

1. Regulation of Dose in Emergency at the TEPCO Fukushima Daiichi Nuclear Power Station (NPS)

Emergency works that began in response to the accident of the TEPCO Fukushima Daiichi NPS caused by the Great East Japan Earthquake of 11 March 2011 were undertaken under high radiation levels and extreme conditions for which normal dose control facilities were ill-equipped to deal with, partially due to the station blackout after the tsunami. There were difficulties in recording the cumulative dose, and delays in monitoring of internal exposure due to insufficient exposure control personnel and equipment. Also, in the summer, workers had to work under the blazing sun, while wearing protective clothing, and some suffered heat stroke. For the problems that occurred, MHLW

issued a series of compulsory directions and administrative guidance to TEPCO and the primary contractors.

This section explains the lessons learned in exposure dose control at the TEPCO Fukushima Daiichi NPS, and shows necessary preparation for responding to future nuclear accidents that may necessitate emergency works. This section explains:

- (a) Problems that occurred after the accident started and the responses by MHLW and TEPCO in Section 1.2;
- (b) The long-term management of health care for emergency workers in Section 1.3; and
- (c) Future actions based on experiences in Section 1.5.

1.1 Temporarily revising emergency dose limits

1.1.1 The increase of emergency dose limits by MHLW Ordinance 2011-23 (Exemption Ordinance)

At the time the accident began at the TEPCO Fukushima Daiichi NPS, emergency dose limits of 100 mSv were in effect for the workers engaged in emergency works based on Regulation on Prevention of Ionizing Radiation Hazards (hereinafter called Ionizing Radiation Ordinance) under the Industrial Safety and Health Act (Act No.57-1972) for the prevention of health impairment.

After its start, radiation protection of workers was also implemented in accordance with the Ionizing Radiation Ordinance. However, consideration for the security of the general public and the prevention of expansion of the nuclear disaster, led to the decision to increase the emergency dose limit in the affected plant to 250 mSv from 100 mSv. This was defined in the Exemption Ordinance of Ionizing Radiation Corresponding to the Situation Resulting from the 2011 Tohoku- Pacific Ocean Earthquake (hereinafter the “Exemption Ordinance”, i.e. MHLW Ordinance 2011-23). This Exemption Ordinance was issued on 14 March 2011, and became effective on 15 March 2011.

Concerning the increase of the emergency dose limits, the points below were taken into consideration:

- According to the International Commission of Radiological Protection (ICRP) recommendation, the emergency dose limit for the “emergency exposure situations in the serious accident” should not exceed approximately 500 mSv, with the exception in the case of life saving actions.
- It is recognized that an exposure dose under 250 mSv may not cause acute radiation symptoms.
- The Radiation Council under the Ministry of Education,

Culture, Sports, Science and Technology (MEXT) agreed that the dose limit was appropriate.

1.1.2 Partial abolishment of increased emergency dose limits for new workers

On 1 November 2011, the emergency dose limit for new workers was decreased to the original (100 mSv) with some exceptions designated by the Minister of MHLW. Exempted works were listed as the emergency works related to responses for the prevention of the loss of cooling systems of nuclear reactors and for the loss of the function of the facilities to suppress the release of radioactive materials to offsite areas when engaged in the works in the reactor buildings and the immediate vicinity for a possible dose rate exceeding 0.1 mSv/h. For the exemptions, the dose limit for emergency works was set as 250 mSv.

1.1.3 The abolishment of the Exemption Ordinance

The exemption ordinance was abolished when Step 2 of the “Road Map towards the Restoration from TEPCO Fukushima Daiichi NPS Accident”, which aimed to achieve long-term stability of the reactors was completed on 16 December 2011.

The dose limit exemption of 250 mSv was applied until 30 April 2012, for those specialists who are highly trained and experienced in operating the reactor cooling systems and in maintaining the facilities for suppressing the emission of radioactive materials (approximately 50 TEPCO employees). For the 20,000 persons who had been engaged in the emergency works, 174 persons had exceeded the 100 mSv emergency dose (including 150 TEPCO employees).

Exposure dose management of emergency workers

3/14/2011	11/1	STEP 2 (12/16)	5/1/2012
Ordinance on Exemption	Revised Ordinance on Exemption + Article 7 of Ionizing Radiation Ordinance	Articles 4 & 7 of Ionizing Radiation Ordinance + transitional measures for the Ordinance to Abolish the Ordinance on Exemption	Articles 4 & 7 of Ionizing Radiation Ordinance
During emergency work period 250mSv (Ordinance on Exemption)	Workers starting to be engaged in emergency work after 1 November	During emergency work period 100mSv (Article 7 of Ionizing Radiation Ordinance (emergency radiation exposure dose limit)) Workers responding to trouble with reactor cooling systems and radioactive materials release suppression systems During emergency work period 250mSv (Revised Ordinance on Exemption)	50mSv/year and 100mSv/5 years Article 4 of Ionizing Radiation Ordinance (Normal radiation exposure dose limit)
During emergency work period 250mSv (Ordinance on Exemption)	Workers who have been engaged in emergency work before 1 November	During emergency work period 250mSv (Transitional measures for the Revised Ordinance on Exemption) *Of 20,000 workers, 174 workers had exposures to radiation doses of more than 100mSv.	Workers engaged in maintaining functions of reactor cooling systems and radioactive materials release suppression systems During emergency work period 100mSv (Article 7 of Ionizing Radiation Ordinance)
250mSv Emergency work period until 30 April 2012 (Transitional measures for the Ordinance to Abolish the Exemption) *Limited to TEPCO employees (about 50)		Workers who possess highly specialized knowledge and experience that are essential for maintaining functions for cooling reactor facilities and of the radioactive material release suppression system, and who have been exposed to radiation doses of more than 100 mSv	

1.2 Problems raised after the accident and the responses by MHLW and TEPCO

The problems that occurred for twenty-two cases are classified into the five categories shown below.

1) Identification of personal involved and dose control (8 cases)

- (1) Poor dose control system at the dose control department
- (2) Insufficient numbers of personal dosimeters
- (3) Lack of dosimeter-lending management
- (4) Delayed notifications to workers
- (5) Delayed monitoring of internal exposure
- (6) Re-evaluation of internal dose assessments
- (7) Additional re-evaluation of internal dose assessments
- (8) Unexpected events including inability to contact the people involved

2) Respiratory protective equipment and protective clothing (4 cases)

- (1) Exceeding emergency exposure dose limit
- (2) Exceeding exposure dose limit for women
- (3) Improper use of respiratory protective equipment
- (4) Improper protective gears

3) Training for new workers (1 case)

- (1) Insufficient training hours for workers

4) Health and medical care system (5 cases)

- (1) Establishment of the medical care system at the affected plant
- (2) Prevention of heat stroke
- (3) Instruction to conduct special medical examinations
- (4) Establishing patient transport systems from the affected plant
- (5) Long-term medical check-up program

5) Preliminary review of work plans (4 cases)

- (1) Poor management systems for developing work plans
- (2) Lack of appropriate work plans
- (3) Insufficient knowledge about contract conditions
- (4) Improvement of the lodging and meals

The responses and actions to these twenty-two cases taken by MHLW and TEPCO are described in the following sections.

1.2.1 Identification of personal involved and dose control

(1) Poor dose control system at the dose control department

As the exposure control systems that were normally used became inoperable due to the tsunami, a significant amount of manual work was required, such as making dosimeter-lending records, inputting dose data and name-based collection and calculation of individual exposure doses. Although the work was eventually taken over by the corporate offices, its progress was delayed due to the many manual records that had to be input. These factors resulted in a substantial delay in the task to accumulate individual exposure dose.

In response to the above, the following actions were taken.

[Actions taken by MHLW]

- MHLW provided guidance for the consolidation of the exposure administration in the corporate offices (23 May 2011).
- MHLW directed the primary contractors with a written notice to submit monthly reports on the status of notifying workers of their exposure doses as well as to

consolidate the exposure administration (22 July 2011).

- MHLW directed organization of a dedicated team to survey workers with whom contact had been lost (10 August 2011).

[Actions taken by TEPCO]

- TEPCO increased the number of staff members in the radiation control department of the corporate offices, inputted data regarding the information in the dosimeter lending record managed at the NPS, and collected and calculated the dose data using spreadsheet software, in accordance with directions. TEPCO was able to submit a report on radiation exposure doses at the end of the subsequent month to MHLW, starting with the data from September 2011.
- The primary contractors established a systematic control organization for exposure control in their corporate offices and reported to MHLW on the status of the exposure dose control on a monthly basis.

(2) Insufficient numbers of personal dosimeters

Many Alarm pocket Dosimeter (APDs) became inoperable after the tsunami. Due to the shortage of APDs, only one APD was given per work group during the period of 15–30 March 2011. TEPCO said it had selected the groups working in areas where exposure was expected to be almost constant. However, using the dose of representative workers could have overlooked some extreme exposures of individual workers because highly radioactive contaminated waste was widely dispersed during this period.

In response to the above, the following actions were taken.

[Actions taken by MHLW]

- MHLW instructed TEPCO to provide each worker with a APD (31 March 2011).

[Actions taken by TEPCO]

- TEPCO obtained APDs from other NPSs and fitted every worker with a APD (1 April 2011).
- TEPCO obtained 4,100 APDs in total for management of the affected plant and 2,200 APDs were made available at J-Village for lending use (as of 17 November 2011)

(3) Lack of dosimeter-lending management

As the normal operating procedures to access controlled areas could not be followed due to the tsunami, TEPCO implemented paper-based dosimeter-lending management, and workers were required to write down their names, affiliations, and radiation exposure doses in the paper-based lending records. However, deficiencies and incorrect information in the records made it difficult to identify individuals and compile name-based consolidated records of doses.

In response to the above, the following actions were taken.

[Actions taken by MHLW]

- MHLW demanded that TEPCO obtain basic information on workers, issue access permits with IDs, and conduct management of entry/exit (23 May 2011).
- MHLW instructed TEPCO to attach a photo to the access permit (7 July 2011).

[Actions taken by TEPCO]

- TEPCO started issuing a “worker identification card” with an ID number at the seismically isolated building (14 April 2011), and at J-Village (8 June 2011); it started writing ID numbers in the dosimeter-lending records.
- TEPCO started identifying individuals based on official documents at J-Village and issuing an access permit with photo ID (29 July 2011).
- TEPCO started using workers’ identification cards in combination with the access permit (8 August 2011).

In addition to the above, MHLW issued the instructions stated below on 29 October 2012, as a solution to the issue that the lower exposure dose was falsely recorded by covering the dosimeter with a lead plate:

- (a) Check the management system of the exposure dose data.
- (b) Use the protective clothing (Tyvek coveralls) with a transparent chest pocket.
- (c) Increase the accuracy of dose monitoring by limiting the wearing of glass badges solely during working hours.
- (d) Record the higher reading of a APD or a glass badge.
- (e) Set the alarm as close as to the reasonable estimated maximum doses as possible.
- (f) Notify workers of their radiation exposure doses by providing written documentation.
- (g) Exchange workers with a high cumulative radiation exposure in a job for workers with a low cumulative radiation exposure, and ensure close communication between the employers and the workers who had received radiation exposure close to the dose limit

(4) Delayed notifications of doses to workers

The normal dose notification system was inoperable due to the tsunami. It took time to manually input dose data which resulted in TEPCO falling behind notifying primary contractors. In addition, the receipts printing system of radiation exposure doses at the time of returning dosimeters was not functioning. Thus, it became difficult for workers to know their own cumulative exposure.

In response to the above, the following actions were taken.

[Actions taken by MHLW]

- MHLW demanded that TEPCO notify workers of their cumulative exposure doses once a week for external exposure and once a month for internal exposure (23 May 2011).
- MHLW demanded that primary contractors submit a report once a month regarding the situation of notifying workers of their radiation exposure doses (22 July 2011).
- MHLW demanded that workers should be issued receipts when returning their dosimeters, starting on 16 August (10 August 2011).

[Actions taken by TEPCO]

- TEPCO was able to notify the primary contractors once a week (reported on 10 August 2011). The receipt showing radiation exposure doses was issued to each worker when returning their dosimeters, starting on 16 August 2011.

(5) Delayed monitoring of internal exposure

Whole-body counters (WBCs) in the NPS became

unavailable, leading to their shortage and that delayed whole body measurements. It also took time to determine an estimation model according to the changes in the target nuclide to be measured as well as to identify the intake date. These factors caused a significant delay in evaluation of the committed dose. In particular, precise measurements were conducted to identify the nuclides at the Japan Atomic Energy Agency (JAEA) and the National Institute of Radiological Sciences (NIRS) for the workers who received high radiation exposure doses, and that took time to determine their committed doses.

In response to the above, the following actions were taken.

[Actions taken by MHLW]

- MHLW demanded that TEPCO measure internal exposure for emergency workers on a monthly basis (23 May 2011).
- MHLW demanded that TEPCO promote internal exposure monitoring and report on the status (22 July 2011).
- MHLW issued warnings of violation of the law to TEPCO and to the employers who had worked in March and had not had their internal exposure measured once within every three months (30 and 31 August 2011).

[Actions taken by TEPCO]

- TEPCO determined the intake dose as that on 12 March 2011 in principle. TEPCO opened the WBC center at J-Village (10 July 2011) and increased the number of WBCs by borrowing three “in-vehicle” type WBCs from JAEA, and purchased new ones. TEPCO secured 11 WBCs in total (18 October 2011).
- TEPCO assessed and determined committed dose with the support of JAEA and NIRS. Monthly monitoring became possible from September 2011.

MHLW identified that there were certain discrepancies between the dose evaluated by the primary contractors and the dose by TEPCO.

(6) Re-evaluation of internal dose assessments

It was noticed that there were significant discrepancies between internal dose assessments of emergency workers made by TEPCO and those reported by primary contractors which were reported to MHLW in April 2013.

In response to the above, the following actions were taken.

[Actions taken by MHLW]

- MHLW decided to re-evaluate the doses reported since May 2013, and some of the committed doses were re-adjusted based on the re-evaluation.
 - (a) MHLW readjusted committed doses based on the standardized method;
 - Standardization of the estimation methodologies of internal dose assessments (intake date, intake scenario, and estimation of I-131 exposure, etc.) in accordance with TEPCO’s methodologies as determined in August 2011.
 - Readjustment of committed doses of 450 workers
 - 1) Increased doses: 431 workers (Max. 48.9 mSv, Ave. 5.0 mSv).
 - 2) Decreased doses: 19 workers (Min. 9.2 mSv, Ave. 2.1 mSv).
 - (b) MHLW corrected miscalculated committed doses (29 workers).

- Miscalculations and errors were found such as incorrect inputting of coefficients, mixing up of data, transmitting data to the wrong contractor, and omitting input of revised data transmitted from TEPCO, etc. into the database.
- Correction of 29 committed doses of workers among 7 contractors (corrections ranged from 3.5 mSv to 18.1 mSv).
- MHLW demanded that TEPCO and primary contractors employ the standardized methodologies for internal dose assessments; all parties were strictly instructed to prevent the recurrence of miscalculations and errors related to internal dose assessments (5 July 2013).

Detailed information is available at:

https://www.mhlw.go.jp/english/topics/2011eq/workers/tepcorprpr_130705.html

(7) Additional re-evaluation of internal dose assessments

In addition to the above, it was found that TEPCO had data on committed effective doses assessed by a method other than the standard methods at the end of January 2014.

Actions taken by MHLW

- MHLW examined data on emergency workers' committed effective doses to ascertain whether there were any other similar cases since February 2014. Examined data were for 6,245 emergency workers, excluding those covered by the previous re-evaluation, from a total of 7,529 emergency workers (data for workers engaged in March and April 2011). This examination revealed that the data for 1,536 emergency workers were suspected to have been obtained by methods other than the standard assessment methods.
- MHLW instructed TEPCO and primary contractors to re-evaluate these data. Consequently, the committed effective doses for 142 emergency workers were readjusted.
- MHLW provided TEPCO with guidance on the following matters.
 - (a) The internal audit sector should inspect the sector in charge of radiation dose control, check the workflow of its operations and data management, etc., and take necessary remedial actions.
 - (b) Before externally reporting or announcing radiation exposure doses, the data should be checked by a person in a quality assurance sector, in principle.
- MHLW instructed primary contractors that independently assess committed effective doses about thorough preservation of all the records, etc.

Detailed information is available at:

https://www.mhlw.go.jp/english/topics/2011eq/workers/tepcorprpr_140325.html

(8) Unexpected events including inability to contact the people involved

It was found that a number of workers could not be identified in the name-based consolidated record (174 individuals, a tentative maximum as of 29 July 2011), during the time that the handwritten dosimeter-circulating record was used for management.

In response to the above, the following actions were taken.

Actions taken by MHLW

- MHLW demanded that TEPCO ask the primary contractors for cooperation and release the information about missing workers, by name, on TEPCO's website (20 June 2011).
- MHLW demanded that TEPCO correct the problem of the missing individuals, such as by verifying with other primary contractors groups and checking for overlaps of similar names (13 July 2011).
- MHLW demanded the primary contractors consolidate exposure control and add a photo to each worker's identification card (22 and 29 July 2011).
- MHLW directed TEPCO to organize a dedicated team to survey workers who could not be contacted (10 August 2011).

Actions taken by TEPCO

- TEPCO, in cooperation with the primary contractors' offices on site, found missing workers one by one by checking the original records, checking for an overlap in similar names, having them confirmed by the primary contractors, making use of professional investigation agencies, and making those missing individuals' names public. However, ten individuals are still missing.

1.2.2 Respiratory protective equipment and protective clothing

(1) Exceeding emergency exposure dose limit

The assessment of internal exposure revealed that 6 emergency workers exceeded the dose limit of 250 mSv (revealed on 10 June 2011; 678 mSv was the highest). This presumably occurred because the workers did not use the charcoal filter cartridge in the respiratory protective equipment, and ate and drank in the main control room, where the concentration of radioactive materials had increased after the hydrogen explosion. (12 March 2011)

In response to the above, the following actions were taken.

Actions taken by MHLW

- MHLW instructed TEPCO that the workers who had worked in the main control room right after the hydrogen explosion, and those whose radiation exposure dose had tentatively exceeded 100 mSv should be stopped from undertaking any radiation work until their doses were determined. TEPCO was also instructed to immediately exclude the 12 workers whose tentative doses had exceeded 200 mSv from emergency works (3 June, 7 June, and 13 June 2011).
- MHLW performed on-site inspections (7 June and 11 July 2011) and demanded that TEPCO correct violations, these were making workers continue at their job when having a dose in excess of 250 mSv (10 June 2011), and failing to require that workers use effective respiratory protective equipment and failing to prohibit them from eating and drinking in contaminated areas (14 July 2011).

Actions taken by TEPCO

- TEPCO excluded the relevant workers from the work that might cause exposure until their doses were determined, and excluded those whose exposure dose exceeded 200 mSv from any work at Fukushima Daiichi NPS in accordance with instructions (reported on 13 June 2011).

(2) Exceeding exposure dose limit for women

The assessment of internal exposure revealed that 2 female workers had exceeded the dose limit of 5 mSv in March (revealed on 27 April 2011; 17 mSv was the highest). While the female workers had been engaged in support tasks in the seismically isolated building since the accident occurred (11- 23 March 2011), the flow of radioactive materials into the building could not be avoided due to the distortion of the entrance door caused by the hydrogen explosion. It should be noted that local exhaust ventilation equipment was later installed and the windows were shielded with lead.

In response to the above, the following actions were taken.

Actions taken by MHLW

- MHLW performed an on-site inspection (27 May 2011) and demanded that TEPCO correct violations which had caused female workers to be exposed in excess of 5 mSv in March (30 May 2011).
- MHLW also instructed TEPCO to ensure exposure dose control for all workers, monitor their health regularly at the site, and to assess the internal exposure of the 2 female workers after excluding them from the work.

Actions taken by TEPCO

- TEPCO decided not to assign women to tasks in the area of the affected plant.

(3) Improper use of respiratory protective equipment

TEPCO failed to provide sufficient explanation with the instructions on how to wear respiratory protective equipment in the education of new workers. Thus, there were still workers who received internal exposure, even in June.

(a) Improper fitting of respiratory protective equipment

The survey on fitting respiratory protective equipment conducted on 26 September 2011 indicated that the leakage rate of respiratory protective equipment was particularly high for those wearing glasses (56% at the highest, 17% on average).

(b) Neglecting to attach filters

One of the workers of a primary contractor was found working near Unit 2 without a charcoal filter cartridge on his full-face mask (13 June 2011). A similar case occurred on 29 June 2011, suggesting that workers had not been well informed about the need to wear respiratory protective equipment.

(c) Contamination inside of respiratory protective equipment

Contamination was found on the inner surface of the mask filters used by 4 workers (14 September 2011). Several similar cases were subsequently found.

In response to the above, the following actions were taken.

Actions taken by MHLW

- Instructions were given to inform workers of the procedures for wearing respiratory protective equipment, to ensure that workers follow the rules regarding the correct way of wearing protective equipment, to provide education, and to post instructions on how to wear respiratory protective equipment (22 June 2011).
- Instructions were given to establish work procedures for surveying contamination of respiratory protective equipment filters (5 October 2011).
- TEPCO was instructed to:

- 1) Take necessary measures for workers wearing glasses

such as giving them sealing pieces to attach to the frames of the eyeglasses to cut leakage;

- 2) Provide more masks so workers could choose one that was best suited to their own face;
- 3) Show workers how to perform fitting tests;
- 4) Introduce respiratory protective equipment with electric powered fans; and
- 5) Improve the contents of the training workers received, based on the results of leakage rate tests using a mask fitting tester (26 September 2011).

Actions taken by TEPCO

- Respiratory protective equipment were sorted by their product makers and sizes in accordance with the instruction so that workers could choose masks suited to their faces more easily (27 September 2011).
- TEPCO started to provide new workers with training about using fitting testers (17 November 2011).
- Masks with electric powered fans were introduced (25 August 2011).

(4) Improper protective gears

(a) The case that a worker soaked his feet in highly contaminated water

A worker who was wearing short mid-calf boots soaked his feet in water (30 cm deep) during work. This caused the skin on both feet to become contaminated (beta ray exposure) (24 March 2011), the radiation dose in the work area had not been monitored before starting work, the worker did not wear high boots, and the worker continued to work although his dosimeter alarm was sounding.

(b) The cases that highly contaminated water was poured over workers

A worker was contaminated when contaminated water was unintentionally poured over his head while he was working to discharge water in the tank of the contaminant removal plant. He was not wearing a hooded, waterproof garment. Another worker, also not wearing a hooded, waterproof garment, was engaged in handling hoses and became contaminated by water (both occurred on 31 August 2011).

In response to the above, the following actions were taken.

Actions taken by MHLW

- MHLW instructed TEPCO to establish a safety and health administration system (24 March 2011).
- MHLW issued guidance to TEPCO and the primary contractors to:
 - 1) Monitor the radiation doses in the work area before starting work in order to understand the contamination level and decide on work procedures;
 - 2) Ensure that workers evacuate when alarms of dosimeters go off and that workers wear effective protective garments and footwear according to the contamination level of the work area (26 March 2011).
- MHLW instructed TEPCO to make its best effort to determine the causes of the incidents and prevent their recurrence (1 September 2011).
- MHLW performed on-site inspections (27 May and 28 September 2011) and demanded violations be corrected by the employers who:

- 1) had not made workers wear suitable footwear (high boots) (in the case of the beta ray exposure on 24 March) (30 May 2011); and
- 2) had not made workers wear effective protective clothing (hooded, waterproof protective clothing) (the cases on 31 August 2011) (5 October 2011).

[Actions taken by TEPCO]

- TEPCO ensured that workers put on rubber boots, and required workers who might be exposed to contaminated water to wear hooded, waterproof garments.

1.2.3 Training for new workers

(1) Insufficient training hours for workers

In the beginning (until around May), only 30 minutes were spent in worker education on the effects of radiation, how to control radiation dose, and the use of protective equipment; this was done at J-Village with instructional materials developed by TEPCO. In addition, the classroom where the worker education program was given was too small. The classroom accommodated only around 20 people per 30 minute session.

In response to the above, the following actions were taken.

[Actions taken by MHLW]

- MHLW instructed TEPCO and the primary contractors to educate new workers on radiation hazards, the use of protective equipment, and the actions and evacuation methods to take in an emergency (13 May, 23 May and 22 July 2011).

[Actions taken by TEPCO]

- TEPCO started a new worker education program in Tokyo from 19 May 2011 and the special education program at J-Village from 8 June 2011 to both TEPCO staff and contractors. Arrangements were made to secure sufficient classroom space.

1.2.4 Health and medical care system

(1) Establishment of the medical care system at the affected plant

TEPCO was able to provide physicians only intermittently at the affected plant. In the first month after the accident, 25 workers became sick or were injured, and 31 workers complained of poor health. One case of a worker suffering a heart attack was reported on 14 May 2011, and this incident showed the urgent need for an emergency clinic that provides 24-hour medical services by physicians. However, securing a qualified staff of physicians, nurses, and radiological technologists has posed a great challenge, and establishing the emergency clinic turned out to be extremely difficult.

In response to the above, the following actions were taken.

[Actions taken by MHLW and relevant ministries (MEXT etc.) and agencies]

- The Fukushima Prefectural Labour Bureau (PLB) demanded that TEPCO ensure workers' mental and physical health.
- The Fukushima PLB contacted and coordinated with the relevant ministers and sent hospitals a request letter for clinic staff under the name of the Director of the Occupational Safety and Health Department.

- The Fukushima PLB was allocated radiological technologists for the clinic, in cooperation with the Association of Radiological Technologists (September 2011).
- MEXT sent the PLB request to a wider range of radiation medicine institutions and was able to secure the dispatch of nurses.
- MHLW also asked the Japan Labour Health and Welfare Organization to steadily supply medical staff from November 2011.
- The University of Occupational and Environmental Health began to dispatch physicians who provide services mainly during the daytime (15 May 2011). A system to ensure the 24-hour on-site presence of physicians was established on 29 May 2011 with the arrival of physicians dispatched from Rosai Hospitals (hospitals for labourers) managed by the Japan Labour Health and Welfare Organization. Subsequently, the plant site clinic was relocated to J-Village (September 2011).
- The National Defense Medical College started dispatching teams of critical incident stress specialists (10 July 2011). The teams provide mental health services on a monthly basis.

[Actions taken by TEPCO]

- TEPCO opened the on-site makeshift medical clinic at Units 5 and 6 in July 2011. More physicians were allocated in September 2011 to the clinic in J-Village in order to provide the initial treatment and triage and routine preventative health care.

(2) Prevention of heat stroke

It has been a concern since May 2011 that emergency workers might be at risk of occupational hazards derived from heat stroke while working for long hours under the blazing sun while wearing heavy equipment, such as a full-face mask, Tyvek coveralls, and rubber gloves.

In response to the above, the following actions were taken.

[Actions taken by MHLW]

- MHLW demanded that TEPCO undertake the following:
 - a) Suspend work from 2 p.m. to 5 p.m. in July and August;
 - b) Shift working hours to early morning, and specify the maximum number of consecutive working hours;
 - c) Check workers' health prior to work, make available air-conditioned rest places where workers can remove their full-face masks;
 - d) Conduct education for the prevention of heat stroke;
 - e) Establish a medical care system (10 June 2011).
- MHLW demanded that TEPCO attach checklists for heat stroke prevention measures when they submit work plans to the inspection office.

[Actions taken by TEPCO]

- TEPCO took measures in addition to the instructions by the MHLW, including the following:
 - a) Distribution of cool vests (vests with refrigerant gel)
 - b) Provision of the wet bulb globe temperature (WBGT) through the internet
 - c) Display the daily warning level for heat stroke at workplaces.

- TEPCO also required workers showing symptoms of mild heat stroke to take a break and a rest. As a result, although 40 patients with heat stroke symptoms were observed, no serious cases were reported.

(3) Instructions to conduct special medical examinations

Considering that exposure exceeding the normal exposure dose limit may cause acute radiation syndrome, special medical examinations conducted every six months would be too late to detect acute radiation damage. The more time that was spent on emergency works, the larger the numbers of workers who were subject to medical examinations. This made it difficult to collect information on the multiple-layered contractors, and the percentage of workers who undertook medical examinations was as low as 60% as of June 2011.

In response to the above, the following actions were taken.

[Actions taken by MHLW]

- MHLW issued the compulsory instruction to TEPCO, under Article 66, paragraph 4, of the Industrial Safety and Health Act, to conduct special medical examinations including blood tests, skin test, and weight measurement, and specified the number of days after the completion of emergency works that the examinations must be taken within under the assumption of a short-term emergency works (16 March 2011).
- Additionally, MHLW re-issued instruction to TEPCO to conduct medical examinations for workers who were exposed to more than 100 mSv and who worked for more than 1 month (25 April 2011).
- In efforts to raise the implementation rate of medical examinations, MHLW regularly investigated the status of conducting the medical examinations and gave instructions to TEPCO and the primary contractors (May and June 2011).

(4) Establishing patient transport systems from the affected plant

In order to transport potentially seriously injured workers from the affected plant, a faster way to transport patients to a hospital was required, because 1-2 hours were needed to transport the patients via J-Village to hospitals. To shorten the transportation time, the MHLW tried to establish efficient patient transportation systems, including direct access of local ambulances to the plant and helicopter airlift to a hospital. The MHLW, however, faced difficulties in making arrangements with the hospitals expected to receive the patients.

In response to the above, the following actions were taken.

[Actions taken by MHLW]

- MHLW staff visited hospitals in Iwaki City and explained decontamination conditions that would allow the hospitals to accept direct patient transportation from the NPS. As a result, in August 2011, non-contaminated patients were allowed to approach hospitals directly from the plant.
- MHLW directed TEPCO to prepare a heliport to be used for an air ambulance, persuaded a helicopter operation company to join the work, and coordinated as a liaison regarding test flights to be conducted by a TEPCO affiliated company.

[Actions taken by TEPCO]

- TEPCO conducted direct transport of non-contaminated patients to hospitals without going through J-Village so that

it was not necessary to decontaminate or transfer a patient to another vehicle (August 2011).

- An agreement was reached with the operation company to locate a heliport in the Fukushima Daini NPS, 13km from the affected plant, instead of using the Hirono town playground near J-Village, 20 km from the affected plant. (February 2012).

(5) Long-term medical check-up program

In addition to the compulsory medical examinations, it became necessary to examine workers who exceeded the normal dose limit of 50 mSv/y and those who exceeded the emergency exposure dose limit of 100 mSv. It also became necessary to conduct health consultations for workers about their long-term mental and physical health.

In response to the above, the following actions were taken.

[Actions taken by MHLW]

- MHLW established the Minister's guidelines pursuant to Item 2, Article 70 of the Industrial Safety and Health Act (11 October 2011). In the guidelines, the employers should basically be required to conduct long-term healthcare. However, the Government should conduct it for the workers who changed their jobs to those that are not related to radiation works, those who are continuously employed by the firms (small to midsize only) but not engaged in radiation work, and persons who are not currently employed.
- As additional medical examinations, MHLW decided to provide cataract eye examinations, for the workers who exceeded 50 mSv, and thyroid examinations and cancer screenings, (stomach, lung, and colon) for those whose dose exceeded 100 mSv, in accordance with the report provided by the experts' meeting.
- The MHLW compiled a report on methods for providing health care and exposure dose control during emergency works in nuclear facilities (1 May 2015). In this report, the items that should be provided to workers were compiled regarding the following items:
 - 1) Long-term health care including the period after termination of employment, such as the medical examination of emergency workers
 - 2) Healthcare during emergency works
 - 3) Ensuring a medical care system in nuclear facilities during emergency works
 - 4) Mid- to long-term exposure dose control to be provided to the workers whose exposure doses exceed the dose limit for regular radiation works
 - 5) Exposure dose control during emergency works
 - 6) Special education to the emergency workers who will be engaged in exceptional emergency works

1.2.5 Preliminary review of work plans

(1) Poor management systems for developing work plans

During the first month from the start of receiving work plans, a large number of plans were submitted from TEPCO in which many deficiencies were found. It took a lot of time to revise the work plans in spite of having provided correction instruction afterwards. As there was no other backup organization to

revise the work plans at that time, the persons in charge at the plant could not respond to reminder notices.

In response to the above, the following actions were taken.

[Actions taken by MHLW]

- The Tomioka Labour Standards Inspection Office developed a review standard and prepared instruction materials to be made available at its office, and continued to give instructions to the persons in charge at the plant.
- MHLW guided the corporate offices to improve the situation by strengthening the organizations involved and increasing the numbers of staff members for the tasks at both the affected plant and corporate offices (30 June 2011). MHLW provided the on-site review service at J-Village on a regular basis.

[Actions taken by TEPCO]

- TEPCO increased the number of staff members to prepare work plans, and defined the roles of the NPS and corporate offices (reported on 13 July 2011).

(2) Lack of appropriate work plans

MHLW directed the primary contractors conducting work activities associated with doses exceeding 1 mSv per day to submit a radiation work plan to the relevant inspection office (23 May 2011). A lot of deficiencies were found in the submitted requests such as excessive length of the work period, improper personnel in charge, unrealistic estimation of the maximum radiation exposure dose, improper use of dosimeters (glass badges, ring badges, and alarm settings), and lack of identification of the work location and work description.

In response to the above, the following actions were taken.

[Actions taken by MHLW]

- MHLW developed review standards and prepared instruction materials to be made available at the office and continuously gave instructions to the staff in charge.

(3) Insufficient knowledge about contract conditions

Information obtained by TEPCO on the relationship among subcontractors, the number of subcontractors and workers, and whether training and medical examinations were provided at the time of employment was not sufficient.

In response to the above, the following actions were taken.

[Actions taken by MHLW]

- MHLW interviewed the primary contractors about the situation of exposure dose control (from late May to mid-

June 2011).

- MHLW requested the primary contractors to report the current contract conditions (relationship among subcontractors, the number of subcontractors and workers, and whether education and medical examinations were provided at the time of employment) on a monthly basis (notified on 27 June 2011).

(4) Improvement of the lodging and meals

Many workers were unable to go back home or to their usual dormitories because the area within the 20 km radius from the affected plant was designated as the restricted area. Furthermore, many workers had to stay near the plant in preparation for any unexpected events. As a result, many workers were forced to sleep all crowded together on the floor in the seismically isolated building of the affected plant or the gymnasium of Fukushima Daini NPS, 13 km from the affected plant. In addition, the meals served were processed food in retort pouches in order to prevent internal exposure. Because workers were engaged in hard work without sufficient rest nor nutritious meals, there were concerns about worsening workers' health and occurrence of an accident caused by their operational errors.

In response to the above, the following actions were taken.

[Actions taken by MHLW]

- MHLW demanded that TEPCO undertake the following actions (20 April 2011):
 - (a) Reserve sleeping areas equipped with bedding and other required supplies.
 - (b) Take preventive measures against infectious diseases.

[Actions taken by TEPCO]

- (a) TEPCO installed double-deck beds and supplied bedclothes for 240 workers in the gymnasium at Fukushima Daini NPS and installed equipment for 30 showers in the gymnasium and 42 double-deck beds in the seismically isolated building.
- (b) TEPCO built a temporary dormitory at J-Village that accommodated 1600 workers.
- (c) TEPCO changed meals from ready-made food in retort pouches to fresh boxed lunches in response to the decrease of possible contamination by radioactive materials and reopened the restaurant in J-Village.
- (d) TEPCO reopened the restaurants in the main administration building at Fukushima Daini NPS (18 June 2012).

1.3 Health management at the TEPCO Fukushima Daiichi NPS

1.3.1 The status of long-term health control at the TEPCO Fukushima Daiichi NPS

MHLW established a ministerial guideline "Guidelines on Maintaining and Improving Health of Emergency Workers at the TEPCO Fukushima Daiichi NPS" on 11 October 2011 (see 3.1 (3) for revision). The *Guidelines* describes "Actions for long-term health control", "Development of a database for workers who have engaged in emergency works" and "Support provided

by the Government".

Based on the guidelines, MHLW and TEPCO are implementing long-term health control such as cancer screenings etc. corresponding to the exposure dose values for the workers who had been engaged in the emergency works at the TEPCO Fukushima Daiichi NPS.

The implementation status of "long-term health management of emergency workers" was updated to that as of October 30, 2025 by the TEPCO.

(1) Status of registration card issuance

Out of 19,812 emergency workers, 19,714 workers (99.5%)

were issued registration cards. Out of 98 workers who were not issued the cards, 18 workers had unknown addresses and excluding 80 who workers died or refused to receive their cards.

(2) Status of handbook for recording radiation exposure doses (handbook) issuance

Out of 911 designated emergency workers, 897 workers (98.5%) were issued handbooks. In February 2013, a document that recommended the handbook application was delivered to the employers of the designated workers. Recommendation of application etc. will be continued in the future.

(3) Status of health consultation or guidance to emergency workers at the support desk (From April 2024 to March 2025)

There were 219 consultations cases, of which 117 cases were long-term health control, and 10 cases were about radiation exposure and health effects.

1.3.2 Awarded compensation as occupational disease caused by ionizing radiation exposure

Regarding the award of compensation to occupationally-exposed workers through the Industrial Accident Compensation Insurance scheme, the criteria were established by the Japanese Government. Provided that these criteria are met based on discussion in a Review Committee consisting of experts of medicine, epidemiology, or radiation protection, workers shall be awarded compensation. The criteria include the previous occupational exposure history until diagnosis of the malignancy such as the effective dose and the time between first occupational exposure and diagnosis of the malignancy. Scientific attribution is not equivalent to legal imputation in an occupational context. Therefore, the granting of these awards does not imply a scientifically proven cause-effect relationship between radiation exposure and any particular case of cancer. Rather, it is the result of the application of criteria.

• Leukemia

A request for approval of a claim for occupational disease was made by a worker as he had developed leukemia due to his engagement in radiation work at the TEPCO Fukushima Daiichi NPS.

MHLW held Review Committee consisting of experts of medicine, epidemiology, or radiation protection to discuss the case. As a result, in October 2015, MHLW found it appropriate to award compensation a claim for occupational disease for the first time since the accident at the TEPCO Fukushima Daiichi NPS.

With respect to leukemia due to occupational exposure, MHLW established criteria for the award of compensation to occupationally-exposed workers* and Review Committee examine each case to give advice on whether the exposure should be awarded by the insurance.

* Criteria for occupational disease approval for occurrence of leukemia :

- 1) Exposure to an equivalent amount of ionizing radiation (5 mSv times the number of years between (first) exposure and diagnosis of the malignancy).
- 2) Onset of leukemia after a period of at least 1 year after the first exposure.

In addition, in August 2016, MHLW awarded compensation based on the above approval criteria by medical review panel the second case of occupational disease of worker who developed leukemia after the accident at the TEPCO Fukushima Daiichi NPS. The third case was awarded compensation by MHLW in December 2017. The fourth case was awarded compensation by the MHLW in December 2022, the fifth case in March 2023, the sixth and the seventh case in March 2024 and the eighth case in October 2025. In December 2022, Polycythemia vera which is related to leukemia was awarded compensation as an occupational disease based on approval criteria for leukemia.

• Thyroid cancer

In December 2016, MHLW compiled medical knowledge on thyroid cancer and radiation exposure in a report after review meeting of medical experts, and published its preliminary view on compensation for an occupational disease as indicated below.

MHLW's preliminary view on compensation for an occupational disease concerning thyroid cancer and radiation exposure:

- 1) The radiation exposure dose should not be less than 100 mSv.
- 2) The onset of cancer must be at least 5 years after their first exposure to radiation.
- 3) Consideration is given to risk factors other than radiation exposure (e.g., fecundity, artificial menopause, and iodine uptake).

In the same month, based on the above preliminary view on compensation for an occupational disease, MHLW awarded compensation a case of thyroid cancer developed in a worker after the accident at the TEPCO Fukushima Daiichi NPS, as an occupational disease in light of the deliberations by medical experts. The second case was awarded compensation by MHLW in December 2018.

• Lung Cancer

In January 2015, MHLW compiled medical knowledge on lung cancer and radiation exposure in a report resulting after review meeting of medical experts, and published the preliminary view on compensation for an occupational disease as indicated below.

MHLW's preliminary view on compensation for an occupational disease concerning Lung Cancer and radiation exposure:

- (1) The radiation exposure dose should not be less than 100 mSv.
- (2) The appearance of cancer must be at least five years after their exposure to radiation.
- (3) Consideration is given to risk factors other than radiation exposure (e.g., smoking and asbestos).

The first claim for case of lung cancer was awarded compensation by MHLW in August 2018, and this was also the first fatal case. The second case was awarded compensation by MHLW in March 2024.

- **Pharyngeal Cancer**

In September 2021, MHLW compiled medical knowledge on pharyngeal cancer and radiation exposure in a report resulting after review meeting of medical experts and awarded compensation two cases of workers' compensation for an occupational disease.

MHLW's preliminary view on compensation for an occupational disease concerning pharyngeal cancer and radiation exposure is as below:

- (1) The radiation exposure dose should not be less than 100 mSv.
- (2) The appearance of cancer must be at least 5 years after their exposure to radiation.
- (3) Consideration is given to risk factors other than radiation exposure (e.g., smoking, alcohol consumption, EB virus).

- **Colon cancer**

In September 2012, MHLW compiled medical knowledge on colon cancer and radiation exposure in a report resulting after review meeting of medical experts, and published the preliminary view on compensation for an occupational disease as indicated below.

MHLW's preliminary view on compensation for an occupational disease concerning colon cancer and radiation exposure is as below:

- (1) The radiation exposure dose should not be less than 100 mSv.
- (2) The appearance of cancer must be at least 5 years after their exposure to radiation.
- (3) Consideration is given to risk factors other than radiation exposure (e.g., alcohol consumption and obesity). The first claim for case of colon cancer was awarded compensation by MHLW in July 2025. In addition, the second case in October 2025.

1.4 Implementation status of measures against exposure to ionizing radiation in decommissioning works

In order to ensure the working conditions as well as the industrial safety and health of workers engaged in decommissioning works at the TEPCO Fukushima Daiichi NPS, the Fukushima Prefectural Labour Bureau provided employers of such workers with focused supervision and instruction. As a result of supervision and instruction provided for 724 employers by 30 September 2015, 409 employers were identified to be violating laws and ordinances related to the labour standards, namely, the Labour Standards Act and the Industrial Safety and Health Act, in some form (violation rate: 56.5%). The total number of violation cases was 656, where violations related to working conditions were found in 406 cases and violations related to industrial safety and health in 250 cases. For the employers discovered to be violating laws and ordinances,

the Fukushima Prefectural Labour Bureau provided instruction towards rectification. Additionally, the Bureau has provided instruction on appropriate implementation of measures stipulated in the “Guidelines on occupational safety and health management at the TEPCO Fukushima Daiichi Nuclear Power Station” formulated on 26 August 2015 (Partially revised: April 2023, March 2025 and May 2025). As a result of inspections for 319 employers involved in decommissioning work at the Fukushima Daiichi Nuclear Power Station and decontamination work in Fukushima Prefecture from January to December 2024, the number of violations was revised.

1.5 Recommendations for emergency work at nuclear facilities

On 10 August 2012, in response to the issues that were shown in previous sections, MHLW demanded the employers who operate nuclear facilities to prepare for nuclear accidents that may necessitate emergency works and also to prepare for the actions that may need to be taken when an accident occurred. This section shows accident preparations, and the actions to be taken at the time of an accident by the employers in response to the directions.

The guidance document is available at;
https://www.mhlw.go.jp/english/topics/2011eq/workers/tepcorp/pr_120810.html

1.5.1 Identification of personal involved and dose control

(1) Poor dose control system at the dose control department

(a) Preparations to be made by the employers

[Actions taken at the nuclear facilities including NPSs (hereinafter referred to as “the nuclear facility”)]

- Develop a plan in preparation for emergency works to establish an organization to consolidate the radiation control of all the emergency workers (hereinafter referred to as “systematic control organization”) in the nuclear facility (or the corporate offices if it is beyond the ability of the nuclear facility).
- Develop an emergency action plan for the case that the normally used systems become unavailable for exposure dose control, and prepare for increasing staff members to be engaged in temporarily exposure dose control.

[Actions taken by the primary contractors]

- Establish the management system for dose control in emergency situations, as well as educate and train staff members to perform radiation control.

[Actions taken in the corporate offices or at the facilities with the functionality of the nuclear department in the corporate offices, excluding at the nuclear facilities (hereinafter “the corporate offices”)]

- If necessary, develop a plan in advance to establish systematic control organization in the corporate offices.
- In preparation for supporting radiation control in the corporate offices and dispatching staff to help at the nuclear

facility, make a staff list, provide required preliminary education and training to inexperienced staff members, and establish a system in the corporate offices for being able to increase the number of staff members temporarily.

(b) Post-accident actions to be taken by the employers

[Actions taken at the nuclear facility]

- Establish a system for exposure dose control such as by temporarily increasing the number of staff members in charge of dosimeter-lending for the case that the systems normally used are not available.

[Actions taken by the primary contractors]

- Ensure a system for exposure dose control such as by temporarily increasing the number of staff members carrying out radiation control in each primary contractor, and establishing an organization that can consolidate radiation exposure doses of workers under all the involved subcontractors.

[Actions taken in the corporate offices]

- Check the system for exposure dose control at the nuclear facility, and provide support such as by dispatching staff members from the corporate offices, as appropriate.
- Check the situation in exposure data inputting work at the nuclear facility and, if there are any problems in the system for exposure dose control, obtain the administrative documents from the said facility and perform exposure dose control directly including the exposure data input and name-based dose consolidations in the corporate offices.

(2) Insufficient numbers of personal dosimeters

(a) Preparations to be made by the employers

[Actions taken at the nuclear facility]

- Prepare sufficient numbers of extra APDs that can be used during emergency works (including battery chargers and emergency power generators, if non-battery-powered) (hereinafter all APDs and their auxiliary equipment are referred to as “APDs”).
- Make agreements with other nuclear facilities in advance to supply sufficient number of APDs for all emergency workers (including those who are not engaged normally in radiation works).

Actions taken in the corporate offices

- Support the nuclear facility such as by discussing and making an agreement with other corporate offices for borrowing APDs.

(b) Post-accident actions to be taken by the employers

Actions taken at the nuclear facility

- Check whether or not sufficient APDs are available immediately after the occurrence of an accident.
- Once the shortage of APDs is found, borrow them immediately from other nuclear facilities in accordance with the agreement made in advance.

Actions taken in the corporate offices

- Check if a sufficient number of APDs are available at the nuclear facility, and if required, provide support to allow the nuclear facility to obtain APDs from other nuclear facilities, as appropriate.

(3) Lack of dosimeter-lending management

(a) Preparations to be made by the employers

Actions taken at the nuclear facility

- In the case that the normally used system becomes unavailable, issue access permits with both personal identification numbers (hereinafter referred to as “ID number(s)”) and photos, and build a backup system in advance that can control exposure dose by the ID number on mobile personal computers or computer systems that can be used in emergency situations (hereinafter referred to as “the backup system”).
- In the case that the backup system is not operable, establish in advance an administrative list form to be filled in by hand and the administration method using the central registration number for each worker’s radiation passbook and driver’s license number (if it is difficult to use those, a combination of date of birth and name) as a temporary ID number (hereinafter referred to as “the temporary ID number”).
- Conduct training on a regular basis so as to implement the management stated in (1) and (2) immediately in emergency situations.

Actions taken in the corporate offices

- In the case that the backup system is not operable at the nuclear facility, set up a backup system in the corporate offices as well. Note, however, that this may not apply to the case that the backup system is installed in the seismically-isolated buildings located at a sufficient isolation distance and consisting of structures and equipment that can maintain internal radiation protective functions (hereinafter referred to as “the seismically isolated building”) even if a hydrogen explosion occurs in a nuclear reactor or its vicinity.

(b) Post-accident actions to be taken by the employers

Actions taken at the nuclear facility

- Make a backup system available.
- Use the hand-written administrative list to manage dosimeters using temporary ID numbers until the backup system is running.
- Once the backup system is running, verify individuals based on official documents, issue access permits, lend dosimeters based on the ID number, and record radiation exposure doses.

Actions taken by the primary contractors

- Ensure proper management of the access permit to prevent its use by anyone except the registered worker.

Actions taken in the corporate offices

- Check the situation of the dosimeter lending administration in the nuclear facility, and provide support such as by making a backup system in the corporate offices operable, as appropriate.

(4) Delayed notifications of dose to workers

(a) Preparations to be made by the employers

Actions taken at the nuclear facility

- Ensure that the backup system prepared for unavailability of the normally used system provides the function of issuing receipts to workers providing them with a written notice of their daily radiation exposure doses.
- Specify in advance the procedures for immediately informing the primary contractors of the input data when it is necessary for the corporate offices to undertake inputting of doses.

Actions taken in the corporate offices

- Plan in advance the procedures for immediately informing the nuclear facility of the dose data at the corporate offices, if the corporate offices are required to do so after the accident.
- For the case that the backup system is not operable at the nuclear facility, set up a backup system with a function to issue receipts in the corporate offices. Note, however, that this may not apply to the case that the backup system is located in the seismically isolated building. (Repeated notice was given for this action.)

(b) Post-accident actions to be taken by the employers

Actions taken at the nuclear facility

- Make a backup system operable, and issue receipts of radiation exposure doses to workers.
- While the backup system is unavailable, issue a written notice of radiation exposure doses to workers at the time of returning dosimeters (hand-written memos are acceptable).
- Immediately inform the primary contractors of the radiation exposure dose data inputted.

Actions taken by the primary contractors

- Immediately notify all the workers under the involved subcontractors through the said subcontractors of the dose data obtained from the nuclear facility.

Actions taken in the corporate offices

- Check the situation in dose data input and notification among employers at the nuclear facility, and perform the tasks such as data input in the corporate offices, as appropriate.
- If the data input task is performed in the corporate offices, provide the input data to the nuclear facility immediately.

(5) Delayed monitoring of internal exposure

(a) Preparations to be made by the employers

Actions taken at the nuclear facility

- In order to measure internal exposure, specify in advance the places to locate mobile WBCs which will be borrowed in case of an accident under the prior agreements made by the relevant corporate offices.

- Develop in advance the method for evaluating internal exposure in emergency situations, such as identifying the date of ingestion or inhalation through a study of worker behavior.

Actions taken in the corporate offices

- For the agreements stated in above, provide support such as by negotiating and concluding agreements with the corporate offices of other utilities and organizations, as appropriate.
- Develop in advance an assessment model to evaluate exposure to radionuclides of cesium and/or radionuclide of iodine after accidents in cooperation with JAEA and NIRS (hereinafter referred to as “the Advanced Radiation Expert Institutes”).
- Develop in advance a plan for responding to an accident including the method for positioning WBCs outside a nuclear facility for the case that they cannot be located inside it. Also, make an agreement with other utilities and the Federation of Electric Power Companies of Japan to make mobile WBCs available for transport in emergency situations.

(b) Post-accident actions to be taken by the employers

Actions taken at the nuclear facility

- Ask other nuclear facilities in accordance with the agreement concluded in advance, to obtain mobile WBCs and transport them to a proper location when the normally used WBCs become unavailable.
- Immediately establish an internal exposure assessment model suitable for the released nuclides, in cooperation with the Advanced Radiation Expert Institutes.
- Immediately determine the nuclides and the date of ingestion or inhalation for the workers who may exceed normal radiation exposure dose limit, by making use of WBCs in the Advanced Radiation Expert Institute, and determine the committed dose.
- Immediately consolidate the committed doses and external radiation doses by name and calculate the sums to ensure workers do not exceed the exposure limit.

Actions taken by the primary contractors

- Check the situation of internal exposure measurement by the involved subcontractors, and guide or support them to provide the measurement to all their workers.

Actions taken in the corporate offices

- Check the situation of internal exposure measurement at the nuclear facility, and if the normally used WBCs become unavailable, provide support so that the nuclear facility can obtain transferable WBCs from other nuclear facilities, and can measure internal exposure at other nuclear institutions.
- Provide technical support in cooperation with the Advanced Radiation Expert Institutes to identify the specific nuclides causing internal exposure, develop an exposure model, and identify the date of ingestion or inhalation.

(6) Unexpected events including inability to contact the people involved

(a) Preparations to be made by the employers

Actions taken at the nuclear facility

- Specify the procedures to successfully identify individuals

until the backup system is up and running, such as by recording temporary ID numbers and names on the hand-written dosimeter lending list.

- For the case that contact is lost with any individual workers, specify in advance the investigation methods including checking the original records, checking for overlap of similar names, having them confirmed by other primary contractor groups, asking the employers’ office on the site to investigate, making use of professional investigation agencies, and making those individuals’ names known in public places.

Actions taken in the corporate offices

- Provide support when the nuclear facility develops survey methods, as appropriate.

(b) Post-accident actions to be taken by the employers

Actions taken at the nuclear facility

- Conduct the dosimeter-lending administration for emergency situations in the manner specified in advance.
- In the case that contact is lost with any individual workers, immediately check for overlap of similar names and ask the employers’ office on the site for reconfirmation, in cooperation with the primary contractors’ office on the site.

Actions taken by the primary contractors

- In the case that contact is lost with any individual workers, immediately check for overlap of similar names and ask the employers’ office on the site for reconfirmation.

Actions taken in the corporate offices

- Check the dosimeter lending procedures at the nuclear facility, and if contact is lost with any individual workers, reconfirm the dose records in the corporate offices, as required.

1.5.2 Respiratory protective equipment and protective clothing

(1) Exceeding emergency exposure dose limit

(a) Preparations to be made by the employers

Actions taken at the nuclear facility

- Prepare required measurement instruments and establish measurement procedures so as to measure radiation dose in the air at any time in places inside of the nuclear facilities where workers work or are on standby in emergency situations (hereinafter referred to as “the standby areas”) (including places where air is considered to be not contaminated under normal conditions).
- In the case standby areas are contaminated, based on the breakthrough time, prepare a sufficient number of charcoal filters for workers to allow them to stay for several days at the standby areas, and store spare filters in the seismically isolated building.
- Train emergency workers (particularly focusing on such workers as drivers who do not generally wear respiratory protective equipment very often, and those wearing glasses) on how to wear respiratory protective equipment in an appropriate manner, and re-educate them at proper intervals.
- Conclude agreements with other nuclear facilities in advance to lend WBCs that can be transferred in emergency situations so as to measure internal exposure of all the emergency workers. (Repeated notice was given for this action.)

Actions taken in the corporate offices

- Provide support to allow the nuclear facility to take the actions, as appropriate.

(b) Post-accident actions to be taken by the employers

Actions taken at the nuclear facility

- Make all the workers in the standby areas wear charcoal filter respiratory protective equipment immediately after an accident, until it is verified that the air is not contaminated based on the concentration of radioactive materials in the air.
- Distribute a sufficient number of charcoal filters in every standby area, based on the breakthrough time.
- In the case that workers need to standby in a work area where air contamination is uncertain, give them some rest at a proper interval in a work area where it is verified that the air is not contaminated.
- Measure the concentrations of radioactive materials in the air and ambient dose rates in the standby areas continuously.
- Immediately measure internal exposure for all the workers in the standby areas where air contamination is uncertain.

Actions taken in the corporate offices

- Check the situation of radiation measurement in the standby areas of the nuclear facility, and provide support such as by dispatching staff members of the radiation control departments in other nuclear facilities, as appropriate.

(2) Exceeding exposure dose limit for women

(a) Preparations to be made by the employers

Actions taken at the nuclear facility

- Prepare the required measurement instruments and establish measurement procedures so as to measure radiation dose in the air at any time in the standby areas. (Repeated notice was given for this action.)
- Prepare charcoal filter respiratory protective equipment at each standby area, and store spare equipment in the seismically isolated building in advance. (Repeated notice was given for this action.)
- Prepare a sufficient number of personal dosimeters such as APDs for all the emergency workers (including those who are not engaged normally in radiation works). (Repeated notice was given for this action.)

Actions taken in the corporate offices

- Provide support to allow the nuclear facility to take the necessary actions, as appropriate.

(b) Post-accident actions to be taken by the employers

Actions taken at the nuclear facility

- Measure the concentrations of radioactive materials in the air and ambient dose rates in the standby areas continuously, putting a higher priority on those areas where female workers are present. Evacuate female workers immediately if there are any possibilities that the doses may exceed the exposure limit.
- Make all the workers in the standby areas wear charcoal filter respiratory protective equipment and APDs immediately after an accident, until it is verified that air is not contaminated by measuring the concentration of radioactive materials in the air. (Repeated notice was given for this action.)

Actions taken in the corporate offices

- Check the situation of measurement in stand-by areas of the

nuclear facility, and provide support regarding the management of female workers, as appropriate.

(3) Improper use of respiratory protective equipment

(a) Preparations to be made by the employers

Actions taken at the nuclear facility

- Group masks by size (or product makers if multiple products are used) in order to have workers easily choose the one best suited to their faces.
- Promote introduction of masks with an electric powered fan.
- Provide new workers with education regarding the performance and usage of masks focusing on the following points, and re-educate them at proper intervals.
 - 1) Verifying proper fitting by using fitting testers.
 - 2) Taking preventive measures against leak-in, especially having workers use sealing pieces on their glasses.
 - 3) Instructing workers how to wear masks, and how to verify operation of fitting filters.
 - 4) Instructing workers how to handle masks properly to prevent contamination inside them.

Actions taken in the corporate offices

- Provide support such as by preparing education materials and training instructors to be dispatched in emergency situations, so that the nuclear facilities can take the necessary actions, as appropriate.

(b) Post-accident actions to be taken by the employers

Actions taken at the nuclear facility

- Immediately educate new workers regarding the points shown in (3) of the previous section, namely “(a) Preparations to be made by the employers”.

Actions taken in the corporate offices

- Check the situation of education for new workers in the nuclear facility, and provide support such as by dispatching instructors to assist in the education sessions and providing education materials, as appropriate.

(4) Improper protective gears

(a) Preparations to be made by the employers

Actions taken at the nuclear facility

- Prepare a sufficient number of rubber boots, chemical protective suits, and waterproof protective clothing (hereinafter referred to as “the protective clothing”) for emergency situations.
- Prepare a sufficient number of dosimeters including APDs for emergency situations (Repeated notice was given for this action.)

Actions taken in the corporate offices

- Provide support to allow the nuclear facility to take action in an appropriate manner.

(b) Post-accident actions to be taken by the employers

Actions taken at the nuclear facility

- Prepare a sufficient amount of protective clothing and ensure workers wear it in an appropriate manner.
- Develop work instructions for the activities handling contaminated water, and provide appropriate education and training using the instructions.

Actions taken in the corporate offices

- Check the status of worker instruction on wearing protective

clothing in the nuclear facility, and provide support, as appropriate.

1.5.3 Training for new workers

(1) Insufficient training hours for workers

(a) Preparations to be made by the employers

Actions taken at nuclear facilities

- Prepare a large enough classroom and sufficient instructional materials, and train instructors so as to provide sufficient sessions in emergency situations to all of those who need the education as new workers.
- In addition to the special education program conventionally offered in nuclear reactor/nuclear fuel handling, develop instructional materials regarding the evacuation methods, emergency responses and radiation dose control methods at the time of an accident, and provide education and re-education at proper intervals, to workers doing these works.
- Educate workers engaged in radiation works (particularly focusing on those such as drivers who do not generally wear respiratory protective equipment and workers wearing eyeglasses) on how to wear respiratory protective equipment in an appropriate manner, and re-educate them at proper intervals (Repeated notice was given for this action.).

Actions taken in the corporate offices

- Support the nuclear facility to develop education and training materials.
- Train a sufficient number of instructors to train workers, in order to dispatch them to the nuclear facility in emergency situations.

(b) Post-accident actions to be taken by the employers

Actions taken at nuclear facilities

- Provide education to emergency workers who require education as new workers and according to the curriculum, prepare materials in advance.
- Check if the classroom size, the materials and the number of instructors are sufficient, and ask the corporate offices for support otherwise.

Actions taken by the primary contractors

- In cooperation with the nuclear facility, support the education for new workers for all the involved subcontractors.

Actions taken in the corporate offices

- Check the situation of educating workers in the nuclear facility, and provide support such as by dispatching instructors to assist in the education sessions and provide education materials, as appropriate.

1.5.4 Health and medical care system

(1) Establishment of the medical care system in the affected plant

(a) Preparations to be made by the employers

Actions taken at nuclear facilities

- Coordinate with the relevant agencies under the support of the District Labour Bureau to establish a council consisting of prefectural health care and medical offices, fire departments, nearby medical centers, nuclear facilities and prefectural labour bureaus, and other relevant agencies (hereinafter referred to as “the council for medical care system”) which aims at establishing a proper medical care

system for workers in nuclear facilities.

- In the case that the normally used medical center becomes unavailable after an accident has occurred, reserve a place which can accommodate materials and equipment for medical centers in a building of the nuclear facility (or an appropriate building located within several kilometers from the nuclear facility if no such building exists there) with a sufficient distance to ensure safety, even if a hydrogen explosion occurs at a nuclear reactor or its vicinities.
- Consider the health and medical care system required to ensure mental and physical health of workers engaged in emergency works, and make the required preparations.

Actions taken in the corporate offices

- Participate in the council for the medical care system to support the nuclear facility in securing a medical care system in emergency situations.

(b) Post-accident actions to be taken by the employers

Instructions to the nuclear facility

- Request the dispatch of medical care workers considering the number of emergency workers, based on the medical care system developed in advance.
- Launch operation of an emergency medical center at the location prepared in advance, in the case that the normally used medical center became unavailable.
- Immediately establish the required medical care system to ensure mental and physical health of workers engaged in emergency works.

Actions taken in the corporate offices

- Check the status of the medical care system in the nuclear facility, and provide support, as appropriate

(2) Prevention of heat stroke

(a) Preparations to be made by the employers

Actions taken at nuclear facilities

- Take preventive measures against heat stroke in advance including determining the suppliers of cooling vests and cooler boxes; building a rest area equipped with the required functions; developing procedures for actions to be taken when heat strokes occurs; forecasting conditions likely to promote heat stroke occurrence using the WBGT; and obtaining educational materials about heat stroke, on the assumption that workers work wearing heavy equipment under the blazing sun.
- Establish in advance a framework to share information among the employers engaged in construction work in the nuclear facility site.

Actions taken in the corporate offices

- Provide the nuclear facility with support to take proper preventive measures against heat stroke, as appropriate.

(b) Post-accident actions to be taken by the employers

Actions taken at nuclear facilities

- Take the planned preventive measures against heat stroke in a proper manner for workers working in hot and humid places.
- Check physical conditions frequently, making use of medical questionnaires.
- When heat stroke occurs, analyze the causes, and reflect the results in measures to prevent recurrence, and share them

through the council consisting of the primary contractors.

Actions taken by the primary contractors

- Provide required guidance or support in cooperation with the nuclear facility to ensure that the involved subcontractors can take proper preventive measures against heat stroke.

Actions taken in the corporate offices

- Check the status of taking preventive measures against heat stroke in the nuclear facility, and provide support, as appropriate.

(3) Instructions to conduct special medical examinations

(a) Preparations to be made by the employers

Actions taken at nuclear facilities

- Build a consensus with the relevant parties in the council for the medical care system to immediately conduct special medical examinations in case that emergency works leads to a high-level of exposure.

Actions taken in the corporate offices

- In the case that the nuclear facility cannot conduct the special medical examinations during emergency works, consider and make required preparations to directly conduct and manage them.

(b) Post-accident actions to be taken by the employers

Actions taken at nuclear facilities

- Conduct special medical examinations in accordance with the inspection items in the examinations as instructed.
- Obtain correct information on the primary contractors, and provide special medical examinations to workers under the involved subcontractors.

- Check the situation of special medical examinations conducted by the primary contractors.

Actions taken by the primary contractors

- Obtain the correct number of workers under the involved subcontractors, and provide the required guidance or support to ensure that the workers under the said subcontractors can undertake the special medical examinations.
- Check the situation of the special medical examinations conducted by the involved subcontractors.

Actions taken in the corporate offices

- Check the situation of the special medical examinations in the nuclear facility, and provide support such as by dispatching medical care workers to assist, as appropriate.

(4) Establishing patient transport systems from the affected plant

(a) Preparations to be made by the employers

Actions taken at nuclear facilities

- Build a consensus with the relevant parties in the council for medical care system on the emergency transport systems.
- Prepare a heliport near the nuclear facility to be used by a helicopter ambulance after the occurrence of an accident.

Actions taken in the corporate offices

- Participate in the council for the medical care system to support the nuclear facility in providing transport systems.

(b) Post-accident actions to be taken by the employers

Instructions to the nuclear facility

- Request emergency transport systems based on the consensus reached in the council for the medical care system.

- Prepare the pre-arranged heliport for an air ambulance according to the severity of the accident, and request the operation of the air ambulance in accordance with the consensus in the council for the medical care system.

Actions taken in the corporate offices

- Check the transport systems in the nuclear facility, and provide support such as by consulting with medical care institutions, fire authorities and aviation authorities, as appropriate.

(5) Long-term medical check-up program

(a) Preparations to be made by the employers

Actions taken at nuclear facilities

- Make advance preparations to take actions for emergency workers, conforming to the Minister's guidelines.

Actions taken in the corporate offices

- Support the nuclear facility to make the required preparations for properly conducting long-term health care in emergency situations.

(b) Post-accident actions to be taken by the employers

Actions taken at nuclear facilities

- Take actions for emergency workers, in accordance with the Minister's guidelines.

Actions taken in the corporate offices

- Check the situation of the long-term management of health care conducted by the nuclear facility to provide support, as appropriate.

1.5.5 Preliminary review of work plans

(1) Poor management systems for developing work plans

(a) Preparations to be made by the employers

Actions taken at nuclear facilities

- In the case that emergency works is required, establish an organizational system at both the nuclear facility and the corporate offices to develop and review the emergency work plans.

Actions taken in the corporate offices

- Formulate an organizational system in advance that allows the corporate offices to review the emergency work plans directly in the case of an emergency.

(b) Post-accident actions to be taken by the employers

Actions taken at nuclear facilities

- Formulate and review details of emergency works under the predetermined organizational system, in order to prepare and submit work plans that include proper actions to mitigate exposure.

Actions taken in the corporate offices

- Check the situation of preparing work plans at the nuclear facility, and provide support such as by reviewing the details at the corporate offices and dispatching staff to help, as appropriate.

(2) Lack of appropriate work plans

(a) Preparations to be made by the employers

Actions taken at nuclear facilities

- Reflect the summarized typical findings indicated by the Labour Standard Inspection Office having jurisdiction over

the nuclear facility when developing work plans in normal situations in addition to emergency works.

[Actions taken in the corporate offices]

- Plan the organizational system in advance to allow the corporate offices to review the details of works directly, in the case that the nuclear facility cannot do the task properly in the case of an emergency.

(a) Post-accident actions to be taken by the employers

[Actions taken at nuclear facilities]

- Develop and review the details of emergency work plans, and prepare and submit work plans that include proper actions to mitigate exposure, based on the findings indicated in advance.

[Actions taken in the corporate offices]

- Check the situation of the work plans prepared by the nuclear facility, and provides support such as by directly reviewing them at the corporate offices, as appropriate.

(3) Insufficient knowledge about contract conditions

(a) Preparations to be made by the employers

[Actions taken at nuclear facilities]

- Arrange in advance the system for collecting information on workers under the involved subcontractors through the primary contractors in the case of an emergency.

[Actions taken by the primary contractors]

- Establish in advance the system for obtaining correct information on workers engaged in emergency works under the involved subcontractors.

[Actions taken in the corporate offices]

- Provide support to allow the nuclear facility to take the necessary actions in an appropriate manner.

(b) Post-accident actions to be taken by the employers

[Actions taken at nuclear facilities]

- Collect information on subcontractors through the primary contractors, and check if education and medical examinations are provided in an appropriate manner.

[Actions taken by the primary contractors]

- Be sure to obtain information on workers under the involved subcontractors who are engaged in emergency works, and provide guidance or support appropriately to ensure that education and medical examinations are provided in a proper manner.

[Actions taken in the corporate offices]

- Check the situation of collecting the information on contract conditions at the nuclear facility, and provide support appropriately.

(4) Improvement of the lodging and meals

(a) Preparations to be made by the employers

[Actions taken at nuclear facilities]

- Prepare temporary sleeping equipment with bedclothes, and plan in advance where to locate them for an emergency.
- Prepare a sufficient volume of emergency meals with good nutritional balance for an emergency.

[Actions taken in the corporate offices]

- Provide support to allow for the nuclear facilities to take the necessary actions in an appropriate manner.

(b) Post-accident actions to be taken by the employers

[Actions taken at nuclear facilities]

- Make temporary sleeping areas available and provide meals based on the pre-determined plan.

[Actions taken in the corporate offices]

- Check the conditions of temporary sleeping areas and meals in the nuclear facility, and provide support, as appropriate.

1.6 Exposure dose distribution of workers at the TEPCO Fukushima Daiichi NPS

The status of the radiation exposure dose is shown on the URL of the MHLW (English)

<https://www.mhlw.go.jp/english/topics/2011eq/workers/tepc/index.html>

Exposure dose distribution of the workers at Fukushima Daiichi NPS (provided by TEPCO)

[Table 1 Cumulative Effective Dose (by year)]

As of 31 October 2025

March 2011 - March 2012

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	6	0	6
200 < E ≤ 250	1	2	3
150 < E ≤ 200	26	2	28
100 < E ≤ 150	117	20	137
75 < E ≤ 100	186	65	251
50 < E ≤ 75	257	262	519
20 < E ≤ 50	630	2,660	3,290
10 < E ≤ 20	491	2,897	3,388
5 < E ≤ 10	377	2,559	2,936
1 < E ≤ 5	589	4,623	5,212
E ≤ 1	735	4,633	5,368
Total	3,415	17,723	21,138
Maximum (mSv)	678.80	238.42	678.80
Average (mSv)	25.15	10.07	12.50

April 2012 - March 2013

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	1	0	1
20 < E ≤ 50	62	675	737
10 < E ≤ 20	129	2,000	2,129
5 < E ≤ 10	266	1,875	2,141
1 < E ≤ 5	579	3,327	3,906
E ≤ 1	589	4,239	4,828
Total	1,626	12,116	13,742
Maximum (mSv)	54.10	43.30	54.10
Average (mSv)	4.49	5.90	5.74

April 2013 - March 2014

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	31	629	660
10 < E ≤ 20	95	2,067	2,162
5 < E ≤ 10	195	1,897	2,092
1 < E ≤ 5	670	3,739	4,409
E ≤ 1	701	4,722	5,423
Total	1,692	13,054	14,746
Maximum (mSv)	41.90	41.40	41.90
Average (mSv)	3.24	5.51	5.25

April 2014 - March 2015

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	11	996	1,007
10 < E ≤ 20	60	2,599	2,659
5 < E ≤ 10	158	2,774	2,932
1 < E ≤ 5	637	5,315	5,952
E ≤ 1	822	7,358	8,180
Total	1,688	19,042	20,730
Maximum (mSv)	29.50	39.85	39.85
Average (mSv)	2.30	5.29	5.04

April 2015 - March 2016

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	6	592	598
10 < E ≤ 20	52	1,947	1,999
5 < E ≤ 10	108	2,247	2,355
1 < E ≤ 5	533	5,114	5,647
E ≤ 1	998	6,599	7,597
Total	1,697	16,499	18,196
Maximum (mSv)	24.00	43.20	43.20
Average (mSv)	1.85	4.52	4.27

April 2016 - March 2017

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	216	216
10 < E ≤ 20	22	1,139	1,161
5 < E ≤ 10	90	1,393	1,483
1 < E ≤ 5	404	4,371	4,775
E ≤ 1	1,162	7,038	8,200
Total	1,678	14,157	15,835
Maximum (mSv)	14.75	38.83	38.83
Average (mSv)	1.27	3.09	2.90

April 2017 - March 2018

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	74	74
10 < E ≤ 20	18	1,133	1,151
5 < E ≤ 10	85	1,038	1,123
1 < E ≤ 5	306	3,571	3,877
E ≤ 1	1,121	6,597	7,718
Total	1,530	12,413	13,943
Maximum (mSv)	15.94	32.74	32.74
Average (mSv)	1.15	2.88	2.69

April 2018 – March 2019

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	21	853	874
5 < E ≤ 10	70	870	940
1 < E ≤ 5	247	2,856	3,103
E ≤ 1	1,105	5,284	6,389
Total	1,443	9,863	11,306
Maximum (mSv)	15.55	19.90	19.90
Average (mSv)	1.04	2.65	2.44

April 2019 – March 2020

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	13	917	930
5 < E ≤ 10	57	857	914
1 < E ≤ 5	284	2,365	2,649
E ≤ 1	1,030	5,185	6,215
Total	1,384	9,324	10,708
Maximum (mSv)	13.92	19.60	19.60
Average (mSv)	0.98	2.77	2.54

April 2020 – March 2021

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	12	926	938
5 < E ≤ 10	62	854	916
1 < E ≤ 5	232	2,319	2,551
E ≤ 1	1,031	4,883	5,914
Total	1,337	8,982	10,319
Maximum (mSv)	14.83	19.31	19.31
Average (mSv)	0.97	2.84	2.60

April 2021 – March 2022

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	7	836	843
5 < E ≤ 10	59	925	984
1 < E ≤ 5	209	2,247	2,456
E ≤ 1	1,083	4,771	5,854
Total	1,358	8,779	10,137
Maximum (mSv)	13.10	17.46	17.46
Average (mSv)	0.85	2.77	2.51

April 2022 – March 2023

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	6	708	714
5 < E ≤ 10	50	966	1,016
1 < E ≤ 5	225	2,261	2,486
E ≤ 1	1,131	5,967	7,098
Total	1,412	9,902	11,314
Maximum (mSv)	11.84	17.60	17.60
Average (mSv)	0.80	2.35	2.16

April 2023 - March 2024

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	5	809	814
5 < E ≤ 10	26	1,135	1,161
1 < E ≤ 5	178	2,137	2,315
E ≤ 1	1,207	6,448	7,655
Total	1,416	10,529	11,945
Maximum (mSv)	13.8	17.0	17.0
Average (mSv)	0.59	2.39	2.18

April 2024 - March 2025

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	4	804	808
5 < E ≤ 10	44	990	1,034
1 < E ≤ 5	166	2,078	2,244
E ≤ 1	1,196	6,627	7,823
Total	1,410	10,499	11,909
Maximum (mSv)	11.5	16.8	16.8
Average (mSv)	0.66	2.27	2.08

April 2025 - September 2025

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	0	176	176
5 < E ≤ 10	2	436	438
1 < E ≤ 5	96	1,423	1,519
E ≤ 1	1,264	6,692	7,956
Total	1,362	8,727	10,089
Maximum (mSv)	5.85	15.47	15.47
Average (mSv)	0.23	1.11	0.99

Note:

*The values of the dose and the number of the workers in the table above may be subject to change, because there are cases that APD data are replaced with monthly dose data measured by integral dosimeters. Or dose data of workers who wore only an integral dosimeter (ex., workers who entered only the Seismic Isolation Building) need to be updated in the table after the publication of the data.

[Table 2 Cumulative External Exposure Dose (by year)]

As of 31 October 2025

March 2011 - March 2012

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	7	3	10
100 < E ≤ 150	58	8	66
75 < E ≤ 100	107	29	136
50 < E ≤ 75	231	195	426
20 < E ≤ 50	674	2,459	3,133
10 < E ≤ 20	554	2,849	3,403
5 < E ≤ 10	428	2,589	3,017
1 < E ≤ 5	600	4,743	5,343
E ≤ 1	756	4,848	5,604
Total	3,415	17,723	21,138
Maximum (mSv)	188.14	199.42	199.42
Average (mSv)	19.15	9.16	10.78

April 2012 - March 2013

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	1	0	1
20 < E ≤ 50	62	675	737
10 < E ≤ 20	129	2,000	2,129
5 < E ≤ 10	266	1,875	2,141
1 < E ≤ 5	579	3,327	3,906
E ≤ 1	589	4,239	4,828
Total	1,626	12,116	13,742
Maximum (mSv)	54.10	43.30	54.10
Average (mSv)	4.49	5.90	5.74

April 2013 - March 2014

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	31	629	660
10 < E ≤ 20	95	2,067	2,162
5 < E ≤ 10	195	1,897	2,092
1 < E ≤ 5	670	3,739	4,409
E ≤ 1	701	4,722	5,423
Total	1,692	13,054	14,746
Maximum (mSv)	41.90	41.40	41.90
Average (mSv)	3.24	5.51	5.25

April 2014 - March 2015

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	11	996	1,007
10 < E ≤ 20	60	2,599	2,659
5 < E ≤ 10	158	2,774	2,932
1 < E ≤ 5	637	5,315	5,952
E ≤ 1	822	7,358	8,180
Total	1,688	19,042	20,730
Maximum (mSv)	29.50	39.85	39.85
Average (mSv)	2.30	5.29	5.04

April 2015 - March 2016

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	6	592	598
10 < E ≤ 20	52	1,947	1,999
5 < E ≤ 10	108	2,247	2,355
1 < E ≤ 5	533	5,114	5,647
E ≤ 1	998	6,599	7,597
Total	1,697	16,499	18,196
Maximum (mSv)	24.00	43.20	43.20
Average (mSv)	1.85	4.52	4.27

April 2016 - March 2017

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	216	216
10 < E ≤ 20	22	1,139	1,161
5 < E ≤ 10	90	1,393	1,483
1 < E ≤ 5	404	4,371	4,775
E ≤ 1	1,162	7,038	8,200
Total	1,678	14,157	15,835
Maximum (mSv)	14.75	38.83	38.83
Average (mSv)	1.27	3.09	2.90

April 2017 - March 2018

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	74	74
10 < E ≤ 20	18	1,133	1,151
5 < E ≤ 10	85	1,038	1,123
1 < E ≤ 5	306	3,571	3,877
E ≤ 1	1,121	6,597	7,718
Total	1,530	12,413	13,943
Maximum (mSv)	15.94	32.74	32.74
Average (mSv)	1.15	2.88	2.69

April 2018 – March 2019

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	21	853	874
5 < E ≤ 10	70	870	940
1 < E ≤ 5	247	2,856	3,103
E ≤ 1	1,105	5,284	6,389
Total	1,443	9,863	11,306
Maximum (mSv)	15.55	19.90	19.90
Average (mSv)	1.04	2.65	2.44

April 2019 – March 2020

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	13	917	930
5 < E ≤ 10	57	857	914
1 < E ≤ 5	284	2,365	2,649
E ≤ 1	1,030	5,185	6,215
Total	1,384	9,324	10,708
Maximum (mSv)	13.92	19.60	19.60
Average (mSv)	0.98	2.77	2.54

April 2020 – March 2021

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	12	926	938
5 < E ≤ 10	62	854	916
1 < E ≤ 5	232	2,319	2,551
E ≤ 1	1,031	4,883	5,914
Total	1,337	8,982	10,319
Maximum (mSv)	14.83	19.31	19.31
Average (mSv)	0.97	2.84	2.60

April 2021 – March 2022

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	7	836	843
5 < E ≤ 10	59	925	984
1 < E ≤ 5	209	2,247	2,456
E ≤ 1	1,083	4,771	5,854
Total	1,358	8,779	10,137
Maximum (mSv)	13.10	17.46	17.46
Average (mSv)	0.85	2.77	2.51

April 2022 – March 2023

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	6	708	714
5 < E ≤ 10	50	966	1,016
1 < E ≤ 5	225	2,261	2,486
E ≤ 1	1,131	5,967	7,098
Total	1,412	9,902	11,314
Maximum (mSv)	11.84	17.60	17.60
Average (mSv)	0.80	2.35	2.16

April 2023 - March 2024

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	5	809	814
5 < E ≤ 10	26	1,135	1,161
1 < E ≤ 5	178	2,137	2,315
E ≤ 1	1,207	6,448	7,655
Total	1,416	10,529	11,945
Maximum (mSv)	13.8	17.0	17.0
Average (mSv)	0.59	2.39	2.18

April 2024 - March 2025

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	4	804	808
5 < E ≤ 10	44	990	1,034
1 < E ≤ 5	166	2,078	2,244
E ≤ 1	1,196	6,627	7,823
Total	1,410	10,499	11,909
Maximum (mSv)	11.5	16.8	16.8
Average (mSv)	0.66	2.27	2.08

April 2025 - September 2025

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	0	176	176
5 < E ≤ 10	2	436	438
1 < E ≤ 5	96	1,423	1,519
E ≤ 1	1,264	6,692	7,956
Total	1,362	8,727	10,089
Maximum (mSv)	5.85	15.47	15.47
Average (mSv)	0.23	1.11	0.99

Note:

*The table shows the external exposure part of the cumulative exposure dose data by fiscal year.

*The values of the exposure dose and the number of the workers in the table above are subject to change, because there are cases that APD data are replaced with monthly dose data measured by integral dosimeters. Or dose data of workers who wore only an integral dosimeter (ex., workers who enter to be updated in the table after the publication of the data.

[Table 3 Cumulative Internal Exposure Dose (by year)]

As of 31 October 2025

March 2011 - March 2012

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	5	0	5
200 < E ≤ 250	1	0	1
150 < E ≤ 200	1	0	1
100 < E ≤ 150	7	0	7
75 < E ≤ 100	11	11	22
50 < E ≤ 75	27	17	44
20 < E ≤ 50	191	125	316
10 < E ≤ 20	399	313	712
5 < E ≤ 10	281	411	692
2 < E ≤ 5	223	691	914
E ≤ 2	2,269	16,155	18,424
Total	3,415	17,723	21,138
Maximum (mSv)	590.00	98.53	590.00
Average (mSv)	6.01	0.90	1.73

April 2012 - March 2013

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	0	0	0
5 < E ≤ 10	0	0	0
2 < E ≤ 5	0	0	0
E ≤ 2	1,626	12,116	13,742
Total	1,626	12,116	13,742
Maximum (mSv)	0.00	0.10	0.10
Average (mSv)	0.00	0.00	0.00

April 2013 - March 2014

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	0	0	0
5 < E ≤ 10	0	0	0
2 < E ≤ 5	0	0	0
E ≤ 2	1,692	13,054	14,746
Total	1,692	13,054	14,746
Maximum (mSv)	0.00	0.00	0.00
Average (mSv)	0.00	0.00	0.00

April 2014 - March 2015

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	0	0	0
5 < E ≤ 10	0	0	0
2 < E ≤ 5	0	0	0
E ≤ 2	1,688	19,042	20,730
Total	1,688	19,042	20,730
Maximum (mSv)	0.00	0.00	0.00
Average (mSv)	0.00	0.00	0.00

April 2015 - March 2016

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	0	0	0
5 < E ≤ 10	0	0	0
2 < E ≤ 5	0	0	0
E ≤ 2	1,697	16,499	18,196
Total	1,697	16,499	18,196
Maximum (mSv)	0.00	0.00	0.00
Average (mSv)	0.00	0.00	0.00

April 2016 - March 2017

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	0	0	0
5 < E ≤ 10	0	0	0
2 < E ≤ 5	0	0	0
E ≤ 2	1,678	14,157	15,835
Total	1,678	14,157	15,835
Maximum (mSv)	0.00	0.00	0.00
Average (mSv)	0.00	0.00	0.00

April 2017 - March 2018

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	0	0	0
5 < E ≤ 10	0	0	0
2 < E ≤ 5	0	0	0
E ≤ 2	1,530	12,413	13,943
Total	1,530	12,413	13,943
Maximum (mSv)	0.00	0.00	0.00
Average (mSv)	0.00	0.00	0.00

April 2018 – March 2019

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	0	0	0
5 < E ≤ 10	0	0	0
2 < E ≤ 5	0	0	0
E ≤ 2	1,443	9,863	11,306
Total	1,443	9,863	11,306
Maximum (mSv)	0.00	0.00	0.00
Average (mSv)	0.00	0.00	0.00

April 2019 – March 2020

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	0	0	0
5 < E ≤ 10	0	0	0
2 < E ≤ 5	0	0	0
E ≤ 2	1,384	9,324	10,708
Total	1,384	9,324	10,708
Maximum (mSv)	0.00	0.00	0.00
Average (mSv)	0.00	0.00	0.00

April 2020 – March 2021

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	0	0	0
5 < E ≤ 10	0	0	0
2 < E ≤ 5	0	0	0
E ≤ 2	1,337	8,982	10,319
Total	1,337	8,982	10,319
Maximum (mSv)	0.00	0.00	0.00
Average (mSv)	0.00	0.00	0.00

April 2021 – March 2022

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	0	0	0
5 < E ≤ 10	0	0	0
2 < E ≤ 5	0	0	0
E ≤ 2	1,358	8,779	10,137
Total	1,358	8,779	10,137
Maximum (mSv)	0.00	0.00	0.00
Average (mSv)	0.00	0.00	0.00

April 2022 – March 2023

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	0	0	0
5 < E ≤ 10	0	0	0
2 < E ≤ 5	0	0	0
E ≤ 2	1,412	9,902	11,314
Total	1,412	9,902	11,314
Maximum (mSv)	0.00	0.00	0.00
Average (mSv)	0.00	0.00	0.00

April 2023 - March 2024

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	0	0	0
5 < E ≤ 10	0	0	0
2 < E ≤ 5	0	0	0
E ≤ 2	1,416	10,529	11,945
Total	1,416	10,529	11,945
Maximum (mSv)	0.00	0.00	0.00
Average (mSv)	0.00	0.00	0.00

April 2024 - March 2025

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	0	0	0
5 < E ≤ 10	0	0	0
2 < E ≤ 5	0	0	0
E ≤ 2	1,410	10,499	11,909
Total	1,410	10,499	11,909
Maximum (mSv)	0.00	0.00	0.00
Average (mSv)	0.00	0.00	0.00

April 2025 - September 2025

Effective dose (E) mSv	TEPCO	Contractors	Total
250 < E	0	0	0
200 < E ≤ 250	0	0	0
150 < E ≤ 200	0	0	0
100 < E ≤ 150	0	0	0
75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0
20 < E ≤ 50	0	0	0
10 < E ≤ 20	0	0	0
5 < E ≤ 10	0	0	0
2 < E ≤ 5	0	0	0
E ≤ 2	1,362	8,727	10,089
Total	1,362	8,727	10,089
Maximum (mSv)	0.00	0.00	0.00
Average (mSv)	0.00	0.00	0.00

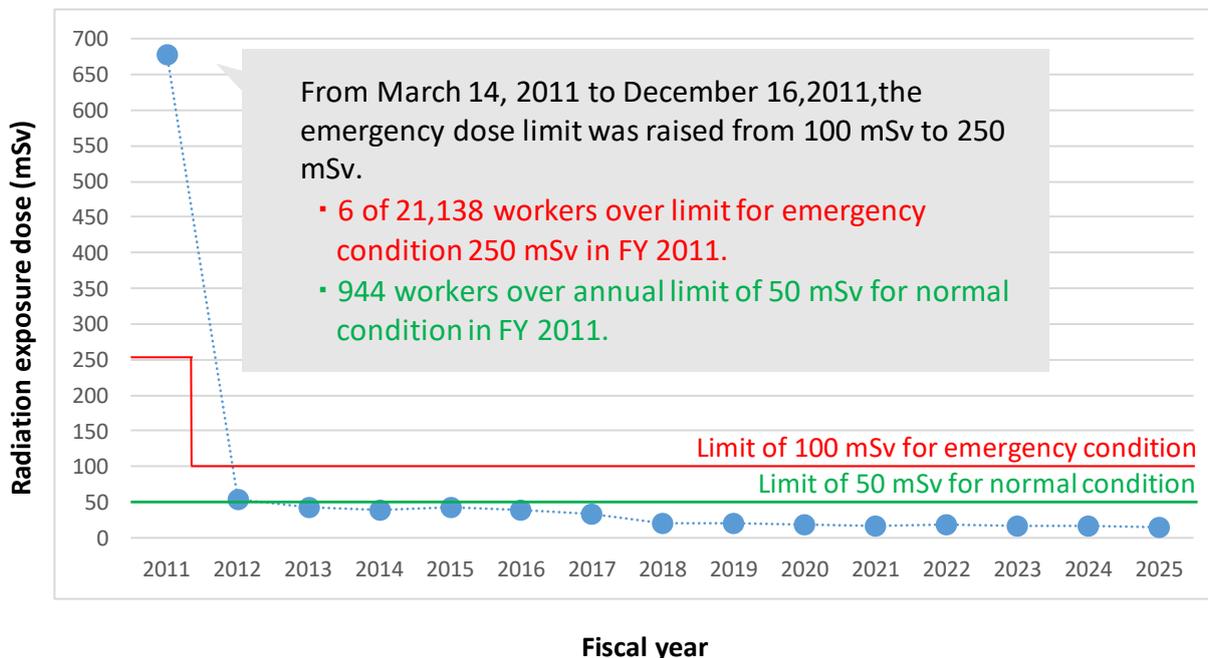
Note:

*The table shows the internal exposure part of the cumulative exposure dose data by fiscal year.

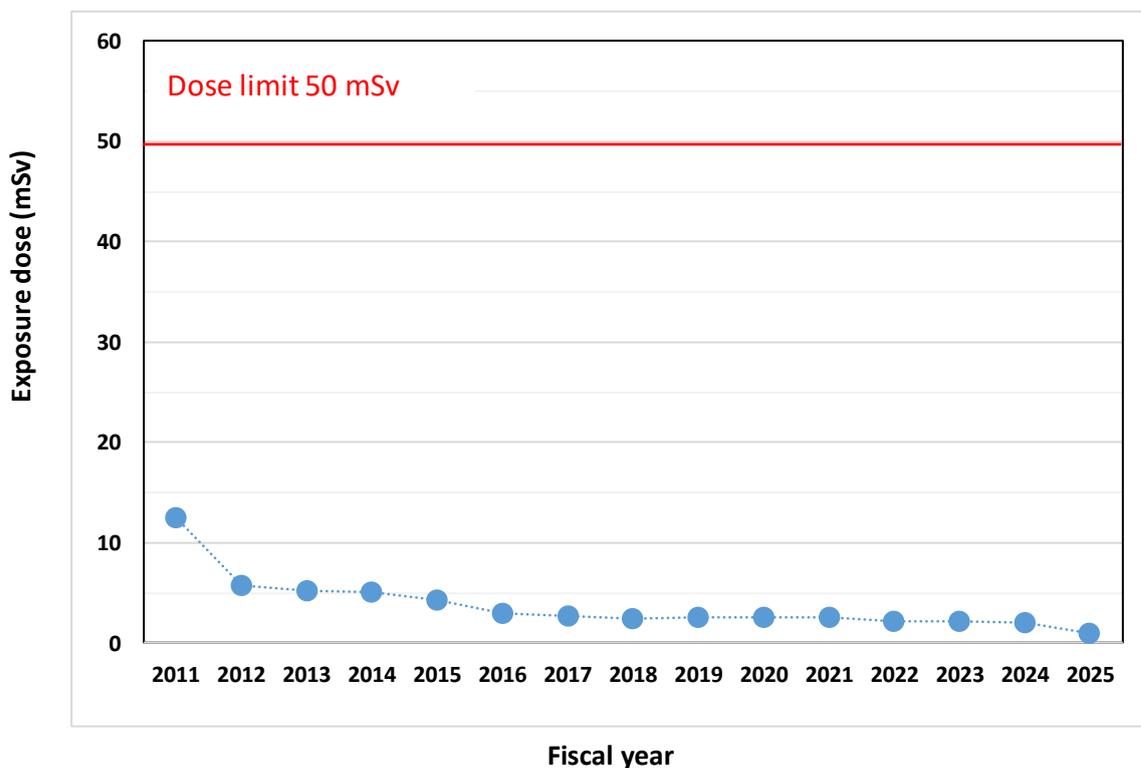
*Depending on the prime contractors, there are some cases in which the internal exposure dose is recorded as that of the WBC measurement month, not the inhalation exposure month.

Workers over dose-limit

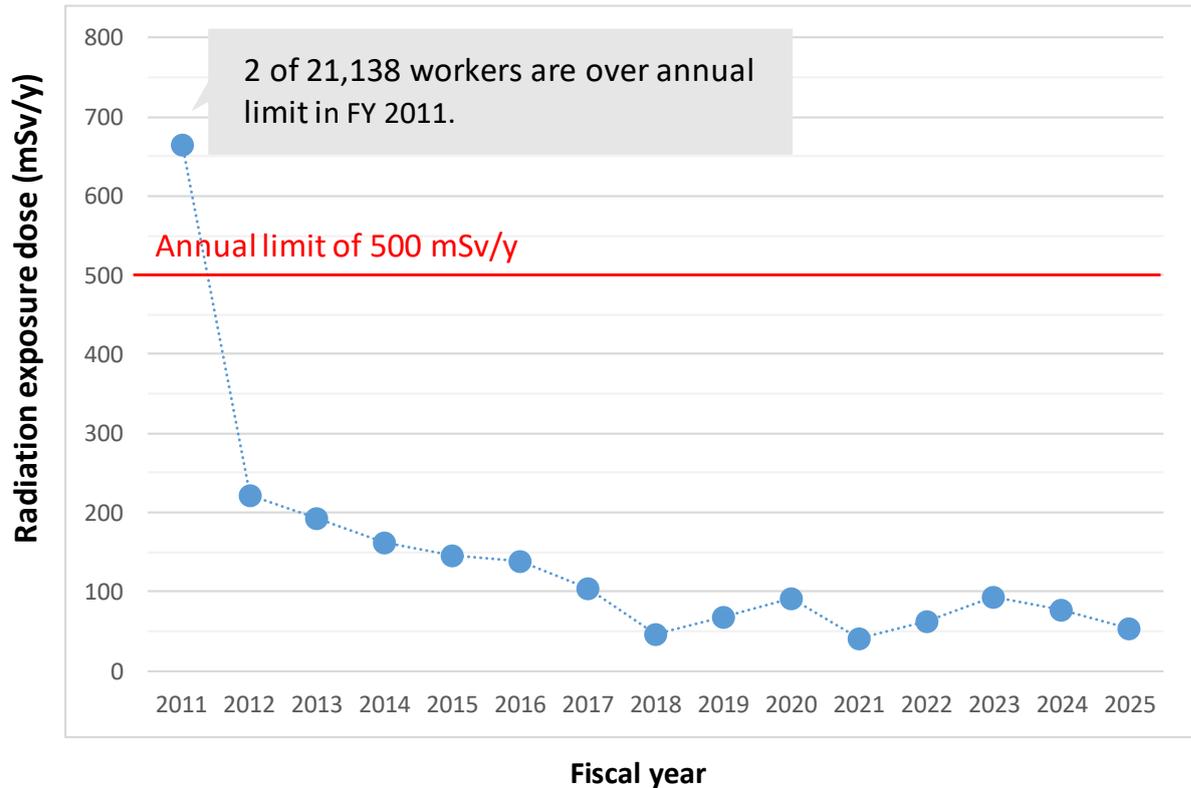
Max. annual effective dose (mSv/y)



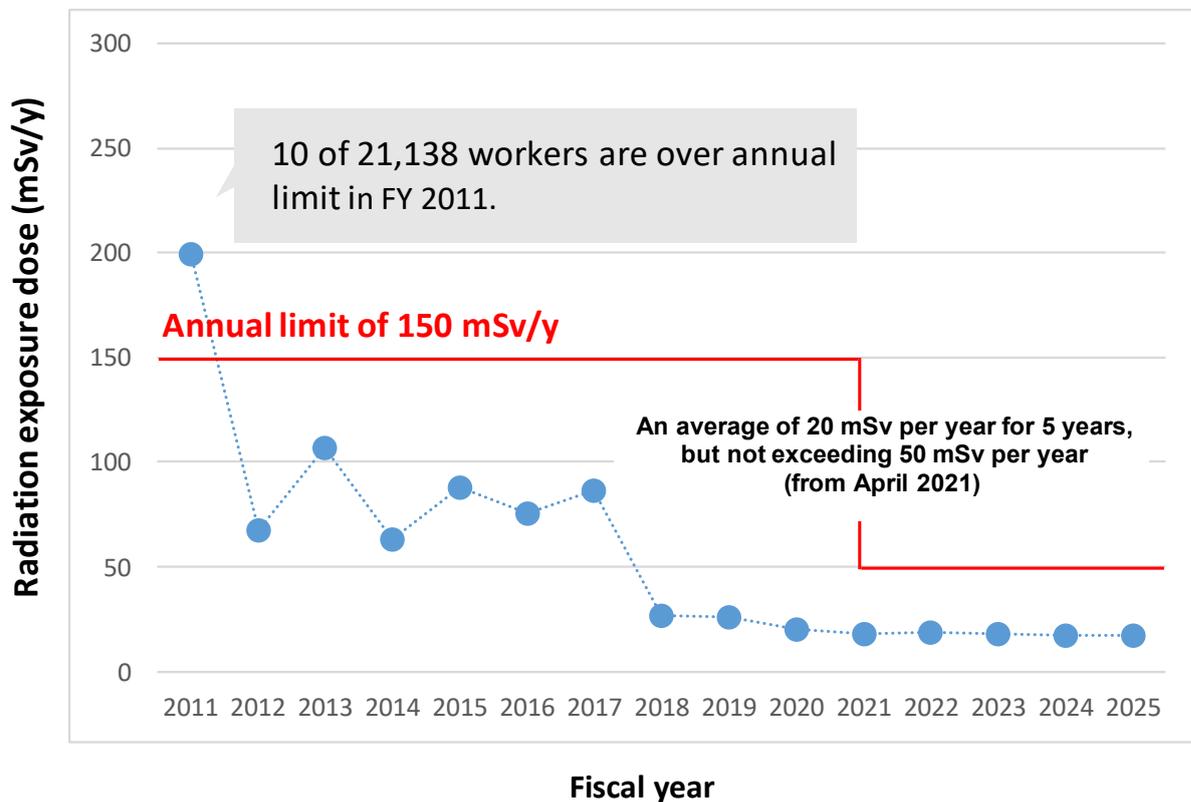
Annual average effective dose (mSv/y)



Max. annual equivalent dose for skin (mSv/y)



Max. annual equivalent dose for eye lens (mSv/y)



As of 31 October 2025

Table 4 Radiation Exposure Dose Distribution (by month)

Month/ Year		E ≤ 1	1 < E ≤										Total	Maximum (mSv)	Average (mSv)
			≤ 5	5 < E ≤ 10	10 < E ≤ 20	20 < E ≤ 50	50 < E ≤ 75	75 < E ≤ 100	100 < E ≤ 150	150 < E ≤ 200	200 < E ≤ 250	250 < E			
March 2011	TEPCO	40	66	239	529	539	119	77	65	16	6	1,696	670.36	31.33	
	Contractors	397	537	399	460	373	65	34	17	2	2	2,286	238.42	14.15	
	Total	437	603	638	989	912	184	111	82	18	2	3,982	670.36	21.55	
April 2011	TEPCO	228	323	857	186	62	1					1,657	59.60	6.66	
	Contractors	1,550	1,468	625	433	128						4,204	49.61	4.35	
	Total	1,778	1,791	1,482	619	190	1					5,861	59.60	5.00	
May 2011	TEPCO	437	782	171	73	14						1,477	33.42	3.14	
	Contractors	2,221	2,369	809	349	80						5,828	48.80	3.37	
	Total	2,658	3,151	980	422	94						7,305	48.80	3.32	
June 2011	TEPCO	513	723	85	30							1,351	16.29	2.12	
	Contractors	2,559	2,653	772	350	66	1	1				6,402	89.50	3.08	
	Total	3,072	3,376	857	380	66	1	1				7,753	89.50	2.91	
July 2011	TEPCO	653	625	53	17	3						1,351	31.13	1.69	
	Contractors	2,934	2,759	587	200	38	3					6,521	61.97	2.43	
	Total	3,587	3,384	640	217	41	3					7,872	61.97	2.30	
August 2011	TEPCO	543	666	57	19	1						1,286	23.33	1.72	
	Contractors	2,826	2,731	485	162	24	2					6,230	66.50	2.20	
	Total	3,369	3,397	542	181	25	2					7,516	66.50	2.12	
September 2011	TEPCO	534	633	38	2							1,207	11.35	1.45	
	Contractors	2,856	2,582	399	140	23						6,000	33.40	2.01	
	Total	3,390	3,215	437	142	23						7,207	33.40	1.92	
October 2011	TEPCO	564	552	45	15	3						1,179	36.35	1.57	
	Contractors	2,823	2,352	337	103	8						5,623	23.50	1.84	
	Total	3,387	2,904	382	118	11						6,802	36.35	1.80	
November 2011	TEPCO	853	280	37	10							1,180	13.40	1.07	
	Contractors	3,354	1,911	228	82	5						5,580	23.03	1.46	
	Total	4,207	2,191	265	92	5						6,760	23.03	1.39	
December 2011	TEPCO	868	282	26	13	3						1,192	23.20	1.10	
	Contractors	3,345	1,729	258	76							5,408	19.20	1.43	
	Total	4,213	2,011	284	89	3						6,600	23.20	1.37	
January 2012	TEPCO	761	284	37	13							1,095	17.00	1.19	
	Contractors	3,236	1,435	203	72	1						4,947	21.90	1.36	
	Total	3,997	1,719	240	85	1						6,042	21.90	1.33	
February 2012	TEPCO	845	231	25	8							1,109	17.63	0.91	
	Contractors	2,940	1,584	221	100	2						4,847	20.91	1.51	
	Total	3,785	1,815	246	108	2						5,956	20.91	1.40	
March 2012	TEPCO	874	220	23	2							1,119	12.10	0.83	
	Contractors	3,029	1,465	206	53	3						4,756	21.83	1.36	
	Total	3,903	1,685	229	55	3						5,875	21.83	1.26	
April 2012	TEPCO	870	179	19	3							1,071	13.00	0.75	
	Contractors	2,835	1,305	151	75	3						4,369	23.90	1.30	
	Total	3,705	1,484	170	78	3						5,440	23.90	1.19	
May 2012	TEPCO	854	177	10	1							1,042	10.20	0.66	
	Contractors	2,898	1,406	246	49							4,599	18.22	1.41	
	Total	3,752	1,583	256	50							5,641	18.22	1.28	
June 2012	TEPCO	829	162	20	3							1,014	12.10	0.78	
	Contractors	3,086	1,652	220	29							4,987	14.94	1.29	
	Total	3,915	1,814	240	32							6,001	14.94	1.21	

Month/ Year		E ≤ 1											Total	Maximum (mSv)	Average (mSv)		
		E ≤ 1	1 < E ≤ 5	5 < E ≤ 10	10 < E ≤ 20	20 < E ≤ 50	50 < E ≤ 75	75 < E ≤ 100	100 < E ≤ 150	150 < E ≤ 200	200 < E ≤ 250	250 < E					
July 2012	TEPCO	854	150	9											1,013	6.60	0.62
	Contractors	3,065	1,621	222	38										4,946	17.33	1.34
	Total	3,919	1,771	231	38										5,959	17.33	1.21
August 2012	TEPCO	835	144	7											986	7.20	0.62
	Contractors	3,299	1,341	120	4										4,764	11.64	1.04
	Total	4,134	1,485	127	4										5,750	11.64	0.97
September 2012	TEPCO	850	123	9											982	8.20	0.57
	Contractors	3,272	1,274	163	29	1									4,739	20.50	1.15
	Total	4,122	1,397	172	29	1									5,721	20.50	1.05
October 2012	TEPCO	826	145	7											978	6.30	0.61
	Contractors	3,307	1,325	136	31										4,799	16.00	1.11
	Total	4,133	1,470	143	31										5,777	16.00	1.03
November 2012	TEPCO	812	149	7											968	9.50	0.61
	Contractors	3,306	1,222	145	27										4,700	18.70	1.09
	Total	4,118	1,371	152	27										5,668	18.70	1.01
December 2012	TEPCO	846	149	10											1,005	7.50	0.58
	Contractors	3,489	1,363	180	10										5,042	15.00	1.10
	Total	4,335	1,512	190	10										6,047	15.00	1.01
January 2013	TEPCO	870	96	3											969	7.39	0.42
	Contractors	3,768	1,310	115	7										5,200	12.90	0.96
	Total	4,638	1,406	118	7										6,169	12.90	0.88
February 2013	TEPCO	870	105	2											977	5.43	0.45
	Contractors	3,917	1,415	263	35										5,630	18.50	1.21
	Total	4,787	1,520	265	35										6,607	18.50	1.09
March 2013	TEPCO	845	140	10	2										997	11.03	0.60
	Contractors	3,908	1,706	335	35										5,984	19.30	1.35
	Total	4,753	1,846	345	37										6,981	19.30	1.24
April 2013	TEPCO	948	108	4											1,060	5.90	0.49
	Contractors	4,029	1,165	111	5										5,310	14.40	0.88
	Total	4,977	1,273	115	5										6,370	14.40	0.81
May 2013	TEPCO	896	100	4											1,000	8.60	0.45
	Contractors	3,920	1,141	92	5										5,158	15.80	0.85
	Total	4,816	1,241	96	5										6,158	15.80	0.78
June 2013	TEPCO	931	87	6											1,024	7.40	0.42
	Contractors	3,731	1,182	85	7										5,005	17.50	0.87
	Total	4,662	1,269	91	7										6,029	17.50	0.79
July 2013	TEPCO	891	96	1											988	5.50	0.43
	Contractors	3,752	1,128	107	9										4,996	14.80	0.89
	Total	4,643	1,224	108	9										5,984	14.80	0.81
August 2013	TEPCO	834	118	4											956	6.10	0.49
	Contractors	3,665	1,211	142	40										5,058	19.89	1.03
	Total	4,499	1,329	146	40										6,014	19.89	0.94
September 2013	TEPCO	933	102	3											1,038	5.60	0.44
	Contractors	3,525	1,420	247	61	1									5,254	20.58	1.28
	Total	4,458	1,522	250	61	1									6,292	20.58	1.14
October 2013	TEPCO	893	146	8											1,047	9.50	0.55
	Contractors	3,460	1,556	343	47										5,406	19.36	1.43
	Total	4,353	1,702	351	47										6,453	19.36	1.29

Month/ Year		Average (mSv)											Total	Maximum (mSv)	Average (mSv)		
		E ≤ 1	1 < E ≤ 5	5 < E ≤ 10	10 < E ≤ 20	20 < E ≤ 50	50 < E ≤ 75	75 < E ≤ 100	100 < E ≤ 150	150 < E ≤ 200	200 < E ≤ 250	250 < E					
November 2013	TEPCO Contractors	954	120	5											1,079	9.20	0.48
	Total	3,700	1,533	303	32										5,568	16.91	1.28
		4,654	1,653	308	32										6,647	16.91	1.15
December 2013	TEPCO Contractors	968	116	2											1,086	5.40	0.44
	Total	3,852	1,627	199	23										5,701	16.81	1.13
		4,820	1,743	201	23										6,787	16.81	1.02
January 2014	TEPCO Contractors	997	84												1,081	4.50	0.37
	Total	4,112	1,505	221	53										5,891	15.80	1.16
		5,109	1,589	221	53										6,972	15.80	1.04
February 2014	TEPCO Contractors	1,018	56	4											1,078	6.50	0.34
	Total	4,611	1,611	168	30										6,420	17.29	1.02
		5,629	1,667	172	30										7,498	17.29	0.92
March 2014	TEPCO Contractors	1,012	85												1,097	4.80	0.36
	Total	4,940	1,867	227	23										7,057	18.49	1.07
		5,952	1,952	227	23										8,154	18.49	0.98
April 2014	TEPCO Contractors	999	94	1											1,094	5.70	0.38
	Total	5,449	1,743	234	19										7,445	16.00	0.98
		6,448	1,837	235	19										8,539	16.00	0.91
May 2014	TEPCO Contractors	1,053	65	1											1,119	5.60	0.31
	Total	5,974	1,794	209	47	1									8,025	20.70	0.95
		7,027	1,859	210	47	1									9,144	20.70	0.87
June 2014	TEPCO Contractors	1,056	66	1											1,123	6.80	0.32
	Total	6,773	1,790	329	26										8,918	16.89	0.95
		7,829	1,856	330	26										10,041	16.89	0.88
July 2014	TEPCO Contractors	1,092	39	1											1,132	5.40	0.27
	Total	7,292	1,728	258	49										9,327	18.69	0.89
		8,384	1,767	259	49										10,459	18.69	0.82
August 2014	TEPCO Contractors	1,062	39												1,101	3.40	0.25
	Total	7,818	1,338	214	9										9,379	17.13	0.71
		8,880	1,377	214	9										10,480	17.13	0.67
September 2014	TEPCO Contractors	1,110	51	1											1,162	6.00	0.27
	Total	8,013	1,634	287	36										9,970	18.22	0.84
		9,123	1,685	288	36										11,132	18.22	0.78
October 2014	TEPCO Contractors	1,112	62												1,174	2.70	0.29
	Total	7,951	1,766	234	18										9,969	14.92	0.80
		9,063	1,828	234	18										11,143	14.92	0.74
November 2014	TEPCO Contractors	1,141	45												1,186	3.00	0.21
	Total	8,198	1,644	269	19										10,130	15.92	0.78
		9,339	1,689	269	19										11,316	15.92	0.72
December 2014	TEPCO Contractors	1,099	60												1,159	4.30	0.24
	Total	8,272	1,912	283	34										10,501	16.74	0.85
		9,371	1,972	283	34										11,660	16.74	0.79
January 2015	TEPCO Contractors	1,111	37												1,148	4.20	0.22
	Total	8,514	1,513	56	1										10,084	12.80	0.56
		9,625	1,550	56	1										11,232	12.80	0.53
February 2015	TEPCO Contractors	1,096	74	6											1,176	8.00	0.33
	Total	8,498	2,214	285	36										11,033	16.80	0.89
		9,594	2,288	291	36										12,209	16.80	0.83

Month/ Year		E ≤ 1	1 < E ≤ 5	5 < E ≤ 10	10 < E ≤ 20	20 < E ≤ 50	50 < E ≤ 75	75 < E ≤ 100	100 < E ≤ 150	150 < E ≤ 200	200 < E ≤ 250	250 < E	Total	Maximum (mSv)	Average (mSv)
March 2015	TEPCO	1,060	79	3									1,142	6.40	0.32
	Contractors	8,036	2,466	553	118								11,173	19.90	1.21
	Total	9,096	2,545	556	118								12,315	19.90	1.13
April 2015	TEPCO	1,100	66										1,166	4.80	0.27
	Contractors	7,693	2,414	248	20								10,375	15.60	0.93
	Total	8,793	2,480	248	20								11,541	15.60	0.86
May 2015	TEPCO	1,092	42										1,134	2.12	0.20
	Contractors	8,100	1,746	98	4								9,948	11.40	0.66
	Total	9,192	1,788	98	4								11,082	11.40	0.61
June 2015	TEPCO	1,128	64										1,192	3.90	0.25
	Contractors	8,185	1,737	167	12								10,101	11.50	0.72
	Total	9,313	1,801	167	12								11,293	11.50	0.67
July 2015	TEPCO	1,119	53	1									1,173	5.10	0.24
	Contractors	8,140	1,646	134	7								9,927	10.72	0.66
	Total	9,259	1,699	135	7								11,100	10.72	0.62
August 2015	TEPCO	1,083	53										1,136	3.38	0.21
	Contractors	8,369	1,040	36	1								9,446	10.30	0.43
	Total	9,452	1,093	36	1								10,582	10.30	0.41
September 2015	TEPCO	1,144	51	1									1,196	5.60	0.24
	Contractors	8,034	1,590	140	16								9,780	15.30	0.67
	Total	9,178	1,641	141	16								10,976	15.30	0.63
October 2015	TEPCO	1,130	52										1,182	3.20	0.22
	Contractors	7,864	1,699	145	9								9,717	14.42	0.70
	Total	8,994	1,751	145	9								10,899	14.42	0.64
November 2015	TEPCO	1,119	48										1,167	4.96	0.22
	Contractors	7,920	1,451	110	7								9,488	13.88	0.61
	Total	9,039	1,499	110	7								10,655	13.88	0.57
December 2015	TEPCO	1,122	47										1,169	2.70	0.21
	Contractors	8,026	1,335	73	5								9,439	13.50	0.56
	Total	9,148	1,382	73	5								10,608	13.50	0.52
January 2016	TEPCO	1,108	38										1,146	3.30	0.20
	Contractors	8,070	1,194	60	4								9,328	16.00	0.51
	Total	9,178	1,232	60	4								10,474	16.00	0.48
February 2016	TEPCO	1,128	49										1,177	4.70	0.22
	Contractors	7,896	1,461	78	12								9,447	12.36	0.59
	Total	9,024	1,510	78	12								10,624	12.36	0.55
March 2016	TEPCO	1,125	44										1,169	2.71	0.20
	Contractors	8,051	1,291	93	19								9,454	13.82	0.59
	Total	9,176	1,335	93	19								10,623	13.82	0.55
April 2016	TEPCO	1,097	16										1,113	1.90	0.16
	Contractors	7,852	870	42									8,764	9.78	0.41
	Total	8,949	886	42									9,877	9.78	0.38
May 2016	TEPCO	1,128	9										1,137	2.50	0.14
	Contractors	7,738	651	19									8,408	9.70	0.32
	Total	8,866	660	19									9,545	9.70	0.30
June 2016	TEPCO	1,166	26										1,192	2.00	0.16
	Contractors	7,928	833	56	6								8,823	13.81	0.42
	Total	9,094	859	56	6								10,015	13.81	0.38

Month/ Year		E ≤ 1	1 < E ≤ 5	5 < E ≤ 10	10 < E ≤ 20	20 < E ≤ 50	50 < E ≤ 75	75 < E ≤ 100	100 < E ≤ 150	150 < E ≤ 200	200 < E ≤ 250	250 < E	Total	Maximum (mSv)	Average (mSv)
July 2016	TEPCO	1,138	12										1,150	1.92	0.11
	Contractors	7,849	791	80	3								8,723	10.70	0.41
	Total	8,987	803	80	3								9,873	10.70	0.38
August 2016	TEPCO	1,125	41										1,166	4.39	0.17
	Contractors	7,951	532	19									8,502	7.10	0.28
	Total	9,076	573	19									9,668	7.10	0.27
September 2016	TEPCO	1,160	20										1,180	3.50	0.14
	Contractors	8,041	689	35									8,765	8.80	0.35
	Total	9,201	709	35									9,945	8.80	0.33
October 2016	TEPCO	1,142	21										1,163	2.40	0.14
	Contractors	7,693	875	48									8,616	8.34	0.42
	Total	8,835	896	48									9,779	8.34	0.39
November 2016	TEPCO	1,167	29										1,196	3.10	0.15
	Contractors	7,646	1,000	50	5								8,701	12.00	0.45
	Total	8,813	1,029	50	5								9,897	12.00	0.42
December 2016	TEPCO	1,144	16	2									1,162	6.24	0.16
	Contractors	7,667	856	46	4								8,573	12.60	0.41
	Total	8,811	872	48	4								9,735	12.60	0.38
January 2017	TEPCO	1,105	24										1,129	2.40	0.15
	Contractors	7,729	785	69	5								8,588	11.00	0.42
	Total	8,834	809	69	5								9,717	11.00	0.38
February 2017	TEPCO	1,127	49										1,176	3.40	0.17
	Contractors	7,659	1,111	121	6								8,897	13.70	0.53
	Total	8,786	1,160	121	6								10,073	13.70	0.48
March 2017	TEPCO	1,132	38										1,170	3.70	0.18
	Contractors	7,525	1,130	162	26								8,843	16.30	0.61
	Total	8,657	1,168	162	26								10,013	16.30	0.56
April 2017	TEPCO	1,027	26										1,053	2.74	0.17
	Contractors	7,165	892	87	5								8,149	11.40	0.47
	Total	8,192	918	87	5								9,202	11.40	0.43
May 2017	TEPCO	1,023	12										1,035	2.40	0.13
	Contractors	7,247	713	78									8,038	8.80	0.39
	Total	8,270	725	78									9,073	8.80	0.36
June 2017	TEPCO	1,023	26										1,049	3.30	0.16
	Contractors	7,301	890	64	9								8,264	12.90	0.45
	Total	8,324	916	64	9								9,313	12.90	0.42
July 2017	TEPCO	1,001	14										1,015	3.80	0.13
	Contractors	7,211	847	55	2								8,115	11.50	0.42
	Total	8,212	861	55	2								9,130	11.50	0.39
August 2017	TEPCO	979	19										998	3.20	0.13
	Contractors	7,164	651	19									7,834	7.60	0.32
	Total	8,143	670	19									8,832	7.60	0.30
September 2017	TEPCO	1,033	15										1,048	3.30	0.11
	Contractors	7,082	657	16									7,755	7.50	0.32
	Total	8,115	672	16									8,803	7.50	0.30
October 2017	TEPCO	1,035	29										1,064	2.50	0.14
	Contractors	6,886	715	32	2								7,635	10.30	0.37
	Total	7,921	744	32	2								8,699	10.30	0.34

Month/ Year		E ≤ 1	1 < E ≤ 5	5 < E ≤ 10	10 < E ≤ 20	20 < E ≤ 50	50 < E ≤ 75	75 < E ≤ 100	100 < E ≤ 150	150 < E ≤ 200	200 < E ≤ 250	250 < E	Total	Maximum (mSv)	Average (mSv)
November 2017	TEPCO	1,027	23										1,050	2.40	0.12
	Contractors	6,874	660	35	5								7,574	11.20	0.37
	Total	7,901	683	35	5								8,624	11.20	0.34
December 2017	TEPCO	961	22										983	2.60	0.14
	Contractors	6,683	578	18	1								7,280	10.31	0.32
	Total	7,644	600	18	1								8,263	10.31	0.30
January 2018	TEPCO	914	24										938	4.14	0.13
	Contractors	6,444	614	23	1								7,082	10.60	0.35
	Total	7,358	638	23	1								8,020	10.60	0.32
February 2018	TEPCO	941	50										991	3.83	0.21
	Contractors	6,353	791	56									7,200	9.80	0.43
	Total	7,294	841	56									8,191	9.80	0.41
March 2018	TEPCO	935	46										981	2.96	0.17
	Contractors	6,394	768	69									7,231	8.83	0.45
	Total	7,329	814	69									8,212	8.83	0.42
April 2018	TEPCO	1,001	13										1,014	2.40	0.11
	Contractors	5,840	509	26									6,375	8.40	0.33
	Total	6,841	522	26									7,389	8.40	0.30
May 2018	TEPCO	927	15										942	1.90	0.12
	Contractors	5,820	481	18									6,319	9.40	0.30
	Total	6,747	496	18									7,261	9.40	0.28
June 2018	TEPCO	939	29										968	2.68	0.14
	Contractors	5,795	488	4									6,287	7.37	0.30
	Total	6,734	517	4									7,255	7.37	0.28
July 2018	TEPCO	867	27										894	2.72	0.13
	Contractors	5,665	597	21									6,283	9.70	0.34
	Total	6,532	624	21									7,177	9.70	0.32
August 2018	TEPCO	947	25										972	2.30	0.13
	Contractors	5,784	453	9									6,246	6.30	0.29
	Total	6,731	478	9									7,218	6.30	0.27
September 2018	TEPCO	985	17										1,002	1.90	0.11
	Contractors	5,684	469	8									6,161	8.00	0.28
	Total	6,669	486	8									7,163	8.00	0.26
October 2018	TEPCO	976	26										1,002	4.17	0.15
	Contractors	5,579	567	18									6,164	8.20	0.35
	Total	6,555	593	18									7,166	8.20	0.32
November 2018	TEPCO	1,009	13										1,022	2.95	0.11
	Contractors	5,556	626	42									6,224	9.88	0.39
	Total	6,565	639	42									7,246	9.88	0.35
December 2018	TEPCO	981	21										1,002	4.52	0.13
	Contractors	5,562	621	55	4								6,242	14.10	0.42
	Total	6,543	642	55	4								7,244	14.10	0.38
January 2019	TEPCO	944	16										960	2.32	0.10
	Contractors	5,569	511	37									6,117	7.81	0.36
	Total	6,513	527	37									7,077	7.81	0.32
February 2019	TEPCO	974	28										1,003	5.38	0.15
	Contractors	5,575	676	58	2								6,311	12.60	0.44
	Total	6,549	704	59	2								7,314	12.60	0.40

Month/ Year		Average (mSv)											Total	Maximum (mSv)	Average (mSv)	
		E ≤ 1	1 < E ≤ 5	5 < E ≤ 10	10 < E ≤ 20	20 < E ≤ 50	50 < E ≤ 75	75 < E ≤ 100	100 < E ≤ 150	150 < E ≤ 200	200 < E ≤ 250	250 < E				
March 2019	TEPCO	960	34	1										995	5.70	0.16
	Contractors	5,532	613	32	1									6,178	11.41	0.39
	Total	6,492	647	33	1									7,173	11.41	0.35
April 2019	TEPCO	920	24											944	2.66	0.13
	Contractors	4,780	491	8										5,279	7.80	0.33
	Total	5,700	515	8										6,223	7.80	0.30
May 2019	TEPCO	967	20											987	2.80	0.13
	Contractors	4,876	552	5										5,433	5.60	0.33
	Total	5,843	572	5										6,420	5.60	0.30
June 2019	TEPCO	1,016	17	1										1,034	5.20	0.12
	Contractors	4,993	538	12										5,543	7.11	0.35
	Total	6,009	555	13										6,577	7.11	0.31
July 2019	TEPCO	964	19											983	3.60	0.13
	Contractors	5,048	547	10										5,605	9.70	0.35
	Total	6,012	566	10										6,588	9.70	0.32
August 2019	TEPCO	1,006	12											1,018	2.75	0.10
	Contractors	5,037	471	6										5,514	7.99	0.30
	Total	6,043	483	6										6,532	7.99	0.27
September 2019	TEPCO	942	12											954	3.52	0.10
	Contractors	4,953	594	12										5,559	8.15	0.37
	Total	5,895	606	12										6,513	8.15	0.33
October 2019	TEPCO	935	22											957	3.22	0.12
	Contractors	5,066	613	31										5,710	7.49	0.39
	Total	6,001	635	31										6,667	7.49	0.35
November 2019	TEPCO	1,024	23											1,047	3.48	0.12
	Contractors	5,255	595	13										5,863	7.21	0.35
	Total	6,279	618	13										6,910	7.21	0.32
December 2019	TEPCO	967	13											980	2.54	0.11
	Contractors	5,212	604	33	5									5,854	12.20	0.40
	Total	6,179	617	33	5									6,834	12.20	0.36
January 2020	TEPCO	982	10											992	2.07	0.09
	Contractors	5,239	558	54	1									5,852	10.01	0.39
	Total	6,221	568	54	1									6,844	10.01	0.35
February 2020	TEPCO	918	15											933	2.96	0.11
	Contractors	5,208	740	61	10									6,019	11.07	0.49
	Total	6,126	755	61	10									6,952	11.07	0.44
March 2020	TEPCO	900	17											917	1.86	0.12
	Contractors	5,252	765	46	4									6,067	14.30	0.47
	Total	6,152	782	46	4									6,984	14.30	0.42
April 2020	TEPCO	807	18											825	3.37	0.11
	Contractors	4,737	591	28	1									5,357	10.40	0.39
	Total	5,544	609	28	1									6,182	10.40	0.35
May 2020	TEPCO	773	9											782	1.81	0.09
	Contractors	4,762	561	25										5,348	8.80	0.38
	Total	5,535	570	25										6,130	8.80	0.34
June 2020	TEPCO	929	18											947	3.00	0.13
	Contractors	4,920	692	52										5,664	9.30	0.46
	Total	5,849	710	52										6,611	9.30	0.41

Month/ Year		E ≤ 1	1 < E ≤ 5	5 < E ≤ 10	10 < E ≤ 20	20 < E ≤ 50	50 < E ≤ 75	75 < E ≤ 100	100 < E ≤ 150	150 < E ≤ 200	200 < E ≤ 250	250 < E	Total	Maximum (mSv)	Average (mSv)
July 2020	TEPCO	997	15										1,012	2.90	0.10
	Contractors	4,967	661	51									5,679	8.42	0.42
	Total	5,964	676	51									6,691	8.42	0.38
August 2020	TEPCO	951	5										956	1.44	0.08
	Contractors	4,969	407	4									5,380	5.40	0.26
	Total	5,920	412	4									6,336	5.40	0.24
September 2020	TEPCO	1,002	13										1,015	2.70	0.10
	Contractors	5,001	496	32	1								5,530	10.51	0.34
	Total	6,003	509	32	1								6,545	10.51	0.30
October 2020	TEPCO	965	11	1									977	6.99	0.11
	Contractors	5,125	510	31	1								5,667	10.50	0.37
	Total	6,090	521	32	1								6,644	10.50	0.33
November 2020	TEPCO	971	25										996	4.84	0.12
	Contractors	5,054	579	48	2								5,683	11.00	0.42
	Total	6,025	604	48	2								6,679	11.00	0.37
December 2020	TEPCO	975	36										1,011	2.29	0.13
	Contractors	5,242	485	26									5,753	9.00	0.33
	Total	6,217	521	26									6,764	9.00	0.30
January 2021	TEPCO	897	20										917	2.53	0.11
	Contractors	5,258	517	8									5,783	6.70	0.33
	Total	6,155	537	8									6,700	6.70	0.30
February 2021	TEPCO	909	21	1									931	6.10	0.13
	Contractors	5,328	517	45	2								5,892	12.40	0.39
	Total	6,237	538	46	2								6,823	12.40	0.36
March 2021	TEPCO	957	40										997	3.42	0.16
	Contractors	5,032	654	55									5,741	8.90	0.44
	Total	5,989	694	55									6,738	8.90	0.40
April 2021	TEPCO	944	25										969	2.19	0.10
	Contractors	4,602	366	6									4,974	6.40	0.28
	Total	5,546	391	6									5,943	6.40	0.25
May 2021	TEPCO	916	24										940	2.99	0.10
	Contractors	4,666	354	7									5,027	5.79	0.28
	Total	5,582	378	7									5,967	5.79	0.25
June 2021	TEPCO	1,034	23										1,057	2.65	0.09
	Contractors	4,783	505	39									5,327	7.76	0.38
	Total	5,817	528	39									6,384	7.76	0.33
July 2021	TEPCO	1,012	16										1,028	3.89	0.10
	Contractors	4,929	476	22									5,427	7.81	0.34
	Total	5,941	492	22									6,455	7.81	0.30
August 2021	TEPCO	919	6										925	1.45	0.06
	Contractors	4,986	353	15									5,354	6.93	0.26
	Total	5,905	359	15									6,279	6.93	0.23
September 2021	TEPCO	980	12										992	2.60	0.07
	Contractors	4,821	607	66	1								5,495	11.30	0.45
	Total	5,801	619	66	1								6,487	11.30	0.39
October 2021	TEPCO	998	19										1,017	1.96	0.09
	Contractors	5,070	472	40									5,582	8.69	0.36
	Total	6,068	491	40									6,599	8.69	0.32

Month/ Year		E ≤ 1	1 < E ≤ 5	5 < E ≤ 10	10 < E ≤ 20	20 < E ≤ 50	50 < E ≤ 75	75 < E ≤ 100	100 < E ≤ 150	150 < E ≤ 200	200 < E ≤ 250	250 < E	Total	Maximum (mSv)	Average (mSv)
November 2021	TEPCO	998	9										1,007	2.00	0.09
	Contractors	5,187	534	22									5,743	7.70	0.36
	Total	6,185	543	22									6,750	7.70	0.32
December 2021	TEPCO	1,001	34										1,035	3.50	0.12
	Contractors	5,284	524	27									5,835	8.43	0.36
	Total	6,285	558	27									6,870	8.43	0.32
January 2022	TEPCO	942	17										959	3.31	0.10
	Contractors	5,169	630	44	1								5,844	10.28	0.41
	Total	6,111	647	44	1								6,803	10.28	0.37
February 2022	TEPCO	877	20										897	4.43	0.11
	Contractors	5,106	708	43	8								5,865	12.70	0.46
	Total	5,983	728	43	8								6,762	12.70	0.42
March 2022	TEPCO	969	32										1,001	3.77	0.13
	Contractors	5,150	670	37	3								5,860	11.20	0.43
	Total	6,119	702	37	3								6,861	11.20	0.39
April 2022	TEPCO	988	35										1,023	4.53	0.14
	Contractors	5,198	398	4									5,600	5.90	0.28
	Total	6,186	433	4									6,623	5.90	0.26
May 2022	TEPCO	980	10										990	2.78	0.08
	Contractors	5,347	340										5,687	4.90	0.24
	Total	6,327	350										6,677	4.90	0.22
June 2022	TEPCO	1,045	29										1,074	2.27	0.10
	Contractors	5,431	612	14									6,057	7.40	0.36
	Total	6,476	641	14									7,131	7.40	0.33
July 2022	TEPCO	992	15										1,007	4.37	0.09
	Contractors	5,593	495	18									6,106	10.00	0.32
	Total	6,585	510	18									7,113	10.00	0.29
August 2022	TEPCO	1,013	11										1,024	1.49	0.07
	Contractors	5,677	354	8									6,039	6.35	0.23
	Total	6,690	365	8									7,063	6.35	0.21
September 2022	TEPCO	1,081	9										1,090	4.60	0.08
	Contractors	5,763	528	30									6,321	7.10	0.34
	Total	6,844	537	30									7,411	7.10	0.30
October 2022	TEPCO	1,020	22										1,042	3.79	0.10
	Contractors	5,932	514	35									6,481	9.39	0.31
	Total	6,952	536	35									7,523	9.39	0.28
November 2022	TEPCO	1,040	14										1,054	2.44	0.09
	Contractors	6,091	585	34	1								6,711	11.76	0.35
	Total	7,131	599	34	1								7,765	11.76	0.32
December 2022	TEPCO	1,031	16										1,047	2.03	0.09
	Contractors	6,169	501	32									6,702	9.91	0.30
	Total	7,200	517	32									7,749	9.91	0.27
January 2023	TEPCO	1,025	10										1,035	2.80	0.07
	Contractors	6,143	431	13									6,587	9.30	0.26
	Total	7,168	441	13									7,622	9.30	0.23
February 2023	TEPCO	1,013	18										1,031	2.45	0.09
	Contractors	6,044	578	29	1								6,652	10.71	0.32
	Total	7,057	596	29	1								7,683	10.71	0.29

Month/ Year		Exposure Level (mSv)											Total	Maximum (mSv)	Average (mSv)		
		E ≤ 1	1 < E ≤ 5	5 < E ≤ 10	10 < E ≤ 20	20 < E ≤ 50	50 < E ≤ 75	75 < E ≤ 100	100 < E ≤ 150	150 < E ≤ 200	200 < E ≤ 250	250 < E					
March 2023	TEPCO Contractors	1,062	19												1,081	3.44	0.08
	Contractors	6,139	638	39	4										6,820	13.42	0.35
	Total	7,201	657	39	4										7,901	13.42	0.32
April 2023	TEPCO Contractors	1,034	18												1,052	3.10	0.09
	Contractors	5,797	613	76	1										6,487	10.10	0.41
	Total	6,831	631	76	1										7,539	10.10	0.36
May 2023	TEPCO Contractors	1,029	8												1,037	3.00	0.05
	Contractors	5,975	446	35	1										6,457	10.10	0.29
	Total	7,004	454	35	1										7,494	10.10	0.25
June 2023	TEPCO Contractors	1,092	5												1,097	2.00	0.06
	Contractors	5,888	644	44											6,576	9.00	0.37
	Total	6,980	649	44											7,673	9.00	0.32
July 2023	TEPCO Contractors	996	2												998	2.30	0.06
	Contractors	6,020	580	21											6,621	7.60	0.31
	Total	7,016	582	21											7,619	7.60	0.28
August 2023	TEPCO Contractors	1,029	4												1,033	2.60	0.05
	Contractors	6,045	326	12											6,383	7.60	0.21
	Total	7,074	330	12											7,416	7.60	0.19
September 2023	TEPCO Contractors	1,045	11												1,056	3.6	0.07
	Contractors	6,084	520	39	1										6,644	10.3	0.32
	Total	7,129	531	39	1										7,700	10.3	0.29
October 2023	TEPCO Contractors	1,057	13												1,070	3.9	0.07
	Contractors	6,127	612	45	1										6,785	10.1	0.36
	Total	7,184	625	45	1										7,855	10.1	0.32
November 2023	TEPCO Contractors	1,059	9												1,068	2.9	0.07
	Contractors	6,326	499	61	1										6,887	11.6	0.34
	Total	7,385	508	61	1										7,955	11.6	0.30
December 2023	TEPCO Contractors	1,037	17												1,054	3.7	0.08
	Contractors	6,378	522	61	2										6,963	10.2	0.33
	Total	7,415	539	61	2										8,017	10.2	0.29
January 2024	TEPCO Contractors	984	9												993	1.9	0.06
	Contractors	6,457	380	18											6,855	8.0	0.24
	Total	7,441	389	18											7,848	8.0	0.22
February 2024	TEPCO Contractors	1,041	3												1,044	1.9	0.06
	Contractors	6,460	468	35	4										6,967	10.8	0.30
	Total	7,501	471	35	4										8,011	10.8	0.26
March 2024	TEPCO Contractors	1,005	12												1,017	3.9	0.08
	Contractors	6,422	440	37											6,899	8.6	0.28
	Total	7,427	452	37											7,916	8.6	0.26
April 2024	TEPCO Contractors	1,003	11												1,014	3.0	0.07
	Contractors	6,031	370	24											6,425	8.8	0.25
	Total	7,034	381	24											7,439	8.8	0.22
May 2024	TEPCO Contractors	971	8												979	4.2	0.08
	Contractors	6,162	354	17											6,533	7.2	0.22
	Total	7,133	362	17											7,512	7.2	0.20
June 2024	TEPCO Contractors	1,024	18												1,042	3.8	0.08
	Contractors	6,201	529	28											6,758	7.7	0.31
	Total	7,225	547	28											7,800	7.7	0.28

Month/ Year		Dose Range (mSv)											Total	Maximum (mSv)	Average (mSv)		
		E ≤ 1	1 < E ≤ 5	5 < E ≤ 10	10 < E ≤ 20	20 < E ≤ 50	50 < E ≤ 75	75 < E ≤ 100	100 < E ≤ 150	150 < E ≤ 200	200 < E ≤ 250	250 < E					
July 2024	TEPCO Contractors	923	16												939	4.2	0.08
	Contractors	6,308	424	42											6,774	9.4	0.29
	Total	7,231	440	42											7,713	9.4	0.26
August 2024	TEPCO Contractors	965	13												978	2.7	0.07
	Contractors	6,084	347	25	2										6,458	11.1	0.23
	Total	7,049	360	25	2										7,436	11.1	0.21
September 2024	TEPCO Contractors	982	10												992	1.9	0.07
	Contractors	6,147	378	10											6,535	7.9	0.22
	Total	7,129	388	10											7,527	7.9	0.20
October 2024	TEPCO Contractors	1,022	16												1,038	4.1	0.09
	Contractors	6,289	554	62											6,905	9.9	0.34
	Total	7,311	570	62											7,943	9.9	0.31
November 2024	TEPCO Contractors	1,034	17												1,052	5.1	0.09
	Contractors	6,318	501	81	3										6,903	10.9	0.35
	Total	7,352	518	82	3										7,955	10.9	0.31
December 2024	TEPCO Contractors	997	19												1,016	2.2	0.08
	Contractors	6,489	412	58											6,959	9.3	0.28
	Total	7,486	431	58											7,975	9.3	0.25
January 2025	TEPCO Contractors	985	13												998	4.5	0.08
	Contractors	6,391	481	34											6,906	10.0	0.28
	Total	7,376	494	34											7,904	10.0	0.25
February 2025	TEPCO Contractors	982	6												988	2.7	0.06
	Contractors	6,347	604	91	1										7,043	10.3	0.38
	Total	7,329	610	91	1										8,031	10.3	0.34
March 2025	TEPCO Contractors	985	17												1,002	3.6	0.08
	Contractors	6,174	602	76	2										6,854	10.8	0.36
	Total	7,159	619	76	2										7,856	10.8	0.33
April 2025	TEPCO Contractors	997	13												1,010	1.7	0.06
	Contractors	5,978	517	18											6,513	9.9	0.28
	Total	6,975	530	18											7,523	9.9	0.25
May 2025	TEPCO Contractors	988	5												993	2.6	0.05
	Contractors	6,155	398	24											6,577	7.4	0.24
	Total	7,143	403	24											7,570	7.4	0.22
June 2025	TEPCO Contractors	1,042	1												1,043	1.1	0.05
	Contractors	6,375	391	11											6,777	7.1	0.22
	Total	7,417	392	11											7,820	7.1	0.20
July 2025	TEPCO Contractors	927	9												936	2.1	0.06
	Contractors	6,381	424	16											6,821	7.5	0.24
	Total	7,308	433	16											7,757	7.5	0.22
August 2025	TEPCO Contractors	1,038	1												1,039	1.3	0.03
	Contractors	6,347	318	43											6,708	8.4	0.22
	Total	7,385	319	43											7,747	8.4	0.20
September 2025	TEPCO Contractors	985	8												993	1.66	0.06
	Contractors	6,447	349	45	1										6,842	10.50	0.24
	Total	7,432	357	45	1										7,835	10.50	0.22

* The values of the exposure dose and the number of the workers in the table above are subject to change, because there are cases that APD data are replaced with monthly dose data measured by integral dosimeters. Or dose data of workers who wore only an integral dosimeter (ex., workers who entered only the Seismic Isolation Building) need to be updated in the table after the publication of the data.

* The record months of the internal exposure dose of workers in the data above could be changed, even if the evaluation values of their internal exposure dose have not changed, when their "inhalation exposure days" (the days when they inhaled radioactive materials) are reviewed. In the case that the record months have been changed, that effect will be described.

Table 5 Radiation Exposure Dose Distribution (by age)

As of 31 October 2025

<u>Ages 18 to 19</u>				<u>Ages 20 to 29</u>			
Effective dose (E) mSv	TEPCO	Contractors	Total	Effective dose (E) mSv	TEPCO	Contractors	Total
100 < E	0	0	0	100 < E	0	0	0
75 < E ≤ 100	0	0	0	75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	0	0	50 < E ≤ 75	0	4	4
20 < E ≤ 50	0	0	0	20 < E ≤ 50	9	129	138
10 < E ≤ 20	0	2	2	10 < E ≤ 20	23	163	186
5 < E ≤ 10	1	0	1	5 < E ≤ 10	45	175	220
1 < E ≤ 5	1	4	5	1 < E ≤ 5	76	306	382
E ≤ 1	19	20	39	E ≤ 1	201	873	1074
Total	21	26	47	Total	354	1650	2004
Maximum (mSv)	9.30	13.2	13.2	Maximum (mSv)	32.55	58.62	58.62
Average (mSv)	0.64	1.33	1.02	Average (mSv)	3.15	4.96	4.64
<u>Ages 30 to 39</u>				<u>Ages 40 to 49</u>			
Effective dose (E) mSv	TEPCO	Contractors	Total	Effective dose (E) mSv	TEPCO	Contractors	Total
100 < E	0	0	0	100 < E	0	0	0
75 < E ≤ 100	0	0	0	75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	28	28	50 < E ≤ 75	0	59	59
20 < E ≤ 50	15	309	324	20 < E ≤ 50	9	431	440
10 < E ≤ 20	26	396	422	10 < E ≤ 20	13	519	532
5 < E ≤ 10	43	363	406	5 < E ≤ 10	23	460	483
1 < E ≤ 5	100	533	633	1 < E ≤ 5	88	674	762
E ≤ 1	286	1644	1930	E ≤ 1	289	2072	2361
Total	470	3273	3743	Total	422	4215	4637
Maximum (mSv)	39.52	69.55	69.55	Maximum (mSv)	35.81	73.86	73.86
Average (mSv)	2.89	6.41	5.97	Average (mSv)	2.04	6.94	6.50
<u>Ages 50 to 59</u>				<u>Ages 60 to 69</u>			
Effective dose (E) mSv	TEPCO	Contractors	Total	Effective dose (E) mSv	TEPCO	Contractors	Total
100 < E	0	0	0	100 < E	0	0	0
75 < E ≤ 100	0	1	1	75 < E ≤ 100	0	0	0
50 < E ≤ 75	0	47	47	50 < E ≤ 75	0	25	25
20 < E ≤ 50	4	421	425	20 < E ≤ 50	2	222	224
10 < E ≤ 20	12	602	614	10 < E ≤ 20	5	307	312
5 < E ≤ 10	29	509	538	5 < E ≤ 10	8	309	317
1 < E ≤ 5	83	872	955	1 < E ≤ 5	33	529	562
E ≤ 1	443	2999	3442	E ≤ 1	168	1809	1977
Total	571	5451	6022	Total	216	3201	3417
Maximum (mSv)	38.24	75.33	75.33	Maximum (mSv)	36.24	63.77	63.77
Average (mSv)	1.25	5.59	5.18	Average (mSv)	1.40	5.03	4.80
<u>Ages 70 and over</u>				<u>Number of workers</u>			
Effective dose (E) mSv	TEPCO	Contractors	Total		TEPCO	Contractors	Total
100 < E	0	0	0	Ages 18 to 19	21	26	47
75 < E ≤ 100	0	0	0	Ages 20 to 29	354	1650	2004
50 < E ≤ 75	0	2	2	Ages 30 to 39	470	3273	3743
20 < E ≤ 50	0	19	19	Ages 40 to 49	422	4215	4637
10 < E ≤ 20	0	13	13	Ages 50 to 59	571	5451	6022
5 < E ≤ 10	0	17	17	Ages 60 to 69	216	3201	3417
1 < E ≤ 5	2	59	61	Ages 70 and over	13	369	382
E ≤ 1	11	259	270	Total	2067	18185	20252
Total	13	369	382	Maximum (mSv)	39.52	75.33	75.33
Maximum (mSv)	2.99	57.82	57.82	Average (mSv)	2.12	5.84	5.46
Average (mSv)	0.54	3.22	3.13				

Note: * The ages above are as of September 30, 2025.

* The values of the exposure dose and the number of the workers in the table above are subject to change, because there are cases that APD data are replaced with monthly dose data measured by integral dosimeters. Or dose data of workers who wore only an integral dosimeter (ex., workers who entered only the Seismic Isolation Building) need to be updated in the table after the publication of the data.