# **ALPS Treated Water Discharge Status Update**



February 27, 2025

Tokyo Electric Power Company Holdings, Inc.



- 1. Monitoring history regarding discharge
- 2. Status of the facility inspection
- 3. Commencement of the dismantling of the J9 area tanks
- 4. Transfer of ALPS treated water in preparation for the future discharges
- 5. Information on the next discharge (management number: 24-7-11)

<sup>\*</sup> 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, "24-7-11" indicates that the data is for the seventh discharge of 2024, which is the eleventh discharge to date.



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# 1-1. Sea area monitoring history



After the completion of the discharge of management number 24-6-10, measurement results of tritium concentrations measured in quick tritium measurements to quickly check the dispersion in water sampled at 10 locations in the vicinity of the discharge outlet (within 3km of the power station) and 4 locations outside of the vicinity of the discharge outlet (within a 10km square in front of the power station) are all below indices (discharge suspension level and investigation level).

(Unit: Bq/liter)

	Compling location	Fra guida au	January	February 2025					
	Sampling location	Frequency	29	3	5	10	17		
	T-1	Twice a week*1	_	<7.1	_	_	_		
	T-2	Twice a week*1	_	<7.2	_	_	_		
	T-0-1	Once a day*2	<7.6	<7.2	1	<8.1	<7.2		
	T-0-1A	Once a day*2	<7.3	<5.9	1	<8.1	<7.2		
In the vicinity	T-0-2	Once a day*2	<7.6	<5.9	1	<8.1	<7.1		
of the discharge outlet	T-0-3A	Twice a week*1	_	<5.8	_	_	_		
	T-0-3	Twice a week*1	-	<5.8	1	1	_		
	T-A1	Twice a week*1	-	<6.1	1	1	_		
	T-A2	Once a day*2	<7.2	<6.1	1	<5.9	<5.9		
	T-A3	Twice a week*1	_	<6.1	1	1	_		
Outside the vicinity of the discharge outlet	T-D5	Once a week	<7.7	<7.1	_	<5.9	<5.9		
	T-S3	Once a month	_	_	_	_			
	T-S4	Once a month	_						
<u> </u>	T-S8	Once a month	_	_	<5.9	_	_		

<sup>\*</sup>X: A "less than" symbol (<) indicates that the analysis result was less than the detection limit indicates that the detected value

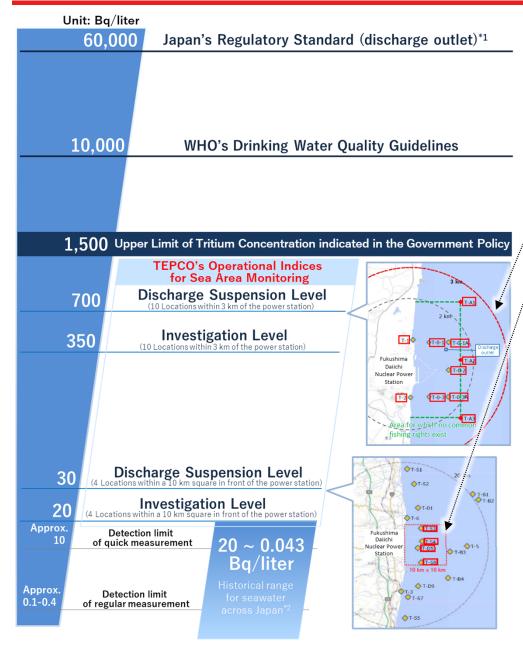
<sup>\*1:</sup> Conduct twice a week during the discharge period and for once a week following the completion of discharge. Conduct once a week outside the discharge period, excluding one week following the completion of discharge

<sup>\*2:</sup> Conduct once a week during the discharge period and once a week following the completion of discharge. Conduct once a month outside the discharge period, excluding one week following the completion of discharge

<sup>\*3:</sup> For sampling locations, refer to "[Reference] Measurement monitoring plan"

# [Reference] Comparison of tritium concentration in seawater





<sup>\*1:</sup> This standard has been stipulated based on the calculation that if a person were to drink approximately 2L of the water coming out of the discharge outlet of a nuclear facility every day for one year, his/her exposure would be 1mSv.

We have set a discharge suspension level and an investigation level as TEPCO's operational indices.

	Discharge suspension level	Investigation level
Within 3km of the power station	700 Bq/L	350 Bq/L
Within a 10km square in front of the power station	30 Bq/L	20 Bq/L

If the discharge suspension level is exceeded, the sea discharge will be immediately suspended.

If the investigation level is exceeded, facilities/operation status will be inspected and the frequency of monitoring will be increased as necessary.

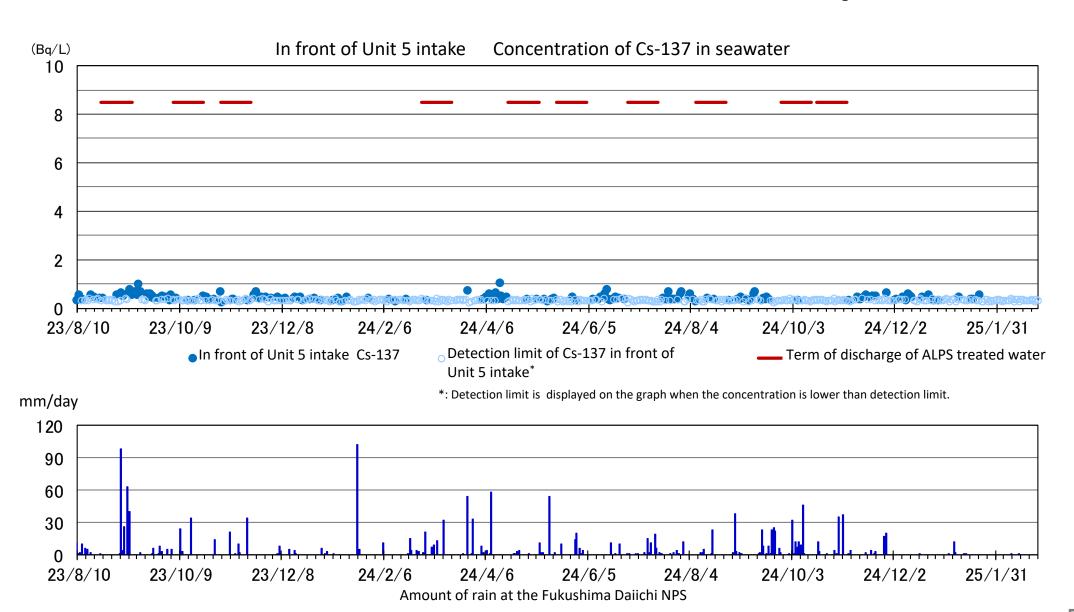
- Even if the tritium concentration exceeds indices (Discharge suspension level and Investigation level), the levels are well below the Japan's regulatory standard of 60,000 Bq/L and the WHO's drinking water quality guidelines of 10,000 Bq/L, and we assess that the surrounding sea areas are still safe.
- It is expected that the concentration of tritium in seawater will be affected depending on the concentration of tritium in the treated water to be released in the future, and higher values than before will be detected. Even in such cases, it is evaluated that the concentration will remain below the investigation level and other indices.

<sup>\*2:</sup> Source: Environmental Radioactivity and Radiation in Japan (Period: April 2019 to March 2022)

# 1-2. Unit 5 intake channel monitoring



Sea water monitoring results at near the intake for seawater to be used for dilution during the discharge of ALPS treated water have confirmed that values are similar to those outside of the term of the discharge.

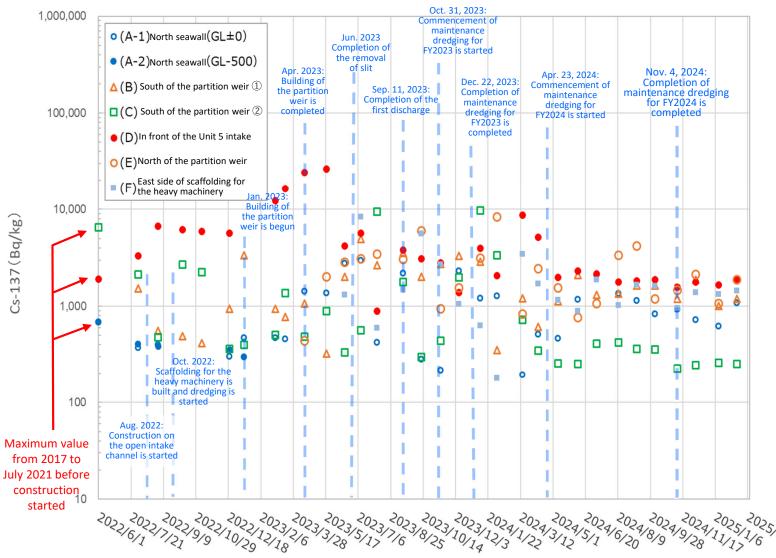


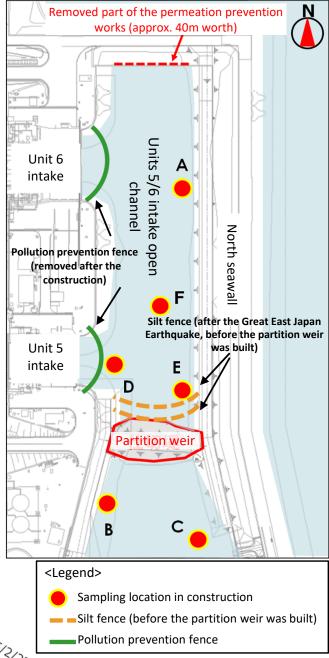
# 1-3. Monitoring results for seabed soil inside the Unit 5/6 intake open channel (1)



Monitoring results for seabed soil in front of Unit 5 intake did not show significant fluctuations from the beginning of construction at the intake open channel until December 2022. While they showed higher readings after January 2023, we have confirmed that these readings decreased after the completion of silt removal.

We will continue to monitor the seabed soil.

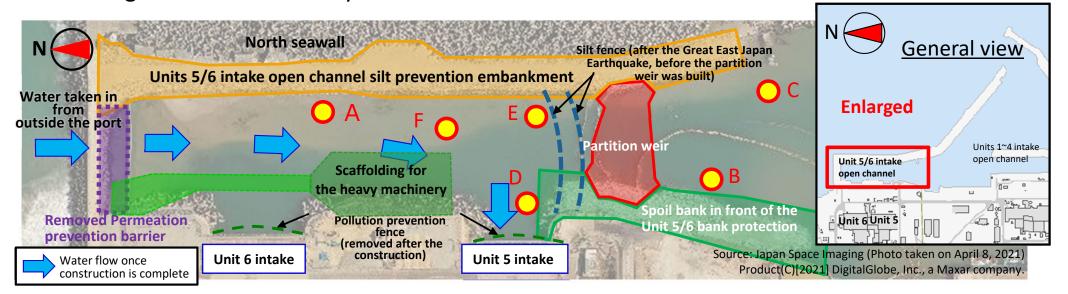




# 1-3. Monitoring results for seabed soil inside the Unit 5/6 intake open channel (2)



The following shows monitoring results for seabed soil inside the unit 5/6 intake open channel from August 2022 to February 2025.



Compling points		Before construction	FY2022	2023		2024						2025						
Sampling points		2017 to July 2021	Aug. ~ Mar.	Apr. ~ Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.
5/6 open channel	Cs-134	4.4~52.3	31.5~39.8	32.0~69.5	44.5	51.1	34.6	34.4	34.8	53.6	51.4	40.4	59.0	64.5	38.1	57.6	37.4	45.4
	Cs-137	163.6~678.6	303.2~468.1	216.7~2975.0	1,210.0	1,270.0	195.2	510.4	461.7	1,169.0	2,107.0	1,337.0	1,135.0	826.2	922.9	725.1	615.9	1,079.0
A-2 North side of the Unit 5/6 Open channel	Cs-134	14.4~58.5	32.5~38.3	-	XOnly campled from the surface (CL + 0m) since cand was removed during dradging													
North side of the silt fence (GL-0.5m)	Cs-137	310.0~689.8	299.1~404.0	-	$lopha$ Only sampled from the surface (GL $\pm$ 0m) since sand was removed during dredging													
partition weir	Cs-134	723.0	34.5~65.6	48.8~97.1	75.2	38.2	52.8	35.1	50.6	48.1	39.7	58.2	55.7	64.5	42.5	57.6	39.4	38.9
	Cs-137	6,475.0	412.8~3,331.0	323.8~4943.0	2,868.0	353.9	1,205.0	613.8	1,125.0	2,086.0	1,308.0	1,342.0	1,638.0	1,622.0	1,190.0	1,863.0	1,006.0	1,185.0
C South side of the partition weir	Cs-134	183.0	30.9~68.7	37.1~234.8	153.3	115.8	42.4	26.5	36.9	39.2	29.5	41.4	38.1	48.6	31.0	29.8	33.8	28.9
	Cs-137	1,893.0	360.8~2,671.0	295.9~9519.0	9,737.0	3,345.0	723.9	348.9	257.0	253.0	409.7	419.6	361.7	356.2	227.4	246.4	258.6	252.8
D Unit 5 intake	Cs-134	-	101.6~3,546.0	50.2~690.7	61.8	50.3	177.8	114.8	79.6	50.3	40.3	64.9	69.3	83.5	52.0	50.7	35.9	35.9
	Cs-137	_	3,301.0~144,000.0	951.7~26400.0	3,981.0	2,069.0	8,661.0	5,140.0	1,970.0	2,305.0	2,166.0	1,763.0	1,834.0	1,866.0	1,563.0	1,773.0	1,656.0	1,898.0
E	Cs-134	-		35.6~147.0	64.4	161.2	46.4	40.4	38.3	37.0	41.6	55.0	50.1	55.7	33.1	42.7	38.4	59.7
	Cs-137	_		437.1~5795.0	3,145.0	8,371.0	829.4	2,427.0	1,551.0	764.6	1,066.0	3,371.0	4,154.0	1,191.0	1,460.0	2,118.0	1,060.0	1,878.0
F	Cs-134	-		40.2~166.1	58.6	31.3	55.3	37.8	87.1	34.1	40.7	49.1	74.8	58.6	48.2	63.2	40.0	42.8
	Cs-137	_		592.4~8303.0	630.9	178.7	3.446.0	1.694.0	1.148.0	891.0	1.884.0	1.020.0	1.654.0	1.606.0	955.9	1.392.0	1.332.0	1.447.0

XUnit: Bq/liter, Figures in gray were below the detection limit



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# 2. Facility inspection status



- The following inspections were implemented and no abnormalities that could affect the discharge schedule were found.
- In light of the inspection results to date including this time, we shall continue to deliberate how to maintain the function of facilities in consideration of the long term operation until the completion of discharge.

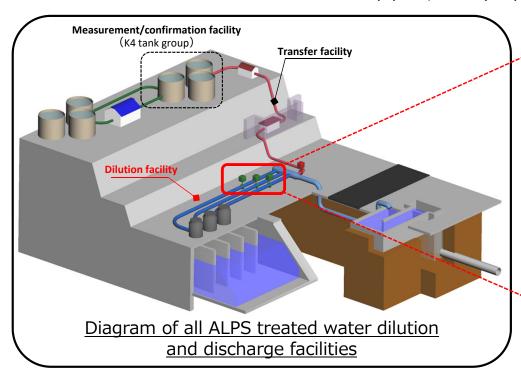
Facility	Primary inspection details	Inspection status				
	Measurement/confirmation tank group C: internal inspection of the bottom of the tanks	Completed (no abnormalities (reported on November 28, 2024))				
Measurement/ confirmation facilities	Measurement/confirmation tank group A: Internal inspection of the bottom of the tanks	Completed (no abnormalities (reported on December 26, 2024))				
	Measurement/confirmation tank group B: Internal inspection of the tanks	Inspection underway (completion expected around May 2025)				
	Circulation pumps: Lubrication oil for bearings replacement	Completed (no abnormalities (reported on January 30, 2024))				
	Agitators: Insulation resistance measurements	Completed (no abnormalities)				
	Miscellaneous: Strainer cleaning, etc.	Completed (no abnormalities (reported on January 30, 2024))				
Transfer facilities	ALPS treated water transfer pumps: Lubrication oil for bearings replacement	Completed (no abnormalities)				
	Emergency isolation valve-1: Disassembly inspection	Completed (no abnormalities)				
	Emergency isolation valve-2: External inspection	Completed (no abnormalities)				
	Miscellaneous: Strainer cleaning, etc.	Completed (no abnormalities)				
Dilution facilities	Seawater transfer pump system C: Disassembly inspection	Completed (no abnormalities)				
	Seawater transfer pump system A: Gland packing replacement	Completed (no abnormalities)				
	Seawater transfer pump system B: Gland packing replacement	Completed (no abnormalities)				
	Sea water transfer pipes/seawater pipe header: Internal inspection	Completed (reported on following pages)				
	Discharge vertical shaft (upper-stream storage): Internal inspection	Completed (no abnormalities)				
Discharge facilities	Discharge vertical shaft (down-stream storage), discharge tunnel: Internal inspection	Completed (reported on following pages)				
Seawater intake	Partitioning weirs: External inspection	Completed (no abnormalities (reported on January 30, 2024))				
facilities	Intake channel system B: Cleaning, external inspection	Completed (no abnormalities)				

Black letters: Completed Faded letters: Not yet completed

# 2-1. Seawater transfer pipe repairs (1/2)



- The internal surface of the seawater transfer pipes (900A, duplex stainless steel) is in good condition and we confirmed that there are no problems with the dilution of ALPS treated water with seawater (already reported).
- Corrosion was found on the vent pipes (6 locations, 50A) and instrument pipe (6 locations, 15A) flanges (duplex stainless steel) which are attached to the seawater transfer pipes (already reported), then they were replaced.





Seawater transfer pipes

#### <Facility overview>

- Seawater transfer pipe
- Vent pipe
- Instrument pipe
- Duplex stainless-steel
- : Line used to transfer seawater that is used to dilute the ALPS treated water so that the tritium concentration is less than 1,500Bq/liter (only seawater exists inside the pipes).
- : Line used to bleed air or take in air when the pipes are filled with water or drained, respectively.
- : Line used to detect main pipe pressure when using the orifice to take flow measurements.
- : Material that is highly resistant to corrosion from seawater (does not require a lining or sealants to protect from corrosion, and enables highly accurate dilution seawater flow measurements). However, since this is a seawater system, some corrosion is expected, and inspections are conducted annually during system shutdown.

# 2-1. Seawater transfer pipe repairs (2/2)



- Trial operation of seawater transfer pump systems A, B, and C were implemented on February 14 and 17, 2025. Leak checks were also performed and it was confirmed that there are no abnormalities.
- The cause of the corrosion found in the ancillary pipes for the seawater transfer pipes during this inspection is gap corrosion that could be prevented by implementing the following countermeasures.
  - ➤ Since the corrosion occurred after 18 months, we will regularly flush the vent pipes, etc., to prevent an increase in localized concentrations of chloride ions caused by stagnant water and implement inspections/check conditions 10 months later.
  - We will continue to ascertain the cause in detail and deliberate other effective countermeasures.



Vent pipe flange (prior to replacement)



Vent pipe flange (after replacement)

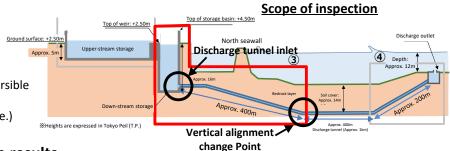
## 2-2. Discharge tunnel and the discharge outlet inspection status



#### ■ An internal inspection of the discharge tunnel and down-stream storage were conducted and no abnormalities were confirmed.

A submersible ROV was put into the down-stream storage on-site and checked the conditions of approximate 400m down the discharge tunnel from the inlet.

(We are deliberating increasing the distance back into the tunnel that the inspection is conducted, but since submersible ROV propulsion may be affected as the submersible ROV cable rubs against sediment and marine organism that has affixed itself to the inside of the tunnel, the distance from the exit will be gradually increased as we obtain knowledge.)



#### **Inspection results**

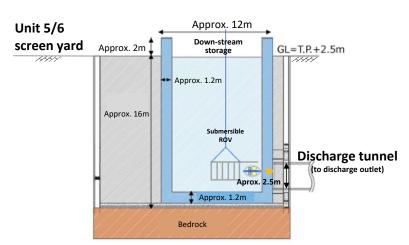
Underlined results were found new during this inspection



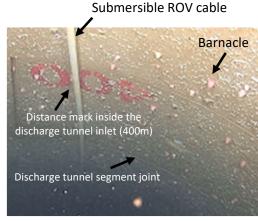
Submersible ROV (W:0.9m×H:1.3m, Mass: Approx. 100kg)

Inspection item	Results of this inspection (February 2025)	Results of previous inspection (February 2024 <sup>※</sup> )		
Marine organism adhesion	Inside the discharge tunnel: Some adhesion of marine life (barnacles) have adhered themselves Inside the down-stream storage: A small amount of marine life has adhered itself to the wall	Barnacles (few)		
Sediment conditions	Inside the discharge tunnel: Approximately 1~2cm of sediment exists until about 50m into the tunnel  Inside the down-stream storage: Approximately 10cm of sediment exists at the bottom	Almost none (some floating mud)		
Issues that may impact discharge, such as cross-sectional closure (foreign objects, etc.)	None	None		

X1 The scope of the last discharge tunnel inspection in February 2024 had conducted from the inlet approximately 100m.



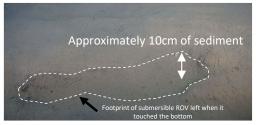
<u>Discharge tunnel/down-stream storage</u> Diagram of submersible ROV inspection



<u>Discharge tunnel wall conditions</u> (400m from the discharge tunnel inlet)



**Discharge tunnel inlet conditions** 



Sediment conditions at the bottom of the down-stream storage



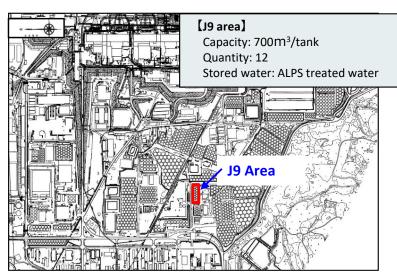
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# 3. Dismantling of the J9 area tanks



- On February 13, 2025 the J9 area tanks were taken out of service and dismantling began on February 14, 2025 (removing the top lid).
  Dismantling of the first tank should be completed around the beginning of March 2025.
- The dismantled tank fragments will be cut into sizes that can fit inside a shipping container and stored in 20-foot full height containers and will be moved to the temporary storage area for storage.
- > This marks the first time a welded tank that stored ALPS treated water has been dismantled so we shall accumulate knowledge while confirming procedures, etc., and move forward with dismantling while prioritizing safety.











# [Reference] Treated water portal site renovations



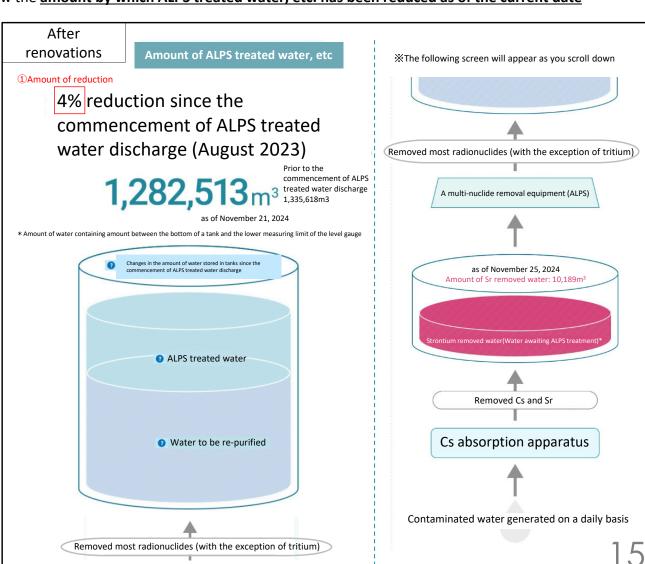
- In conjunction with the commencement of J9 area tanks dismantling the "Treated Water Portal Site ALPS Treated Water, etc. Status" will be renovated during March 2025.
- The page will be renovated so that it is easier to understand by how much the amount of ALPS treated water, etc. has been reduced since the commencement of discharge. The major change as shown below.

→ The way of displaying tank usage rate will be changed to show the amount by which ALPS treated water, etc. has been reduced as of the current date

since the commencement of discharge

Now Amount of ALPS treated water, etc. and Sr removed water stored in tanks as of February 13, 2025 **1,297,736** m<sup>3</sup> \*Amount of water containing amount between the bottom of a tank and the lower measuring limit of the level gauge of the total capacity is being used Total amount of ALPS treated water, etc. and Sr removed water being stored Actual ALPS treated water, etc 1 ALPS treated water Approx. 30% 1 Water to be re-purified Approx. 70% 1,287,680 10.354m

ALPS-treated water, etc. status TEPCO





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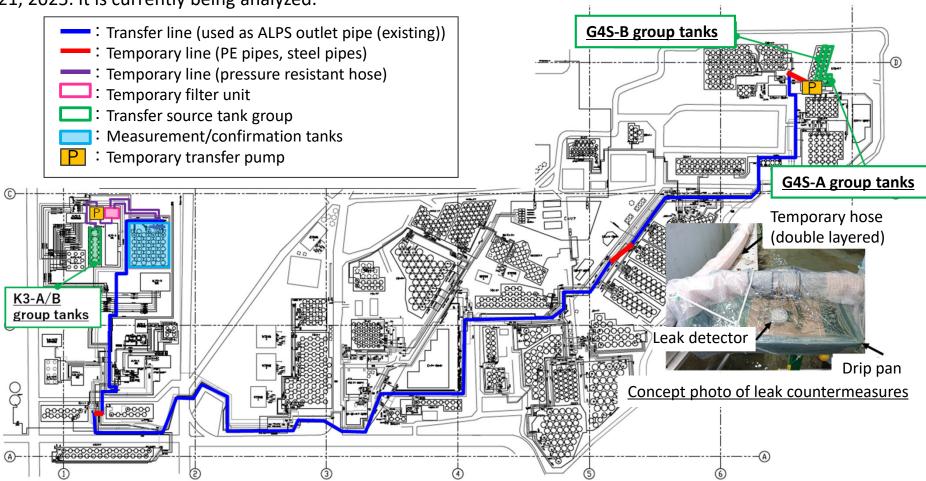
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## 4. Transfer of ALPS treated water in preparation for the future discharges



Transfer of ALPS treated water from G4S area Group A/B to measurement/confirmation facility tank group C in preparation for the discharge of Management number: 24-7-11 was conducted (from November 27, 2024 to December 19, 2024). Circulation/agitation has been commenced since January 7, 2025 and a sample was taken on January 14, 2025. It is currently being analyzed.

Transfer of ALPS treated water from G4S area Group B and K3 area Group A/B to measurement/confirmation facility tank group A in preparation for the discharge of Management number: 25-1-12 was conducted (from January 6, 2025 to February 10, 2025). Circulation/agitation has been commenced since February 13, 2025 and a sample was taken on February 21, 2025. It is currently being analyzed.





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## 5-1. Information on the next discharge (management number: 24-7-11)



- In order to confirm that facility status has not changed since the initial discharges into the sea (1<sup>st~</sup>3<sup>rd</sup> discharges of FY2023), general performance of all components that comprise the ALPS treated water dilution/discharge facilities will be confirmed using the following procedure.
- This confirmation shall be, for the time being, implemented once a year and in two stages, just like the initial discharging into the sea. Accordingly, the 7th discharge to be implemented in FY2024 (11th discharge in total) will be discharged in two stages.

#### First Stage • • • General performance confirmation of components (no discharg into the sea)

- (1) Upper-stream storage emptied
- (2) ALPS treated water (measurement/confirmation tank group C) tritium concentration entered into system
- (3) One seawater transfer pump started up
- (4) ALPS treated water transfer pump started up after the seawater transfer pump reaches rated flow
- (5) ALPS treated water transfer flow automatically adjusted in accordance with tritium concentration so that the post-diluted ALPS treated water concentration is 700Bg/liter\*
- (6) After rated flow has been reached, the ALPS treated water transfer pump and the seawater transfer pump will be shutdown

XValue determined so that the upper operational limit of 1,500Bq/liter is not exceeded in consideration of analysis uncertainty and instrument discrepancies

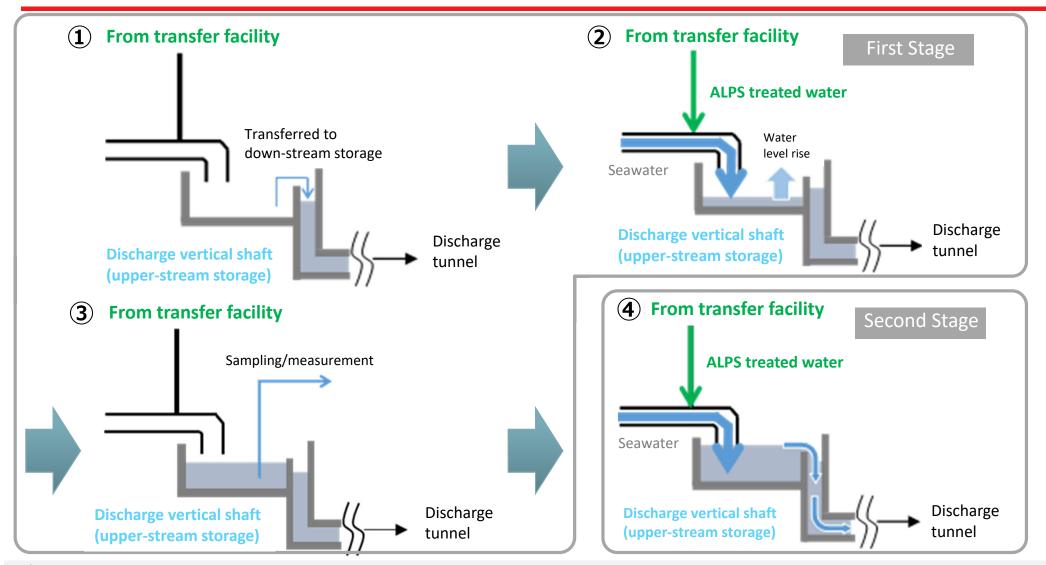
Components shall be activated as mentioned above to confirm there are no problems with performance. The concentration of tritium in the diluted water in upper-stream storage shall also be measured to confirm that it is less than 700Bq/liter.

#### Second Stage · · · Continuous discharg into the sea

- (7) Two seawater pumps started up in succession (commencement of discharge of diluted water from upper-stream storage)
- (8) After the two seawater pumps have reached rated flow the ALPS treated water transfer pump shall be started up (continuous discharge) ("the post-dilution tritium concentration" during continuous discharge shall be managed using calculated values and analysis values from water sampled daily from downstream of the seawater flow header)

# 5-2. Method of dicharge in two stage





- ① The discharge vertical shift (upper-stream storage) emptied
- 2 A small amount (approximately 1m³) of ALPS treated water will be diluted with seawater (approximately 1,200m³) and then held in the discharge vertical shift (upper-stream storage).
- ③ It will be confirmed that there are no problems with the series of operations of the ALPS treated water dilution and discharge facilities and that the concentration of tritium in water stored in the discharge vertical shift (upper-stream storage) is less than 700 Bq/liter. [Processes ① through ③ comprise the First Stage].
- 4 Then, TEPCO will move on to the Second Stage which will be continuous discharge into the sea.



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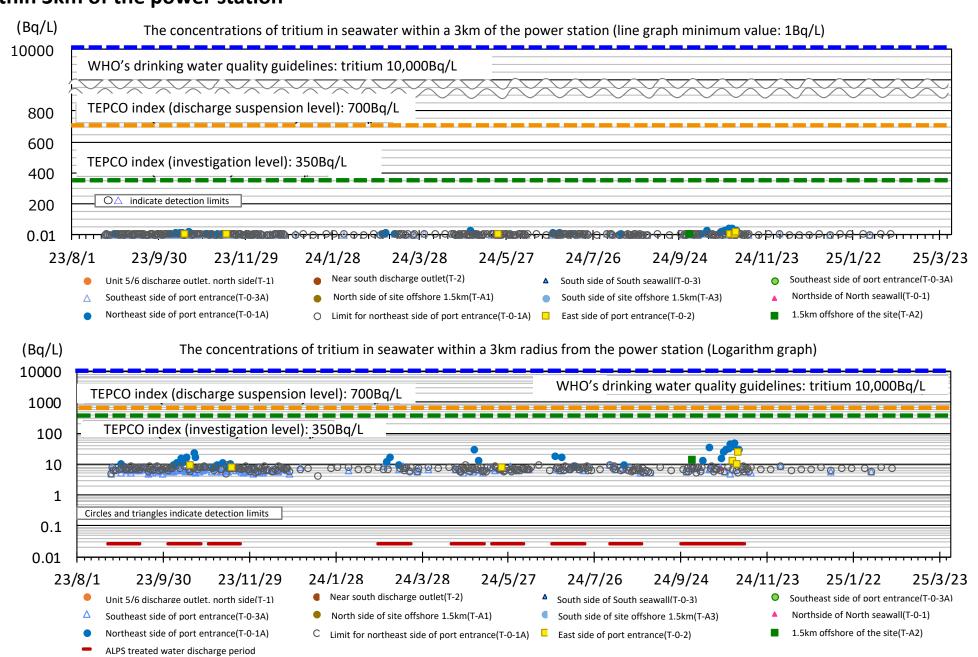
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## (Reference) Sea area monitoring results (1/2)

## quick monitoring



#### within 3km of the power station

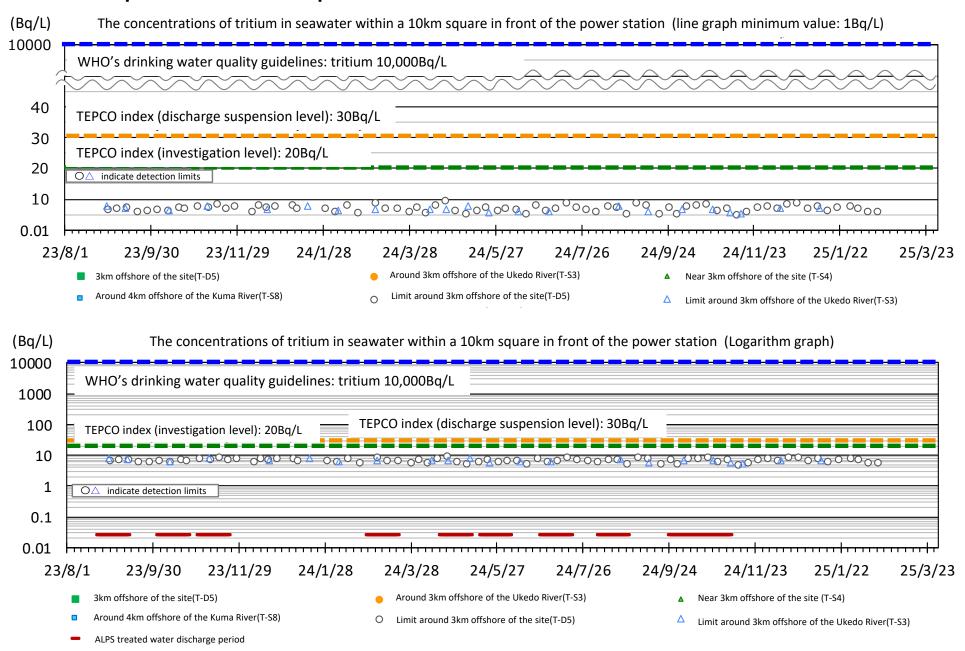


# (Reference) Sea area monitoring results (2/2)

## quick monitoring



#### within a 10km square in front of the power station

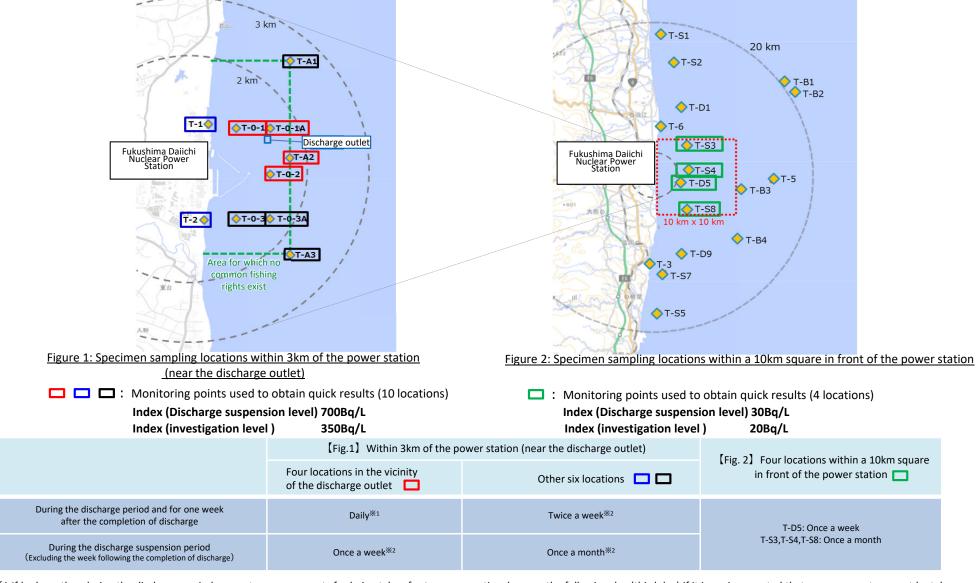


## [Reference] Sea area monitoring plan

#### for obtaining quick measurements of the concentration of tritium in seawater



We have engaged in monitoring to obtain quick measurements of the concentration of tritium in seawater with targeting the upper detection limit for 10Bq/liter, and index to determine discharge suspension (the discharge suspension level) was set.



<sup>\*\*1</sup> If bad weather during the discharge period prevents measurements for being taken for two consecutive days, on the following day (third day) if it is again expected that measurements cannot be taken, measured results will be quickly obtained from T-1 and T-2.

<sup>\*2</sup> We have engaged in monitoring daily since the commencement of discharge in August 2023, but the monitoring plan was changed on December 26, 2023 in light of actual measurements taken during discharge (Announced on December 25, 2023)