

Overview of the Report from the Expert Meeting on the Long-term Healthcare etc. of Workers at the TEPCO Fukushima Daiichi Nuclear Power Plant

- I. Long-term healthcare for emergency workers, such as medical examinations, including the period after termination of their employment
 1. Cancer screening, etc.
 - Employers shall provide cancer screening, etc. according to the attached table (some are changed based on the results of the latest epidemiologic surveys, although there is no need for change for the workers subjected to the examinations, such as a cancer screening).
 - Employers shall provide antismoking education for smokers.
 2. Implementation of a “stress check”
 - Employers should provide a “stress check” to all emergency workers as much as possible.
 - It is desirable for nuclear facility employers and primary contractors to provide support to related contractors as required.
- II. Healthcare during emergency works
 - Employers shall immediately provide examinations by medical doctors and treatment to those workers who are exposed to effective dose or equivalent dose beyond the regular dose limit in a short period of time.
 - Employers shall provide medical examinations to the emergency workers by medical doctors once within one month as well as when they are transferred from emergency works to other works or at the termination of their employment to examine: (1) existence of subjective symptoms and objective symptoms, (2) white blood cells count and differential count , (3) red blood cell count and hemoglobin content or a hematocrit value, (4) thyroid stimulating hormone (TSH), free triiodothyronine (free T3) and free thyroxine (free T4), (5) eyes for cataract, and (6) skin.
- III. Ensuring the medical care system in nuclear facilities during emergency works
 - The “Network of medical doctors familiar with the emergency medical treatment” should be established in order to immediately respond to accidents in nuclear facilities anywhere in the country.
 - The Network operator shall recruit the Medical Staff members, etc. on condition that they would be dispatched to nuclear facilities in the case of an accident and provide them with

multiple training sessions including practical training.

- The Network operator shall have discussions with relevant organizations and identify medical institutions that can accept the workers with industrial accident from nuclear facilities.
- The Network operator shall conduct training focusing on transportation and acceptance of contaminated workers with industrial accident from nuclear facilities to the local medical institutions.

IV. Mid- to long-term exposure dose control for workers who are exposed to the dose beyond the dose limit for regular radiation works

1. How to control radiation exposure doses from exceeding the lifetime radiation exposure doses during the subsequent period following the accident

- Employers shall define a exposure dose limit per 5-year period individually for each worker based on the numerical value calculated by dividing the residual exposure doses that are obtained by subtracting accumulated exposure dose (total of emergency exposure dose and regular exposure dose) from lifetime radiation exposure dose (1 Sv) with the residual working period derived from subtracting the current age from the last age of the working period (68 years old assuming to work in the period of 50 years from 18 years old).
- Employers shall recalculate the exposure dose limit per 5-year period every 5 years to reflect the detail in subsequent radiation exposure.

* Example calculation concerning the case for emergency exposure dose: 500 mSv, regular exposure dose radiation work = 100 mSv (cumulative exposure doses: 600 mSv) and age= 45 years old,

$$(1) (1000 \text{ mSv} - 600 \text{ mSv}) / (68 - 45) = 17.4 \text{ mSv/y}$$

$$(2) \text{ Exposure dose limit in per 5-year period: } 17.4 \text{ mSv/y} \times 5 \text{ years} = 87 \text{ mSv} \Rightarrow 85 \text{ mSv (rounded down to every 5 mSv)}$$

2. How to control exposure doses in which regular exposure dose limit radiation works is applied within an exposure dose control period including the time of the accident

- Employers may assign regular radiation works, where radiation exposure is additionally being controlled under the level of 5 mSv/year, only to workers whose total radiation exposure dose (of the emergency exposure dose and the regular exposure dose) exceeds 100 mSv/5-year period, which is the regular exposure limit, when he/she is a member of the essential human resources to guarantee safe operation of the nuclear power plant.

V. Exposure dose control during emergency works

1. Setup of an exceptional emergency exposure dose limit
 - The Minister of Health, Labour and Welfare may define the special exposure dose limit (hereafter referred to as "exceptional emergency exposure dose limit") within the range not exceeding 250 mSv when he/she considers that it is difficult to keep the exposure dose limit of 100 mSv in the emergency work.
 - The Minister of Health, Labour and Welfare should immediately define 250 mSv as the exceptional emergency exposure dose limit when the nuclear emergency specified in the Item 1, Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness or the accident that is highly likely to lead to such emergency should occur.
2. Restriction on exceptional emergency workers
 - The workers who are engaged in the works to which an exceptional emergency exposure dose limit is applied (hereafter referred to as "exceptional emergency worker" and "exceptional emergency work" respectively) should be limited to those who are assigned by the nuclear facility operator as nuclear emergency management organization personnel ("nuclear emergency personnel") specified in the nuclear operator disaster prevention plan.
 - In assigning nuclear emergency personnel, the nuclear facility operators shall define the work conditions for the exceptional emergency work, and conclude a labour contract under mutual agreement. The employers should also pay due consideration to the workers' wishes as much as possible when deploying them to the exceptional emergency work in the future.
3. Optimization of the exposure dose control
 - Employers shall make efforts to minimize the risks that exceptional emergency workers are exposed to ionizing radiation depending on the circumstances of the accident.
 - Employers shall report the radiation exposure records of the exceptional emergency workers periodically to the Minister of Health, Labour and Welfare.
 - The Minister of Health, Labour and Welfare should abolish the exceptional emergency exposure dose limit as early as possible by taking into consideration the situation of the accident, the details of the emergency works, and other conditions.
4. Follow-up after the end of work
 - Employers shall periodically submit the results of the medical examination, radiation exposure dose records, etc. of exceptional emergency workers to the Minister of Health,

Labour and Welfare.

VI. Special education provided to exceptional emergency workers

1. Workers to be educated

- The special education for exceptional emergency workers should be provided to nuclear emergency personnel who are specified in the nuclear operator disaster prevention plan by the nuclear facility operator.
- The special education for exceptional emergency workers should be provided to the workers who had the special education to radiation workers.

2. Education to be provided

- Lectures (about 6.5 hours): (1) Knowledge on structures and handling methods of the facilities and equipment to deal with the exceptional emergency works in nuclear facilities, (2) Knowledge on the methods relevant to the exceptional emergency works in nuclear facilities, (3) Knowledge on the biological impacts of ionizing radiations and the exposure dose control method, and (4) Relevant laws and regulations.
- Practices (about 6 hours): (1) Structures and handling methods of the facilities and equipment to use for the works relevant to the exceptional emergency works in nuclear facilities, (2) Methods of work relevant to the exceptional emergency works in nuclear facilities.
- In case where there are changes in the detail of the lessons for education, employers shall provide re-education. In terms of the practice, the employers shall strive to maintain the skills they have learned by periodically providing re-education once within every year.

Attached Table Items and Frequency of Examinations such as Cancer Screening, etc.

Examination	Examination Items	Examination Frequency
Stomach cancer screening	a. Abdominal X-ray fluoroscopic or gastroendoscopy b. Helicobacter/Pylori antibody test	a : Once a year b : Once for each worker
Lung cancer screening	a. Chest X-ray examination b. Sputum cytodiagnosis for smokers c. Chest CT when a medical doctor has determined the necessity based on the results of an inspection of the aforementioned a. and radiation exposure dose, etc.	a and b : Once a year c : Once a year for smokers and once every 3 years for nonsmokers
Colorectal cancer screening	a. Fecal occult blood test b. Colonoscopy when a medical doctor has determined the necessity based on the results of the test of the aforementioned a. and radiation exposure dose, etc.	a : Once a year b : Once in approximately every 10 years
Thyroid gland inspection	a. Neck ultrasound examination b. Examination of thyroid stimulating hormone (TSH) and free triiodothyronine (free T3) and free thyroxine (free T4) by withdrawing blood sampling when a medical doctor has determined the necessity based on the results of the aforementioned test a. and radiation exposure dose, etc.	a : Once every 3 to 5 years
Other examinations	a. Hepatitis virus screening (HBs antigen and HCV antibody) b. Renal function tests (urea nitrogen, creatinine and uric acid) and serum electrolyte analysis (Na, K, Cl, Ca and P)	a : Once for each worker b : Once a year