Measures for the prevention of radiation hazards for restoration/reconstruction work in new evacuation areas

Purpose of the Revision of the Ionizing Radiation Ordinance for Decontamination

- The Nuclear Emergency Response Headquarters and the Reconstruction Agency revised the classification of the evacuation area around the TEPCO Fukushima Daiichi Nuclear Power Plant (restricted area and deliberated evacuation area) into 3 zones on 1 April 2012: (1) Areas where it is expected that the residents will have difficulties in returning for a long time; (2) Areas in which the residents are not permitted to live; and (3) Areas in which evacuation orders are ready to be lifted (see the attached schematic figure of the restricted and evacuation areas).

Table. Relationship between the evacuation areas and zoning in decontamination related laws

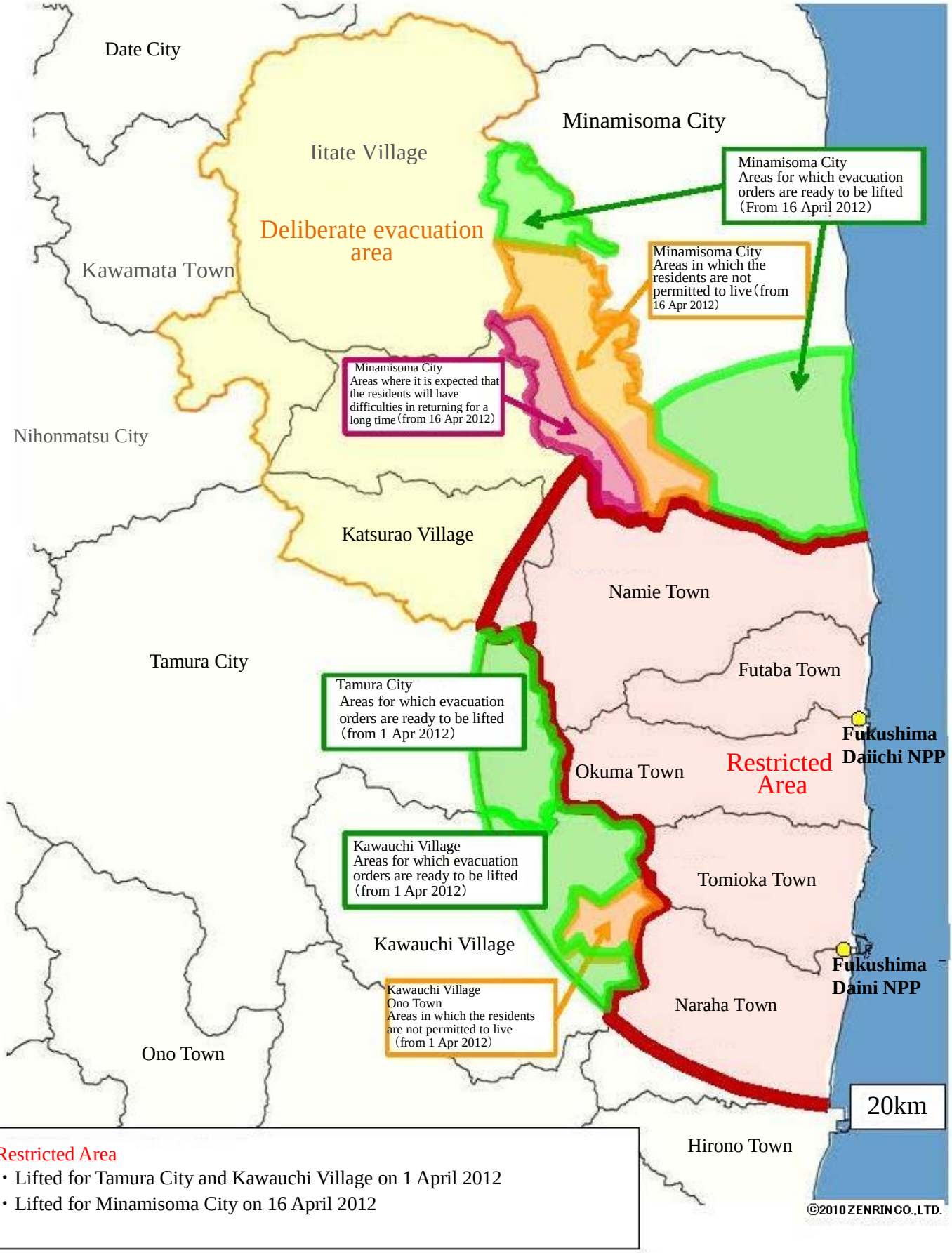
Evacuation areas	New evacuation areas	Zones specified in the Act on Special Measures Concerning Handling of Radioactive Pollution	Zones specified in the Ionizing Radiation Ordinance for Decontamination
Restricted areas, deliberate evacuation area	Areas where it is expected that the residents will have difficulties in returning for a long time	Special decontamination areas	Special decontamination areas, etc.
	Areas in which the residents are not permitted to live		
	Areas in which evacuation orders are ready to be lifted		
—		Intensive contamination survey areas	

- In the "Areas for which evacuation orders are ready to be lifted", activities can be started for: (1) Restoring local infrastructures other than decontamination works; (2) Restarting businesses such as manufacturing industries: (3) Preparing to reopen hospitals and welfare facilities; (4) Restarting agriculture and forestry industries: and (5) Transportation services associated with these activities.
- "Ionizing Radiation Ordinance for Decontamination" which came into force on 1 January 2012 is applicable only for decontamination works (decontaminating, etc., and collecting, transporting and storing wastes). For application to the above activities, revision of the Ordinance was required.
- Therefore, the specialist committee organized to discuss decontamination related works was reorganized to discuss measures to protect workers from radiation hazards in the evacuation areas. The committee compiled their discussions and issued a secondary report on 27 April 2012.
- Based on this report, the Ionizing Radiation Ordinance for Decontamination was revised and guidelines were prepared that summarize relevant laws and regulations comprehensively and in an easy to understand way.

※ Under this revision, "works for handling designated contaminated soil and wastes (tasks handling soil with a cesium concentration exceeding 10,000 Bq/kg)" and "works under a designated dose rate (tasks performed in the areas where the average ambient air dose rate exceeds 2.5 μSv/h" (excluding decontamination works.) were defined.

※ Assumed work: works for handling designated contaminated soil and wastes: Works (1) and (4) above; works under a designated dose rate: works (2), (3) and (5) above (it is unlikely that the average ambient dose rate exceeds 2.5 μSv/h for indoor works).

（after 1 April 2012）



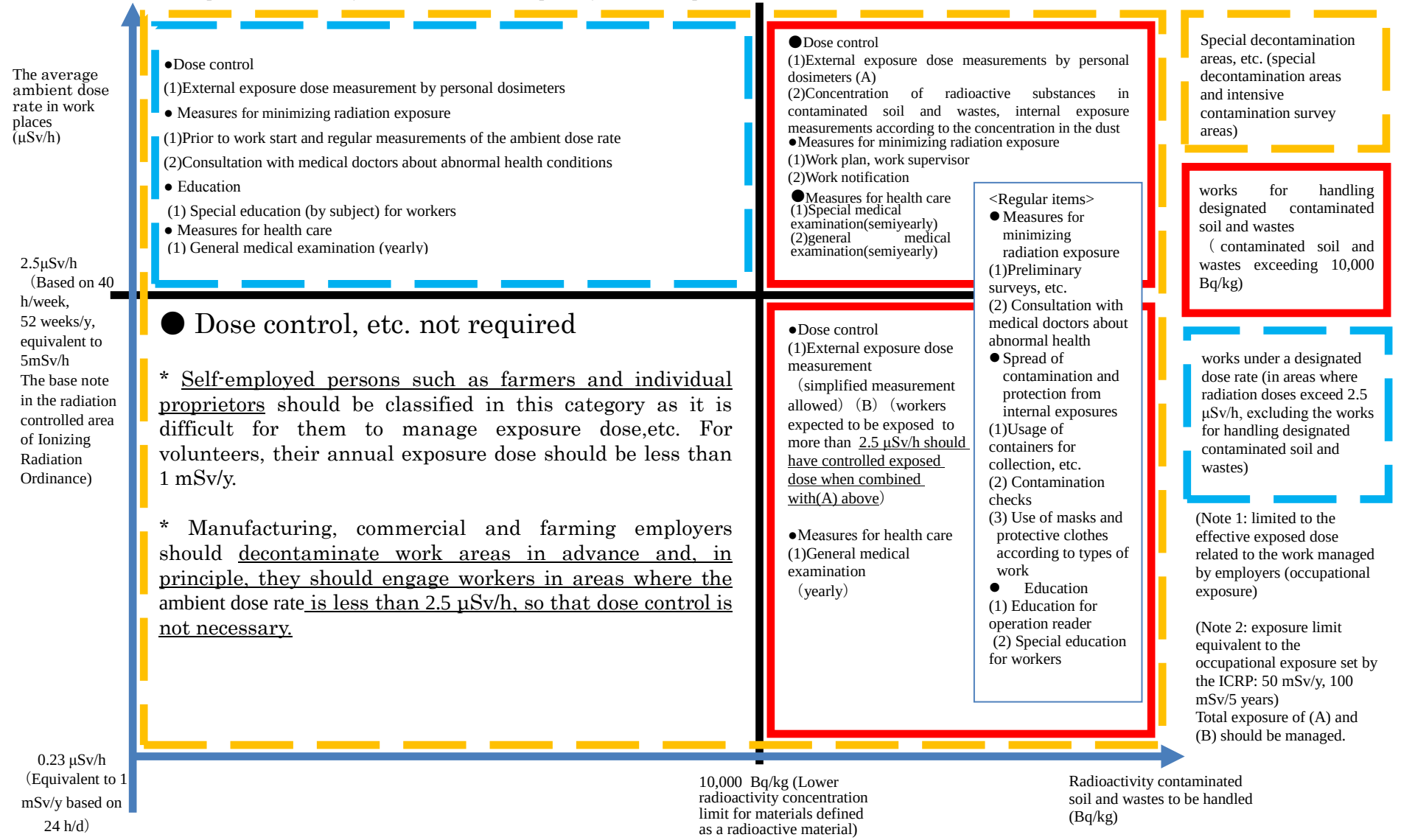
Restricted Area
- Lifted for Tamura City and Kawauchi Village on 1 April 2012
- Lifted for Minamisoma City on 16 April 2012

Exposure 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 radiation exposure.

(2) When implementing works for handling designated contaminated soil and wastes and works under a designated dose rate, the minimization of radiation exposure received by workers should take priority, and work places should be decontaminated in advance.



Overview of the Revised Ionizing Radiation Ordinance for Decontamination

Associated with the revision of evacuation areas, works for handling designated contaminated soil and wastes is added to the decontamination works to widen the range of such operations, and necessary measures will be defined to minimize radiation exposure for workers engaged in works under a designated dose rate.

●Applicable for works for handling designated contaminated soil and wastes and works under a designated dose rate
○Applicable only for works for handling designated contaminated soil and wastes
◎Applicable for works for handling designated contaminated soil and wastes with dose exceeding **2.5 μSv/h**

1． Actions to minimize radiation exposure

（Exposure dose limit ）

●Effective doses should not exceed 100mSv per 5 years and 50mSv/y.

*Effective doses should not exceed 5mSv per 3 months for female workers who may become pregnant

（Measurement of dose ）

●External exposure dose during the decontamination works should be measured with personal dosimeters in the areas where the radiation dose rate exceeds 2.5μSv/h (equivalent to 5 mSv/y, based on 52 weeks/year and 40 h/week)

○These doses can be measured by an easier method in the areas where the radiation dose not exceeds 2.5 μSv/h (limited to when workers are engaged in works for handling designated contaminated soil and wastes are expected to work in places where such doses will exceed 2.5μSv/h from the nature of the work)

*The deliberate evacuation area and restricted areas are expected to fall roughly into these categories.

◎ Internal exposure dose of workers handling soil with highly radioactive contaminated soil and wastes*[2] within the environment containing a high dust concentration*[1] should be monitored once every 3 months. For other workers, screening examination should be implemented; if their exposure dose exceeds the screening criteria, internal exposure dose should be monitored.

*[1] Dust contains cesium in an amount exceeding 10 mg/m^3.

*[2] Work handling contaminated soil and wastes with a cesium concentration exceeding 500,000 Bq/kg.

（Recording and keeping the results of the measurements of radiation doses）

●Monitored radiation doses of workers should be recorded and kept for 30 years and relevant workers should be notified of them.
(The records may be transferred to a designated organization after being kept for 5 years and in the case that the relevant workers leave the job.)

（Preliminary surveys, work plans, work managers and work notifications）

●Average ambient dose rate should be surveyed prior to commencing decontamination work, and thereafter once in two weeks.

○Concentration of cesium should be surveyed prior to commencing decontamination work, and thereafter once in two weeks.

◎ The head of the relevant Labour Standards Inspection Office should be notified about work activities such as decontamination of soil in the areas where the radiation dose rate exceeds 2.5 μSv/h. Work plans should be identified and handled by operation leader.

●Applicable for works for handling designated contaminated soil and wastes and works under a designated dose rate
○Applicable only for works for handling designated contaminated soil and wastes
◎Applicable for works for handling designated contaminated soil and wastes with dose exceeding **2.5 μSv/h**

（Medical examination）

●When radiation dose exceeds the limit, medical consultation should be provided immediately and such incidents should be reported to the head of the relevant Labour Standards Inspection Office.

2. Prevention of the spread of contamination

（Measures to prevent contamination from the storage of removed soil, etc.）

○ When collecting, transporting and storing removed soil generated from works for handling designated contaminated soil and wastes, containers meeting certain requirements* should be used and measures should be taken to prohibit access to the storage area.
*These are containers with no possibility of dispersing/spilling removed soil, and whose 1-cm equivalent dose rate at a distance of 1 meter from the surface of the containers does not exceed 0.1 mSv/h.

（Contamination screening）

○ A contamination screening point should be established near the work place handling designated contaminated soil and wastes, and the bodies, clothing and other gear that the workers wear should be inspected for contamination, when they leave their work place.

○ When contamination levels exceed 40 Bq/cm^2, workers should wash their bodies to reduce the contamination level to below the criterion, and other gear should be removed.

○ Items removed from the work place should be inspected for contamination. If the contamination level of any item exceeds 40 Bq/cm^2, it should not be removed from the area.

（Protective equipment）

○ When workers are engaging in work which may generate a high dust concentration or when handling highly radioactive contaminated soil and wastes, dust mask, protective clothes and other protective equipment should be used.

（Prohibition of smoking and consumption of food）

○ No smoking, eating or drinking is allowed at work places where radioactive materials could be ingested.

3.Education of workers and health care, etc.

●Applicable for works for handling designated contaminated soil and wastes and works under a designated dose rate
○Applicable only for works for handling designated contaminated soil and wastes
◎Applicable for works for handling designated contaminated soil and wastes with dose exceeding **2.5 μSv/h**

（Special education for workers）

●When engaging workers for works for handling designated contaminated soil and wastes or works under a designated dose rate, education on the impact of radiation, dose control and relevant law, etc. should be provided.
*Requirements are defined for each of the following: (1) works for handling designated contaminated soil and wastes and (2) works under a designated dose rate.

（Medical examination）

◎ Special medical examination including investigation of radiation exposure history should be conducted for workers who engage in works for handling designated contaminated soil and wastes under the radiation dose rate exceeding 2.5μSv/h when employing or reallocating workers, and thereafter once every 6 months. Personal medical examination card are prepared which need to be stored for 30 years, and workers should be notified of the medical examination results. (The cards may be transferred to a designated organization after being kept for 5 years and in the case that the relevant workers leave the job.)

◎When the results of the special medical examination indicate that a worker has radiological hazards, necessary measures are to be taken (i.e., transferring the worker to an alternative job, reduction of work hours) until the hazard is resolved.

（Issuance of radiation dose records to terminated workers）

●When workers leave their jobs or an operation is terminated, the records of radiation dose and the medical examination card of the workers should be transferred to the organization designated by the Minister of Health, Labour and Welfare, and the transcripts of those documents should be issued to the workers.

（Report on the results of medical examination）

◎Employers should report the results of routine special medical examinations to the head of the Labour Standards Inspection Office.

4. Others

●Works for handling designated contaminated soil and wastes and works under a designated dose rate stipulated in the Ionizing Radiation Ordinance for Decontamination are excluded from the radiation work applicable under the Ionizing Radiation Ordinance.

●The Provisions of the Ionizing Radiation Ordinance for Decontamination should be applied to works for handling designated contaminated soil and wastes and works under a designated dose rate which are conducted in the TEPCO Fukushima Daiichi NPP except those activities conducted in areas in reactor facilities, steam turbines and their accessory facilities, or in areas surrounding those.

Enforcement date : 1 July 2012