

# Outline of Decommissioning, Contaminated Water and Treated Water Management

October 30, 2025

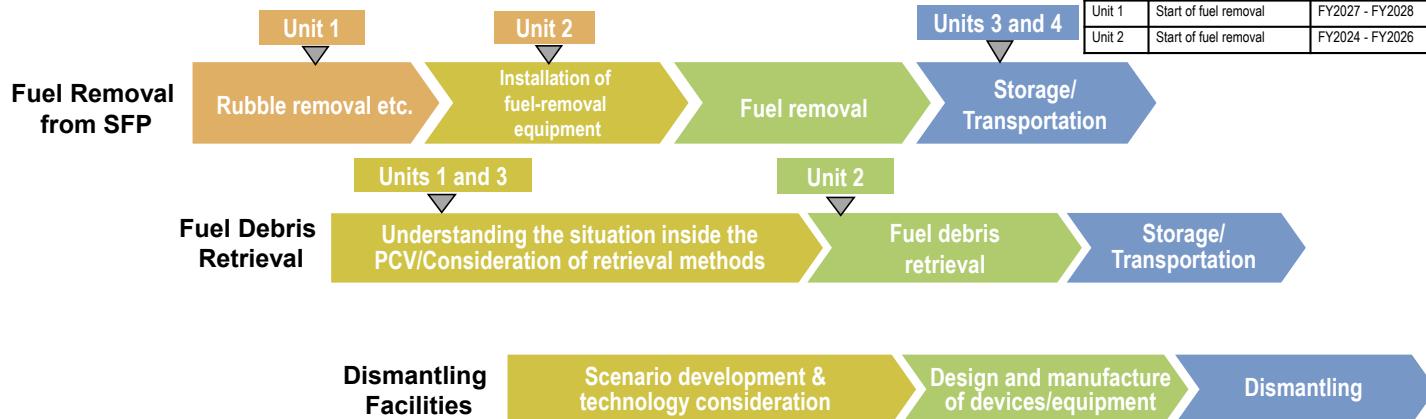
Secretariat of the Team for Countermeasures for  
Decommissioning, Contaminated Water and Treated Water

## Main decommissioning work and steps

Fuel removal from the spent fuel pool was completed on December 22 2014 at Unit 4 and February 28 2021 at Unit 3. Trial fuel debris retrieval at Unit 2 commenced from September 10 2024 and a milestone of the Mid- and Long-Term Roadmap "Commencing fuel debris retrieval at the first Unit" was achieved. Work continues sequentially toward the start of fuel removal from Units 1 and 2 and fuel debris (Note 1) retrieval from Units 1-3. (Note 1) Fuel assemblies having melted through in the accident with nearby metal materials etc.

<Milestones in the Mid- and Long-Term Roadmap>

Units 1-6	Completion of fuel removal	Within 2031
Unit 1	Start of fuel removal	FY2027 - FY2028
Unit 2	Start of fuel removal	FY2024 - FY2026



## Contaminated water management - triple-pronged efforts -

### (1) Efforts to promote contaminated water management based on the three basic policies

- ① "Removing" the contamination source
- ② "Redirecting" groundwater from the contamination source
- ③ "Preventing leakage" of contaminated water

- For stagnant water in buildings (contaminated water), first, cesium and strontium are reduced by the cesium absorption apparatuses (SARRY and KURION). Then, stagnant water in buildings is treated by the multi-nuclide removal system (ALPS) and stored in welded-joint tanks.
- Multi-layered contaminated water management measures, including land-side impermeable walls and subdrains, have stabilized the groundwater at a low level and the increased contaminated water generated during rainfall is being suppressed by repairing damaged portions of the building roofs facing onsite. Through these measures, the generation of contaminated water has been suppressed and reduced from approx. 540 m³/day (in May 2014) before implementing measures to approx. 70 m³/day (in FY2024). It was confirmed that the milestone of "suppressing the amount of contaminated water generated to 100 m³/day or less during average rainfall within FY2025," which was achieved in FY2023, has been maintained in FY2024.
- Measures will proceed to further reduce and suppress the amount of contaminated water generated to approx. 50-70 m³/day by FY2028.

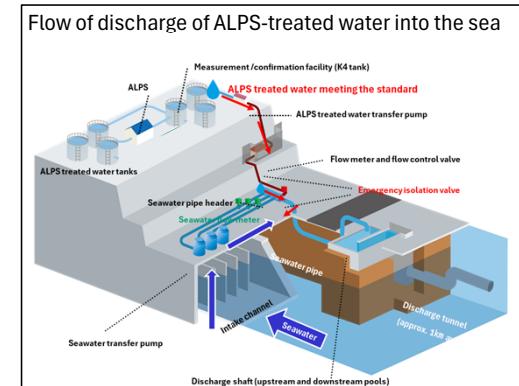
### (2) Efforts to complete stagnant water treatment

- To reduce the stagnant water levels in buildings as planned, work to install additional stagnant water transfer equipment will proceed.
- In 2020, treatment of stagnant water in buildings was completed, except for the Units 1-3 Reactor Buildings, Process Main Building and High-Temperature Incinerator Building.
- While assessing the dust impact, measures to reduce the stagnant water level were implemented. In March 2023, the target water level in each building was achieved. For the Units 1-3 Reactor Buildings, "reducing stagnant water in the Reactor Buildings to about half the amount at the end of 2020 during the period FY2022-2024" was achieved.
- Measures are being implemented for the reduction of radiation dose and stabilization of zeolite sandbags on the basement floors of the Process Main Building and High-Temperature Incinerator Building.

## Measures for treated water

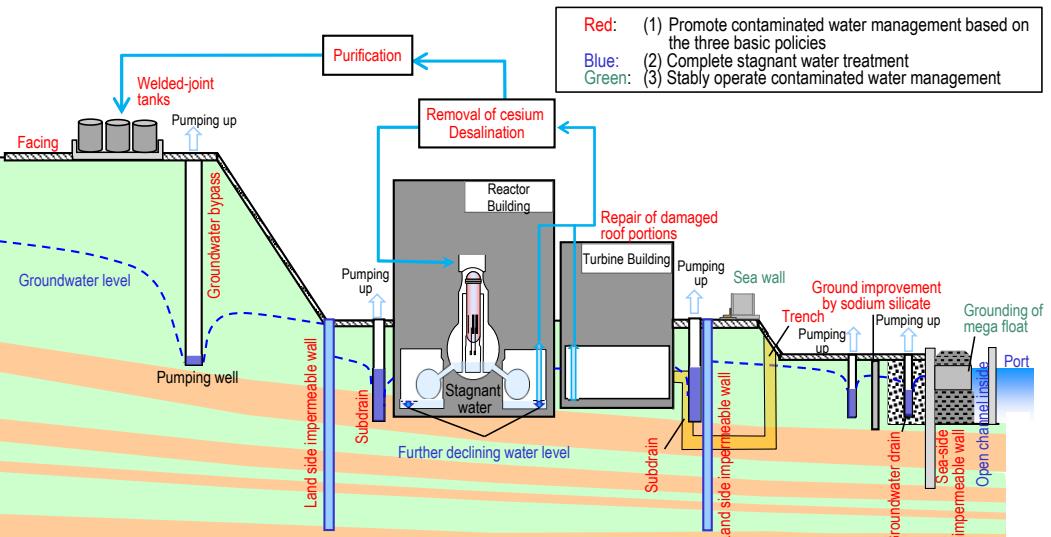
### Handling of ALPS-treated water

Regarding the discharge of ALPS-treated water into the sea, TEPCO must comply with regulatory and other safety standards to safeguard the public, the surrounding environment and agricultural, forestry and fishery products. To minimize adverse impacts on reputation, ongoing efforts will continue, including enhanced monitoring, ensuring objectivity and transparency by engaging with third-party experts and having safety checked by the IAEA. Moreover, accurate information will be disseminated with full transparency.



### (3) Efforts to stably operate contaminated water management

- As part of the tsunami countermeasures, openings in buildings were closed and work to install sea walls was completed. As countermeasures for heavy rain, sandbags are being installed to suppress direct inflow into buildings while work to enhance drainage channels and other measures is being implemented as planned.



## Progress status

- ◆ The temperatures of the Reactor and the Primary Containment Vessel of Units 1-3 have been maintained stable. There was no significant change in the concentration of radioactive materials newly released from Reactor Buildings into the air. It was concluded that the comprehensive cold shutdown state had been maintained.

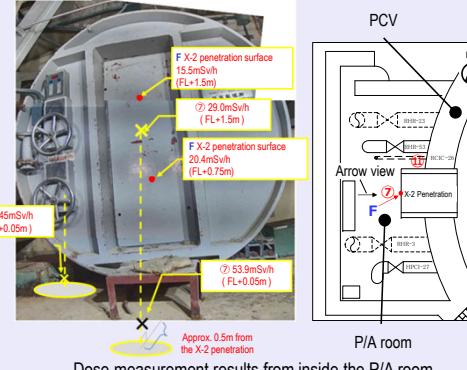
### Unit 3 Investigation results for the inside of the Unit 3 Personal Access Lock and past investigation results for each penetration

For full-scale fuel debris retrieval from Unit 3, we are deliberating accessing the fuel debris from the X-6 penetration, the X-1B penetration and the TIP room. To examine the feasibility of using any other penetrations, from August 19 to September 19, 2025, we investigated the personnel access lock room (P/A room)\*1 outside the Primary Containment Vessel (PCV). Remotely operated quadruped robots (SPOT) and crawler robots (Packbot) were used for the investigation, for visual inspection using cameras, dose measurements and point cloud data acquisition.

By the visual inspection, no molten material adhering to the surface of the X-2 penetration flange in the P/A chamber, nor any signs of leakage or deformations, like those found in the front chamber of the Unit 2 X-6 penetration were confirmed. Moreover, no abnormality such as deformation was found in the P/A chamber. Dose measurement results show hot spots existing on the floor.

In addition to the hotspots identified during this investigation, contamination may also exist elsewhere, so G/I measurement results will be analyzed to create a more detailed radiation source distribution. Dose reduction measures inside the P/A room are necessary if it is to be used for fuel debris retrieval, but there are also obstructions such as a piping system and the air dose rates are high. Accordingly, the process of reducing doses in the P/A room may take considerable time.

The results of this investigation will be utilized in examining methods and environmental improvement for full-scale fuel debris retrieval.



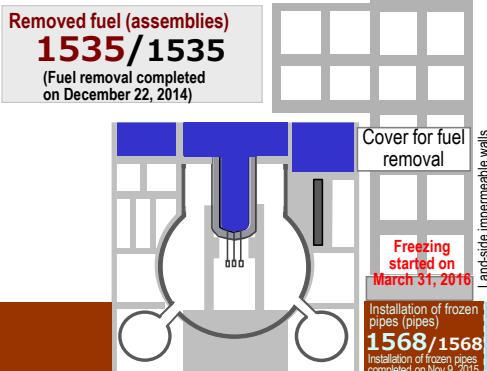
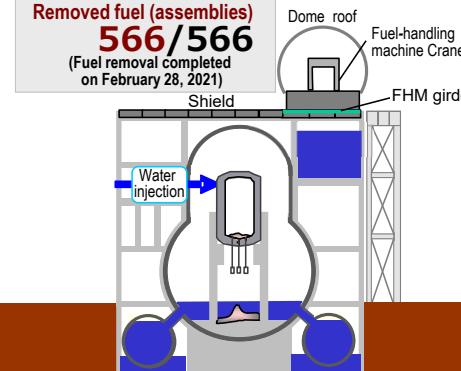
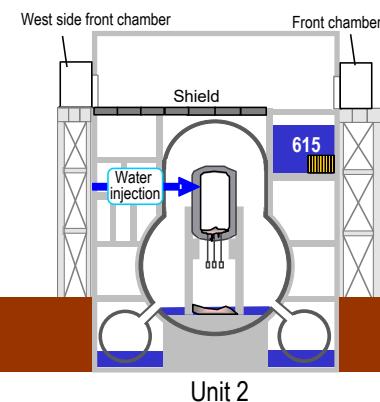
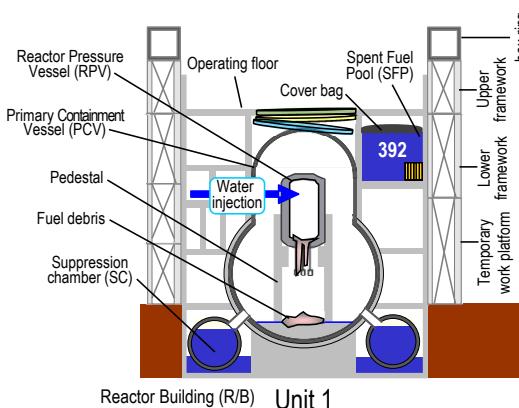
\* 1 Before the accident, used as passage through which persons enter into PCV during inspection.

### Unit 3 PCV internal investigation (non-submerged area) using a micro-drone

For Unit 3, we have been lowering the water level inside the PCV by reducing the amount of cooling water injected into the reactor. We reached the hold point based on an objective water level of approximately T.P7,300 on October 17, 2025.

Moreover, we did not see any abnormalities in related parameters such as the RPV bottom/PCV temperature gauge.

Work to remove the permanent monitoring instruments commenced on October 24 and the investigation will begin in December.



Unit 3  
Unit 4

### Unit 2 Progress of work towards fuel removal

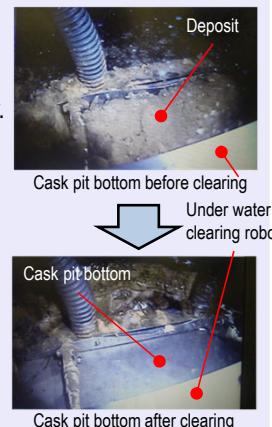
For Unit 2, the fuel-removal system was carried into the work platform in May 2025. At present, operation tests for the main equipment of the fuel-removal system (crane, jib crane and fuel-handling machine) are underway in the front chamber\*2 as part of efforts towards completion inspection on October 30.

The process will transition to operation tests inside the Reactor Building (R/B) from November. Based on the investigation in the spent fuel pool in 2020, firstly deposits at the bottom of the cask pit will be cleared, and then sheet pieces on the fuel rack will be removed. Clearing at the bottom of the cask pit will commence from October 21 and clearing will be completed in early November.

Towards the removal of sheet pieces on the fuel rack, mockup tests were conducted in the robot test pool in the Naraha Center for Remote Control Technology Development of the Japan Atomic Energy Agency and it was confirmed that sheet pieces on the fuel handle mockup could be collected by the underwater ROV.

In the test inside R/B, when the tele-runner moves on the runway girder, after the contamination spreading prevention house is expanded, the shutter between the front chamber and R/B will open.

\*2 Chamber covering the opening of the external wall on the south side of R/B, to prepare the work environment during the carrying-out of fuel removal and to prevent dispersion and diffusion of radioactive materials



### Progress status towards recovery of the Additional Radioactive Waste Incinerator

In response to the steam and gas generation associated with the fermentation and heat generation of chips and the subsequent fire alarm activation on February 2024 at the waste storage pit of the Additional Radioactive Waste Incinerator, the incinerator has been suspended. Towards recovery at the end of FY2025, restoration work commenced from March 2025. In parallel, in response to peeling detected on a concrete portion of the pit, an investigation into its soundness was conducted. Based on the result, the pit was determined to be reusable after being repaired. Including pit repair, restoration will be completed at the end of FY2025.

Work to prevent recurrence of steam and gas generation will conflict with the restoration work in the work area and will accordingly be delayed until the beginning of FY2026. It is expected to take about four months and operation will resume from August 2026.

It is evaluated that "elimination of temporary outdoor storage within FY2028" can be achieved.

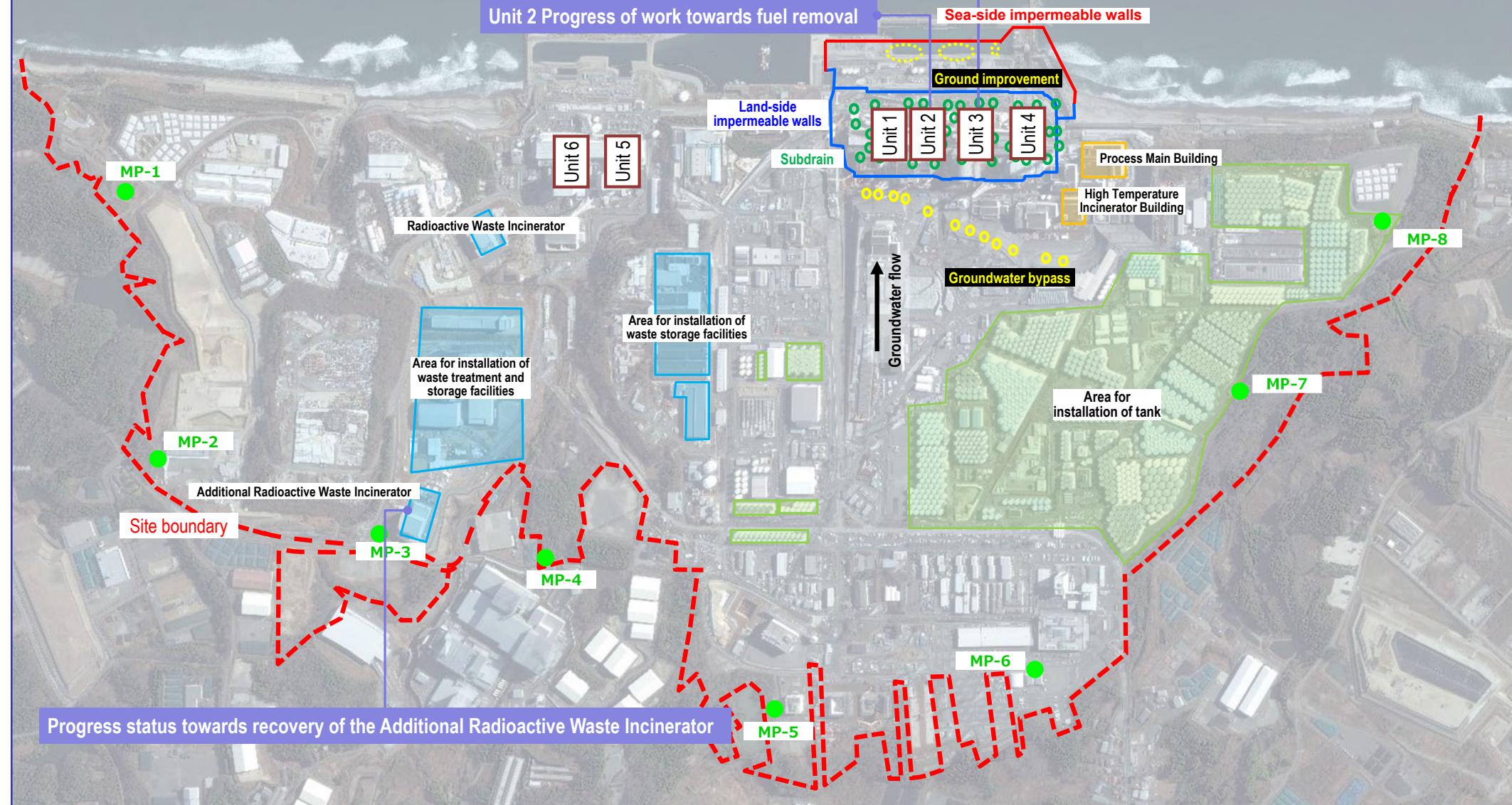


## Major initiatives – Locations on site

Unit 3 Investigation results for the inside of the Unit 3 Personal Access Lock and past investigation results for each penetration

Unit 3 PCV internal investigation (non-submerged area) using a micro-drone

Unit 2 Progress of work towards fuel removal

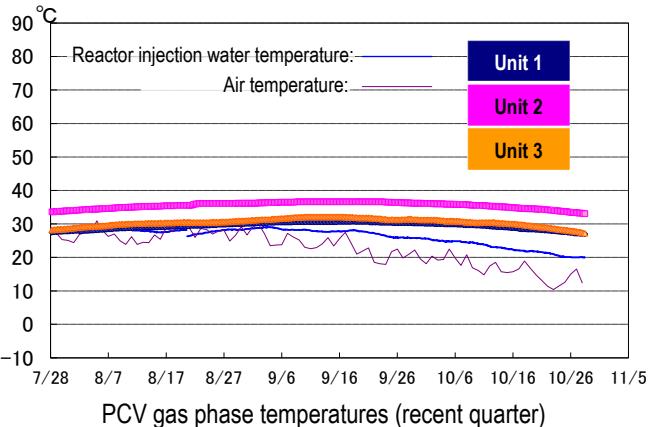
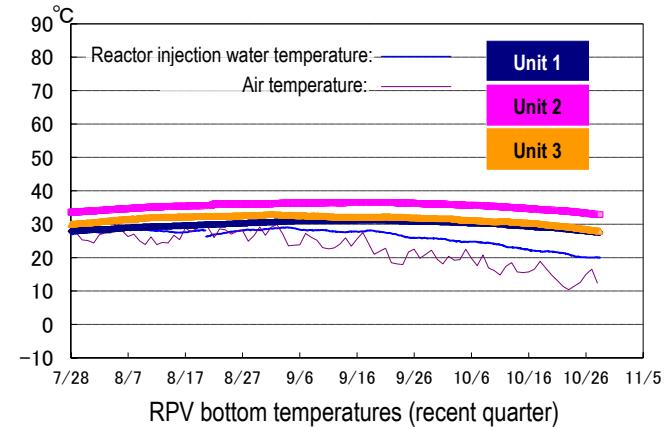


Progress status towards recovery of the Additional Radioactive Waste Incinerator

## I. Confirmation of the reactor conditions

### Temperatures inside the reactors

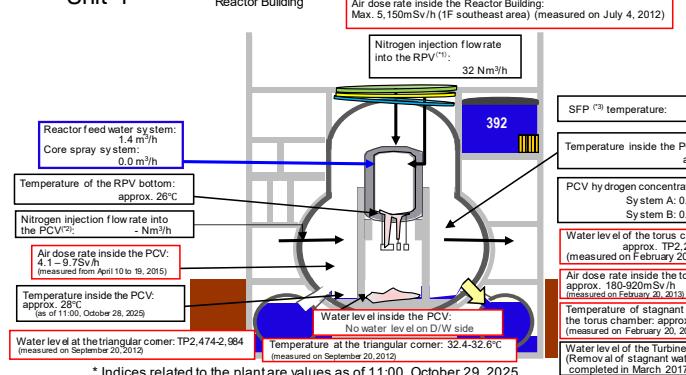
Through continuous reactor cooling by water injection, the temperatures of the Reactor Pressure Vessel (RPV) bottom and the Primary Containment Vessel (PCV) gas phase were maintained as shown below for recent, though they varied depending on the unit and location of the thermometer.



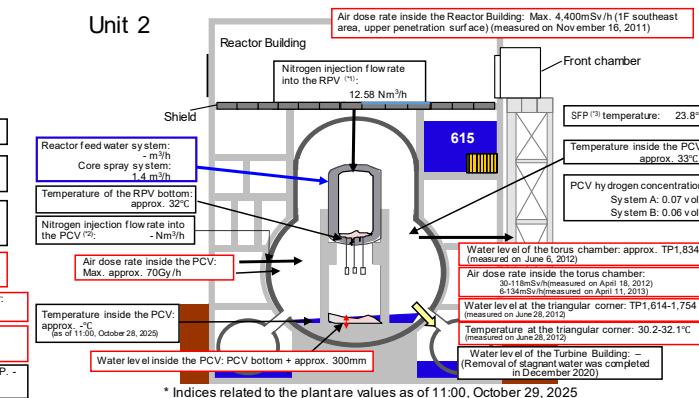
\*1 The trend graphs show part of the temperature data measured at multiple points.

\*2 A part of data could not be measured due to maintenance and inspection of the facility and other work.

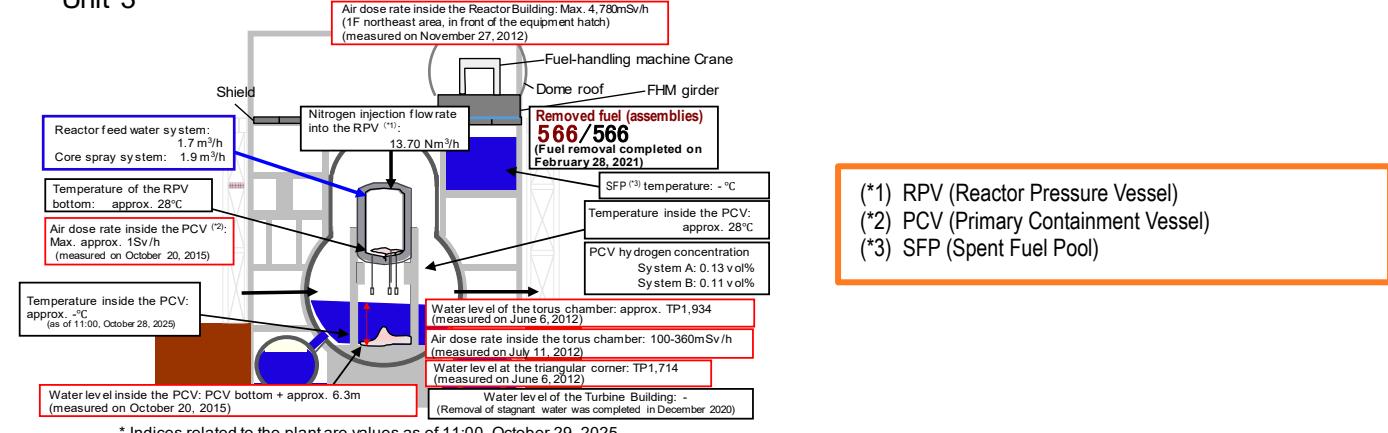
### Unit 1



### Unit 2



### Unit 3



(\*1) RPV (Reactor Pressure Vessel)  
(\*2) PCV (Primary Containment Vessel)  
(\*3) SFP (Spent Fuel Pool)

### Release of radioactive materials from the Reactor Buildings

As of September 2025, the concentration of radioactive materials newly released from Reactor Building Units 1-4 into the air and measured at the site boundary was evaluated at approx.  $5.8 \times 10^{-12}$  Bq/cm<sup>3</sup> and  $8.9 \times 10^{-12}$  Bq/cm<sup>3</sup> for Cs-134 and -137 respectively, while the radiation exposure dose due to the release of radioactive materials there was less than 0.00003 mSv/year.

## Annual radiation dose at site boundaries by radioactive materials (cesium) released from Reactor Building Units 1-4

### (Reference)

- \* The concentration limit of radioactive materials in the air outside the surrounding monitoring area:  
[Cs-134]:  $2 \times 10^{-5}$  Bq/cm<sup>3</sup>  
[Cs-137]:  $3 \times 10^{-5}$  Bq/cm<sup>3</sup>
- \* Data of Monitoring Posts (MP1-MP8).  
Data of Monitoring Posts (MPs) measuring the air dose rate around the site boundary showed 0.283-0.951  $\mu$ Sv/h (September 24 – October 28, 2025). To measure the variation in the air dose rate of MP2-MP8 more accurately, work to improve the environment (trimming trees, removing surface soil and shielding around the MPs) was completed.

Note 1: Different formulas and coefficients were used to evaluate the radiation dose in the facility operation plan and monthly report. The evaluation methods were integrated in September 2012. As the fuel removal from the spent fuel pool (SFP) commenced for Unit 4, the radiation exposure dose from Unit 4 was added to the items subject to evaluation since November 2013. The evaluation has been changed to a method considering the values of continuous dust monitors since FY2015, with data to be evaluated monthly and announced the following month.

Note 2: Radiation dose was calculated using the evaluation values of release amount from Units 1-4 and Units 5 and 6. The radiation dose of Unit 5 and 6 was evaluated based on expected release amount during operation until September 2019 but the evaluation method was reviewed and changed to calculate based on the actual measurement results of Units 5 and 6 from October.

Note 3: Dose assessment has been changed since July 2024 due to the change of standard meteorology, etc. in the implementation plan (effective July 8, 2024).

### Other indices

There was no significant change in indices, including the pressure in the PCV and the PCV radioactivity density (Xe-135) for monitoring criticality, nor was any anomaly in the cold shutdown state or criticality sign detected.

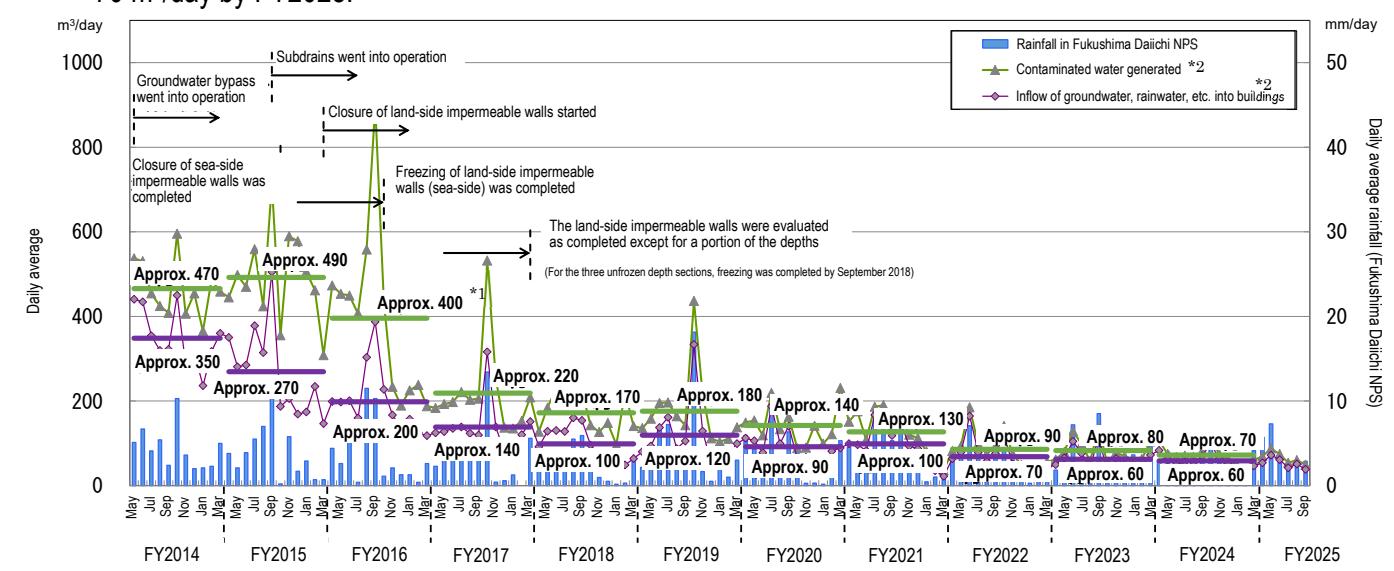
Based on the above, it was confirmed that the comprehensive cold shutdown state had been maintained and the reactors remained in a stabilized condition.

## II. Progress status by each plan

### Measures for contaminated water and treated water

#### ➤ Status of contaminated water generated

- Multi-layered contaminated water management measures, including land-side impermeable walls and subdrains, have stabilized the groundwater at a low level and the increased contaminated water generated during rainfall is being suppressed by repairing damaged portions of building roofs facing onsite. Through these measures, the generation of contaminated water has been suppressed and reduced from approx. 540 m<sup>3</sup>/day (in May 2014) before implementing measures to approx. 70 m<sup>3</sup>/day (in FY2024). It was confirmed that the milestone of "suppressing the amount of contaminated water generated to 100 m<sup>3</sup>/day or less during average rainfall within FY2025," which was achieved in FY2023, has been maintained in FY2024.
- Measures will proceed to further reduce the amount of contaminated water generated and suppress to approx. 50-70 m<sup>3</sup>/day by FY2028.



\*1 Values differ from those announced at the 20<sup>th</sup> Committee on Countermeasures for Contaminated Water Treatment (held on August 25, 2017) because the method of calculating the contaminated water volume generated was reviewed on March 1, 2018. Details of the review are described in the materials for the 50<sup>th</sup> and 51<sup>st</sup> meetings of the Secretariat of the Team for Countermeasures for Decommissioning and Contaminated Water Treatment.  
\*2: The monthly daily average is derived from the daily average from the previous Thursday to the last Wednesday, which is calculated based on the data measured at 7:00 on every Thursday

Figure 1: Changes in contaminated water generated and inflow of groundwater and rainwater into buildings

- Operation of the Water-Treatment Facility Special for Subdrains & Groundwater drains
  - At the Water-Treatment Facility Special for Subdrains & Groundwater drains, release started from September 14, 2015, and up until October 21, 2025, 2795 release operations had been conducted.

The water quality of all temporary storage tanks satisfied the operational target.

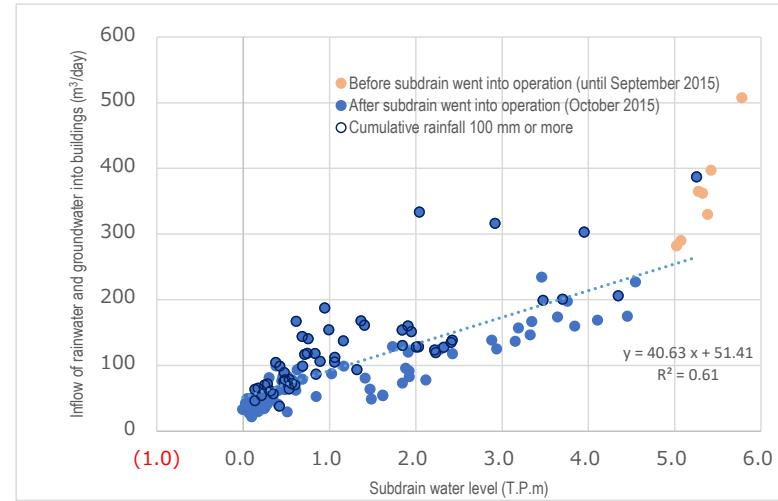


Figure 2: Correlation between inflow such as groundwater and rainwater into buildings and the water level of Units 1-4 subdrains

- Implementation status of facing
  - Facing is a measure that involves asphalt the on-site surface to reduce the radiation dose, prevent rainwater from infiltrating the ground and reduce the amount of underground water flowing into buildings. As of the end of September 2025, 97% (1,410,000 m²) of the planned area (1,450,000 m²) on site had been completed. For the area inside the land-side impermeable walls, facing is proceeded after appropriate yard coordination from the zones in which facing can be implemented without affecting the decommissioning work. As of the end of September 2025, 55% (30,000 m²) of the planned area (60,000 m²) had been completed.

#### ➤ Status of the groundwater level around buildings

- Regarding the groundwater level in the area inside the land-side impermeable walls, the difference between the inside and outside has remained constant, though the groundwater level on the mountain side varied due to rainfall. The groundwater level of the groundwater drain observation well remained sufficiently lower than the ground surface, at around T.P.+1.4m (the height of the ground surface: T.P.+2.5m).
- Regarding the subdrains of Units 1-4, the pumping amount varied depending on precipitation. The pumping amount in the T.P.+2.5m area remained constant after the facing in this area was completed.

#### ➤ Operation of the multi-nuclide removal system and other water-treatment facilities

- Regarding the multi-nuclide removal system (existing), hot tests using radioactive water were conducted (System A: from March 30, 2013, System B: from June 13, 2013, System C: from September 27, 2013). On March 23, 2022, an inspection prior-to-use certificate was granted by the Nuclear Regulation Authority (NRA) and the entire inspection prior to use was completed. For the multi-nuclide removal system (additional), an inspection prior to use certificate was granted by the NRA on October 12, 2017. Regarding the multi-nuclide removal system (high-performance), hot tests using radioactive water were conducted from October 18, 2014. In March 2, 2023, an inspection prior to use certificate was granted by the NRA and the entire inspection prior to use was completed.
- Treatment measures comprising the removal of strontium by cesium-adsorption apparatus (KURION), the secondary cesium-adsorption apparatus (SARRY) and the third cesium-adsorption apparatus (SARRY II) continued. Up until October 16, 2025, approx. 801,000 m³ had been treated.

#### ➤ Risk reduction of strontium-reduced water

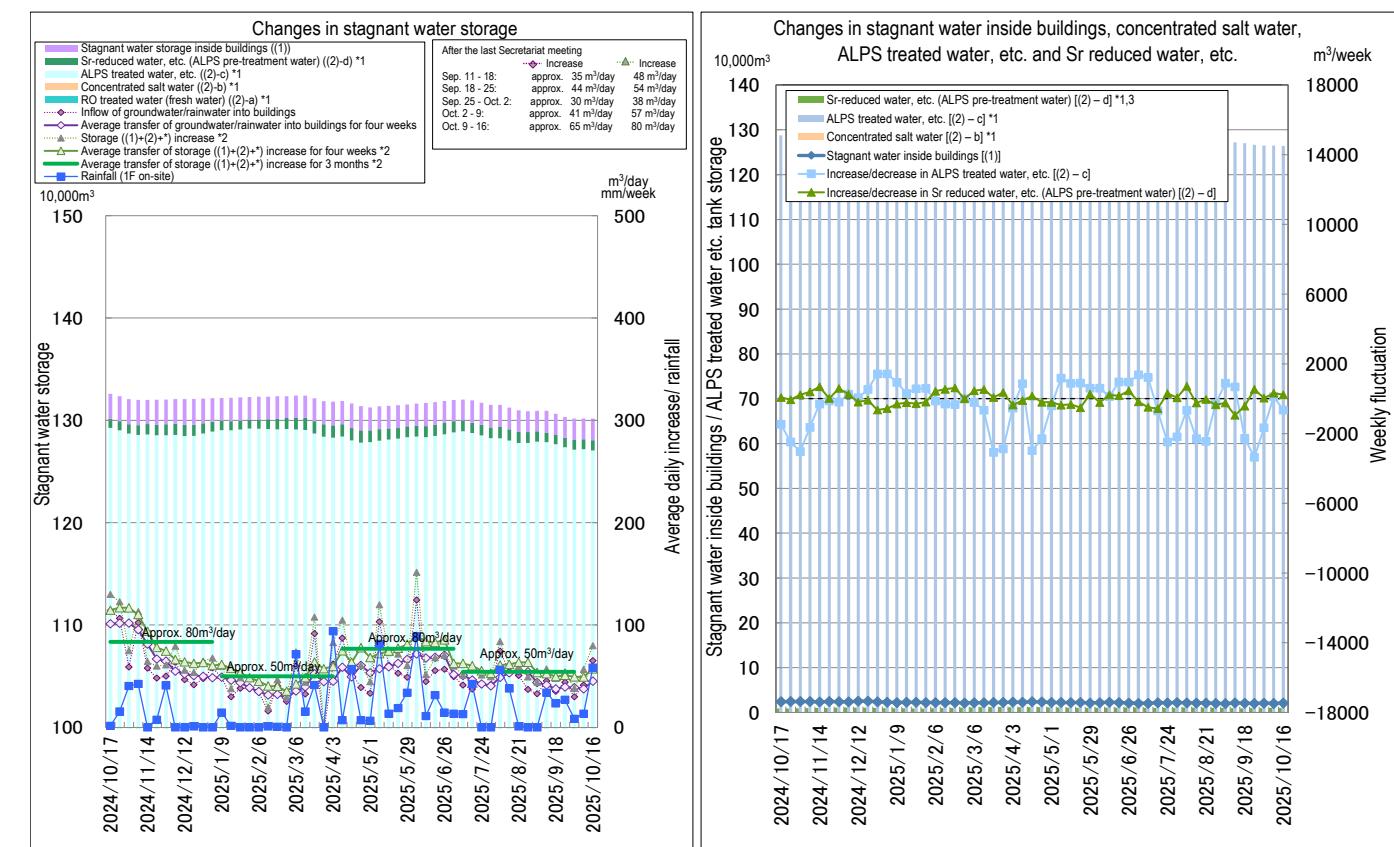
- To reduce the risks of strontium-reduced water, treatment using existing, additional and high-performance multi-nuclide removal system is underway. Up until October 16, 2025, approx. 967,000 m³ had been treated.

#### ➤ Storage status of stagnant water and amount of ALPS treated water, etc. stored in tanks

- The volume of ALPS treated water, etc. was approx. 1,266,684 m³ as of October 16, 2025.

- The total volume of ALPS treated water discharged into the sea since the discharge commenced on August 24, 2023, was approx. 117,650 m³ as of the completion of the fourth discharge in FY2025.

As of October 16, 2025



(1): Stagnant water storage inside buildings (Units 1-4, Process Main Building, High Temperature Incinerator Building, Waste Liquid Supply Tank, SPT (A), SPT (B), Units 1-3 CST, buffer tank)  
 (2): Units 1-4 tank storage [(2)-a RO-treated water (fresh water)] + [(2)-b Concentrated salt water] + [(2)-c ALPS treated water, etc.] + [(2)-d Sr-reduced water, etc. (ALPS pre-treatment water)]  
 \*: Water amount from tank bottom to water-level gauge 0% (DS)  
 \*1: Water amount for which the water-level gauge indicates 0% or more  
 \*2: Calculated in the method of contaminated water generated [(Inflow of groundwater/rainwater into buildings) + (other transfer) + (chemical injection into ALPS)], amount of ALPS treated water discharged was not taken into account.  
 \*3: Amount of Sr-reduced water and others increased and decreased depending on the operation status of facilities due to clog of the cross-flow filter for the multi-nuclide removal system.

Figure 3: Status of stagnant water storage

#### ➤ Status of discharge of ALPS treated water

As of October 28, 2025

Measurement object	Requirement and operation target	Measurement results	Compliance with requirement
[TEPCO] Tritium concentration in seawater (sea-area monitoring at 4 points within 3 km of the Power Station)	<ul style="list-style-type: none"> <li>• Discharge suspension level: 700 Bq/L or less</li> <li>• Investigation level: 350 Bq/L or less</li> </ul>	<ul style="list-style-type: none"> <li>(Sampled on October 27)</li> <li>• Below the lower detection limit (less than 5.6 – 6.9 Bq/L)</li> </ul>	<ul style="list-style-type: none"> <li>○</li> <li>○</li> </ul>
[TEPCO] Tritium concentration in seawater (sea-area monitoring at 1 point within a 10 km square area in front of the Power Station)	<ul style="list-style-type: none"> <li>• Discharge suspension level: 30 Bq/L or less</li> <li>• Investigation level: 20 Bq/L or less</li> </ul>	<ul style="list-style-type: none"> <li>(Sampled on October 27)</li> <li>• Below the lower detection limit (less than 5.5 Bq/L)</li> </ul>	<ul style="list-style-type: none"> <li>○</li> <li>○</li> </ul>
[Ministry of the Environment] Tritium concentration in seawater (at 3 points off the coast of Fukushima Prefecture)	<ul style="list-style-type: none"> <li>• National safety requirement: 60,000 Bq/L</li> <li>• WHO drinking water guidelines: 10,000 Bq/L</li> </ul>	<ul style="list-style-type: none"> <li>(Sampled on October 15)</li> <li>• Below the lower detection limit (less than 9 Bq/L)</li> </ul>	<ul style="list-style-type: none"> <li>○</li> <li>○</li> </ul>
[Fisheries Agency] Tritium concentration in marine products (flounder and others)	-	<ul style="list-style-type: none"> <li>(Sampled on October 21)</li> <li>• Below the lower detection limit (less than 9.6 Bq/kg)</li> </ul>	<ul style="list-style-type: none"> <li>○</li> </ul>
[Fukushima Prefecture] Tritium concentration in seawater (at 9 points off the coast of Fukushima Prefecture)	<ul style="list-style-type: none"> <li>• National safety requirement: 60,000 Bq/L</li> <li>• WHO drinking water guidelines: 10,000 Bq/L</li> </ul>	<ul style="list-style-type: none"> <li>(Sampled on October 22)</li> <li>• Below the lower detection limit (less than 3.9 – 4.3 Bq/L)</li> </ul>	<ul style="list-style-type: none"> <li>○</li> <li>○</li> </ul>

- From September 11 to 29, 2025, the fourth discharge of ALPS treated water into the sea in FY2025 was conducted.
- Regarding the status of sea-area monitoring on handling ALPS treated water, more tritium measurement points for seawater and fish were established near the power station and off the coast of Fukushima Prefecture and measurements of tritium and Iodine-129 of seaweed near the power station were added from April 20, 2022. As of October 29, 2025, no significant variation had been detected.
- Regarding sea-area monitoring conducted by TEPCO at 4 points within 3 km of the power station, rapid measurements taken of the tritium concentration in the seawater sampled on October 27 showed concentrations under the lower detection limit (less than 5.6 – 6.9 Bq/L) at all points, which were below the TEPCO operation indices of 700 Bq/L (discharge suspension level) and 350 Bq/L (investigation level).
- Regarding sea-area monitoring conducted by TEPCO at 1 point within a 10 km square area in front of the power station, rapid measurements taken of the tritium concentration in the seawater sampled on October 27 showed concentrations under the detection limit (less than 5.5 Bq/L), which was below the TEPCO operation indices of 30 Bq/L (discharge suspension level) and 20 Bq/L (investigation level).
- The quick measurement results obtained by each organization were as follows:
 

Ministry of the Environment: The analytical results (obtained via rapid measurements) for seawater sampled on October 15 at 3 points off the coast of Fukushima Prefecture showed tritium concentrations below the lower detection limit (less than 9 Bq/L) at all sampling points, which would have no adverse impact on human health and the environment.

Fisheries Agency: Rapid analytical results for tritium in flounder sampled on October 21 showed tritium concentrations below the lower detection limit (less than 9.6 Bq/kg) in all samples.

Fukushima Prefecture: On October 22, tritium concentrations in seawater at 9 sampling points off the coast of Fukushima Prefecture below the lower detection limit were recorded (less than 3.9 – 4.3 Bq/L) at all sampling points, which would have no adverse impact on human health and the environment.

#### Fuel removal from the spent fuel pools

Activities ahead of spent fuel removal from the pool are progressing steadily while ensuring seismic capacity and safety.

- **Progress of work towards fuel removal at Unit 1**
  - Ahead of installing a large cover over the Reactor Building, ground assembly and on-site installation are both underway.
  - In the off-site yard, ground assembly of the Temporary work platform, upper and lower frameworks and box-rings was completed. Ground assembly of the moving roof and the overhead crane for rubble removal is underway.
  - On site, the installation of the box-rings, exhaust equipment for the large cover, and other facilities is underway.
  - For Unit 1, rubble inside the large cover will be cleared before fuel removal begins. To mitigate the consequences if the fuel-handling machine's auxiliary hoist falls during rubble clearance, an additional cover was installed over the spent fuel pool (SFP) gate on June 27, 2025.
  - As a result of the mock-up test, it was confirmed that the SFP gate would remain unaffected even if the auxiliary hoist were to fall onto the additional cover.
  - The installation of the large cover makes it difficult to directly inject water from outside, such as by using a concrete pump truck. Therefore, to diversify water injection methods in addition to the existing SFP cooling system, an alternative injection line was installed.
  - With waste reduction in mind, the fuel-handling machine that was installed in Unit 4 in 2013 will be sent back to the manufacturer for modification and will be reused for Unit 1.
  - For reuse, parts that cannot be reused as they are, or those expected to be discontinued or to deteriorate over time will be newly manufactured.
  - Installing a large cover requires the process to be extended. Considering the fact that the detailed dose impact can be confirmed from the operating floor, shielding needs to be added as an additional means of reducing radiation exposure and the work time needs to be reviewed. Work stoppages have become increasingly common due to bad weather, issues with the large cranes used on site, and other factors.
  - Considering the possibility of future schedule extensions due to similar factors, and taking reduced work hours caused by intense summer heat and other factors into account, the expected completion date for installing the large cover

has been revised from around summer 2025 to within FY2025.

- For starting fuel removal (FY2027-2028), future timelines can be shortened by revising work procedures and other aspects after rubble removal is completed. Accordingly, the start date currently remains unchanged.
- To remove rubble effectively, all rubble conditions need to be fully assessed, considering ongoing uncertainties in the process. The decision over whether to revise the entire timeline will be considered after the mid-stage of rubble retrieval.

➤ **Progress of work toward fuel removal at Unit 2**

- Work to install runway girders, which support the rails to be used when the fuel removal system moves between the Reactor Building and the front chamber, was completed.
- To ensure visibility during fuel removal, a purification system was installed in the spent fuel pool.
- The fuel removal system was transported from the factory on May 21, 2025, carried into the site of the Fukushima Daiichi Nuclear Power Station on May 24, and hoisted within the work platform for fuel removal on May 30.
- At present, operation tests for each equipment of the fuel removal system and cleaning of the cask pit bottom are underway as part of work to install the fuel removal system.
- Completion inspection of the crane and the jib crane was undergone on October 30, 2025, and the process will transition to operation tests inside the Reactor Building from November.
- After cleaning of the cask pit bottom is completed, sheet pieces will be removed.
- Progress towards work for the fuel removal to be commenced in FY2026 remains steady at present and work prioritizing safety will proceed.

#### Plans to store, process and dispose of solid waste and decommission of reactor facilities

Promoting efforts to reduce and store waste generated appropriately and R&D to facilitate adequate and safe storage, processing and disposal of radioactive waste

➤ **Management status of rubble and trimmed trees**

- As of the end of September 2025, the total storage volume for concrete and metal rubble was approx. 413,300 m<sup>3</sup> (+600 m<sup>3</sup> compared to the end of August with an area-occupation rate of 68%). The total storage volume of trimmed trees was approx. 68,900 m<sup>3</sup> (+100 m<sup>3</sup>, with an area-occupation rate of 39%). The total storage volume of used protective clothing was approx. 10,100 m<sup>3</sup> (-400 m<sup>3</sup>, with an area-occupation rate of 40%). The total storage volume of radioactive solid waste (incinerated ash and others) was approx. 38,500 m<sup>3</sup> (a slight increase, with an area-occupation rate of 60%). The increase in rubble was due to decontamination of flanged tanks, move for site preparation, and work related to areas around Units 1-4 buildings, etc.

➤ **Management status of secondary waste from water treatment**

- As of October 2, 2025, the total storage volume of waste sludge was 516 m<sup>3</sup> (area-occupation rate: 74%), while that of concentrated waste fluid was 9,470 m<sup>3</sup> (area-occupation rate: 92%). The total number of stored spent vessels, High-Integrity Containers (HICs) for the multi-nuclide removal system and others, was 5,934 (area-occupation rate: 86%).

#### Reduction in radiation dose and mitigation of contamination

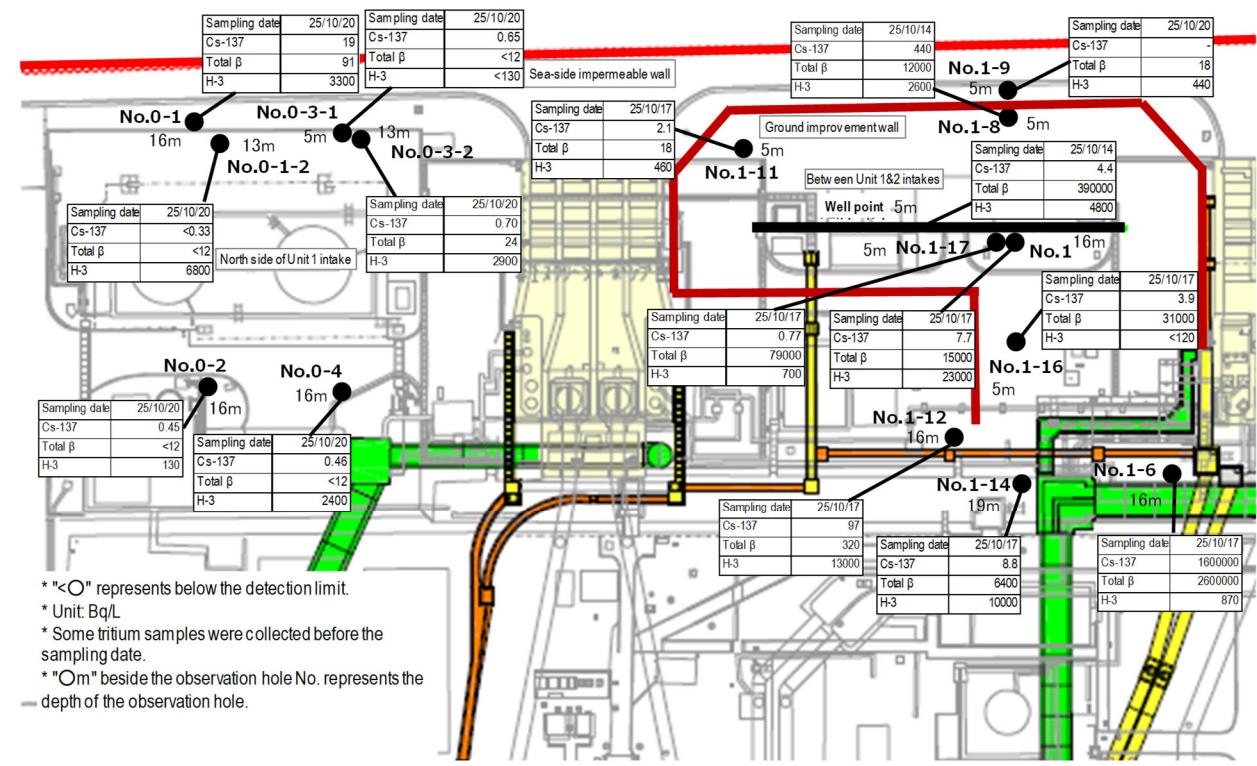
Effective dose-reduction at site boundaries and purification of port water to mitigate the impact of radiation on the external environment

➤ **Status of the groundwater and seawater on the east side of Turbine Building Units 1-4**

- In the Unit 1 intake north side area, the H-3 concentration was below the legal discharge limit of 60,000 Bq/L at all observation holes and remained constant or has been declining overall. The concentration of total  $\beta$  radioactive materials has remained constant overall but increased temporarily from April 2020 and is even currently increasing or declining at a low concentration at observation holes including Nos. 0-1, 0-1-2, 0-2, 0-3-1, 0-3-2 and 0-4. The trend continues to be carefully monitored.
- In the area between the Units 1 and 2 intakes, the H-3 concentration has remained below the legal discharge limit of 60,000 Bq/L at all observation holes. It has been increasing or declining at Nos. 1-14 and 1-17 but has otherwise remained constant or been declining overall. The concentration of total  $\beta$  radioactive materials has remained constant

overall but has been increasing at No. 1-6 and increasing or declining at low concentration at Nos. 1-8, 1-9, 1-11, 1-12 and 1-14. The trend continues to be carefully monitored.

- In the area between the Units 2 and 3 intakes, the H-3 concentration has been below the legal discharge limit of 60,000 Bq/L at all observation holes. It has remained constant or been declining at many observation holes overall. The concentration of total  $\beta$  radioactive materials has remained constant overall but has been increasing and larger fluctuation was seen at No. 2-5. The trend continues to be carefully monitored.
- In the area between the Units 3 and 4 intakes, the H-3 concentration has been below the legal discharge limit of 60,000 Bq/L at all observation holes and remained constant or been declining overall. The concentration of total  $\beta$  radioactive materials has remained constant overall but has been increasing or declining at Nos. 3-4 and 3-5. The trend continues to be carefully monitored.
- In the groundwater on the east side of the Turbine Buildings, as with the total  $\beta$  radioactive materials, the concentration of cesium has also remained constant as the overall area but been increasing or declining at observation holes with a low concentration and exceeded the previous highest record at some observation holes. Investigations will continue, including to ascertain the impact of rainfall.
- The concentration of radioactive materials in drainage channels has remained constant overall, despite increasing during rainfall. In Drainage Channel D, drainage of the low-dose area on the west side of the site started to pass from August 30, 2022. It has remained low, despite concentrations of cesium and total  $\beta$  radioactive materials increasing during rainfall. From November 29, 2022, continuous monitors were installed and drainage around the Units 1 and 2 switch yard started to pass.
- In the open channel area of the seawater intake for Units 1 to 4, the concentration of radioactive materials in seawater has remained below the legal discharge limit and been declining long term, despite the temporary increases in Cs-137 and Sr-90 observed during rainfall. They have also been declining following the completed installation and the connection of steel pipe sheet piles for the sea-side impermeable walls. The concentration of Cs-137 remained slightly higher in front of the south-side impermeable walls and slightly lower on the north side of the east breakwater since March 20, 2019, when the silt fence was transferred to the center of the open channel due to mega float-related construction.
- In the port area, the concentration of radioactive materials in seawater has remained below the legal discharge limit and been declining long term, despite temporary increases in Cs-137 and Sr-90 observed during rainfall. They have remained below the level of those in the Units 1-4 intake open channel area and been declining following the completed installation and connection of steel pipe sheet piles for the sea-side impermeable walls.
- In the area outside the port, regarding the concentration of radioactive materials in seawater, those of Cs-137 and Sr-90 declined and remained low after steel pipe sheet piles for the sea-side impermeable walls were installed and connected. Regarding the concentration of Cs-137, a temporary increase was sometimes observed on the north side of the Units 5 and 6 outlets and near the south outlet due to the influence of weather, marine meteorology and other factors. Regarding the concentration of Sr-90, variation was observed in FY2021 in the area outside the port (north and south outlets). Monitoring of the tendency continues, including the potential influence of weather, marine meteorology and others. During the period for which ALPS treated water was discharged, the tritium concentration increased at the sampling point near the discharge outlet, but this was considered within the assumed range based on the oceanic dispersion simulation results.



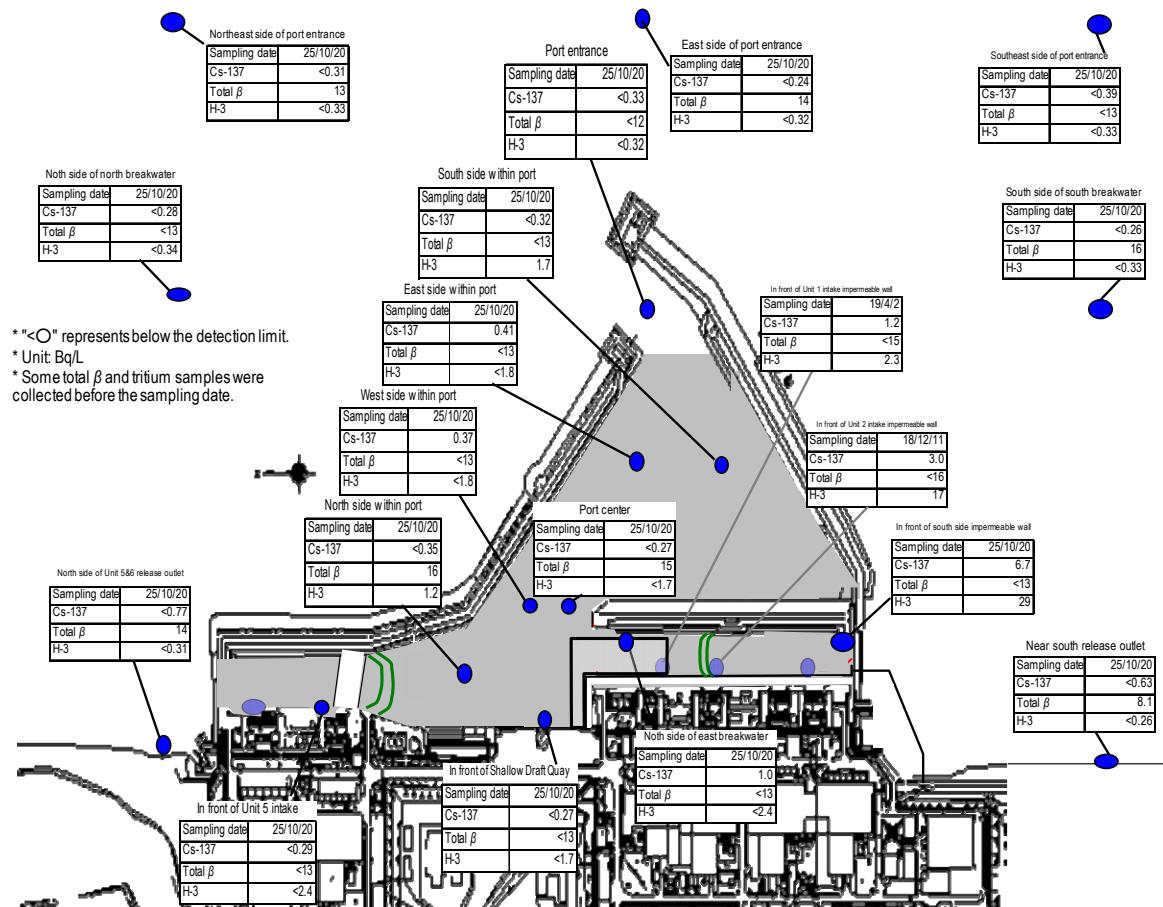


Figure 5: Seawater concentration around the port

#### Outlook of the number of staff required and efforts to improve the labor environment and conditions

Adequate number of staff will be secured in the long-term, while firmly implementing radiation control of workers. The work environment and labor conditions will be continuously improved by responding to the needs on the site.

##### ➤ Staff management

- The monthly average total of personnel registered for at least one day per month to work on site during the past quarter from June – August 2025 was approx. 8,900 (cooperating company workers and TEPCO HD employees), which exceeded the monthly average workforce (approx. 7,700). Accordingly, sufficient personnel were registered to work on site.
- It was confirmed with the prime contractors that the estimated manpower necessary for the work in November 2025 (approx. 5,000 workers per day: cooperating company workers and TEPCO HD employees) would be secured at present. The average numbers of workers per day per month (actual values) for the most recent two years were maintained, at approx. 3,600 to 4,900.
- The number of workers from within Fukushima Prefecture increased and outside remained constant. As of September 2025, the local employment ratio (cooperating company workers and TEPCO HD employees) remained constant at around 70%.
- The average exposure doses of workers were approx. 2.16, 2.18 and 2.08 mSv/person-year during FY2022, 2023 and 2024, respectively (The legal exposure dose limits are 100 and 50 mSv/person-year respectively over five years, the TEPCO HD management target is 20 mSv/person-year).
- For most workers, the exposure dose remained sufficiently within the limit and allowed them to continue engaging in radiation work.

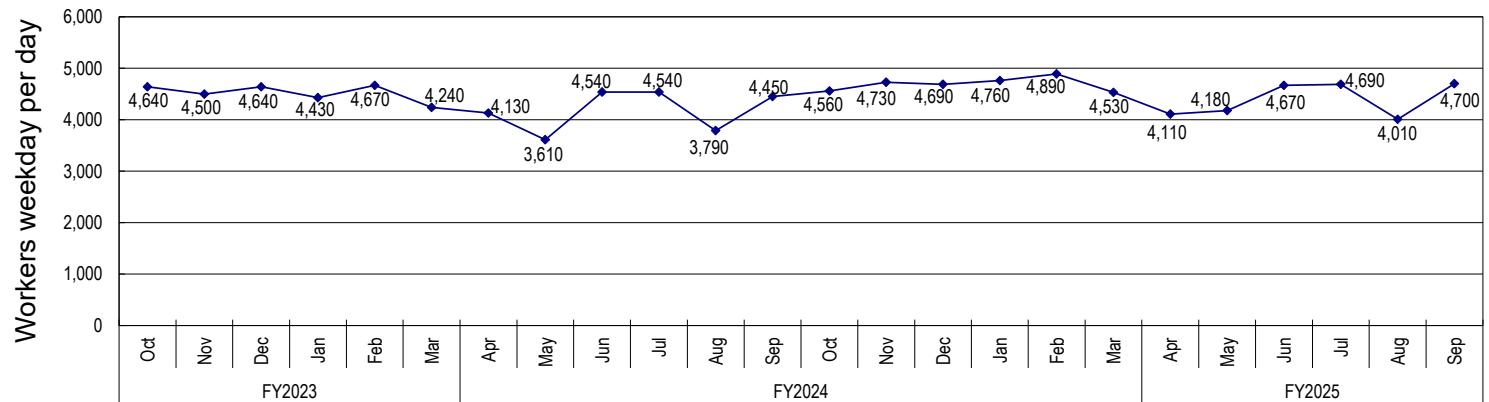


Figure 6: Changes in the average number of workers weekday per day for each month of the most recent 2 years (actual values)

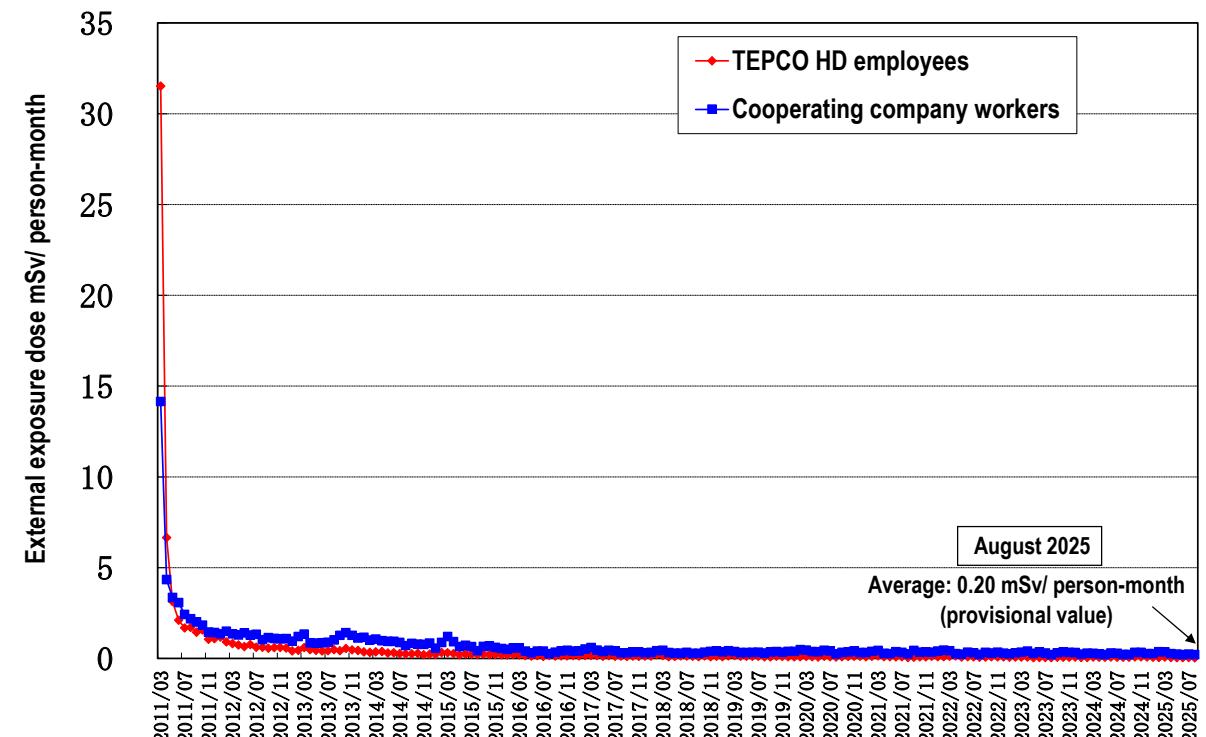


Figure 7: Changes in monthly average exposure dose of individual worker (monthly exposure dose since March 2011)

##### ➤ Health management of workers in the Fukushima Daiichi Nuclear Power Station

- As health management measures in line with the guidelines of the Ministry of Health, Labour and Welfare (issued in August 2015), a scheme was established and operated, whereby prime contractors confirmed reexamination at medical institutions and the subsequent status of workers who were diagnosed as requiring "detailed examination and treatment" in the health checkup, with TEPCO confirming the operation status by the prime contractors.
- The recent report on the management status of the health checkup during the first quarter (April - June) in FY2025 confirmed that the prime contractors had provided appropriate guidance and managed operations properly under the scheme. The report on the follow-up status during the fourth quarter in FY2024 previously confirmed that responses to workers, which had not been completed by the time of the previous report, were being provided on an ongoing basis and checking of operations would continue.

##### ➤ Status of heat stroke cases

- In FY2025, measures to further prevent heat stroke commenced from April to cope with the intense heat period.
- In FY2025, nine workers suffered heat stroke due to works until October 27 (in FY2024, eight workers up until the end of October). An environment encouraging workers to appeal any unwellness will continue to be created and countermeasures will be taken to prevent heat stroke.

➤ Countermeasures for infectious diseases

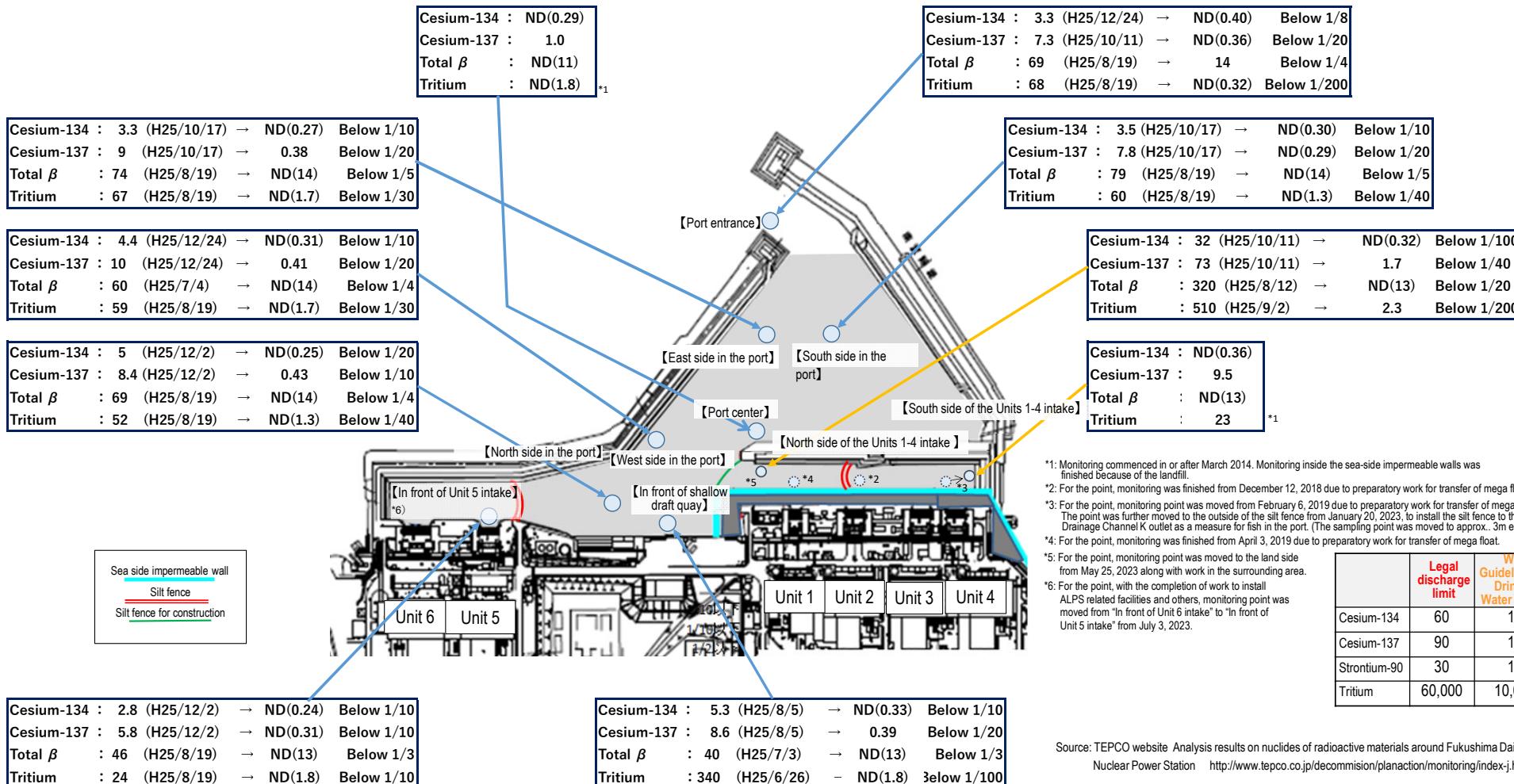
- Countermeasures for various infectious diseases (influenza, norovirus, COVID-19, etc.) depend on personal decisions and basic countermeasures (visiting medical institutions when feeling unwell, ventilation, avoidance of the “Three Cs”, frequent handwashing, etc.) being implemented appropriately by each worker and TEPCO proceeds with decommissioning while prioritizing safety.

## Status of seawater monitoring within the port (comparison between the highest values in 2013 and the latest values)

"The highest value" → "the latest value (sampled during October 6 - 27)"; unit (Bq/L); ND represents a value below the detection limit

Summary of TEPCO data as of October 28, 2025

Note: The Total  $\beta$  measurement value is the total radioactivity concentration of radioactive materials that emit  $\beta$ -ray (Potassium-40, Cesium-137, Strontium-90, progeny nuclide Yttrium-90, etc.). In general, approx. 12 Bq/L of natural nuclide Potassium-40 is included in seawater.



\*1: Monitoring commenced in or after March 2014. Monitoring inside the sea-side impermeable walls was finished because of the landfill.

\*2: For the point, monitoring was finished from December 12, 2018 due to preparatory work for transfer of mega float.

\*3: For the point, monitoring point was moved from February 6, 2019 due to preparatory work for transfer of mega float. The point was further moved to the outside of the silt fence from January 20, 2023, to install the silt fence to the Drainage Channel K outlet as a measure for fish in the port. (The sampling point was moved to approx. 3m east side)

\*4: For the point, monitoring was finished from April 3, 2019 due to preparatory work for transfer of mega float.

\*5: For the point, monitoring point was moved to the land side from May 25, 2023 along with work in the surrounding area.

\*6: For the point, with the completion of work to install ALPS related facilities and others, monitoring point was moved from "In front of Unit 6 intake" to "In front of Unit 5 intake" from July 3, 2023.

	Legal discharge limit	WHO Guidelines for Drinking Water Quality
Cesium-134	60	10
Cesium-137	90	10
Strontium-90	30	10
Tritium	60,000	10,000

Source: TEPCO website Analysis results on nuclides of radioactive materials around Fukushima Daiichi Nuclear Power Station <http://www.tepco.co.jp/decommission/planaction/monitoring/index-j.html>

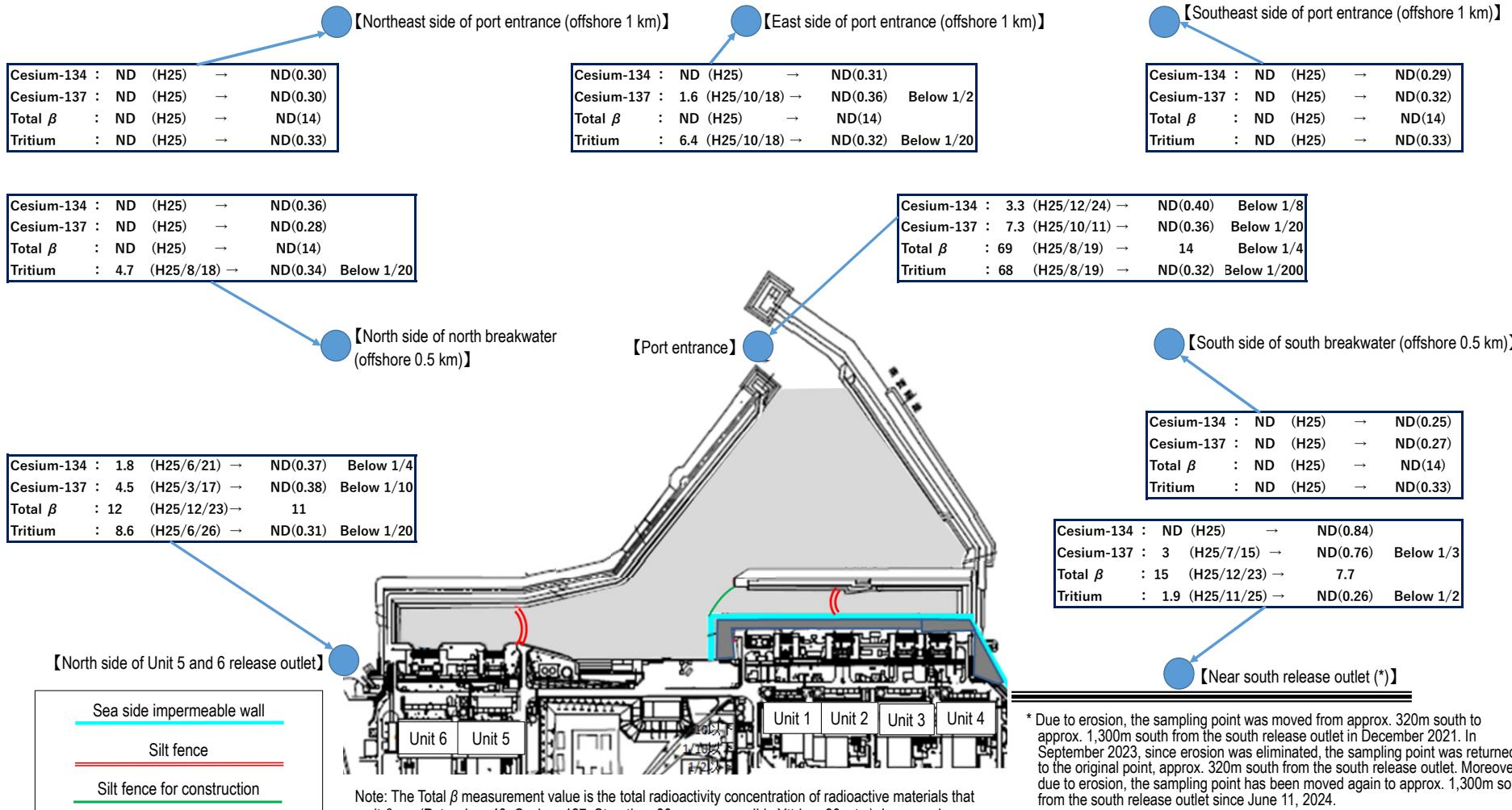
## Status of seawater monitoring around outside of the port (comparison between the highest values in 2013 and the latest values)

Unit (Bq/L); ND represents a value below the detection limit; values in ( ) represent the detection limit; ND (2013) represents ND throughout 2013

(The latest values sampled during September 29 - October 27)

Summary of TEPCO data as of October 28, 2025

	Legal discharge limit	WHO Guidelines for Drinking Water Quality
Cesium-134	60	10
Cesium-137	90	10
Strontium-90	30	10
Tritium	60,000	10,000

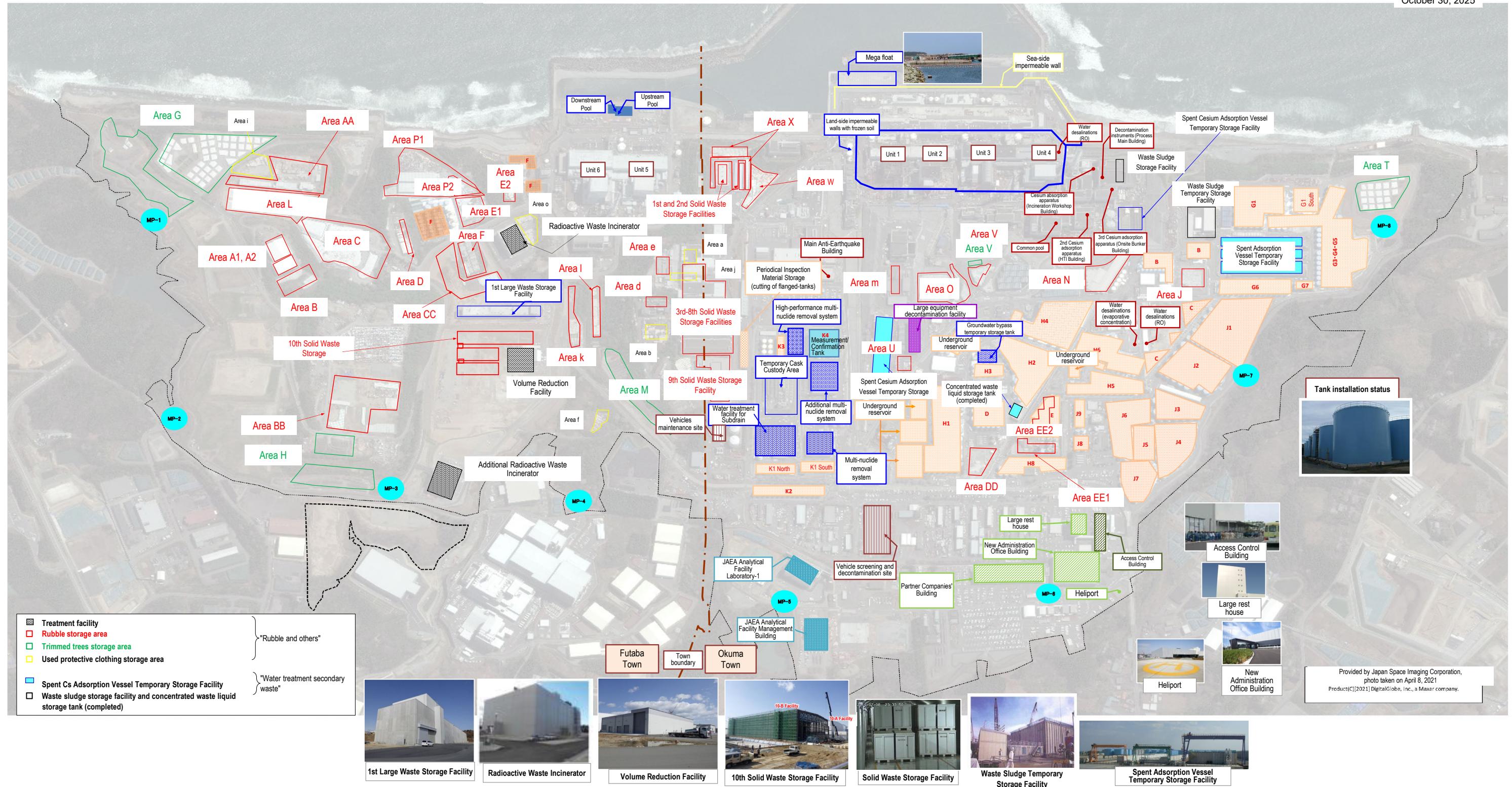


\* Due to erosion, the sampling point was moved from approx. 320m south to approx. 1,300m south from the south release outlet in December 2021. In September 2023, since erosion was eliminated, the sampling point was returned to the original point, approx. 320m south from the south release outlet. Moreover, due to erosion, the sampling point has been moved again to approx. 1,300m south from the south release outlet since June 11, 2024.

Source: TEPCO website, Analysis results on nuclides of radioactive materials around Fukushima Daiichi Nuclear Power Station <http://www.tepco.co.jp/decommission/planaction/monitoring/index-j.html>

## TEPCO Holdings Fukushima Daiichi Nuclear Power Station Site Layout

Appendix 2  
October 30, 2025



Storage status of rubble and water treatment secondary waste is quoted from "Fukushima Daiichi Nuclear Power Station Solid Waste Storage Management Plan ~FY2024 Revision~" published in December 2024

- Efforts to promote contaminated water management based on three basic policies:  
① "Removing" the contamination source ② "Redirecting" groundwater from the contamination source  
③ "Preventing leakage" of contaminated water

## Milestones of the Mid- and Long-Term Roadmap (major target processes)

- [Completed] Suppressing the amount of contaminated water generated to 150 m<sup>3</sup>/day or less (within 2020)
- [Completed] Suppressing the amount of contaminated water generated to 100 m<sup>3</sup>/day or less (within 2025)
- [Completed] Treatment of stagnant water in buildings was completed\* (within 2020) \*Except for Units 1-3 Reactor Buildings, Process Main Building and High Temperature Incinerator Building.
- [Completed] Stagnant water in Reactor Buildings was reduced to about a half of the level at the end of 2020 (FY2022-FY2024)

## 2 Handling of ALPS treated water

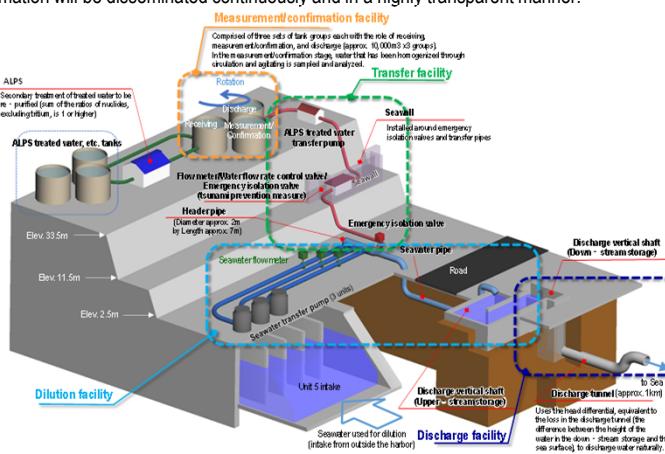
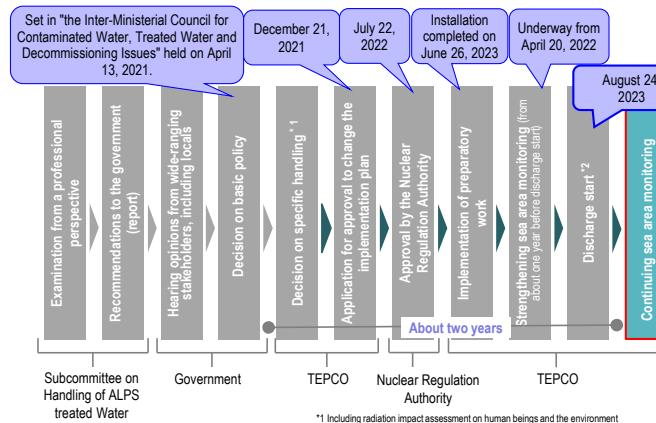
In "the Inter-Ministerial Council for Contaminated Water, Treated Water and Decommissioning Issues" held on April 13, 2021, the basic policy on how to handle ALPS treated water was set. Based on this, the response of TEPCO was announced on April 16.

Regarding the discharge of ALPS treated water into the sea, TEPCO must comply with regulatory and other safety-related standards to ensure the safety of the public, surrounding environment and agricultural, forestry and fishery products. To minimize adverse impacts on reputation, monitoring will be further enhanced, objectivity and transparency ensured by engaging with third-party experts and safety checked by the IAEA. Moreover, accurate information will be disseminated continuously and in a highly transparent manner.

Reference 2 / 6

October 30, 2025

Secretariat of the Team for Countermeasures for Decommissioning, Contaminated Water and Treated Water



### Information provision and communication to foster understanding

- Occasions to deepen the understanding are organized by communications related to decommissioning via various media and visit to the power station.



- On the dedicated website "Treated Water Portal Site" (Japanese, English, Chinese and Korean) within the TEPCO website, monitoring results of radioactive materials are published timely.
- Visit and dialogue meetings of Fukushima Daiichi Nuclear Power Station have been held since FY2019 for 13 cities, towns and villages in the Hamadori region. From FY2021 onward, these activities have been expanded to include the entire Fukushima Prefecture.
- Through various opportunities such as visit and on-site explanations, communications continue where opinions of related parties are heard, their thoughts are taken seriously, and TEPCO conveys its efforts, thoughts, and countermeasures for reputational damage.

### Examination concerning handling of ALPS treated water

Tritiated Water Taskforce (2013.12 – 2016.5, 15 meetings)



2016.6 Report of Tritiated Water Taskforce

Tank area viewed from the Large Rest House (2015.10.29)

2014

2015

2016

2017

2018

2019

2020

2021

2022

2023

Subcommittee on Handling of ALPS treated water (2016.11 – 2020.1, 17 meetings)

2018.8 Explanatory and hearing meeting, receiving opinions

2020.2 Report of Subcommittee on Handling of ALPS treated water (2020.4 – 2020.10, 7 meetings)

Opportunity for receiving opinions from parties concerned concerning handling of ALPS treated water

Review meeting concerning the implementation plan on handling of ALPS treated water (2021.7 – 2022.4, 15 meetings)

2021.4.13 The basic policy on the handling of ALPS treated water was set  
 2021.4.16 The response of TEPCO was announced

2021.12.21 The "Application Documents for Approval to Amend the Implementation Plan for Fukushima Daiichi Nuclear Power Station Specified Nuclear Facility" regarding ALPS treated water were submitted to the Nuclear Regulation Authority  
 2021.12.28 "The Action Plan concerning the Continuous Implementation of the Basic Policy on Handling of ALPS Treated Water" was formulated

2023.8.24 Commencement of discharge

2022.4.28, 5.13, 7.15

Application to partially revise the Application Documents for Approval to Amend the Implementation Plan was submitted

2023.5.10 Approval for the Application Documents for Approval to Amend the Implementation Plan was submitted

2023.2.14, 20 Application for the Application Documents for Approval to Amend the Implementation Plan was submitted (amendment of organizational structure, and nuclides to be measured and assessed, and others)

2022.8.4 Work has commenced

2022.7.22 Application for the Application Documents for Approval to Amend the Implementation Plan was approved

2023.6.26 Completion of installation

2023.7.7 Receipt of Certificate of Completion for Inspection Prior to Use

2022.11.14 Application for the Application Documents for Approval to Amend the Implementation Plan was submitted (amendment of organizational structure, and nuclides to be measured and assessed, and others)

### ● Rearing test of marine organisms

All planned marine organisms rearing tests have been completed. The results confirmed by the rearing tests were as follows:

- Marine organisms rearing tests were conducted both in "normal seawater" and in "ALPS treated water diluted with seawater". The marine organisms in these two environments were compared via rearing data to confirm the absence of any significant differences between the two populations.

- TEPCO confirmed that "tritium is not concentrated in the living bodies and that the concentration of tritium in living bodies does not exceed that of the rearing environment" as demonstrated in previous knowledge.

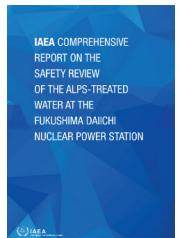
- Flounders and abalones that were being raised in normal seawater were put in "water discharged into the environment" and TEPCO confirmed that there was no remarkable change in the growth of the flounders or abalones around this time. Flounder and abalone were reared in water discharged into the environment for approximately six months and we confirmed that there is no change in the growth of them.

### ● Publication of the Comprehensive Report of the IAEA safety review

The Comprehensive Report on the safety review concerning handling of ALPS treated water was published by the IAEA on July 4, 2023.

In the Executive Summary of the IAEA Comprehensive Report, the IAEA concluded the following: (1) the activities by Japan associated with the discharge of ALPS treated water into the sea are consistent with relevant international safety standards, (2) the discharge of the ALPS treated water will have a negligible radiological impact on people and the environment.

We will continue to share necessary information with the IAEA, while striving to foster further understanding of the international community about the discharge of ALPS treated water into the sea.



<https://www.iaea.org/topics/response/fukushima-daiichi-alps-treated-water-discharge-comprehensive-reports>

### 3 Removal of fuel from spent pool

Reference 3/6

October 30, 2025

Secretariat of the Team for Countermeasures for Decommissioning, Contaminated Water and Treated Water

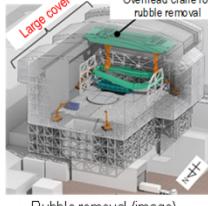
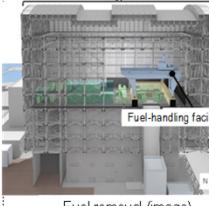
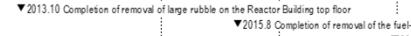
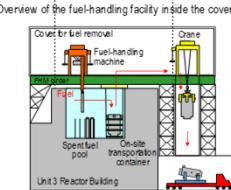
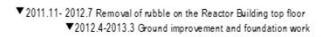
#### Legend

#### Rubble removal, etc.

#### Installing a fuel removal machine

#### Fuel removal

#### Storage and handling of fuel

Milestones of the Mid- and-Long-Term Roadmap (major target processes)														
<ul style="list-style-type: none"> <li>Completion of Units 1-6 fuel removal (within 2031)</li> <li>Completion of installation of Unit 1 large cover (around FY2023), start of Unit 1 fuel removal (FY2027-2028)</li> <li>Start of Unit 2 fuel removal (FY2024-2026)</li> </ul>														
2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025~
<p><b>Unit 1</b></p> <p>For Unit 1, a large cover will be installed over the whole building, within which rubble will be removed.</p> <p><b>&lt;Reference&gt; Progress to date</b> Rubble removal on the north side of the operating floor started from January 2018 and has been implemented sequentially. In July and August 2019, the well plug, which was misaligned, was investigated, followed in August and September by the conditions of the overhead crane. Based on the results of these investigations, as the removal requires more careful work taking dust scattering into consideration, two methods were examined: Installing a cover after rubble removal, initially installing a large cover over the Reactor Building, then removing rubble inside the cover.</p>	<p><b>Rubble removal (image)</b></p> 	<p><b>Fuel removal (image)</b></p> 	<p><b>Fuel removal</b></p> <ul style="list-style-type: none"> <li>2017.12 Completion of building cover dismantling and windbreak fence installation</li> <li>2018.1-2020.12 Removal of X-braces</li> <li>2020.3-6 Installation of spent fuel pool cover</li> <li>2020.9-11 Measures to prevent and alleviate rubble falling</li> <li>2020.11-2021.6 Dismantling of remaining cover</li> <li>2021.8 Start of large cover pre-work</li> <li>2022.4 Start of large cover installation work</li> </ul>	<p><b>Storage and handling of fuel</b></p> <ul style="list-style-type: none"> <li>In order to install a large cover at the Unit 1 Reactor Building, high-dose locations on the south side exterior wall, and as a measure to reduce radiation exposure, shielding was installed over the high-dose locations.</li> <li>The target to complete the installation of the Unit 1 large cover had been around the summer of FY2025, based on the impact of hot spots detected on the south side (announced in December 2023).</li> <li>The procedure was to be extended, because as the lower structure was installed and the installed cover could not be confirmed from the operating floor, radiation exposure reduction measures need to be implemented to ensure safer work. In addition, days when work was forced to be suspended due to bad weather increased, and trouble occurred with the crane used for the work.</li> <li>Based on the possibility of future process extension for similar reasons, and the necessity to assume shortened work time due to intense heat and others, expected completion of installation of a large cover will be changed from around the summer in FY2025 to within FY2025.</li> <li>Among the milestones of the Mid- and-Long-Term Roadmap, the start of fuel removal from the Unit 1 spent fuel pool, which is set from FY2027 to FY2028, is not reviewed at present, because future process can be shortened by reviewing the work procedures and others in work after rubble removal.</li> </ul>										
<p><b>Unit 2</b></p> <p>For Unit 2, with the removal of spent fuel in mind, a "gantry for fuel removal" (gantry and front room) will be constructed on the south side of the building.</p> <p><b>&lt;Reference&gt; Progress to date</b> Previously, scope to recover the existing overhead crane and the fuel-handling machine was examined. However, the high radiation dose inside the operating floor meant the decision was taken to dismantle the upper part of the building in November 2015. Findings from internal investigations of the operating floor from November 2018 to February 2019 underlined the potential to conduct limited work there and the means of accessing from the south side was examined.</p>	<p><b>Yard construction</b></p> 	<p><b>Installation of the runway girder (2024.3.19)</b></p> 	<p><b>Fuel removal</b></p> <ul style="list-style-type: none"> <li>2016.9-2017.4 West-side gantry installation work</li> <li>2017.5 Opening a hole in the west-side external wall</li> <li>2018.8-2020.12 Moving and containment of remaining objects</li> <li>2020.6 Investigation inside the spent fuel pool</li> <li>2021.6-2022.1 Decontamination of RB operating floor (1)</li> <li>2021.9-2022.5 Shielding installation in RB operating floor (1)</li> <li>2022.5-2022.6 Transfer of FIM</li> <li>2022.7-2023.1 Removal and clean-up of FIM operation room</li> <li>2022.12-2023.3 Removal of existing facilities in operating floor</li> <li>2023.4-2023.11 Decontamination of RB operating floor (2)</li> <li>2023.11-Shielding of RB operating floor (2)</li> <li>2024.4 Start of preparation for installing an opening</li> <li>2024.5 Completion of installation of gantry for fuel removal</li> <li>2024.9 Start of trial operation of ventilation equipment</li> <li>2024.10 Start of installation of runway girder</li> <li>2025.3 Completion of installation of runway girder</li> <li>2025.5 Completion of hanging of fuel-handling machine</li> </ul>	<p><b>Storage and handling of fuel</b></p> <ul style="list-style-type: none"> <li>As part of efforts to remove fuel from the Unit 2 spent fuel pool and based on findings from internal operating floor investigations from November 2018 to February 2019, instead of fully dismantling the upper part of the building, the decision was made to install a small opening on the south side and use a boom crane. Examination continues to initiate fuel removal from FY2024 to FY2026.</li> <li>2021.10-2022.4 Ground improvement work</li> <li>2022.3. Start of steel erection</li> <li>2023.2 Start of south-side existing facilities dismantling</li> </ul>										
<p><b>Unit 3</b></p> <p>All fuel assemblies from Unit 3 had been removed by February 2021.</p>	<p><b>Completion of removal of large rubble on the Reactor Building top floor</b></p> 	<p><b>Completion of removal of the fuel-handling machine within the spent fuel pool</b></p> 	<p><b>Overview of the fuel-handling facility inside the cover</b></p> 	<p><b>Before installing a cover for fuel removal, the process of removing large rubble from the spent fuel pool was completed in November 2015. To ensure safe and steady fuel removal, training via remote control was conducted at the factory using the actual fuel-handling machine to be installed on site (February – December 2015). Installation of the fuel removal cover was completed on February 23, 2018.</b></p> <p><b>With fuel removal in mind, rubble retrieval training inside the pool, which was scheduled in conjunction with fuel removal training, started from March 15, 2019 and fuel removal started from April 15, 2019. Fuel removal was completed on February 28, 2021.</b></p>	<p><b>Unit 3 Cover for fuel removal (dome roof) 2019.2.21</b></p> 									
<p><b>Unit 4</b></p> <p>All fuel assemblies from Unit 4 had been removed by December 2014.</p>	<p><b>Completion of removal of rubble on the Reactor Building top floor</b></p> 	<p><b>Completion of removal of the overhead crane and fuel-handling machine</b></p> 	<p><b>Fuel removal</b></p> 	<p><b>In the Mid- and-Long-Term Roadmap, the Phase 1 target involved starting to remove fuel from inside the spent fuel pool (SFP) of the 1st Unit within two years of completing Step 2 (by December 2013). On November 5, 2013, fuel removal from Unit 4, namely the first Unit, got underway and Phase 2 of the roadmap started.</b></p> <p><b>On November 5, 2014, within a year of commencing fuel removal work, all 1,331 spent fuel assemblies in the pool had been transferred. The transfer of the remaining non-irradiated fuel assemblies to the Unit 6 SFP was completed on December 22, 2014. (two of the non-irradiated fuel assemblies were removed in advance in July 2012 for fuel checks).</b></p> <p><b>This marks the completion of fuel removal from the Unit 4 Reactor Building.</b></p>										

\* Part of the photo is corrected because it includes machine information related to nuclear material protection.

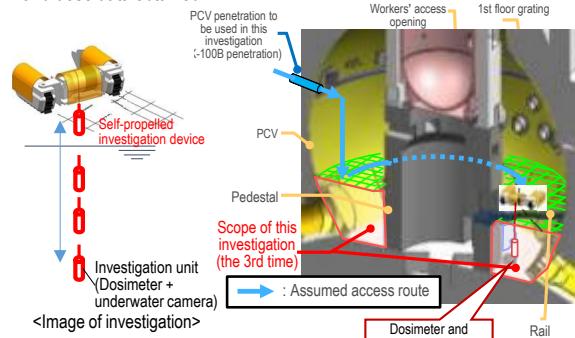
Milestones of the Mid- and Long-Term Roadmap (major target processes)

Commencement of fuel debris retrieval from the first unit (Unit 2). Expanding the scale in stages (From September 10, 2024, trial fuel debris retrieval commenced)

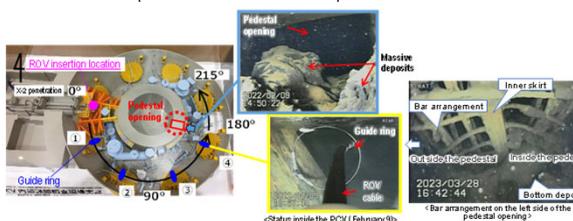
Before removing fuel debris, investigations inside the Primary Containment Vessel (PCV) are conducted to inspect the conditions there, including locations of fuel debris.

**Unit 1 Investigation overview**

- In April 2015, a device having entered the inside of the PCV via a narrow opening (bore:  $\phi 100$  mm) collected information such as images and airborne dose inside the PCV 1st floor.
- In March 2017, an investigation using a self-propelled investigation device was conducted to inspect the spreading of debris to the basement floor outside the pedestal, with images taken of the PCV bottom status for the first time. The conditions inside the PCV will continue to be examined, based on the imagery and dose data obtained.



In February 2022, "the guide ring" was installed to facilitate the investigation. From March 28, 2023, the investigation inside the pedestal by ROV-A2 started and confirmed that a portion of the bar arrangement was exposed. Regarding the soundness of the pedestal, based on the past earthquake resistant evaluation by the International Research Institute for Nuclear Decommissioning (IRID), it was evaluated that even though a portion of the pedestal was lost, there would be no serious risk. However, as the present information is very limited, the investigation will continue to acquire as much information as possible for continued evaluation.

**Unit 1 PCV internal investigation**

Investigations inside the PCV	1st (2012.10)	<ul style="list-style-type: none"> <li>- Acquiring images</li> <li>- Measuring the air temperature and dose rate</li> <li>- Measuring the water level and temperature</li> <li>- Sampling stagnant water</li> <li>- Installing permanent monitoring instrumentation</li> </ul>
	2nd (2015.4)	<ul style="list-style-type: none"> <li>- Confirming the status of the PCV 1st floor</li> <li>- Acquiring images</li> <li>- Measuring the air temperature and dose rate</li> <li>- Replacing permanent monitoring instrumentation</li> </ul>
	3rd (2017.3)	<ul style="list-style-type: none"> <li>- Confirming the status of the PCV 1st basement floor</li> <li>- Acquiring images</li> <li>- Measuring the dose rate</li> <li>- Sampling deposit</li> <li>- Replacing permanent monitoring instrumentation</li> </ul>
	4th (From 2022.2)	<ul style="list-style-type: none"> <li>- Acquiring information inside PCV (inside/outside of the pedestal)</li> <li>- Acquiring images</li> <li>- Measuring deposit thickness and sampling deposit</li> <li>- Detecting debris, 3D mapping</li> </ul>
	Leakage points from PCV	<ul style="list-style-type: none"> <li>- PCV vent pipe vacuum break line bellows (identified in 2014.5)</li> <li>- Sand cushion drain line (identified in 2013.11)</li> </ul>

Evaluation of the location of fuel debris inside the reactor by measurement using muons  
Confirmed that there was no large fuel in the reactor core. (2015.2-5)

**Unit 2 Investigation overview**

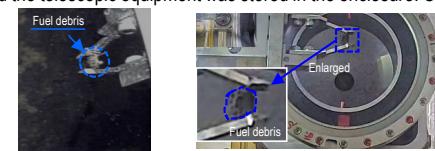
- In January 2017, a camera was inserted from the PCV penetration to inspect the conditions of the rail on which the robot traveled. The results of a series of investigations confirmed some gratings had fallen and deformed as well as a quantity of deposit inside the pedestal.
- In January 2018, the conditions below the platform inside the pedestal were investigated. Based on the analytical results of images obtained in the investigation, deposits, probably including fuel debris, were found at the bottom of the pedestal. Moreover, multiple parts exceeding the surrounding deposits were also detected. We presumed that there were multiple instances of fuel debris falling.
- In February 2019, an investigation touching the deposits at the bottom of the pedestal and on the platform was conducted and confirmed that the pebble-shaped deposits, etc. could be moved and that hard rock-like deposits that could not be gripped may exist.



- In October 2020, a deposits contact investigation at the PCV penetration (X-6 penetration) was conducted. This confirmed that deposits inside the penetration had not deformed and come unstuck.



- From September 10, 2024, the end tool of the telescopic equipment passed through the isolation valve, and the trial fuel debris retrieval commenced. On October 30, fuel debris was gripped with the end tool, on November 2, the guide pipe was pulled off, and the telescopic equipment was stored in the enclosure. On November 7, fuel debris was carried out from the hatch on a side of the enclosure, and the trial retrieval was completed.

**Unit 2 PCV internal investigation**

Investigations inside the PCV	1st (2012.1)	<ul style="list-style-type: none"> <li>- Acquiring images</li> <li>- Measuring the air temperature</li> </ul>
	2nd (2012.3)	<ul style="list-style-type: none"> <li>- Confirming water surface</li> <li>- Measuring the water temperature</li> <li>- Measuring the dose rate</li> </ul>
	3rd (2013.2 - 2014.6)	<ul style="list-style-type: none"> <li>- Acquiring images</li> <li>- Sampling stagnant water</li> <li>- Measuring water level</li> <li>- Installing permanent monitoring instrumentation</li> </ul>
	4th (2017.1-2)	<ul style="list-style-type: none"> <li>- Acquiring images</li> <li>- Measuring the dose rate</li> <li>- Measuring the air temperature</li> </ul>
	5th (2018.1)	<ul style="list-style-type: none"> <li>- Acquiring images</li> <li>- Measuring the dose rate</li> <li>- Measuring the air temperature</li> </ul>
	6th (2019.2)	<ul style="list-style-type: none"> <li>- Acquiring images</li> <li>- Measuring the dose rate</li> <li>- Determining characteristics of a portion of deposit</li> </ul>
Leakage points from PCV	-	- No leakage from the torus chamber rooftop - No leakage from any internal/external surfaces of S/C

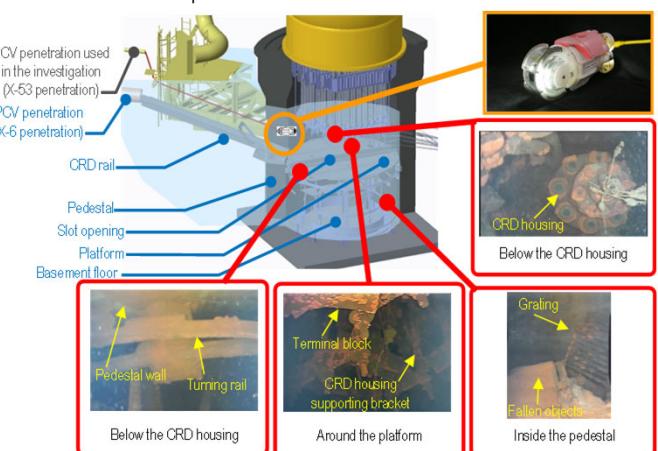
Evaluation of the location of fuel debris inside the reactor by measurement using muons

The existence of high-density materials, which were considered to constitute fuel debris, was confirmed at the bottom of RPV and in the lower part and outer periphery of the reactor core. It was assumed that a significant portion of fuel debris existed at the bottom of RPV. (2016.3-7)

**Unit 3 Investigation overview**

- In October 2014, the conditions of X-53 penetration, which may be under water and which is scheduled for use to investigate the inside of the PCV, were investigated via remote-controlled ultrasonic test equipment. The results showed that the penetration was not under water.
- In October 2015, to confirm the conditions inside the PCV, an investigative device was inserted into the PCV from X-53 penetration to obtain images, data on dosage and temperature and sample stagnant water. No damage to the structure and walls inside the PCV was identified and the water level was almost identical to estimated values. In addition, the dose inside the PCV was confirmed to be lower than in other Units.
- In July 2017, the inside of the PCV was investigated using the underwater ROV (remotely operated underwater vehicle) to inspect the inside of the pedestal. Analysis of the imagery obtained in the investigation identified damage to multiple structures and the supposed core internals.
- Videos obtained in the investigation were reproduced in 3D. Based on the reproduced images, the relative positions of the structures, such as the rotating platform slipping off the rail with a portion buried in deposits, were visually understood.

## &lt;Conditions inside the pedestal&gt;

**Unit 3 PCV internal investigation**

Investigations inside the PCV	1st (2015.10-12)	<ul style="list-style-type: none"> <li>- Acquiring images</li> <li>- Measuring the air temperature and dose rate</li> <li>- Measuring the water level and temperature</li> <li>- Sampling stagnant water</li> <li>- Installing permanent monitoring instrumentation (2015.12)</li> </ul>
	2nd (2017.7)	<ul style="list-style-type: none"> <li>- Acquiring images</li> <li>- Installing permanent monitoring instrumentation (2017.8)</li> </ul>
Leakage points from PCV	- Main steam pipe bellows (identified in 2014.5)	
Evaluation of the location of fuel debris inside the reactor by measurement using muons The evaluation confirmed that no large lump existed in the core area where fuel had been placed and that a portion of the fuel debris potentially existed at the bottom of the RPV. (2017.5-9)		

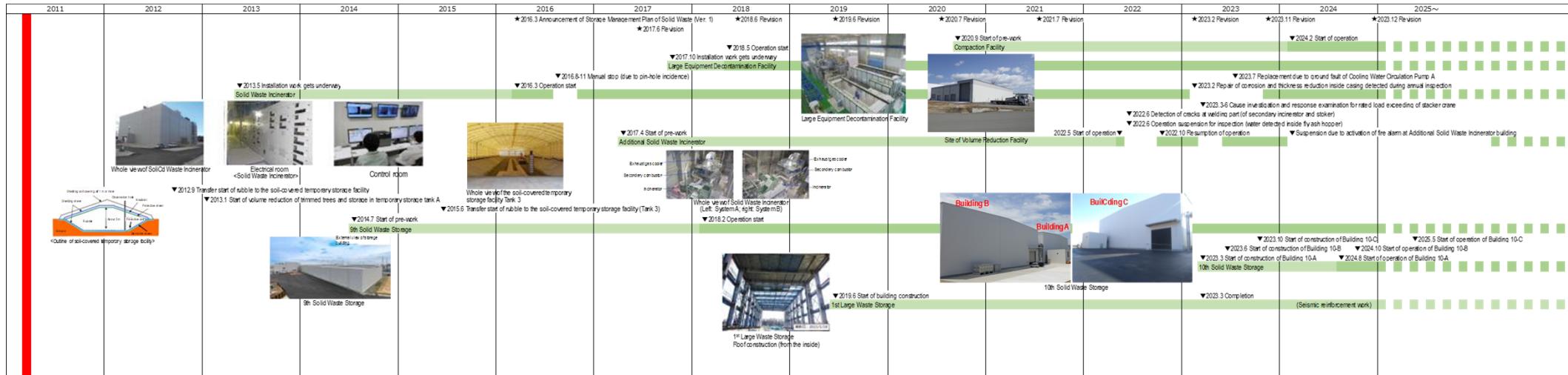
## 5 Management of solid radioactive waste

Reference 5/6  
October 30, 2025

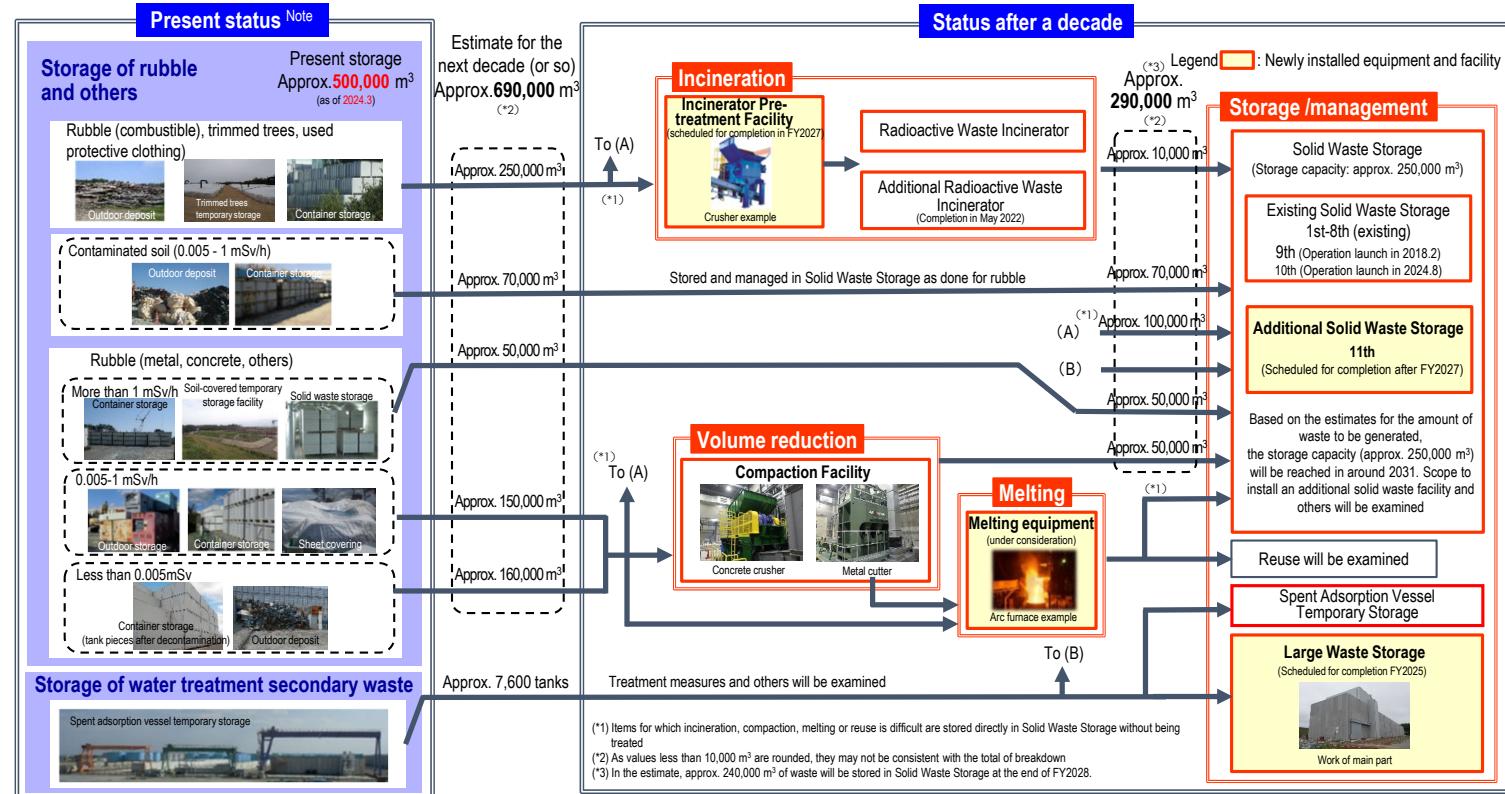
Secretariat of the Team for  
Countermeasures for Decommissioning,  
Contaminated Water and Treated Water

Milestones of the Mid- and Long-Term Roadmap (major target processes)

Eliminating temporary outdoor storage of rubble and others \* Except for secondary waste of water treatment and materials for reuse or recycling (within FY2028)



- Solid Waste Storage Management Plan for the Fukushima Daiichi Nuclear Power Station (Revision in December 2024)



- The exposure dose at the site boundaries will be reduced by aggregation to indoor storage and eliminating outdoor storage.
- The exposure dosage in exhaust gas from incinerators and at site boundaries is measured and announced on the website and others.

## 6 Improvement of work environment

While ensuring reliable exposure dose management for workers, sufficient personnel are secured. Moreover, while getting a handle on on-site needs, the work environment and labor conditions are continuously improved.

Regarding the site-wide reduction in the radiation dose and prevention of contamination spreading, the radiation dose on site was reduced by removal of rubble, topsoil and facing. Moreover, the operation was improved to use environmentally-improved areas as a Green Zone, within which workers are allowed to wear general work clothes and disposable dust-protective masks which are less of a physical burden.

2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024~	
<p>▼ From March 12, 2011, in response to the increased airborne concentration of radioactive materials, instructions were issued to wear full-face masks throughout the Fukushima Daiichi NPS site, excluding the Main Anti-Earthquake Building and the rest house.</p> <p>External view of Access Control Facility</p>	<p>▼ From May 2013, full-face mask unnecessary area was expanded sequentially.</p> <p>Large rest house under construction (2014.9.30)</p>	<p>▼ In June 2013, operation of the Access Control Facility started near the main gate of the Fukushima Daiichi NPS, to which duties conducted at J-village were shifted, including contamination examination, decontamination, switching protective equipment on and off and distribution/collection of dosimeters.</p> <p>Access Control Facility (2014.11.7)</p>	<p>▼ To help workers in the Fukushima Daiichi NPS precisely understand the conditions of their workplaces, a total of 86 dose-rate monitors were installed by January 2015. These monitors allow workers to confirm on-site dose rates at their workplace in real time.</p> <p>In March 2015, the Fukushima revitalization meal service center opened.</p> <p>▼ A large rest house for workers was established and its operation commenced in May 2015. Spaces in the large rest house are also installed for office work and collective worker safety checks as well as taking rest. In March 2016, a convenience store opened in the large rest house. In April, the shower room went into operation.</p> <p>Move in general working clothes (2016.1.7)</p>	<p>Facing (2017.4.13)</p>	<p>▼ In February 2017, operation started at the Partner Companies' Building next to the New Administration Office Building.</p> <p>▼ In May 2017, a heliport for emergency transport was installed inside the Fukushima Daiichi NPS and went into operation. Compared to the previous operation at Koryoamia Coast, Futaba Town or Fukushima Daiichi NPS, relying to a doctor helicopter, a faster response is available for seriously ill patients requiring treatment at external medical institutions.</p>	<p>▼ From November 2018, from the west-side high-ground area, where Units 1-4 can be viewed, visitors can see the site in their normal clothes without having to change.</p> <p>Visit by Governor of Fukushima Prefecture to the Fukushima Daiichi NPS (2018.11.1)</p>	<p>Visit by Prime Minister Kishida to the Fukushima Daiichi NPS (2021.10.17)</p>				<p>Visit by Prime Minister Ishiba to the Fukushima Daiichi NPS (2024.12.14)</p> <p>(Left) Observation of the decommissioning state at high ground from which whole view of Units 1-4 can be seen</p> <p>(Right) Encouragement from Prime Minister Ishiba</p>	<p>&lt;Travel survey results of major roads within the site&gt;</p> <p>Compared with the last fiscal year, the dose rate was reduced on roads on the east side of Units 1-4 (area of black dot in the figure). In the area, the dose rate reduction is considered attributable to the construction of sea walls and others.</p> <p>&lt;FY2023 4th Quarter&gt; (Measured in February 2024)</p> <p>Provided by Japan Tissue Imaging Corp. (C) DigitalGlobe</p>	<p>&lt;FY2024 4th Quarter&gt; (Measured in March 2025)</p> <p>Provided by Japan Tissue Imaging Corp. (C) DigitalGlobe</p>	
<p>▼ In May 2013, areas excluding those around Unit 1-4, tank areas and rubble storage areas were set to full-face mask unnecessary areas.</p> <p>Site map showing the transition of unnecessary areas</p>	<p>▼ In May 2015, full-face mask unnecessary area was expanded to cover about 90% of the site.</p> <p>Site map showing the transition of unnecessary areas</p>	<p>▼ In March 2017, the G-zone area was expanded (to cover 95% of the whole site).</p> <p>Site map showing the transition of unnecessary areas</p>	<p>▼ In March 2016, based on the progress of measures to reduce the environmental dosage on site, the site was categorized into two zones. Highly contaminated area around Units 1-4 buildings, etc. and other areas where limited operation started to protect protective equipment according to each category.</p> <p>Site map showing the transition of unnecessary areas</p>	<p>▼ In May 2018, within about 95% of the site, workers are allowed to wear light equipment such as general workwear and disposable dust-protective masks.</p> <p>Site map showing the transition of unnecessary areas</p>						<p>▼ In August 2021, operation started while eliminating the need for the D2 mask during light work in G-zone outside the protection area around Unit 1-4 (except for inside Units 5 and 6).</p> <p>Site map showing the transition of unnecessary areas</p>	<p>Site map showing the transition of unnecessary areas</p>	<p>Site map showing the transition of unnecessary areas</p>		

