

**Situation of Storing and Treatment of Accumulated Water including Highly Concentrated  
Radioactive Materials at Fukushima Daiichi Nuclear Power Station  
(21<sup>st</sup> Release)**

November 16, 2011  
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.

<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 Centralized Radiation 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 (Unit 1 to 4 (including condensers and trenches)), and stored and treated amount in the Accumulated Water Storing Facility (including underpass area close to the High Temperature Incinerator Building), and other related data, as of November 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 Unit 1 and 2 and Unit 3 and 4 building will not exceed OP. 3,000, based on the stored amount in the Accumulated Water Storing Facility and the operating situation of the radioactive material treatment equipment. Water is transferred to the Process Main Building in principle, by securing enough capacity for stably accepting accumulated water in the Process Main Building.

Hence, priority for treatment is placed on the accumulated water in the Process Main Building in order to reserve the capacity for accepting the accumulated water in the building.

We assume stored amounts in each unit building (Unit 1 to 4 (including condenser and trench)),

and stored and treated amount in the Accumulated Water Storing Facility (including underpass area close to the High Temperature Incinerator Building), and other related data on November 22, as shown in Attachment -2.

**(2) Middle term forecast**

Regarding accumulated water in Unit 1 and 2 building and Unit 3 and 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.

We are transferring accumulated water keeping its level in the building below OP. 3,000 considering water injection amount increase to keep the reactor cold shutdown.

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 Facility (including underpass areas close to the High Temperature Incinerator Building) for 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.

Also, the water treated at the radioactive material treatment equipment can be stored in the middle and low level waste water tanks, which are currently being installed.

END

# Storage and treatment of high level radioactive accumulated water (as of November 15, 2011)

Classification	
<span style="color: red;">█</span>	High level radioactive water
<span style="color: purple;">█</span>	Treated water (saltwater)
<span style="color: green;">█</span>	Treated water (concentrated saltwater)
<span style="color: blue;">█</span>	Treated water (freshwater)
<span style="color: black;">█</span>	Freshwater

	Storage volume 1	Change from last report	Storage capacity 2
Concentrated saltwater receiving tank	80,981m <sup>3</sup>	+ 2,665m <sup>3</sup>	85,600m <sup>3</sup>
Freshwater receiving tank	7,745m <sup>3</sup>	+ 613m <sup>3</sup>	25,100m <sup>3</sup>
Concentrated waste liquid storage tank	3,843m <sup>3</sup>	+ 309m <sup>3</sup>	9,500m <sup>3</sup>

1 Storage volume are reference data, because water levels are unstable while desalination plants and evaporative concentration apparatuses are in operation.  
 2 Operational upper limit

	Chlorine density
Before/ after desalination	3,000ppm / 3ppm (sampled on Nov. 1)
Before/ after evaporative concentration	9,000ppm / 2ppm (sampled on Nov. 1)

	Storage volume	change from last report	Storage volume 2
Waste liquid supply tank	1,068m <sup>3</sup>	+ 52m <sup>3</sup>	1,200m <sup>3</sup>
SPT(B)	1,149m <sup>3</sup>	783m <sup>3</sup>	3,100m <sup>3</sup>

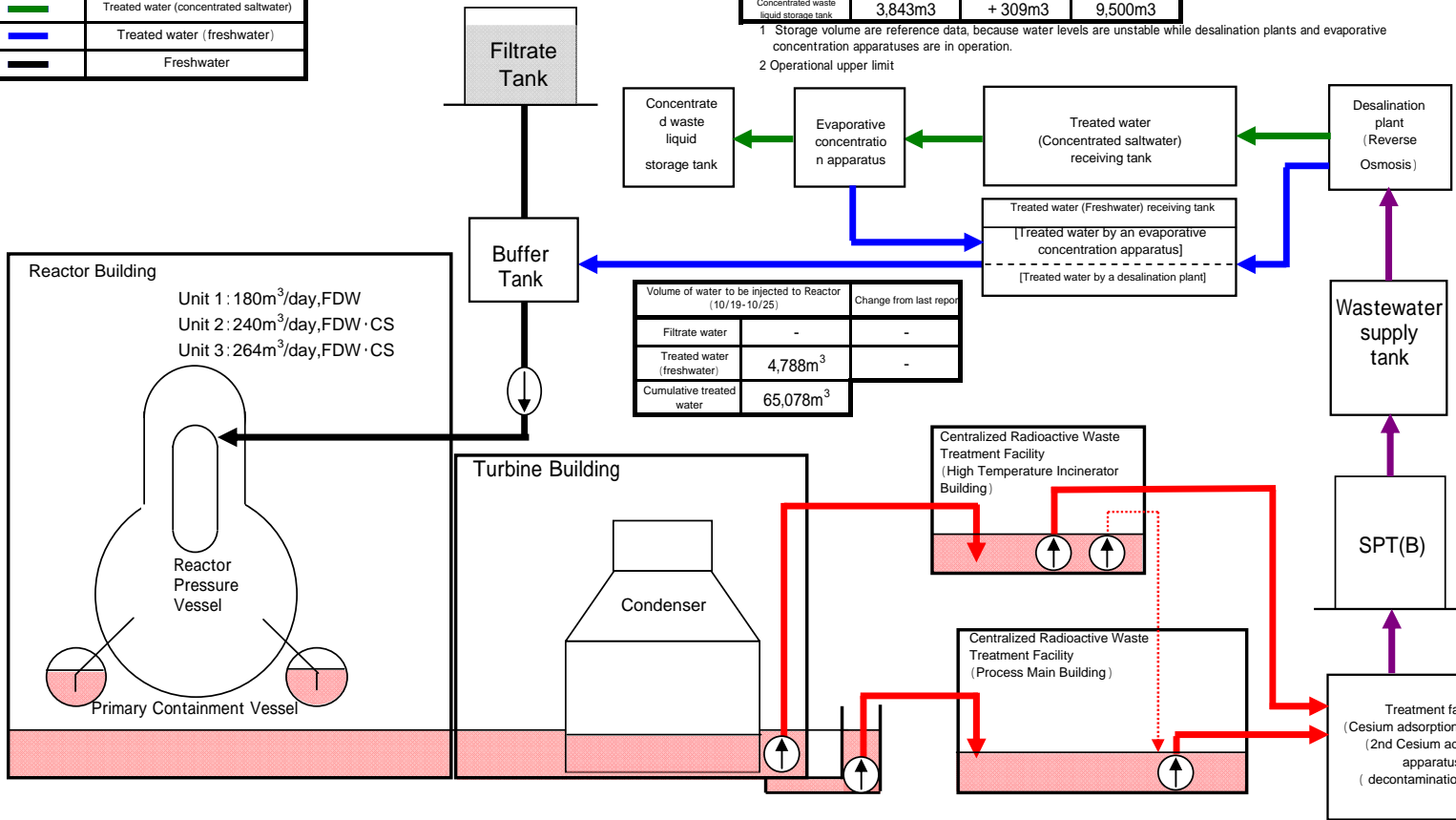
2 Operational Upper limit

Place of sampling	Radioactivity density 3
Process Main Building	7.2E+05 Bq/cm <sup>3</sup> (sampled on Nov.1)
Exit of cesium adsorption apparatus	7.4E+01 Bq/cm <sup>3</sup> (sampled on Nov.1)
Exit of decontamination facility	-
High Temperature Incinerator Building	4.3E+05 Bq/cm <sup>3</sup> (sampled on Oct.31)
Exit of second cesium adsorption apparatus	ND (< 4.7E-01 Bq/cm <sup>3</sup> ) (sampled on Nov. 1)

3 Data of Cs-137 are described above.

Nuclide	DF 4,5
I-131	- ( - )
Cs-134	9.8E+03 ( > 4.4E+05 )
Cs-137	9.7E+03 ( > 9.1E+05 )

4 Data sampled on Nov. 1 (operations of cesium adsorption facility - decontamination facility)  
 5 Data in parentheses are those sampled on Oct 31 and Nov. 1 (operation of the 2nd Cesium adsorption apparatus)



Volume of water to be injected to Reactor (10/19-10/25)	Change from last report
Filtrate water	-
Treated water (freshwater)	4,788m <sup>3</sup>
Cumulative treated water	65,078m <sup>3</sup>

Facility	Storage volume	Change from last report	Water level in T/B	Transfer to
Unit 1	Approx. 14,750m <sup>3</sup>	310m <sup>3</sup>	OP.3,486	Process Main Building
Unit 2	Approx. 22,500m <sup>3</sup>	+ 900m <sup>3</sup>	OP.3,155	
Unit 3	Approx. 24,200m <sup>3</sup>	+ 1,300m <sup>3</sup>	OP.3,110	High Temperature Incinerator Building
Unit 4	Approx. 18,700m <sup>3</sup>	+ 800m <sup>3</sup>	OP.3,098	
<b>Total</b>	<b>Approx. 80,150m<sup>3</sup></b>			

Storage Facility	Storage volume	Change from last report	Water level	Treated volume (11/2-11/8)	Cumulative treated volume	Waste produced	Change from last report	Storage capacity
Process Main Building	Approx. 6,650m <sup>3</sup>	2,330m <sup>3</sup>	OP.1,451	Approx. 6,910m <sup>3</sup>	Approx. 161,710m <sup>3</sup>	Sludge	581m <sup>3</sup>	700 2
High Temperature Incinerator Building	Approx. 3,270m <sup>3</sup>	760m <sup>3</sup>	OP.2,145			Used vessels	285 7	+ 8 393 8
<b>Total</b>	<b>Approx. 9,920m<sup>3</sup></b>							

2 Shows the operational limit.  
 6 Including approx. 4,080m<sup>3</sup> (cumulative treated volume: approx. 56,580m<sup>3</sup>) of treated volume by the 2nd Cesium adsorption apparatus.  
 7 Including 24 used vessels of 2nd Cesium adsorption apparatus.  
 8 Storage capacity will vary according to stored used vessels of 2nd Cesium adsorption apparatus.

**Note:**  
 - Last report as of November 8, 2011  
 - Transferred from Units 2 and 3 to High Temperature Incinerator Building (November 8 - 10: transfer from Unit 2 to High Temperature Incinerator Building was suspended, from November 8: transfer from Unit 3 has been suspended).  
 - First Cesium adsorption apparatus and 2nd Cesium adsorption apparatus have been operated in parallel (First facility utilization factor: 33.7% (Plan: 35%), Second facility utilization factor: 48.6% (Plan 50%) (reference))  
 - Nov 11-13: the water was transferred from Unit 1 turbine building to Unit 2 turbine building  
 - The representation of the storage capacity has been changed. In this report and thereafter, the "operational limit instead" of the "design limit" is used.

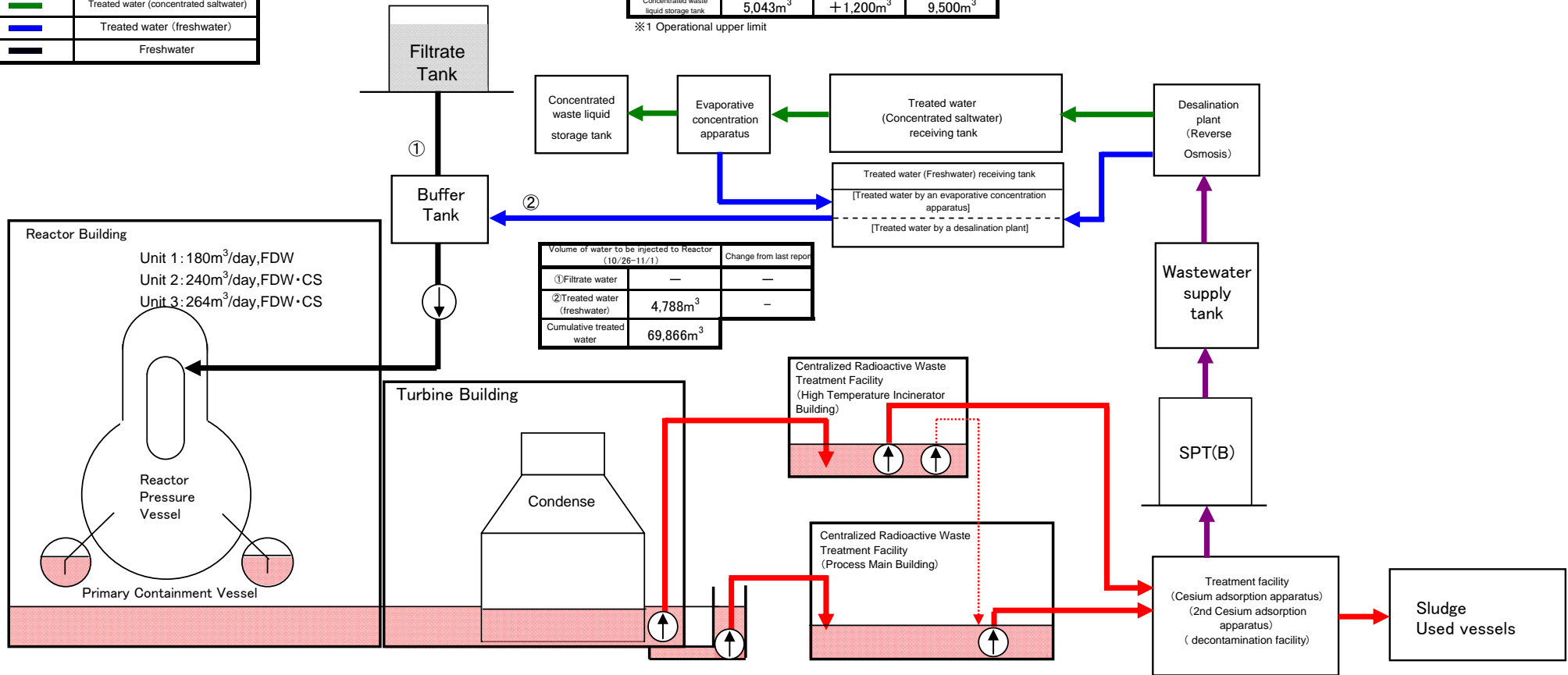
# Storage and treatment of high level radioactive accumulated water (assumed situations as of November 22, 2011)

Classification	
<span style="color:red">—</span>	High level radioactive water
<span style="color:purple">—</span>	Treated water (saltwater)
<span style="color:green">—</span>	Treated water (concentrated saltwater)
<span style="color:blue">—</span>	Treated water (freshwater)
<span style="color:black">—</span>	Freshwater

Storage volume		Change from last report	Storage capacity ※1
Concentrated saltwater receiving tank	80,909m <sup>3</sup>	▲72m <sup>3</sup>	91,900m <sup>3</sup>
Freshwater receiving tank	7,709m <sup>3</sup>	▲36m <sup>3</sup>	25,100m <sup>3</sup>
Concentrated waste liquid storage tank	5,043m <sup>3</sup>	+1,200m <sup>3</sup>	9,500m <sup>3</sup>

※1 Operational upper limit

Volume of water to be injected to Reactor (10/26-11/1)		Change from last report
①Filtrate water	—	—
②Treated water (freshwater)	4,788m <sup>3</sup>	—
Cumulative treated water	69,866m <sup>3</sup>	

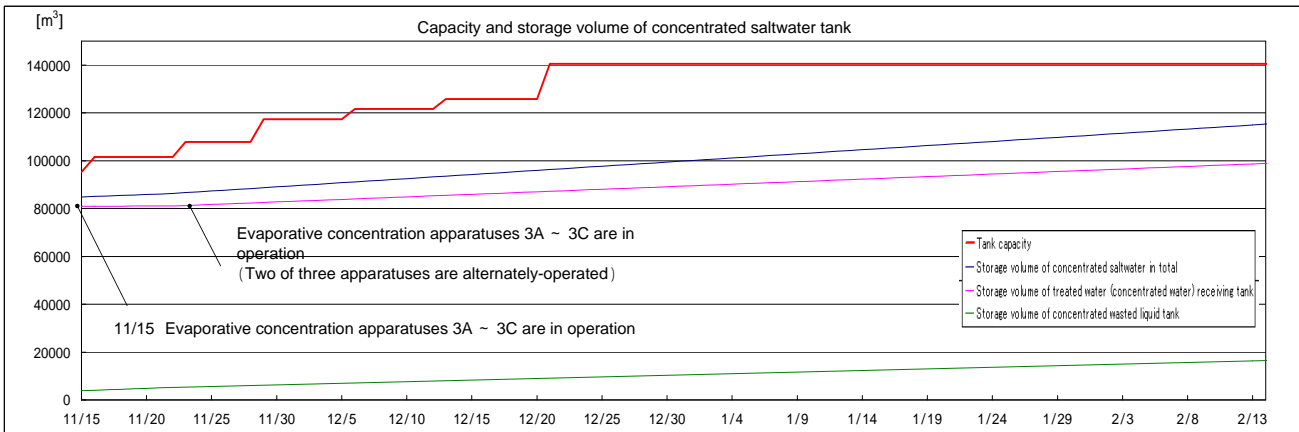
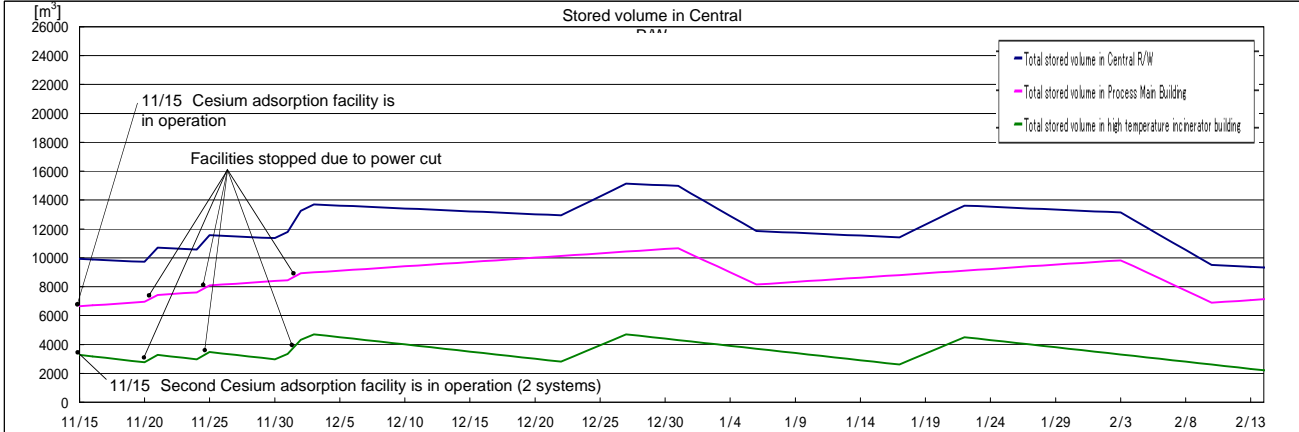
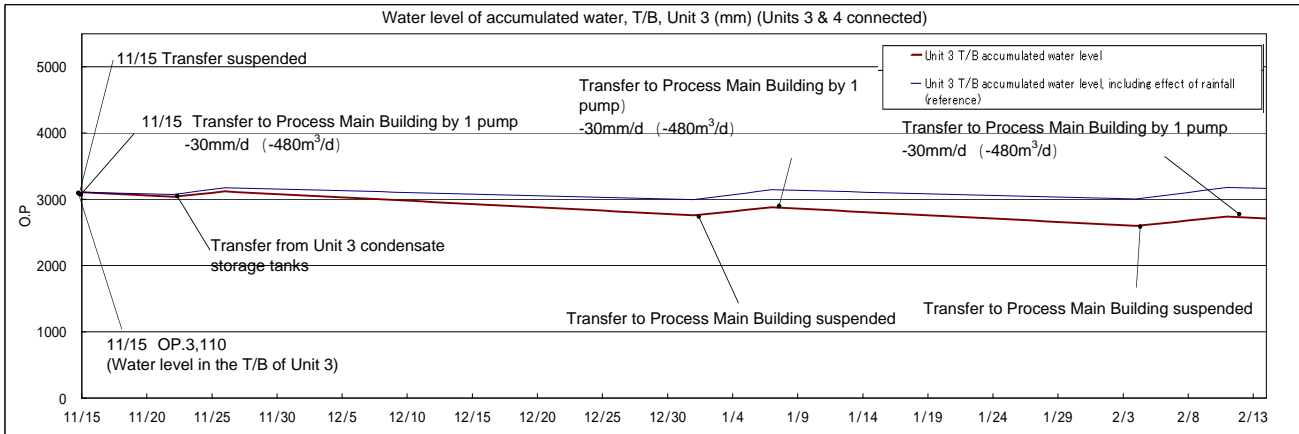
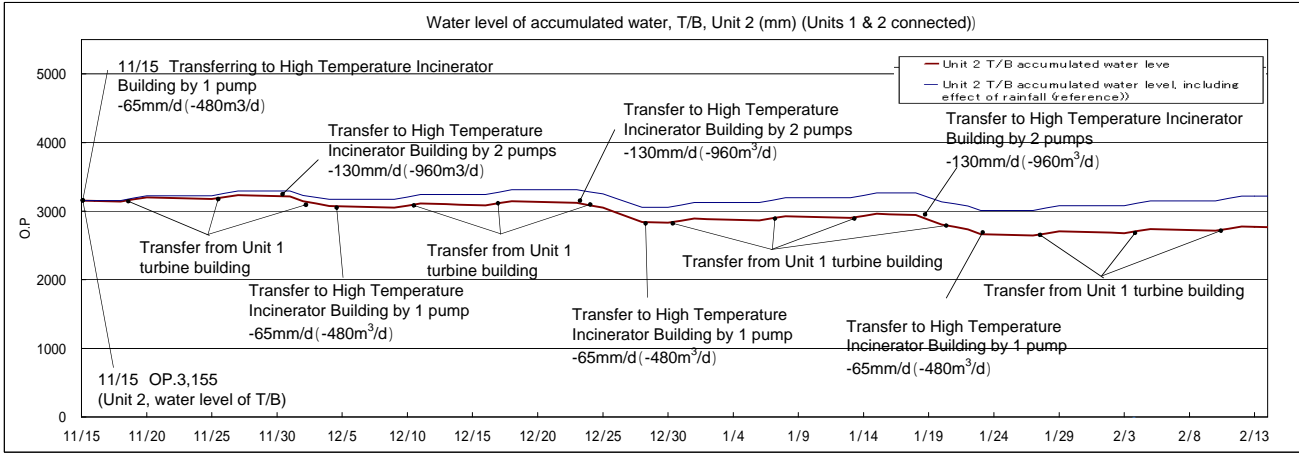


Facility	Storage volume	Change from last report	Water level in T/B	Transfer to
Unit 1	Approx. 14,530m <sup>3</sup>	▲220m <sup>3</sup>	OP.3,184	High Temperature Incinerator Building
Unit 2	Approx. 22,700m <sup>3</sup>	+200m <sup>3</sup>	(Unit 2 T/B)	
Unit 3	Approx. 23,700m <sup>3</sup>	▲500m <sup>3</sup>	OP.3,045	Process Main Building
Unit 4	Approx. 18,200m <sup>3</sup>	▲500m <sup>3</sup>	(Unit 3 T/B)	
Total	Approx. 79,130m <sup>3</sup>			

Storage Facility	Storage volume	Change from last report	Water level	Treated volume (10/26-11/1)	Cumulative treated volume	Waste produced		Change from last report	Storage capacity
Process Main Building	Approx. 7,510m <sup>3</sup>	+860m <sup>3</sup>	OP.1,696	5,880m <sup>3</sup>	Approx.167,590m <sup>3</sup> ※2	Sludge	581m <sup>3</sup>	—	700m <sup>3</sup> ※1
High Temperature Incinerator Building	Approx. 3,290m <sup>3</sup>	+20m <sup>3</sup>	OP.2,163	※2		Used vessels	290 ※3	+5	393 ※4
Total	Approx. 10,800m <sup>3</sup>								

※1 Shows the operational limit.  
 ※2 Including approx. 3,360m<sup>3</sup> (cumulative treated volume: approx. 59,940m<sup>3</sup>) of treated volume by the 2nd Cesium adsorption apparatus.  
 ※3 Including 24 used vessels of 2nd Cesium adsorption apparatus.  
 ※4 Storage capacity will vary according to stored used vessels of 2nd Cesium adsorption

Note:  
 -Water in Unit 2 and Unit 3 will be transferred to High Temperature Incinerator Building and Process Main Building (Transfer from Unit 3 will be resumed, and this time to Process Main Building.)  
 -First Cesium adsorption apparatus and 2nd Cesium adsorption apparatus will be operated in parallel (First facility utilization factor: 30%, Second facility utilization factor: 40% (reference)).  
 -Treatment facilities (first Cesium adsorption apparatus and 2nd Cesium adsorption apparatus) will be temporarily stopped due to the power cut  
 -Transfer from Unit 1 turbine building to Unit 2 turbine building is planned.  
 -The representation of the storage capacity has been changed. In this report and thereafter, the "operational limit instead" of the "design limit" is used.



Note - Amount of water treatment is assumed to be 1,020m<sup>3</sup>/d (It can be adjusted according to level of accumulated water in T/B.)  
 - Assume 5mm increase per day of accumulated water level of T/B including influences of rainfall in case we consider 3-year-averaged rainfall near 1F from August to October.