Situation of Storage and Treatment of Accumulated Water including Highly Concentrated Radioactive Materials at Fukushima Daiichi Nuclear Power Station (141st Release)

March 12, 2014
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 March 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 March 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.

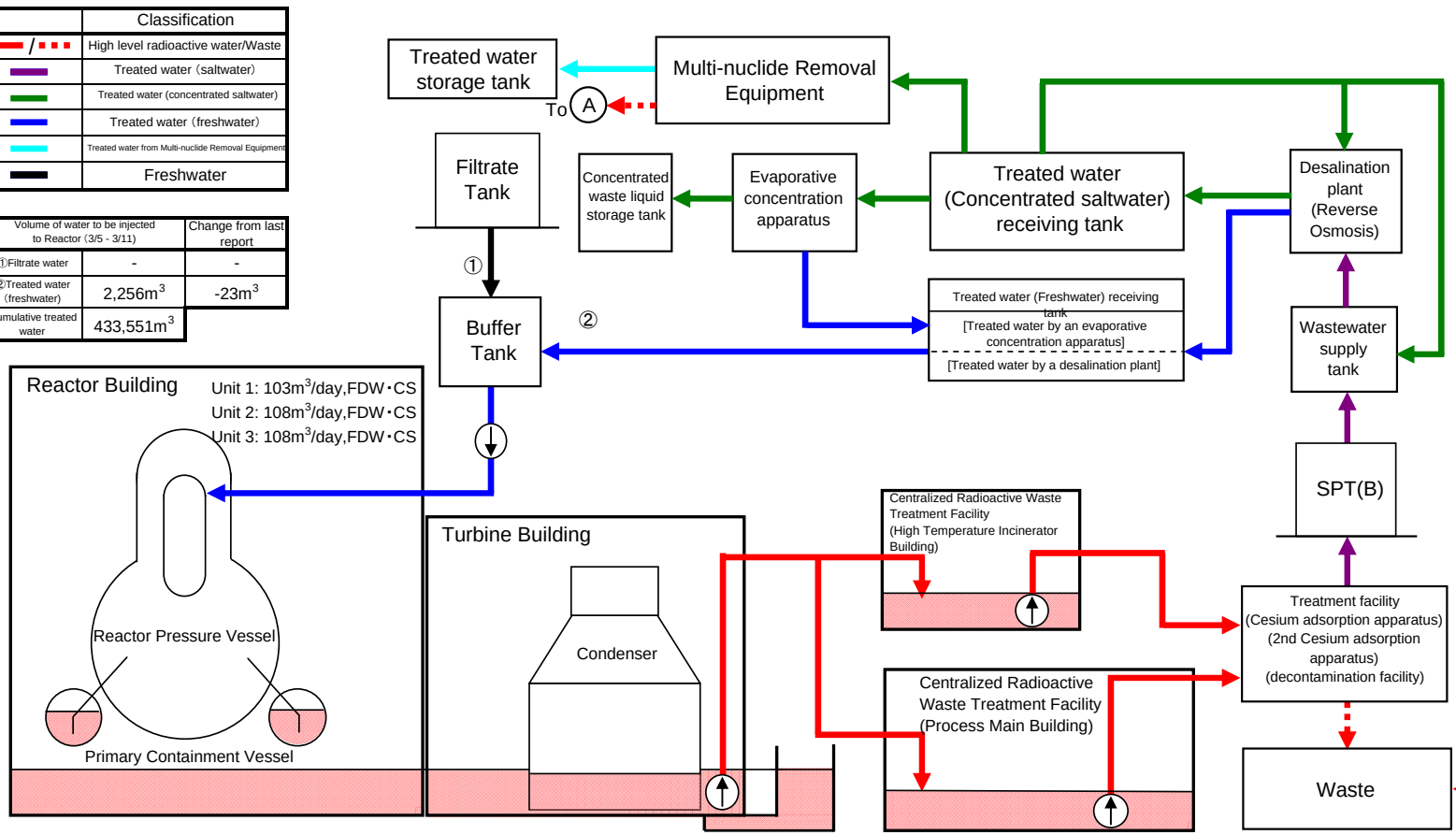
END

Storage and treatment of high level radioactive accumulated water (as of March 11, 2014)

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（3/5 - 3/11）		Change from last report
①Filtrate water	-	-
②Treated water (freshwater)	2,256m^3	-23m^3
Cumulative treated water	433,551m^3	



Storage volume *1		Change from last report	Storage capacity*2*3
Concentrated saltwater receiving tank*4	341,169m^3	-309m^3	365,200m^3
Freshwater receiving tank	25,241m^3	-722m^3	31,400m^3
Concentrated waste liquid storage tank	9,201m^3	No change	9,500m^3
Treated water storage tank*5	62,792m^3	+3,531m^3	75,600m^3

Storage volume		Change from last report	Storage volume*2
Waste liquid supply tank	716m^3	-4m^3	1,200m^3
SPT(B)	1,868m^3	+591m^3	3,100m^3

	Chloride concentration
Before/After Desalination	290ppm / 2ppm（Sampled on Mar. 4）
Before/After Evaporative Concentration	6,900ppm / 2ppm（Sampled on Dec. 20, 2011）

Place of Sampling	Radioactivity density*6
Process Main Building	2.5E+04 Bq/cm^3 (Sampled on Dec. 17)
Exit of cesium adsorption apparatus	3.4E-01 Bq/cm^3 (Sampled on Dec. 17)
Exit of decontamination facility	-
High Temperature Incinerator Building	2.3E+04 Bq/cm^3 (Sampled on Mar. 4)
Exit of second cesium adsorption apparatus	4.5E-01 Bq/cm^3 (Sampled on Mar. 4)

Facility	Storage volume	Change from last report	Water level in T/B
Unit 1	Approx.13,700m^3	+100m^3	OP.2,611
Unit 2	Approx.22,200m^3	+700m^3	OP.3,145
Unit 3	Approx.21,100m^3	No change	OP.2,701
Unit 4	Approx.15,500m^3	-600m^3	OP.2,629
Total	Approx.72,500m^3		

Storage Facility	Storage volume	Change from last report	Water level	Treated volume (3/5 - 3/11)	Cumulative treated volume
Process Main Building	Approx.16,050m^3	+620m^3	OP.4,536	Approx. 5,540m^3 *7	Approx.893,880m^3 *7
High Temperature Incinerator Building	Approx. 2,200m^3	-440m^3	OP.1,241		
Total	Approx.18,250m^3				

Waste produced		Change from last report	Storage capacity
Sludge	597m^3	No change	700m^3 *2
Used vessels	820*8	+10	2,514

[Highlights from the previous update (March 4, 2014) to thepresent status]
- Since March 8, water transfer from Unit 2 to the Unit 3 Turbine Building has been restarted, and transfer is in progress.
- On March 10, destination of water transfer from Unit 3 was switched from the High Temperature Incinerator Building to the Process Main Building, and water transfer is in progress.
- Since November 29, 2012, water transfer from Unit 4 has been under suspension.
- Cesium Adsorption Apparatus and 2nd Cesium Adsorption Apparatus are under operation (Cesium Adsorption Apparatus: Availability factor 5.7% (Projected: 5%), 2nd Cesium Adsorption Apparatus: Availability factor 60.2% (Projected: 55%)).
- On March 10, Cesium Adsorption Apparatus was restarted.
- On March 10, 2nd Cesium Adsorption Apparatus was suspended.
- Storage capacity of the treated water storage tank will be changed by operating the tanks.

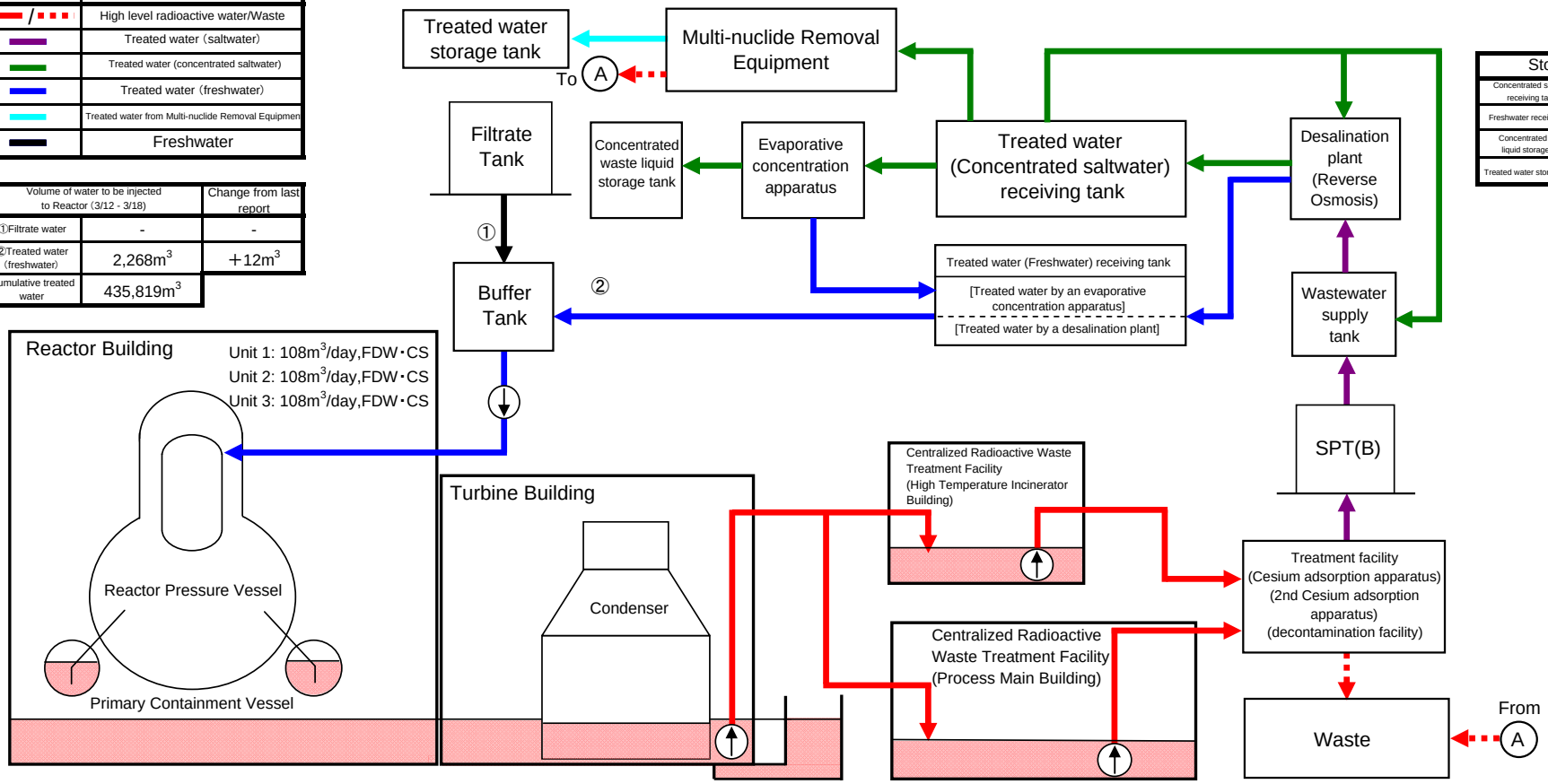
*1 The figures are just for reference when the water level of Desalination System and Evaporative concentration apparatus are not stable.
*2 Shows the operational limit.
*3 The underground reservoirs are not included in the figure.
*4 Storage capacity of the filtrate water tank (4,600m^3) is included in the figure.
*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 (480m^3)
2nd Cesium adsorption apparatus (5,060m^3)
Breakdown of the cumulative treated amount: Cesium adsorption apparatus (204,220m^3)
2nd Cesium adsorption apparatus (689,660m^3)
*8 Breakdown of the used vessels: Cesium adsorption apparatus (466)
2nd cesium Cesium adsorption apparatus (98)
Storage container of the Multi-nuclide Removal Equipment (240) and treated column (1)
Used vessels of mobile type treatment apparatus (15, include 11 vessels used for purification of spent fuel pool)

Storage and treatment of high level radioactive accumulated water (as of March 18, 2014)

Attachment-2

	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 (3/12 - 3/18)		Change from last report
①Filtrate water	-	-
②Treated water（freshwater）	2,268m^3	＋12m^3
Cumulative treated water	435,819m^3	



Storage volume		Change from last report	Storage capacity*1*2
Concentrated saltwater receiving tank*3	341,043m^3	-126m^3	365,200m^3
Freshwater receiving tank	24,989m^3	-252m^3	31,400m^3
Concentrated waste liquid storage tank	9,201m^3	No change	9,500m^3
Treated water storage tank*4	66,257m^3	＋3,465m^3	79,800m^3

Facility	Storage volume	Change from last report	Water level in T/B
Unit 1	Approx. 13,600m^3	-100m^3	OP.2,866 (Unit 2 T/B)
Unit 2	Approx. 20,300m^3	-1,900m^3	
Unit 3	Approx. 22,000m^3	＋900m^3	OP.2,826 (Unit 3 T/B)
Unit 4	Approx. 16,800m^3	＋1,300m^3	
Total	Approx. 72,700m^3		

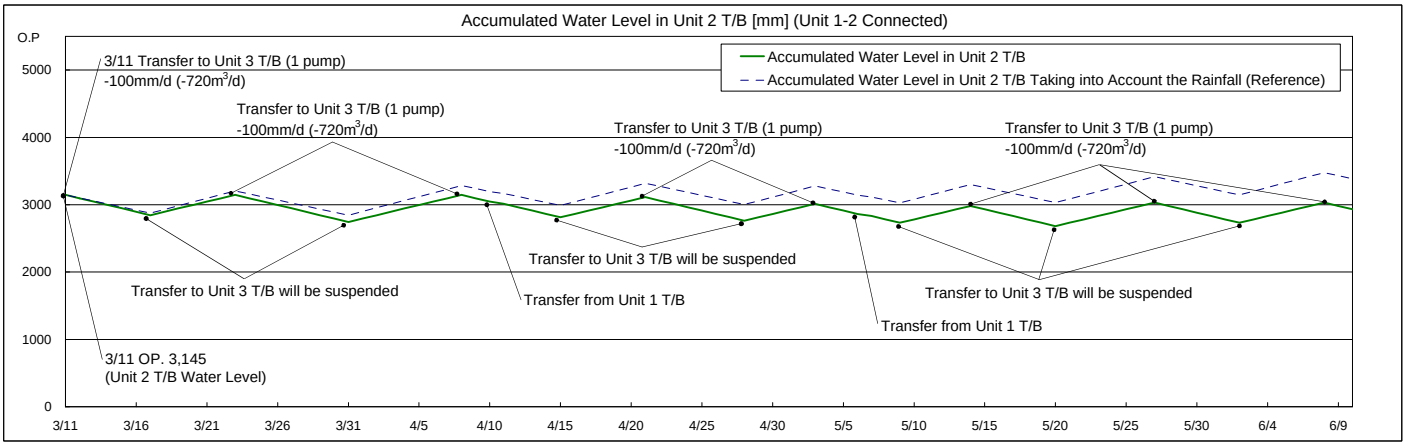
Storage Facility	Storage volume	Change from last report	Water level	Treated volume (3/12 - 3/18)	Cumulative treated volume	Waste produced		Change from last report	Storage capacity
Process Main Building	Approx. 15,360m^3	-690m^3	OP.4,340	Approx. 5,040m^3 *5	Approx. 898,920m^3 *5	Sludge	597m^3	No Change	700m^3 *1
High Temperature Incinerator Building	Approx. 4,200m^3	＋2,000m^3	OP.2,898			Used vessels	840*6	+20	2,514
Total	Approx. 19,560m^3								

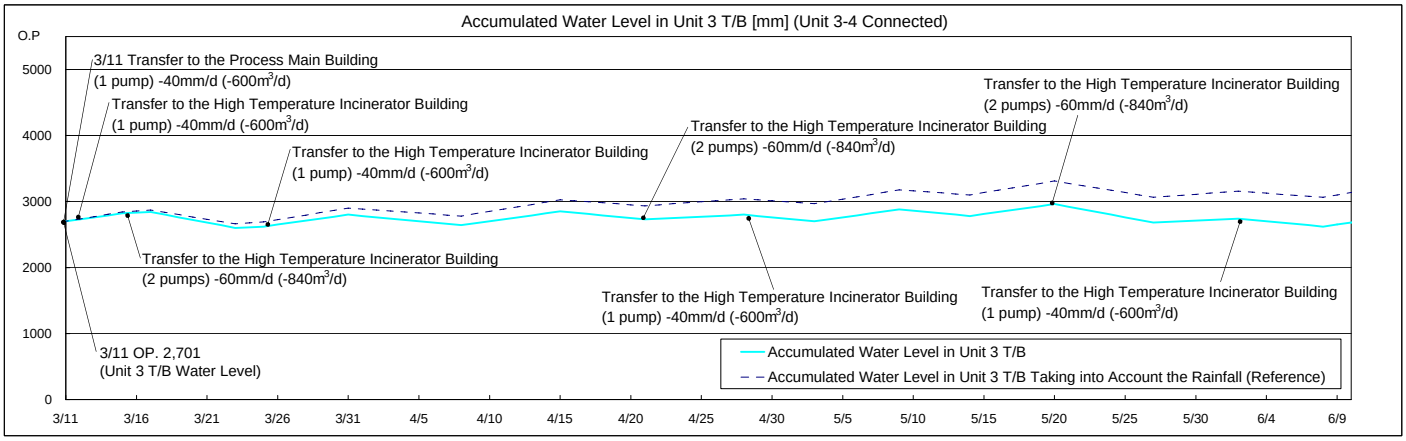
[Highlights from the present status (March 11, 2014) to the supposition status]
- Water transfer from Unit 2 to Unit 3 Turbine Building will be suspended.
- Destination of water transfer from Unit 3 will be switched from the Process Main Building to the High Temperature Incinerator Building.
- Water transfer from Unit 4 will be stopped continuously.
- Operation of Cesium Absorption Apparatus is scheduled: Availability Factor 25% (Projected)
- Operation of 2nd Cesium Absorption Apparatus is scheduled: Availability Factor 35% (Projected)
- Storage capacity of the treated water storage tank will be changed by operating the tanks.

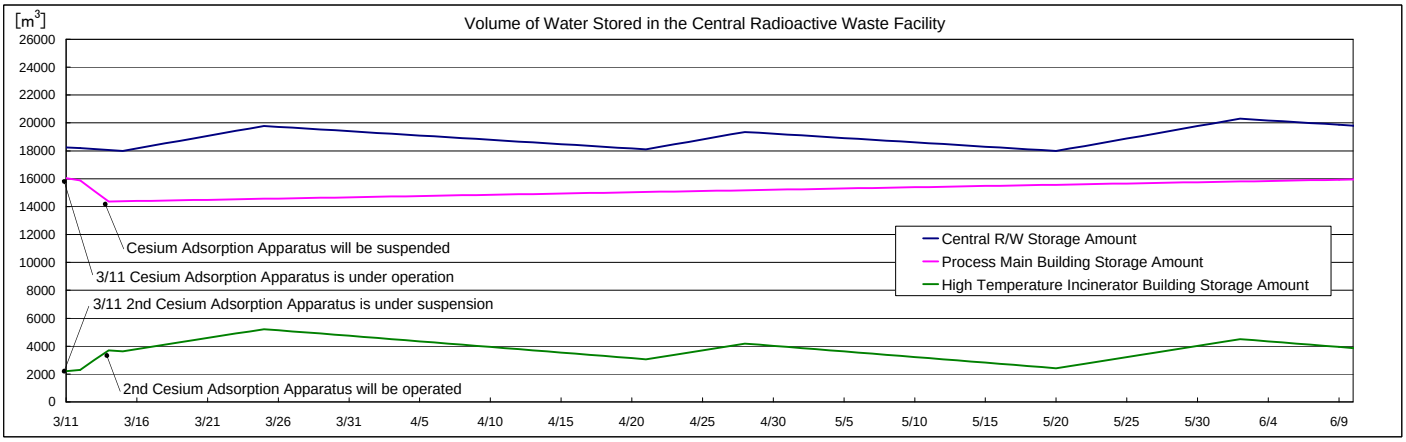
*1 Shows the operational limit.
*2 The underground reservoirs are not included in the figure.
*3 Storage capacity of the filtrate water tank (4,600m^3) is included in the figure.
*4 The treated water from the Multi-nuclide Removal Equipment (under hot test) is stored. Freshwater and concentrated saltwater 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 (2,100m^3)
2nd Cesium adsorption apparatus (2,940m^3)
Breakdown of the cumulative treated amount: Cesium adsorption apparatus (206,320m^3)
2nd Cesium adsorption apparatus (692,600m^3)
*6 Breakdown of the used vessels: Cesium adsorption apparatus (472)
2nd cesium Cesium adsorption apparatus (98)
Storage container of the Multi-nuclide Removal Equipment (254) and treated column (1) Used vessels of mobile type treatment apparatus (15, include 11 vessels used for purification of spent fuel pool)

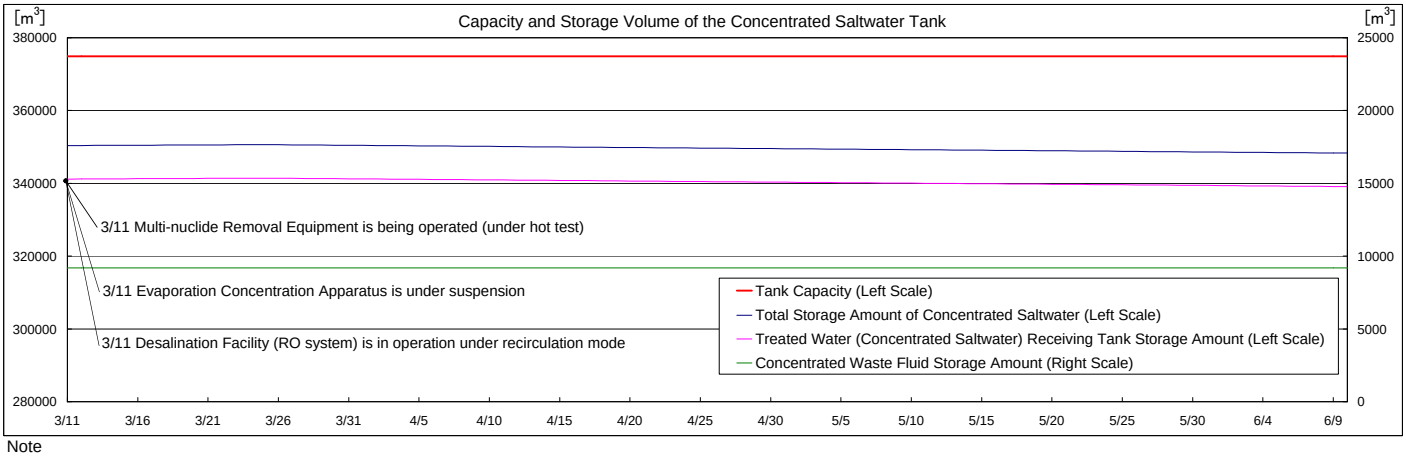
Simulation Results of Accumulated Water Treatment in Unit 1-4 T/B

Attachment-3









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).