

# **Situation of Storage and Treatment of Accumulated Water including Highly Concentrated Radioactive Materials at Fukushima Daiichi Nuclear Power Station (202nd Release)**

May 22, 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 the future forecast based upon the current situation has 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 May 21 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 May 28, 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.

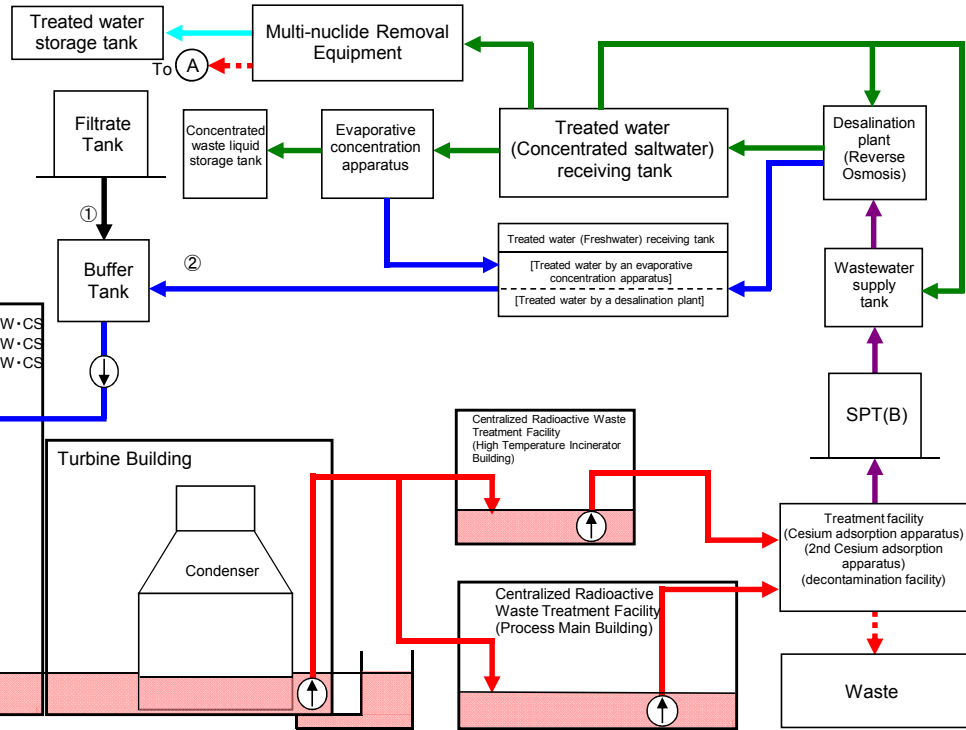
Also, the water treated at the radioactive material treatment equipment (fresh water and condensed salt water) can be stored in the middle and low level waste water tanks.

END

# Storage and treatment of high level radioactive accumulated water (as of May 21, 2015)

Classification	
<span style="color:red">■</span> / <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 (5/15- 5/21)		Change from last report
① Filtrate water	-	-
② Treated water (freshwater)	2,184m <sup>3</sup>	-40m <sup>3</sup>
Cumulative treated water	571,247m <sup>3</sup>	

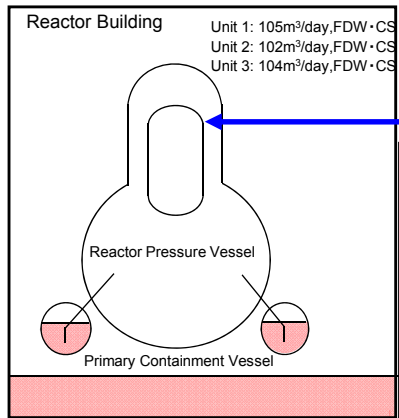


Storage volume <sup>*2,3</sup>	Change from last report	Storage capacity <sup>*4,5</sup>	
Concentrated saltwater receiving tank <sup>1</sup>	8,872m <sup>3</sup>	-8,707m <sup>3</sup>	36,700m <sup>3</sup>
Freshwater receiving tank	15,686m <sup>3</sup>	-1,945m <sup>3</sup>	27,500m <sup>3</sup>
Concentrated waste liquid storage tank	9,226m <sup>3</sup>	+11m <sup>3</sup>	20,000m <sup>3</sup>
Treated water storage tank	434,515m <sup>3</sup>	+9,895m <sup>3</sup>	475,100m <sup>3</sup>
Strontium-treated water storage tank	179,243m <sup>3</sup>	+7,448m <sup>3</sup>	207,700m <sup>3</sup>

Storage volume	Change from last report	Storage capacity <sup>*4</sup>	
Wastewater supply tank	723m <sup>3</sup>	-36m <sup>3</sup>	1,200m <sup>3</sup>
SPT(B)	857m <sup>3</sup>	+168m <sup>3</sup>	3,100m <sup>3</sup>

Chloride concentration	
Before/After Desalination	600ppm /1ppm (Sampled on May 12)
Before/After Evaporative Concentration	-

Place of Sampling	Radioactivity density <sup>*6</sup>
Process Main Building	1.9E+07 Bq/cm <sup>3</sup> (Sampled on Apr.7)
Exit of cesium adsorption apparatus	2.9E+02 Bq/cm <sup>3</sup> (Sampled on Apr. 7)
Exit of decontamination facility	-
High Temperature Incinerator Building	1.6E+07 Bq/cm <sup>3</sup> (Sampled on May 12)
Exit of second cesium adsorption apparatus	8.2E+02 Bq/cm <sup>3</sup> (Sampled on May 12)



Facility	Storage volume	Change from last report	Water level in T/B
Unit 1	Approx. 13,400m <sup>3</sup>	No Change	OP.2,438
Unit 2	Approx. 17,900m <sup>3</sup>	-100m <sup>3</sup>	OP.2,919
Unit 3	Approx. 19,200m <sup>3</sup>	+600m <sup>3</sup>	OP.2,903
Unit 4	Approx. 16,600m <sup>3</sup>	+500m <sup>3</sup>	OP.2,878
Total	Approx. 67,100m <sup>3</sup>		

Storage Facility	Storage volume	Change from last report	Water level	Treated volume (5/15-5/21)	Cumulative treated volume	Waste produced	Change from last report	Storage capacity	
Process Main Building	Approx. 16,190m <sup>3</sup>	+140m <sup>3</sup>	OP.4,575	Approx.4,600m <sup>3</sup> <sup>*7</sup>	Approx. 1,227,120m <sup>3</sup> <sup>*7</sup>	Sludge	597m <sup>3</sup>	No Change	700m <sup>3</sup> <sup>*4</sup>
High Temperature Incinerator Building	Approx. 3,560m <sup>3</sup>	-580m <sup>3</sup>	OP.2,142			Used vessels	2,456 <sup>*8</sup>	+48	6,055
Total	Approx. 19,750m <sup>3</sup>								

[Main operations that have been conducted during the period from May 14, 2015 (the previous announcement data) to May 21, 2015]

- On May 14, the facility to which water accumulated at Unit 2 had been transferred was changed from the High Temperature Incinerator Building to Unit 3 T/B.
- On May 15, water transfer from Unit 2 to Unit 3 T/B was suspended. On May 16, water transfer from Unit 2 to the High Temperature Incinerator Building resumed.
- On May 18, the facility to which water accumulated at Unit 2 had been transferred was changed from the High Temperature Incinerator Building to Unit 3 T/B.
- On May 19, the facility to which water accumulated at Unit 2 had been transferred was changed from Unit 3 T/B to the High Temperature Incinerator Building, and since then the transfer has continued.
- On May 14, water transfer from Unit 3 to the High Temperature Incinerator Building was suspended. On May 16, water transfer from Unit 3 to the High Temperature Incinerator Building resumed.
- On May 18, water transfer from Unit 3 to the High Temperature Incinerator Building was suspended. On May 19, water transfer from Unit 3 to the High Temperature Incinerator Building resumed, and since then, the transfer has continued.
- Since Apr. 24, Cesium Adsorption Apparatus has been suspended.
- 2nd Cesium Adsorption Apparatus has been operated: the availability factor has been 54.8% (previously assumed: 60%)
- On May 19 and 20, water transfer from the Additional Underground Storage Facility for Radioactive Waste at Unit 2 to the Radioactive Waste Treatment Facility at Unit 2 was conducted.
- Storage capacity of the Treated Water Storage Tank and the Strontium-treated Water Storage Tank will be increased by adding tanks.

\*1 "Storage volume" and "Storage capacity" in the table do not include those of the tanks where the removal of contaminated water has been completed (the disposal of residual water is being conducted in the tanks and the like except for D area and H3 area). The storage capacity as of May 21 is approx. 186,700m<sup>3</sup>. Based on the treated amount of concentrated saltwater, the estimated amount of the residual water is approx. 9,500m<sup>3</sup>.

\*2 The figures of the data are treated as a reference, because water levels during water transfer are not stable.

\*3 The figures of the storage volume do not include those of the following volumes that have accumulated from the bottom of the tanks to the height of so-called "down scale (DS)" where water gauges show 0%: Concentrated saltwater receiving tank (approx. 1,000m<sup>3</sup>), Freshwater receiving tank (approx. 1,000m<sup>3</sup>), Concentrated waste liquid storage tank (approx. 1,000m<sup>3</sup>), Treated water storage tank (approx. 1,000m<sup>3</sup>), Strontium-treated water storage tank (approx. 3,000m<sup>3</sup>).

\*4 The figures of the data show the operational limits.

\*5 The figures of "Storage capacity" do not include those of the volumes that have accumulated from the bottom of the tanks to the height of so-called "down scale (DS)" where water gauges show 0%. However, each tank has the capacity that accommodates more than the storage volume that accumulates up to the height of "DS."

\*6 The data shown here are those of Cs-137.

\*7 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 (4,600m<sup>3</sup>)

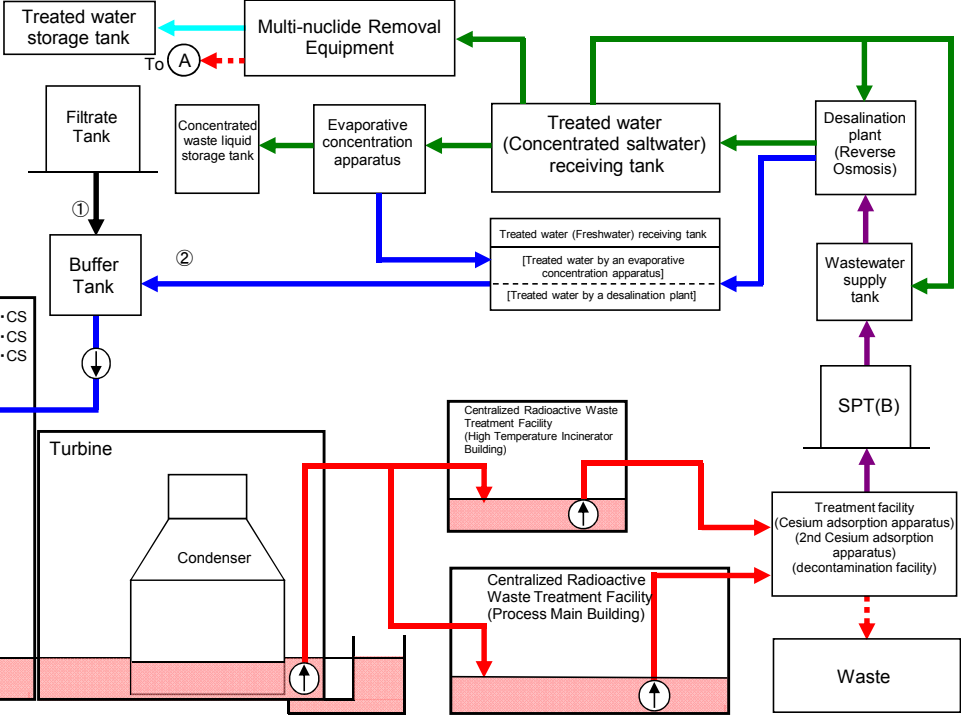
Breakdown of the cumulative treated amount: Cesium adsorption apparatus (281,100m<sup>3</sup>)  
 2nd Cesium adsorption apparatus (946,020m<sup>3</sup>)  
 Cesium adsorption apparatus (618)

\*8 Breakdown of the used vessels:  
 2nd Cesium adsorption apparatus (130) Others: Storage container (1,517),  
 Treated column (3), Used vessel (131), Filters and so forth (57)

# Storage and treatment of high level radioactive accumulated water (as of May 28, 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 (5/22 - 5/28)		Change from last report
① Filtrate water	-	-
② Treated water (freshwater)	2,268m <sup>3</sup>	+84m <sup>3</sup>
Cumulative treated water	573,515m <sup>3</sup>	



Storage volume <sup>*2</sup>	Change from last report	Storage capacity <sup>*3,4</sup>	
Concentrated saltwater receiving tank <sup>5</sup>	2,359m <sup>3</sup>	-6,513m <sup>3</sup>	36,700m <sup>3</sup>
Freshwater receiving tank	15,434m <sup>3</sup>	-252m <sup>3</sup>	27,500m <sup>3</sup>
Concentrated waste liquid storage tank	9,226m <sup>3</sup>	No change	20,000m <sup>3</sup>
Treated water storage tank <sup>5</sup>	442,782m <sup>3</sup>	+8,267m <sup>3</sup>	475,100m <sup>3</sup>
Strontium-treated water storage tank	185,767m <sup>3</sup>	+6,524m <sup>3</sup>	207,700m <sup>3</sup>

Facility	Storage volume	Change from last	Water level in T/B
Unit 1	Approx. 13,400m <sup>3</sup>	No Change	OP.2,947
Unit 2	Approx. 18,000m <sup>3</sup>	+100m <sup>3</sup>	(Unit 2 T/B)
Unit 3	Approx. 19,000m <sup>3</sup>	-200m <sup>3</sup>	OP.2,892
Unit 4	Approx. 16,700m <sup>3</sup>	+100m <sup>3</sup>	(Unit 3 T/B)
Total	Approx. 67,100m <sup>3</sup>		

Storage Facility	Storage volume	Change from last report	Water level	Treated volume (5/22 - 5/28)	Cumulative treated volume	Waste produced	Change from last report	Storage capacity	
Process Main Building	Approx. 16,310m <sup>3</sup>	+120m <sup>3</sup>	OP.4,610	Approx.5,040m <sup>3</sup> *5	Approx. 1,232,160m <sup>3</sup> *5	Sludge	597m <sup>3</sup>	No Change	700m <sup>3</sup> *3
High Temperature Incinerator Building	Approx. 4,940m <sup>3</sup>	+1,380m <sup>3</sup>	OP.3,286			Used vessels	2,489 <sup>5</sup>	+33	6,055
Total	Approx. 21,250m <sup>3</sup>								

[Main operations that are planned to be conducted during the period from May 21, 2015 to May 28, 2015.]

- The facility to which water accumulated at Unit 2 has been transferred will be changed from the High Temperature Incinerator Building to Unit 3 T/B.
- Water transfer from Unit 2 to Unit 3 T/B is scheduled to be suspended. Water transfer from Unit 2 to the High Temperature Incinerator Building is scheduled to resume.
- Water transfer from Unit 3 to the High Temperature Incinerator Building is scheduled to be suspended. Water transfer from Unit 3 to the High Temperature Incinerator Building is scheduled to resume.
- The operation of Cesium Adsorption Apparatus will continue to be suspended.
- The operation of 2nd Cesium Adsorption Apparatus is scheduled (assumed Availability Factor 60%).

\*1 "Storage volume" and "Storage capacity" in the table do not include those of the tanks where the removal of contaminated water has been completed (meaning the disposal of residual water is being conducted.)

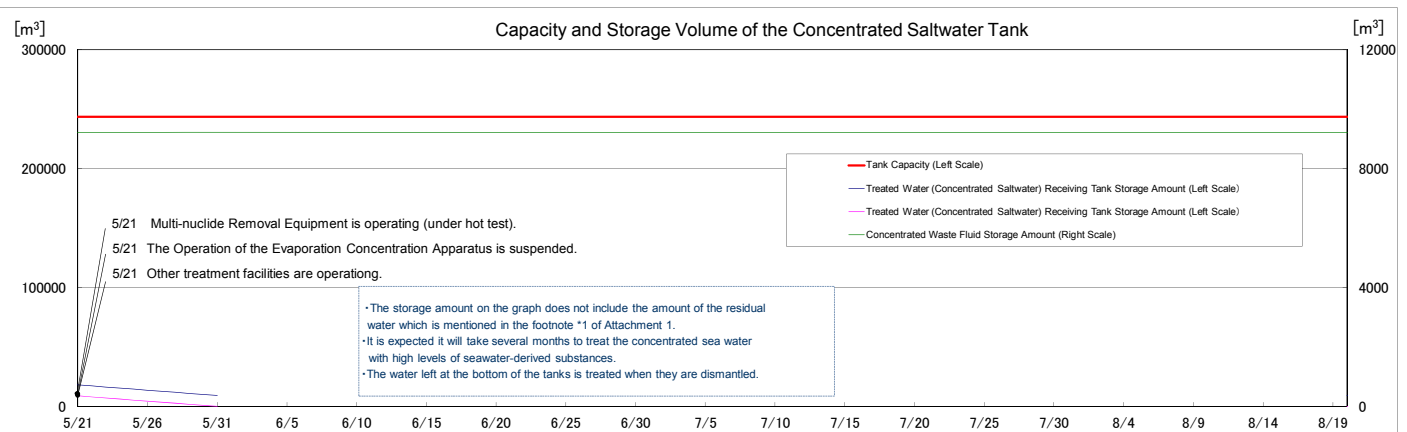
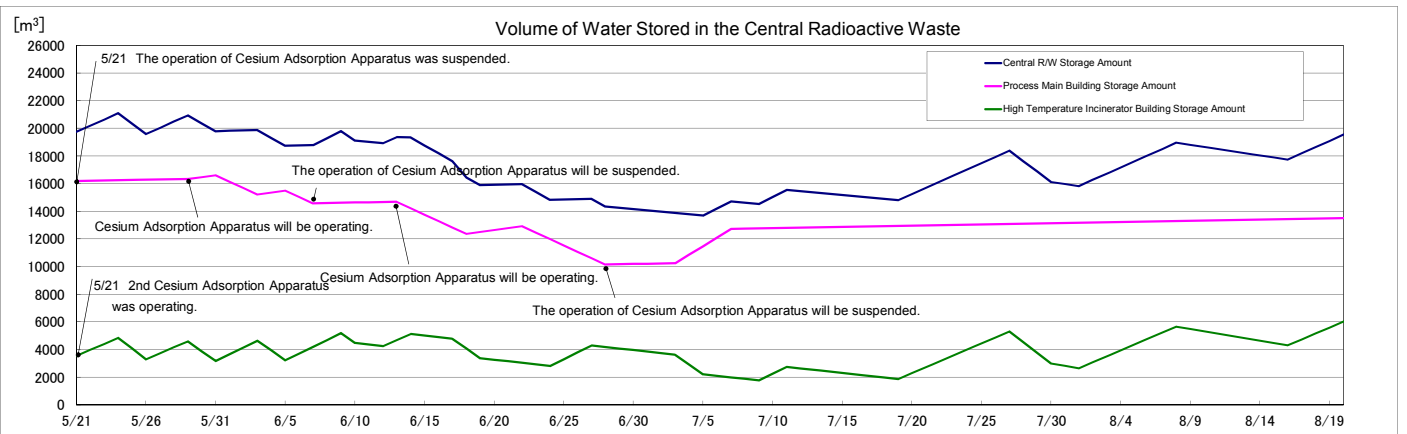
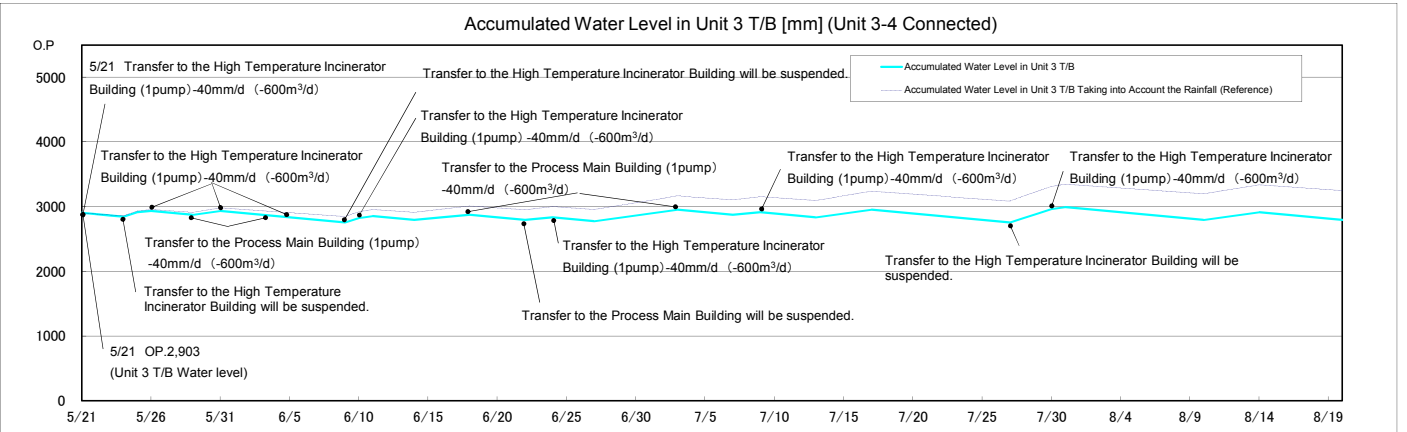
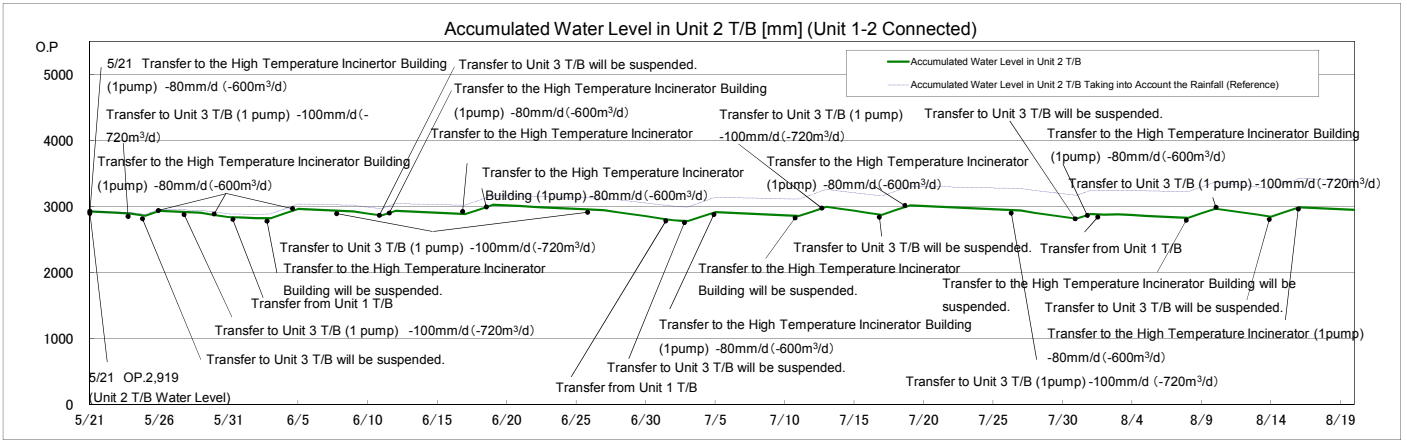
\*2 The figures of the storage volume do not include those of the following volumes that have accumulated from the bottom of the tanks to the height of so-called "down scale (DS)," where water gauges show 0%.

\*3 The figures of the data show the operational limits.

\*4 The figures of "Storage capacity" do not include those of the volumes that have accumulated from the bottom of the tanks to the height of so-called "down scale (DS)," where water gauges show 0%. However, each tank has the capacity that accommodates more than the storage volume that accumulates up to the height of "DS."

\*5 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 (5,040m<sup>3</sup>)  
 Breakdown of the cumulative treated amount: Cesium adsorption apparatus (281,100m<sup>3</sup>)  
 2nd Cesium adsorption apparatus (951,060m<sup>3</sup>)  
 Cesium adsorption apparatus (618)

\*5 Breakdown of the used vessels:  
 Cesium adsorption apparatus (618)  
 2nd cesium Cesium adsorption apparatus (132),  
 Others: Storage container (1,547),  
 Treated column (3)  
 Used vessels (132)  
 Filters and so forth (57)



Note

- The amount of water treated by the 2nd Cesium Adsorption Apparatus is estimated to be 780m<sup>3</sup>/d (Subject to change depending on the factors such as the levels of water accumulated in T/Bs.)
- "Accumulated Water Levels in Unit 2 and 3 T/Bs" are simulated water levels in consideration of the change of the water levels caused by recent rainfall, inflow of groundwater, etc. in the surrounding areas of the Fukushima Daiichi Nuclear Power Station.
- "Accumulated Water Levels in Unit 2 and 3 T/Bs Taking into Account the Rainfall" are simulated water levels which are calculated by adding to the accumulated water amounts which are assumed to increase at the rate of 5mm a day when the surrounding areas of the Fukushima Daiichi Nuclear Power Station have the rainfall equal to the average amount of rain which fell for three months from August to October in 2008 to 2010.
- The storage capacity in the graph includes that of the tanks where the removal of contaminated water has been completed (meaning the disposal of residual water is being conducted.)