

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

November 30, 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 29, 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 December 6, 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 29, 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	80,157m <sup>3</sup> + 290m <sup>3</sup>	98,200m <sup>3</sup>
Freshwater receiving tank	11,637m <sup>3</sup> + 2,696m <sup>3</sup>	25,100m <sup>3</sup>
Concentrated waste liquid storage tank	4,910m <sup>3</sup> + 361m <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	1,126m <sup>3</sup> + 11m <sup>3</sup>	1,200m <sup>3</sup>
SPT(B)	1,902m <sup>3</sup> + 44m <sup>3</sup>	3,100m <sup>3</sup>

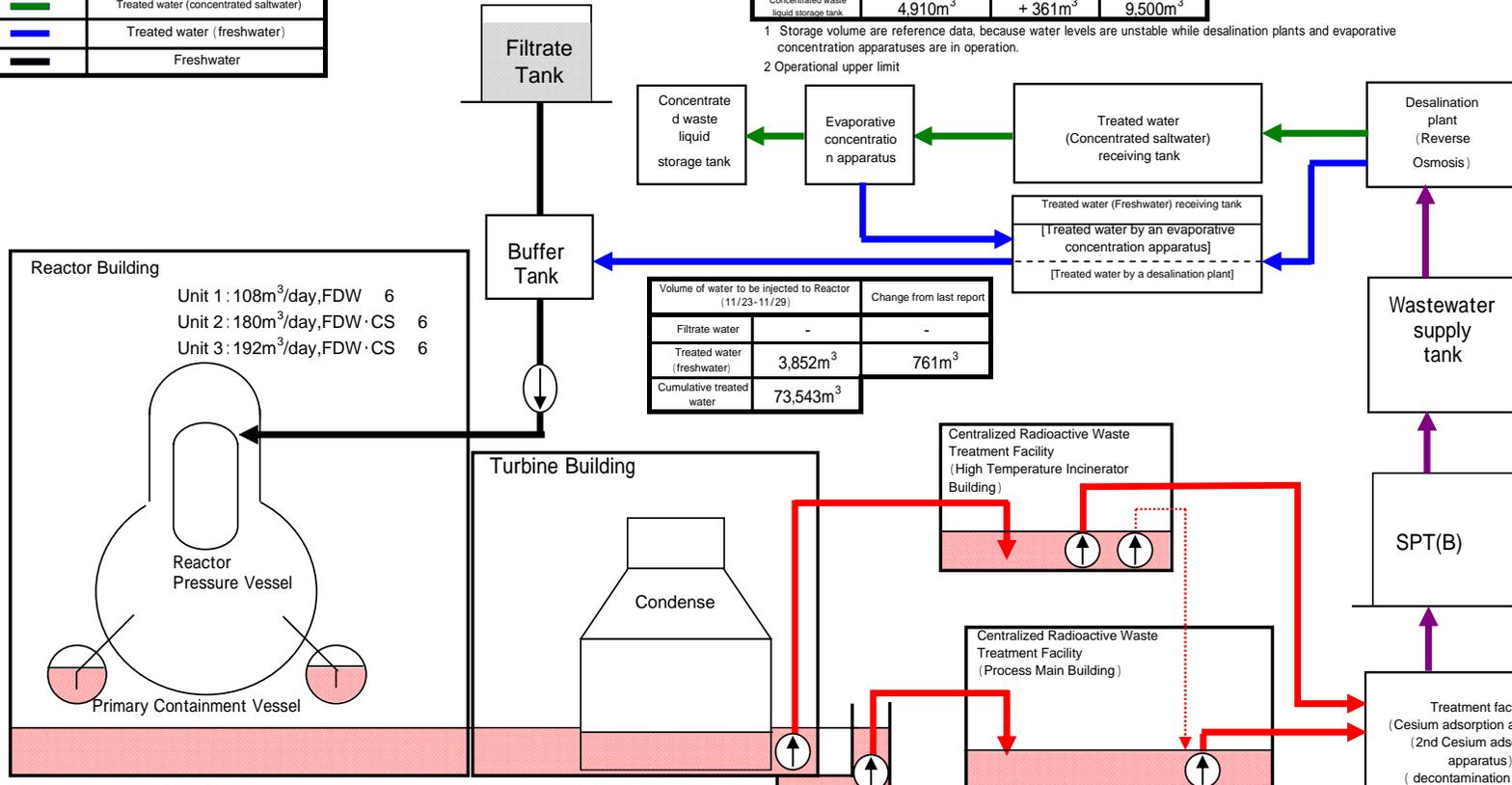
2 Operational Upper limit

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 (11/23-11/29)	Change from last report
Filtrate water	-
Treated water (freshwater)	3,852m <sup>3</sup> 761m <sup>3</sup>
Cumulative treated water	73,543m <sup>3</sup>

6 From November 24 to 26, we changed the water injection amount of Unit1-3 into the reactor as follows,  
 Unit 1:132m<sup>3</sup>/day 120m<sup>3</sup>/day 108m<sup>3</sup>/day, Unit 2:240m<sup>3</sup>/day 204m<sup>3</sup>/day 180m<sup>3</sup>/day, Unit 3:264m<sup>3</sup>/day 216m<sup>3</sup>/day 192m<sup>3</sup>/day

Facility	Storage volume	Change from last report	Water level in T/B	Transfer to
Unit 1	approx.14,150m <sup>3</sup>	690m <sup>3</sup>	OP.3,321	High Temperature Incinerator Building
Unit 2	approx.21,600m <sup>3</sup>	300m <sup>3</sup>	OP.3,015	
Unit 3	approx.23,200m <sup>3</sup>	400m <sup>3</sup>	OP.2,984	Process Main Building
Unit 4	approx.18,100m <sup>3</sup>	200m <sup>3</sup>	OP.3,012	
Total	approx.77,050m <sup>3</sup>			

Storage Facility	Storage volume	Change from last report	Water level	Treated volume (11/23-11/29)	Cumulative treated volume	Waste produced	Change from last report	Storage capacity
Process Main Building	approx.9,170m <sup>3</sup>	+ 1,360m <sup>3</sup>	OP.2,168	approx.6,690m <sup>3</sup>	approx.175,140m <sup>3</sup>	Sludge	581m <sup>3</sup>	700m <sup>3</sup> 2
High Temperature Incinerator Building	approx.3,250m <sup>3</sup>	+ 140m <sup>3</sup>	OP.2,126	7	7	Used vessels	298 8	+ 8 393 9
Total	approx.12,420m <sup>3</sup>							

2 Shows the operational limit.  
 7 Including approx. 3,910m<sup>3</sup> (cumulative treated volume:approx. 64,670m<sup>3</sup>) of treated volume by the 2nd Cesium adsorption apparatus.  
 8 Including 26 used vessels of 2nd Cesium adsorption apparatus.  
 9 Storage capacity will vary according to stored used vessels of 2nd Cesium adsorption apparatus.

Note:  
 · Last report as of November 22, 2011  
 · Transferred from Units 2 and 3 to Process Main Building & High Temperature Incinerator Building.  
 · First Cesium adsorption apparatus and 2nd Cesium adsorption apparatus have been operated in parallel (First facility utilization factor: 33.1% (Plan: 30%), Second facility utilization factor: 46.5 % (Plan 40%) (reference))  
 · Nov 25: First Cesium adsorption apparatus and 2nd Cesium adsorption apparatus suspended due to power lost.  
 · From Nov 21 to 24 :the water was transferred from Unit 3 condensate storage tanks to Unit 3 turbine building.  
 · Nov 24 :the water was transferred from On-site Bunker Building to Process Main Building.  
 · From Nov 25 to 27 :the water was transferred from Unit 1 turbine building to Unit 2 turbine building.

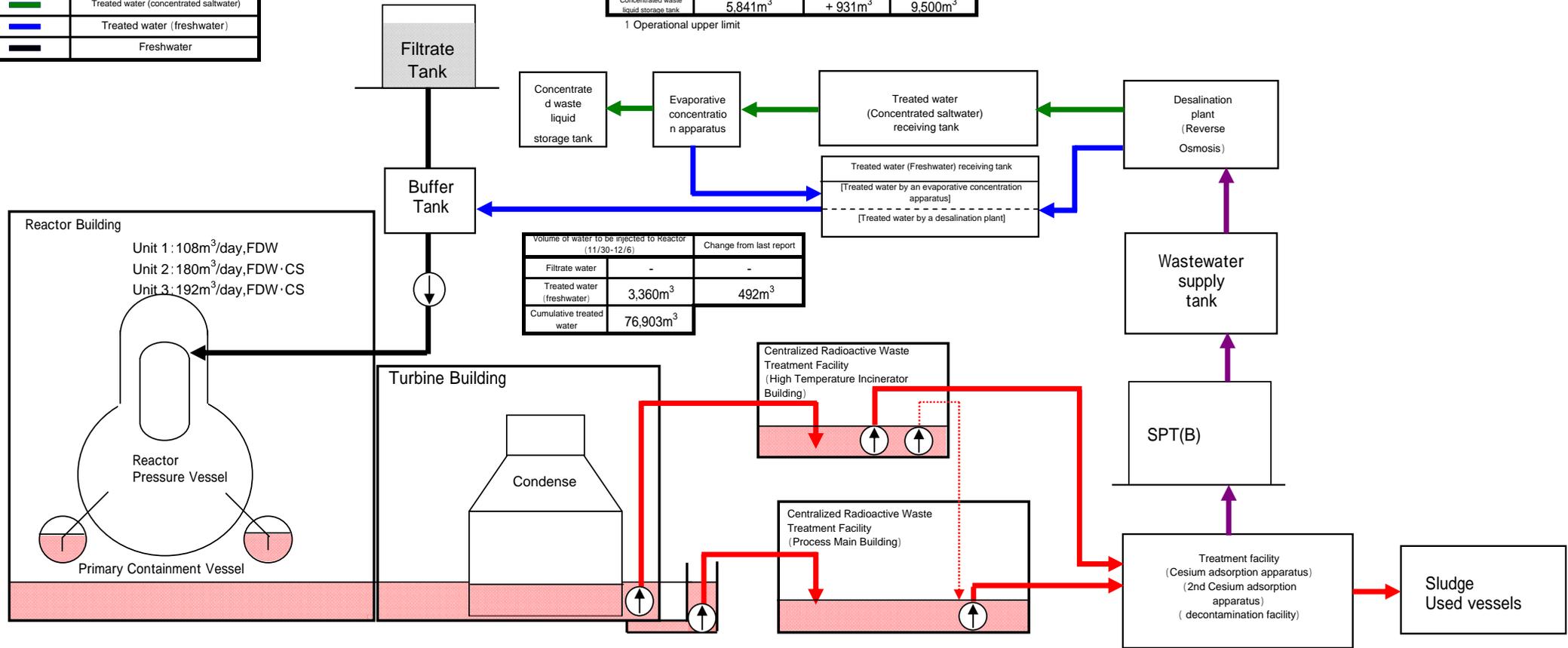
# Storage and treatment of high level radioactive accumulated water (assumed situations as of December 6, 2011)

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 <sup>1</sup>
Concentrated saltwater receiving tank	81,137m <sup>3</sup>	+ 980m <sup>3</sup>	107,700m <sup>3</sup>
Freshwater receiving tank	12,666m <sup>3</sup>	+ 1,029m <sup>3</sup>	25,100m <sup>3</sup>
Concentrated waste liquid storage tank	5,841m <sup>3</sup>	+ 931m <sup>3</sup>	9,500m <sup>3</sup>

<sup>1</sup> Operational upper limit

Volume of water to be injected to Reactor (11/30-12/6)		Change from last report
Filtrate water	-	-
Treated water (freshwater)	3,360m <sup>3</sup>	492m <sup>3</sup>
Cumulative treated water	76,903m <sup>3</sup>	

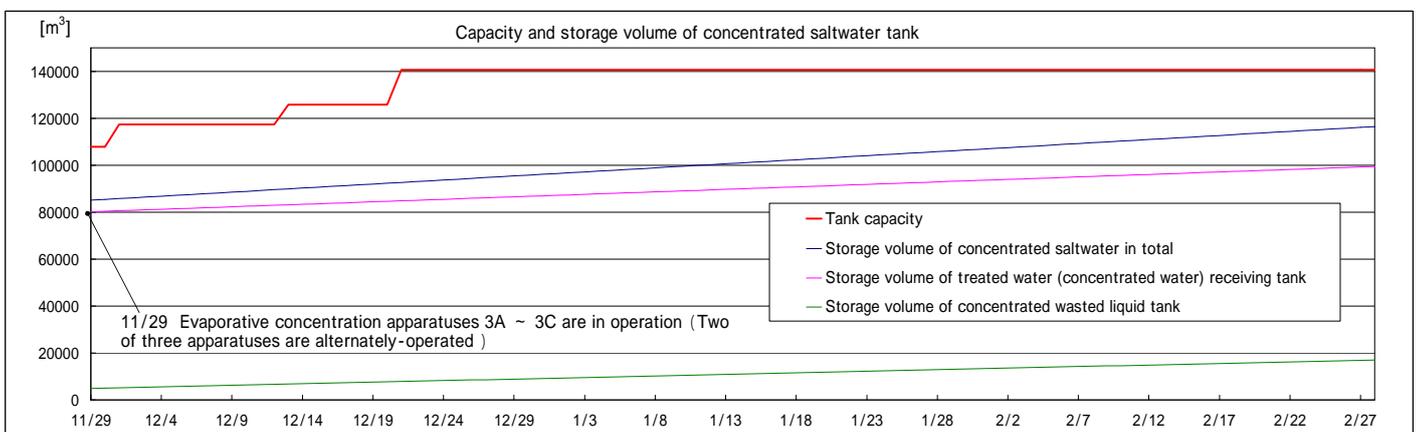
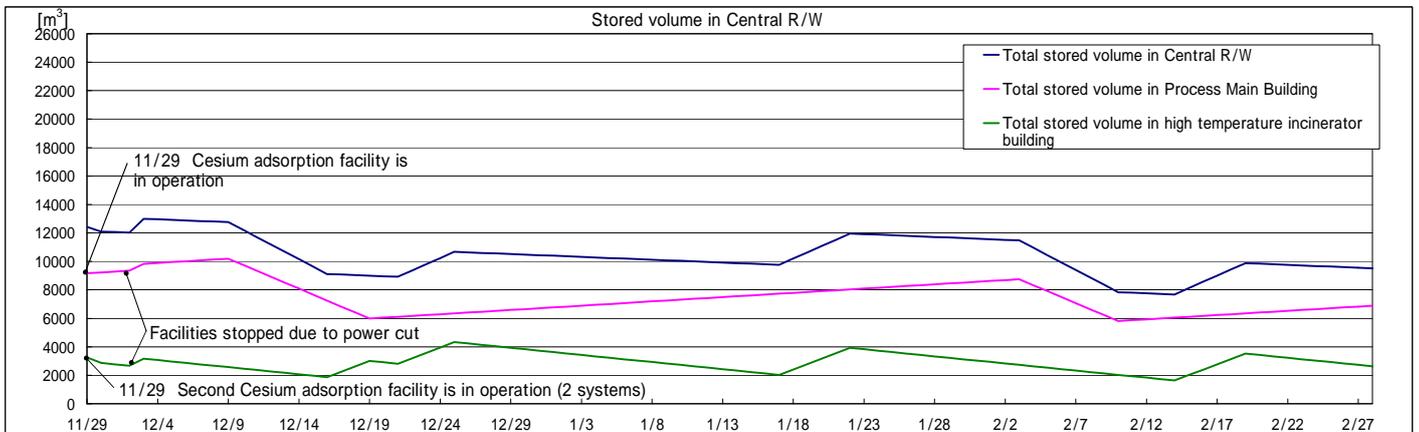
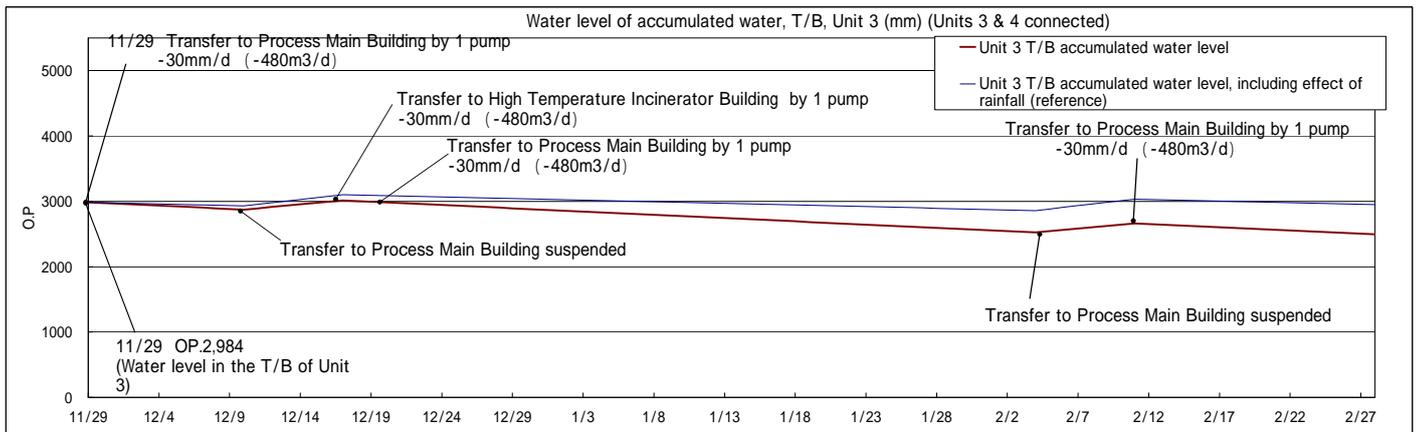
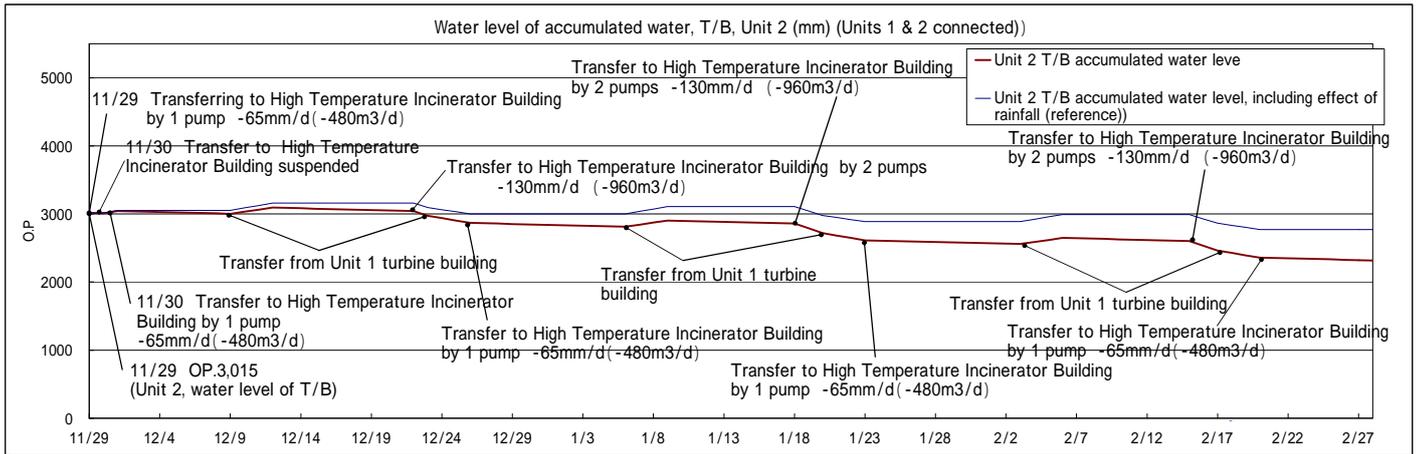


Facility	Storage volume	Change from last report	Water level in T/B	Transfer to
Unit 1	approx.14,370m <sup>3</sup>	+ 220m <sup>3</sup>	OP.3,003 (Unit 2 T/B)	High Temperature Incinerator Building
Unit 2	approx.21,500m <sup>3</sup>	100m <sup>3</sup>	OP.2,915 (Unit 3 T/B)	Process Main Building
Unit 3	approx.22,700m <sup>3</sup>	500m <sup>3</sup>		
Unit 4	approx.17,600m <sup>3</sup>	500m <sup>3</sup>		
Total	approx.76,170m <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.10,090m <sup>3</sup>	+ 920m <sup>3</sup>	OP.2,430	6,300m <sup>3</sup>	approx.181,440m <sup>3</sup>	Sludge	581m <sup>3</sup>	-	700m <sup>3</sup> 1
High Temperature Incinerator Building	approx.3,090m <sup>3</sup>	160m <sup>3</sup>	OP.1,993	2	2	Used vessels	302 3	+ 4	393 4
Total	approx.13,180m <sup>3</sup>								

- 1 Shows the operational limit.
- 2 Including approx. 3,780m<sup>3</sup> (cumulative treated volume: approx.68,450m<sup>3</sup>) of treated volume by the 2nd Cesium adsorption apparatus.
- 3 Including 26 used vessels of 2nd Cesium adsorption apparatus.
- 4 Storage capacity will vary according to stored used vessels of 2nd Cesium adsorption apparatus.

Note:  
 · Water in Unit 2 and Unit 3 will be transferred to High Temperature Incinerator Building and Process Main Building. (Transferring from Unit 2 to High Temperature Incinerator Building will be temporarily stopped )  
 · First Cesium adsorption apparatus and 2nd Cesium adsorption apparatus will be operated in parallel (First facility utilization factor: 30%, Second facility utilization factor: 45% (reference)).  
 · Treatment facilities (first Cesium adsorption apparatus and 2nd Cesium adsorption apparatus) will be temporarily stopped due to the power cut



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.