**Situation of Storage and Treatment of Accumulated Water including Highly Concentrated Radioactive Materials at Fukushima Daiichi Nuclear Power Station (80th Release)**

January 4, 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 January 1, 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 January 8, 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 January 1, 2013)

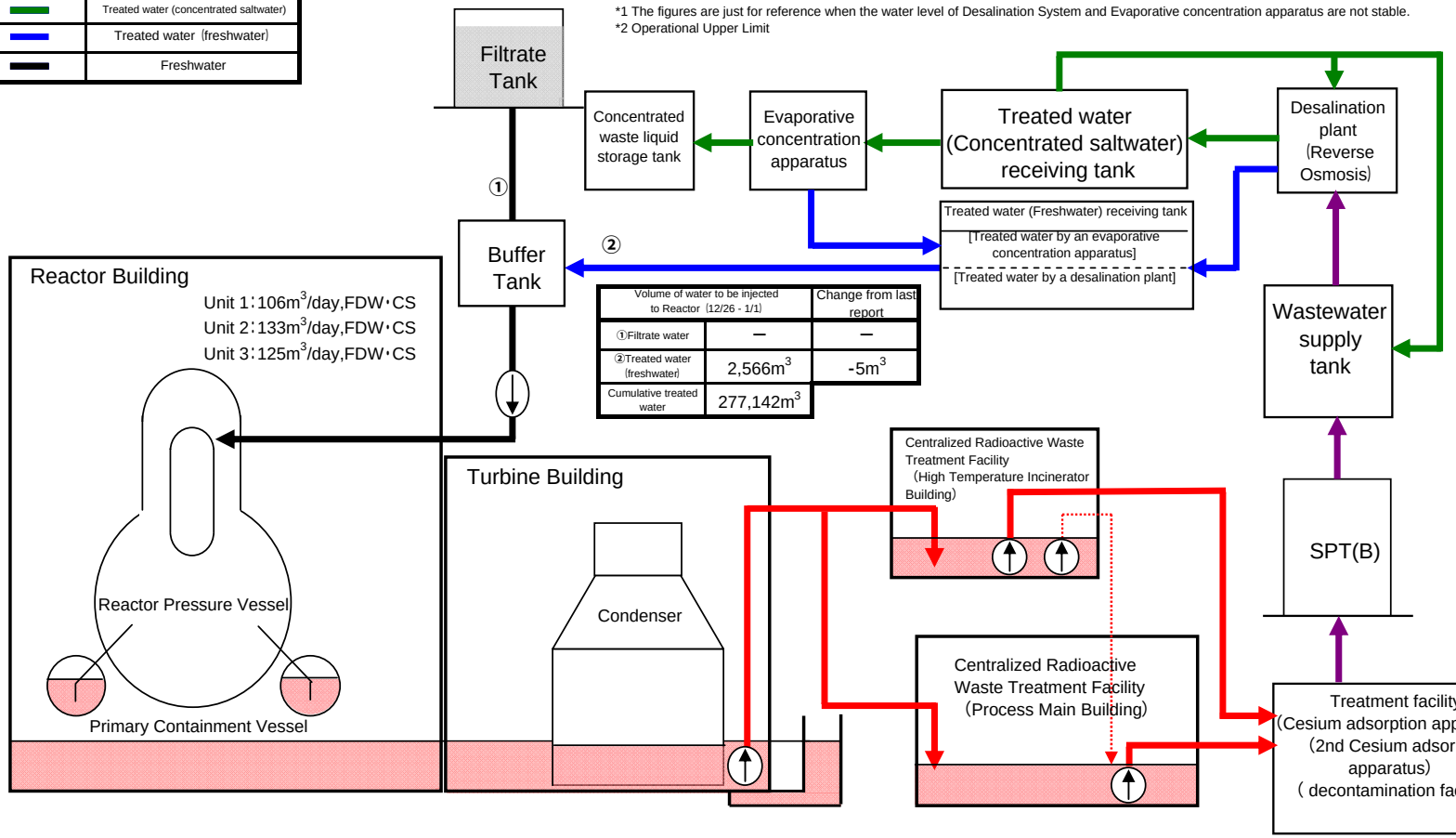
Attachment-1

| | Classification |
|---|---|
| | High level radioactive water |
| | Treated water (saltwater) |
| | Treated water (concentrated saltwater) |
| | Treated water (freshwater) |
| | Freshwater |

| Storage volume *1 | | Change from last report | Storage capacity *2 |
|---|---|---|---|
| Concentrated saltwater receiving tank | 215,967m$^3$ | +2,959m$^3$ | 221,500m$^3$ |
| Freshwater receiving tank | 23,897m$^3$ | -548m$^3$ | 31,400m$^3$ |
| Concentrated waste liquid storage tank | 5,509m$^3$ | -5m$^3$ | 9,500m$^3$ |

*1 The figures are just for reference when the water level of Desalination System and Evaporative concentration apparatus are not stable.
*2 Operational Upper Limit

| | Chloride concentration |
|---|---|
| Before/After Desalination | 300ppm / <1ppm (Sampled on Dec. 18) |
| Before/After Evaporative Concentration | 6,900ppm / 2ppm (Sampled on Dec. 20, 2011) |




| Volume of water to be injected to Reactor (12/26 - 1/1) | | Change from last report |
|---|---|---|
| ①Filtrate water | — | — |
| ②Treated water (freshwater) | 2,566m$^3$ | -5m$^3$ |
| Cumulative treated water | 277,142m$^3$ | |

| Storage volume | | Change from last report | Storage volume *2 |
|---|---|---|---|
| Waste liquid supply tank | 1,115m$^3$ | +61m$^3$ | 1,200m$^3$ |
| SPT(B) | 1,468m$^3$ | +316m$^3$ | 3,100m$^3$ |

*2 Shows the operational limit.

| Place of Sampling | Radioactivity density *3 |
|---|---|
| Process Main Building | 5.9E+04 Bq/cm$^3$ (Sampled on Dec. 6) |
| Exit of cesium adsorption apparatus | 1.1E+01 Bq/cm$^3$ (Sampled on Dec. 6) |
| Exit of decontamination facility | — |
| High Temperature Incinerator Building | 3.5E+04 Bq/cm$^3$ (Sampled on Dec. 18) |
| Exit of second cesium adsorption apparatus | 1.2E+01 Bq/cm$^3$ (Sampled on Dec. 18) |

*3 Data of Cs-137 are described above.

| Nuclide | DF *4,5 |
|---|---|
| I-131 | — (—) |
| Cs-134 | 5.4E+03 (3.0E+03) |
| Cs-137 | 5.4E+03 (2.9E+03) |

*4 Data sampled on December 6
(operations of cesium adsorption facility - decontamination facility)
*5 Data in parentheses are those sampled on December 18
(operation of the 2nd Cesium adsorption apparatus)

| Facility | Storage volume | Change from last report | Water level in T/B |
|---|---|---|---|
| Unit 1 | Approx.14,000m$^3$ | +100m$^3$ | OP.2,732 |
| Unit 2 | Approx.22,500m$^3$ | +600m$^3$ | OP.3,128 |
| Unit 3 | Approx.22,600m$^3$ | -600m$^3$ | OP.2,907 |
| Unit 4 | Approx.17,200m$^3$ | -500m$^3$ | OP.2,890 |
| Total | Approx.76,300m$^3$ | | |

| Storage Facility | Storage volume | Change from last report | Water level | Treated volume (12/26-1/1) | Cumulative treated | Waste produced | | Change from last report | Storage capacity |
|---|---|---|---|---|---|---|---|---|---|
| Process Main Building | Approx.13,680m$^3$ | +70m$^3$ | OP.3,688 | Approx.5,570m$^3$ *6 | Approx.538,710m$^3$ *6 | Sludge | 597m$^3$ | No change | 700m$^3$ *2 |
| High Temperature Incinerator Building | Approx.3,730m$^3$ | +200m$^3$ | OP.2,510 | | | Used vessels | 470 *7 | +2 | 1,137 *8 |
| Total | Approx.17,410m$^3$ | | | | | | | | |

*2 Shows the operational limit.
*6 Including approx. 5,570m$^3$ (cumulative treated volume:approx.367,730m$^3$) of treated volume by the 2nd Cesium adsorption apparatus.
*7 Including 68 used vessels of 2nd Cesium adsorption apparatus.
*8 Storage capacity will vary according to stored used vessels of 2nd Cesium adsorption apparatus.

Note:
- The previous update: December 25, 2012
- On December 26, water transfer from Unit 2 to Unit 3 Turbine Building was stopped. On December 30, water transfer from Unit 2 to Unit 3 Turbine Building was restarted, and water transfer is in progress.
- Water transfer from Unit 3 to the High Temperature Incinerator Building is in progress.
- Since November 29, water transfer from Unit 4 has been under suspension.
- 2nd Cesium Adsorption Apparatus are under operation (Availability factor 66.3% (Projected: 65%)).
- Since December 7, Cesium Absorption Apparatus was stopped continuously.
- On December 27, water transfer from Unit 1 to Unit 2 Turbine Building was conducted.

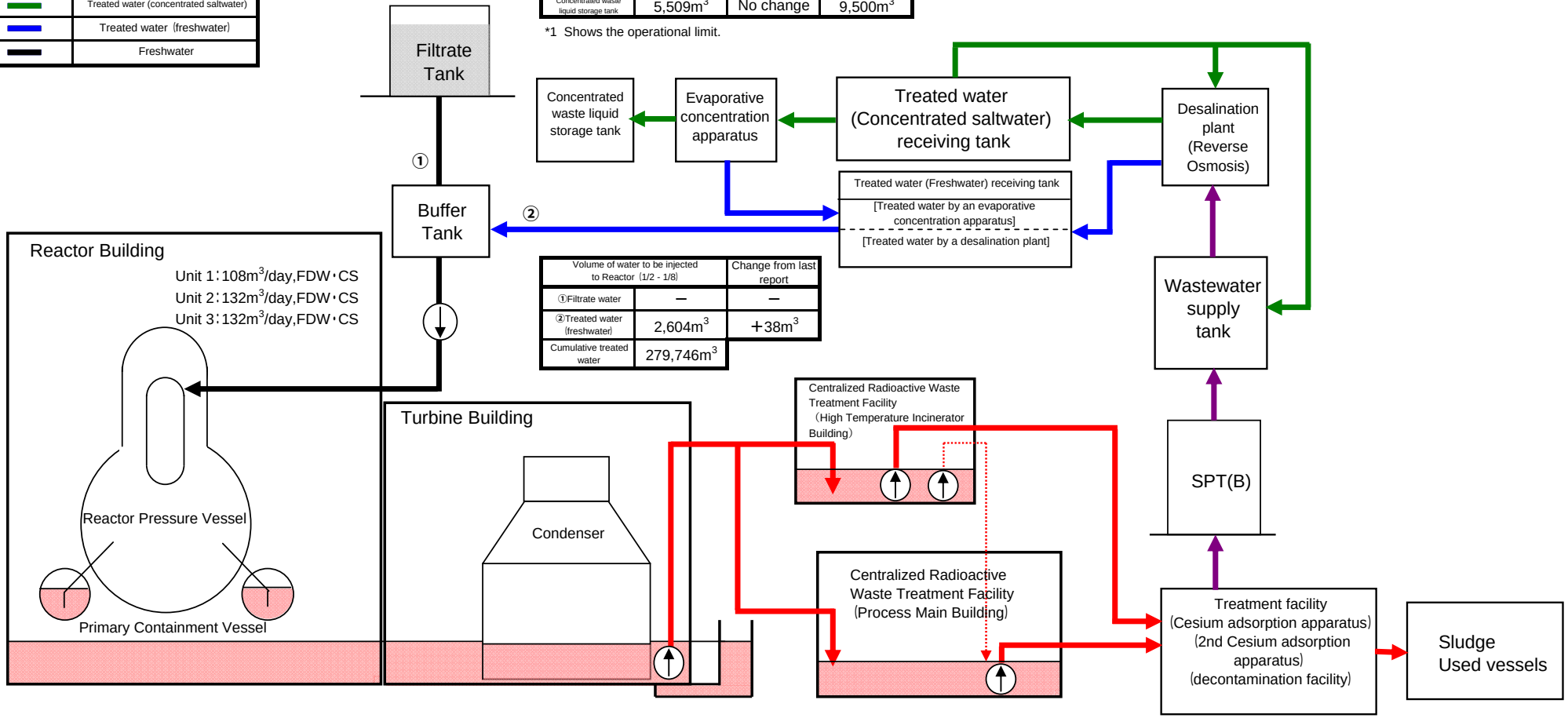
Attachment-2

# Storage and treatment of high level radioactive accumulated water (January 8, 2013)

| | Classification |
|---|---|
| | High level radioactive water |
| | Treated water (saltwater) |
| | Treated water (concentrated saltwater) |
| | Treated water (freshwater) |
| | Freshwater |

| Storage volume | | Change from last report | Storage capacity *1 |
|---|---|---|---|
| Concentrated saltwater receiving tank | 218,067m$^3$ | +2,100m$^3$ | 221,500m$^3$ |
| Freshwater receiving tank | 24,653m$^3$ | +756m$^3$ | 31,400m$^3$ |
| Concentrated waste liquid storage tank | 5,509m$^3$ | No change | 9,500m$^3$ |

*1 Shows the operational limit.




| Volume of water to be injected to Reactor (1/2 - 1/8) | | Change from last report |
|---|---|---|
| ①Filtrate water | – | – |
| ②Treated water (freshwater) | 2,604m$^3$ | +38m$^3$ |
| Cumulative treated water | 279,746m$^3$ | |

| Facility | Storage volume | Change from last report | Water level in T/B |
|---|---|---|---|
| Unit 1 | Approx.13,900m$^3$ | -100m$^3$ | OP.2,901 (Unit 2 T/B) |
| Unit 2 | Approx.21,000m$^3$ | -1,500m$^3$ | |
| Unit 3 | Approx.23,100m$^3$ | +500m$^3$ | OP.2,976 (Unit 3 T/B) |
| Unit 4 | Approx.17,900m$^3$ | +700m$^3$ | |
| Total | Approx.75,900m$^3$ | | |

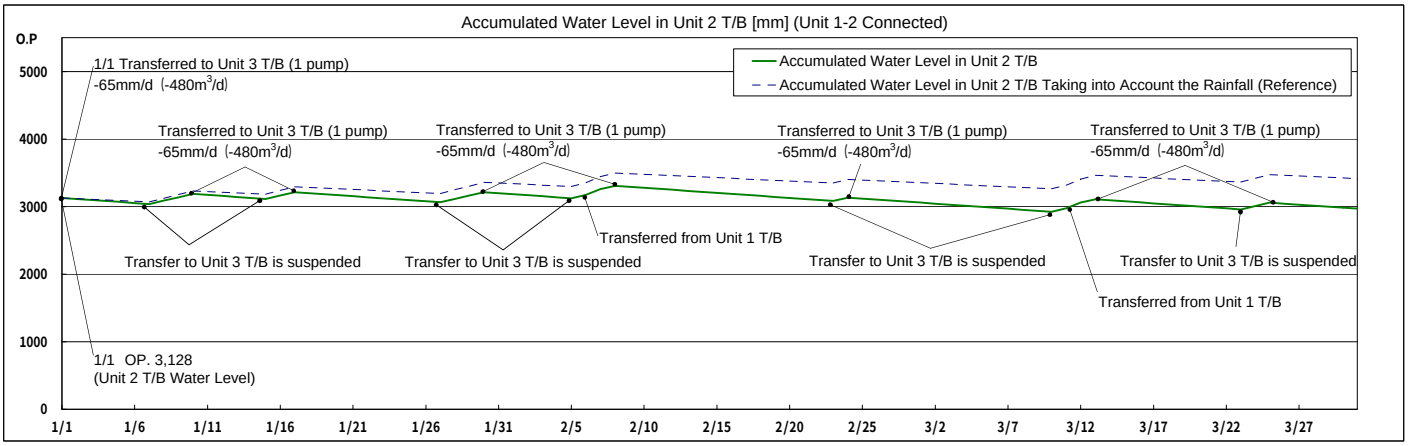
| Storage Facility | Storage volume | Change from last report | Water level | Treated volume (1/2 - 1/8) | Cumulative treated | Waste produced | | Change from last report | Storage capacity |
|---|---|---|---|---|---|---|---|---|---|
| Process Main Building | Approx.13,810m$^3$ | +130m$^3$ | OP.3,742 | Approx.5,460m$^3$ *2 | Approx.544,170m$^3$ *2 | Sludge | 597m$^3$ | No Change | 700m$^3$ *1 |
| High Temperature Incinerator Building | Approx.3,690m$^3$ | -40m$^3$ | OP.2,476 | | | Used vessels | 470 *3 | No Change | 1,137 *4 |
| Total | Approx.17,500m$^3$ | | | | | | | | |

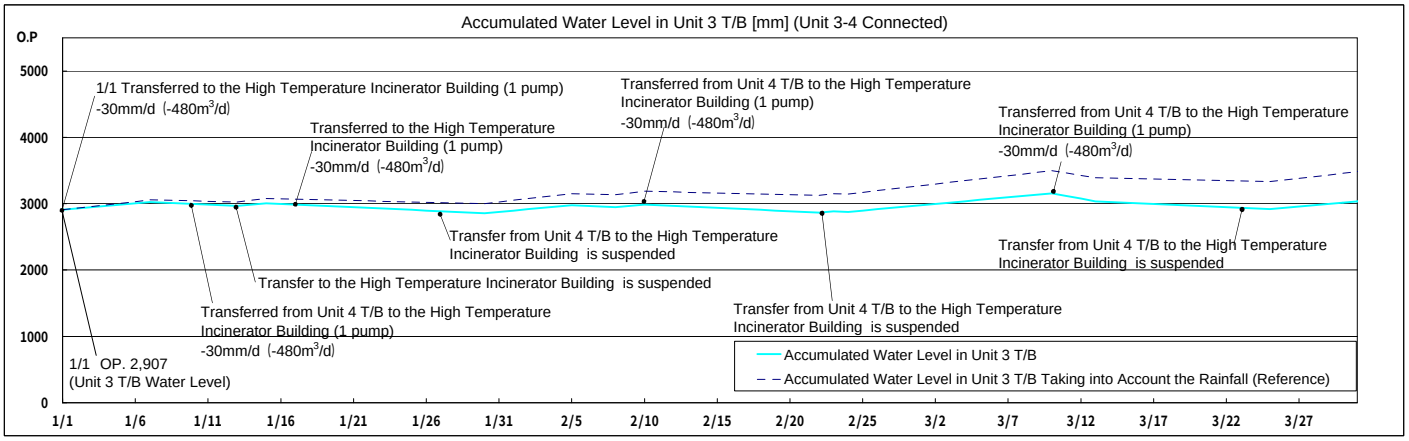
*1 Shows the operational limit.
*2 Including approx.5,460m$^3$ (cumulative treated volume:approx.373,190m$^3$) of treated volume by the 2nd Cesium adsorption apparatus.
*3 Including 68 used vessels of 2nd Cesium adsorption apparatus.
*4 Storage capacity will vary according to stored used vessels of 2nd Cesium adsorption apparatus.

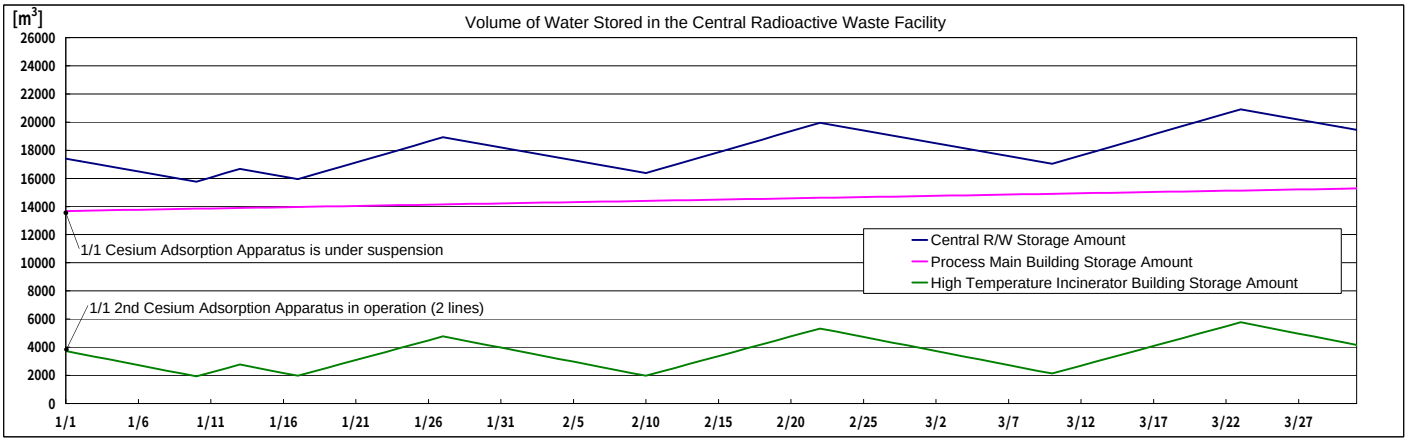
Note:
- Water transfer from Unit 2 to Unit 3 Turbin Building will be stopped.
- Water transfer from Unit 3 to the High Temperature Incinerator Building will be conducted.
- Water transfer from Unit 4 will be stopped continuously.
- Operation of 2nd Cesium Absorption Apparatus is scheduled: Availability Factor 65% (Projected)
- Cesium Absorption Apparatus will be stopped continuously.

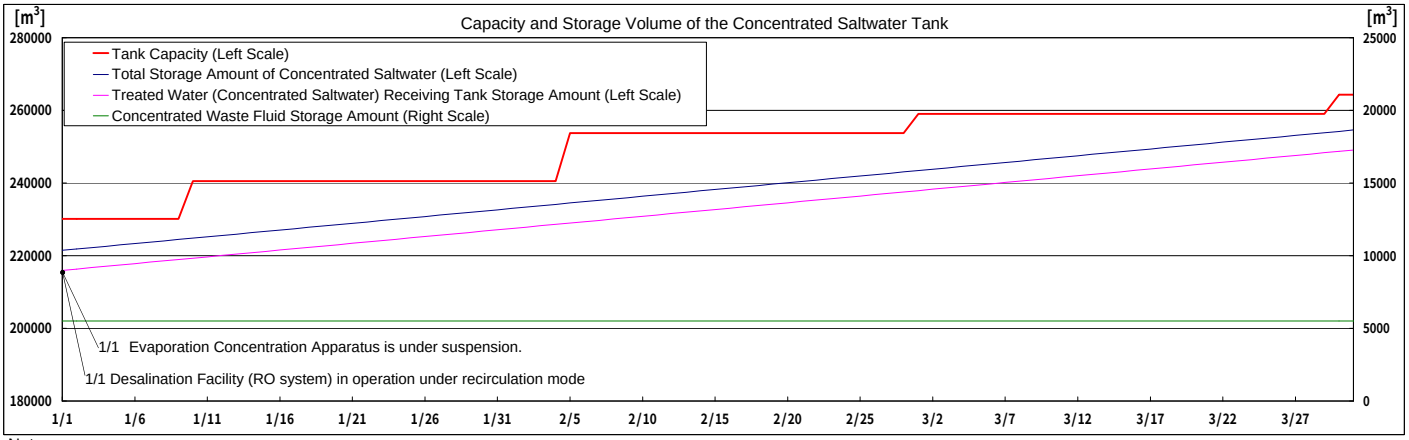
Attachment-3

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




Note

- The treated water volume is assumed to be 780m$^3$/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).