Events and highlights on the progress related to recovery operations at TEPCO's Fukushima Daiichi Nuclear Power Station

December 2024
The Government of Japan

Section 1: Summary of updates from April through June 2024

1.1: Decommissioning and Contaminated Water management

Since the last report, there has been progress on the decommissioning and contaminated water management at TEPCO's Fukushima Daiichi Nuclear Power Station (hereinafter "Fukushima Daiichi NPS") as detailed below. For specifics, please refer to section 2.

1. Regarding the discharging of the ALPS treated water into the sea, three discharges were carried out from April to June 2024. (For further details please refer to Page 10)
   Refer to the following URL
   https://www.tepco.co.jp/en/hd/decommission/information/newsrelease/reference/pdf/2024/reference_20240419_01-e.pdf
   https://www.tepco.co.jp/en/hd/decommission/information/newsrelease/reference/pdf/2024/reference_20240517_01-e.pdf
   https://www.tepco.co.jp/en/hd/decommission/information/newsrelease/reference/pdf/2024/reference_20240628_01-e.pdf

2. The IAEA review of Safety Related Aspects of Handling of ALPS Treated Water at Fukushima Daiichi NPS, second review since the start of the discharge, was carried out from April 23 to 26, 2024. (For further details please refer to Page 10 to 11)
   Refer to the following URL
   https://www.meti.go.jp/english/press/2024/0426_001.html
   https://www.mofa.go.jp/press/release/pressite_000001_00304.html

3. On April 11, TEPCO announced that as a result of the internal inspection of tanks used to store ALPS treated water, localized corrosion and flaking paint was found in three tanks. (For further details please refer to Page 10)
   Refer to the following URL
   https://www.tepco.co.jp/en/hd/decommission/information/newsrelease/reference/pdf/2024/reference_20240411_01-e.pdf

4. On April 24, a loss of electric power occurred at a part of the electric power distribution system at Fukushima Daiichi NPS. (For further details please refer to Page 11)
   Refer to the following URL
   https://www.meti.go.jp/english/press/2024/0424_002.html
   https://www.tepco.co.jp/en/hd/decommission/information/newsrelease/reference/pdf/2024/reference_20240424_01-e.pdf
   https://www.tepco.co.jp/en/hd/decommission/information/newsrelease/reference/pdf/2024/reference_20240425_03-e.pdf

5. At Unit 1 Reactor Building, removal of overflowing rubble from the south side external wall was completed on April 25. (For further details please refer to Page 12).
   Refer to the following URL

https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/mp202405.pdf

6. On Unit 2, connection of the connection structure and pipes to the penetration (X-6) was completed on June 26. (For further details please refer to Page 13).
   Refer to the following URL
   https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/mp202406.pdf

7. TEPCO's monitoring results are available at its website. (For further details please refer to Page 18).

1.2: Sea area Monitoring results

Measurement results of tritium concentrations in sea water sampled since the commencement of the first discharge on August 24, 2023, were all below indices (discharge suspension level and investigation level). For further details please refer to the section 3.

1.3: Off-site Environmental Remediation

The Ministry of the Environment (MOE) completed the full-scale decontamination in the Special Decontamination Area (SDA) by the end of March 2017 as planned, and decontamination mainly conducted by the municipalities in the Intensive Contamination Survey Area (ICSA) was also completed in March 2018. This means that the full-scale decontamination based on the Act on Special Measures was completed, excluding the "Restricted Area". For further details please refer to the section 4.

1.4: Food products

Japan has a robust control system which prevents the distribution of food exceeding the Japanese maximum levels (JMLs), conservatively set on the safe side. Monitoring and inspections of radionuclides in food are continuously being conducted, and restrictions on food distribution and the removal of these restrictions are taken based on monitoring results. Restriction on meats was lifted during the period April to June 2024.

Monitoring data for the major food products marketed in FY2023 in Japan show that all are below the JMLs. According to the Total Diet Study for Japanese food, the effective dose in CY 2023 is estimated as far below 1 mSv/year (0.0005-0.0010 mSv/year). These results confirm the safety of Japanese food.

For further details please refer to the section 5.

1.5: Radiation protection of worker

The Ministry of Health, Labour and Welfare (MHLW) has provided guidance on the prevention of radiation hazards to workers engaged in the decommissioning work at Fukushima Daiichi NPS or decontamination and related work; additionally, the Ministry has taken relevant and necessary measures such as the provision of long-term healthcare for emergency workers. For further details please refer to the section 6.

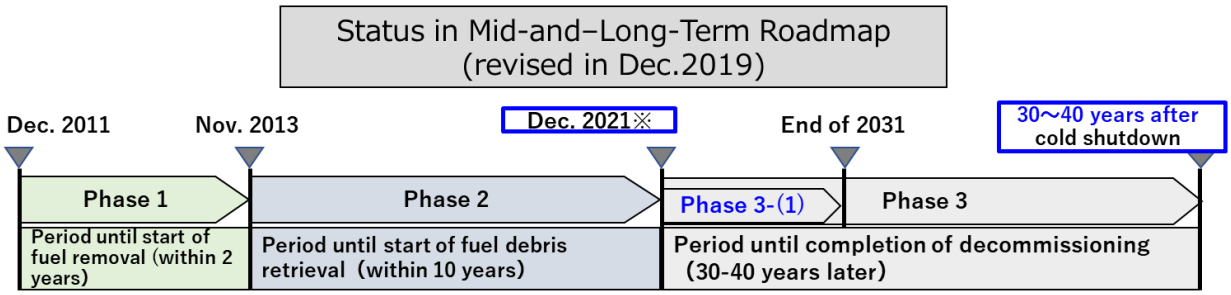
Section 2: Decommissioning, contaminated water and treated water management at Fukushima Daiichi NPS

2.1: Mid-and-Long-Term Roadmap

Decommissioning work at Fukushima Daiichi NPS has been conducted by the following milestones described in the "Mid-and-Long-Term Roadmap" with safety as the priority.

The entire decommission process will take 30 to 40 years, and the decommissioning is an unprecedented work with technical challenges. Therefore, the Government of Japan and TEPCO have prioritized each task and set the goal to achieve them.

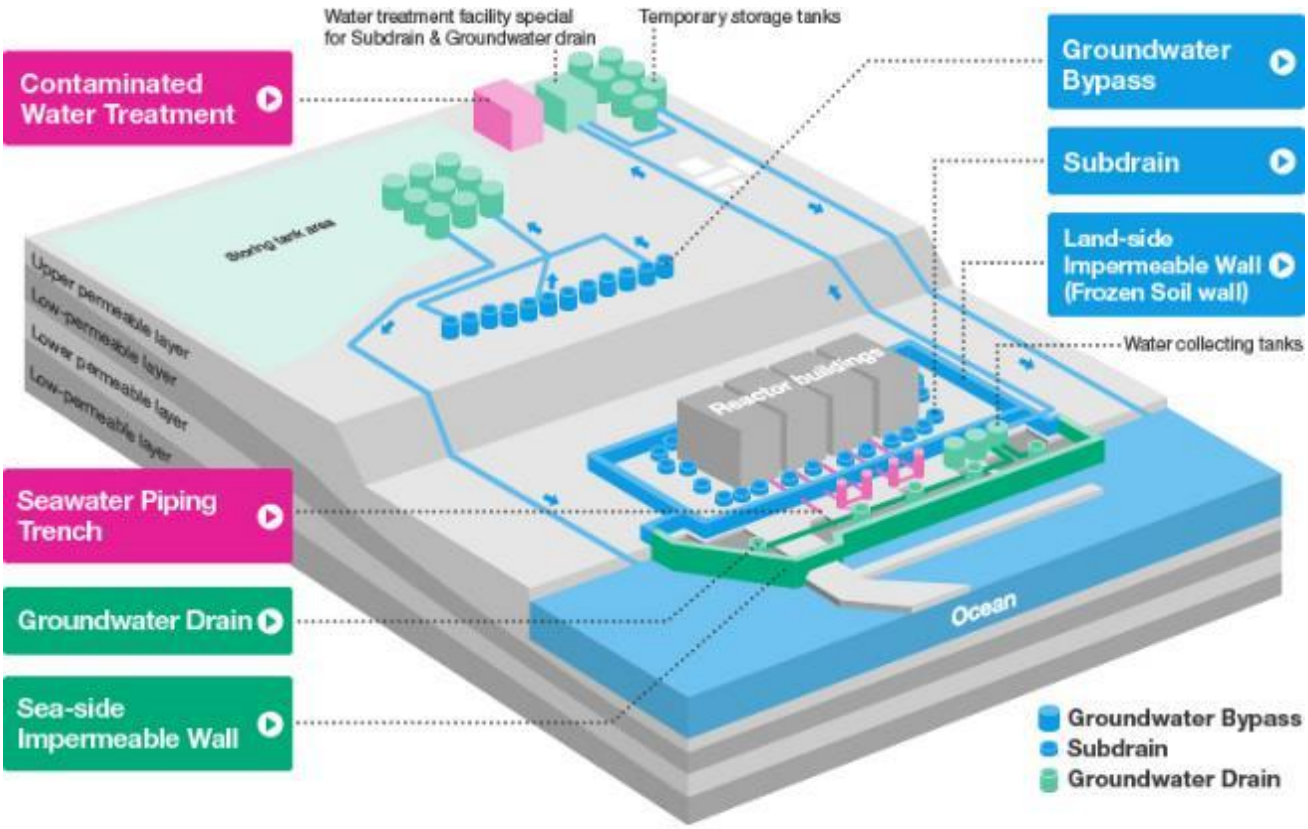
Mid-and-Long-Term Roadmap towards the Decommissioning of Fukushima Daiichi NPS (revised on December 27, 2019)
<Outline of the Mid-and-Long-Term Roadmap>
https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/20191227_1.pdf
<The Mid-and-Long-Term Roadmap>
https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/20191227_3.pdf



2.2: Water management

1. Major initiatives for water management

The preventive and multi-layered measures against contaminated water issue are implemented based on the three principles; “Redirecting ground water from contamination source” and “Preventing leakage of contaminated water” and “Removing contamination sources”.



Source: TEPCO

(1) Groundwater bypass

(a) Objective

The groundwater bypass aims to intercept clean groundwater as it flows downhill toward the sea, and reroute it safely around the facility.

(b) Mechanism

Clean groundwater is pumped from the wells installed on the mountain-side area of the reactor buildings and then discharged into the port area after confirming that water quality met the operational targets.

(c) Recent situations

Up until June 30, 2024, 528 releases were conducted. The pumped-up groundwater was temporarily stored in tanks and released after TEPCO and a third-party organization had confirmed that the quality met the operational targets. The pumps are inspected and cleaned as necessary to operate appropriately.

The result of sea area monitoring shows that the radiation level of seawater outside the port area remains low enough compared to the density limit specified by the Reactor Regulation and WHO guidelines for drinking water quality, in addition significant change in the radioactivity has not been observed.

TEPCO's website related to groundwater bypass:
http://www.tepco.co.jp/en/decommision/planaction/groundwater/index-e.html

Detailed analysis results regarding the water quality of the groundwater being pumped out for by-passing at Fukushima Daiichi NPS (published by Ministry of Economy, Trade and Industry (METI))
https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/sd202406.pdf
(June 2024)
https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/sd202405.pdf
(May2024)
https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/sd202404.pdf
(April 2024)

(2) Sub-drain and groundwater drain systems

(a) Objective

The sub-drain system aims to prevent clean groundwater from being contaminated by pumping it and reducing its inflow into the reactor buildings, and thus it is reducing the generation of contaminated water.

The groundwater drain system aims to prevent leakage of groundwater that contains slight radioactivity by pumping it before flowing into the port.

(b) Mechanism

Groundwater that contains slight radioactivity is pumped from the wells installed in the vicinity of the reactor buildings (called sub-drain) and the wells installed in the bank protection area (called groundwater drain) and then the groundwater treated through special purification equipment to meet the stringent operational targets set by TEPCO. The purified groundwater is discharged into the port area after passing water quality inspections.

(c) Recent situations

The operation of the sub-drain and groundwater drain systems started in September 2015. The effects of the sub-drain system are measured by two markers: the water level of the sub-drain, and the difference between the water level of the sub-drain and that of the reactor buildings.

Up until June 30, 2024, 2,483 releases were conducted after TEPCO and a third-party organization confirmed that the quality met the operational targets. The result of sea area monitoring confirms that the radiation level of seawater outside the port area remains low enough compared to the density limit specified by the Reactor Regulation, and no significant change in the radioactivity level has been observed.

TEPCO's website related to the sub-drain and groundwater drain systems:
http://www.tepco.co.jp/en/decommision/planaction/sub-drain/index-e.html

Detailed analysis results regarding the water quality of the groundwater pumped up by sub-drain and purified at Fukushima Daiichi NPS (published by METI)
https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/sd202406.pdf
(June 2024)
https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/sd202405.pdf
(May2024)
https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/sd202404.pdf
(April 2024)

(3) Land-side impermeable wall (Frozen soil wall)

(a) Objective

The installation of the land-side impermeable wall aims to prevent clean groundwater from being contaminated. This will be achieved by surrounding the reactor buildings with an in-ground frozen barrier and blocking groundwater from flowing into the buildings.

(b) Mechanism

An approximately 1,500 meters long wall, composed of frozen pipes driven into the ground, surrounds the Unit 1-4 reactor buildings. The barrier will be formed around the buildings to block groundwater inflow by supplying chilled brine (a freezing material) through the pipes and freezing the soil.

(c) Recent situations

After the installation work was completed, freezing began in March 2016, and construction of the land-side impermeable walls was completed in September 2018. At the 21st Committee on Countermeasures for Contaminated Water Treatment, held on March 7, 2018, which evaluated that "a water-level management system, which keeps groundwater isolation from the buildings, had been established and it had allowed a significant reduction in the amount of contaminated water generated".

The groundwater level in the inner area of the land-side impermeable walls has been decreasing year by year, and the difference between the inner and outer water levels is maintained on the mountain side, although there are some fluctuations due to rainfall. The water level in the groundwater drain observation well is well below the ground surface.

TEPCO's website related to the land-side impermeable wall:
http://www.tepco.co.jp/en/decommision/planaction/landwardwall/index-e.html

(4) Sea-side impermeable wall

(a) Objective

The installation of the sea-side impermeable wall aims to prevent the leakage of contaminated water into the ocean. This was achieved by installing a wall to block groundwater from flowing into the port area, and thus protecting the marine environment against pollution.

(b) Mechanism

A wall, approximately 780 meters long and composed of 594 steel pipes with a diameter of 1.1 meters and a length of 30 meters, were installed around the bank protection area near the reactor buildings. The groundwater flowing from the site is blocked by the wall and pumped by the sub-drain and the groundwater drain systems. Consequently, the wall prevents groundwater from flowing into the port area and also reduces the risk of contaminated water flowing into the ocean in case of any leakage.

(c) Situations

In October 2015, the sea-side impermeable wall construction was completed. It has been confirmed that the radiation level of seawater inside the port area substantially decreased. In addition to the operation of the sub-drain and the groundwater drain systems, the completion of the wall marks major progress in water management at Fukushima Daiichi NPS.

TEPCO's website related to the sea-side impermeable wall:
http://www.tepco.co.jp/en/decommision/planaction/seasidewall/index-e.html

(5) Completion of waterproofing and closure work of seawater piping trench

Highly concentrated contaminated water was generated because of the accident and it became stagnant inside the seawater piping trench of Unit 2, 3 and 4. In order to prevent the risk of the contaminated water leaking into the ocean, the stagnant water was removed and the seawater piping trench was waterproofed.

The work at Unit 2 was completed in 2017, following the work at Unit 3 and 4, which was completed in 2015. No stagnant water inside the seawater piping trench is in each unit.

(6) Progress of stagnant water removal and treatment in buildings

To reduce the stagnant water levels in buildings as planned, work to install additional stagnant water transfer equipment is underway. 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. While assessing the dust impact, measures to reduce the stagnant water level were implemented. In March 2023, the target water level in each building was achieved. For the Units 1-3 Reactor Buildings, "reducing stagnant water in the Reactor Buildings to about half the amount at the end of 2020 during the period FY2022-2024" was achieved.

For zeolite sandbags on the basement floors of the Process Main Building and High-Temperature Incinerator Building, will be implemented measures to reduce the radiation dose such as recovery by ROV with stabilization in mind.

To reduce the risk of stagnant water in the basement buildings, water levels in the Unit 1-4 buildings are being lowered sequentially. The connecting part between Unit 1 and 2 was separated on September 13, 2018. And separation of the connecting part between Unit 3 and 4 was completed in December 2017.

Towards the floor-surface exposure of basement of the buildings, excluding the Unit 1-3 Reactor Buildings, Process Main Building and the High Temperature Incinerator Building within 2020, which is a milestone (main target process) of the Mid-and-Long-Term Roadmap, levels of contaminated water in buildings were reduced. On December 24, 2020, the achievement of the milestone was confirmed. To achieve another milestone set for FY2022-2024 to reduce the amount of stagnant water in the reactor buildings to about half of the amount at the end of 2020, ongoing efforts to manage contaminated water will be continued.

(7) Control of the generation of contaminated water

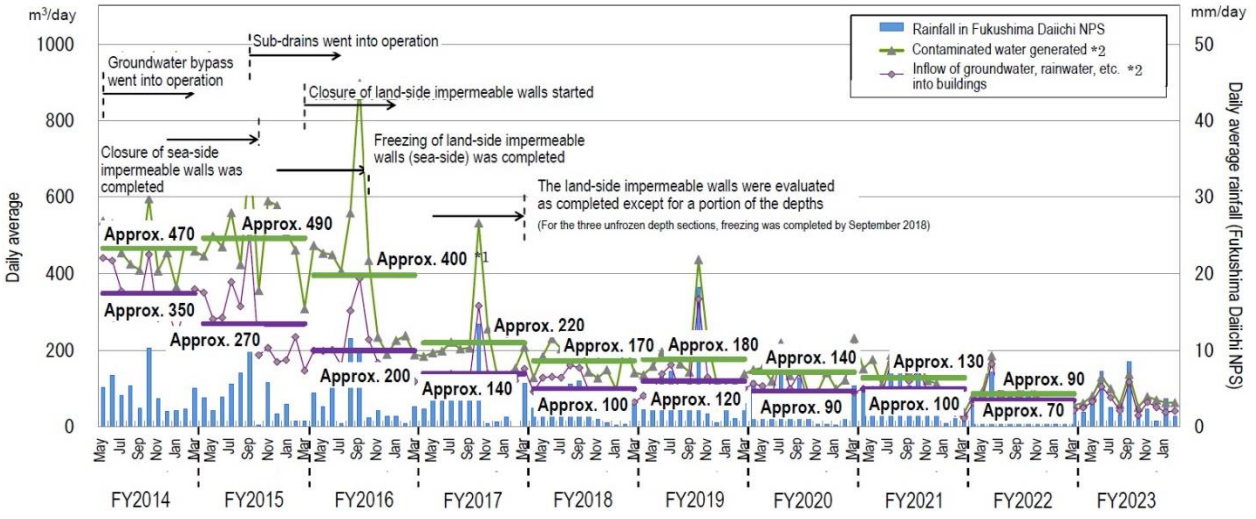
Multi-layered measures, including pumping up by sub-drains and land-side impermeable walls, which were implemented to control the continued generation of contaminated water, reduced the groundwater inflow into buildings.

Following the steady implementation of measures (groundwater bypass, sub-drains, land-side impermeable walls, etc.), the inflow of the groundwater and rainwater into buildings reduced from approx. 350 m^3/day (in FY2014) to approx. 60 m^3/day (in FY2023), though it depends on rainfall.

In FY2023, as well as the effects of existing multi-layered measures, facing and other measures further progressed. In conjunction with low rainfall, the average contaminated water generated suppress approx. 80m3/day (but rainfall of FY2023 was less than normal years), and even when being evaluated with rainfall of normal years, approx. 90m^3/day, which was evaluated that the milestone prescribed in the Mid-and-Long-Term Roadmap “suppressing the amount of contaminated water generated to less than 100m^3/day during average rainfall within FY 2025” was achieved ahead of schedule.

TEPCO presented the outlook that suppress contaminated water generated to 50-70m^3/day or lower would be achieved by 2028, by measures including facing of the Units 1-4 buildings, the Unit1 Reactor Building cover and water stoppage of gaps between buildings will proceed.

Measures will continue to further reduce the volume 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.

2. Purification treatment of contaminated water and management of treated water

(1) Objective

The purification treatment of contaminated water aims to remove sources of contamination.

(2) Mechanism

Contaminated water that accumulated at the site of Fukushima Daiichi NPS is treated at multiple facilities including Multi-nuclide Removal Facility (Advanced Liquid Processing System = ALPS). In this process, after the concentration of cesium and strontium in the contaminated water is reduced, ALPS removes most of the radioactive materials except tritium and radioactive materials are reduced to about one millionth, compared to the water before purification.

(3) Recent situations

As of August 24, 2023, the volumes treated by existing, additional and high-performance multi-nuclide removal equipment were approx. 508,000, 756,000 and 104,000 m^3, respectively.

TEPCO's website related to purification treatment of contaminated water:
https://www.tepco.co.jp/en/decommission/progress/watertreatment/index-e.html

ALPS treated water, which is treated to remove most of the radioactive materials except tritium, is stored in tanks located on the hill at the site. The total amount of the ALPS treated water is approx. 1.30 million tons as of June 20, 2024. Regarding the total amount of tritium stored in the tanks, TEPCO estimated it was to be about 780 trillion Bq as of March 2023.

TEPCO conducted a secondary treatment test and analysis of some of the tanks of treated water in December, 2020. As a result, it was confirmed that all radionuclides other than tritium met the regulatory standards. In addition, third-party analysis of the tanks with high concentrations was also conducted after secondary treatment. The results were the same as those confirmed by TEPCO, confirming that the tanks meet the regulatory standards.

Fukushima Daiichi Nuclear Power Station Results from secondary treatment performance confirmation tests on water treated with multi-nuclide removal equipment (final report)
https://www.tepco.co.jp/en/decommission/progress/watertreatment/images/201224.pdf

(4) Management of treated water

<Background>

For more than six years, the handling of the water has been studied by Tritiated water Task Force and ALPS subcommittee. The subcommittee report was published in February 2020. After publication of this report, hundreds of meetings were held with local municipalities and relevant people in agricultural, forestry and fishery industries and various other parties concerned. Seven "meeting for hearing opinions" were held, with the attendance of vice ministers of related ministries. In addition, more than 4,000 opinions have been received through public comment.

The GOJ selects discharge into the sea, based on achieving certain and consistent compliance with their regulatory standards set forth based on the recommendation of the ICRP and considering the successful precedence in Japan, as well as in conducting secure and sound monitoring.

The discharge of the ALPS treated water into the sea is conducted after i) purification/re-purification to meet regulatory standards set based on international standards with an exception of tritium and ii) to allay the concerns of the consumers, the target concentration of tritium should be the same as the operational target (less than 1,500 Bq/L, that is less than 1/40 of the regulatory standard value for tritium) by sufficient dilution (more than 100 times) by sea water, prior to the discharge into the sea, and iii) The total annual amount of tritium to be discharged will be at a level below the operational target value for tritium discharge of the Fukushima Daiichi NPS before the accident (22 trillion Bq/year).

By taking such measures, the safety of the public, environment, agricultural, forestry and fishery products and others in the surrounding areas will be ensured as it has always been. In addition, the Government and TEPCO have strengthen and enhanced monitoring before and after the discharge by activities including newly introduced monitoring of tritium at fishing ground, swimming beaches and other areas. And all measures will be taken so as to gain national and international understanding regarding the discharge.

Since no technology for separating tritium has yet been found as being immediately practical use at the Fukushima Daiichi NPS. However, new technological trends will be carefully and continuously monitored, and if a viable technology emerges, it will be implemented as rapidly as practicable.

Basic Policy on handling of ALPS treated water at the Tokyo Electric Power Company Holdings' Fukushima Daiichi Nuclear Power Station:
https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/bp_alps.pdf

International Atomic Energy Agency (IAEA) safety review has concluded that Japan's plans to release treated water stored at the Fukushima Daiichi nuclear power station into the sea are consistent with IAEA Safety Standards. Over the past two years the IAEA has conducted a detailed review of the safety related aspects of handling and discharge of ALPS treated

water and issued its comprehensive report on July 4, 2023. The report concluded that the approach and activities for this discharge are consistent with relevant international safety standards and would have a negligible radiological impact on people and the environment. In the summary, the IAEA also stated that IAEA is committed to engage with Japan on the release of ALPS-treated water before, during and after release and that further reviews and monitoring provide additional transparency and reassurance to the international community.
Refer to the following URL
https://www.iaea.org/newscenter/pressreleases/iaea-finds-japans-plans-to-release-treated-water-into-the-sea-at-fukushima-consistent-with-international-safety-standards

TEPCO started discharging ALPS treated water stored at the Fukushima Daiichi NPS into the sea from August 24, 2023. The IAEA has been present on site and states that the IAEA will have a presence on site for as long as the treated water is released, in line with Director General Grossi's commitment for the IAEA to engage with Japan on the discharge of ALPS treated water before, during, and after the treated water discharges occur.
Refer to the following URL
https://www.iaea.org/newscenter/pressreleases/iaea-director-general-statement-on-discharge-of-fukushima-daiichi-alps-treated-water-0

Regarding the discharging of the ALPS treated water into the sea, seven discharges were carried out from August 2023 to June 2024. With the completion of the fourth discharge of the ALPS treated water, TEPCO has completed the discharges for FY 2023 as planned. The IAEA's independent on-site analysis confirmed that the tritium concentration is far below the operational limit of 1,500 becquerels per litre for all four batches.
Refer to the following URL
https://www.tepco.co.jp/en/decommission/progress/watertreatment/performance_of_discharges/index-e.html

On April 11, 2024, TEPCO announced that as a result of the internal inspection of tanks used to store ALPS treated water, localized corrosion and flaking paint was found in three tanks. The discovered corrosion was localized and was most likely caused by water (ALPS treated water) that seeped in between the flaking paint and the tank base metal. The corrosion was not of a nature that would impact the structural integrity of the tank, and there was no risk of leakage when storing ALPS treated water. The aforementioned locations would be repaired prior to using the tanks again to store ALPS treated water.
Refer to the following URL
https://www.tepco.co.jp/en/hd/decommission/information/newsrelease/reference/pdf/2024/reference_20240411_01-e.pdf

From April 23 to 26, 2024, six IAEA officials including Mr. Gustavo Caruso, Director and Coordinator, Department of Nuclear Safety and Security and nine international experts (from Argentina, Australia, China, France, Republic of Korea, Russia, United Kingdom, United States, and Vietnam), visited Japan for the review mission regarding the safety of the discharge of ALPS treated water from TEPCO's FDNPS into the sea. This is the second review mission after the start of the discharge into the sea. During the review mission, IAEA officials and international experts discussed technical details regarding the safety of discharges of ALPS treated water into the sea based on the IAEA international safety standards. The overview of the meetings and the site visit to TEPCO's FDNPS is as follows. The Government of Japan and TEPCO explained the updates on the status of the ALPS

treated water discharge on FY 2023 and the discharge plan for FY 2024, as well as the effort consistent with the international safety standards after the start of the discharge, and both sides discussed. On April 24, the Task Force visited the TEPCO's FDNPS to review the status of the discharge facilities.
Refer to the following URL
https://www.meti.go.jp/english/press/2024/0426_001.html
https://www.mofa.go.jp/press/release/pressite_000001_00304.html

At around 10:43 am on April 24, 2024, a loss of electric power occurred at a part of the electric power distribution system at FDNPS. The safety function of the FDNPS was ensured as the cooling function of the reactor building was being maintained by the uninterrupted power supply. The electric power was restored around 16:03. There were no significant changes in monitoring posts etc. In the event of a power loss, the ALPS treated water discharge facility was stopped as it is designed. The discharge was stopped without any safety problems as the emergency shutdown valve was automatically closed upon sensing the out of operation of the relevant equipment due to the electricity loss. The discharge was resumed at 17:16. METI instructed TEPCO to take all possible measures to ensure safety of decommissioning work, including the safety of workers, as well as to carefully disseminate information.
Refer to the following URL
https://www.meti.go.jp/english/press/2024/0424_002.html
https://www.tepco.co.jp/en/hd/decommission/information/newsrelease/reference/pdf/2024/reference_20240424_01-e.pdf
https://www.tepco.co.jp/en/hd/decommission/information/newsrelease/reference/pdf/2024/reference_20240425_03-e.pdf

2.3: Decommissioning

1. Fuel removal and fuel debris retrieval from the reactor buildings

(1) Basic information

At the time of the accident in March 2011, the nuclear power station operator of Unit 1, 2 and 3 were unable to maintain the cooling of the reactor cores due to power loss. This resulted in the generation of a huge amount of hydrogen gas from the melted fuel. The pressure in the containment buildings continued to increase from the accumulation of hydrogen which eventually caused hydrogen explosions in Units 1, 3 and 4, resulting in structural damage. However, since November 2011, the nuclear power station operator has been maintaining these units in a stable condition with no significant release of radioactive material to the environment.

The most important tasks in the decommissioning process are the fuel removal from the spent fuel pools and the retrieval of fuel debris (melted and solidified fuel) from the Primary Containment Vessels (PCV). Currently, various measures are being implemented in order to make progress towards these goals, including removal of rubble accumulated in the buildings and investigation of the condition inside the PCV through the use of state-of-the-art technologies.

(2) Unit 1

Toward investigating the inside the PCV of Unit 1, creation of the three holes in the inner door was completed in April 2020. The remotely operated underwater robot (that is called "ROV-A", "ROV-A2", "ROV-C") was inserted to insert the detailed visual investigation of the pedestal, and measure the deposit thickness from February to June 2022.

In June 2021, TEPCO started to install the large cover to cover the entire reactor building as a countermeasure against dust scattering.

From December 2022 to March 2023, the remotely operated underwater robot (that is called "ROV-D","ROV-E", "ROV-B", "ROV-A2") was inserted to detect deposit debris (gamma-ray nuclide analysis), take a sample of the deposit, investigate for creating a deposit 3D-mapping, and conduct an investigation inside the pedestal in which exposure of a portion of bar arrangement was confirmed at the foundation inside the pedestal.

From February to March 2024, an aerial survey inside PCV by a small drone was conducted to inspect the inner wall and structures inside the pedestal, the status of the fallen Control Rod Drive (CRD) housing and others.

Reactor Building, removal of overflowing rubble from the south side external wall was completed on April 25, 2024. No significant variation was confirmed in the dust concentration during removal work. Except for the south side and a portion of the west side neighboring the south side, installation of the lower structure was completed. At present, anchor drilling is underway and base plates are being installed sequentially.

Nuclear Information Corner
https://www.tepco.co.jp/electricity/mechanism_and_facilities/power_generation/nuclear_power/info-j.html

(3) Unit 2

As for Unit 2, to help facilitate the fuel removal from the spent fuel pool, currently, TEPCO is proceeding with preparation work. For example, shielding has been installed on the top floor (operating floor) of the Reactor Building since November 2023, concrete placement was completed in March 2024 and the installation of partition shielding in April 2024, and the entire work to install shielding was completed.

Regarding retrieval of fuel debris, in the trial retrieval plan, a robot arm will be used to access the PCV, obstacles inside the PCV will be removed by the cutting equipment and powder fuel debris will be collected by metal-brush type adhering equipment or vacuum-container type suction equipment. For remotely operated work in a severe environment with high exposure to radiation and within a confined space, tests and training will be implemented using a realistic mock-up in advance and work will be implemented steadily with safety first. Fuel debris retrieved from the trial will be placed in closed metal transportation casks to be transported to the existing analysis facility.

Equipment (robot arm) for the Unit 2 trial fuel debris retrieval, which had been developed in the UK, transferred from the UK in July 2021. A performance verification test and operational training in the domestic facility (in Kobe) was finished in January 2022. The

Image: Equipment for the Unit 2 trial fuel debris retrieval

equipment was transported to Naraha Center for Remote Control Technology Development of the Japan Atomic Energy Agency (JAEA), where the test to verify the operation of the robot arm started from February 2022.

During the test to verify the performance of the trial retrieval equipment, points for which improvement is expected are being checked. For the robot arm, to reduce the contact risk detected in the test to verify the capability to penetrate the X-6 penetration, the operational accuracy and other aspects are being improved. For the dual arm manipulator, other improvements made include modifying the tool structure. An access test to the pedestal bottom by remote self-operation of the robot arm was completed. At present, a test combining the robot arm and the dual arm manipulator is underway.

At the PCV penetration (X-6 penetration), the hatch was opened in October 2023, and deposits covering around the inlet were detected. Removing work of deposits in X-6 penetration which is used to insert robot arm started in January 2024. Deposits and cables could not be removed by using of low-pressure-water device, muddy sediments were almost completely removed by using of high-pressure-water. Removing work by using Abrasive Water Jet is in the process.

The telescopic-type equipment, which will be used in the fuel debris trial retrieval, underwent a pre-service (pressure proof) test by the Nuclear Regulation Authority (NRA) at the factory on June 18, 2024, and was determined as "good." At present, preparation for transporting to the Fukushima Daiichi Nuclear Power Station is underway and the equipment will also undergo a test after installation. On site, connection of the connection structure and pipes to the penetration (X-6) was completed on June 26, 2024. Preparation for installing the telescopic-type equipment to the Reactor Building will continue. At present, the trial retrieval is expected to commence from around August to October 2024.

(4) Unit 3

On February 28, 2021, removal of 566 fuel assemblies remaining in the spent fuel pool was completed. As the top floor of the Unit 3 Reactor Building, where the spent fuel pool was located, was in a high-dose environment, fuel assemblies were removed by remote operation.

Despite various problems encountered during work, partner companies and TEPCO collaborated on an ongoing basis to improve matters and subsequently finished the planned work.

(5) Unit 4

Despite a hydrogen explosion, the fuel assemblies of Unit 4 were not damaged, as the nuclear power station was in cold shutdown status and all the fuel had been stored in the spent fuel pool before the accident. The fuel assemblies in the pool were taken out and transferred to the common pool located within the station site. This fuel removal operation started on November 2013 and was safely completed in December 2014.

(6) Unit 5 and 6

These reactors were not operating at the time of the accident, but the fuel remained in the reactor. In addition, unlike the case of Units 1, 2 and 3, the reactors of Unit 5 and 6 did not encounter power loss and the reactor cores were successfully cooled off.

Given that the conditions of the buildings and the equipment for storing the fuel are stable and risks of causing any problem in the decommissioning process are estimated to be low compared to the other Units, the fuel assemblies of Units 5 and 6 are safely stored in the spent fuel pool in each building for the time being.

Fuel removal from the SFP on Unit 6 is started from August 30, 2022. The milestone is to complete the fuel removal within 2031, and from now on, fuel will be carefully removed fuel from the spent fuel pools without impact on fuel removal from Units 1, 2 and 3.

(7) Completion of dismantling plan for the Unit 1/2 exhaust stack

The dismantling of the Unit 1/2 exhaust stack, which was entrusted to Able Co., Ltd., was completed in May 2020. This work improved the seismic tolerance of the exhaust stack and reduced risks.

2. Waste management

As of the end of March 2024, the total storage volume of the concrete and metal rubble was approx. 398,600m³ (with an area-occupation rate of 88%). The total storage volume of trimmed trees was approx. 79,500 m³ (with an area-occupation rate of 45%). The total storage volume of used protective clothing was approx. 20,800m³ (+1900m³, with an area-occupation rate of 82 %).

In February 2024, trouble occurred at the additionally built miscellaneous waste incinerator. This facility incinerates trimmed trees and is currently undergoing a close examination of the impact on future storage plans while work to restore the facility is underway.

As of the end of March 2024, the total storage volume of waste sludge was 423 m³ (area-occupation rate: 60%), while that of concentrated waste fluid was 9,477 m³ (area-occupation rate: 92%). The total number of stored spent vessels, High-Integrity Container (HIC) for multi-nuclide removal equipment, etc., was 5,697 (area-occupation rate: 88 %).

In March 2024, based on the review status at the technical meeting to review the Implementation Plans for Specified Nuclear Power Facilities (NRA) of this fiscal year, the mid- and long-term risk reduction target map, the status of on-site decommissioning and others, the analysis plan was updated. As major reflation items, plans until FY2028 were included in the scope, policy for examination against targets indicated in the risk map and policy for implementing the process and analysis were organized and reflected in the analysis plan.

The radioactive material analysis and research facility Laboratoy-1 of the Okuma Analysis and Research Center the Japan Atomic Energy Agency (JAEA) became operational in October 2022. After a demonstration period of analytical techniques, full-scale analysis of solid waste began in FY2024.

3. Working environment

In order to achieve a long-term decommissioning, it is important to ensure a stable workforce (In the last two years, about 3,000-4,600 workers per day). TEPCO has implemented the improvement of the working environment such as (1) providing warm food, (2) setting up a large rest area, and a convenience store, (3) developing emergency medical facilities and systems, and ensuring workplace safety which starts from the reduction of radiation exposure. By the decontamination work including pavement and contaminated water management, the ordinary clothing area which does not require wearing protective clothing and full-faced masks, is expanded to about 96% of the site.

4. The 5th IAEA peer review mission

Japan receives regular reviews from the IAEA on the Fukushima Daiichi decommissioning efforts. From June 30 to August 27, 2021, the 5th IAEA Review was conducted including the visit to Japan. On August 27, the last day of the review, Japan received a report from the IAEA Review mission.

The IAEA Review team finds many significant progresses in many areas. From organizational point of view, re-organization of the Fukushima Daiichi Decontamination and Decommissioning Engineering Company (FDEC) is strengthening the project management and safety functions. In risk reduction, fuel removal from Unit 3 spent fuel pool has completed and site management works against flooding, earthquake and tsunami are developing. In addition, significant R&D efforts have been accomplished to access PCV internals including the design, development, prototype and delivery of a robotic arm for the trial fuel debris retrieval.

The IAEA review team appreciates Japan's efforts concerning the advisory points of the previous reviews. Especially, the IAEA Review team appreciates the decision making of the Government of Japan regarding a basic policy on handling of the ALPS treated water as it will facilitate the implementation of the whole decommissioning plan.

Major advisory points are (i) encouraging FDEC to continue focusing on strengthening of engineering and project management functions as well as human resource development, (ii) developing planning scenarios for the entire decommissioning programme including all Fukushima Daiichi units, (iii) continuing exploring technologies and approaches to remove difficult-to-handle damaged fuel, (iv) developing a comprehensive feasibility and risk analysis of the retrieval options of fuel debris, (v) D&D Safety and Quality Office should be engaged early on in the R&D process to address any risk and safety issues with new technologies, (vi) encouraging TEPCO to perform an analysis of the site water balance considering the large volume of water that has been treated and stored.

Full report of 5th review:
https://www.meti.go.jp/press/2021/08/20210827004/20210827004-2.pdf

2.4: Organizations related to decommissioning and contaminated water and treated water management

1. Fukushima Daiichi Decontamination & Decommissioning (D&D) Engineering Company

In April 2014, TEPCO established a company for the purpose of clarifying the responsibilities and authorities inside the company, and streamlining the process of decision making regarding decommissioning and contaminated water management at Fukushima Daiichi NPS.

In addition, the company invited nuclear specialists from outside TEPCO, such as high ranking nuclear executives of manufacturers, in order to collect and share expertise and technology of manufacturers.

This company is playing an important role on the frontline of decommissioning and contaminated water management.

TEPCO's website related to Fukushima Daiichi D&D Engineering Company:
http://www.tepco.co.jp/en/decommision/team/index-e.html

2. Nuclear Damage Compensation and Decommissioning Facilitation Corporation (NDF)

In August 2014, the Nuclear Damage Compensation Facilitation Fund, originally established in 2011 to support the compensation for nuclear damage resulted from the Fukushima Daiichi NPS accident, was reorganized into Nuclear Damage Compensation and Decommissioning Facilitation Corporation (NDF).

NDF's mission is to support decommissioning activities at Fukushima Daiichi NPS. As an example, it formulates decommissioning strategies and develops plans for the research and development (R&D) program on technology necessary for decommissioning.

NDF published the "Technical Strategic Plan 2023 for Decommissioning of the Fukushima Daiichi Nuclear Power Station of Tokyo Electric Power Company Holdings, Inc." on October 18, 2023; aiming to provide a firm technical basis for the government's "Mid- and-Long-Term Roadmap" and facilitate the smooth and steady implementation of decommissioning.

In August 27 and 28, 2023, NDF held the 7th International Forum on the Decommissioning of the Fukushima Daiichi NPS to listen to locals and provide them with easily understandable information on the decommissioning of the Fukushima Daiichi NPS and widely share the latest progress on the decommissioning work and technical outcomes with Japanese and foreign experts.

In March 2024, NDF published the report on Sub-committee for the evaluation of fuel debris retrieval methods.

NDF's booklet:
https://www.ndf.go.jp/files/user/soshiki/pamph_e.pdf
Technical Strategic Plan 2023 for Decommissioning of the Fukushima Daiichi Nuclear Power Station of Tokyo Electric Power Company Holdings, Inc.:
https://dd-ndf.s2.kuroco-edge.jp/files/user/pdf/en/strategic-plan/book/20231222_SP2023eFT.pdf
The 7th International Forum on the Decommissioning of Fukushima Daiichi NPS (2023):
https://ndf-forum.com/en/
The report on Sub-committee for the evaluation of fuel debris retrieval methods:
https://dd-ndf.s2.kuroco-edge.jp/files/user/pdf/en/committee/pdf/report/20240308reporteFT.pdf

3. International Research Institute for Nuclear Decommissioning (IRID)

In August 2013, IRID was established by 18 corporations and organizations related to R&D of technology for the decommissioning of Fukushima Daiichi NPS. In accordance with the Mid-and-long-term Roadmap written by the Government of Japan, IRID is conducting R&D on removal of fuel from the spent fuel pools, removal of fuel debris from the PCVs and disposal of radioactive wastes, and gathering domestic and international expertise. The methods developed at IRID are helping decommissioning efforts.

IRID's website:
http://irid.or.jp/en/

4. Collaborative Laboratories for Advanced Decommissioning Science (CLADS)

In April 2015, Japan Atomic Energy Agency (JAEA) established the CLADS. This institution is aimed at being an international hub for R&D on decommissioning, and promoting cooperation in R&D and human resource development (HRD) among government, industry and academia.

CLADS main building was established in Tomioka-machi, Fukushima in April 2017, which is a central facility of CLADS where educational and research institutions at home and abroad work together to conduct R&D on decommissioning.

CLADS is expected to collaborate on research activities with Naraha Center for Remote Control Technology Development and Okuma Analysis and Research Center.

CLADS has held a series of Fukushima Research Conference (FRC) on Decommissioning Research and Development since 2015.

JAEA's website related to the CLADS:
https://clads.jaea.go.jp/en/

2.5: Communication

(1) Briefing session

The Government of Japan has held briefing sessions periodically on Fukushima Daiichi NPS to the Diplomatic missions in Tokyo. Most recently, the 123th session was held by video conference on August 22, 2023.

Press Release by MOFA:
https://www.mofa.go.jp/press/release/press5e_000031.html

(2) parties concerned on handling of ALPS treated water

As described in 2.2, the ALPS Subcommittee published its report on February 10, 2020 which shows the options for discharge of the ALPS treated water.

Based on the report, the Government of Japan has been holding meetings as an opportunity to receive opinions from a wide variety of parties concerned, including representatives of local municipalities and associations in the fields of agriculture, forestry and fisheries. GoJ held the seven7th "Meetings as Opportunities for Receiving Opinions" on October 8. In addition, public comments were made from April to July, and about 4,000 opinions were received.

<Outline of the report>
https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/20200210_alps_sum.pdf

<Report>
https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/20200210_alps.pdf

(Reference: IAEA, Final report of the follow-up review mission)
https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/4fu-report.pdf

Section 3: Monitoring results

3.1: Monitoring results reported by TEPCO

(1) Outline of the item

The concentrations of radionuclides in ALPS treated water (29 nuclides that are subject to measurement/assessment, tritium, and 39 of the nuclides that are subject to removal by ALPS but not to measurement/assessment for a total of 69 nuclides) shall be measured prior to dilution and discharge (including measurement by third-parties) to confirm that the water has been purified so that the concentrations of these radionuclides, with the exception of tritium, fall below regulatory standards for discharge into the environment. The monitoring of seawater and sea areas would be strengthened, and measurement results continuously disclosed. No anomalies have been identified as a result of this monitoring to date.

(2) Monitoring result data

Results of ALPS treated water and sea area monitoring are available in the following webpage.

https://www.tepco.co.jp/en/hd/decommission/data/analysis/index-e.html

A website summarizing the results of major sea area monitoring, including results from other organizations, is also available in the following webpage.

https://www.monitororbs.jp/en/

3.2: Offsite monitoring results

1. Monitoring results of air dose rates obtained within the 20 km zone around Fukushima Daiichi NPS

(1) Outline of the item

The monitoring of air dose rates within the 20 km zone around Fukushima Daiichi NPS has been conducted. The air dose rates within the 20 km zone have gradually declined over time since May 2011 (soon after the accident at Fukushima Daiichi NPS on March 11, 2011).

(2) Noteworthy updates in the past months

As described in (1) above, the air dose rates within the 20 km zone around the NPS have been on a downward trend, and the monitored air dose rates were stable in the period from April to June 2024. Based on these results, no further announcement was made on this item (e.g., a significant rise of air dose rates within the 20 km zone) during this period.

(3) Monitoring results

The following URL leads to the monitoring results of air dose rates in Fukushima prefecture including the 20 km zone around Fukushima Daiichi NPS:

https://www.erms.nsr.go.jp/nra-ramis-webg/

https://radioactivity.nra.go.jp/en/results/land/air-dose/within-20km

2. Monitoring results of dust in air and soil within the 20 km zone around Fukushima Daiichi NPS

(1) Dust

The monitoring results of dust obtained in the period from April to June 2024 were shown that the concentrations of dust were either ND (ND indicates that the measurement result is below the detection limit) or very low. Based on the results, no further announcement was made on this item (e.g., a significant rise of the activity concentrations obtained from dust samples) during this period.

(2) Soil

Radiation monitoring of soil is conducted as appropriate. The most recent monitoring of soil was conducted in October 2023.

(3) Monitoring results

The following URL provides the monitoring results (from April 2011 to the present):
https://radioactivity.nra.go.jp/en/results/land/dust-soil/within-20km

3. Converted values and measured values of environmental radiation dose rates at 1m height from the ground surface in 46 prefectures in total other than Fukushima Prefecture

(1) Outline

The air dose rates measured using the monitoring stations located in other prefectures have mostly returned to the same level of the air dose rates before the accident.

(2) Updates from April to June 2024

The converted and measured values were relatively stable from April to June 2024. Based on the results, no further announcement was made on this item (e.g., a significant rise of the converted and measured values) during this period.

(3) Monitoring results

The following URL leads to the estimated and measured values, and new monitoring results are uploaded:
https://radioactivity.nra.go.jp/en/results/land/prefecture/air-dose-level-survey

3.3: Sea area monitoring results of seawater, sediment, biota, and fishery products

1. Outline

Sea area monitoring results in the area around Fukushima Daiichi NPS have indicated that the radioactivity levels obtained from outside of the port or in the open sea have been relatively stable.

2. Updates during the period from April to June 2024

As described above, the sea area monitoring results were relatively stable from April to June 2024. Based on the results, any further announcement was not made on this item (e.g., a significant rise of sea area monitoring results) during this period.

3. Related information

Sea area monitoring is classified to be conducted in 5 areas (Area 1: Sea area close to Fukushima Daiichi NPS, Area 2: Coastal area, Area 3: Off-shore area, Area 4: Outer sea area, and Area 5: Tokyo bay area), and this information is available under the "Monitoring of sea water", section of the NRA webpage entitled "Readings of Sea Area Monitoring". This webpage also includes monitoring results of sediment under the "Monitoring of marine soil" section, and it is also classified into 4 areas (Area 1: Sea area close to Fukushima Daiichi NPS, Area 2: Coastal area, Area 3: Off-shore area, Area 4: Tokyo bay area). The NRA has been providing report on sea area monitoring results. The "Readings of Sea Area Monitoring" webpage covers various issues and the webpage's information is periodically updated on a weekly basis. The following URLs lead to the webpage and report on sea area monitoring:

Readings of Sea Area Monitoring
https://radioactivity.nra.go.jp/en/results#sec-09

Sea Area Monitoring (Monthly Report)
https://radioactivity.nra.go.jp/en/docs/reps/sea-area

Section 4: Off-site Environmental Remediation

4.1: Decontamination

Full-scale decontamination in the Special Decontamination Area (SDA) was completed by the end of March 2017 as planned under the responsibility of the Government of Japan. The decontamination mainly conducted by the municipalities in the Intensive Contamination Survey Area (ICSA) was also completed in March 2018. This means that the full-scale decontamination based on the Act on Special Measures was completed, excluding the "Restricted Area". The air dose rates in the environment have been continuously decreasing.

In the wake of the progress of the decontamination lift of designations of ICSA and SDA municipalities has also proceeded. At the end of March 2024, designations of ICSA for 3 municipalities were lifted, which were the 37th -39th cases in ICSA.

As a result, the number of municipalities designated as ICSA is currently 65 (including municipalities outside Fukushima Prefecture).

In the Restricted Area, the Specified Reconstruction and Revitalization Base Area (SRRBA) was established, and in SRRBA, the environment for return of people was put in place, including decontamination and demolition of houses. By November 2023, all evacuation orders in 6 municipalities which include SRRBA had been lifted as planned. In the Restricted Area other than SRRBA, the Special Residential Revitalization Area (SRRA) was established, aiming at return of people and reconstruction of their living environment by lifting evacuation orders over the course of 2020's. From December 2023, environmental restoration initiatives such as decontamination and demolition of houses have been in progress.

4.2: Interim Storage Facility (ISF)

As for the Interim Storage Facility (ISF), in which the soil and waste generated from decontamination activities in Fukushima (hereinafter referred to as "removed soil and waste") are stored intensively and safely, MOE has promoted land acquisitions to secure the necessary areas. More than 80% of the total areas (approximately 95% of privately owned areas) have been acquired as of the end of June 2024. Construction of ISF was started in November 2016 and the storage of the removed soil and waste started in October 2017.

As of the end of June 2024, all planned Soil Storage Facilities were constructed, and approximately 13,900,000m^3 of removed soil and waste has been transported to ISF.

4.3: Managed recycling of removed soil

MOE has taken necessary measures toward the completion of the final disposal outside Fukushima Prefecture within 30 years from the start of interim storage in ISF, which is stipulated in a Japanese law. In order to reduce the amount of final disposal outside Fukushima Prefecture as much as possible, MOE has promoted volume reduction and the managed recycling of removed soil. With regard to the managed recycling, currently a demonstration project for development of farmland in Iitate Village, Fukushima Prefecture, and a demonstration project for road embankment in the premise of ISF have been implemented. MOE also makes its efforts to build nationwide understanding for the necessity and safety of the managed recycling, by disseminating achievements etc. of the demonstration projects. Also, as one of the initiatives to build public understanding for the managed recycling, potted plants using the removed soil generated by decontamination in Fukushima Prefecture were placed in the offices of relevant ministries and agencies of the national government. As of the end of June 2024, potted plants have been placed at 23 facilities outside of Fukushima Prefecture. No changes have been observed for the air dose rate caused by the placement of the potted plants.

4.4: IAEA-MOE Experts Meetings

Upon the request of the MOE, the IAEA held four Experts Meetings on "Environmental Remediation of Off-Site Area after the Fukushima Daiichi Power Station Accident" in 2016 and 2017. In March 2023, the IAEA published the "Consolidated Report" of the IAEA-MOE Experts Meeting, which contains contents of discussion during the Experts Meetings, as well as up-to-date information about environmental remediation in Fukushima. In addition, in 2023 and 2024, three IAEA-MOE Experts Meetings on "Volume Reduction and Recycling of Removed Soil Arising from Decontamination Activities" were held with the objective to provide assessment, advice and support, from technical and social perspectives, with MOE's initiatives on the managed recycling and the final disposal of the removed soil. The summary reports of the first and the second meetings were published in September 2023 and January 2024, respectively. The final report is scheduled to be published in around summer of 2024.

The following URL leads to MOE's website, in which information related to the Environmental Remediation is updated.

http://josen.env.go.jp/en/

Section 5: Food products

5.1: Summary of testing

Food samples are routinely monitored to ensure that they are safe for all members of the public.

During the month of April 2024, 3,451 samples were taken and analyzed. Among these samples, 5 samples were found to be above the limits. This represents 0.14 percent of all samples.

During the month of May 2024, 1,449 samples were taken and analyzed. Among these samples, 8 samples were found to be above the limits. This represents 0.55 percent of all samples.

During the month of June 2024, 7,678 samples were taken and analyzed. Among these samples, 31 samples were found to be above the limits. This represents 0.40 percent of all samples.

Restrictions will be imposed on the distribution of food products, if the level of radioactive contaminants of the food product exceeds the limit (caesium-134+caesium-137: 100 Becquerel/kg). Restrictions are to be removed, when the level of radioactive contaminants of the food product is constantly below the limit for a certain period of time. Therefore, the products, on which the distribution restrictions are newly imposed, are the products whose radioactive contaminants level exceeded the limit in the past month. By the same logic, the products whose restrictions are newly removed are the products whose radioactive contaminants level has been lower than the limit for a certain period of time.

*limits: caesium-134+caesium-137: 100 Becquerel/kg of general foods, 10 Becquerel/kg of drinking water, 50 Becquerel/kg of milk, 50 Becquerel/kg of infant foods.

5.2: Results of monitoring food products

1. The current situation and protective measures

A fact sheet uploaded in the link below is the summary of the current situation and the measures taken by the Government of Japan:

https://www.mhlw.go.jp/content/001327508.pdf

2. Noteworthy updates in the past months (during the period from April to June2024)

The lists of food products, whose status on the restrictions was changed, are as follows.

(1) Products whose distribution was newly restricted in April 2024

- None

(2) Products whose restrictions were removed in April 2024

- Bear meat obtained after capturing in Shibata-city (limiting to bear meat which is managed based on shipment and inspection policy set by Niigata prefecture)

(3) Products whose distribution was newly restricted in May 2024
- None

(4) Products whose restrictions were removed in May 2024
- None

(5) Products whose distribution was newly restricted in June 2024
- None

(6) Products whose restrictions were removed in June 2024
- None

3. Monitoring results data

See the link below (new monitoring results are added once a month):
http://www.mhlw.go.jp/english/topics/2011eq/index_food_radioactive.html

4. Information focused on the safety of the fishery product

(1) Summary of monitoring on fishery products

According to the monitoring results of fishery products, from January 2023 to June 2024, in marine fish species, the excess ratio* was 0% (No sample that exceeding the JML out of 19,407 samples) and in freshwater fish species, the excess ratio was 0% (No samples that exceeding the JML out of 2,041 samples).

*excess ratio: (Number of samples containing more than 100 Bq/kg) / (Total number of samples)

Further information, including monitoring data and actions to ensure the safety of fishery products, is available on the Fisheries Agency's website.
http://www.jfa.maff.go.jp/e/inspection/index.html

(2) Report on the Monitoring of Radionuclides in Fishery Products

Since the accident at the Fukushima Daiichi NPS, the Government of Japan and local authorities have cooperated closely with relevant bodies to secure the safety of fishery products. With an aim to promote accurate understanding on the safety of Japanese fisheries products at home and abroad, the data and information accumulated by monitoring in the last three years was evaluated comprehensively in the report, which was published in May 2014.

In October 2017, the Fisheries Agency of Japan released an updated report, which reflects the latest data and recent research results. It shows that, after six years since the accident, the level of radioactive Cs in fishery products has declined substantially.

The report is available at the following URLs:
Japanese version, full report
https://www.jfa.maff.go.jp/j/housyanou/attach/pdf/houkokusyo-12.pdf

Japanese version, summary
http://www.jfa.maff.go.jp/j/housyanou/attach/pdf/kekka-216.pdf

English translation, full report
http://www.jfa.maff.go.jp/e/inspection/attach/pdf/index-34.pdf

English translation, summary
http://www.jfa.maff.go.jp/e/inspection/attach/pdf/index-35.pdf

5.3: Total Diet Study

The dietary intake of radionuclides in 15 areas across Japan including Fukushima, is surveyed biannually, and the effective dose is estimated as far below 1 mSv/year (0.0005-0.0010mSv/year, in 2023).

Japanese version, press releases
https://www.mhlw.go.jp/shinsai_jouhou/shokuhin.html
https://www.caa.go.jp/policies/policy/standards_evaluation/food_pollution/criterion

Japanese version, summary of the latest version is available at the following URL
https://www.caa.go.jp/policies/policy/standards_evaluation/food_pollution/criterion/assets/standards_cms105_240717_08.pdf

English translation, summary of the latest version is available at the following URL
https://www.caa.go.jp/policies/policy/standards_evaluation/food_pollution/criterion/assets/standards_cms105_240717_09.pdf

Section 6: Radiation Protection of Workers

Information pertaining to radiation protection of workers involving TEPCO's Fukushima Daiichi NPP Accident is updated on the following website of the Ministry of Health, Labour and Welfare (MHLW):
https://www.mhlw.go.jp/english/topics/2011eq/workers/index.html

6.1: Regulations and Guidelines, etc.

Regulations and Guidelines, etc. from the MHLW on radiation protection of workers are available on the following webpage:
https://www.mhlw.go.jp/english/topics/2011eq/workers/ri/index.html?no=tab2
https://www.mhlw.go.jp/english/topics/2011eq/workers/ri/index.html?no=tab3

6.2: TEPCO's Fukushima Daiichi NPS

Status of the exposure dose, health care management and radiation protection of the workers at TEPCO's Fukushima Daiichi NPS are as follows:

1. Status of Radiation Exposure

   Exposure doses of the workers at TEPCO's Fukushima Daiichi NPS are reported to the MHLW once a month. The latest monthly report is available on the following webpage:
   https://www.mhlw.go.jp/english/topics/2011eq/workers/tepco/index.html?no=tab1

2. Radiation Protection

   Information on radiation protection of the workers at TEPCO's Fukushima Daiichi NPS:
   https://www.mhlw.go.jp/english/topics/2011eq/workers/tepco/index.html?no=tab2

   Measures for occupational safety and health management are enhanced at the TEPCO Fukushima Daiichi Nuclear Power Plant - A guideline was formulated - (Updated on August 26, 2015)
   https://www.mhlw.go.jp/english/topics/2011eq/workers/tepco/rp/pr_150826.html

3. Long-term Health Care

Information on long-term health care of emergency workers including health examination and guidelines:

"Guidelines on Maintaining and Improving Health of Emergency Workers at Nuclear Facilities, etc." is available on the following webpage. (Updated on August 31, 2015)

https://www.mhlw.go.jp/english/topics/2011eq/workers/tepco/rp/pr_150831_attachment06.pdf

4. Good Practices in Radiation Exposure Controls

Updated Information on Good Practices in Radiation Exposure Dose Reduction Measures (Commissioned by the Ministry of Health, Labour and Welfare) (Updated in February 2023)

https://www.mhlw.go.jp/english/topics/2011eq/workers/tepco/gre/gre_2301.pdf

5. Other Related Topics;

Updated Information on Healthcare of Workers at the Fukushima Daiichi Nuclear Power Plant (Updated on Jul 25, 2024)

https://www.mhlw.go.jp/english/topics/2011eq/workers/tepco/ort/ort_240725.pdf

Start of a weekly on-site consultation desk to address health matters of decommissioning workers, etc. (Updated on June 24, 2016)

https://www.mhlw.go.jp/english/topics/2011eq/workers/tepco/ort/ort_160624.html

6.3: Decontamination/Remediation

The status of radiation protection of the workers engaged in decontamination and remediation of contaminated materials derived from Fukushima Daiichi NPS Accident is as follows.

https://www.mhlw.go.jp/english/topics/2011eq/workers/dr/index.html?no=tab1

1. Decontamination/Remediation

Information on decontamination/remediation including guidelines:

https://www.mhlw.go.jp/english/topics/2011eq/workers/dr/index.html?no=tab2

2. Waste Disposal

Information on waste disposal work including guidelines:

https://www.mhlw.go.jp/english/topics/2011eq/workers/dr/index.html?no=tab3

3. Other Related Topics

Other related information:

https://www.mhlw.go.jp/english/topics/2011eq/workers/dr/index.html?no=tab4

6.4: Other Information

Statistics on radiation exposure doses of decontamination workers and other items are as follows:

https://www.mhlw.go.jp/english/topics/2011eq/workers/ors/index.html?no=tab1

Dose Statistical Data Based on the Information Registered with the System of Registration and Management of Radiation Exposure Doses for Decontamination and Related Work (2023) (by Radiation Effects Association)

https://www.rea.or.jp/chutou/koukai_jyosen/2023nen/English/honbun_jyosen-2023-English.html

Section 7: Other issues on recovery operations

7.1: Public communication

1. Provision of updates to the IAEA

The Government of Japan has actively been strengthening its communication process to ensure timely dissemination of accurate information on the current status of activities onsite in multiple languages for the international community. Japan provides updates in a timely manner and all of the updates provided to the IAEA are available on this webpage:
https://www.iaea.org/newscenter/focus/fukushima/status-update

2. Lifting of evacuation orders

Current condition of evacuation order areas of Fukushima Daiichi NPS (as of June 2021)

In Tamura city, the order of Preparation areas for lift of evacuation order was lifted on April 1, 2014. In Naraha town, the order of Preparation areas for lift of evacuation order was lifted on September 5, 2015. In Katsurao village, the order of Habitation restricted areas and Preparation areas for lift of evacuation order were lifted on June 12, 2016. In Kawauchi village, the order of Preparation areas for lift of evacuation order was lifted on June 14,2016. In Minamisoma city, the order of Habitation restricted areas and the order of Preparation areas for lift of evacuation order were lifted on July 12,2016. In Iitate village, Kawamata town and Namie town, the orders of Habitation restricted areas and Preparation areas for lift of evacuation order were lifted on March 31, 2017. In Tomioka town, the orders of Habitation restricted areas and the order of Preparation areas for lift of evacuation order were lifted on April 1, 2017. In Okuma town, the order of Habitation restricted areas and the order of Preparation areas for lift of evacuation order were lifted on April 10, 2019. Except for the Evacuation Orders of Futaba town, all of the orders of Habitation restricted areas and the orders of Preparation areas for lift of evacuation order were lifted by spring 2019. The evacuation orders were lifted for parts of Futaba Town on March 4, 2020, Okuma Town on March 5, and Tomioka Town on March 10. As a result, the evacuation orders were lifted for all areas except for the Restricted areas by March 2020. The JR Joban line also resumes full operation from March 14, 2020. The evacuation orders were lifted for the specified reconstruction and revitalization base areas of Katsurao village on June 12, 2022, Okuma town on June 30, and Futaba town on August 30, Namie town on March 31, 2023, Iitate village on May 1, and Tomioka town on April 1, November 30.

As for cities, towns, and villages, where evacuation orders were lifted, it was confirmed that annual cumulative dose, the total radiation dose which residents in the cities, towns, and villages would receive per year, was surely below 20mSv, and also the reconstruction of infrastructure necessary for people's daily life and decontamination were steadily advancing. In the wake of consultation with these cities, towns, and villages and adequate explanation to the residents through briefing sessions and by other means, the above-mentioned lift of the evacuation orders was determined.

<Reference> Classification of evacuation orders:

- Preparation areas for lift of evacuation order
  Entry into the area is permitted. Overnight stay in the area is generally prohibited. Business activities are permitted except those to be provided for residents living inside the area.

- Habitation restricted areas
  Entry into the area is permitted.
  Overnight stay in the area is prohibited in principle. Business activities are permitted but limited in some cases.

- Restricted area
  Entry into the area is prohibited in principle, and staying in this area is also prohibited.

- Restricted area effective from March 10, 2020
  https://www.meti.go.jp/english/earthquake/nuclear/roadmap/index.html

3. Relevant activities in disseminating information to the public

(1)Press Conference

Recovery operations at the Fukushima Daiichi NPS including contaminated water issues are one of the major issues which the Government of Japan has been focusing on. Since progress has been made frequently, there are updates arising on a daily basis. To explain the updates to the public, the Government of Japan disseminates the relevant information through press conferences. The Chief Cabinet Secretary and the Minister of Economy, Trade and Industry are the main briefers of the press conference, but other ministers or press secretaries may also be the briefer, depending on the subject.

(2)Information delivery to media

The government has been providing relevant information for both the domestic and the foreign press including those stationed in Tokyo and for other media, using various means such as press conferences, press briefings, press tours and press releases. As an example, the Fisheries Agency has conducted press briefings to domestic and foreign media with relevant ministries in order to facilitate better understanding for monitoring on fishery products.

(3)Providing information to foreign nations

The Ministry of Foreign Affairs sends out a notification with relevant information to all foreign missions stationed in Tokyo and IAEA, in principle once a month. The same information is conveyed to all Japanese embassies, consulate generals, and missions. If necessary, the information would be shared with foreign nations and relevant organizations through these diplomatic channels.

In addition, the Government of Japan has held briefing sessions periodically on Fukushima Daiichi NPS to the Diplomatic missions in Tokyo. Most recently, the 123th session was held on August 22, 2023.

Press Release by MOFA:
https://www.mofa.go.jp/press/release/press5e_000031.html

Furthermore, the Ministry of Economy, Trade and Industry (METI) has produced a short video clip on the current situation in Fukushima Daiichi NPS and a brochure entitled “Important stories on Decommissioning – Decommissioning of TEPCO’s Fukushima Daiichi NPS and the Discharge of ALPS Treated Water into the Sea-”.

The video clip and the brochure are available at the following link:
https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/index.html

(4)Measures taken by TEPCO

TEPCO has been disseminating information on the situation at the FDNPS both domestically and internationally via its website and social media. TEPCO is also conducting a site visit to the FDNPS with the aim of allowing people to experience the actual situation by visiting and observing the actual site. In addition, a virtual tour is available on the website.

＜Inside Fukushima Daiichi＞
https://www.tepco.co.jp/en/insidefukushimadaiichi/index-e.html

(5)Disseminating information to Japanese populations

In general, the information is shared with Japanese populations through the channels shown above in (1)-(2). In addition to these efforts, the Government of Japan has improved public communication by enriching the content of relevant ministries' webpages and by hosting local briefing sessions on a case by case basis. METI regularly informs the progress of the decommissioning activities and contaminated water countermeasures to Fukushima prefecture and 13 local municipalities surrounding the site through video conference and direct visits.

4. Efforts on eliminating negative reputation impact and risk communication

(1)The Strategy for the Enhancement of the Elimination of Negative Reputation Impact and Risk Communication

In December 2017, the Government of Japan formulated the "The Strategy for the Enhancement of the Elimination of Negative Reputation Impact and for Risk Communication", based on a thorough review of the past efforts by relevant ministries and agencies, in order to clear up negative reputation impact which lacks in scientific grounds, and unfounded prejudice and discrimination.

In addition to the risk communication with the affected people, this strategy, focusing on providing information to the general public in a simple manner, specifies objects and contents for information in order of importance, from three perspectives, that is, "To inform", "To treat" and "To invite", and examines concrete ways of delivering information. Under this strategy, relevant ministries and agencies cooperate in a unified manner both at home and abroad.

(a)To inform

To inform the general public, mostly schoolchildren, their parents, and expectant and nursing mothers, of basic points of radiation, health effects of radiation, the safety of foods and drinking water made in Fukushima, the status of the affected areas in which the recovery is in progress, etc.

(b) To treat

To inform retailers, distributors, consumers, embassies in Tokyo, and foreign VIPs, press, residents and tourists, of the appeal and tastiness of Fukushima products, system of ensuring the safety of foods and drinking water, the standards of radioactive substances, the control system of foods at production stage, etc.

(c) To invite

To inform teachers, those involved with a Parent-Teacher Association, travel agencies, foreign tourists, VIPs and press, and visitors from outside Fukushima, of the attraction of Fukushima as a destination, air dose rate and the safety of foods in Fukushima, and the supports for educational travels provided by Fukushima Prefecture.

(2)The Policy Package on Radioactive Risk Communication for Evacuees Returning to Their Homes

In February 2014, the Government of Japan compiled "The Policy Package on Radioactive Risk Communication for Evacuees Returning to Their Homes", in order to promote the implementation of detailed risk communication in response to the concerns of individuals. Relevant ministries and agencies also work together to promote measures including the

organization of follow-up meetings on the policy package, focusing on the viewpoints of (a) dissemination of accurate and easy-to-understand information, (b) continuous development of risk communication on a national scale, and (c) improving detailed risk communication.

(3)Practical measures for evacuees to return their homes by NRA

NRA formulated practical measures of radiation protection for the evacuees, who will return to their homes, from scientific and technological points of view in cooperation with other governmental organizations. The practical measures continue to address the difficulties which the evacuees have been facing. It is expected that the practical measures will be helpful for the evacuees to make decisions on whether they will return to their homes or not.

The detail of these measures taken by NRA are available at the following link:
https://www.nra.go.jp/data/000067234.pdf

7.2: Websites for your reference

Further information on each section above is available at the following websites:

The Prime Minister's Office
http://japan.kantei.go.jp/ongoingtopics/waterissues.html
The Food Safety Commission (FSC)
http://www.fsc.go.jp/english/emerg/radiological_index_e1.html
The Reconstruction Agency (RA)
http://www.reconstruction.go.jp/english/
The Ministry of Foreign Affairs (MOFA)
http://www.mofa.go.jp/j_info/visit/incidents/index.html
The Ministry of Health Labour and Welfare (MHLW)
http://www.mhlw.go.jp/english/topics/2011eq/index_food.html
The Ministry of Agriculture, Forestry and Fisheries (MAFF)
https://www.maff.go.jp/e/policies/market/reference/reference.html
The Fisheries Agency (FA)
http://www.jfa.maff.go.jp/e/index.html
The Ministry of Economy, Trade and Industry (METI)
http://www.meti.go.jp/english/earthquake/nuclear/decommissioning/index.html
https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/atw.html
https://www.meti.go.jp/english/earthquake/nuclear/roadmap/
The Ministry of the Environment (MOE)
http://josen.env.go.jp/en/
The Nuclear Regulation Authority (NRA)
http://www.nra.go.jp/english/index.html
The Japan Atomic Energy Agency (JAEA)
http://www.jaea.go.jp/english/index.html
Tokyo Electric Power Company (TEPCO)
http://www.tepco.co.jp/en/nu/fukushima-np/index-e.html
https://www.tepco.co.jp/en/decommission/progress/fuel-debris/index-e.html
https://www.tepco.co.jp/en/decommission/progress/watertreatment/index-e.html
Fukushima Daiichi Decontamination & Decommissioning Engineering Company
http://www.tepco.co.jp/en/press/corp-com/release/2014/1235009_5892.html
Nuclear Damage Compensation and Decommissioning Facilitation Corporation (NDF)
http://www.ndf.go.jp/soshiki/pamph_e.pdf
International Research Institute for Nuclear Decommissioning (IRID)

http://irid.or.jp/en/

The Collaborative Laboratories for Advanced Decommissioning Science (CLADS)
https://clads.jaea.go.jp/en/

IAEA assessment on aspects presented in the December 2024 report 'Events and highlights on the progress related to recovery operations at TEPCO's Fukushima Daiichi Nuclear Power Station'

Preparation for the fuel debris retrieval from Unit 2 Primary Containment Vessel (PCV)

According to Japan's report, as for the preparation for the fuel debris retrieval from Unit 2 PCV, the pre-service (pressure proof) test for the telescopic-type equipment to be used in the trial retrieval of fuel debris was conducted by the Nuclear Regulation Authority (NRA) in June 2024. The proof was concluded as a "good" test. As of June 2024, the preparation for the equipment transportation to TEPCO's Fukushima Daiichi NPS is underway. It is expected that the trial retrieval operations will start "from around August to October 2024".

The IAEA acknowledges the progress that has been made in the preparatory work for the fuel debris retrieval from Unit 2 PCV, including the installation of the telescopic-type equipment to be used in the trial retrieval of the fuel debris.

Preparation for the spent-fuel removal from Unit 1 spent fuel pool

Based on the information provided by Japan, the preparation for the removal of spent fuel from Unit 1 spent fuel pool continued during the reported period. Since June 2021, TEPCO has been conducting the work to install a large cover of the entire Unit 1 reactor building as a countermeasure against dust scattering. As a part of the work at the reactor building, removal of overflowing rubble from the south side external wall was completed in April 2024. The report stated that during the work there was no confirmed significant variation in the dust concentration, and that the installation of the lower structure which would support the construction of the large cover was completed except for the south side and a portion of the west side near the south side.

The IAEA acknowledges the steady progress of the preparatory work for spent fuel removal from Unit 1, including removal of overflowing rubble and installation of the lower structure.

Sea area monitoring results

According to Japan's data, while remaining well below the investigation level and the discharge suspension level, temporarily and slightly elevated levels of tritium in seawater relative to the long-term background were reported within a 3 km vicinity of the discharge outlet, during and immediately after discharges of ALPS treated water. A similar pattern can be observed for tritium in fish monitored close to the discharge outlet.

The IAEA acknowledges that levels of radionuclides in the marine environment offshore FDNPS and other areas monitored on the east coast of Japan are low and relatively stable. For public reassurance, including with respect to the ALPS treated water discharges, the IAEA encourages the continuation of sea area monitoring. Furthermore, the IAEA considers that the ongoing data quality assurance programme which is in place is key to ensuring the accuracy and the quality of the results of the monitoring programme. It also enhances transparency and contributes to building stakeholders' confidence.

Food products

Based on the information provided , the joint FAO/IAEA centre acknowledges that confidence in the safety of the food supply continues to be maintained by appropriate monitoring, regulatory action and public communication. Based on the information provided by Japan, the situation regarding the safety of the food supply, fishery and agricultural production continues to remain stable. Food restrictions continue to be revised and updated as necessary in line with food monitoring results. Many thousands of food samples were collected over the reporting period and this indicates continued vigilance of the authorities in Japan and their commitment to protecting consumers and trade.