Information (17:00), March 25, 2021

To All Missions (Embassies, Consular posts and International Organizations in Japan)

Report on the discharge record and the seawater monitoring results at Fukushima Daiichi Nuclear Power Station during February

The Ministry of Foreign Affairs wishes to provide all international Missions in Japan with a report on the discharge record and seawater monitoring results with regard to groundwater pumped from the sub-drain and groundwater drain systems, as well as, bypassing groundwater pumped during the month of February at Fukushima Daiichi Nuclear Power Station (NPS).

1. Summary of decommissioning and contaminated water management

In February, the summary of monthly progress on decommissioning and contaminated water management of Fukushima Daiichi NPS was issued shown in Appendix 1. For more information, please see the following URL:
https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/mp202102.pdf

2. Sub-drain and Groundwater Drain Systems

In February, purified groundwater pumped from the sub-drain and groundwater drain systems was discharged on the dates shown in Appendix 1. Prior to every discharge, an analysis on the quality of the purified groundwater to be discharged was conducted by Tokyo Electric Power Company (TEPCO) and the results were announced.

All the test results during the month of February have confirmed that the radiation levels of sampled water were substantially below the operational targets set by TEPCO (these operational targets are well below the density limit specified by the Reactor Regulation). The results of these analyses were also confirmed by a third-party organization (Tohoku Ryokka Kankyohozen Co.).

In addition, TEPCO and Japan Atomic Energy Agency (JAEA), at the request of the Government of Japan, regularly conduct more detailed analyses on the purified groundwater. The results of JAEA's latest analyses confirmed that TEPCO's analyses were accurate and verified that the radiation levels of sampled groundwater was substantially below the operational target (see Appendix 2).

Moreover, TEPCO publishes the results of analyses conducted on seawater sampled during the discharge operation at the nearest seawater sampling post from the discharge point (see Appendix 3). The results show that the radiation levels of seawater remain lower than the density limit specified by the Reactor Regulation and significant change in the radioactivity has not been observed.

2. Groundwater Bypassing

In February, the pumped bypassing groundwater was discharged on the dates shown in Appendix 4. Prior to every discharge, an analysis on the quality of the groundwater to be discharged was conducted by TEPCO and the results were announced.

All the test results during the month of February have confirmed that the radiation levels of sampled water were substantially below the operational targets set by TEPCO (these operational targets are well below the density limit specified by the Reactor Regulation). The results of these analyses were also confirmed by Japan Chemical Analysis Center.

In addition, TEPCO and JAEA, at the request of the Government of Japan, regularly conduct more detailed analyses on the groundwater. The results of JAEA's latest analyses confirmed that TEPCO's analyses were accurate and verified that the radiation levels of the sampled groundwater were substantially below the operational target (see Appendix 5).

Moreover, TEPCO publishes analysis results on seawater sampled during the discharge operation at the nearest seawater sampling post from the discharge point (see Appendix 6). The result shows that the radiation levels in seawater remain lower than the density limit specified by the Reactor Regulation and significant change in the radioactivity has not been observed. The analysis had been conducted once a month until March 2017. Since April 2017, it is conducted four times a year because there has been no significant fluctuation in the concentration of radioactive materials in the sea water, and no influence on the surrounding environment has been confirmed.

The sampling process for analyses conducted this month is the same as the one conducted in the information disseminated last month. Results of the analyses are shown in the attached appendices:

(For further information, please contact TEPCO at (Tel: 03-6373-1111) or refer to the TEPCO's website:
http://www.tepco.co.jp/en/nu/fukushima-np/handouts/index-e.html)

Contact: International Nuclear Cooperation Division,
Ministry of Foreign Affairs, Tel 03-5501-8227

Outline of Decommissioning and Contaminated Water Management

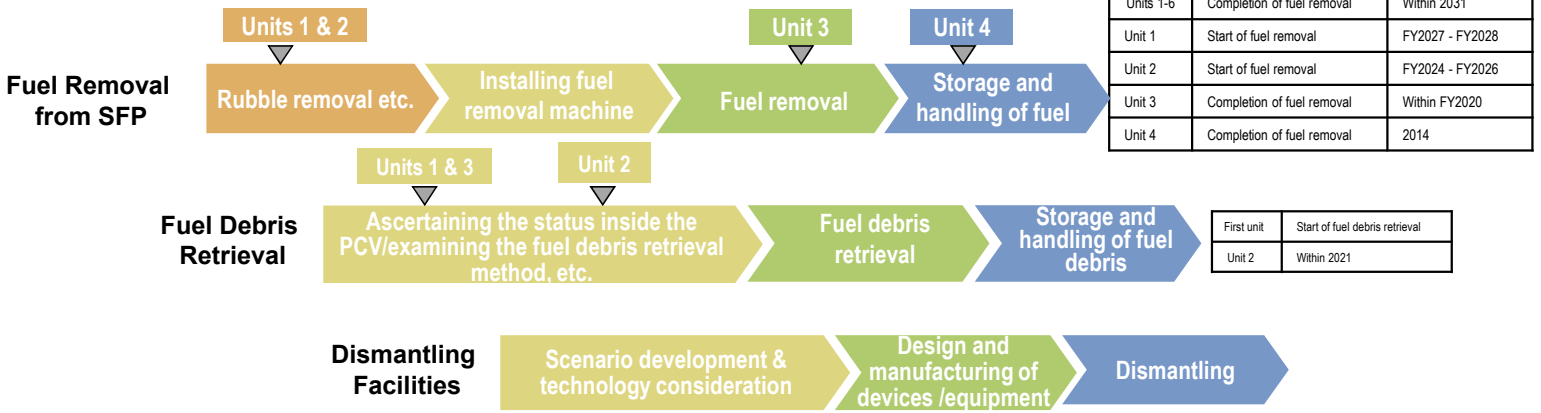
February 25, 2021
Secretariat of the Team for Countermeasures for Decommissioning and Contaminated Water Treatment

Main decommissioning work and steps

Appendix 1

Fuel removal from the spent fuel pool was completed in December 2014 at Unit 4 and started from April 15, 2019 at Unit 3. Dust concentration in the surrounding environment is being monitored and work is being implemented with safety first. 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.

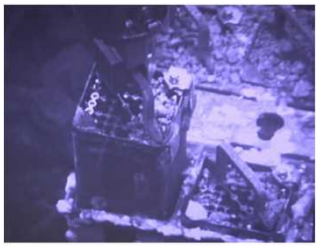


Units 1-6	Completion of fuel removal	Within 2031
Unit 1	Start of fuel removal	FY2027 - FY2028
Unit 2	Start of fuel removal	FY2024 - FY2026
Unit 3	Completion of fuel removal	Within FY2020
Unit 4	Completion of fuel removal	2014

First unit	Start of fuel debris retrieval
Unit 2	Within 2021

Fuel removal from the spent fuel pool

Fuel removal from the spent fuel pool started from April 15, 2019 at Unit 3. Rubble and fuel are being removed, aiming to complete fuel removal by the end of FY2020.



Fuel removal (April 15, 2019)

Removed fuel (assemblies)
553/566
(As of February 25, 2021)

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

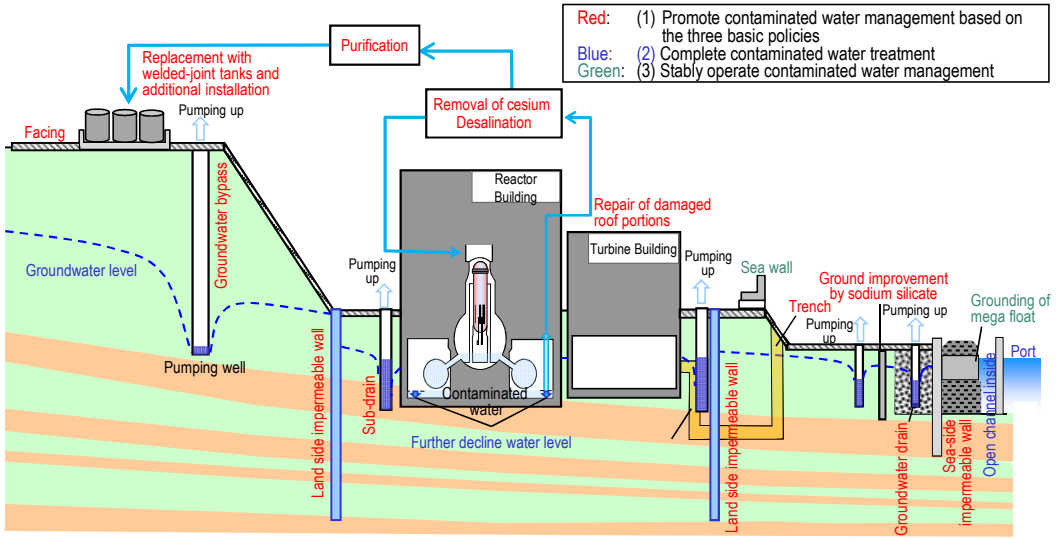
- Strontium-reduced water from other equipment is being re-treated in the multi-nuclide removal equipment (ALPS) and stored in welded-joint tanks.
- Multi-layered contaminated water management measures, including land-side impermeable walls and sub-drains, have stabilized the groundwater at a low level 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 contaminated water treatment

- To lower the contaminated water levels in buildings as planned, work to install additional contaminated 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 contaminated 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 contaminated water there will be reduced to about half of 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 closing building openings and installing sea walls to enhance drainage channels and other measures are being implemented as planned.



Progress status

◆ The temperatures of the Reactor Pressure Vessel (RPV) and Primary Containment Vessel (PCV) of Units 1-3 have been maintained within the range of approx. 15-20°C*1 over the past month.
There was no significant change in the concentration of radioactive materials newly released from Reactor Buildings into the air*2. It was concluded that the comprehensive cold shutdown condition had been maintained.

* 1 The values varied somewhat, depending on the unit and location of the thermometer.
* 2 In January 2021, the radiation exposure dose due to the release of radioactive materials from the Unit 1-4 Reactor Buildings was evaluated at less than 0.00004 mSv/year at the site boundary. The annual radiation dose from natural radiation is approx. 2.1 mSv/year (average in Japan).

No influence of the earthquake on February 13 on the outside

On February 13, an earthquake (magnitude 7.3) occurred off the coast of Fukushima Prefecture.

An inspection detected puddles (a total of about 3,000 cc) which was considered pool water flooding near the Unit 5 and 6 and the common spent pool, and leakage from flanged tanks which stored stagnant water of Units 5 and 6 and others. The inspection also confirmed that some rubble containers had fallen and some sample/treated-water tanks of the multi-nuclide removal equipment were displaced, but it was confirmed that there was no influence on the outside.

When an earthquake occurs, a check to confirm any influence on the environment is conducted based on the monitoring dates. After the check, information is transmitted sequentially based on the inspection results. Efforts will continue to ensure safety and swift and transparent information transmission.

Unit 1 and 3 PCV Drops in Water Levels detected No influence on the outside and careful monitoring continues

The water level of the Primary Containment Vessel (PCV) is declining from February 15 at Unit 1 and February 17 at Unit 3 respectively.

On February 21, the pressure inside the Unit 1 PCV also declined due to the decline of the water level, as seen during the water injection suspension test.

There was no significant variation in the monitoring posts, dust monitors and others on the site boundary, nor any influence on the outside.

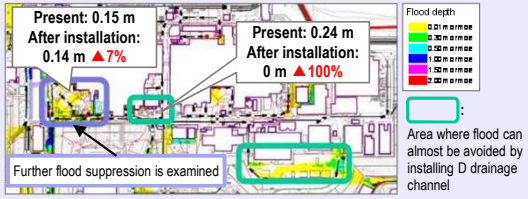
It was confirmed that water was being injected to the reactor appropriately. The water-level decline is considered attributable to the change in condition of the PCV-damaged parts due to the earthquake on February 13, and careful monitoring will continue.

Installation of a new D drainage channel to effectively eliminate heavy-rain risk and function before the FY2022 typhoon season

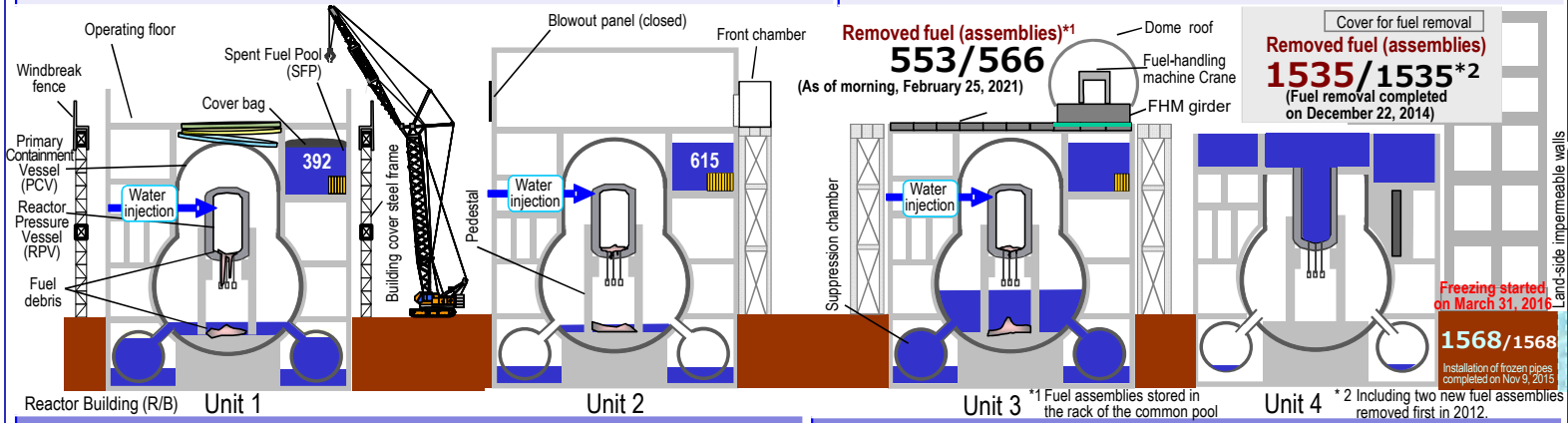
In readiness for large-scale heavy rain frequently occurring in Japan recently, a new D drainage channel will be installed.

A flood simulation was conducted to determine the influence on onsite facilities during heavy rain. The results confirmed that almost all flooding around the Unit 1-4 buildings could be avoided.

From February 2021, preparatory work started to complete the work before the FY2022 typhoon season.



<Image after installing D drainage channel based on flood simulation result>



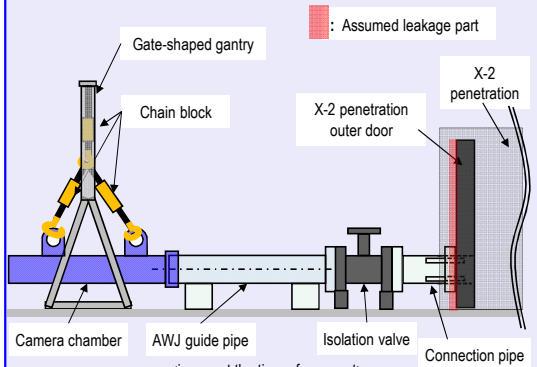
*1 Fuel assemblies stored in the rack of the common pool
* 2 Including two new fuel assemblies removed first in 2012.

Unit 1 The cause of the decline in pressure during preparation for the obstacle investigation inside the PCV identified

On January 21, during the work to insert the camera equipment and investigate the obstacle, the PCV pressure declined.

This event was considered attributable to applying a load when installing the new camera equipment, which subsequently led to leakage from the seal part of the X-2 penetration outer door.

After reducing the load during work to install the new camera equipment and reinforcing that seal part, work to investigate the obstacle will resume.



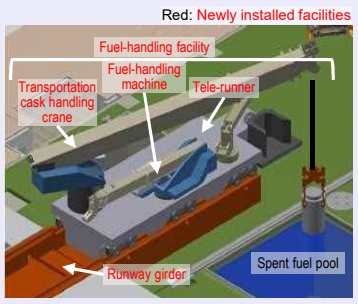
<image at the time of an event>

Unit 2 Status of examination toward fuel removal and progress status of the work

Toward starting fuel removal from FY2024~2026, the facilities including the fuel-handling facility are being designed.

To prepare a work environment on the top floor of the Reactor Building, the dose was investigated after the work on the remaining objects and measures to further reduce the dose will be examined.

Regarding the large amount of radioactive materials having adhered to the PCV head, which was specifically confirmed by the investigation of the Nuclear Regulatory Commission, preparation for fuel removal will proceed with due consideration of this issue.



<Structure of the fuel-handling facility>

Unit 3 Confirmed that lifting of all fuel assemblies was possible and fuel removal steadily continues - 553/566 fuel assemblies -

Another lifting test after removing rubble over the fuel assemblies or other work confirmed that all fuel assemblies remaining in the spent fuel pool would be liftable.

From February 3, the removal of fuel assemblies with deformed handles (18 in total) started and at present, 553 of 566 fuel assemblies have been removed.

Toward completing the removal, work will continue with safety first.

<Lifting of a fuel assembly with deformed handle>

Appendix 2

Results of analyses on the quality of the purified groundwater pumped from the sub-drain and groundwater drain systems at Fukushima Daiichi NPS (made available by TEPCO prior to discharge)

(Unit: Bq/L)

Date of sampling *Date of discharge	Detected nuclides	Analytical body	
		TEPCO	Third-party organization
February 23rd, 2021 *Discharged on February 28th	Cs-134	ND (0.76)	ND (0.84)
	Cs-137	ND (0.65)	ND (0.62)
	Gross β	ND (0.70)	ND (0.34)
	H-3	1,100	1,200
February 13th, 2021 *Discharged on February 18th	Cs-134	ND (0.72)	ND (0.79)
	Cs-137	ND (0.54)	ND (0.72)
	Gross β	ND (1.9)	ND (0.32)
	H-3	1,000	1,100
February 11th, 2021 *Discharged on February 16th	Cs-134	ND (0.82)	ND (0.58)
	Cs-137	ND (0.60)	ND (0.72)
	Gross β	ND (2.0)	ND (0.33)
	H-3	1,100	1,100
February 10th, 2021 *Discharged on February 15th	Cs-134	ND (0.67)	ND (0.61)
	Cs-137	ND (0.65)	ND (0.57)
	Gross β	ND (0.63)	ND (0.30)
	H-3	1,000	1,100
February 7th, 2021 *Discharged on February 12th	Cs-134	ND (0.45)	ND (0.55)
	Cs-137	ND (0.60)	ND (0.57)
	Gross β	ND (2.0)	ND (0.33)
	H-3	1,000	1,100
February 5th, 2021 *Discharged on February 10th	Cs-134	ND (0.76)	ND (0.46)
	Cs-137	ND (0.60)	ND (0.63)
	Gross β	ND (1.8)	ND (0.28)
	H-3	1,000	1,000
February 3rd, 2021 *Discharged on February 8th	Cs-134	ND (0.53)	ND (0.65)
	Cs-137	ND (0.60)	ND (0.51)
	Gross β	ND (1.5)	ND (0.32)
	H-3	980	1,000
February 1st, 2021 *Discharged on February 6th	Cs-134	ND (0.64)	ND (0.59)
	Cs-137	ND (0.65)	ND (0.51)
	Gross β	ND (0.61)	ND (0.32)
	H-3	1,000	1,100

January 30th, 2021 *Discharged on February 4th	Cs-134	ND (0.60)	ND (0.62)
	Cs-137	ND (0.69)	ND (0.72)
	Gross β	ND (1.7)	ND (0.32)
	H-3	1,100	1,200
January 28th, 2021 *Discharged on February 2nd	Cs-134	ND (0.76)	ND (0.61)
	Cs-137	ND (0.73)	ND (0.61)
	Gross β	ND (2.0)	ND (0.34)
	H-3	1,000	1,100
January 27th, 2021 *Discharged on February 1st	Cs-134	ND (0.63)	ND (0.70)
	Cs-137	ND (0.54)	ND (0.63)
	Gross β	ND (1.9)	ND (0.35)
	H-3	1,100	1,100

* * ND: represents a value below the detection limit; values in ( ) represent the detection limit.
* In order to ensure the results, third-party organizations have also conducted an analysis and verified the radiation level of the sampled water.
* Third-party organization : Tohoku Ryokka Kankyohozen Co., Ltd

Result of detailed analyses conducted by TEPCO, JAEA, and Japan Chemical Analysis Center (In order to confirm the validity of analysis, the Government of Japan also requests JAEA; and TEPCO requests Japan Chemical Analysis Center to conduct independent analyses)

(Unit: Bq/L)

Date of sampling	Detected nuclides	Analytical body		
		JAEA	TEPCO	Japan Chemical Analysis Center
January 2nd,2021	Cs-134	ND (0.0028)	ND (0.0047)	ND (0.0070)
	Cs-137	0.0051	0.0066	ND (0.0051)
	Gross α	ND (0.57)	ND (3.4)	ND (1.9)
	Gross β	ND (0.47)	ND (0.65)	ND (0.55)
	H-3	1,200	1,100	1,200
	Sr-90	0.0031	0.0037	0.0082

* ND: represents a value below the detection limit; values in ( ) represent the detection limit.

Appendix 4

Results of analysis on the seawater sampled near the discharge point (North side of Units 5 and 6 discharge channel)

(Unit: Bq/L)

Date of sampling	Detected nuclides	Sampling point (South discharge channel)
January 28th, 2021 *Sampled before discharge of purified groundwater.	Cs-134	ND (0.60)
	Cs-137	ND (0.69)
	Gross β	13
	H-3	ND (1.8)

(Reference)

(Unit: Bq/L)

Radionuclides	Operational Targets	Density Limit specified by the Reactor Regulation	World Health Organization (WHO) Guidelines for Drinking Water Quality
Cs-134	1	60	10
Cs-137	1	90	10
Gross α	—	—	—
Gross β	3 (1) ※	—	—
H-3	1,500	60,000	10,000
Sr-90	—	30	10

※ The operational target of Gross β is 1 Bq/L in the survey which is conducted once every ten days.

Appendix 5

Results of analyses on the water quality of the groundwater pumped up for bypassing at Fukushima Daiichi NPS (made available by TEPCO prior to discharge)

(Unit: Bq/L)

Date of sampling *Date of discharge	Detected nuclides	Analytical body	
		TEPCO	Japan Chemical Analysis Center
February 4th, 2021 *Discharged on February 12th	Cs-134	ND (0.69)	ND (0.48)
	Cs-137	ND (0.65)	ND (0.51)
	Gross β	ND (0.66)	ND (0.71)
	H-3	110	120
January 26th, 2021 *Discharged on February 5th	Cs-134	ND (0.78)	ND (0.51)
	Cs-137	ND (0.47)	ND (0.53)
	Gross β	ND (0.66)	ND (0.56)
	H-3	95	97

- * ND: represents a value below the detection limit; values in ( ) represent the detection limit
- In order to ensure the results, Japan Chemical Analysis Center, a third-party organization, has also conducted an analysis and verified the radiation level of the sampled water.

Appendix 6

Result of detailed analyses conducted by TEPCO, JAEA, and Japan Chemical Analysis Center (In order to confirm the validity of analysis, the Government of Japan also requests JAEA; and TEPCO requests Japan Chemical Analysis Center to conduct independent analyses)

(Unit: Bq/L)

Date of sampling	Detected nuclides	Analytical body		
		JAEA	TEPCO	Japan Chemical Analysis Center
January 4th, 2021	Cs-134	ND (0.0028)	ND (0.0041)	ND (0.0063)
	Cs-137	ND (0.0022)	ND (0.0044)	ND (0.0046)
	Gross α	ND (0.65)	ND (3.4)	ND (1.9)
	Gross β	ND (0.49)	ND (0.59)	ND (0.63)
	H-3	91	89	91
	Sr-90	0.0011	ND (0.0014)	ND (0.0052)

* ND: represents a value below the detection limit; values in ( ) represent the detection limit.

Results of analyses on the seawater sampled near the discharge point (Around South Discharge Channel)

(Unit: Bq/L)

Date of sampling ※conducted four times a year	Detected nuclides	Sampling point (South discharge channel)
December 3rd, 2020	Cs-134	ND (0.72)
	Cs-137	ND (0.72)
	Gross β	11
	H-3	ND (1.9)

(Reference) (Unit: Bq/L)

Radionuclides	Operational Targets	Density Limit specified by the Reactor Regulation	World Health Organization (WHO) Guidelines for Drinking Water Quality
Cs-134	1	60	10
Cs-137	1	90	10
Gross α	—	—	—
Gross β	5 (1) ※	—	—
H-3	1,500	60,000	10,000
Sr-90	—	30	10

※ The operational target of Gross β is 1 Bq/L in the survey which is conducted once every ten days.