

# **Situation of Storage and Treatment of Accumulated Water including Highly Concentrated Radioactive Materials at Fukushima Daiichi Nuclear Power Station (184<sup>th</sup> Release)**

January 16, 2015

Tokyo Electric Power Company

## **1. Introduction**

This document is to report the following matters in accordance with the instruction of “Installment of treatment facility and storing facility of water including highly concentrated radioactive materials at Fukushima Daiichi Nuclear Power Station of the Tokyo Electric Power Company (Instruction) “(NISA No. 6, June 8, 2011), dated on June 9, 2011.

<Instruction>

TEPCO should report to NISA the situation of storing and treatment of the contaminated water in the Power Station and future forecast based upon the current situation have to be reported to NISA as soon as the treatment facility starts its operation. Also, subsequently, continued report has to be submitted to NISA once a week until the treatment of the accumulated water in the Central Radioactive Waste Treatment Facility is completed.

## **2. Situation of storing and treatment of accumulated water in the building (actual record)**

Stored amounts in each unit building (Units 1 to 4 (including condensers and trenches)) and stored and treated amounts, and other related data in the Accumulated Water Storing Facility as of January 15 are shown in the Attachment -1.

## **3. Forecast of storing and treatment**

### **(1) Short term forecast**

Water transfer is planned so that the levels of the accumulated water in Units 1&2 and Units 3&4 building will be maintained around at the level of OP. 3,000, based on the stored amount in the Accumulated Water Storing Facilities and the operating situation of the radioactive material treatment equipment. Water is transferred to the Process Main Building and/or High Temperature Incinerator Building as Accumulated Water Storing Facilities.

Treatment is implemented considering the situation of storage and transfer of Accumulated Water Storing Facilities.

We assume stored amounts in each unit building (Units 1 to 4 (including condenser and trench)), and stored and treated amounts, and other related data in the Accumulated Water Storing

Facilities as of January 22, as shown in Attachment -2.

**(2) Middle term forecast**

Regarding accumulated water in Unit 1&2 building and Unit 3&4 building, from the viewpoint of reducing the risks of discharging to the ocean and leaking into the groundwater, it is necessary to keep enough capacity for the accumulated water in the building until its level reaches OP. 4,000 and to keep the accumulated water level lower than the groundwater level. On the other hand, based on the view of limiting inflow of underwater to buildings and reducing the amount of emerged accumulated water, we are planning to transfer accumulated water keeping its level in the building around OP. 3,000 considering water tank capacity.

As for accumulated water of the Process Main Building and the High Temperature Incinerator Building, we are planning to treat the accumulated water considering the situation of construction of middle and low level waste water tanks, the operation factor of the radioactive material treatment instruments and duration for maintenance.

We forecast stored amounts in each unit building (Unit 1 to 4 (including condensers and trenches)), and storing and treatment situations in the Accumulated Water Storing Facilities for the next 3 months, as shown in Attachment -3.

Stored amounts in each building and the water storage equipment are forecasted to be unchanged in case transfer and treatment were implemented as scheduled without rain. However, it would be subject to change depending on the operation factor of the radioactive material treatment instruments and so on.

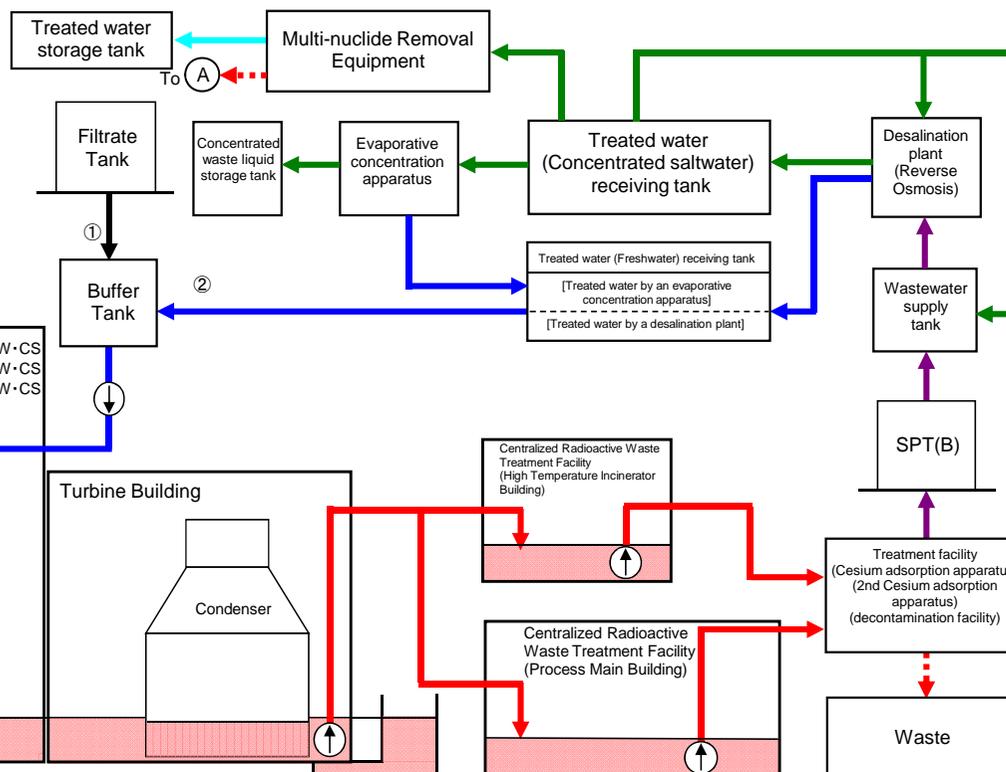
Also, the water treated at the radioactive material treatment equipment (fresh water and condensed salt water) can be stored in the middle and low level waste water tanks.

END

# Storage and treatment of high level radioactive accumulated water (as of January 15, 2015)

Classification	
<span style="color:red">■</span> / <span style="color:red">■</span> / <span style="color:red">■</span>	High level radioactive water/Waste
<span style="color:blue">■</span>	Treated water (saltwater)
<span style="color:green">■</span>	Treated water (concentrated saltwater)
<span style="color:purple">■</span>	Treated water (freshwater)
<span style="color:cyan">■</span>	Treated water from Multi-nuclide Removal Equipment
<span style="color:black">■</span>	Freshwater

Volume of water to be injected to Reactor (1/9- 1/15)	Change from last report
① Filtrate water	-
② Treated water (freshwater)	2,216m <sup>3</sup>
Cumulative treated water	531,677m <sup>3</sup>



	Storage volume <sup>1</sup>	Change from last report	Storage capacity <sup>2,3</sup>
Concentrated saltwater receiving tank <sup>4</sup>	286,127m <sup>3</sup>	-10,294m <sup>3</sup>	381,700m <sup>3</sup>
Freshwater receiving tank	24,600m <sup>3</sup>	+503m <sup>3</sup>	27,500m <sup>3</sup>
Concentrated waste liquid storage tank	8,959m <sup>3</sup>	-10m <sup>3</sup>	20,000m <sup>3</sup>
Treated water storage tank	269,717m <sup>3</sup>	+10,191m <sup>3</sup>	310,800m <sup>3</sup>
Strontium-treated water storage tank	6,960m <sup>3</sup>	+2,708m <sup>3</sup>	13,800m <sup>3</sup>

	Storage volume	Change from last report	Storage volume <sup>2</sup>
Wastewater supply tank	680m <sup>3</sup>	-73m <sup>3</sup>	1,200m <sup>3</sup>
SPT(B)	736m <sup>3</sup>	-269m <sup>3</sup>	3,100m <sup>3</sup>

	Chloride concentration
Before/After Desalination	460ppm/1ppm (Sampled on Jan. 13)
Before/After Evaporative Concentration	6,900ppm/2ppm (Sampled on Dec. 20, 2011)

Place of Sampling	Radioactivity density <sup>5</sup>
Process Main Building	3.1E+04 Bq/cm <sup>3</sup> (Sampled on Jan.10)
Exit of cesium adsorption apparatus	1.2E+01 Bq/cm <sup>3</sup> (Sampled on Jan. 10)
Exit of decontamination facility	-
High Temperature Incinerator Building	3.0E+04 Bq/cm <sup>3</sup> (Sampled on Jan.13)
Exit of second cesium adsorption apparatus	8.2E-01 Bq/cm <sup>3</sup> (Sampled on Jan. 13)

Facility	Storage volume	Change from last	Water level in T/B
Unit 1	Approx. 13,200m <sup>3</sup>	-100m <sup>3</sup>	OP.2,361
Unit 2	Approx. 15,300m <sup>3</sup>	-500m <sup>3</sup>	OP.2,505
Unit 3	Approx. 21,500m <sup>3</sup>	+800m <sup>3</sup>	OP.2,794
Unit 4	Approx. 16,200m <sup>3</sup>	+800m <sup>3</sup>	OP.2,729
Total	Approx. 66,200m <sup>3</sup>		

Storage Facility	Storage volume	Change from last report	Water level	Treated volume (1/9-1/15)	Cumulative treated volume	Waste produced	Change from last report	Storage capacity	
Process Main Building	Approx. 11,020m <sup>3</sup>	-1,120m <sup>3</sup>	OP.2,694	Approx.4,470m <sup>3</sup> <sup>6</sup>	Approx. 1,140,720m <sup>3</sup> <sup>6</sup>	Sludge	597m <sup>3</sup>	No Change	
High Temperature Incinerator Building	Approx. 3,560m <sup>3</sup>	-60m <sup>3</sup>	OP.2,141			Used vessels	1,575 <sup>8</sup>	+50	700m <sup>3</sup> <sup>3,12</sup>
Total	Approx. 14,580m <sup>3</sup>								3,317

[Main operations that have been conducted during the period from January 8, 2014 (the previous announcement data) to January 15, 2015]

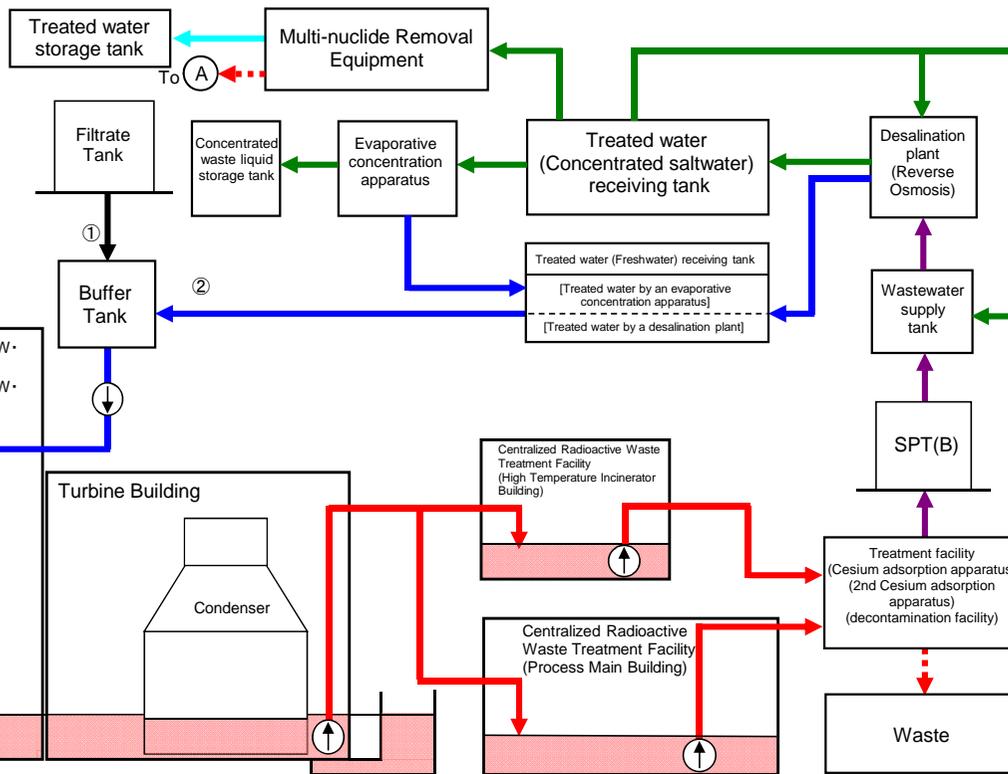
- Water transfer from Unit 2 to the High Temperature Incinerator Building has been conducted.
- Water transfer from Unit 3 to the Process Main Building has been conducted.
- Water transfer from Unit 4 has been stopped since Nov. 29, 2012.
- Cesium Adsorption Apparatus and 2nd Cesium Adsorption Apparatus has been in operation; the availability factor of the former is 12.4% (previously assumed: 10%) and the availability factor of the latter is 40.8% (previously assumed: 40%)
- On Jan. 10, the operation of Cesium Adsorption Apparatus was suspended.
- On Jan. 13, water transfer from the On-Site Bunker to the Process Main Building was conducted.
- Storage capacity of the Concentrated Saltwater Storage Tank, the Treated Water Storage Tank and the Strontium-Treated Water Storage Tank has been increased by adding tanks.

\*1 As for the desalination plant (reverse osmosis) or the evaporative concentration apparatus, the data is treated as a reference, because the water levels are not stable during the operation.  
 \*2 Shows the operational limit.  
 \*3 The underground reservoirs are not included in the figure.  
 \*4 Storage capacity of the filtrate water tank (4,600m<sup>3</sup>) is included in the figure.  
 \*5 The data shown here are those of Cs-137.  
 \*6 Total treated amount of Cesium adsorption apparatus and 2nd Cesium adsorption apparatus  
 Breakdown of the treated amount: Cesium adsorption apparatus (1,040m<sup>3</sup>)  
 2nd Cesium adsorption apparatus (3,430m<sup>3</sup>)  
 Breakdown of the cumulative treated amount: Cesium adsorption apparatus (250,860m<sup>3</sup>)  
 2nd Cesium adsorption apparatus (889,860m<sup>3</sup>)  
 \*7 Breakdown of the used vessels:  
 Cesium adsorption apparatus (550)  
 2nd cesium Cesium adsorption apparatus (120),  
 Storage container of the Multi-nuclide Removal Equipment (853), treated column (3) and a used vessel (7)  
 Used vessels of mobile type treatment apparatus (29, including  
 vessels used for purification of spent fuel pool) and filters (13).

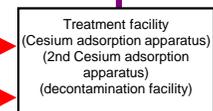
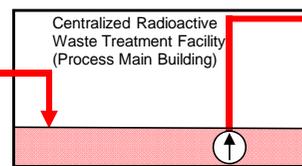
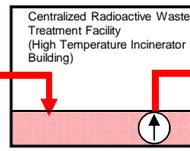
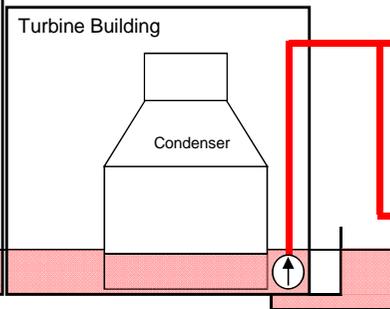
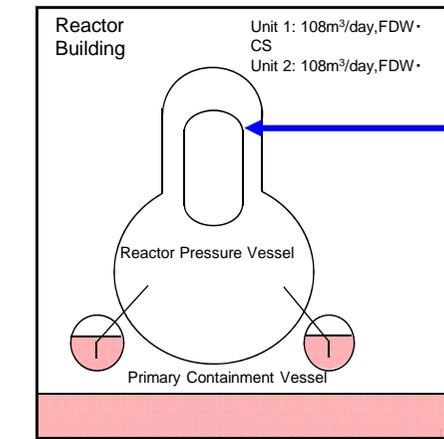
# Storage and treatment of high level radioactive accumulated water (as of January 22, 2015)

Classification	
■ / ■ ■ ■	High level radioactive water/Waste
■	Treated water (saltwater)
■	Treated water (concentrated saltwater)
■	Treated water (freshwater)
■	Treated water from Multi-nuclide Removal Equipment
■	Freshwater

Volume of water to be injected to Reactor (1/16- 1/22)	Change from last report
① Filtrate water	-
② Treated water (freshwater)	+52m <sup>3</sup>
Cumulative treated water	533,945m <sup>3</sup>



Storage volume	Change from last report	Storage capacity <sup>1)2)</sup>
Concentrated saltwater receiving tank <sup>3)</sup>	271,430m <sup>3</sup> -14,697m <sup>3</sup>	381,700m <sup>3</sup>
Freshwater receiving tank	23,676m <sup>3</sup> -924m <sup>3</sup>	27,500m <sup>3</sup>
Concentrated waste liquid storage tank	8,959m <sup>3</sup> No change	20,000m <sup>3</sup>
Treated water storage tank <sup>4)</sup>	281,696m <sup>3</sup> +11,979m <sup>3</sup>	310,80m <sup>3</sup>
Strontium treated water storage tank	12,560m <sup>3</sup> +5,600m <sup>3</sup>	13,800m <sup>3</sup>



Facility	Storage volume	Change from last	Water level in T/B
Unit 1	Approx. 13,200m <sup>3</sup>	No Change	OP.2,471
Unit 2	Approx. 15,000m <sup>3</sup>	-300m <sup>3</sup>	(Unit 2 T/B)
Unit 3	Approx. 21,400m <sup>3</sup>	-100m <sup>3</sup>	OP.2,775
Unit 4	Approx. 16,500m <sup>3</sup>	+300m <sup>3</sup>	(Unit 3 T/B)
Total	Approx. 66,100m <sup>3</sup>		

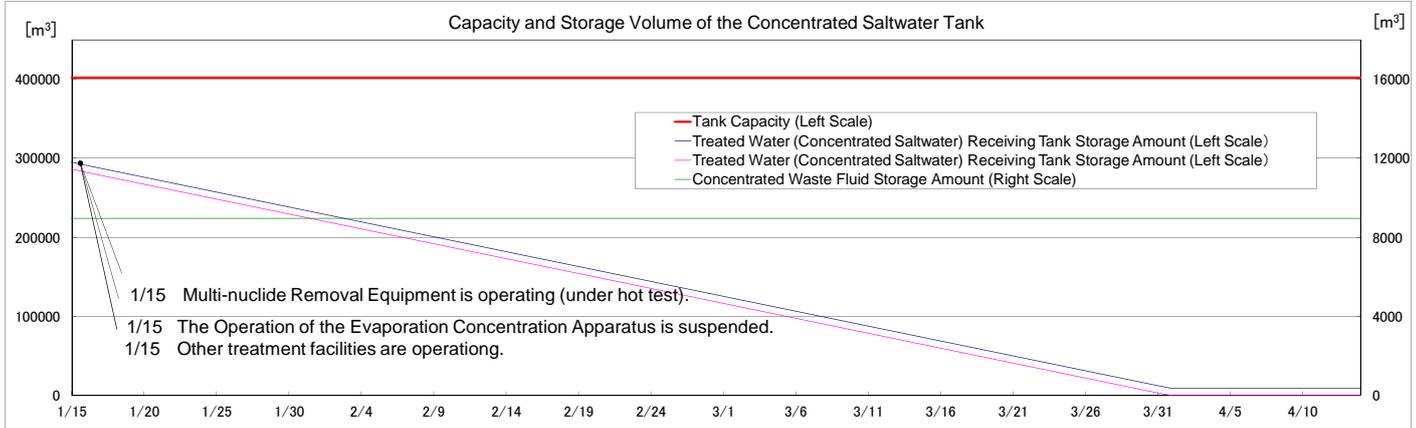
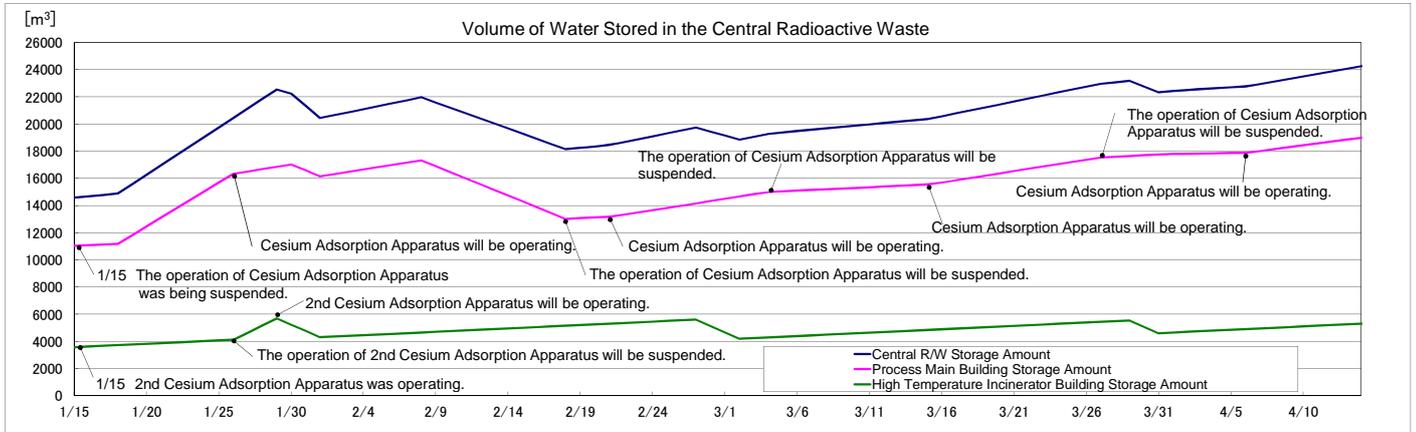
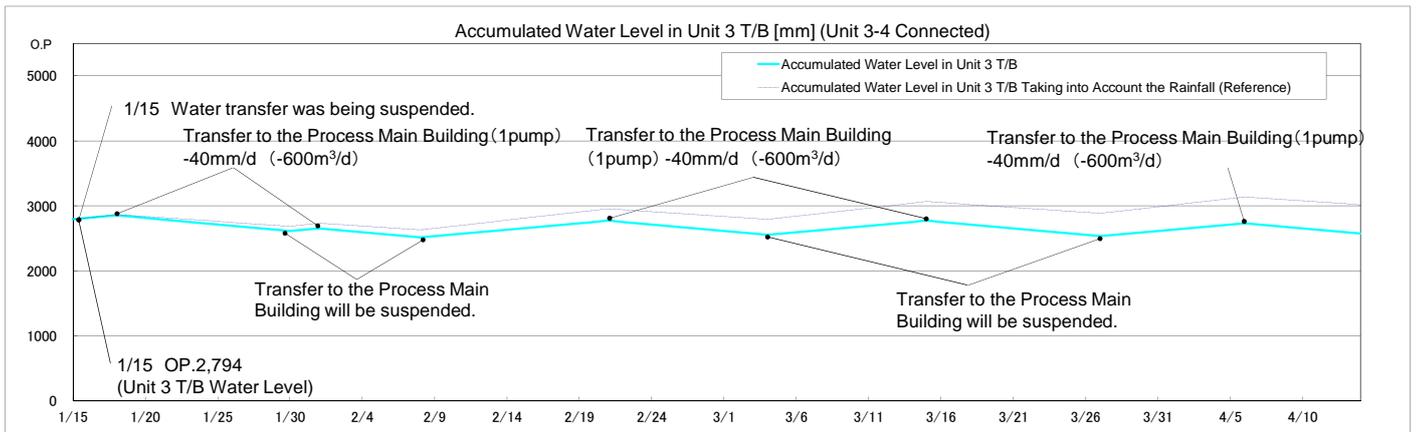
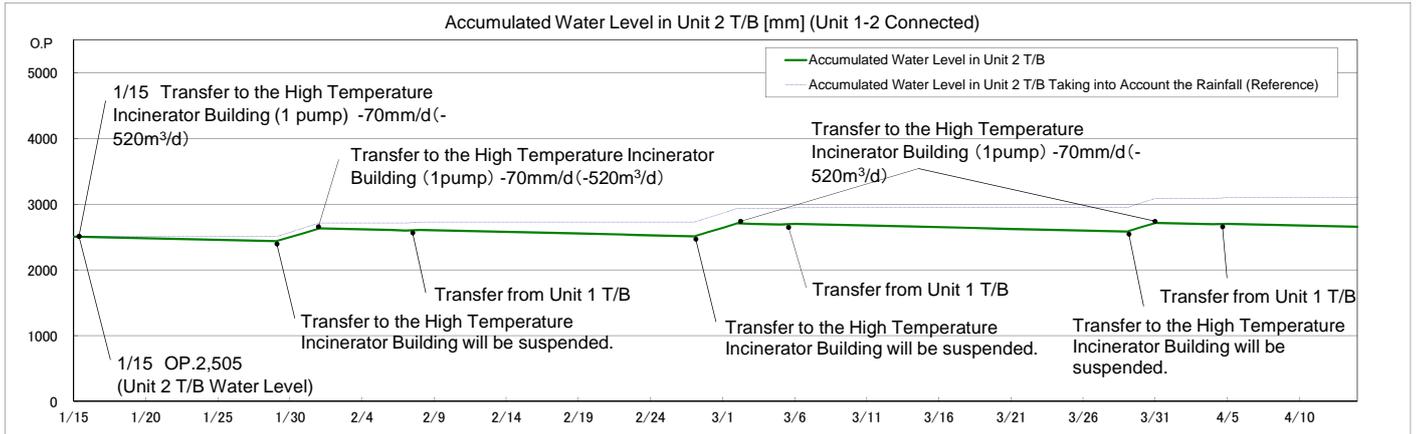
Storage Facility	Storage volume	Change from last report	Water level	Treated volume (1/16 - 1/22)	Cumulative treated volume	Waste produced	Change from last report	Storage capacity
Process Main Building	Approx. 13,180m <sup>3</sup>	+2,160m <sup>3</sup>	OP.3,472	Approx.3,360m <sup>3</sup> 14	Approx. 1,144,080m <sup>3</sup> 14	Sludge	597m <sup>3</sup>	No Change
High Temperature Incinerator Building	Approx. 3,890m <sup>3</sup>	+330m <sup>3</sup>	OP.2,411			Used vessels	1,612 <sup>5</sup>	+37
Total	Approx. 17,070m <sup>3</sup>							

[Main operations that are planned to be conducted during the period from January 15, 2015 to January 22, 2015.]

- Water transfer from Unit 2 to the High Temperature Incinerator Building will be conducted.
- Water transfer from Unit 3 to the Process Main Building will resume.
- Water transfer from Unit 4 will continue to be suspended.
- The operation of Cesium Adsorption Apparatus will continue to be suspended.
- The operation of 2nd Cesium Adsorption Apparatus is scheduled: Assumed Availability Factor 40%

<sup>1)</sup> Shows the operational limit. <sup>2)</sup> The underground reservoirs are not included in the figure.  
<sup>3)</sup> Storage capacity of the filtrate water tank (4,600m<sup>3</sup>) is included in the figure.  
<sup>4)</sup> Total treated amount of Cesium adsorption apparatus and 2nd Cesium adsorption apparatus  
 Breakdown of the treated amount: Cesium adsorption apparatus (0m<sup>3</sup>)  
 2nd Cesium adsorption apparatus (3,360m<sup>3</sup>)  
 Breakdown of the cumulative treated amount: Cesium adsorption apparatus (250,860m<sup>3</sup>)  
 2nd Cesium adsorption apparatus (893,220m<sup>3</sup>)  
<sup>5)</sup> Breakdown of the used vessels:  
 Cesium adsorption apparatus (550)  
 2nd cesium Cesium adsorption apparatus (120),  
 Storage container of the Multi-nuclide Removal Equipment (886), treated column (3) and used vessels (8)  
 Used vessels of mobile type treatment apparatus (30, including 11 vessels used for purification of spent fuel pool) and filters (15)

# Simulation Results of Accumulated Water Treatment in Unit 1-4 T/B



**Note**

- The treated water volume is assumed to be 720m<sup>3</sup>/d (Subject to change depending on the level of water accumulated in T/B).
- The accumulated water level in T/B is a simulated water level in consideration of fluctuation of water level such as recent rainfall, inflow of groundwater, etc.
- The accumulated water level in T/B is assumed to increase by 5mm daily, taking into consideration the average rain fall in the surrounding areas of the Fukushima Daiichi Nuclear Power Station (August-October in 2008 to 2010).