

Fukushima Daiichi Nuclear Power Station

Commencement of the discharge of ALPS treated water into the sea (first discharge in FY2024)

< Reference document >
April 19, 2024
Tokyo Electric Power Company Holdings, Inc.
Fukushima Daiichi Decontamination and
Decommissioning Engineering Company

- We have confirmed that analysis results of the samples taken in February for the tank group C at the measurement and confirmation facility, including analysis by external agencies, have met government's regulatory standards. Therefore, we are planning to commence the discharge of ALPS treated water from the measurement/confirmation facility tank group C (first discharge in FY2024) from April 19, 2024.
- During the first four discharges in FY2023, 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 regularly 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).

<Announced by April 17>

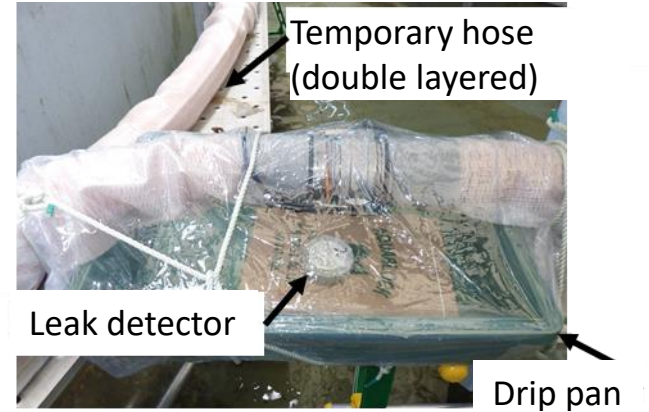
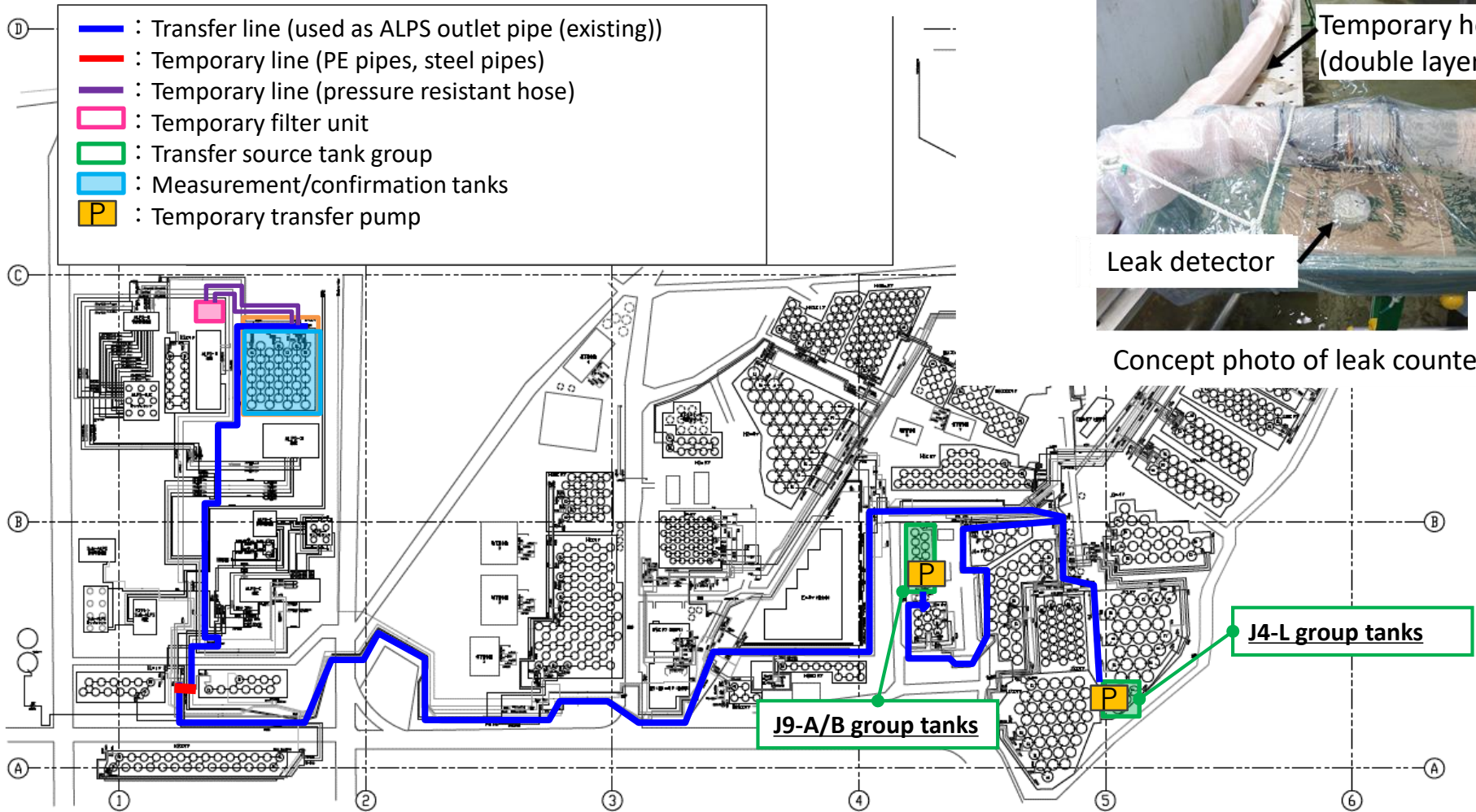
- Yesterday (April 18), we confirmed that two seawater transfer pumps were started up sequentially and the rated flow was reached.
- Today (April 19), the ALPS treated water transfer pumps were started up and the discharge into the sea commenced at 11:14 AM.
- During the discharge period, water samples 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 7 and 8). 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

- 11:14AM Commenced ALPS treated water transfer procedure
- 11:42AM Confirmed that there are no abnormalities in the field

[Reference] Transfer of ALPS treated water in preparation for the first discharge in FY2024

- Transfer of ALPS treated water from K3 area Group A/B and J4 area Group L to measurement/confirmation facility tank group C in preparation for the first discharge in FY2024 has been conducted (Transfer was completed on February 16. Agitation/circulation commenced on February 22, and samples were taken on February 29.).



Concept photo of leak countermeasures



[Reference] FY2024 discharge plan (1/2)

- The FY2024 discharge plan is as follows: There will be seven discharges during the year that will result in an annual discharge of approximately 54,600m³ of treated water and an annual tritium discharge volume of approximately 14 trillion Bq.
- ALPS treated water generated daily during FY2024 shall be stored in tanks that have been emptied by transferring the water in them to the measurement/confirmation facility (excluding the J9 area in which the tanks will be dismantled)

Management number*1		Amount of water to be transferred*2		Discharge period
24-1-5	K3 area Group A/B (Transferred to Measurement/confirmation facility group C)	: <u>Approx. 4,510m³</u>	Secondary treatment: No Tritium concentration : 180,000-200,000 Bq/liter*3 Total amount of tritium: 1.5 trillion Bq	April-May
	J4 area Group L (Transferred to Measurement/confirmation facility group C)	: <u>Approx. 3,240m³</u>		
24-2-6	J4 area Group L (Transferred to Measurement/confirmation facility group A)	: <u>Approx. 2,030m³</u>	Secondary treatment: No Tritium concentration : 170,000-190,000 Bq/liter*3 Total amount of tritium: 1.4 trillion Bq	May-June
	J9 area Group A/B (Transferred to Measurement/confirmation facility group A)	: <u>Approx. 5,710m³</u>		
24-3-7	J9 area Group A/B (Transferred to Measurement/confirmation facility group B)	: <u>Approx. 1,800m³</u>	Secondary treatment: No Tritium concentration : 160,000-180,000 Bq/liter*3 Total amount of tritium: 1.3 trillion Bq	June-July
	K1 area Group C/D (Transferred to Measurement/confirmation facility group B)	: <u>Approx. 6,000m³</u>		
24-4-8	K1 area Group C/D (Transferred to Measurement/confirmation facility group C)	: <u>Approx. 4,700m³</u>	Secondary treatment: No Tritium concentration : 160,000~310,000 Bq/liter*3 Total amount of tritium: 1.7 trillion Bq	July-August
	G4 south area Group C (Transferred to Measurement/confirmation facility group C)	: <u>Approx. 3,100m³</u>		

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*1 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.

*2 Underlined texts indicate actual results.

*3 Average value of the tank group that was assessed taking into account the radioactive decay until April 1, 2024

[Reference] FY2024 discharge plan (2/2)

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Management number*1		Amount of water to be transferred		Discharge period
24-5-9	G4 south area Group C (Transferred to Measurement/confirmation facility group A)	: Approx. 6,700m ³	Secondary treatment: No Tritium concentration : 300,000~350,000 Bq/liter ※2 Total amount of tritium: 2.4 trillion Bq	August-September
	G4 south area Group A (Transferred to Measurement/confirmation facility group A)	: Approx. 1,100m ³		
24-6-10	G4 south area Group A (Transferred to Measurement/confirmation facility group B)	: Approx. 7,800m ³	Secondary treatment: No Tritium concentration : 340,000~350,000 Bq/liter ※2 Total amount of tritium: 2.7 trillion Bq	September-October
Inspection suspension (including full inspections of measurement/confirmation facility Group B)				
24-7-11	G4 south area Group A (Transferred to Measurement/confirmation facility group C)	: Approx. 800m ³	Secondary treatment: No Tritium concentration : 340,000~400,000 Bq/liter ※2 Total amount of tritium: 3.0 trillion Bq	February-March
	G4 south area Group B (Transferred to Measurement/confirmation facility group C)	: Approx. 7,000m ³		

➔ Total amount of tritium to be discharged during FY2024 : Approx. **14 trillion Bq**

*1 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.

*2 Average value of the tank group that was assessed taking into account the radioactive decay until April 1, 2024




[Reference] Outline of the first discharge in FY2024

(Management Number: 24-1-5)

Outline of discharge for group K4-C

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: 0.31) (details on p1 of the link)	
	Tritium concentration	190,000Bq/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 740 times (design dilution factor), 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	Approximately 260Bq/liter		
Term of discharge	Approximately 17 days		

[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.

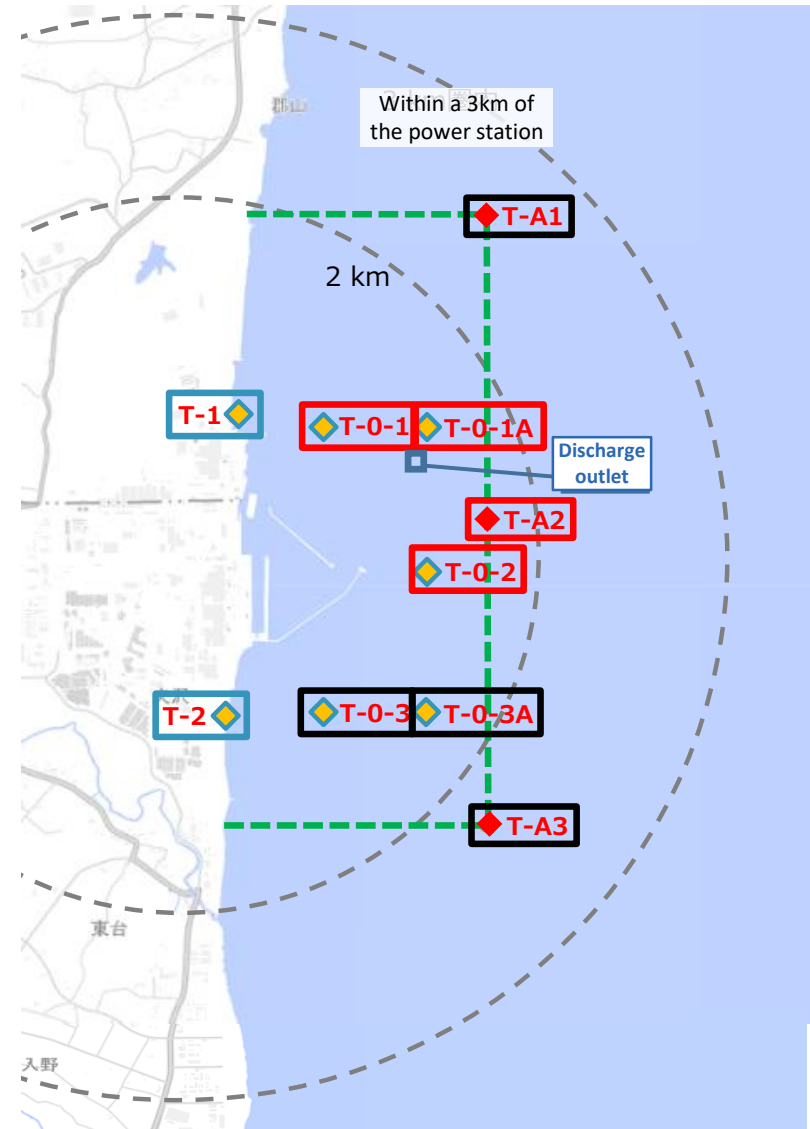
※2 If two days are missed because of bad weather condition during the discharge period, and it is predicted that measurements will not be able to be taken the next day either (third day in a row), quick tritium measurement will be conducted at T-1 and T-2 on the third day.

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

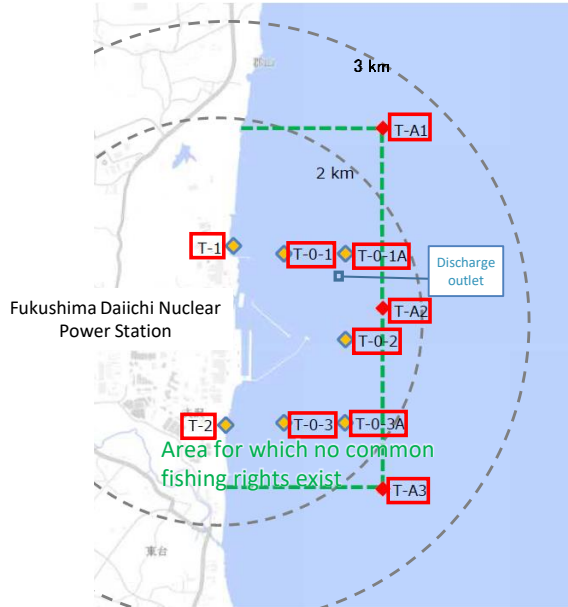


[Reference] Monitoring plans for quick tritium measurements

- 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

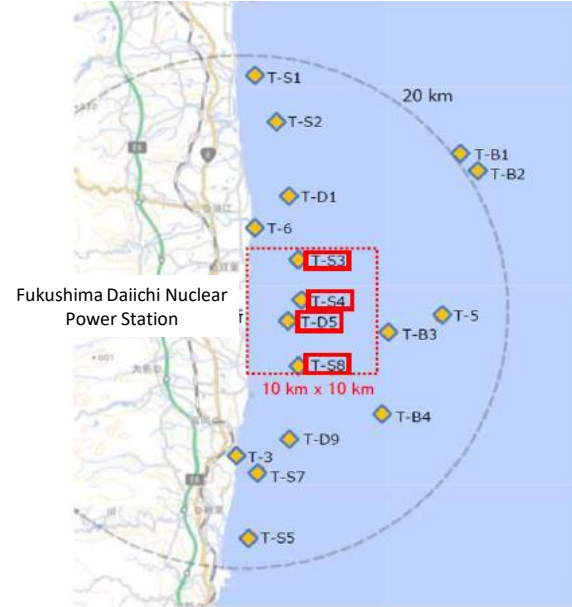
Figure 1. Sampling locations within a 3km radius of the power station (in the vicinity of the discharge outlet)



: 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)