# Information(16:00), February 28, 2023

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 January**

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 January at Fukushima Daiichi Nuclear Power Station (NPS).

1. Summary of decommissioning and contaminated water management

In January 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/mp202301.pdf

2. Sub-drain and Groundwater Drain Systems

In January purified groundwater pumped from the sub-drain and groundwater drain systems was discharged on the dates shown in Appendix 2. 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 January 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 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 3).

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 4). 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.

3. Groundwater Bypassing

In January, the pumped bypassing groundwater was discharged on the dates shown in Appendix 5. 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 January 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 6).

Moreover, TEPCO publishes analysis results on seawater sampled during the discharge operation at the nearest seawater sampling post from the discharge point (see Appendix 7). 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 Energy Cooperation Division,
Ministry of Foreign Affairs, Tel 03-5501-8227

# Outline of Decommissioning, Contaminated Water and Treated Water Management

January 26, 2023
Secretariat of the Team for Countermeasures for Decommissioning, Contaminated Water and Treated Water

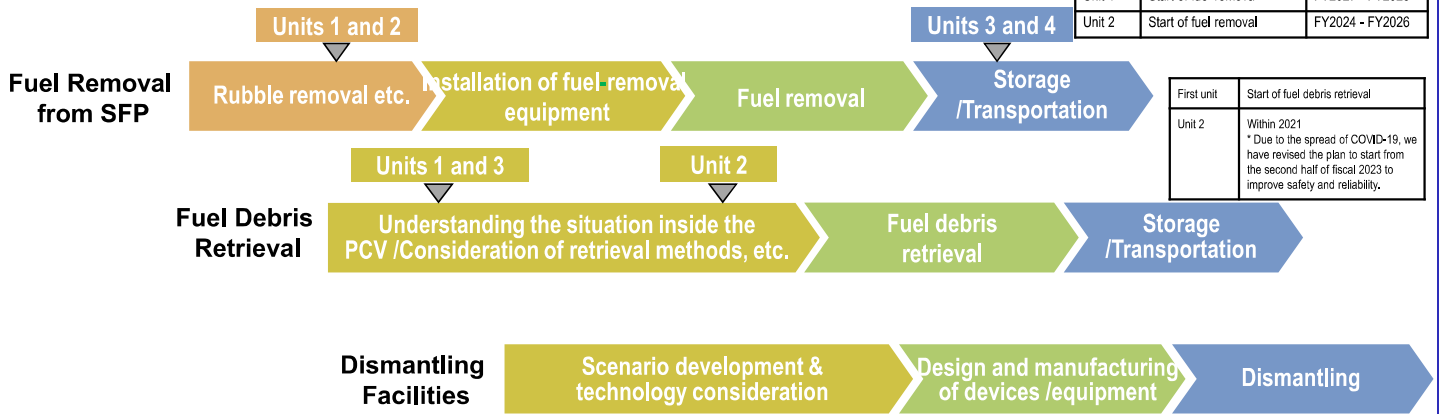
## Main decommissioning work and steps

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

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

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

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

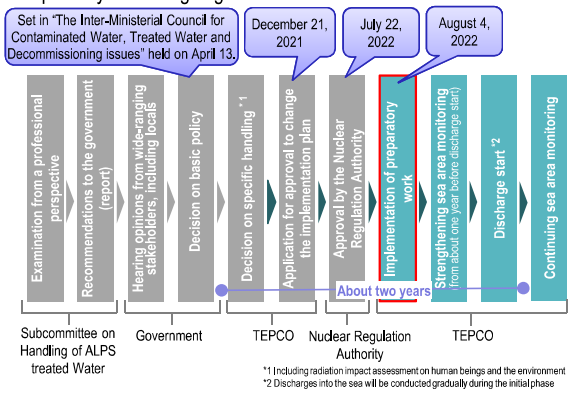



| | |
|---|---|
| First unit | Start of fuel debris retrieval |
| Unit 2 | Within 2021<br>* Due to the spread of COVID-19, we have revised the plan to start from the second half of fiscal 2023 to improve safety and reliability. |

## Measures for treated water Appendix 1

### Handling of ALPS treated water

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




## 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

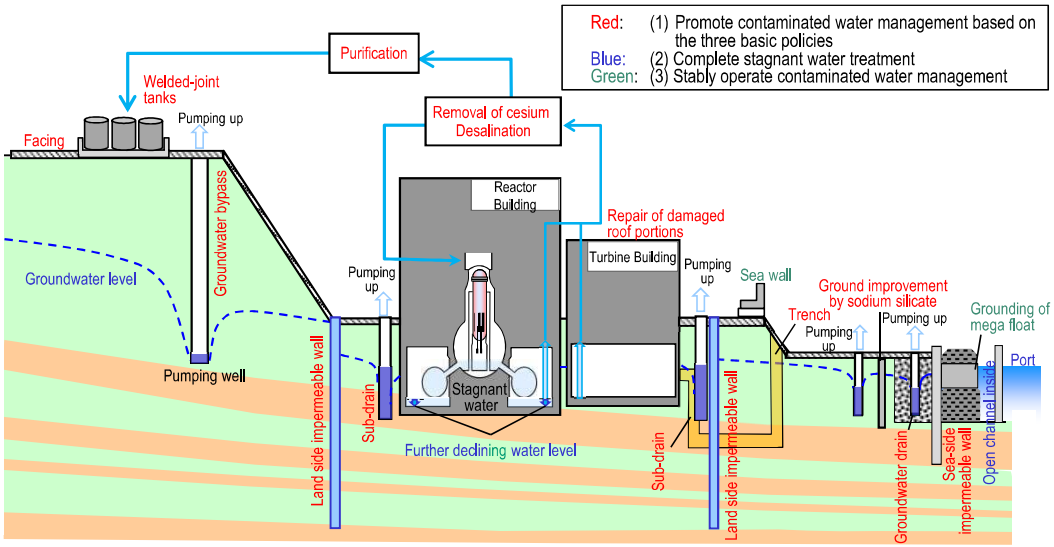
- Strontium-reduced water from other equipment is being re-treated in the Advanced Liquid Processing System (ALPS: multi-nuclide removal equipment) and stored in welded-joint tanks.
- Multi-layered contaminated water management measures, including land-side impermeable walls and sub-drains, have stabilized 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. 130 $m^3$/day (in FY2021).
- Measures continue to further suppress the generation of contaminated water to 100 $m^3$/day or less within 2025.

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

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

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

- Various measures are underway to prepare for tsunamis. For heavy rain, sandbags are being installed to suppress direct inflow into buildings while work to close openings in buildings and install sea walls to enhance drainage channels and other measures is being implemented as planned.



# Progress status

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

## The Inter-Ministerial Council concerning the Continuous Implementation of the Basic Policy on Handling of ALPS Treated Water

On January 13, 2023, the 5th meeting of the Inter-Ministerial Council concerning the Continuous Implementation of the Basic Policy on Handling of ALPS Treated Water was held and confirmed "the progress of countermeasures having been implemented and the continuous implementation of the basic policy on handling of ALPS treated water."

In future, each measure to secure safety and prevent adverse impacts on reputation will be steadily implemented and the effectiveness of these measures will be increased. Moreover, details of each measure will be repeatedly explained and dialogues will be held. Toward discharge ALPS treated water into the sea, activities to foster understanding will be further focused.

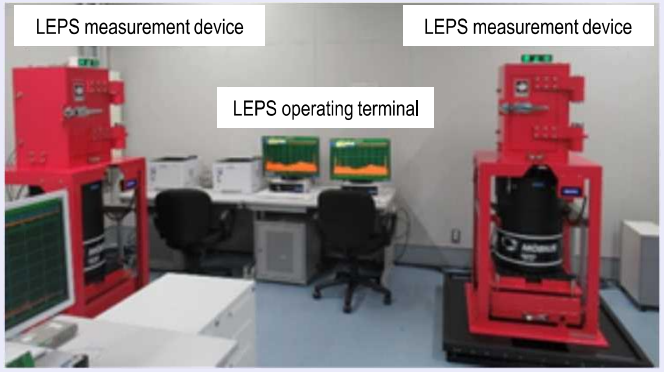
## Progress status of work to install the ALPS treated water dilution/discharge facility and related facilities

To analyze the ALPS treated water, the nuclides (other than the 62 nuclides subject to removal by ALPS) emitting low-energy radiation need also be newly analyzed. To measure these nuclides, it was decided to introduce germanium semiconductor detectors (LEPS) for low-energy photons and two detectors were installed in the chemical analysis building in December 2022.

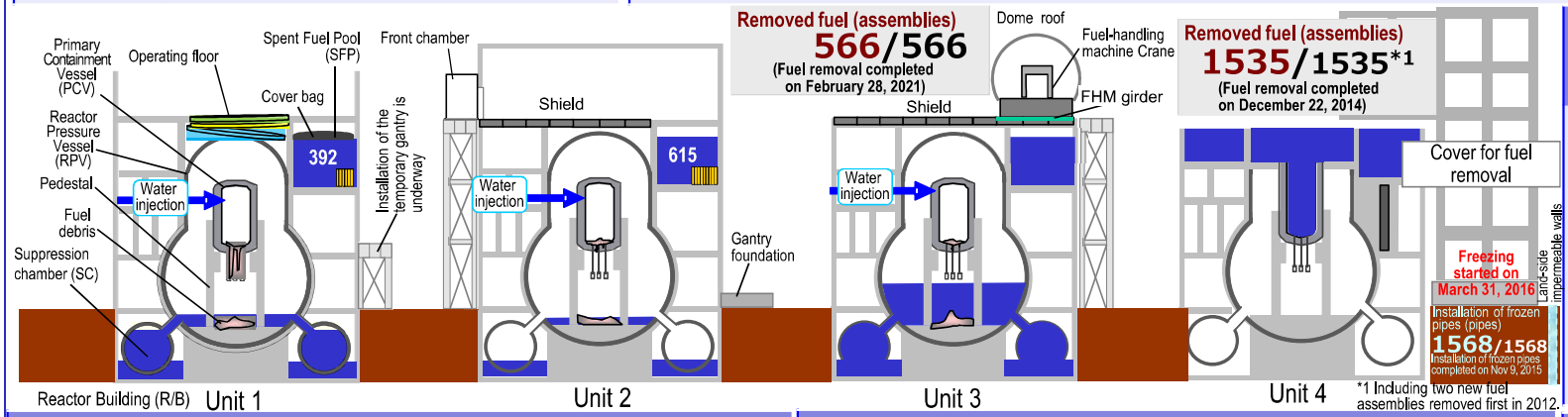
Moreover, to accurately analyze even minute amounts of tritium in seawater, it needs to be measured after being concentrated by electrolysis. In response, eight electrolytic concentrators were also supplied in December 2022.

Both types of equipment will go into operation within FY2022.

In work to install the ALPS treated water dilution/discharge facility and related facilities, the measurement/confirmation facility and the transfer facility are being installed. From January 16, the parts already installed will undergo a pre-service test.




< Installation of germanium semiconductor detectors (LEPS) for low energy photon >




*1 Including two new fuel assemblies removed first in 2012.

## Unit 1 Status of the Primary Containment Vessel (PCV) internal investigation (the latter half)

Regarding deposit sampling using ROV-E, which had been conducted since January 12, 2023, the elbow of the installation equipment did not stretch to the designated position.

Toward resuming the investigation, the ROV installation equipment was inspected, ROV-E was installed and the operation was verified.

Subsequently, event reproducibility will be verified and after preparation is completed, the investigation will resume.

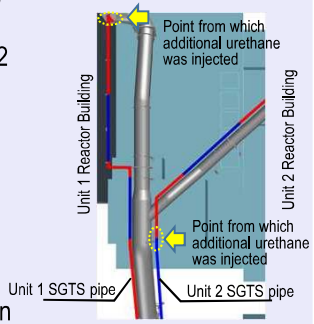
## Progress toward resuming work to remove a portion of the Unit 1/2 SGTS pipes

Toward resuming work to remove a portion of the pipes of the Standby Gas Treatment System (SGTS) in the upper part of the Unit 1/2 Radioactive Waste Treatment Building, measures to improve reliability, such as modifying the cutter and preventing oil leakage of the hydraulic hose, are being implemented.

At present, a cutting test is underway outside the site. Subsequently, a mockup test using mockup pipes, which simulates the on-site conditions as much as possible, will be conducted.

As measures to further prevent dust scattering, additional urethane will be injected in February 2023.

Work will be resumed around late February.



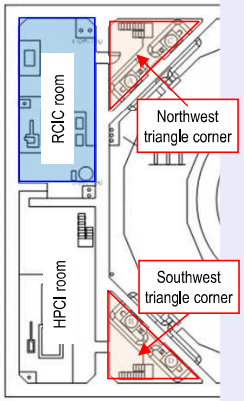

< Points from which additional urethane was injected >

## Unit 2 Investigation of the basement floor of the Reactor Building

As part of efforts to examine the access method to the Reactor Core Isolation Cooling System (RCIC) room and the High-Pressure Coolant Injection System (HPCI) room, which are located on the Unit 2 Reactor Building basement floor, the status of the triangle corners (northwest and southwest) on the first basement floor were inspected in December 2022.

The inspection confirmed that no interference was generated by equipment damage or others that might hinder entry to the RCIC and HPCI rooms, the doors to these rooms were closed and there was no significant damage within the scope that could be confirmed.

Based on the information obtained, access and investigation methods will be examined.




< Outline of the Unit 2 Reactor Building first basement floor >

## Unit 6 Review of the process to remove spent fuel

Work is underway to load spent fuel having been stored in the common pool with the dry casks and transport them on-site to the Temporary Cask Custody Area. However, when the airtightness of the dry casks was assessed, the criteria were deemed not to be satisfied.

This was considered attributable to clad (iron oxide) or calcium carbonate having adhered to the fuel. As a countermeasure, a procedure to clean every fuel assemblies before loading them into the cask was added.

Due to this change, the process to remove Unit 6 spent fuel will be reviewed to completion in the 1st half of FY2025.

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<br>*Date of discharge | Detected nuclides | Analytical body | |
|---|---|---|---|
| | | TEPCO | Third-party organization |
| January 25th, 2023<br>*Discharged on January 30th | Cs-134 | ND (0.70) | ND (0.65) |
| | Cs-137 | ND (0.80) | ND (0.55) |
| | Gross β | ND (0.71) | ND (0.34) |
| | H-3 | 950 | 1000 |
| January 23rd, 2023<br>*Discharged on January 28th | Cs-134 | ND (0.59) | ND (0.67) |
| | Cs-137 | ND (0.77) | ND (0.55) |
| | Gross β | ND (1.9) | ND (0.40) |
| | H-3 | 950 | 990 |
| January 21st, 2023<br>*Discharged on January 26th | Cs-134 | ND (0.41) | ND (0.59) |
| | Cs-137 | ND (0.54) | ND (0.57) |
| | Gross β | ND (1.8) | 0.54 |
| | H-3 | 880 | 950 |
| January 19th, 2023<br>*Discharged on January 24th | Cs-134 | ND (0.53) | ND (0.69) |
| | Cs-137 | ND (0.69) | ND (0.66) |
| | Gross β | ND (1.8) | ND (0.39) |
| | H-3 | 840 | 930 |
| January 17th, 2023<br>*Discharged on January 22nd | Cs-134 | ND (0.65) | ND (0.65) |
| | Cs-137 | ND (0.60) | ND (0.58) |
| | Gross β | ND (0.64) | ND (0.34) |
| | H-3 | 820 | 890 |
| January 15th, 2023<br>*Discharged on January 20th | Cs-134 | ND (0.45) | ND (0.65) |
| | Cs-137 | ND (0.73) | ND (0.58) |
| | Gross β | ND (1.8) | ND (0.31) |
| | H-3 | 850 | 870 |
| January 13th, 2023<br>*Discharged on January 18th | Cs-134 | ND (0.68) | ND (0.62) |
| | Cs-137 | ND (0.60) | ND (0.54) |
| | Gross β | ND (2.0) | ND (0.34) |
| | H-3 | 810 | 890 |
| January 11th, 2023 | Cs-134 | ND (0.53) | ND (0.67) |

| | | | |
|---|---|---|---|
| *Discharged on January 16th | Cs-137 | ND (0.65) | ND (0.58) |
| | Gross β | ND (2.1) | ND (0.34) |
| | H-3 | 840 | 860 |
| January 9th, 2023 *Discharged on January 14th | Cs-134 | ND (0.55) | ND (0.69) |
| | Cs-137 | ND (0.65) | ND (0.66) |
| | Gross β | ND (0.58) | ND (0.33) |
| | H-3 | 820 | 830 |
| January 7th, 2023 *Discharged on January 12th | Cs-134 | ND (0.63) | ND (0.67) |
| | Cs-137 | ND (0.65) | ND (0.41) |
| | Gross β | ND (1.6) | ND (0.34) |
| | H-3 | 760 | 780 |
| January 5th, 2023 *Discharged on January 10th | Cs-134 | ND (0.46) | ND (0.50) |
| | Cs-137 | ND (0.69) | ND (0.58) |
| | Gross β | ND (1.8) | ND (0.34) |
| | H-3 | 720 | 760 |
| January 3rd, 2023 *Discharged on January 8th | Cs-134 | ND (0.60) | ND (0.55) |
| | Cs-137 | ND (0.65) | ND (0.49) |
| | Gross β | ND (1.9) | 0.42 |
| | H-3 | 790 | 840 |
| January 1st, 2023 *Discharged on January 6th | Cs-134 | ND (0.53) | ND (0.57) |
| | Cs-137 | ND (0.65) | ND (0.77) |
| | Gross β | ND (0.62) | ND (0.33) |
| | H-3 | 840 | 870 |
| December 30th, 2022 *Discharged on January 4th | Cs-134 | ND (0.63) | ND (0.54) |
| | Cs-137 | ND (0.65) | ND (0.55) |
| | Gross β | ND (2.0) | ND (0.36) |
| | H-3 | 870 | 950 |
| December 28th, 2022 *Discharged on January 2nd | Cs-134 | ND (0.66) | ND (0.62) |
| | Cs-137 | ND (0.60) | ND (0.49) |
| | Gross β | ND (1.9) | ND (0.33) |
| | H-3 | 810 | 860 |

* * 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

Appendix 3

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 |
| December 1st,2022 | Cs-134 | ND (0.0030) | ND (0.0047) | ND (0.0061) |
| | Cs-137 | 0.0028 | ND(0.0043) | ND (0.0056) |
| | Gross α | ND (0.39) | ND (3.8) | ND (2.2) |
| | Gross β | ND (0.47) | ND (0.73) | ND (0.51) |
| | H-3 | 700 | 690 | 700 |
| | Sr-90 | ND (0.0093) | 0.0026 | 0.0063 |

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

(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.

※ The reference table shows the values of operational targets before discharge. Since the values after discharge contain natural radioactive materials in seawater, there will be differences between the values and the operational targets values.

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) |
|---|---|---|
| December 8th, 2022<br>*Sampled before discharge of purified groundwater. | Cs-134 | ND (0.66) |
| | Cs-137 | ND (0.79) |
| | Gross β | 11 |
| | H-3 | ND (0.30) |

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<br>*Date of discharge | Detected nuclides | Analytical body | |
|---|---|---|---|
| | | TEPCO | Third-party organization |
| January 27th, 2023<br>*Discharged on February 1st | Cs-134 | ND (0.53) | ND (0.71) |
| | Cs-137 | ND (0.87) | ND (0.61) |
| | Gross β | ND (0.63) | ND (0.34) |
| | H-3 | 55 | 54 |
| January 26th, 2023<br>*Discharged on January 31st | Cs-134 | ND (0.70) | ND (0.55) |
| | Cs-137 | ND (0.65) | ND (0.54) |
| | Gross β | ND (0.75) | ND (0.34) |
| | H-3 | 45 | 53 |
| January 20th, 2023<br>*Discharged on January 25th | Cs-134 | ND (0.53) | ND (0.68) |
| | Cs-137 | ND (0.65) | ND (0.57) |
| | Gross β | ND (0.65) | ND (0.34) |
| | H-3 | 56 | 54 |
| January 13th, 2023<br>*Discharged on January 20th | Cs-134 | ND (0.81) | ND (0.79) |
| | Cs-137 | ND (0.60) | ND (0.54) |
| | Gross β | ND (0.69) | ND (0.31) |
| | H-3 | 43 | 54 |
| January 7th, 2023<br>*Discharged on January 12st | Cs-134 | ND (0.57) | ND (0.69) |
| | Cs-137 | ND (0.73) | ND (0.52) |
| | Gross β | ND (0.59) | ND (0.35) |
| | H-3 | 57 | 56 |
| December 31st, 2022<br>*Discharged on January 6th | Cs-134 | ND (0.58) | ND (0.62) |
| | Cs-137 | ND (0.69) | ND (0.54) |
| | Gross β | ND (0.63) | ND (0.33) |
| | H-3 | 54 | 60 |

- * 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

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 |
| December 3rd, 2022 | Cs-134 | ND (0.0029) | ND (0.0047) | ND (0.0066) |
| | Cs-137 | ND (0.0022) | ND (0.0041) | ND (0.0049) |
| | Gross α | ND (0.71) | ND (3.0) | ND (2.2) |
| | Gross β | ND (0.55) | ND (0.69) | ND (0.52) |
| | H-3 | 62 | 60 | 62 |
| | Sr-90 | 0.0027 | ND (0.0016) | ND (0.0066) |

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

(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.

※ The reference table shows the values of operational targets before discharge. Since the values after discharge contain natural radioactive materials in seawater, there will be differences between the values and the operational targets values.

Appendix 7

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

(Unit: Bq/L)

| Date of sampling<br>※conducted four times a year | Detected nuclides | Sampling point<br>(South discharge channel) |
|---|---|---|
| December 8th, 2022 | Cs-134 | ND (0.60) |
| | Cs-137 | ND (0.54) |
| | Gross β | 12 |
| | H-3 | ND (0.30) |