo-village, Izumizaki-village, Nakajima-village, Yabuki-town, Tanagura-town, Samegawa-village, Ishikawa-town, Tamakawa-village, Hirata-village, Asakawa-town, Furudono-town, Miharu-town, Ono-town, Hirono-town and Shinchi-town, and areas other than those that used to be designated as restricted areas and planned evacuation areas in Tamura-city, Minamisoma-city, Kawamata-town and Kawauchi-village
Ibaraki Prefecture	19	All areas in Hitachi-city, Tsuchiura-city, Ryugasaki-city, Josho-city, Hitachiohta-city, Takahagi-city, Kitaibaraki-city, Toride-city, Ushiku-city, Tsukuba-city, Hitachinaka-city, Kashima-city, Moriya-city, Inashiki-city, Tsukubamirai-city, Tokai-village, Miho-village, Ami-town and Tone-town
Tochigi Prefecture	7	All areas in Kanuma-city, Nikko-city, Otawara-city, Yaita -city, Nasushiobara-city, Shioya-town and Nasu-town
Gunma	8	All areas in Kiryu-city, Numata-city, Shibukawa-

Gunma Prefecture	10	All areas in Kiryu City, Numata City, Shibukawa City, Annaka City, Midori City, Shimonita Town, Nakanojo Town, Takayama Village, Higashiagatsuma Town, and Kawaba Village
Saitama Prefecture	2	(Abbreviated)
Chiba Prefecture	9	(Abbreviated)
Total	100	

Prefecture		city, Midori-city, Shimonita-town, Takayama-village, Higasiagatsuma-town and Kawaba-village
Saitama Prefecture	2	All areas in Misato-city and Yoshikawa-city
Chiba Prefecture	9	All areas in Matsudo-city, Noda-city, Sakura-city, Kashiwa-city, Nagareyama-city, Abiko-city, Kamagaya-city Inzai-city and Shirai-city
Total	92	

* Prepared by Division of Environmental Restoration, Environmental Restoration and Resources Recycling Bureau, Ministry of the Environment（January 2018）

Attachment 2 Methods for Measuring and Evaluating Average Air Dose Rates

1 (Abbreviated)

2 Basic concept

(1)-(3) (Abbreviated)

(4) It is not intended that measurement before starting work is required even if the employer can determine that the average air dose rate in the subject workplace is far below 2.5μSv/h and the work performed there does not fall under operations under designated doses, based on the air dose rates officially announced by the Ministry of Education, Culture, Sports, Science and Technology, the nature of the work, etc.

3 (Abbreviated)

Attachment 2 Methods for Measuring and Evaluating Average Air Dose Rates

1 (Abbreviated)

2 Basic concepts

(1)-(3) (Abbreviated)

(4) It is not intended that measurement before starting work is required even if the employer can determine that the average air dose rate in the subject workplace is far below 2.5μSv/h and the work performed there does not fall under operations under designated doses, based on the air dose rates officially announced by the Nuclear Regulation Authority.

3 (Abbreviated)

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

Old	New
Section 1 Objectives With the progress in decontamination, full-scale works regarding disposal of waste and soil contaminated with radioactive materials discharged by the accident of TEPCO Fukushima Daiichi Nuclear Power Plant associated with the Great East Japan Earthquake on 11 March 2011 (hereinafter the waste and soil are referred to as “accident-derived waste” and the radioactive material is referred to as “radioactive materials discharged by the accident”) are expected to be undertaken. Under such circumstances, there is an increased need for measures to protect workers engaged in those works from radiation hazards. Therefore, in light of the characteristics of the works, the Ordinance on Prevention of Ionizing Radiation Hazards (Ministry of Labour Ordinance No. 41, 1972, hereinafter referred to as "Ionizing Radiation Ordinance") will be revised in order to define necessary actions to protect workers from radiation hazards. The revised ordinance will come into effect on 1 July 2013 except some provisions. Together with the revised Ionizing Radiation Ordinance, in a proper effort to help further promote the measures for the prevention of radiation hazards during the accident-derived waste disposal, these guidelines aim at collectively providing the essence of the actions that employer should take and the provisions specified in the Industrial Safety and Health Act (Act No. 57, 1972) and other relevant laws and regulations, in addition to the provisions specified by the revised Ionizing Radiation Ordinance. (Abbreviated)	Section 1 Objectives These guidelines are established for the purpose of preventing radiation-related health hazards to workers engaged in disposal of objects contaminated with radioactive materials discharged by the accident of the Fukushima Daiichi Nuclear Power Plant of Tokyo Electric Power Company (hereinafter the objects are referred to as the “accident-derived waste” and the radioactive materials are referred to as the “radioactive materials discharged by the accident”) associated with the Great East Japan Earthquake on 11 March 2011 in conjunction with the Ordinance on Prevention of Ionizing Radiation Hazards (Ministry of Labour Ordinance No. 41, 1972, hereinafter referred to as the "Ionizing Radiation Ordinance") which stipulates provisions for the disposal of accident-derived waste. Aiming to facilitate precise implementation of preventive measures for radiation hazards during works for the accident-derived waste disposal, these guidelines together with the Ionizing Radiation Ordinance are intended to describe important matters among the following in an integrated manner: • actions which an employer is obligated to carry out, • matters which are stipulated in the Industrial Safety and Health Act (Act No. 57, 1972) and other applicable laws and regulations, and • in addition to the above, matters which are stipulated in the Ionizing Radiation Ordinance. (Abbreviated)
Section 2 Scope 1 Scope (1) (Abbreviated) (a), (b) (Abbreviated) (c) In addition to those listed in (a) and (b), any other objects whose quantities or concentration of radioisotopes, except radioactive cesium, is larger than the values specified in Article 2, paragraph 2, of the Ionizing Radiation Ordinance due to concentration through processes toward disposal. 2 Relation to the Ionizing Radiation Ordinance for Decontamination	Section 2 Scope 1 Scope (1) (Abbreviated) (a), (b) (Abbreviated) (c) In addition to those listed in (a) and (b), any other objects whose quantity or concentration of radioisotopes other than radioactive cesium is larger than the values specified in Article 2, paragraph 2, of the Ionizing Radiation Ordinance due to concentration, etc. through processes toward disposal. 2 Relation to the Ionizing Radiation Ordinance for Decontamination

(1) (Abbreviated) (2) The Ionizing Radiation Ordinance for Decontamination and the guidelines on decontamination works (hereinafter referred to as "the Ionizing Radiation Ordinance for Decontamination") cover certain works in special decontamination areas specified in Article 25, paragraph 1, of the " Act on Special Measures Concerning the Handling of Environmental Pollution by Radioactive Materials Discharged by the Nuclear Power Station Accident Associated with the Tohoku District of the Pacific Ocean Earthquake That Occurred on 11 March 2011" (Act No.110, 2013) or intensive contamination survey areas specified in Article 32, paragraph 1, of the same act (hereinafter referred to as "special decontamination areas, etc.") where radiation sources cannot be controlled (i.e., current exposure situation). These guidelines should be for works involving the disposal of accident-derived waste, etc. that can be handled as a controlled radiation source, and when exposure from the source is dominant (i.e., a planned exposure situation). (Abbreviated)	(1) (Abbreviated) (2) The Ionizing Radiation Ordinance for Decontamination and the guidelines on decontamination works (hereinafter referred to as the "Ionizing Radiation Ordinance for Decontamination, etc.") cover certain works in special decontamination areas specified in Article 25, paragraph 1, of the “Act on Special Measures Concerning the Handling of Environmental Pollution by Radioactive Materials Discharged by the Nuclear Power Station Accident Associated with the Tohoku District of the Pacific Ocean Earthquake That Occurred on 11 March 2011" (Act No.110, 2011) or intensive contamination survey areas specified in Article 32, paragraph 1, of the same act (hereinafter referred to as the "special decontamination areas, etc.") where radiation sources cannot be controlled (i.e., existing exposure situation). These guidelines should be for works involving the disposal of accident-derived waste, etc. that can be handled as a controlled radiation source, and when exposure from the source is dominant (i.e., a planned exposure situation). (Abbreviated)
Section 3 Methodology for setting radiation controlled areas and radiation dose control	Section 3 Methodology for setting radiation controlled areas and radiation dose control
1 General Principles	1 General principles
2 Clear indication of radiation controlled areas (1), (2) (Abbreviated) (3) (Abbreviated) (a), (b) (Abbreviated) (c) Details for specifying radiation controlled areas should be subject to the provision in Article 3 of the Ionizing Radiation Ordinance and the Labour Standards Bureau Notification No.253, as of 30 March 2001.	2 Clear indication of radiation controlled areas (1), (2) (Abbreviated) (3) (Abbreviated) (a), (b) (Abbreviated) (c) Details for specifying radiation controlled areas should be subject to the provisions in Article 3 of the Ionizing Radiation Ordinance and the “Enforcement, etc. of Ordinance for Partial Revision of the Industrial Safety and Health Act and the Ordinance on Prevention of Ionizing Radiation Hazards” (the Labour Standards Bureau Notification No.253, as of 30 March 2001, hereinafter referred to as the “Labour Standards Bureau Notification No.253 Circular Notice”).
3 Measurement of radiation exposure doses (1), (2) (Abbreviated)	3 Measurement of radiation exposure doses (1), (2) (Abbreviated)

(3) (Abbreviated) (a) (Abbreviated) (b) The method for measuring internal exposure dose should be subject to the provisions in Article 2 of "the Limit and Method Determined by Minister of Health, Labour and Welfare, pursuant to the regulations including Article 3, paragraph 3, of the Ordinance on Prevention of Ionizing Radiation Hazards (Notification of Ministry of Labour No.93, 1988, hereinafter referred to as "the measurement notification".) (4) (Abbreviated)	(3) (Abbreviated) (a) (Abbreviated) (b) The method for calculating internal exposure dose should be subject to the provisions in Article 2 of the "Limit and Method Determined by Minister of Health, Labour and Welfare, pursuant to the regulations including Article 3, paragraph 3, of the Ordinance on Prevention of Ionizing Radiation Hazards (Notification of Ministry of Labour No.93, 1988, hereinafter referred to as the "measurement notification"). (4) (Abbreviated)
4, 5 (Abbreviated)	4, 5 (Abbreviated)
Section 4 Dose limits at facilities	Section 4 Dose limits at facilities
1-3 (Abbreviated)	1-3 (Abbreviated)
4 Measurement of working environment (1)-(3) (Abbreviated) (4) (Abbreviated) (a) Dose equivalent rate or dose equivalent in radiation controlled areas should be measured by using the methods specified in Articles 7 and 8 of the Working Environment Measurement Standards (Notification of Ministry of Labour No.46, 1976) and Labour Standards Bureau Notification No.253, as of 30 March 2001. (b) (Abbreviated)	4 Measurement of working environment (1)-(3) (Abbreviated) (4) (Abbreviated) (a) Dose equivalent rate or dose equivalent in radiation controlled areas should be measured by using the methods specified in Articles 7 and 8 of the Working Environment Measurement Standards (Notification of Ministry of Labour No.46, 1976) and Labour Standards Bureau Notification No.253 Circular Notice. (b) (Abbreviated)
Section 5 (Abbreviated)	Section 5 (Abbreviated)
Section 6 Measures for preventing contamination	Section 6 Measures for preventing contamination
1-3 (Abbreviated)	1-3 (Abbreviated)
4 Protective equipment (1) (Abbreviated) (2) Protective clothing (a) The disposal operator should prepare effective protective clothing, gloves, or shoes to be used by workers engaged in the works that may exceed one-tenth (4Bq/cm^2) of the surface contamination	4 Protective equipment (1) (Abbreviated) (2) Protective clothing (a) For the prevention of contamination, the disposal operators should prepare effective protective clothing, gloves, or shoes to be used by their workers engaged in the works that may handle

limit. (b) The disposal operator should provide effective protective clothing, gloves, or shoes to workers handling accident-derived waste who may be exposed to splashing or flying powder that come from such waste. (c)-(f) (Abbreviated) (3), (4) (Abbreviated) 5 (Abbreviated) Section 7-10 (Abbreviated) Section 11 Exemption for special decontamination areas, etc. 1 Exemption in case of constructing disposal sites in special decontamination areas, etc. (1) (Abbreviated) (2) (Abbreviated) (a), (b) (Abbreviated) (c) 40Bq/cm^2 may be defined as the equivalent to a count of 13,000 per minute from GM Counters. If measuring the contamination is difficult due to high ambient dose rate in the surrounding area, the contamination measurement area should be built at a place where ambient dose rate is sufficiently low. 2 (Abbreviated)	such objects exceeding one-tenth (4Bq/cm^2) of the surface contamination limit. (b) The disposal operators should provide effective protective clothing, gloves, or shoes, which effectively prevent contamination, to their workers handling accident-derived waste who may be exposed to splashing or flying powder that comes from such waste. (c)-(f) (Abbreviated) (3), (4) (Abbreviated) 5 (Abbreviated) Section 7-10 (Abbreviated) Section 11 Exemption for special decontamination areas, etc. 1 Exemption in case of constructing disposal sites in special decontamination areas, etc. (refer to Attachment 4) (1) (Abbreviated) (2) (Abbreviated) (a), (b) (Abbreviated) (c) The contamination density of 40Bq/cm^2 may be defined as the equivalent to a count value of 13,000cpm from GM counters. If measuring the contamination is difficult due to high ambient dose rates in the surrounding area, the contamination measurement area should be set at a place where the ambient dose rate is sufficiently low. 2 (Abbreviated)
Attachment 1-1. Simplified measurement procedures of radioactivity concentration 1, 2 (Abbreviated) Table 1 Values of the factor X listed by the measurement date and container types	Attachment 1-1. Simplified measurement procedures of radioactivity concentration 1, 2 (Abbreviated) Table 1 Values of the factor X listed by the measurement date and container types*

Measurement date	Values of the factor X				
	V5 containers	Sandbag	Flexible containers	200 L drum cans	2 L polyethylene bottles
Until October 2014	3.7E+04	8.3E+0E	1.1E+07	2.9E+06	1.1E+05
Until January 2015	3.8E+04	8.5E+05	1.1E+07	2.9E+06	1.1E+05

Measurement date	Values of the factor X				
	V5 containers	Sandbags	Flexible containers	200 L drum cans	2 L polyethylene bottles
Until January 2018	4.4E+04	9.9E+05	1.3E+0	3.5E+06	1.3E+05
Until April 2018	4.4E+04	1.0E+06	1.3E+07	3.5E+06	1.3E+05

Until April 2015	3.8E+04	8.6E+05	1.1E+07	3.0E+06	1.1E+05
Until July 2015	3.9E+04	8.8E+05	1.2E+07	3.0E+06	1.1E+05
Until October 2015	3.9E+04	8.9E+05	1.2E+07	3.1E+06	1.1E+05
Until January 2016	4.0E+04	9.0E+05	1.2E+07	3.1E+06	1.2E+05
Until April 2016	4.0E+04	9.1E+05	1.2E+07	3.2E+06	1.2E+05
Until July 2016	4.1E+04	9.3E+05	1.2E+07	3.2E+06	1.2E+05
Until October 2016	4.2E+04	9.4E+05	1.2E+07	3.3E+06	1.2E+05
Until January 2017	4.2E+04	9.5E+05	1.3E+07	3.3E+06	1.2E+05
Until April 2017	4.3E+04	9.6E+05	1.3E+07	3.3E+06	1.2E+05
Until July 2017	4.3E+04	9.7E+05	1.3E+07	3.4E+06	1.2E+05
Until October 2017	4.3E+04	9.8E+05	1.3E+07	3.4E+06	1.3E+05
Until January 2018	4.4E+04	9.9E+05	1.3E+07	3.5E+06	1.3E+05
Until July 2018	4.5E+04	1.0E+06	1.3E+07	3.5E+06	1.3E+05
Until October 2018	4.5E+04	1.0E+06	1.4E+07	3.5E+06	1.3E+05
Until January 2019	4.5E+04	1.0E+06	1.4E+07	3.6E+06	1.3E+05
Until April 2019	4.6E+04	1.0E+06	1.4E+07	3.6E+06	1.3E+05
Until July 2019	4.6E+04	1.0E+06	1.4E+07	3.6E+06	1.3E+05
Until October 2019	4.6E+04	1.0E+06	1.4E+07	3.7E+06	1.3E+05
Until January 2020	4.7E+04	1.1E+06	1.4E+07	3.7E+06	1.3E+05
Until April 2020	4.7E+04	1.1E+06	1.4E+07	3.7E+06	1.4E+05
Until July 2020	4.7E+04	1.1E+06	1.4E+07	3.7E+06	1.4E+05
Until October 2020	4.7E+04	1.1E+06	1.4E+07	3.7E+06	1.4E+05
Until January 2021	4.8E+04	1.1E+06	1.4E+07	3.8E+06	1.4E+05
Until April 2021	4.8E+04	1.1E+06	1.4E+07	3.8E+06	1.4E+05
Until July 2021	4.8E+04	1.1E+06	1.5E+07	3.8E+06	1.4E+05
Until October 2021	4.8E+04	1.1E+06	1.5E+07	3.8E+06	1.4E+05
Until January 2022	4.8E+04	1.1E+06	1.5E+07	3.8E+06	1.4E+05

* Prepared by the Office of Workers Health Planning for Ionizing Radiation, Industrial Health Division, Industrial Safety and Health Department, Labour Standards Bureau, Ministry of Health, Labour and Welfare with the cooperation of Japan Atomic Energy Agency

[New]

Attachment 4 List of Special Decontamination Areas, etc.

1 Special Decontamination Areas

- Applicable Areas

Areas, etc. included in former restricted areas and planned evacuation areas

	Number of Municipalities	Designated Zone
Fukushima Prefecture	11	Naraha-town, Tomioka-town, Ohkuma-town, Futaba-town, Namie-town, Katsurao-village, Iitate-village. And areas that used to be designated as restricted and planned evacuation areas in Tamura-city, Minamisoma-city, Kawamata-town and Kawauchi-village

2 Special Decontamination Areas

- Applicable Areas

Areas, etc. for which radiation dose is 0.23μSv/h or more

	Number of Municipalities	Designated Area
Iwate Prefecture	3	All areas in Ichinoseki-city, Ohshu-city and Hiraizumi-town
Miyagi Prefecture	8	All areas in Shiroishi-city, Kakuda-city, Kurihara-city, Shichikashuku-town, Ohgawara-town, Marumori-town, Watari-town and Yamamoto-town
Fukushima Prefecture	36	All areas in Fukushima-city, Koriyama-city, Iwaki-city, Shirakawa-city, Sukagawa-city, Soma-city, Nihonmatsu-city, Date-city, Motomiya-city, Koori-town, Kunimi-town, Ohtama-village, Kagamiishi-town, Ten-ei-village, Aizubange-town, Yugawa-village, Aizumisato-town, Nishigo-village, Izumizaki-village, Nakajima-village, Yabuki-town, Tanagura-town, Samegawa-village, Ishikawa-town, Tamakawa-village, Hirata-village, Asakawa-town, Furudono-town, Miharu-town, Ono-town, Hirono-town and Shinchi-town, and areas other than those that used to be designated as restricted areas or planned evacuation areas in Tamura-city, Minamisoma-city, Kawamata-town and Kawauchi-village
Ibaraki Prefecture	19	All areas in Hitachi-city, Tsuchiura-city, Ryugasaki-city, Josho-city, Hitachiohta-city, Takahagi-city, Kitaibaraki-city, Toride-city, Ushiku-city, Tsukuba-city, Hitachinaka-city, Kashima-city, Moriya-city, Inashiki-city, Tsukubamirai-city, Tokai-village, Miho-village, Ami-town and Tone-town
Tochigi Prefecture	7	All areas in Kanuma-city, Nikko-city, Otawara-city, Yaita -city, Nasushiobara-city, Shioya-town and Nasu-town
Gunma Prefecture	8	All areas in Kiryu-city, Numata-city, Shibukawa-city, Midori-city, Shimonita-town, Takayama-village, Higasiagatsuma-town and Kawaba-village
Saitama Prefecture	2	All areas in Misato-city and Yoshikawa-city
Chiba Prefecture	9	All areas in Matsudo-city, Noda-city, Sakura-city, Kashiwa-city, Nagareyama-city, Abiko-city, Kamagaya-city Inzai-city and Shirai-city
Total	92	

* Prepared by the Division of Environmental Restoration, Environmental Restoration and Resources Recycling Bureau, Ministry of the Environment (January 2018)