

Fukushima Daiichi Nuclear Power Station

Commencement of the fourth discharge for FY2023

< Reference document >
February 28, 2024
Tokyo Electric Power Company Holdings, Inc.
Fukushima Daiichi Decontamination and
Decommissioning Engineering Company

- During the first three discharges, we have taken samples from the seawater pipe every day to measure tritium concentration in order to confirm that tritium is being suitably diluted. As a result, we have been able to confirm that the analysis values are approximately equal to the calculated concentrations, and less than 1,500Bq/liter.
- For seawater, tritium analysis has been conducted every day with the detection limit increased to about 10 Bq/liter, in order to quickly obtain tritium concentration results. As a result, we have confirmed that the analysis values are below both the discharge suspension level (700 Bq/liter) and the investigation level (350 Bq/liter).
- From the performances of first three discharges, we have confirmed that the dilution at the seawater pipe header has been conducted as designed, and that there is no significant difference between the calculated values and measured values of tritium concentration after dilution, we will temporarily cease the two-stage discharge. From the fourth discharge onwards, we will conduct the two-stage discharge once a year for the time being, to confirm the current status of facilities, which have been able to conduct the discharge smoothly, remains unchanged.
- We have confirmed that analysis results of the samples taken last December for the tank group B at the measurement and confirmation facility, including analysis by external agencies, have met government's regulatory standards.

<Announced by February 26>

- Yesterday (February 27), we confirmed that two seawater transfer pumps were started up sequentially and the rated flow was reached.
- Today (February 28), the ALPS treated water transfer pumps were started up and the discharge into the sea commenced at 11:11 AM.
- During the discharge period, water samples will be taken from the seawater pipe to confirm that tritium is being suitably diluted. In addition, in order to confirm that the tritium concentration is below the discharge suspension level (700Bq/liter*) and the investigation level (350Bq/liter*), we will take seawater samples from 10 locations within 3km of the power station and other locations, and perform seawater tritium analyses with an increased detection limit of approximately 10Bq/liter (refer to slide 5 and 6). Analysis results for all the water samples will be publicly disclosed as soon as they are obtained.
- We will continue to engage in this process with the utmost vigilance to ensure that there are no unintentional discharge of ALPS treated water into the sea.

*Indices for sea area monitoring within 3 km of the power station

[Reference] Today's completed tasks

- 11:11AM Commenced ALPS treated water transfer procedure
- 11:26AM Confirmed that there are no abnormalities in the field

[Reference] FY2023 Discharge Plan

- Transfer of ALPS treated water from the K4 tank area group E and K3 area group A to the measurement/confirmation facility group B was completed on December 11, 2023.
- Agitation/circulation commenced on December 15, and samples were taken on December 22.
- The collected samples are currently being analyzed. The 4th discharge is scheduled to commence in late February.

Management number*3

23-1-1	Measurement/confirmation facility (K4 area) Group B:	Approx. 7,800m ³	Secondary treatment: No Tritium concentration: 140,000Bq/liter Total amount of tritium: 1.1 trillion Bq	Completed
23-2-2	Measurement/confirmation facility (K4 area) Group C:	Approx. 7,800m ³	Secondary treatment: No Tritium concentration: 140,000Bq/liter Total amount of tritium: 1.1 trillion Bq	Completed
23-3-3	Measurement/confirmation facility (K4 area) Group A:	Approx. 7,800m ³	Secondary treatment: No Tritium concentration: 130,000Bq/liter Total amount of tritium: 1.0 trillion Bq	Completed
23-4-4	K4 area Group E (Transferred to Measurement/confirmation facility group B *2): K3 area Group A (Transferred to Measurement/confirmation facility group B *2):	Approx. 4,500m ³ Approx. 3,300m ³	Secondary treatment: No Tritium concentration: 170,000~210,000Bq/liter *1 Total amount of tritium: 1.4 trillion Bq *1	Details on the next page

➔ Total amount of tritium discharged during FY2023: Approx. **5 trillion Bq**

*3 The management number is made up of the fiscal year, followed by the discharge number for that fiscal year, and the total number of discharges to date. For example, "24-1-5" indicates that the data is for the first discharge of 2024, which is the fifth discharge to date.

*1 Average value of the tank group that was assessed taking into account the radioactive decay until July 1, 2023

*2 To be transferred to K4 area tank group B that will be empty after the 1st discharge is completed

Outline of discharge for group K4-B



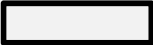
Attributes of the treated water	Concentration of the 29 types of radionuclides (excluding tritium) in scope of measurement/evaluation	Within regulatory requirements (sum of the ratios of legally required concentrations of radioactive substances is less than 1) (sum of the ratios of concentration: 0.34*)	(details on p1 of the link)
	Tritium concentration	170,000Bq/liter*	(details on p2 of the link)
	Concentration of the 39 significant types of radionuclides measured voluntarily	No significant radionuclides identified	(details on p3 of the link)
	Status of water quality assessment	Within government and prefectural requirements	(details on p4 of the link)
	Water temperature	Same as outdoor temperature. After diluted to approximately 740 times, same as sea water temperature (not the same as plant's thermal discharge)	
Expected volume of treated water discharge		Approximately 7,800m ³	
Treated water flow rate		Approximately 460m ³ /day (set not to exceed designed maximum on 500m ³ /day)	
Dilution sea water flow rate		Approximately 340,000m ³ /day (same speed as walking in the tunnel [approximated 1m/second])	
Concentration of tritium after dilution		Approximated 230Bq/liter	
Term of discharge		Approximately 17 days	



* Comparison of concentrations before/after sea water dilution

	Before dilution	After dilution (740 times)	
29 types	0.34	0.00046	} 0.0043 (1/230 of government requirements)
Tritium	2.83	0.0038	

[Reference] Future monitoring plan for quick tritium measurements

	A total of 4 locations ^{※1} in the vicinity of the discharge outlet 	Other 6 locations  
During the discharge period and for one week following the completion of discharge	Quick measurements : Conduct daily ^{※2} (Normal measurement: Conduct once a week)	Quick measurements : Conduct twice a week (Normal measurement: Conduct once a week)
Outside the discharge period (Excluding one week following the completion of discharge)	Quick measurements : Conduct once a week (Normal measurement: Conduct once a week)	Quick measurements : Conduct once a month (Normal measurement: Conduct once a week)

※1 Selected considering 3 monitoring points conducted by Ministry of the Environment in the vicinity of the discharge outlet, detection performance of monitoring conducted by TEPCO, and direction of ocean current.

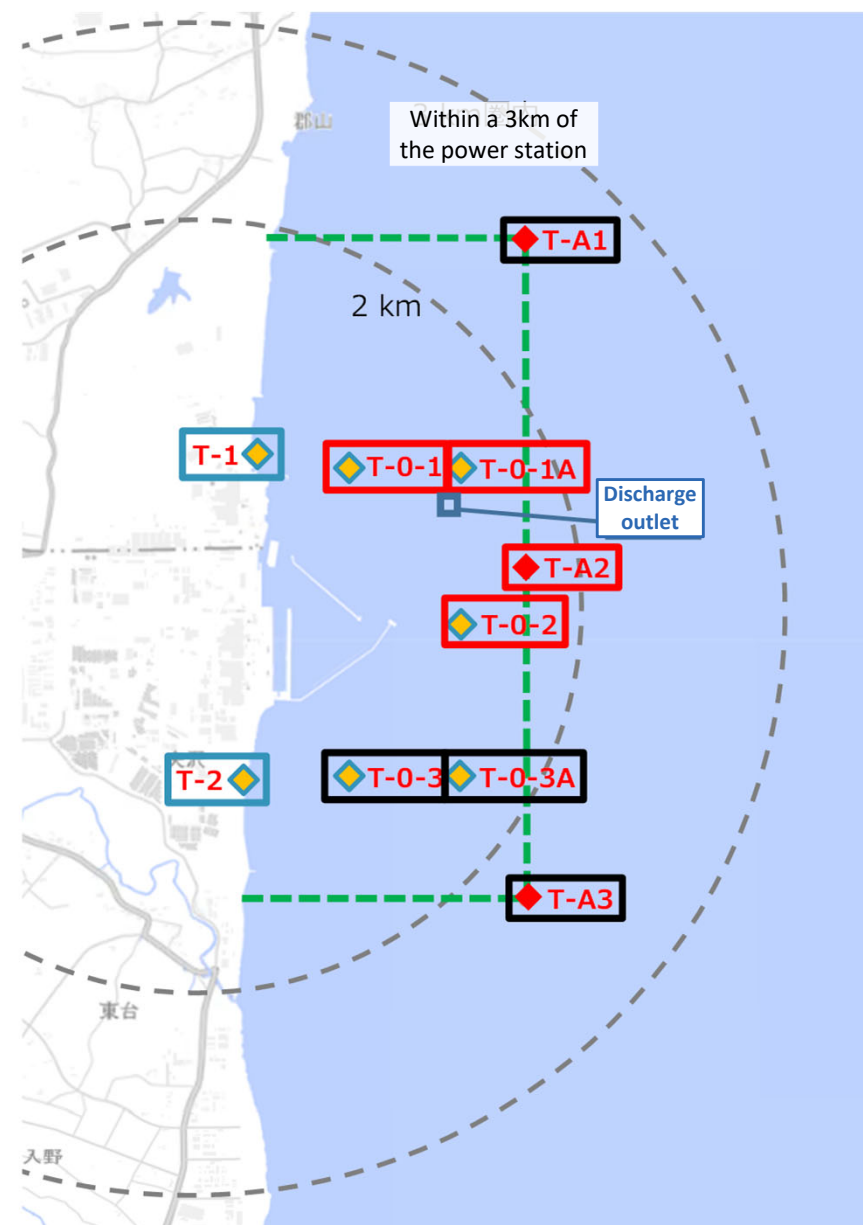
※2 If two days are missed because of bad weather condition during the discharge period, and it is predicted that measurements will not be able to be taken the next day either (third day in a row), quick tritium measurement will be conducted at T-1 and T-2 on the third day.

Quick measurement : Analysis performed with a detection limit of 10Bq/liter in order to quickly confirm that the discharged water is dispersing from the discharge outlet as anticipated after leaving the discharge outlet.

Normal measurement: Analysis performed with a detection limit of 0.4Bq/liter (once a week), and 0.1Bq/liter (once a month) in accordance with the government's Comprehensive Radiation Monitoring Plan.

Note) The same specimen may be used for both quick measurements and normal analysis

- During the analysis of samples from the other 6 locations, this plan may be revised if
 - ✓ Tritium is detected during quick measurements
 - ✓ Concentrations that exceed detection limits for quick measurements are detected during normal analysis

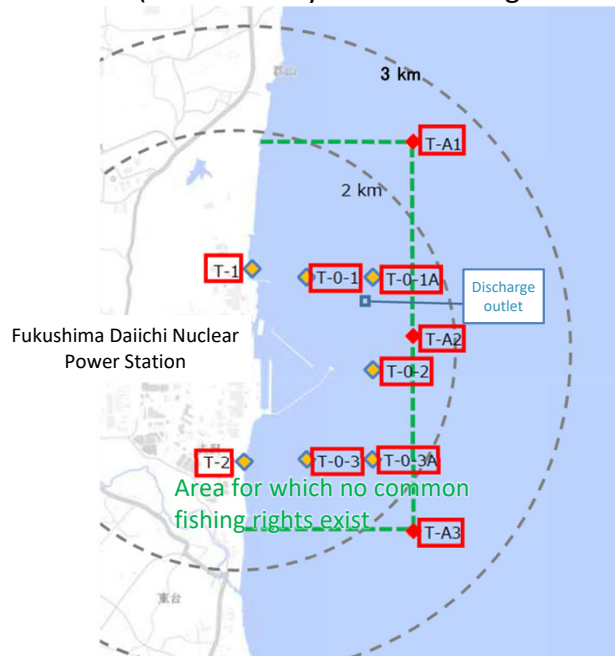


[Reference] Monitoring plans for quick tritium measurements

- Seawater tritium analysis is implemented once a week at all points on Figures 1 and 2 below, with the detection limit set to 0.1-0.4Bq/liter.
- In addition, quick tritium measurements with the detection limit set to 10Bq/liter will be implemented at the locations outlined in the red frames in Figures 1 and 2 below. In the case "discharge suspension level" indicators are exceeded, the discharge into the sea will be suspended.
- After the commencement of the discharge, in light of the monitoring frequency outlined by the various organizations within the Comprehensive Monitoring Plan, frequency of quick tritium measurements specifically near the discharge outlets shown in Figure 1 will be increased from once a week to everyday for the time being.

To be revised

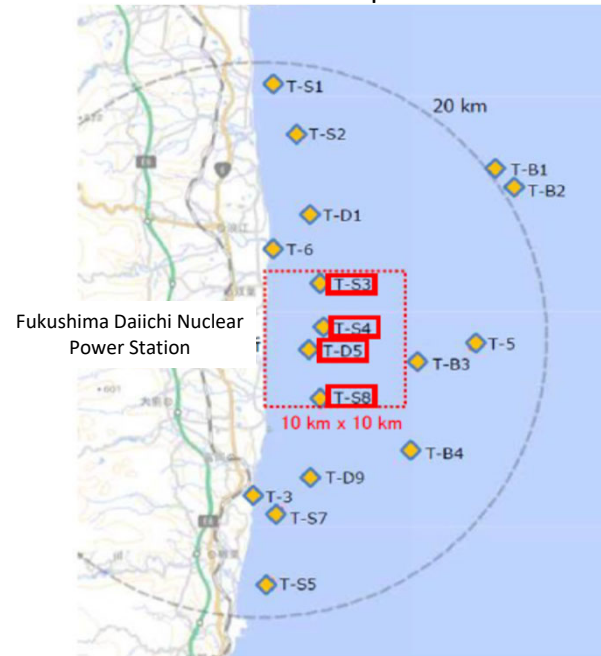
Figure 1. Sampling locations within a 3km radius of the power station (in the vicinity of the discharge outlet)



 : Monitoring locations for measurements to obtain results quickly (10 locations)
Indicator (discharge suspension level): 700Bq/liter
 Analysis frequency: once a week → **Every day for the time being**

Remains the same

Figure 2. Sampling locations within a 10km square in front of the power station



 : Monitoring locations for measurements to obtain results quickly (4 locations)
Indicator (discharge suspension level): 30Bq/liter
 Analysis frequency: Once a week (T-D5),
 Once a month (T-S3, T-S4, T-S8)