Situation of Storage and Treatment of Accumulated Water including Highly Concentrated Radioactive Materials at Fukushima Daiichi Nuclear Power Station (103rd Release)

June 12, 2013
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 amount in the Accumulated Water Storing Facility (including underpass area close to the High Temperature Incinerator Building), and other related data, as of June 11, 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 amount in the Accumulated Water Storing Facilities (including underpass area close to the High Temperature Incinerator Building), and other related data as of June 18, 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 (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. 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.

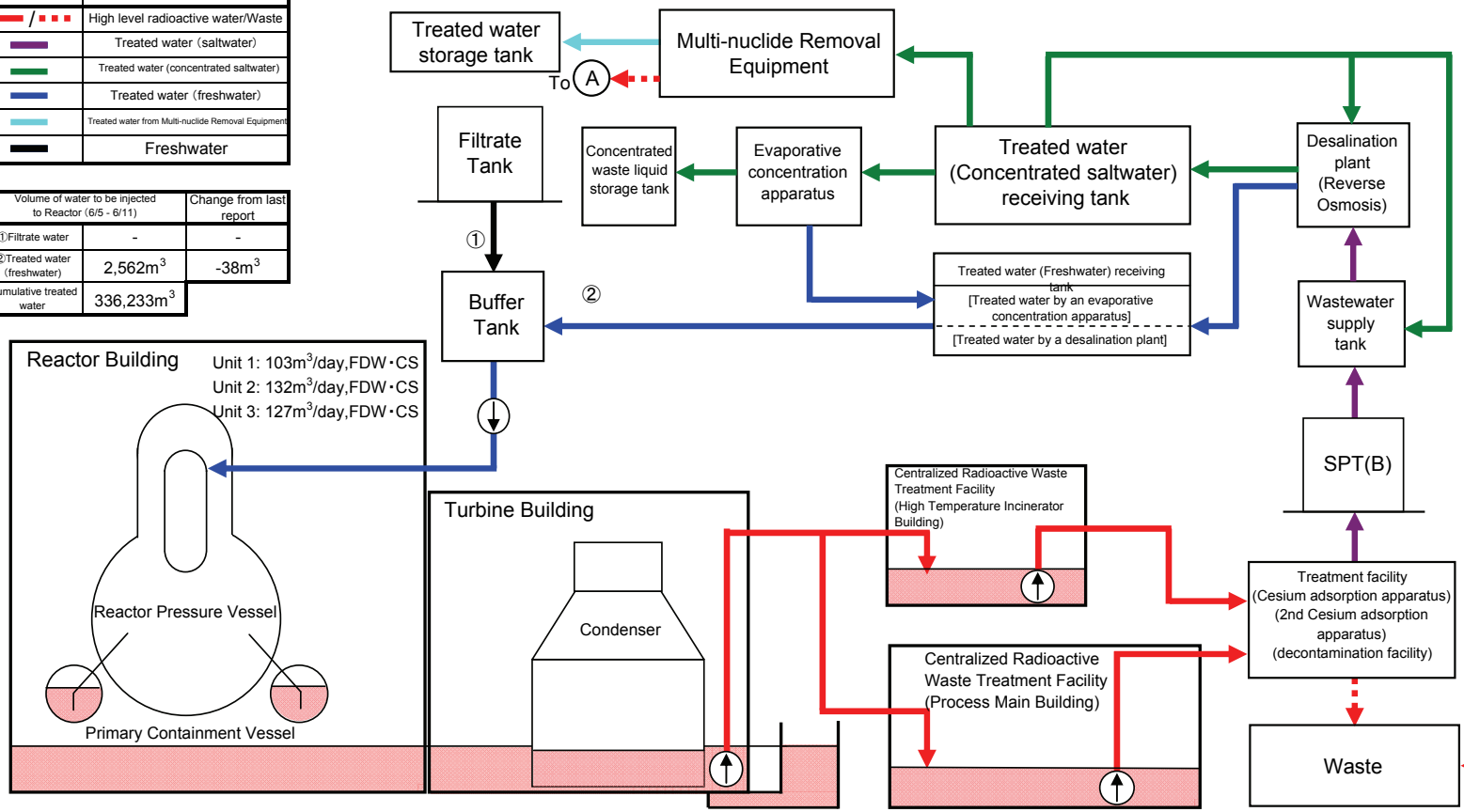
END

Storage and treatment of high level radioactive accumulated water (as of June 11, 2013)

Attachment-1

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 (6/5 - 6/11)		Change from last report
①Filtrate water	-	-
②Treated water (freshwater)	2,562m^3	-38m^3
Cumulative treated water	336,233m^3	



Storage volume *1		Change from last report	Storage capacity*2*3
Concentrated saltwater receiving tank*4	255,984m^3	+1,104m^3	270,800m^3
Freshwater receiving tank	29,478m^3	+197m^3	31,400m^3
Concentrated waste liquid storage tank	9,209m^3	+16m^3	9,500m^3
Treated water storage tank*5	10,205m^3	+1,099m^3	26,700m^3

Storage volume		Change from last report	Storage volume*2
Waste liquid supply tank	1,063m^3	+159m^3	1,200m^3
SPT(B)	1,757m^3	+107m^3	3,100m^3

	Chloride concentration
Before/After Desalination	340ppm / <1ppm (Sampled on May 14)
Before/After Evaporative Concentration	6,900ppm / 2ppm (Sampled on Dec. 20, 2011)

Place of Sampling	Radioactivity density*6
Process Main Building	6.4E+04 Bq/cm^3 (Sampled on Mar. 19)
Exit of cesium adsorption apparatus	6.9E+00 Bq/cm^3 (Sampled on Mar. 19)
Exit of decontamination facility	-
High Temperature Incinerator Building	3.7E+04 Bq/cm^3 (Sampled on May 14)
Exit of second cesium adsorption apparatus	3.5E-01 Bq/cm^3 (Sampled on May 14)

Facility	Storage volume	Change from last report	Water level in T/B
Unit 1	Approx.13,900m^3	No Change	OP.2,806
Unit 2	Approx.22,200m^3	+500m^3	OP.3,068
Unit 3	Approx.22,200m^3	-200m^3	OP.2,847
Unit 4	Approx.16,800m^3	-500m^3	OP.2,822
Total	Approx.75,100m^3		

Storage Facility	Storage volume	Change from last report	Water level	Treated volume (6/5 - 6/11)	Cumulative treated volume
Process Main Building	Approx.15,960m^3	+90m^3	OP.4,510	Approx.5,750m^3 *7	Approx.662,910m^3 *7
High Temperature Incinerator Building	Approx.2,680m^3	-190m^3	OP.1,635		
Total	Approx.18,640m^3				

Waste produced		Change from last report	Storage capacity
Sludge	597m^3	No change	700m^3 *2
Used vessels	531*8	+ 4	2,472

[Highlights from the previous update (June 4, 2013) to the present status]
- On June 8, water transfer from Unit 2 to Unit 3 Turbine Building was restarted and transfer is in progress.
- On June 7, water transfer from Unit 3 to the High Temperature Incinerator Building was temporarily suspended and transfer is in progress.
- Since November 29, water transfer from Unit 4 has been under suspension.
- 2nd Cesium Adsorption Apparatus is under operation (Availability factor 68.5% (Projected: 65%)).
- Since March 21, Cesium Absorption Apparatus has been stopped.
- From June 3 to 9, water transfer from the underground reservoir iii to the underground reservoir vi was conducted.
- From June 3 to 9, water transfer from the underground reservoir vi to G6 tank was conducted. Transfer of concentrated seawater stored in the underground reservoir i, ii, iii and vi to the aboveground tank is completed.
- The underground reservoir iii and vi were excluded from the calculation of storage capacity of the “concentrated saltwater receiving tank.”
- G6 tank was included to the calculation of storage capacity of the "concentrated saltwater receiving tank."
- Storage capacity of the "concentrated saltwater receiving tank" will be increased by adding tanks.

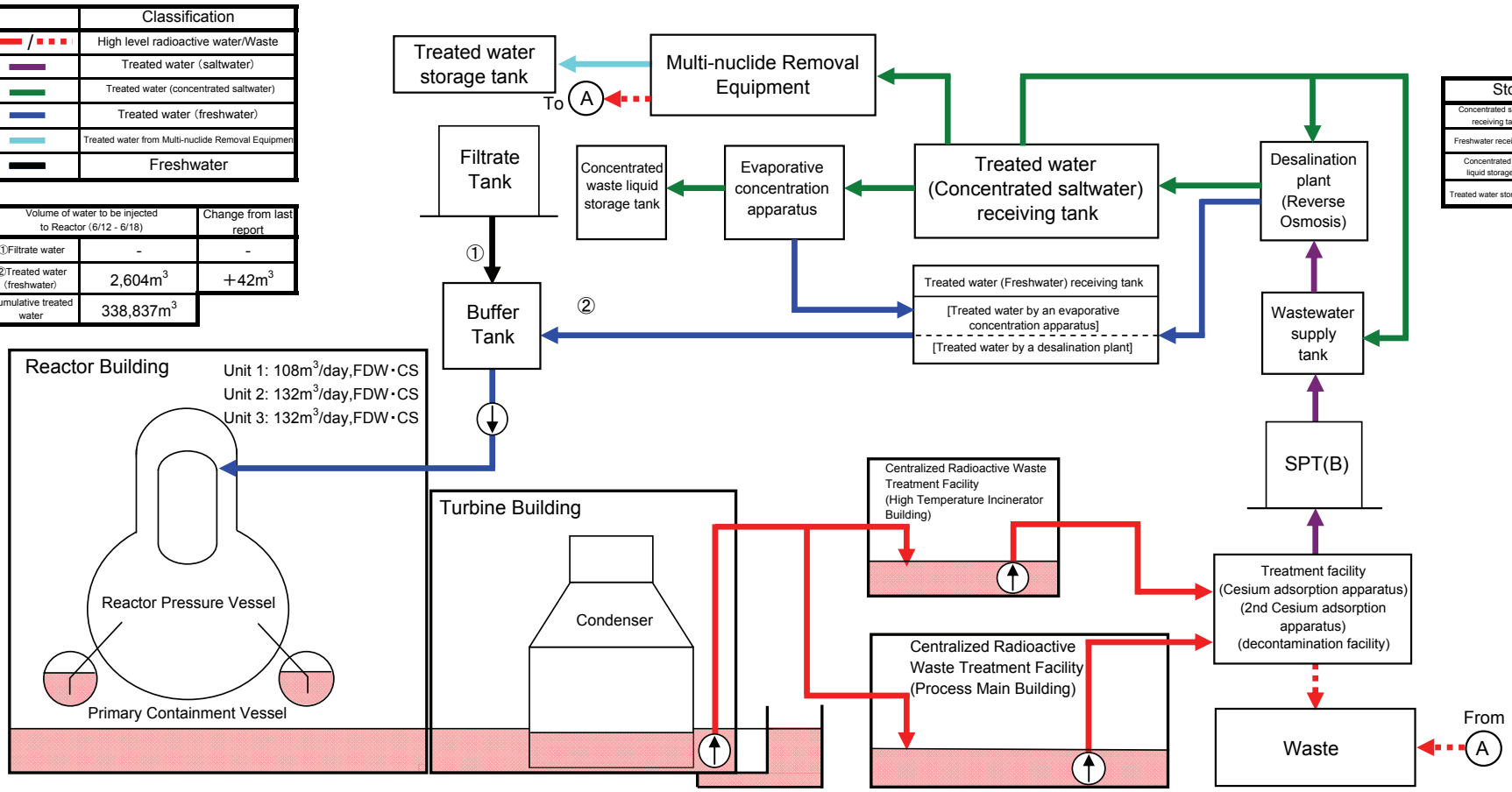
*1 The figures are just for reference when the water level of Desalination System and Evaporative concentration apparatus are not stable.
*2 Shows the operational limit.
*3 The underground reservoirs are not included in the figure.
*4 Includes the storage capacity (4,600m^3) of the filtrate tank.Storage capacity of G6 tank No.9, where the leakage was found on June 5, 2013, is set to be equivalent to the amount currently stored (approx. 140m^3).
*5 The treated water from the Multi-nuclide Removal Equipment (under hot test) is stored. Freshwater and concentrated saltwater will be stored depending on the operation status.
*6 Data of Cs-137 are described above.
*7 Total treated amount of Cesium adsorption apparatus and 2nd Cesium adsorption apparatus
Breakdown of the treated amount: Cesium adsorption apparatus (0m^3)
2nd Cesium adsorption apparatus (5,750m^3)
Breakdown of the cumulative treated amount: Cesium adsorption apparatus (179,610m^3)
2nd Cesium adsorption apparatus (483,300m^3)
*8 Breakdown of the used vessels: Cesium adsorption apparatus (424)
2nd cesium Cesium adsorption apparatus (80)
Storage container of t e Multi-nuclide Removal Equipment (27) and treated column (0)

Attachment-2

Storage and treatment of high level radioactive accumulated water (June 18, 2013)

	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 (6/12 - 6/18)		Change from last report
①Filtrate water	-	-
②Treated water (freshwater)	2,604m^3	+42m^3
Cumulative treated water	338,837m^3	



Storage volume		Change from last report	Storage capacity*1*2
Concentrated saltwater receiving tank*3	258,516m^3	+2,532m^3	271,900m^3
Freshwater receiving tank	29,394m^3	-84m^3	31,400m^3
Concentrated waste liquid storage tank	9,209m^3	No Change	9,500m^3
Treated water storage tank*4	10,655m^3	+450m^3	29,900m^3

Facility	Storage volume	Change from last report	Water level in T/B
Unit 1	Approx. 14,000m^3	+100m^3	OP.3,165 (Unit 2 T/B)
Unit 2	Approx. 22,800m^3	+600m^3	
Unit 3	Approx. 21,600m^3	-600m^3	OP.2,775 (Unit 3 T/B)
Unit 4	Approx. 16,400m^3	-400m^3	
Total	Approx. 74,800m^3		

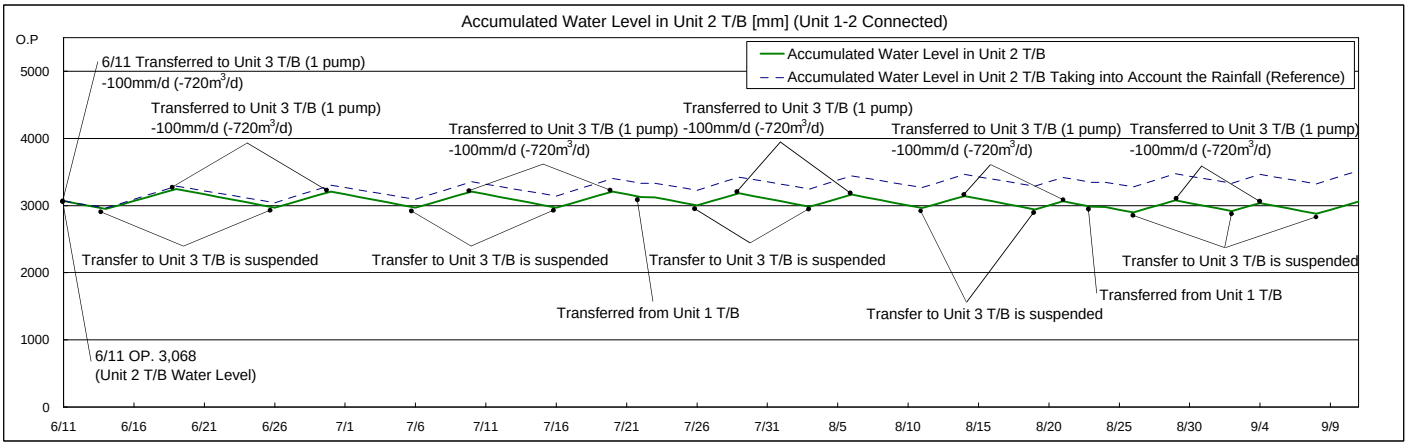
Storage Facility	Storage volume	Change from last report	Water level	Treated volume (6/12 - 6/18)	Cumulative treated volume	Waste produced		Change from last report	Storage capacity
Process Main Building	Approx. 16,080m^3	+120m^3	OP.4,545	Approx. 5,460m^3 *5	Approx. 668,370m^3 *5	Sludge	597m^3	No Change	700m^3 *1
High Temperature Incinerator Building	Approx. 2,860m^3	+180m^3	OP.1,786			Used vessels	533*6	+2	2,472
Total	Approx. 18,940m^3								

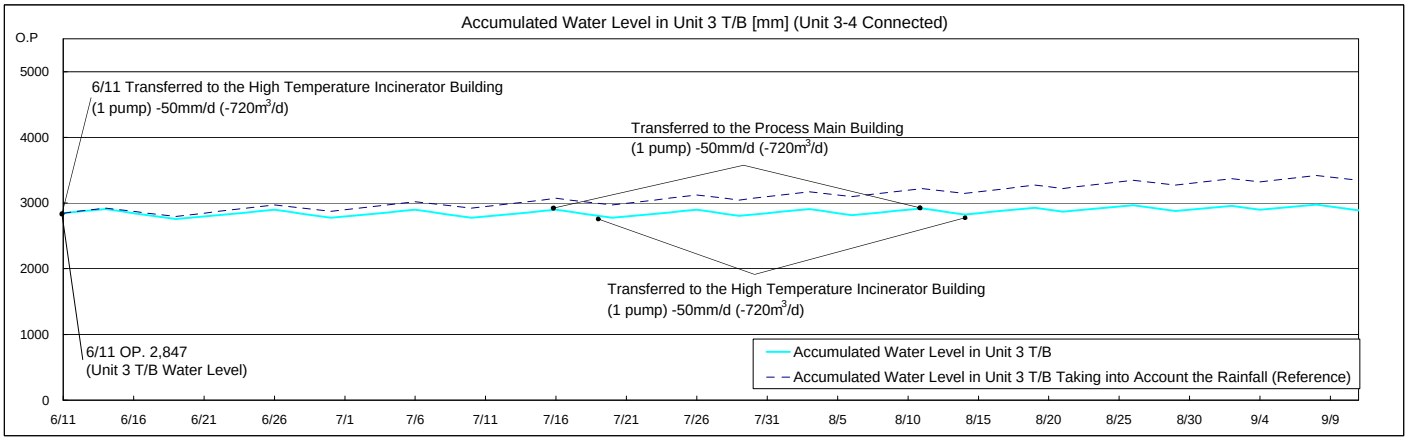
[Highlights from the present status (June 11, 2013) to the supposition status]
- Water transfer from Unit 2 to Unit 3 Turbin Building will be suspended.
- Water transfer from Unit 3 to the High Temperature Incinerator Building will be conducted.
- Water transfer from Unit 4 will be stopped continuously.
- Operation of 2nd Cesium Absorption Apparatus is scheduled: Availability Factor 65% (Projected)
- Cesium Absorption Apparatus will be stopped continuously.
- Storage capacity of the "concentrated saltwater receiving tank" and the "treated water storage tank" will be increased by adding tanks.

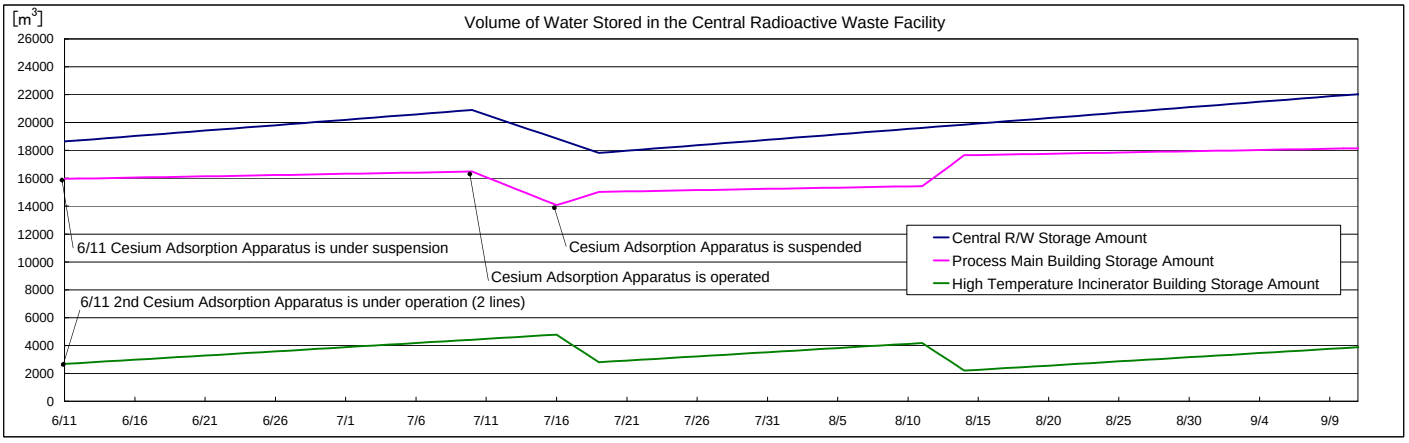
*1 Shows the operational limit.
*2 The underground reservoirs are not included in the figure.
*3 Includes the storage capacity (4,600m^3) of the filtrate tank.Storage capacity of the filtrate water tank is included in the figure. Storage capacity of G6 tank No.9, where the leakage was found on June 5, 2013, is set to be equivalent to the amount currently stored (approx. 140m^3).
*4 The treated water from the Multi-nuclide Removal Equipment (under hot test) is stored. Freshwater and concentrated saltwater will be stored depending on the operation status.
*5 Total treated amount of Cesium adsorption apparatus and 2nd Cesium adsorption apparatus
Breakdown of the treated amount: Cesium adsorption apparatus (0m^3)
2nd Cesium adsorption apparatus (5,460m^3)
Breakdown of the cumulative treated amount: Cesium adsorption apparatus (179,610m^3)
2nd Cesium adsorption apparatus (488,760m^3)
*6 Breakdown of the used vessels: Cesium adsorption apparatus (424)
2nd cesium Cesium adsorption apparatus (80)
Storage container of the Multi-nuclide Removal Equipment (29) and treated column (0)

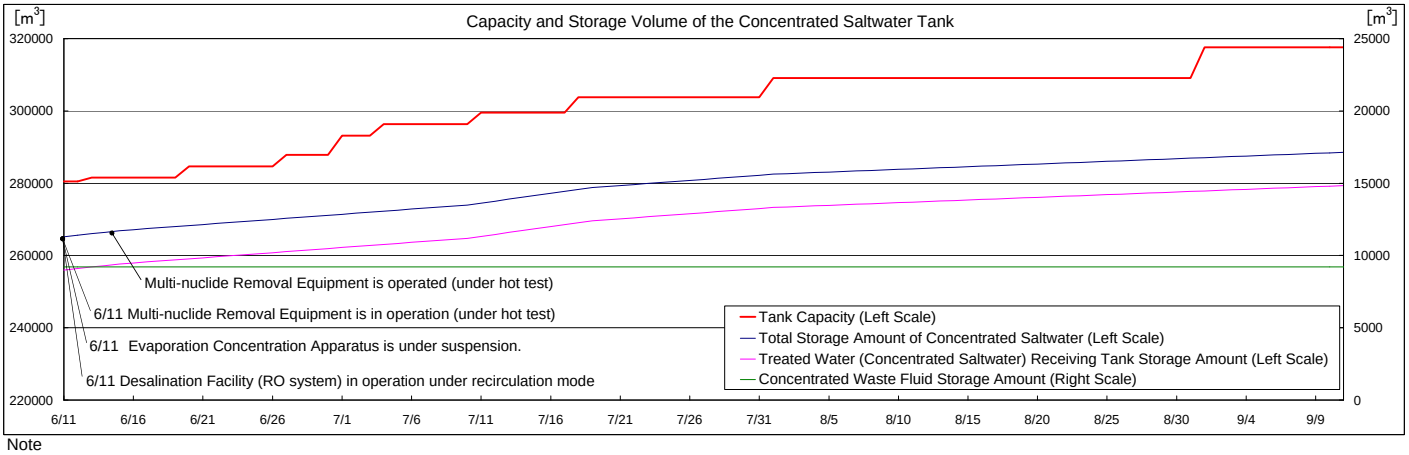
Simulation Results of Accumulated Water Treatment in Unit 1-4 T/B

Attachment-3 (1)









Note

- The treated water volume is assumed to be 780m3/d (Subject to change depending on the level of water accumulated in T/B).
- The accumulated water level in T/B is a simulation result in consideration of flactuation of water level such as recent rainfall, inflow of groundwater, and 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 area of Fukushima Daiichi Nuclear Power Station (August-October in the past 3 years).