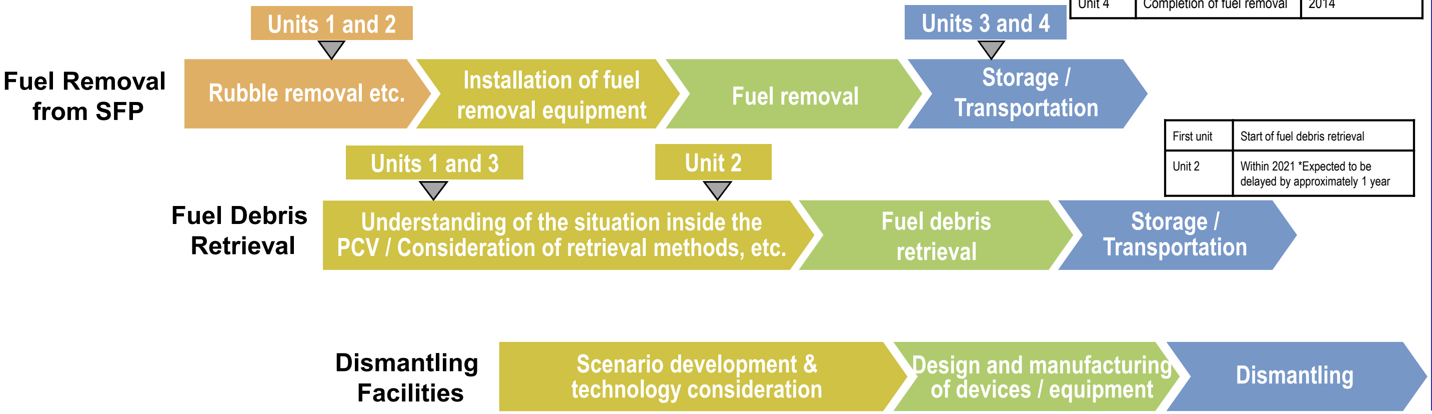
Outline of Decommissioning, Contaminated Water and Treated Water Management

Main decommissioning work and steps

Fuel removal from the spent fuel pool was completed in December 2014 at Unit 4 and on February 28, 2021 at Unit 3.
Work continues sequentially toward the start of fuel removal from Units 1 and 2 and debris (Note 1) retrieval from Units 1-3.

(Note 1) Fuel assemblies having melted through in the accident.

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
Unit 3	Completion of fuel removal	Within FY2020
Unit 4	Completion of fuel removal	2014

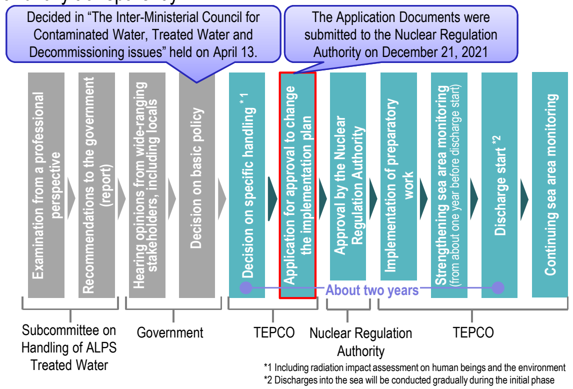


First unit	Start of fuel debris retrieval
Unit 2	Within 2021 *Expected to be delayed by approximately 1 year

Measures of 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, monitoring will be further enhanced and objectivity and transparency ensured by engaging with third-party experts and having safety checked by the IAEA. Moreover, accurate information will be disseminated continuously and fully transparently.



Contaminated water management – triple-pronged efforts -

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

① "Remove" the source of water contamination ② "Redirect" fresh water from contaminated areas
③ "Retain" contaminated water from leakage

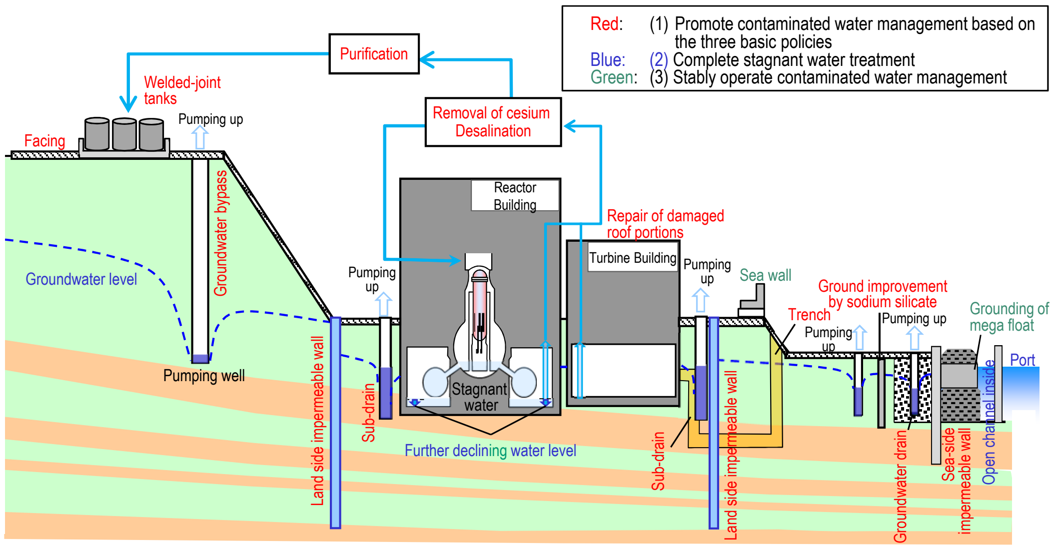
- Strontium-reduced water from other equipment is being re-treated in the multi-nuclide removal equipment (ALPS) and stored in welded-joint tanks.
- Multi-layered contaminated water management measures, including land-side impermeable walls and sub-drains, have stabilized the groundwater at a low level and the increased contaminated water generated during rainfall is being suppressed by repairing damaged portions of building roofs, facing onsite, etc. Through these measures, the generation of contaminated water was reduced from approx. 540 m^3/day (in May 2014) to approx. 180 m^3/day (in FY2019) and approx. 140 m^3/day (in 2020).
- Measures continue to further suppress the generation of contaminated water to 100 m^3 /day or less within 2025.

(2) Efforts to complete stagnant water treatment

- To lower the stagnant water levels in buildings as planned, work to install additional stagnant water transfer equipment is underway. At present, the floor surface exposure condition can be maintained except for the Unit 1-3 Reactor Buildings, Process Main Building and the High Temperature Incinerator Building.
- In 2020, treatment of stagnant water in buildings was completed, except for the Unit 1-3 Reactor Buildings, Process Main Building and High-Temperature Incinerator Building. For Reactor Buildings, the amount of stagnant water there will be reduced to about half the amount at the end of 2020 during the period FY2022-2024.
- For Zeolite sandbags on the basement floors of the Process Main Building and High-Temperature Incinerator Building, measures to reduce the radiation dose are being examined with stabilization in mind.

(3) Efforts to stably operate contaminated water management

- To prepare for tsunamis, various measures are underway. For heavy rain, sandbags are being installed to suppress direct inflow into buildings while work sealing off openings in buildings and installing sea walls to enhance drainage channels and other measures are being implemented as planned.



Progress Status and Future Challenges of the Mid-and-Long-Term Roadmap toward Decommissioning of TEPCO Holdings Fukushima Daiichi Nuclear Power Station (Outline)

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 condition had been maintained.

Submission of the "Application Documents for Approval to Amend the Implementation Plan" regarding ALPS treated water

Regarding the handling of ALPS treated water, considering the Basic Policy decided by the Japanese government in April 2021, TEPCO has been reviewing facility design to secure safety and proceed with preliminary preparation, while also explaining the review status to those in the region and other relevant parties and listening to their opinions.

On December 21, we submitted the "Application Documents for Approval to Amend the Implementation Plan" for the basic design of the ALPS treated water dilution/discharge facility and related facilities to the Nuclear Regulation Authority(NRA).

The NRA will review this application.

Geological survey and others in the sea area needed for examination of facilities regarding ALPS treated water

To review the details of the design of facilities for securing safety regarding the handling of ALPS treated water and ensure safety of the work, geological data is being surveyed on the area offshore of the power station.

On November 27, a prior magnetic survey of the seabed was conducted and it was confirmed that there was no hindrance to the forthcoming geological survey and others.

The geological survey was scheduled to start from December 1. However, due to unfavorable marine weather, the survey was delayed about two weeks and started from December 14.

In parallel, work to improve the environment, such as installing steel pipes around the water release shaft has been underway since December 10.

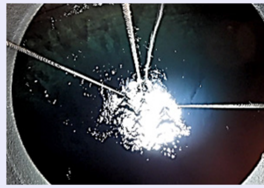
<Geological survey>

Test to verify the stirring effect of tanks for measurement and verification of ALPS treated water

To measure the radioactivity concentration of ALPS treated water more precisely, a stirrer will be installed for each sample tank. On November 23, the operation and effects of the stirrer were verified using reagent.

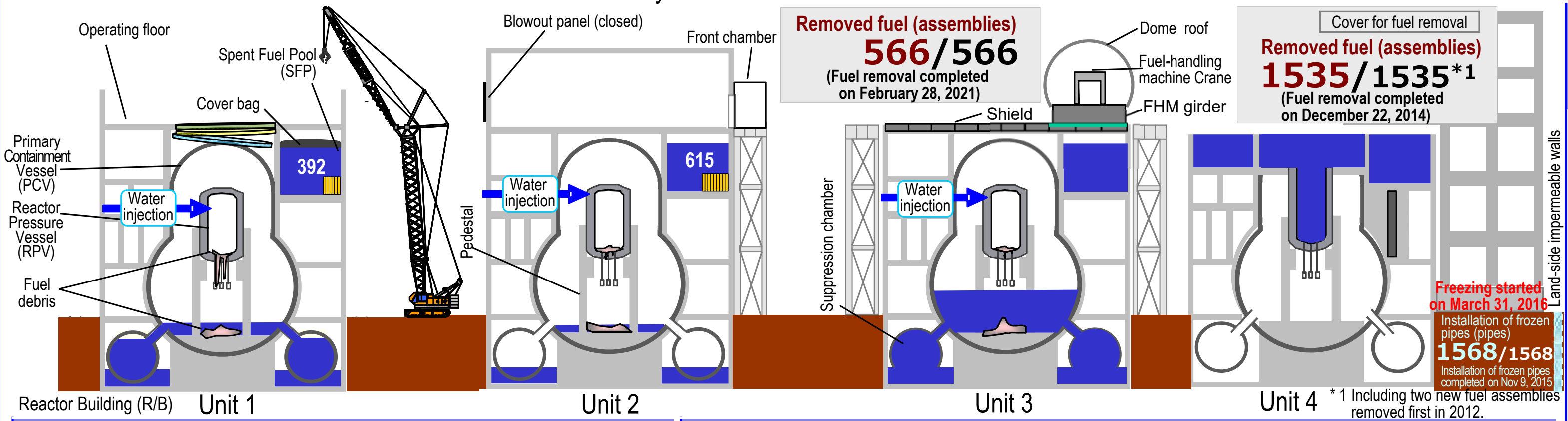
As the concentration of reagent in the sample tank reached the assumed level, stirring by the stirrer was evaluated as effective.

From February 2022, a circulation verification test will be conducted using ten connected sample tanks.



<Tank surface during stirring>

<Stirrer>

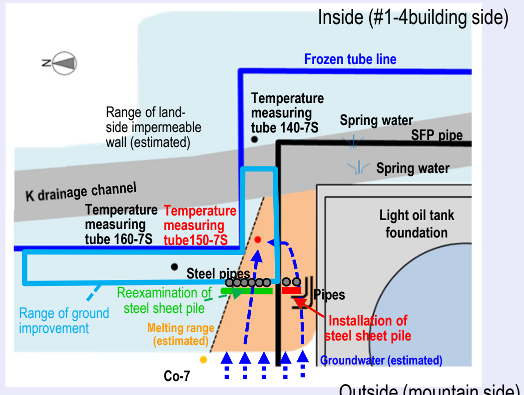


Trial water stoppage in response to the temporary temperature increase of the land-side impermeable wall temperature measuring tubes

For trial water stoppage in response to the temporary temperature increase of the land-side impermeable wall temperature measuring tubes, work to install steel pipes started from December 6 and was completed on December 13.

On December 10, the temperature of the temperature measuring tubes declined to 0°C. However, no significant change was detected in temperature of the tubes, spring water volume of K drainage channel and others by installing steel pipes. To further increase the water stoppage effects, additional steel sheet piles are being installed from December 18.

Performance of impermeable wall is evaluated as being sustained based on the monitoring results showing a sufficient difference maintained between water levels inside and outside the land-side impermeable walls and no significant variation detected in the trend of pumping volume from the sub-drain.



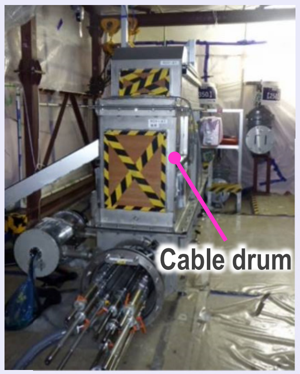
<Sectional view>

Toward starting the Unit 1 PCV internal investigation in mid-January 2022, pre-work is underway

Toward the PCV internal investigation, installation of equipment and materials in the remote-control room was completed on December 14.

On December 16, work to install a cable drum which mounted the underwater investigative robot was also completed.

Toward starting the Unit 1 PCV internal investigation in mid-January 2022, work will continue including verification of the equipment.



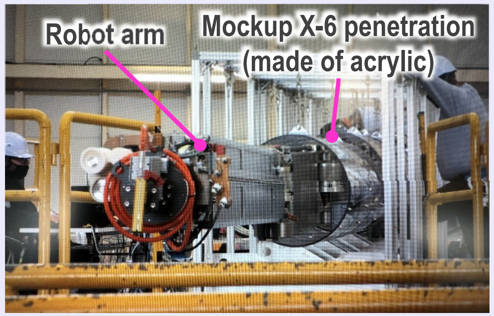
<Installation of equipment>

Toward the Unit 2 PCV internal investigation, performance tests of the trial retrieval equipment and training are underway

Performance tests of the trial retrieval equipment and training have been underway from August in a domestic factory (in Kobe). At present, tests to pass through the mockup X-6 penetration or others are being conducted.

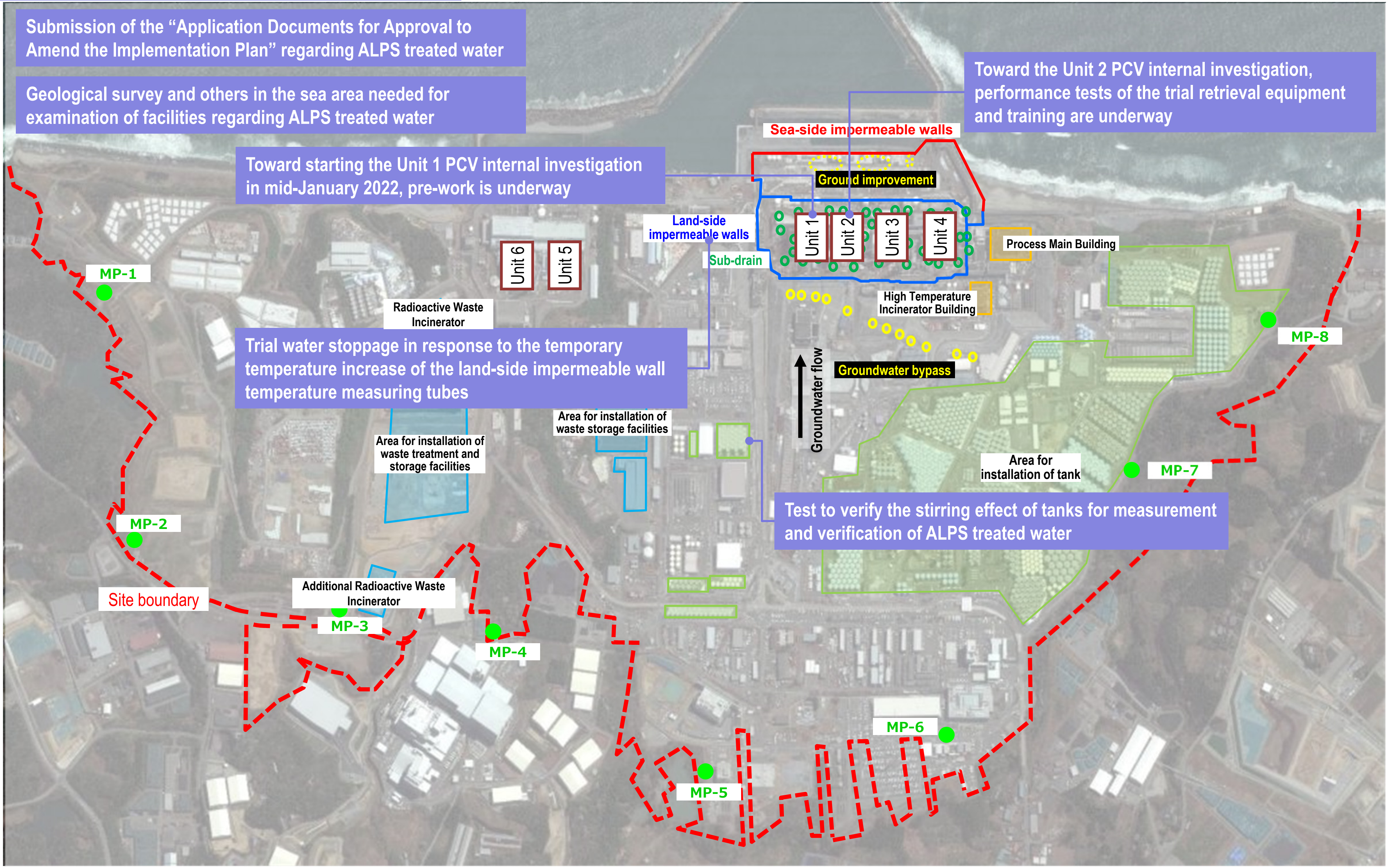
Before opening the X-6 penetration hatch, work to install an isolation room started from November.

Work will continue according to the plan toward the internal investigation and trial retrieval.



<X-6 penetration pass test>

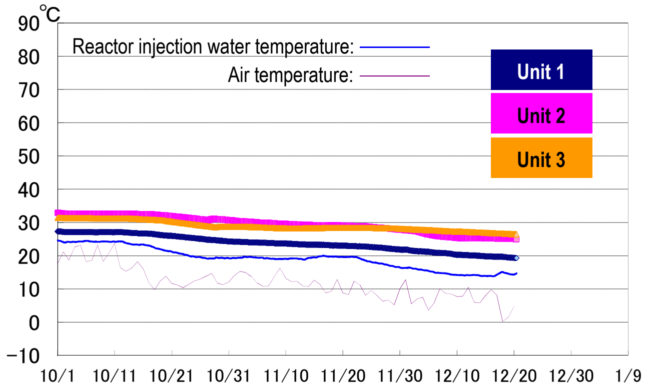
Major initiatives – Locations on site



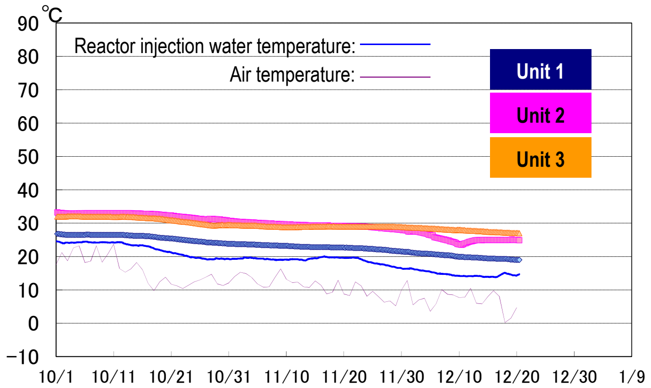
I. Confirmation of the reactor conditions

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 within the range of approx. 20 to 30°C for the past month, though it varied depending on the unit and location of the thermometer.

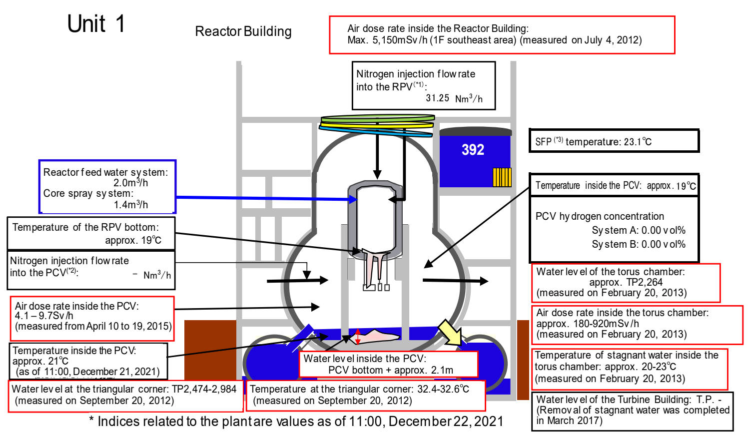


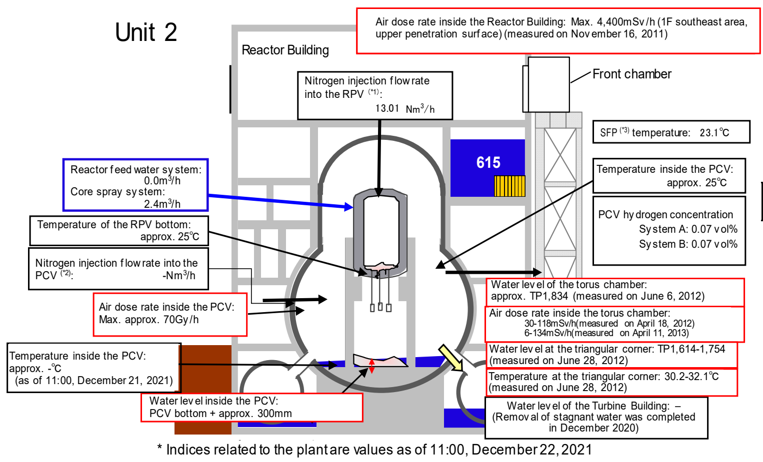
RPV bottom temperatures (recent quarter)

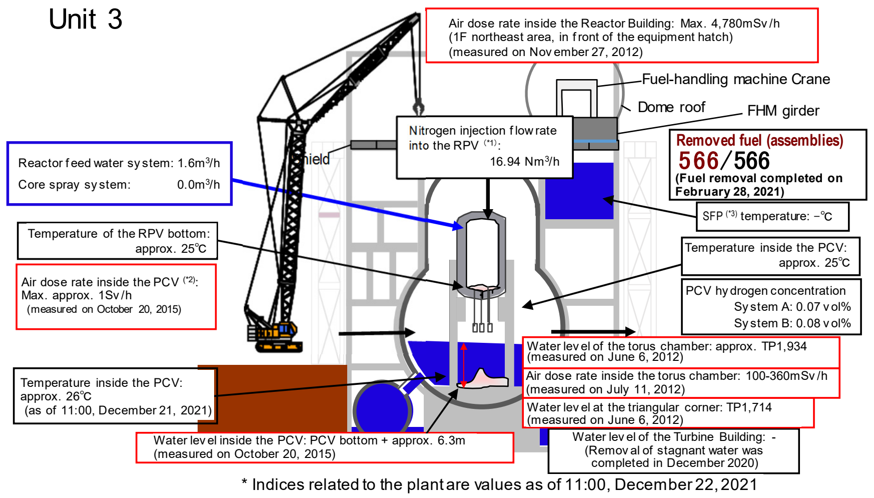


PCV gas phase temperatures (recent quarter)

*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.





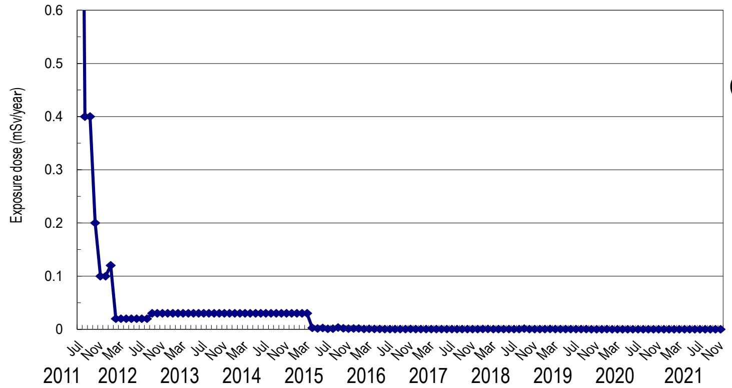


(*1) RPV (Reactor Pressure Vessel)
(*2) PCV (Primary Containment Vessel)
(*3) SFP (Spent Fuel Pool)

Release of radioactive materials from the Reactor Buildings

As of November 2021, 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. 3.2×10^{-12} Bq/cm³ and 2.7×10^{-12} Bq/cm³ for Cs-134 and -137 respectively, while the radiation exposure dose due to the release of radioactive materials there was less than 0.00006 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]: 2×10^{-5} Bq/cm³ Marc
  [Cs-137]: 3×10^{-5} Bq/cm³
* Data of Monitoring Posts (MP1-MP8).
  Data of Monitoring Posts (MPs) measuring the air dose rate around the site boundary showed 0.328 – 1.095 μSv/h (November 24 to December 21, 2021).
  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.

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 condition or criticality sign detected.

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

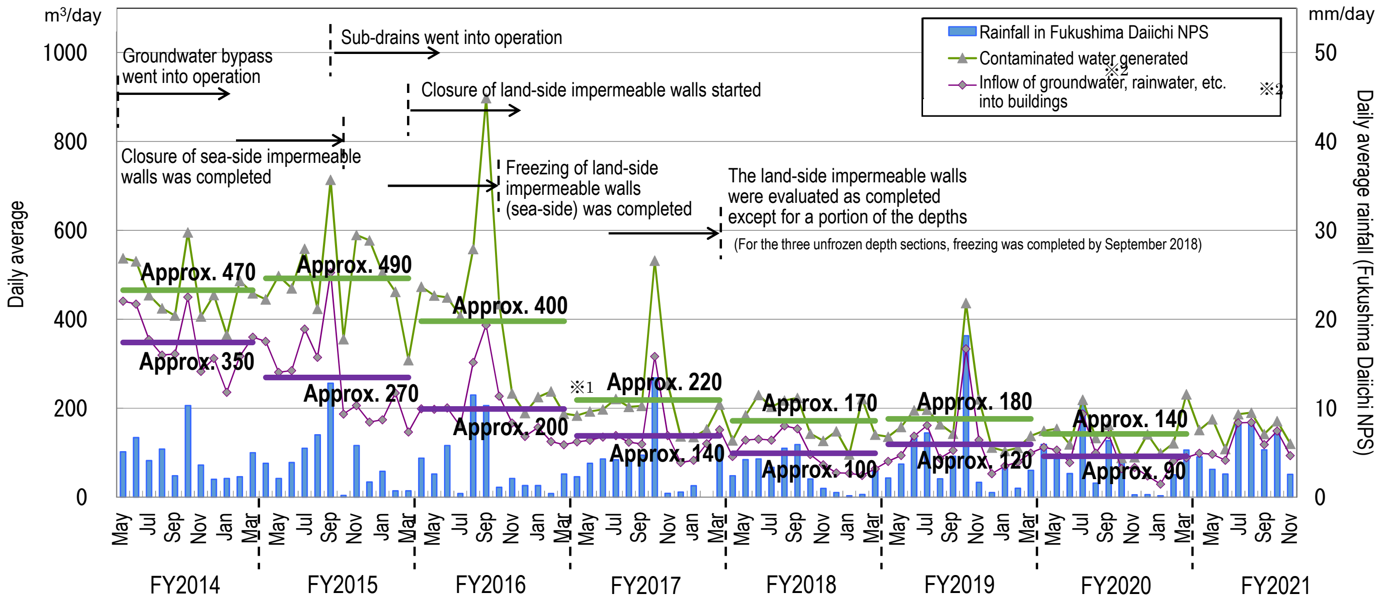
II. Progress status by each plan

Handling of ALPS treated water

Based on the three basic policies: "remove" the source of water contamination, "redirect" fresh water from contaminated areas and "retain" contaminated water from leakage, multi-layered contaminated water management measures have been implemented to stably control groundwater

➢ Status of contaminated water generated

- Multi-layered measures, including pumping up by sub-drains and land-side impermeable walls, which were implemented to control the continued generation of contaminated water, suppressed the groundwater inflow into buildings.
- After implementing "redirecting" measures (groundwater bypass, sub-drains, land-side impermeable walls and others) and rainwater prevention measures, including repairing damaged portions of building roofs, the amount of contaminated water generated within FY2020 declined to approx. 140 m³/day.
- Measures will continue to further reduce the amount of contaminated water generated.



*1 Values differ from those announced at the 20th 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 50th and 51st 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 Sub-drain & Groundwater drains

- At the Water-Treatment Facility special for Sub-drain & Groundwater drains, release started from September 14, 2015 and up until December 13, 2021 and 1,739 releases were conducted.
- The water quality of all temporary storage tanks satisfied the operation target.

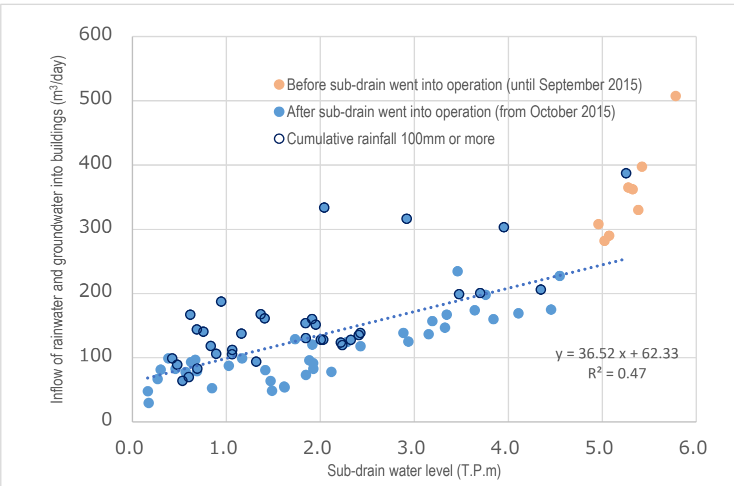


Figure 2: Correlation between inflow such as groundwater and rainwater into buildings and the water level of Units 1-4 sub-drains

➢ Implementation status of facing

- Facing is a measure involving asphalting of the on-site surface to reduce the radiation dose, prevent rainwater infiltrating the ground and decrease the amount of underground water flowing into buildings. As of the end of November 2021, 95% of the planned area (1,450,000 m² on site) had been completed. For the area inside the land-side impermeable walls, implementation proceeds appropriately after constructing a yard from implementable zones that leave the decommissioning work unaffected. As of the end of November 2021, 25% of the planned area (60,000 m²) had been completed.

➢ Status of groundwater level around buildings

- The groundwater level in the area inside the land-side impermeable walls has been declining every year. On the mountain side, the difference between the inside and outside was maintained, despite varying during rainfall. The water level of the groundwater drain observation well has been maintained at approx. T.P. +1.4 m, sufficiently below the ground surface (T.P. 2.5 m).

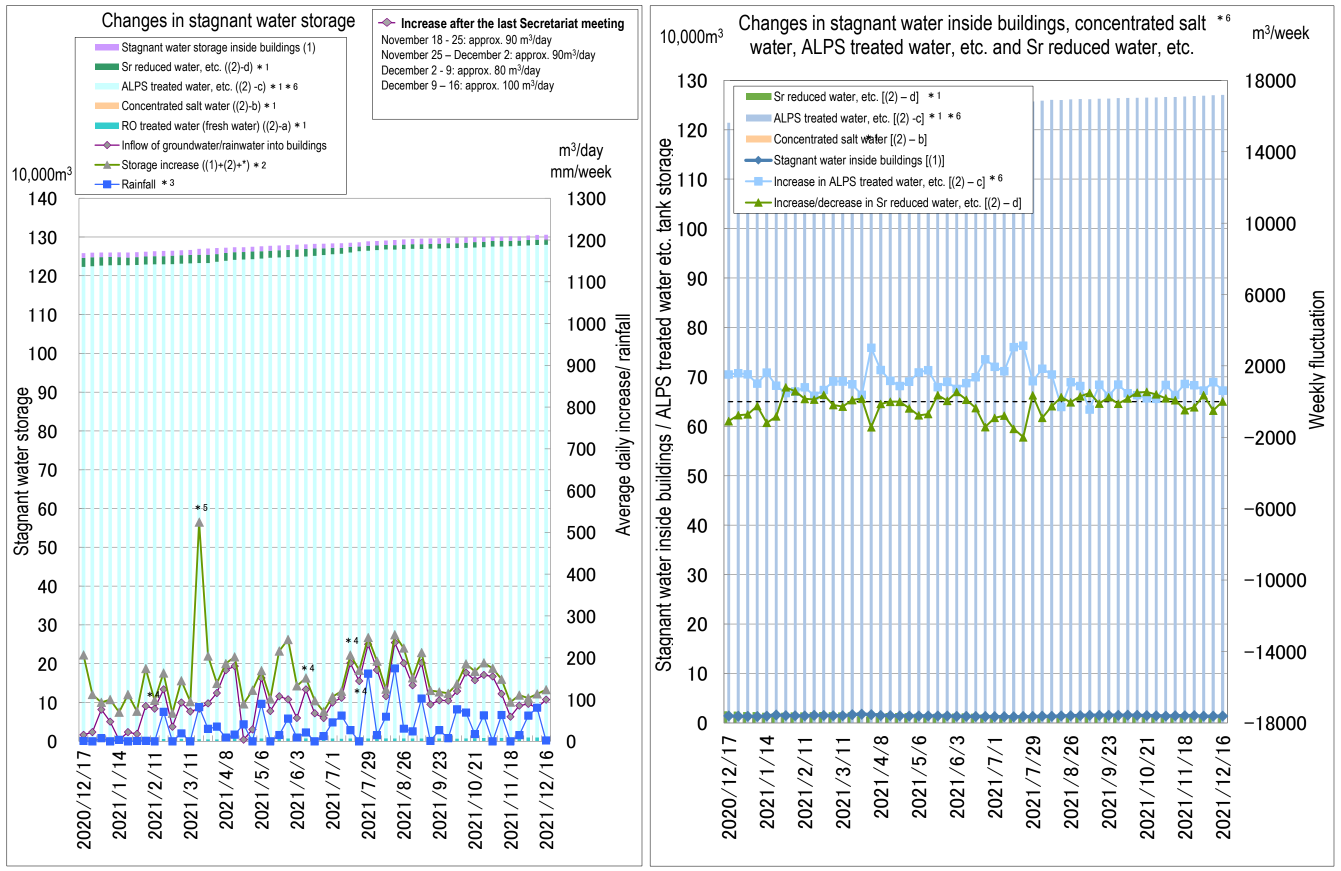
➢ Operation of multi-nuclide removal equipment

- Regarding the multi-nuclide removal equipment (existing and high-performance), hot tests using radioactive water are underway (for existing equipment, System A: from March 30, 2013, System B: from June 13, 2013, System C: from September 27, 2013; and for high-performance equipment, from October 18, 2014). The additional multi-nuclide removal equipment went into full-scale operation from October 16, 2017.
- As of December 16, 2021, the volumes treated by existing, additional and high-performance multi-nuclide removal equipment were approx. 481,000, 721,000 and 103,000 m³, respectively (including approx. 9,500 m³ stored in the J1(D) tank, which contained water with highly concentrated radioactive materials at the System B outlet of the existing multi-nuclide removal equipment).
- 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 December 16, 2021, approx. 664,000 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 equipment is underway. Up until December 16, 2021, approx. 826,000 m³ had been treated.

As of December 16, 2021



*1: Water amount for which the water-level gauge indicates 0% or more

*2: To detect storage increases more accurately, the calculation method was reviewed as follows from February 9, 2017: (The revised method was applied from March 1, 2018)
[(Inflow of groundwater/rainwater into buildings) + (other transfer) + (chemical injection into ALPS)]

*3: Changed from December 13, 2018 from rainfall in Namie to that within the site.

*4: Considered attributable to the fluctuation inflow of groundwater, rainwater, and others to buildings due to the decline in the level of contaminated water in buildings.
(February 4-11, June 3-10 and July 8-22, 2021)

*5: Stored amount increased due to transfer to buildings in association with decommissioning work on March 18, 2021.
(Major breakdown of the transferred amount: (1) Contaminated water inside the tank fences (water transferred from the Shallow Draft Quay drainage channel) was transferred to the Process Main Building: approx. 390 m³/day, (2) Contaminated water inside the tank fences (water transferred from the Shallow Draft Quay drainage channel) was transferred to the High Temperature Incinerator Building: approx. 10 m³/day, (3) Transfer from the Unit 3 additional FSTR to the Unit 3 Radioactive Waste Treatment Building: approx. 10 m³/day and others)

*6: The notation of treated water by the multi-nuclide removal equipment and others was reviewed in accordance with redefining of ALPS treated water by the Government (April 27, 2021)

Figure 3: Status of stagnant water storage

➢ Measures to reduce contamination of reused tanks

- From tanks to store strontium-reduced water and others to tanks to store ALPS treated water and others, the reuse of welded-joint tanks proceeds.
- Based on the condition inside the tanks after treatment of residual water, reused tank areas will be classified into three categories (1)-(3), each of which will be subject to measures and examination to keep the sum of ratios of legally required concentrations.
- Regarding category (3), for which examination was underway, the sum of ratios of the legally required concentrations will be minimized by transferring "water whose sum is more than one" which requires secondary treatment and receiving ALPS treated water to the source tanks.
- Water stored in the category (3) tank area will undergo secondary treatment to become ALPS treated water.

➢ Start of drilling of the Unit 3 Reactor Building 1st floor

- In Unit 3, cooling water leaked from the penetration for pipes of the main steam isolation valve (MSIV). Via the floor funnel, leaking water flowed into the southeast triangle corner and was then channeled to the torus chamber by a temporary pump (where a permanent pump was installed).
- On March 9, 2021, the floor funnel was blocked and a puddle spread to the northeast triangle corner and subsequently increased the water level there.
- To prevent any recurrence, the floor will be drilled, without passing the floor funnel, to drain to the torus chamber where a permanent pump has been installed.
- Drilling will be conducted in two phases from the air-conditioner room on the second floor, which is located above the outside of the MSIV room, and barriers will be implemented to channel any leaking liquid to the drilled part. Water conduit pipes will also be installed from the drilled part to near the water surface inside the torus chamber.
- As preparation for on-site work was completed, floor drilling will start sequentially.

➢ Status of collection of resin leaking from the Unit 3 FSTR building CUW spent resin storage tank room

- On September 1, 2020, leakage of waste liquid and resin was detected from the pipe connecting with the Reactor Water Clean-up System (CUW) spent resin storage tank on the basement floor of the Unit 3 Filter Sludge Tank Room (FSTR) building.
- Leaked resin started to be collected from June 2021 and was then transferred to waste sludge tank (B) in the FSTR building. Approx. 20% of the resin was collected but since a portion could not be collected by this method in the initial plan, work was suspended in July 2021, whereupon the collection method was reviewed.
- Based on the collection results, it was confirmed that waster resin both inside and outside the tank was harder than assumed, but that wet waste resin could be collected after moving near the underwater pump by sprinkling or others, and that resin was broken by direct watering.
- From December 15, moves to start collecting resin outside the tank got underway in each area divided by installing sand bags. Resin was gradually moved to the pump side by sprinkling from a position from which the sprinkling hose could be taken down and a remote-control robot with jet-cleaning capability was used as required.
- For resin inside the tank, a method is being examined to discharge material outside after collecting resin outside the tank.

Fuel removal from the spent fuel pools

Work to help remove spent fuel from the pool is progressing steadily while ensuring seismic capacity and safety.

➢ Main work to help spent fuel removal at Unit 1

- From late April 2021, work to assemble a temporary gantry and others has been underway in a yard outside the site as part of efforts to install a large cover.
- A work yard was prepared around the Reactor Building and work to install a large cover started from August 2021.
- Before installing the anchor of the large cover, the exterior walls of the Reactor Building were investigated. An investigation of representative parts on the west side of the building confirmed that both cracks and concrete strength were within the assumed range, and that the anchor would be installable as planned.

➢ Main work to help spent fuel removal at Unit 2

- To reduce the dose on the operating floor, a mockup of the decontamination work was implemented. Preparatory work in the front room of the west-side gantry was conducted from June 22, 2021 and decontamination work has been underway since August 19, 2021.
- For elevated walls on the top floor of the Reactor Building, decontamination within accessible range, such as the ceiling surface, was completed. Work continues to install shielding.
- After installing shielding, the dose will be evaluated to determine any need for additional decontamination and shielding measures.
- From October 28, work to improve the ground started toward installing the gantry for fuel removal.

➢ Cleaning of Unit 4 non-irradiated fuel assemblies stored in Unit 6

- Regarding the (180) non-irradiated fuel assemblies stored in the Unit 6 spent fuel pool, to minimize the amount of mixed rubble and surface dose of the fuel assemblies, cleaning by water flow will start from January 2022.
- At the time of mockup, the removal effect of the rubble removal equipment was about 80%.

Retrieval of fuel debris

➢ Progress status toward Unit 1 PCV internal investigation

- All work to install guide pipes was completed on October 14, related to creating an access route toward the internal investigation of the Unit 1 Primary Containment Vessel (PCV).
- To acquire information related to the construction plan to collect deposits toward fuel debris retrieval, a remotely operated underwater vehicle (ROV) will be inserted into the basement within the PCV from X-2 penetration to investigate inside and outside the pedestal.
- From November 5, pre-work is underway, such as covering the work area and installing equipment and materials in the on-site headquarters and the remote-control room, as part of the PCV internal investigation.

➢ Progress status toward Unit 2 PCV internal investigation and trial retrieval

- The trial retrieval equipment for Unit 2 fuel debris, which had been developed in the UK, arrived in Japan on July 10.
- The ongoing performance verification test in a domestic factory (Kobe), which started from August, continues.

➢ Sampling of inclusive water toward reducing the dose of the Unit 1 reactor auxiliary cooling system

- In the Mid-and-Long-term Decommissioning Action Plan 2021, toward fuel debris retrieval, the environment inside the Reactor Building will be improved.
- Improvement of the environment inside the building has already started in some parts. For Unit 1, the dose will be reduced sequentially from the Reactor Building Closed Cooling Water (RCW) System (RCM heat exchanger and dry-well dehumidifying facilities).
- After pre-work, inclusive water of the RCM heat exchanger, will be sampled from March 2022. Based on the sampling results, later work will be examined.

➢ Investigation into the drilled part of the shield plug planned on the top floor of the Unit 2 Reactor Building

- To utilize work to examine the method for future fuel retrieval and clarify the accident, in collaboration with the Secretariat of the Nuclear Regulation Authority, investigations are being conducted using the drilled part, a measurement method which is less susceptible to the impact of contamination on the floor surface of the operation floor.
- As part of efforts to further ascertain the contamination status of the shield plug, before examining the location for a new drilled part, the dose on the shield plug was investigated in October 2021.
- Based on the investigative results, the location was decided and the drilling was conducted from November 29 to December 7. An investigation at the new drilled part was conducted from November 30 to December 14.

➢ Status of the inspection in association with malfunction of the crawler crane detected during

preliminary work to remove the Unit 1/2 SGTS pipes

- On November 3, 2021, during preliminary work to remove the Unit 1/2 SGTS pipe, at the time of the monthly inspection of the crawler crane (known as Tsubame), an abnormal sound was detected near the bearing for two of three swivel reducers (hereinafter referred to as the “reducers”).
- The overhaul conducted to investigate what led to the foreign substances detected, including brake dust, iron powder, sandy dust, and others attached on the shaft seal (oil seal) of the upper cover. In addition, a partial defect was also detected in the connection to the level gage pipe of the upper cover for the reducer (rear).
- After opening the upper cover, the internal parts were inspected. The inspection detected wearing of the bearing and wobbling of the inner and outer rings, but no other factors elsewhere, such as wearing or damage, which would have caused abnormal sound.
- To reduce crane troubles during work, the annual inspection was conducted from January 27, 2022 ahead of schedule.
- After the annual inspection, preparation to remove the Unit 1/2 SGTS pipe will resume from mid-January 2022 and removal will start from late January.
- Rainwater prevention measures (removal of the main exhaust duct and rubble) of the roof of the Unit 1/2 Radioactive Waste Treatment Building (Rw/B) will start from early March 2022.

➢ Progress of work for the Unit 3 PCV intake facility

- As a measure to boost quake resistance, there is a plan to gradually lower the water level of the Primary Containment Vessel (PCV).
- In Step 1, intake by a self-priming pump is planned using the existing pipe that connects to the lower part of the suppression chamber.
- As preparation, before draining via the existing pipe, the vent valve of the system pipe was opened. As combustible gas was detected during the ventilation, the vent valve was closed and the operation was suspended. Later, the exhaust gas was sampled and Kr-85, a long half-life radionuclide originated from the accident, was detected.
- As the valves presumably connected to the PCV were closed before the operation, the gas was not thought to have originated from the PCV. Stagnant gas inside the system was possibly generated by an inflow into the system at the time of the accident, radiation decomposition of water held in the system, or other reasons.
- To ensure safety the pipe cutting work toward installing the intake facility remains safe, stagnant gas in the heat exchanger and pipes must be purged and replaced. Work will be resumed after ensuring safety.

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 the rubble and trimmed trees

- As of the end of November 2021, the total storage volume for concrete and metal rubble was approx. 312,500 m^3 (+1,100 m^3 compared to the end of October with an area-occupation rate of 76%). The total storage volume of trimmed trees was approx. 140,800 m^3 (registering a slight increase, with an area-occupation rate of 80%). The total storage volume of used protective clothing was approx. 28,900 m^3 (-1,400 m^3, with an area-occupation rate of 55%). The increase in rubble was mainly attributable to work related to tanks and site preparation, removal of crushed stone, and decontamination of flanged tanks. As of the end of November 2021, there were 16 temporary deposits with storage capacity exceeding 1,000m^3 and total storage volume of 55,600 m^3.

➢ Management status of secondary waste from water treatment

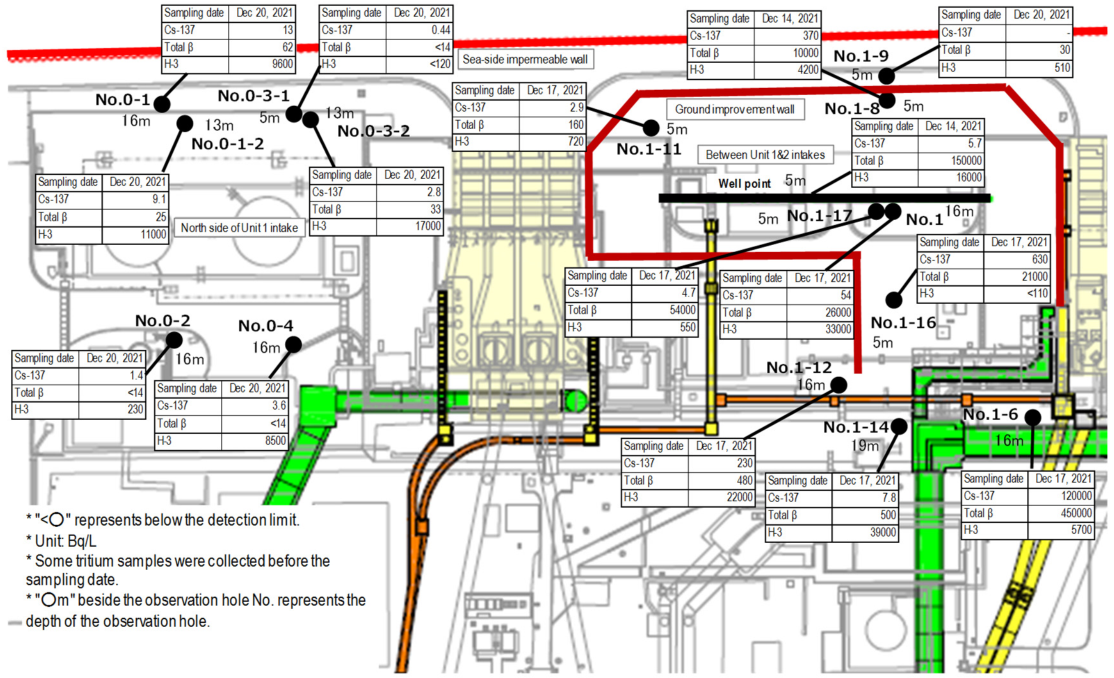
- As of the end of November 2021, the total storage volume of waste sludge was 440 m^3 (area-occupation rate: 63%), while that of concentrated waste fluid was 9,323 m^3 (area-occupation rate: 91%). The total number of stored spent vessels, High-Integrity Containers (HICs) for multi-nuclide removal equipment and other vessels, was 5,253 (area-occupation rate: 82%).

Reduction in radiation dose and mitigation of contamination

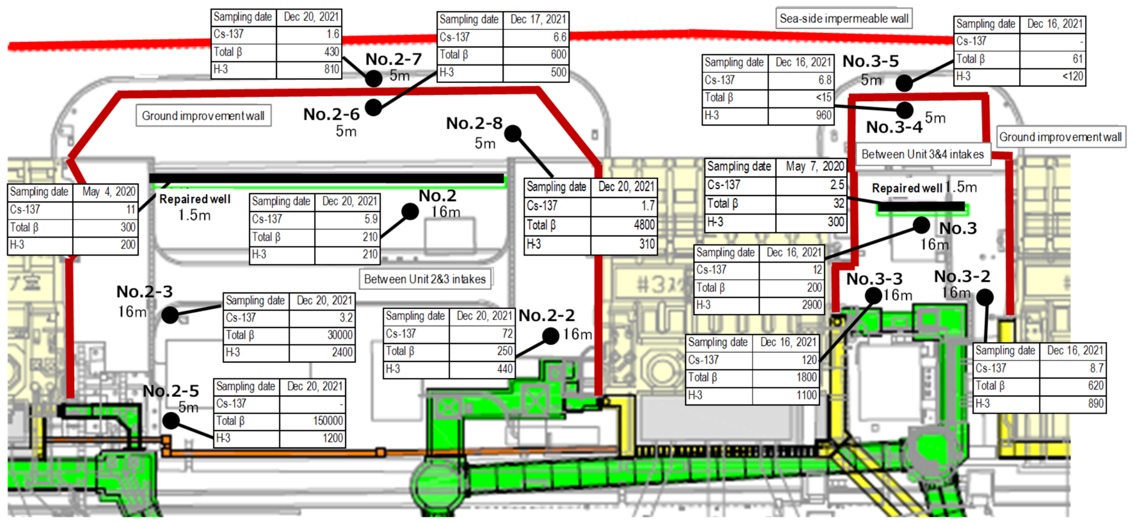
Effective dose-reduction at site boundaries and purification of port water to mitigate the impact of radiation on the external environment

➢ Status of 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 β radioactive materials increased temporarily from April 2020 and has been increasing or declining at No. 0-3-2 but remains constant or is declining overall.
- In the area between the Unit 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 No. 1-14 but has remained constant or been declining overall. The concentration of total β radioactive materials has remained constant or been declining at many observation holes overall.
- In the area between the Unit 2 and 3 intakes, the H-3 concentration has been below the legal discharge limit of 60,000 Bq/L at all observation holes and has remained constant or been declining overall. The concentration of total β radioactive materials has been increasing at Nos. 2-2 and 2-8 but remained constant or been declining at many observation holes overall.
- In the area between the Unit 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, although increasing and declining at No. 3-3. The concentration of total β radioactive materials has also remained constant or been declining overall.
- The concentration of radioactive materials in drainage channels has remained constant overall, despite increasing during rainfall.
- In the open channel area of seawater intake for Units 1 to 4, the concentration of radioactive materials in seawater has remained below the legal discharge limit and has been declining long term, despite temporary increases in Cs-137 and Sr-90 noted 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 has 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 Unit 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 has been observed since last year in the area outside the port (north and south outlets). Monitoring of the tendency continues, including the potential influence of the weather, marine meteorology and others.



<Unit 1 intake north side, between Unit 1 and 2 intakes>



<Between Unit 2 and 3 intakes, between Unit 3 and 4 intakes>

Figure 4: Groundwater concentration on the Turbine Building east side

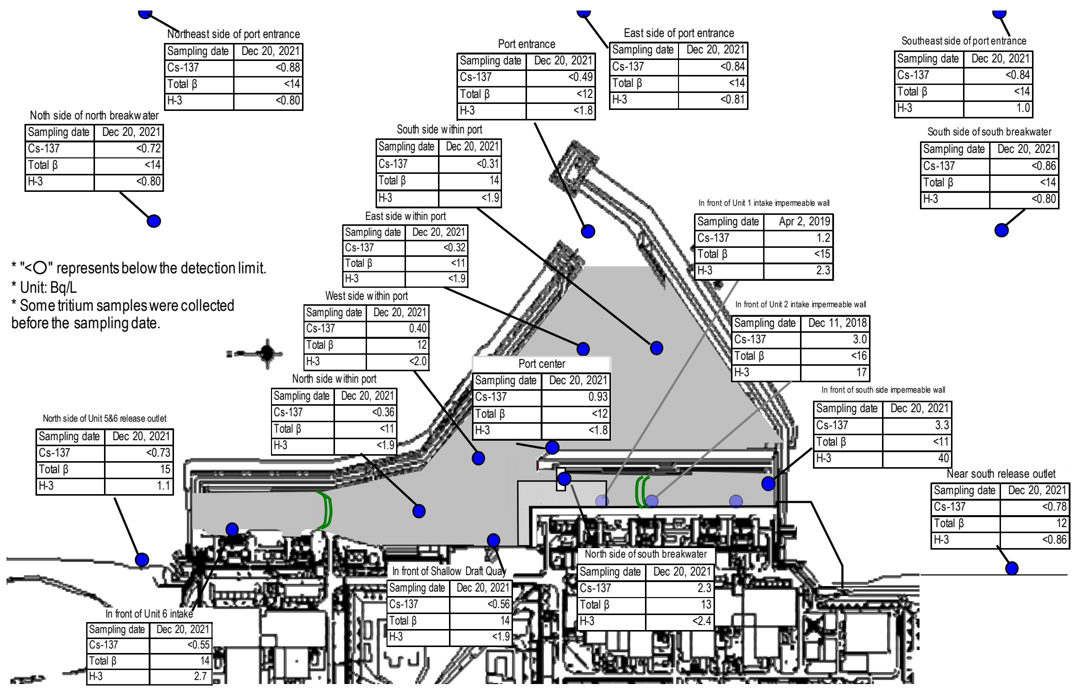


Figure 5: Seawater concentration around the port

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 August to October 2021 was approx. 8,800 (cooperating company workers and TEPCO HD employees), which exceeded the monthly average workforce (approx. 6,500). Accordingly, sufficient personnel are registered to work on site.
- It was confirmed with the prime contractors that the estimated manpower necessary for the work in January 2022 (approx. 3,900 workers per day: cooperating company workers and TEPCO HD employees) would be secured at present. The average numbers of workers per day for each month (actual values) for the most recent 2 years were maintained, with approx. 3,000 to 4,200.
- The number of workers from both within and outside Fukushima Prefecture increased slightly. The local employment ratio (cooperating company workers and TEPCO HD employees) as of November 2021 also decreased slightly to around 65%.
- The average exposure doses of workers were at approx. 2.44, 2.54 and 2.60 mSv/person-year during FY2018, 2019 and 2020, respectively. (The legal exposure dose limits are 100 mSv/person and 50 mSv/person-year over five years, the TEPCO HD management target is 20 mSv/person-year).
- For most workers, the exposure dose was sufficiently within the limit and allowed them to continue engaging in radiation work.

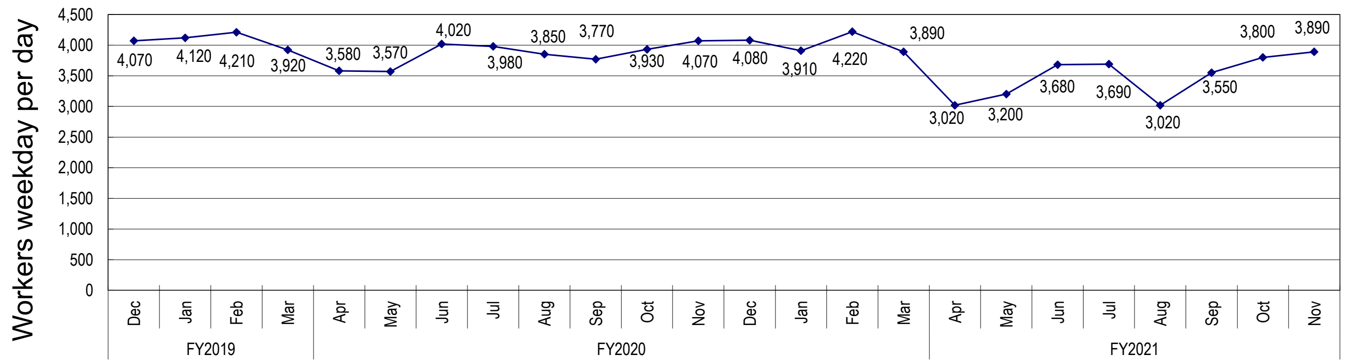


Figure 6: Changes in the average number of workers weekday per day for each month of the past 2 years (actual values)

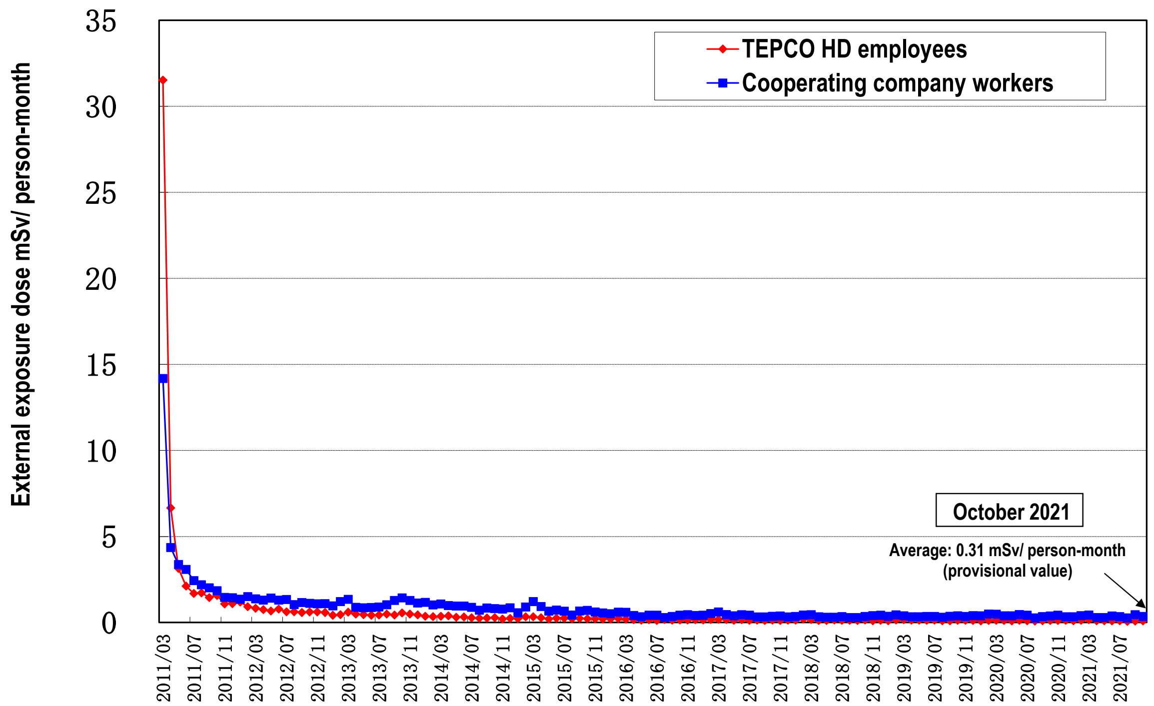


Figure 7: Changes in monthly average exposure dose of individual worker
(monthly exposure dose since March 2011)

- Additional countermeasures to suppress the spread of COVID-19 infections in the new year holiday season
  - The number of COVID-19 infections decreased nationwide. However, given the risk of this becoming an increase due to the spread of the Omicron variant, additional countermeasures will be implemented in the new year holiday season to protect the power station operations. Countermeasures to prevent the infection spreading, such as requiring employees to take their temperature before coming to the office, wear masks at all times, avoid the "Three Cs" (Closed spaces, Crowded places, Close-contact settings) by using the rest house in shifts, eat silently and carefully select business travel, will continue to be properly implemented and decommissioning work will proceed with safety first.
  - As additional countermeasures in the new year holiday season, for TEPCO HD employees and cooperating company workers, during the period from December 25 (Sat.), 2021 to January 3 (Mon.), 2022 (including cases that include part of this period), the following countermeasures will be implemented in addition to the ongoing ones:
    - Those who move outside Fukushima Prefecture must undergo an antigen test
    - Those who live in Fukushima Prefecture and contact a visitor from outside the prefecture must undergo an antigen test
  - As of 15:00, December 22, 2021, 104 TEPCO HD employees and cooperating company workers (including 10 TEPCO HD employees) of the Fukushima Daiichi NPS had contracted COVID-19 and a total of no employees after September 2.
  - No significant influence on decommissioning work, such as a corresponding delay to work processes due to this infection, had been identified.
  - Work began to examine the viability of a third workplace vaccination of COVID-19.
- Measures to prevent infection and expansion of influenza and norovirus
  - Since November, measures for influenza and norovirus have been implemented, including free influenza vaccinations (subsidized by TEPCO HD) at medical clinics around the site (from October 11, 2021 to January 29, 2022) for cooperating company workers. As of December 18, 2021, a total of 4,046 workers had been vaccinated. In addition, a comprehensive range of other measures is also being implemented, including daily actions to prevent infection and expansion (measuring body temperature, health checks and monitoring infection status) and response after detecting possible infections (swift exit of possible patients and control of entry, mandatory wearing of masks in working spaces, etc.).
- Status of influenza and norovirus cases
  - Until the 50th week of 2021 (December 13-19, 2021), no influenza or norovirus infections were recorded. The totals for the same period for the previous season showed one influenza and one norovirus infection respectively.

Note: The above data is based on reports from TEPCO HD and cooperating companies, which include diagnoses at medical clinics outside the site.
The subjects of this report were cooperating company workers and TEPCO HD employees in Fukushima Daiichi and Daini Nuclear Power Stations.

Status of Units 5 and 6

- Status of spent fuel storage in Units 5 and 6
  - Regarding Unit 5, fuel removal from the reactor was completed in June 2015. A total of 1,374 spent and 168 non-irradiated fuel assemblies, respectively, were stored in the spent fuel pool (storage capacity: 1,590 assemblies).
  - Regarding Unit 6, fuel removal from the reactor was completed in November 2013. A total of 1,456 spent and 198 non-irradiated fuel assemblies (180 of which transferred from the Unit 4 spent fuel pool) are stored in the spent fuel pool (storage capacity: 1,654), while 230 non-irradiated fuel assemblies are stored in the storage facility of non-irradiated fuel assemblies (storage capacity: 230).
- Status of stagnant water treatment in Units 5 and 6
  - Stagnant water in Units 5 and 6 buildings is transferred from Unit 6 Turbine Building to the outdoor tanks and sprinkled after undergoing oil separation and RO treatment and confirming the concentration of the radioactive materials.
- Increase in the water level in N5 tank of the Units 5 and 6 contaminated water treatment equipment
  - On November 25, during the transfer of water purified by the Units 5 and 6 contaminated water treatment equipment to the F tank area N2 tank, an increase in the water level was detected in N5 tank in the same area and the equipment was suspended. After the suspension of transfer to the N2 tank, the water level of N5 tank was being monitored and based on the results, the increase in the water level was considered attributable to an inflow from N2 to N5 tank.
  - For the N5 tank, after confirming that the sprinkling criteria had been satisfied, water was sprinkled sequentially from November 22. However, unanalyzed water in N2 tank was likely to inflow and sprinkled before analysis.
  - Contaminated water in Units 5 and 6 was groundwater around the Units 5 and 6 buildings flowing into the buildings and being pumped up. The water in N2 tank was analyzed and it was confirmed that the radioactivity was below the sprinkling criteria.
  - Based on this event, the operation will be reviewed and facilities modified to prevent inflow from pre-analysis tanks to tanks for sprinkling.

Others

- Unplanned sprinkling of water in the J3 rainwater collection tank before analysis
  - On November 29, a worker accidentally sprinkled water in the J3 water collection tank before analysis instead of water in J2 tank.
  - On November 30, the following analytical results were confirmed for water in J3 rainwater collection tank: cesium 134 and 137 and tritium were below the detection limit; and strontium 90 was 0.52 Bq/L. This meant that the sum of the ratios of the concentrations required by law was 0.038 and below the drainage criteria On November 29, a worker accidentally sprinkled water in the J3 water collection tank before analysis instead of water in J2 tank (0.21 or less).
  - Following the sprinkling, there was no significant variation in the values recorded by on-site radiation monitors and monitoring posts.
  - The accidental sprinkling of rainwater before analysis was attributable to unfulfilled basic actions by the worker such as visually confirming valve operation and lack of stop. To prevent any recurrence, measures were implemented such as assigning different keys to each tank. In addition, education concerning human-error prevention and awareness-raising will be continuously provided.
- Body contamination during work to replace the hot air heater intake duct for the desalination equipment
  - On November 19, when the four TEPCO HD employees exited the controlled area after work to replace the hot air heater intake duct for the desalination equipment (RO-3), body contamination was detected in two of them (for the remaining two, contamination was detected only on their work clothes).
  - The two with body contamination left the controlled area after satisfying the level below the exit criteria by decommissioning. The doctor of the emergency medical room in the access control facility diagnosed in an interview that they did not experience any abnormality.
  - As for the results of the intranasal contamination test, the possibility of internal exposure could not be denied, hence their urine was examined, and based on the results, the detailed committed dose will be calculated. The effective dose (provisional), estimated based on the dust concentration measured after the work, was below the recording level (2mSv).

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 December 17-20)"; unit (Bq/L); ND represents a value below the detection limit

Note: The Total β measurement values include natural potassium 40 (approx. 12 Bq/L).
They also include the contribution of yttrium 90, which radioactively balance strontium 90.

Summary of TEPCO data as of December 20, 2021

Cesium-134	:	ND(0.63)
Cesium-137	:	0.93
Total β	:	ND(12)
Toritium	:	ND(1.8)

※1

Cesium-134 :	3.3	(H25/12/24)	→	ND(0.48)	Below 1/6
Cesium-137 :	7.3	(H25/10/11)	→	ND(0.49)	Below 1/10
Total β :	69	(H25/8/19)	→	ND(12)	Below 1/5
Toritium :	68	(H25/8/19)	→	ND(1.8)	1/30以下

Cesium-134 :	3.3	(H25/10/17)	→	ND(0.32)	Below 1/10
Cesium-137 :	9	(H25/10/17)	→	ND(0.32)	Below 1/20
Total β :	74	(H25/8/19)	→	ND(11)	Below 1/6
Toritium :	67	(H25/8/19)	→	ND(1.9)	Below 1/30

Cesium-134 :	3.5	(H25/10/17)	→	ND(0.28)	Below 1/10
Cesium-137 :	7.8	(H25/10/17)	→	ND(0.31)	Below 1/20
Total β :	79	(H25/8/19)	→	14	Below 1/5
Toritium :	60	(H25/8/19)	→	ND(1.9)	Below 1/30

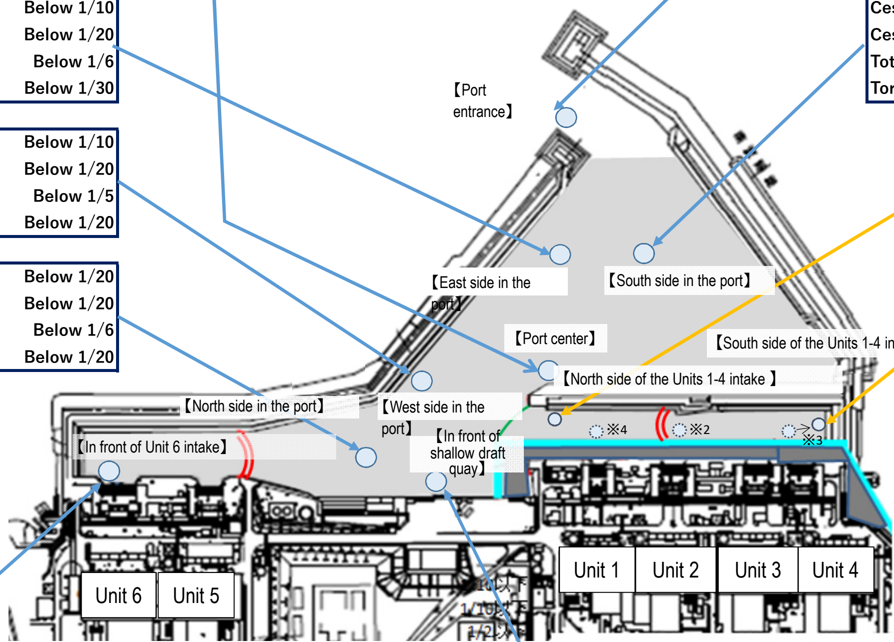
Cesium-134 :	4.4	(H25/12/24)	→	ND(0.33)	Below 1/10
Cesium-137 :	10	(H25/12/24)	→	0.40	Below 1/20
Total β :	60	(H25/7/4)	→	12	Below 1/5
Toritium :	59	(H25/8/19)	→	ND(2.0)	Below 1/20

Cesium-134 :	32	(H25/10/11)	→	ND(0.51)	Below 1/60
Cesium-137 :	73	(H25/10/11)	→	2.3	Below 1/30
Total β :	320	(H25/8/12)	→	13	Below 1/20
Toritium :	510	(H25/9/2)	→	ND(2.4)	Below 1/200

Cesium-134 :	5	(H25/12/2)	→	ND(0.25)	Below 1/20
Cesium-137 :	8.4	(H25/12/2)	→	ND(0.36)	Below 1/20
Total β :	69	(H25/8/19)	→	ND(11)	Below 1/6
Toritium :	52	(H25/8/19)	→	ND(1.9)	Below 1/20

Cesium-134	:	ND(0.50)
Cesium-137	:	3.3
Total β	:	ND(11)
Toritium	:	40

※1



Sea side impermeable wall
Silt fence
Silt fence for construction

Cesium-134 :	2.8	(H25/12/2)	→	ND(0.59)	Below 1/4
Cesium-137 :	5.8	(H25/12/2)	→	ND(0.55)	Below 1/10
Total β :	46	(H25/8/19)	→	14	Below 1/3
Toritium :	24	(H25/8/19)	→	2.7	Below 1/8

Cesium-134 :	5.3	(H25/8/5)	→	ND(0.38)	Below 1/10
Cesium-137 :	8.6	(H25/8/5)	→	ND(0.56)	Below 1/10
Total β :	40	(H25/7/3)	→	14	Below 1/2
Toritium :	340	(H25/6/26)	→	ND(1.9)	Below 1/100

※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.

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

	Legal discharge limit	WHO Guidelines for Drinking Water Quality
Cesium-134	60	10
Cesium-137	90	10
Strontium-90 (strongly correlate with Total β)	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/decommision/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 December 17-20)

Summary of TEPCO data as of December 20, 2021

	Legal discharge limit	WHO Guidelines for Drinking Water Quality
Cesium-134	60	10
Cesium-137	90	10
Strontium-90 (strongly correlate with Total β)	30	10
Tritium	60,000	10,000

【Northeast side of port entrance (offshore 1 km)】

Cesium-134 :	ND	(H25)	→	ND(0.62)	
Cesium-137 :	ND	(H25)	→	ND(0.88)	
Total β :	ND	(H25)	→	ND(14)	
Toritium :	ND	(H25)	→	ND(0.80)	

【East side of port entrance (offshore 1 km)】

Cesium-134 :	ND	(H25)	→	ND(0.64)	
Cesium-137 :	1.6	(H25/10/18)	→	ND(0.84)	Below 1/2
Total β :	ND	(H25)	→	ND(14)	
Toritium :	6.4	(H25/10/18)	→	ND(0.81)	Below 1/7

【Southeast side of port entrance (offshore 1 km)】

Cesium-134 :	ND	(H25)	→	ND(0.78)	
Cesium-137 :	ND	(H25)	→	ND(0.84)	
Total β :	ND	(H25)	→	ND(14)	
Toritium :	ND	(H25)	→	1.0	

【North side of north breakwater (offshore 0.5 km)】

Cesium-134 :	ND	(H25)	→	ND(0.78)	
Cesium-137 :	ND	(H25)	→	ND(0.72)	
Total β :	ND	(H25)	→	ND(14)	
Toritium :	4.7	(H25/8/18)	→	ND(0.80)	Below 1/5

【Port entrance】

Cesium-134 :	3.3	(H25/12/24)	→	ND(0.48)	Below 1/6
Cesium-137 :	7.3	(H25/10/11)	→	ND(0.49)	Below 1/10
Total β :	69	(H25/8/19)	→	ND(12)	Below 1/5
Toritium :	68	(H25/8/19)	→	ND(1.8)	Below 1/30

【South side of south breakwater (offshore 0.5 km)】

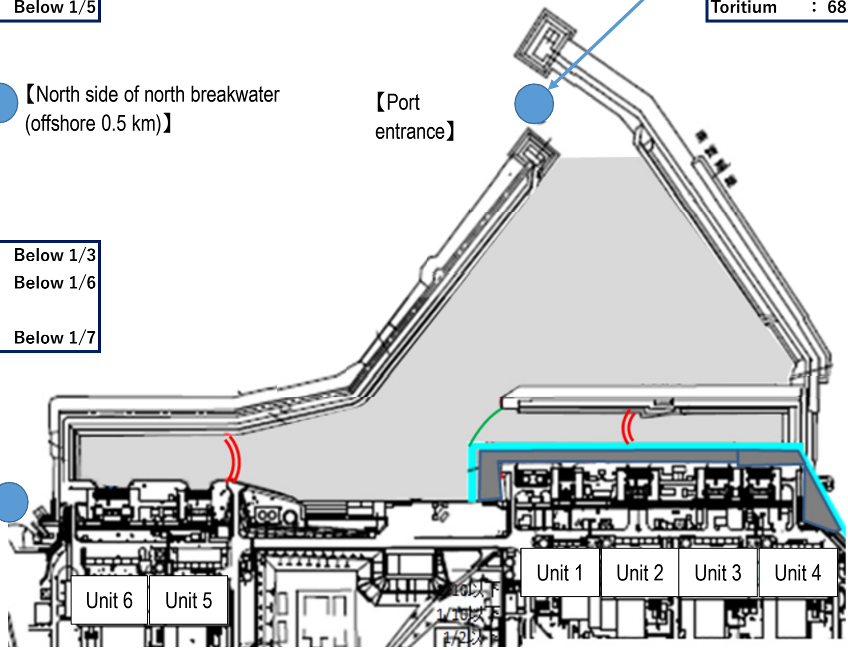
Cesium-134 :	ND	(H25)	→	ND(0.59)	
Cesium-137 :	ND	(H25)	→	ND(0.86)	
Total β :	ND	(H25)	→	ND(14)	
Toritium :	ND	(H25)	→	ND(0.80)	

【North side of Unit 5 and 6 release outlet】

Cesium-134 :	1.8	(H25/6/21)	→	ND(0.50)	Below 1/3
Cesium-137 :	4.5	(H25/3/17)	→	ND(0.73)	Below 1/6
Total β :	12	(H25/12/23)	→	15	
Toritium :	8.6	(H25/6/26)	→	1.1	Below 1/7

【Near south release outlet】

Cesium-134 :	ND	(H25)	→	ND(0.76)	
Cesium-137 :	3	(H25/7/15)	→	ND(0.78)	Below 1/3
Total β :	15	(H25/12/23)	→	12	
Toritium :	1.9	(H25/11/25)	→	ND(0.86)	Below 1/2



Sea side impermeable wall

Silt fence

Silt fence for construction

Note: The Total β measurement values include natural potassium 40 (approx. 12 Bq/L). They also include the contribution of yttrium 90, which radioactively balance strontium 90.

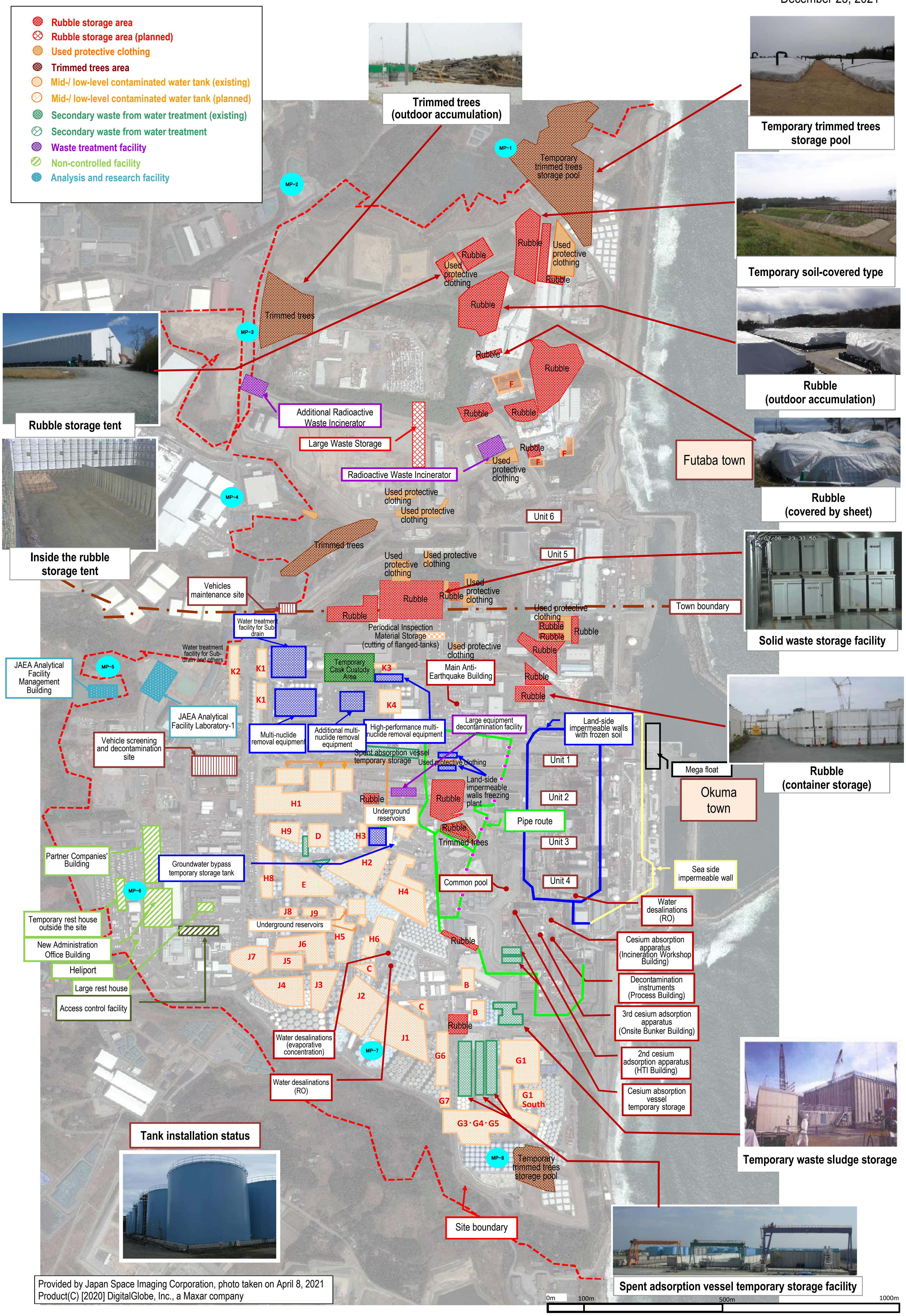
Note: Because safety of the sampling points was unassured due to the influence of Typhoon No. 10 in 2016, samples were taken from approx. 330 m south of the Unit 1-4 release outlet. Samples were also taken from a point approx. 280m south from the same release outlet from January 27, 2017 and approx. 320m from March 23, 2018.

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

Appendix 2

December 23, 2021

TEPCO Holdings Fukushima Daiichi Nuclear Power Station Site Layout



Provided by Japan Space Imaging Corporation, photo taken on April 8, 2021
Product(C) [2020] DigitalGlobe, Inc., a Maxar company

1-1 Contaminated water management

- Efforts to promote contaminated water management based on three basic policies:
  ① "Remove" the source of water contamination ② "Redirect" fresh water from contaminated areas
  ③ "Retain" contaminated water from leakage

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

- [Completed] Suppressing the amount of contaminated water generated to 150 m^3/day or less (within 2020)
- Suppressing the amount of contaminated water generated to 100 m^3/day or less (within 2025)

2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022

Contaminated water management 【Remove】

Contaminated water treatment facility

▽Reception start of contaminated water to Central Waste Treatment Building
▽Decontamination equipment (AREVA)
▽Evaporative concentration equipment
▽Cesium Adsorption Apparatus (KURION)
▽2nd Cesium Adsorption Apparatus (SARRY)
▽Treatment of RO-condensed salt water complete
▽Reduction of strontium by Cesium Adsorption Apparatus (KURION) (from 2015.1.6)
▽Reduction of strontium by 2nd Cesium Adsorption Apparatus (SARRY) (from 2014.12.26)
▽Purification of strontium-reduced water in flanged tanks complete
▽Purification of strontium-reduced water complete
▽Reduction of strontium by 3rd Cesium Adsorption Apparatus (SARRY II) (from 2019.7.12)
▽Treatment start of strontium-reduced water (ALPS: from 2015.12.4, additional: from 2015.5.27, high-performance: from 2015.4.15)
▽Multi-nuclide Removal Equipment (ALPS) (System A: from 2013.3.30, System B: from 2013.6.13, System C: from 2013.9.27, hot tests conducted)
▽Multi-nuclide Removal Equipment (additional ALPS)
▽Start of full-scale operation (from 2017.10.16)
▽Multi-nuclide Removal Equipment (high performance ALPS) (from 2014.10.18, hot tests conducted)


Cesium Adsorption Apparatus (KURION)

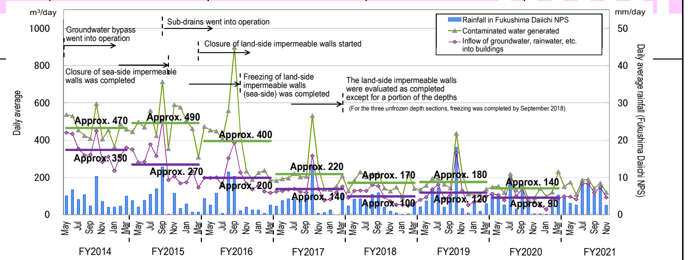

Landing of 2nd Cesium Adsorption Apparatus (SURRY)


Multi-nuclide removal equipment (ALPS)

Removal of contaminated water from seawater pipe trench

【Removal of contaminated water in seawater pipe trench】
▽Trench Purification by mobile equipment
Unit 2
▽Completion of tunnel filling
▽Transfer of stagnant water complete
▽Completion of shaft filling
▽Completion of tunnel filling
▽Transfer of stagnant water complete
▽Completion of shaft filling (except for upper part of ...)
Unit 3
▽Completion of tunnel filling
▽Filling of openings II and III complete
▽Transfer stagnant water complete
▽Completion of filling parts running ove...
Unit 4


Unit 2 seawater pipe trench Shaft D filling work



Contaminated water management 【Redirect】

Groundwater bypass

▽Installation start of groundwater bypass
▽Operation start of groundwater bypass (drainage started from 2014.5.21)
▽Suppressing the average amount of contaminated water generated to approx. 140 m3/day

Sub-drain

▽Recovery of existing sub-drain pit and start of new installation
▽Installation start of Water-Treatment Facility special for Sub-drain & Groundwater drains
▽Operation start of sub-drain (drainage started from 2015.9.14)
(Treatment capacity: 1000 m3/day)
▽Enhancement of treatment capacity
(2000 m3/day)

Land-side impermeable wall

▽Installation start of land-side impermeable walls
▽Freezing start
Start of maintenance operation ▽
▽Start of maintenance operation on north and south sides
▽Freezing completion
▽Start of maintenance operation in all sections
▽Freezing completion (except for some parts)

Facing

▽Completion of waterproof pavement (facing)
(except for areas of 2.5 and 6.5m above sea level and around Unit 1-4)
▽Completion of waterproof pavement (facing)
(except for around Unit 1-4)

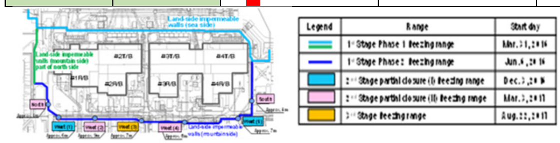
Contaminated water management 【Retain】

Bank groundwater measures

High concentration of radioactive materials detected from observation well of bank ▽
▽Area 2.5m above sea level – Start of ground improvement by water glass
▽Completion
▽Start of pumping of water from contaminated areas (well point)
▽Installation start of seaside impermeable walls
▽Installation of seaside impermeable walls complete
▽Operation start of groundwater drain (pumping-up started on 2015.11.5)

Storage facility

▽Storage in steel square tanks
▽Purification of RO-condensed salt water complete
▽Replacement of steel square tanks complete
▽Removal of steel horizontal tanks complete (except for condensed waste liquid storage tank)
▽Water leakage (300L) from flanged tank
▽Water leakage (100t) from flanged tank
▽Storage in flanged cylindrical tanks
▽Completion of fence to prevent leakage expanding
▽Purification of strontium-reduced water in flanged tanks complete
▽Water leakage (10L) from flanged tank
▽Work to raise fence height complete
▽Transfer and storage of all treated water in welded-joint tanks
▽Leakage of contaminated water from underground reservoir => Start of transfer to tanks
▽Transfer of contaminated water to tanks complete
▽Storage in cylindrical steel welded-joint tanks
▽Purification of strontium-reduced water complete
▽Sprinkling start of rainwater within tank fences by rainwater treatment facility (from 2014.5.21)


Closure parts of the land-side impermeable walls (on the mountain side)


Pumping well


Sub-drain purification system


Land-side impermeable wall brine (refrigerant) circulation pipe


Construction of welded-joint tanks


Placement of seaside impermeable walls complete

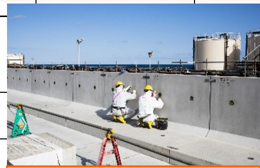

Flanged and welded-joint tanks

1-2 Contaminated water management

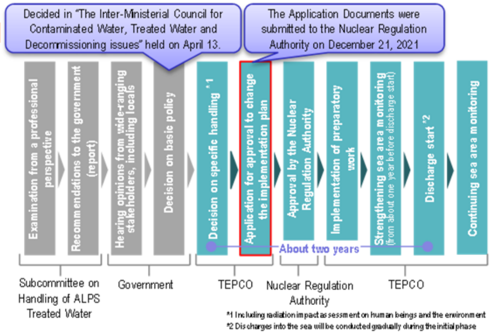
Milestones of the Mid- and-Long-Term Roadmap (major target processes)

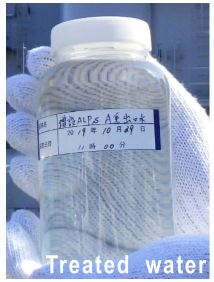
- [Completed] Treatment of contaminated water in buildings* (within 2020)
  - * Except for Unit 1-3 Reactor Buildings, Process Main Building and High-Temperature Incinerator Building
- Reducing contaminated water in Reactor Buildings to about half the amount at the end of 2020 (FY2022-2024)

		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Treatment of stagnant water		▽Installation of stagnant water transfer equipment/transfer start		▽Completion of work to improve reliability of transfer line (replacement with PE pipes)			▽Start to maintain water-level difference with sub-drain water level ▽Transfer start from each building to Central Rw Building	▽Floor exposure of Unit 1 T/B ▽Separation of stagnant water between Units 3 and 4	▽Separation of stagnant water between Units 1 and 2	▽Floor exposure of Unit 1 Rw/B	▽Floor exposure of Unit 2 T/B, Rw/B ▽Floor exposure of Unit 3 T/B, Rw/B ▽Floor exposure of Unit 4 R/B, T/B, Rw/B	▽Treatment of stagnant water in buildings complete	
Countermeasures to tsunami risks	Closure of openings			▽Examination start of measures to close building openings	▽Work for common pool complete	▽Work for Units 1 and 2 T/B complete ▽Work for HTI building complete			▽Work for Process Main Building complete	▽Work for Unit 3 T/B complete		▽Work for Unit 1-3 R/B complete	
	Seawall	▽Installation of outer-rise tsunami seawall complete									▽Construction start of Tsushima Trench Tsunami Seawall	Japan Trench tsunami seawall ▽Completion of installation ▽on-site start	
	Mega float								▽Start of marine construction	Temporary grounding of mega float▽	▽Internal filling complete (reduction of tsunami risks)		


Chishima Trench Tsunami Seawall complete


Construction of Japan Trench Tsunami Seawall





2 Handling of ALPS treated water

In "The Inter-Ministerial Council for Contaminated Water, Treated water and Decommissioning" held on April 13, the basic policy on how to handle ALPS treated water was decided. 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.

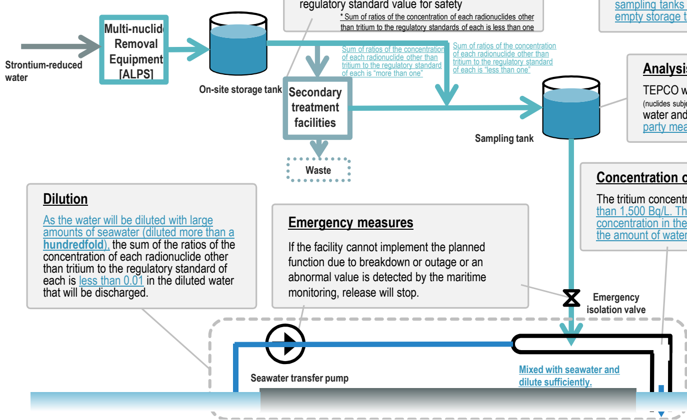
Examination concerning handling of ALPS treated water

- Tritiated Water Taskforce (2013.12 – 2016.5, 15 meetings)
- 2016.6 Report of Tritiated Water Taskforce
- 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
- Opportunity for receiving opinions from parties concerned concerning handling of ALPS treated water (2020.4 – 2020.10, 7 meetings)
- 2021.4.13 The basic policy on the handling of ALPS treated water was decided
- 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

2014 — 2015 — 2016 — 2017 — 2018 — 2019 — 2020 — 2021 — 2022


Tank area viewed from the Large Rest House (2015.10.29)

[Conceptual diagram of facilities for releasing ALPS treated water into the sea]



Secondary treatment
Secondary treatment will be conducted as necessary to ensure the level of radioactive materials, excluding tritium, is lower* than the regulatory standard value for safety
* Sum of ratios of the concentration of each radionuclides other than tritium to the regulatory standards of each is less than one

Dilution
As the water will be diluted with large amounts of seawater (diluted more than a **hundredfold**), the sum of the ratios of the concentration of each radionuclide other than tritium to the regulatory standard of each is less than 0.01 in the diluted water that will be discharged.

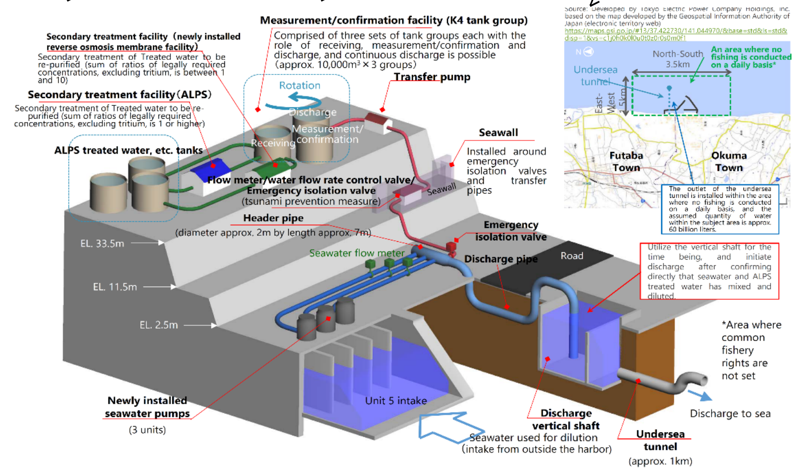
Emergency measures
If the facility cannot implement the planned function due to breakdown or outage or an abnormal value is detected by the maritime monitoring, release will stop.

Site use plan
To stably discharge ALPS treated water and construct facilities necessary for decommissioning, construction of sampling tanks and alternative tanks and dismantling of empty storage tanks and others will be examined.

Analysis of ALPS treated water
TEPCO will publish the concentration of tritium, 62 nuclides (nuclides subject to removal by ALPS) and carbon-14 in ALPS treated water and the results of assessments as well as the third-party measurement and assessment results.

Concentration of tritium inside discharged water
The tritium concentration of the discharged water will be less than 1,500 Bq/L. This will be assessed based on the tritium concentration in the ALPS treated water before discharge and the amount of water it was diluted by.

Amount discharged
In the near term, discharge amounts will be within the threshold of 22 trillion Bq/year which **was** the target discharge management value for Fukushima Daiichi before the accident. This amount will be reviewed as needed based on decommissioning progress made.



3 Removal of fuel from spent pool

Milestones of the Mid- and-Long-Term Roadmap (major target processes)
- Completion of Unit 1-6 fuel removal (within 2031)
- Completion of installation of Unit 1 large cover (around FY2023), start of Unit 1 fuel removal (FY2027-2028)
- Start of Unit 2 fuel removal (FY2024-2026)

Reference
December 23, 2021
Secretariat of the Team for Countermeasures for Decommissioning and Contaminated Water Treatment

Legend: Rubble removal, etc. → Installing a fuel removal machine → Fuel removal → Storage and handling of fuel

2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021

Unit 4

All fuel assemblies from Unit 4 had been removed by December 2014.

▼ 2011.11- 2012.7 Removal of rubble on the Reactor Building top floor
▼ 2012.4-2013.3 Ground improvement and foundation work
▼ 2013.4-2013.7 Installation of external walls and roof panels
▼ 2013.6-2013.10 Installation of overhead crane and fuel-handling machine
▼ 2013.8-2013.10 Removal of rubble inside the reactor well and pool
▼ 2013.11.18 Start of fuel removal
▼ 2014.12.22 Fuel removal was completed (1533 assemblies)


<Unit 4 Cover for fuel removal>

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 18, 2013, fuel removal from Unit 4, namely the first Unit, got underway and Phase 2 of the roadmap started.
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)
This marks the completion of fuel removal from the Unit 4 Reactor Building.

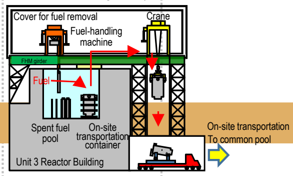

Fuel removal

Unit 3

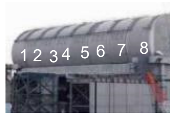
All fuel assemblies from Unit 3 had been removed by February 2021.

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.
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.

Overview of the fuel-handling facility inside the cover



▼ 2013.10 Completion of removal of large rubble on the Reactor Building top floor
▼ 2015.8 Completion of removal of the fuel-handling machine B within the spent fuel pool
▼ 2016.12 Completion of shielding on the Reactor Building top floor
▼ 2017.1 Installation start of a cover for fuel removal
▼ 2019.4.15 Start of fuel removal
▼ 2021.2.28 Fuel removal completed (566 assemblies)



<Unit 3 Cover for fuel removal (dome roof) 2019.2.21>

Unit 2

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.

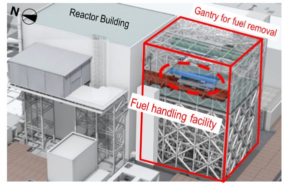
As part of efforts to remove fuel from the Unit 2 spent fuel pool and based on findings from internal operating floor investigations from November 2018 to February 2019, instead of fully dismantling the upper part of the building, the decision was made to install a small opening on the south side and use a boom crane. Examination continues to initiate fuel removal from FY2024 to FY2026.

<Reference> Progress to date
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.


<Unit 2 Construction of gantry for fuel removal>

▼ 2015.3-2016.11 Yard construction
▼ 2016.9-2017.4 West-side gantry installation work
▼ 2017.5 Opening a hole in the west-side external wall
▼ 2018.8-2020.12 Moving and containment of remaining objects
▼ 2020.6 Investigation inside the spent fuel pool
▼ 2021.10 Start of ground improvement work

Unit 2
Overview of fuel removal
(bird's-eye view)



Unit 1

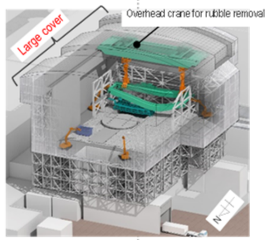
For Unit 1, a large cover will be installed over the whole building, within which rubble will be removed.

As part of efforts to remove fuel from the Unit 1 spent fuel pool, investigations are underway to ascertain the conditions of the fallen roof on the south side and the contamination of the well plug. Based on the results, "the method initially installing a large cover over the Reactor Building, then removing rubble within the cover" was selected to ensure safer and more secure removal. Work to install a large cover started from August 2021. Work to complete the installation of a large cover by around FY2023 is ongoing, with fuel removal scheduled to run from FY2027 to FY2028.

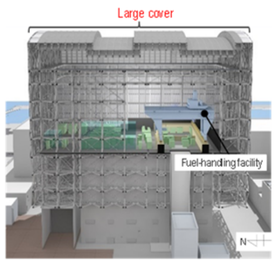
<Reference> Progress to date
Rubble removal on the north side of the operating floor started from January 2018 and has been implemented sequentially. In July and August 2019, the well plug, which was misaligned, was investigated, followed in August and September by the conditions of the overhead crane. 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.

▼ 2020.3-6 Installation of spent fuel pool cover
▼ 2020.9-11 Measures to prevent and alleviate rubble falling
▼ 2020.11-2021.6 Dismantling of remaining cover
▼ 2017.12 Completion of building cover dismantling and windbreak fence installation
▼ 2018.1-2020.12 Rubble removal on the north side of Reactor Building
▼ 2018.9-12 Removal of X-braces
▼ 2021.8 Start of large cover pre-work


<Unit 1 Dismantling of remaining cover>



Rubble removal (image)



Fuel removal (image)

2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021

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

4 Work toward fuel debris retrieval

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

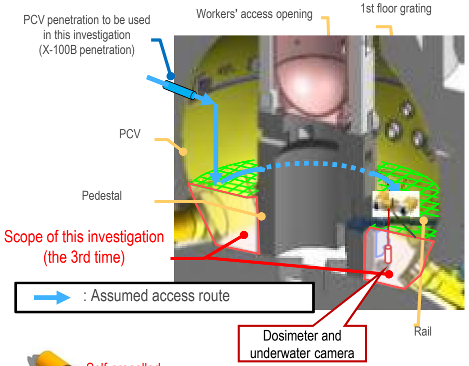
Start of fuel debris retrieval from the first unit (Unit 2). Expanding the scale in stages (within 2021 * The schedule will be extended for about 1 year due to the spread of COVID-19 infections)

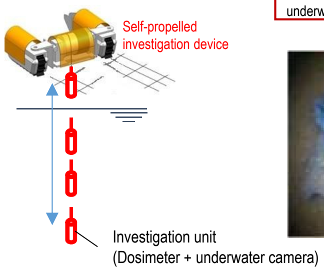
Before removing fuel debris, investigations inside the Primary Containment Vessel (PCV) are conducted to inspect the conditions there, including locations of fuel debris.

Unit 1 Investigation overview

・In April 2015, a device having entered the inside of the PCV via a narrow opening (bore:φ100 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.





<Image near the bottom>

<Image of investigation>

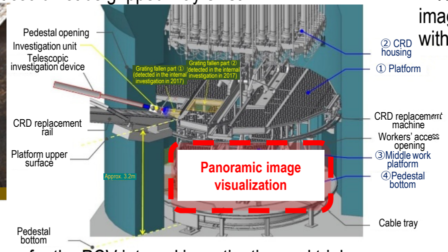
Unit 2 Investigation overview

・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.

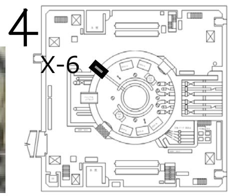
Bottom of the pedestal (after being processed in panoramic image visualization)



・In October 2020, as part of work to prepare for the PCV internal investigation and trial retrieval, a contact investigation to study deposits inside the penetration (X-6 penetration) was conducted, which involved inserting a guide pipe incorporating an investigative unit into the penetration. This confirmed that deposits inside the penetration had not deformed and come unstuck. The investigative information obtained will be utilized in the mockup test of the equipment to remove deposits inside the X-6 penetration.

<Conditions of deposits before and after contact>

<Work in front of the penetration>



<Unit 2 Reactor Building 1st floor Location of the penetration>

Unit 3 Investigation overview

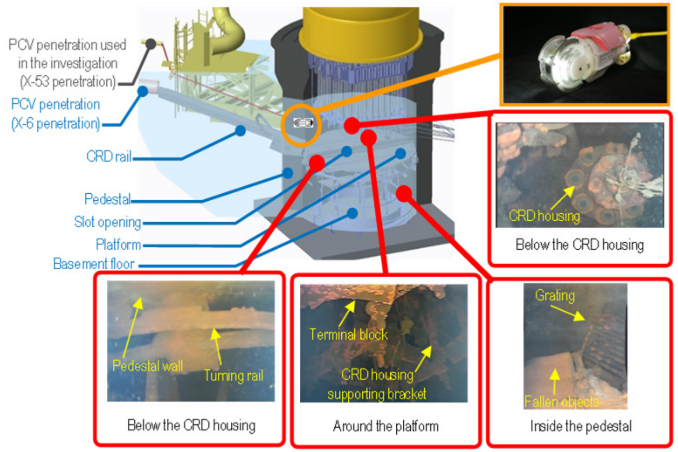
・In October 2014, the conditions of X-53 penetration, which may be under water and which is scheduled for use to investigate the inside of the PCV, was investigated via remote-controlled ultrasonic test equipment. The results showed that the penetration was not under water.

・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.

<Conditions inside the pedestal>



Unit 1 PCV internal investigation

Investigations inside the PCV	1st (2012.10)	- Acquiring images - Measuring the air temperature and dose rate - Measuring the water level and temperature - Sampling stagnant water - Installing permanent monitoring instrumentation
	2nd (2015.4)	Confirming the status of the PCV 1st floor - Acquiring images - Measuring the air temperature and dose rate - Replacing permanent monitoring instrumentation
	3rd (2017.3)	Confirming the status of the PCV 1st basement floor - Acquiring images - Measuring the dose rate - Sampling deposit - Replacing permanent monitoring instrumentation
Leakage points from PCV	- PCV vent pipe vacuum break line bellows (identified in 2014.5) - Sand cushion drain line (identified in 2013.11)	

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 PCV internal investigation

Investigations inside the PCV	1st (2012.1)	- Acquiring images - Measuring the air temperature
	2nd (2012.3)	- Confirming water surface - Measuring the water temperature - Measuring the dose rate
	3rd (2013.2 – 2014.6)	- Acquiring images - Sampling stagnant water - Measuring water level - Installing permanent monitoring instrumentation
	4th (2017.1-2)	- Acquiring images - Measuring the dose rate - Measuring the air temperature
	5th (2018.1)	- Acquiring images - Measuring the dose rate - Measuring the air temperature
	6th (2019.2)	- Acquiring images - Measuring the dose rate - Measuring the air temperature - Determining characteristics of a portion of deposit
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 PCV internal investigation

Investigations inside the PCV	1st (2015.10-12)	- Acquiring images - Measuring the air temperature and dose rate - Measuring the water level and temperature - Sampling stagnant water - Installing permanent monitoring instrumentation (2015.12)
	2nd (2017.7)	- Acquiring images - Installing permanent monitoring instrumentation (2017.8)
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)

Images are provided by the International Research Institute for Nuclear Decommissioning (IRID)

5 Management of solid radioactive waste

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)

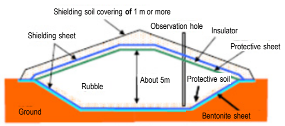
★ 2017.6 Revision ★ 2018.6 Revision ★ 2019.6 Revision ★ 2020.7 Revision ★ 2021.7 Revision

★ 2016.3 Announcement of Storage Management Plan of Solid Waste (Ver. 1)

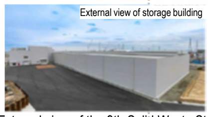
▼ 2012.9 Transfer start of rubble to the soil-covered temporary storage facility

▼ 2015.6 Transfer start of rubble to the soil-covered temporary storage facility (Tank 3)

▼ 2013.1 Start of volume reduction of trimmed trees and storage in temporary storage tank A



<Outline of soil-covered temporary storage facility>



External view of the 9th Solid Waste Storage

▼ 2014.7 Start of pre-work
9th Solid Waste Storage
▼ 2018.2 Operation start


Whole view of the soil-covered temporary storage facility Tank 3

▼ 2019.6 Start of building construction
1st Large Waste Storage

1st Large Waste Storage Roof construction (from the inside)

2021.3 High alert issued from the Shallow Draft Quay drainage channel PS monitor▼ (leakage from temporary storage Area W)

▼ 2021.7 Leakage of radioactive materials from a notch tank stored in temporary storage Area P

2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022

▼ 2013.5 Installation work gets underway
Solid Waste Incinerator
▼ 2016.3 Operation start
▲2016.8-11 Manual stop (due to pin-hole incidence)

▼ 2017.4 Start of pre-work
Additional Solid Waste Incinerator

2017.10 Installation work gets
▼ 2018.5 Operation start
Large Equipment Decontamination Facility


External view of Large Equipment Decontamination Facility

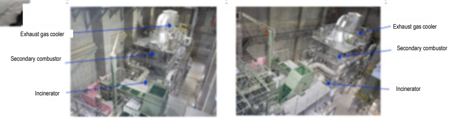
▼ 2020.9 Start of pre-work
Compaction Facility

Site of Volume Reduction Facility


Whole view of Solid Waste Incinerator


Electrical room


Control room



Whole view of Solid Waste Incinerator (Left: System A; right: System B)

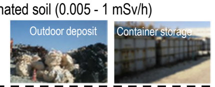
Present status Note

Storage of rubble and others

Present storage Approx.480,000 m³ (as of 2021.3)

Rubble (combustible), trimmed trees, used protective clothing)

Contaminated soil (0.005 - 1 mSv/h)



Rubble (metal, concrete, others)

More than 1 mSv/h

0.005-1 mSv/h

Less than 0.005mSv

Storage of water treatment secondary waste

Note: Used protective clothing before incineration and BG-level concrete waste for which treatment and reuse is decided at present are not included.

Estimate for the next decade (or so) Approx.**790,000** m³ (*2)

- Approx. 290,000 m³ → To (A) (*1)
- Approx. 60,000 m³
- Approx. 60,000 m³
- Approx. 170,000 m³ → To (A) (*1)
- Approx. 220,000 m³
- Approx. 6,500 tanks

Status after a decade

Legend [red box]: Newly installed equipment and facility

Incineration

Incinerator Pre-treatment Facility (scheduled for completion in FY2025)


Crusher example

Radioactive Waste Incinerator

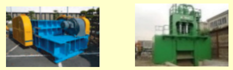
Additional Radioactive Waste Incinerator (scheduled for completion in FY2021)
2021.3 The installation process was reviewed
Toward an operation launch within FY2021, installation work continues


Work of main part

Stored and managed in Solid Waste Storage as done for rubble

Volume reduction

Compaction Facility (scheduled for completion in FY2022)


Concrete crusher example　Metal cutter example

Melting

Melting equipment


Electric furnace example

To (B)

Treatment measures and others will be examined

(*3) Approx. **270,000** m³ (*2)

- Approx. 20,000 m³
- Approx. 60,000 m³
- (*1) (A) Approx. 60,000 m³
- (B) Approx. 60,000 m³
- Approx. 70,000 m³
- (*1)

Storage /management

Solid Waste Storage (Storage capacity: approx. 260,000 m³)

Existing Solid Waste Storage 1st-8th (existing) 9th (Operation launch in 2018.2)

Additional Solid Waste Storage 10th-11th (Scheduled for completion after FY2022)

Based on the estimates for the amount of waste to be generated, the storage capacity (approx. 260,000 m³) will be reached in around 2032. Scope to install an additional solid waste facility and others will be examined

Reuse will be examined

Spent Adsorption Vessel Temporary Storage

Large Waste Storage (scheduled for completion in FY2022) Toward an operation launch within FY2022, installation work is underway


Work of main part

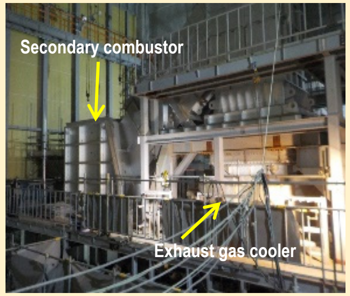
(*1) Items for which incineration, compaction, melting or reuse is difficult are stored directly in Solid Waste Storage without being treated
(*2) As values less than 10,000 m³ are rounded, they may not be consistent with the total of breakdown
(*3) In the estimate, approx. 250,000 m³ of waste will be stored in Solid Waste Storage at the end of FY2028.

- 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.

●Efforts to eliminate temporary outdoor storage of rubble and others

To incinerate trimmed trees and combustible rubble (woods, packing materials, paper and others), work to install the Additional Solid Waste Facility is underway.


Whole view of the Additional Solid Waste Incinerator Building



Main equipment

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.

External view of Access Control Facility

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.

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 workplaces in real time.

In February 2017, operation started at the Partner Companies' Building next to the New Administration Office Building.

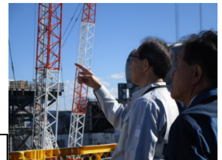
In May 2017, a heliport for emergency transport was installed inside the Fukushima Daiichi NPS and went into operation.
Compared to the previous operation (at Koriyama Coast, Futaba Town or Fukushima Daini NPS, relaying to a doctor helicopter), a faster response is available for seriously ill patients requiring treatment at external medical institutions.

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.

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.

In March 2015, the Fukushima revitalization meal service center opened.

From November 2018, from the west-side high-ground area, where Unit 1-4 can be viewed, visitors can see the site in their normal clothes without having to change.



Visit by Governor of Fukushima Prefecture to the Fukushima Daiichi NPS (2018.11.1)

Visit by Prime Minister Kishida to the Fukushima Daiichi NPS (2021.10.17)

2011 — 2012 — 2013 — 2014 — 2015 — 2016 — 2017 — 2018 — 2019 — 2020 — 2021 — 2022

Changes in operation of controlled area

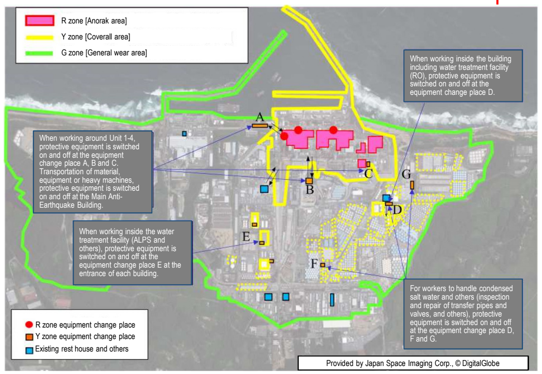
From May 2013, full-face mask unnecessary area was expanded sequentially.

In May 2015, full-face mask unnecessary area was expanded to cover about 90% of the site.

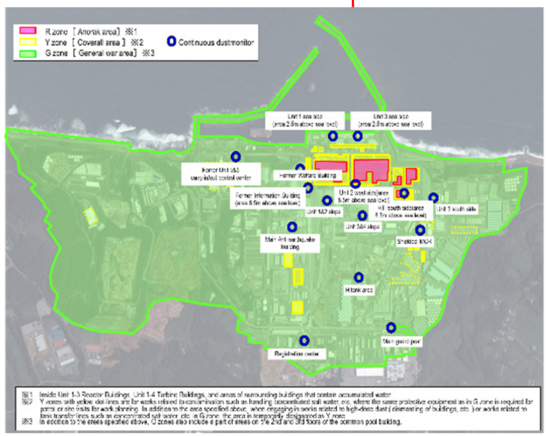
In March 2017, the G-zone area was expanded (to cover 95% of the whole site).

In August 2021, operation started while eliminating the need for the DS2 mask during light work in G-zone outside the protection area around Unit 1-4 (except for inside Units 5 and 6).

In May 2013, areas excluding those around Unit 1-4, tank areas and rubble storage areas were set to full-face mask unnecessary areas.



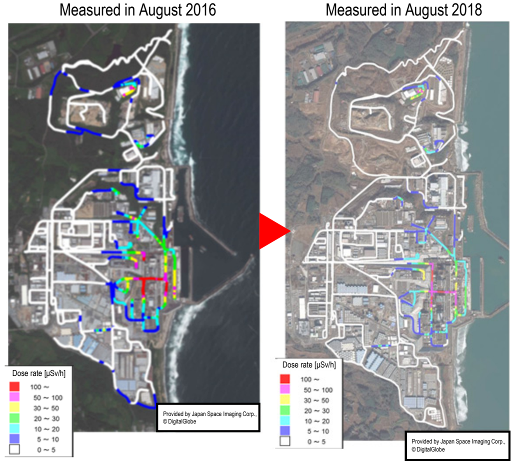
In March 2016, based on the progress of measures to reduce the environmental dosage on site, the site was categorized into two zones: Highly contaminated area around Unit 1-4 buildings, etc. and other areas where limited operation started to optimize protective equipment according to each category.



In May 2018, within about 96% of the site, workers are allowed to wear light equipment such as general workwear and disposable dust-protective masks.

<Travel survey results of major roads within the site>
The dose rate has been declining every year.

Measured in August 2016 / Measured in August 2018



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