Annex 1

Overview of the second report from the Expert Meeting on Radiation Protection for Decontamination and Related Works

1. **Scope**

This document is for employers providing services that involve (a) handling of contaminated soil whose radioactive concentration exceeds 10,000 Bq/kg (hereinafter referred to as the "works for handling designated contaminated soil and wastes") or (b) works under the average ambient dose rate higher than 2.5 μSv/h (excluding works for handling designated contaminated soil and wastes, hereinafter referred to as the "works under a designated dose rate") at the special decontamination areas or intensive contamination survey areas (hereinafter referred to as "special decontamination areas, etc.) specified in the Act on Special Measures Concerning the Handling of Radioactive Pollution, excluding those aiming at decontaminating soil or collecting radioactive waste.

(Note): For decontamination works, the Ionizing Radiation Ordinance for Decontamination came into effect on 1 January 2012.

2. Exposure dose control for workers and its control method

(1) Fundamental Principle

(a) Employers shall strive to minimize the ionizing radiation received by workers.

(b) When implementing the works for handling designated contaminated soil and wastes or works under a designated dose rate, employers shall give priority to minimize the exposure doses received by workers, and strive to take measures such as decontaminating workplaces in advance.

(2) Employers who provide works for handling designated contaminated soil and wastes or works under a designated dose rate at the special decontamination areas, etc. shall measure the effective dose of workers by the methods specified for each case (a) to (c) below.

(a) Case of assigning workers to the works for handling designated contaminated soil and wastes at workplaces where the average ambient dose rates exceed 2.5 μSv/h.

External exposures: Measurement with personal dosimeters

Internal exposures: Measurement according to the type of work and the radioactive concentration of the soil to be handled.

	Soil with high radioactivity concentration (≥ 500,000 Bq/kg)	Other than soil with high radioactivity concentration
Work in high dust	Measurement of internal	Screening

concentration ($\geq$ 10mg/m^3)	exposure once every three months	
Work other than above	Screening	Screening*

*Limited to the case where high dust concentration is generated unexpectedly.

(b) Case of assigning workers to works under a designated dose rate

External exposure: measurement with personal dosimeters

(c) Case of assigning workers to works for handling designated contaminated soil and wastes in the areas where the average ambient dose rate is less than 2.5μSv/h (limited to the cases where workers are normally expected to work in areas where the average ambient dose rate is higher than 2.5μSv/h, given the nature of the work, such as restoration work on local infrastructures).

External exposure: In addition to measurement with personal dosimeters, the evaluation based on the ambient dose or measured exposure doses of a representative worker may also be acceptable.

(3) Since independent business man such as farmers and self employed business owner find proper managing of exposure doses difficult, it is desirable to avoid undertaking such works for handling designated contaminated soil and wastes. When works under a designated dose rate are undertaken, appropriate measures shall be taken in advance such as decontaminating workplaces.

(4) The limitation of the exposure doses received by workers shall be 100 mSv and 50 mSv for the duration of five years and one year, respectively. It shall be 5 mSv for the duration of three months for female workers who have a possibility of pregnancy. For pregnant workers, effective dose due to internal exposure is a maximum of 1 mSv, with an equivalent dose maximum of 2 mSv received on the abdominal surface.

(5) The results of the measurements shall be recorded, stored for 30 years and workers shall be notified of them without delay (the records can be transferred to a designated organization after storing them for five years or the workers resign from their jobs).

3. Measures to minimize radiation exposure

(1). Preliminary examination

(a) When implementing works for handling designated contaminated soil and wastes, the employers shall survey conditions of the workplaces, average ambient dose rate and concentration of radioactive materials in advance. When continuing the work at the same workplaces, they shall survey them once every two weeks.

(b) When implementing works under a designated dose rate, the employers shall survey the average ambient dose rate in advance. When continuing the work at the same workplaces,

they shall survey them once every two weeks.

(2) When implementing works for handling designated contaminated soil and wastes in the areas where the average ambient dose rate exceeds 2.5μSv/h, the employers shall establish work plans in advance.

(3) When implementing works for handling designated contaminated soil and wastes in the areas where the average ambient dose rate exceeds 2.5μSv/h, the employers shall appoint a work supervisor who leads the work.

(4) When implementing works for handling designated contaminated soil and wastes in the areas where the average ambient dose rate exceeds 2.5μSv/h, the employers shall submit a "Notice of commencement of works for handling designated contaminated soil and wastes" to the Head of the relevant Labor Standards Inspection Office.

4. Measures to prevent the escalation of the contamination and internal exposure

(1) It is advisable that employers who implement works for handling designated contaminated soil and wastes remove highly radioactive soils as much as possible from the workplaces in advance, except in cases where they implement work in which a dose lowering effect equal to or greater than the effect gained from the removal of contaminated soil such as cover soil, paving and reverse plowing. However, this provision does not apply to the work to recover the infrastructures that are required for decontamination related works such as those for restoring water and electricity supplies and roads.

(2) When employers implementing works for handling designated contaminated soil and wastes, collect, transport and store contaminated soil and wastes where the radioactive concentration exceeds 10,000 Bq/kg (herein after referred to as "designated contaminated soil and wastes"), they shall use specially dedicated containers and implement necessary measures to avoid the dispersal and spilling of the soil from the containers while the soil and wastes are stored.

(3) Employers who implement works for handling designated contaminated soil and wastes shall establish contamination monitoring areas near the workplace to prevent the spread of contamination by workers through the inspection of their contamination when workers leave their workplace. When personal contamination is found, the body should be washed. When equipment attached to workers is found to be contaminated, the equipment should be removed. Any contaminated articles should not, in principle, be taken out of the workplace.

(4) Employers who implement works for handling designated contaminated soil and wastes shall provide workers with effective respiratory protective equipment and protective clothing to avoid personal contamination and internal exposure.

(Dust mask)

	Soil with high radioactivity concentration (≥ 500,000 Bq/kg)	Other than soil with high radioactivity concentration
Work under high dust concentration (≥ 10mg/m3)	Dust collection efficiency 95% and over	Dust collection efficiency 80% and over
Work other than above	Dust collection efficiency 80% and over	Dust collection efficiency 80% and over*

*Surgical masks may be used when there is no mineral dust.

(Protective clothing)

	Soil with high radioactivity concentration (≥ 500,000 Bq/kg)	Other than soil with high radioactivity concentration
Work under high dust concentration (≥ 10mg/m^3)	Whole-body chemical protective clothing worn over a long-sleeve shirt, with rubber gloves, gumboots	Long-sleeve shirts, cotton gloves, rubber boots
Work other than above	Long-sleeve shirts, rubber gloves, rubber boots	Long-sleeve clothes, cotton gloves, rubber boots

(4) Employers who implement works for handling designated contaminated soil and wastes shall prohibit workers from smoking, eating and drinking in the workplaces where they might inhale or ingest contaminated soil, etc.

5. Education for workers

(1) Employers who implement works for handling designated contaminated soil and wastes shall provide education for work supervisors.

(2) Employers who implement works for handling designated contaminated soil and wastes shall provide special education lectures and practical training for workers on the following subjects.

A. Lectures

(a) Knowledge on impacts of ionizing radiation on living organisms and exposure dose control methods

(b) Knowledge on methods of works for handling designated contaminated soil and wastes.

(c) Knowledge on structure and instruction of machines used for works for handling designated contaminated soil and wastes.

(d) Relevant laws and regulations

B. Practical training

Methods of works for handling designated contaminated soil and wastes and the machines used for the works

(3) Employers who implement works under a designated dose rate shall provide workers with special education through lectures on the following subjects.

(a) Knowledge on impacts of ionizing radiation on living organisms and exposure dose control methods

(b) Knowledge on methods of measuring ionizing radiation

(c) Relevant laws and regulations

(4) It is advisable that similar education shall be provided to others who self-employed workers such as farmers.

(5) It is advisable that the ordering party who place on order of works for handling designated contaminated soil and wastes should confirm whether the contractor has established a system to secure the necessary numbers of educated supervisors and workers to implement the work by the time they commence the work.

6. Measures for health care

(1) Employers who implement works for handling designated contaminated soil and wastes in areas where the average ambient dose rate exceeds 2.5 μSv/h shall provide medical examinations for workers assigned to works for handling designated contaminated soil and wastes at the time of employment, at the time of transferring to this work, and once every six months regularly. (When exposure doses do not exceed 5 mSv/y, items other than exposure dose history can be omitted.)

(2) Employers who implement works for handling designated contaminated soil and wastes in areas where the average ambient dose rate exceeds 2.5 μSv/h shall prepare personal cards based on their medical examination results and keep them for 30 years (it is possible to transfer the cards to a designated organization when the employers terminate their business or workers leave their jobs).

6. Safety and health management system

(1) The primary contractors who implement works for handling designated contaminated soil and wastes shall appoint a person as the general safety and health manager from those persons who conduct overall management of works for handling designated contaminated soil and wastes to conduct safety and health management properly, with responsibility for the following:

A. Appoint personnel responsible for the safety and health management in relevant subcontractors

B. Hold safety and health coordinating meetings consisted of all subcontractors

C. Provide guidance and support to prepare work plans

(2) Primary contractors who implement works for handling designated contaminated soil and wastes or works under a designated dose rate shall appoint a radiation administrator who will be responsible for systematic control of radiation exposure to workers including those of relevant sub-contractors.

(3) Employers who implement works for handling designated contaminated soil and wastes or works under a designated dose rate shall appoint health administrators or health and safety promoters, depending on the sizes of their workplace, who are responsible for managing technical aspects of the works such as measurement of exposure doses and recording the measured results. The technical aspects of the works shall also include, for the employers who implement works for handling designated contaminated soil and wastes monitoring of contamination, prevention of personal contamination and internal exposure, education of workers and actions for health care.

It is desirable that a safety and health promoter shall be appointed even in those workplaces where the number of workers is less than 10.

(4) Employers who implement works for handling designated contaminated soil and wastes or works under a designated dose rate shall appoint a radiation administrator regardless of the sizes of their workplaces, who is responsible for the measurement of exposure doses and recording the results of the measurements. Employers who implement works for handling designated contaminated soil and wastes shall appoint a radiation administrator who is responsible for management of contamination and prevention of personal contamination and internal exposure.

Radiation dose control, etc. during restoration/reconstruction work to be started associated with the revision of evacuation areas

<Fundamental principles>

(1) Employers should make efforts to minimize exposure dose.

(2) When implementing specified contaminated soil handling operations and specified high radiation dose work, the minimization of exposed dose received by workers should take priority, and work places should be decontaminated in advance.