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

(Labour Standards Bureau Notification No. 0615-6, 15 June 2012)

(Revision: Labour Standards Bureau Notification No.1226-21, 26 December 2013)

(Revised parts from the previous version are underlined)

Section 1 Purpose

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" (MHLW 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 in order to protect the workers engaged in decontamination of the soil and collection of waste that are contaminated with radioactive materials generated from the accident at the Tokyo Electric Power Company Fukushima Daiichi Nuclear Power Plant caused by the Great East Japan Earthquake on 11 March 2011. In addition, the "Guidelines on Prevention of Radioactive Hazards for Workers Engaged in Decontamination Work" was established (Labour Standards Bureau Notification No. 1222-6 of 22 December 2011, hereinafter referred to as "Guidelines on Decontamination Works").

Associated with the changes to the demarcation of evacuation areas, restoration of local infrastructure, manufacturing, hospitals/welfare facilities operations, agriculture and forestry work, intermediate processing of waste, repairs and maintenance work, transportation work, and other types of work are expected to commence at special decontamination areas specified pursuant to the provision of Paragraph 1, Article 25 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 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 Paragraph 1, Article 32 of the Act (hereinafter referred to as "special decontamination areas, etc."). Therefore, it has become necessary to implement measures for protecting high risk workers who will be engaged in decontamination and other related operations from radiation hazards.

Concerning the aforementioned issues, employers to whom the conditions of old version of Ionizing

Radiation Ordinance for Decontamination are applicable were defined as “employers who provide works for decontamination, etc. or collecting waste, etc.” at the special decontamination areas, etc. but employers engaged in restoration and reconstruction efforts other than the decontamination and other related operations were not covered by the Ordinance. Therefore, the Ionizing Radiation Ordinance for Decontamination was partially revised to regulate measures for appropriately protecting workers from health hazards caused by radiation, according to the types of restoration and reconstruction work. The revised ordinance will take effect on 1 July 2012.

The purpose of these guidelines is to present issues specified in the revised Ionizing Radiation Ordinance for Decontamination as well as to call attention to the important measures in which the employers are required to implement. In addition, these guidelines are intended to integrally introduce the most important points of the Industrial Safety and Health Act (No. 57 of the Act, 1972), the revised Ionizing Radiation Ordinance for Decontamination and relevant laws in order to advance providing appropriate measures of protection from radiation hazards in restoration and reconstruction efforts. The intention of these guidelines not only applies to the workers involved in operations but also extends to individual proprietors, self-employed workers, and volunteers so that their safety and the health will be protected.

The employers should strive to implement the measures described in these guidelines appropriately and make every effort to prevent radiation hazards while considering realities of their work sites.

Section 2 Application

These guidelines apply to employers who provide services other than the decontamination work at the sites where the average ambient dose rate exceeds 2.5μSv/h due to radioactive materials generated by the nuclear accident (limited to those materials specified in Paragraph 2, Article 2 of the Ordinance on Prevention of Ionizing Radiation Hazards – MHLW ordinance, No. 41, 1972, hereinafter referred to as the “Ionizing Radiation Ordinance” - hereinafter referred to as the “radioactive materials discharged by the accident”) (works conducted under a designated dose rate are hereinafter referred to as “works under a designated dose rate,” and employers who provide services under a designated dose rate as “employers of workers under a designated rate,” respectively, in the special decontamination areas, etc. specified in the Act on Special Measures Concerning the Handling of Radioactive Pollution). The following issues need to be considered when applying these guidelines:
It should be noted that under water operations in the surrounding sea areas of the TEPCO Fukushima

Daiichi Nuclear Power Plant are not subject to these guidelines. However, employers who manage divers should provide measures for their divers to measure and record external exposure doses.

(1) "Decontamination works" constitute operations involving decontamination of soil, collection of waste, or handling of designated contaminated soil and wastes. When these operations are conducted, relevant provisions in the Ionizing Radiation Ordinance and the guidelines on decontamination works will be applied.

(2) Issues concerning the "works under a designated dose rate"

a. Operations conducted indoors such as manufacturing are not subject to work under a designated dose rate if the average ambient dose rate inside the work facilities is 2.5μSv/h or less even when the average ambient dose rate outside exceeds 2.5μSv/h.

b. Driving, loading, and unloading vehicles are considered as works under a designated dose rate only when: (i) the loading and unloading site (excluding loading operations concerning recovery efforts of local infrastructure) is in the location where the average ambient dose rate exceeds 2.5μSv/h, and workers are expected to stay at the site for over 40 hours per month to perform the loading and unloading operations, or (ii) conveyance of loads used for recovery efforts, especially those loads indispensable to rebuilding the local infrastructure (e.g., construction machinery, construction materials, soil, and gravel) takes place at sites where the average ambient dose rate exceeds 2.5μSv/h.

Note that only passing through the site where the average ambient dose rate exceeds 2.5μSv/h should not be subject to works under a designated dose rate because the stay duration is limited to a brief period.

c. The areas where average ambient dose rate may exceed 2.5μSv/h due to the controlled radiation source such as an X-ray apparatus should be considered as a radiation controlled area specified in Paragraph 1, Article 3 of the Ordinance on Prevention of Ionizing Radiation because works under a designated dose rate are essentially limited to work sites where radioactive materials discharged by the accident heightened the air dose rate to above the 2.5μSv/h level.

Section 3 Recipients of radiation exposure dose control and methods

1. General principles

(1) Employers of workers who are engaged in works under a designated dose rate should make every effort to minimize the ionizing radiation exposure to all of their workers including those

engaged in high risk operations (hereinafter referred to as "workers engaged in works under a designated dose rate") and other workers involved in the lower risk operations.

(2) The employers, when implementing the works under a designated dose rate, should give top priority to minimizing radiation exposure to their workers, and strive to ensure that appropriate measures such as decontamination are taken at their work sites before commencing work.

a. The (1) above states that employers should maintain radiation exposure of their workers to the minimum achievable level with the principles of optimization by the International Commission on Radiological Protection (ICRP), when workers perform their operations.

b. The (2) above states that when operations are expected to entail a certain level of radiation exposure, it is necessary to make minimizing radiation exposure to workers engaged in high risk operations the top priority by implementing decontamination measures based on the ICRP principles of justification, prior to commencing work. Furthermore, employers should carefully evaluate the situations and confirm if the risk of radiation exposure to their workers outweighs the public benefit and the necessity of operations before starting projects.

c. In light of the ICRP principle of justification, and considering the fact that the workers in manufacturing and business industries tend to receive higher radiation exposure doses from long working hours, and the urgency of their work is not necessarily pressing, they should be required to minimize the radiation dose of their work sites and surrounding areas to the less than 2.5μSv/h level by decontamination in advance so that they will be able to work in conditions without the need for radiation dose control in principle.

If appropriate measures for decontamination have been taken before commencing work, manufacturing and other operations conducted indoors are expected to be not subject to the works under a designated dose rate in the areas where the average ambient dose rate outdoors is less than 3.8μSv/h set by the Nuclear Emergency Response Headquarters for regulating the restart of these operations. This is because the ambient dose rate indoors is expected to be in the below 1.5μSv/h level, that is approximately 40% less than the maximum criteria, due to the shielding effect of the building.

2. Measurement of radiation exposure doses

(1) When the employers of workers under a designated dose rate assign their workers to work at the sites where the average ambient dose rate exceeds 2.5μSv/h, they should measure the external radiation exposure doses of the workers with personal dosimeters.

(2) Given the difficulties in controlling radiation exposure doses for individual proprietors and self-employed workers, employers should enforce appropriate measures, such as decontamination, and prevent individual proprietors and self-employed workers from engaging

in the works under a designated dose rate.

a. Individual proprietors and self-employed workers who are obliged to conduct works under a designated dose rate should be considered as workers engaged in operations under a designated dose rate, and the present guidelines should be applied.

b. Volunteers should work at sites where the average ambient dose rate is 2.5μSv/h (equivalent to approximately 5mSv/y when working 40 hours per week for 52 weeks) or less, and frequencies of their operations should be limited to several dozen times (days) per year so that their effective exposure doses do not exceed 1mSv/y.

3. Radiation exposure dose limit

(1) The employers of workers under a designated dose rate should ensure that the total effective exposure doses received by their workers measured in 2-(1) should not exceed the following criteria:

a. 100mSv per five years and 50mSv per year for male workers and female workers who have been clinically confirmed as infertile

b. 5mSv per three months for fertile female workers (excluding those who have been clinically confirmed as infertile and those who meet the criteria in (c) below)

c. Equivalent exposure dose of 2mSv on the abdominal surface for pregnant female workers

(2) When transferring workers, who had been engaged in decontamination work or radiation work in the radiation controlled areas specified in Article 3 of the Ionizing Radiation Ordinance, to works under a designated dose rate, the employers of workers under a designated dose rate should ensure that the total of effective doses received by workers during decontamination work measured in (2)-1 and effective doses received by their former decontamination work or radiation work in the radiation controlled areas do not exceed the limit presented in (1).

(3) The employers of workers under a designated dose rate should investigate the exposure history of workers at the time of employment or transfer by referring to their exposure dose records issued by the previous employers. If the workers had the exposure history, confirm the location, nature of work, duration, and other details concerning radiation exposure. If workers do not have the records, direct them to request reissuing of their records to the previous employers in order to manage the radiation doses specified in (1) and (2).

(4) In order to ensure the appropriate management of radiation control in all workers who are engaged in works under a designated dose rate at various locations, the commencement date of the “five-year” tracking period for radiation exposure described in (1)-(a) should be standardized on 1 January 2012, and should end on 31 December 2016. The same dates apply to the employers who newly enter the market for works under a designated dose rate during this period. In this case, relevant regulations will be applied through identifying the radiation

exposure dose limit by multiplying 20mSv with the number of remaining years from the business commencement date until 31 December 2016.

(5) The commencement date of the "one-year" tracking period for radiation exposure described in (1)-(a) should be standardized on 1 January 2012 just as the "five-year" tracking period and should end on 31 December 2012. If radiation exposure doses received between1 January 2012 to 30 June 2012 are recorded, then those doses should be added to the exposure doses measured after 1 July 2012 to determine the value of radiation exposure for radiation control.

(6) The employers of workers under a designated dose rate should identify the value of radiation exposure doses received by new hires between "one-year" and "five-year" periods from their previous employers before starting them on the operations if they were hired in the midst of the "one-year" or the "five-year" periods. If workers do not have the records, direct them to request reissuing of their records to their previous employers.

(7) Regardless of the provisions in (3) and (4) above, employers who primarily provide radiation work and other related services are allowed to follow the standardized radiation tracking periods independently established in their work sites.

(8) The employers of workers under a designated dose rate should notify the commencing date of the periods described in (4) and (5) to the workers engaged in the operations.

4. Records of radiation exposure dose measurement

(1) The employers of workers under a designated dose rate should calculate the radiation exposure doses of their workers in the following categories based on the measurement methods described in 2 and preserve the dose records for 30 years. This rule also applies to the survey results described in 3-(3). However, exceptions are allowed when records are transferred to the organization designated by the Ministry of Health, Labour and Welfare after they had been kept for five years or when the workers terminated employment. If this is the case, the employers should refer to the Format 1 as an example of recording the details.

It should be noted that if the workers engaged in works under a designated dose rate were used to be engaged in radiation work specified in Paragraph 1, Article 4 of the Ionizing Radiation Ordinance, or decontamination work in the special decontamination areas, etc., the total radiation exposure doses received during these periods should be combined with exposure doses received during works under a designated dose rate and recorded for preservation.

a. The total effective exposure doses of male workers and infertile female workers should be recorded every three month, one year, and five year periods (for those whose effective doses have never exceeded 20 mSv/y for a period of five years, total effective doses in every three month and one year periods).

b. The total effective exposure doses of fertile female workers should be recorded every one month, three month, and one year periods. (The total effective exposure doses can be determined by combining the measurements obtained every three month and one year periods only if workers have no risks to receive effective exposure doses of 1.7 mSv/month).

c. The total equivalent doses received on abdominal surface every one month and throughout the period of pregnancy for pregnant female workers.

(2) The employers of workers under a designated dose rate should inform the detail of the records described in (1) to the workers engaged in the operations without delay.

(3) The employers of workers under a designated dose rate should transfer the records described in (1) to the organization designated by the Ministry of Health, Labour and Welfare, when closing their businesses.

(4) The employers of workers under a designated dose rate should issue copies of the records described in (1) to their workers when the workers terminate employment or when the employers close their businesses.

(5) In order to appropriately manage radiation exposure control of fixed-term contract workers and temporary workers, the employers of workers under a designated dose rate are required to adhere to the following guidelines:

a. The employers should determine and record their radiation exposure doses every month when staffing fixed-term contract workers or temporary workers for a fixed period of less than three months.

b. At the end of contract periods, the employers should determine the total effective exposure doses received by these workers by combining all doses received during their contract periods and issue the copies of their records to these workers.

Section 4 Measures for reducing radiation exposure

1. Preliminary survey

(1) The employers of workers under a designated dose rate should measure and record the results of the average ambient dose rate (μSv/h) of their work sites prior to commencing work and every two weeks thereafter as long as the sites are in their use. However, if the average ambient dose rate becomes stabilized at the below 2.5μSv/h level, the employers are no longer required to measure and record the average ambient dose rate of their work sites.

(2) The methods for measurement and evaluation of the average ambient dose rate are shown in the Attachment 2. The purpose of the preliminary survey is to determine the appropriate measures

for radiation exposure dose control by identifying whether the average ambient dose rate at the work sites exceed 2.5μSv/h. Therefore, when employers identify that the dose rate at their work sites exceeds 2.5μSv/h based on the results of the airborne monitoring published by the Ministry of Education, Culture, Sports, Science, and Technology, these results can be used as substitutes for the air dose rate at each work site. Furthermore, if the air dose rate at the work sites clearly demonstrated to fall below the 2.5μSv/h level, the operations that take place at those sites are not considered works under a designated dose rate, and dose measurement is not necessary.

(3) The employers of workers engaged in works under a designated dose rate should clearly inform their workers of the results of preliminary survey including the end dates of (1) and (2), methods of measurement, and summaries of the highlights in written documents prior to commencing work.

2. Consultation with medical doctors

(1) The employers of workers under a designated dose rate should ensure that the appropriate health services and consultation by the medical doctors are provided to their workers if their workers correspond to any of the following cases:
   a. When workers received effective exposure doses higher than the radiation exposure dose limit
   b. When workers accidentally inhaled or ingested radioactive materials discharged by the accident
   c. When workers cannot reduce their levels of contamination to less than 40Bq/cm^2 by washing themselves
   d. When workers have contaminated wounds

(2) The above (1)-(b) is limited to cases in which a certain degree of internal exposure is expected, for example, when workers have been buried in landslide filled with a large volume of earth and sand, resulting in the contamination levels above the criteria by the workers' nasal smear tests; or when workers ingested a large volume of earth, sand, or contaminated water.

Section 5 Worker Education

1. Special education for workers under a designated dose rate

(1) The employers of workers under a designated dose rate should provide special lectures intended to enhance workers' knowledge and understanding in the following areas before assigning them to the works:

b. The effect of ionizing radiation on human bodies and the methods for controlling radiation exposure doses
c. Radiation measurement methods
d. Relevant laws and regulations

(2) Details of implementation for the special education programs are shown in Attachment 3.

2. Programs for other workers who need education and training

(1) Ideally, the same education programs to the workers under a designated dose rate should be provided to individual proprietors, self-employed workers, and volunteer workers.

(2) It is recommended that the contractee of the works under a designated dose rate ensures before placing the order that the needed number of workers who completed the special education programs can be secured by the commencement of the work.

Section 6 Healthcare measures

1. Medical examinations

(1) The employers of workers under a designated dose rate should provide general medical examinations on the following items to their full-time workers under a designated dose rate at the time of their employment and once every year thereafter on a regular basis. Temporary subcontracted workers should be provided with the medical examinations by their employer.

a. Investigations of medical and work history
b. Examinations for the existence of objective and subjective symptoms
c. Measurement of height, weight, and abdominal circumference; vision and hearing tests
d. Chest X-ray and sputum examinations
e. Blood pressure measurement
f. Examinations for anemia
g. Examinations for liver functions
h. Examinations of blood lipid levels
i. Blood sugar test
j. Urine analysis
k. Examination by electrocardiogram

(2) Workers who were examined on the items from (f) to (i) and (k) of (1) above at the previous routine medical examinations are exempted from all or a part of these items if a medical doctor determines these examinations are unnecessary. Furthermore, workers may be exempted from the item (c) and (d) with the consent of a medical doctor, based on the criteria specified by the

Ministry of Health, Labour and Welfare.

(3) The employers of workers under a designated dose rate should create personal medical examination cards based on the results of the medical examinations in (1) and preserve them for five years.

2. Follow-up on the results of medical examinations

(1) The employers of workers under a designated dose rate should seek advice from a medical doctor about the results of the medical examinations described in 1 above in the following manner :

a. The employers should seek advice from the medical doctor within three months after the date of the medical examinations

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

(2) The employers of workers under a designated dose rate should inform the results of the medical examinations to the workers who received the examinations in 1 without delay.

(3) Based on the results of the medical examinations in 1 above, the employers should take necessary measures to protect the health of their workers who have or may have developed a radiation related disorder. For example, employers may need to transfer the workers to the alternative positions or locations, or to consider providing shorter hours or changing their work methods until complete remission.

Section 7 Safety and health control system

1. Unitary management of radiation exposure dose by primary contractors

Each primary contractor engaged in works under a designated dose rate shall designate radiation administrator and require him/her/them to implement a unitary management of the radiation exposure doses of workers including those working for related subcontractors, including the items listed below. It is desirable to select radiation administrator from those with a national qualification on nuclear radiation or those who have been provided with a radiation exposure dose management training program by a professional education institute.

(1) 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.

(2) Conduct and/or support radiation exposure dose management personnel of related

subcontractors to ensure that the measures to be taken by related subcontractors stipulated in No.7-3 are properly implemented."

2. Safety and health management system by employers

(1) The employers of workers under a designated dose rate should appoint health officer or safety and health promoters, based on the size of their work sites. These managers and promoters are expected to oversee technical issues associated with measuring radiation doses and recording the measurement results.

The appointment of health managers or safety and health promoters is recommended to even at work sites where the number of workers is less than 10.

(2) Regardless the size of their work sites, employers should appoint a radiation manager who is responsible for measuring radiation doses and recording the results of the measurements, etc.

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

The employers of workers under a designated dose rate should take the following measures when assigning workers engaged in emergency work at the Fukushima Daiichi Nuclear Power Plant of TEPCO to the work under a designated dose rate:

(1) Submit "a status report on radiation dose control, etc. for the designated emergency worker" (the Ionizing Radiation Ordinance form no. 3) to the Industrial Health Division of the Ministry of Health, Labour and Welfare at the end of every three months, pursuant to Article 59-2 of the Ionizing Radiation Ordinance.

(2) Provide health guidance and necessary examinations to workers who received exposure doses exceeding 50mSv during emergency work, in accordance with the "Guidelines on maintaining and promoting health of emergency workers at the TEPCO Fukushima Daiichi Nuclear Power Plant" (Public Notice No.5, 2011).

Attachment 1.List of special decontamination areas ,etc.

1. Special decontamination areas

- Designated areas

  Restricted areas or 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, Minamisoma-city, Kawamata-town, and Kawauchi-village

2. Intensive contamination survey areas

- Designated areas

  Areas with the radiation dose rate of 0.23 μSv/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 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, 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 Shiroi-city
Total	100	

Attachment 2.Measurement methods and evaluation for the average ambient dose rate

1. Purpose

The purpose of measuring the average ambient dose rate for employers is to evaluate and determine if the dose rate at the work site exceeds 2.5μSv/h and the appropriateness of their strategies for dose control, when assigning their workers to conduct works under a designated dose rate.

2. Fundamental policy

(1) The average ambient dose rate of the work site should be measured prior to commencing work.

(2) If operations are conducted at the same site, the dose rate should be measured once every two weeks. Even when the measured dose rate decreases to the less than 2.5μSv/h level, measurement should be continued to be taken until the dose rate decreases to the level approximately 90 % of 2.5μSv/h (2.2μSv/h). This is because measured values can vary depending on the weather. In addition, the dose rate should be measured when major changes are observed in the surrounding areas of the work site with natural disasters such as a typhoon, flooding, and a land slide.

(3) The measured dose rate should reflect realities of radiation exposure to workers.

(4) The measurement of the dose rate is exempted in cases where the average ambient dose rate of the work site is apparently lower than 2.5μSv/h, and the specific operations that take place are clearly judged not subject to works under a designated dose rate, based on the average ambient dose rate and the nature of work officially announced by the Ministry of Education, Culture, Sports, Science and Technology.

3. Measurement and evaluation of the average ambient dose rate

(1) Common items

(a) The mean average ambient dose rate should be measured at the location one meter above the ground

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

(2) Method of measurement

The average ambient dose rate at the work site should be measured at least at three different points where the dose rate is likely to be the highest, and the average of those results should be determined as the final mean ambient dose rate of the work site. When the work site is over 1,000m^2, the measurement should be taken from each section of the area that is divided into the less than 1,000m^2 scale in size.

Attachment 3.Special education for workers

Special education for workers who are engaged in works under a designated dose rate should be provided by lectures.

The title of the lectures is presented in the left column, the topic in the middle column, and the minimum duration of the lecture is shown in the right column of the following table.

Title	Topic	Duration
The effect of ionizing radiation on human bodies and the methods of controlling radiation exposure doses	1) Types and nature of ionizing radiation 2) Effects of ionizing radiation on cells, tissues, organs, and the whole body 3) Radiation exposure dose limits and methods of exposure dose measurements 4) Methods for confirming and recording the results of exposure dose measurements	1 hour
Methods of radiation measurement	1) Methods of radiation measurement 2) Methods of monitoring the dose equivalent rate from external radiation 3) Urgent steps for responding to unexpected situations	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, the Ionizing Radiation Ordinance for Decontamination	1 hour