

# **Situation of Storage and Treatment of Accumulated Water including Highly Concentrated Radioactive Materials at Fukushima Daiichi Nuclear Power Station (53<sup>rd</sup> Release)**

June 26, 2012

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 26, 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 July 3, 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 28, 2012) 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  | 147,712m <sup>3</sup>   | + 2,535m <sup>3</sup>   | 163,500m <sup>3</sup>   |
| Freshwater receiving tank              | 17,622m <sup>3</sup> *3 | + 1,092m <sup>3</sup>   | 25,100m <sup>3</sup> *4 |
| Concentrated waste liquid storage tank | 5,518m <sup>3</sup>     | + 11m <sup>3</sup>      | 9,500m <sup>3</sup>     |

\*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  
 \*3 Including the collection water approx. 270m<sup>3</sup> from discharge channel.  
 \*4 Including the temporary tank of the collection water approx. 300m<sup>3</sup> from discharge channel. (isolated.)

|  | Chloride concentration             |
|--|------------------------------------|
| Before/After Desalination              | 850ppm / 2ppm (Sampled on 6/19)    |
| Before/After Evaporative Concentration | 6,900ppm / 2ppm (Sampled on 12/20) |

|                          | Storage volume      | change from last report | Storage volume 2    |
|--------------------------|---------------------|-------------------------|---------------------|
| Waste liquid supply tank | 1,008m <sup>3</sup> | + 38m <sup>3</sup>      | 1,200m <sup>3</sup> |
| SPT(B)                   | 1,438m <sup>3</sup> | -                       | 3,100m <sup>3</sup> |

\*2 Shows the operational limit.

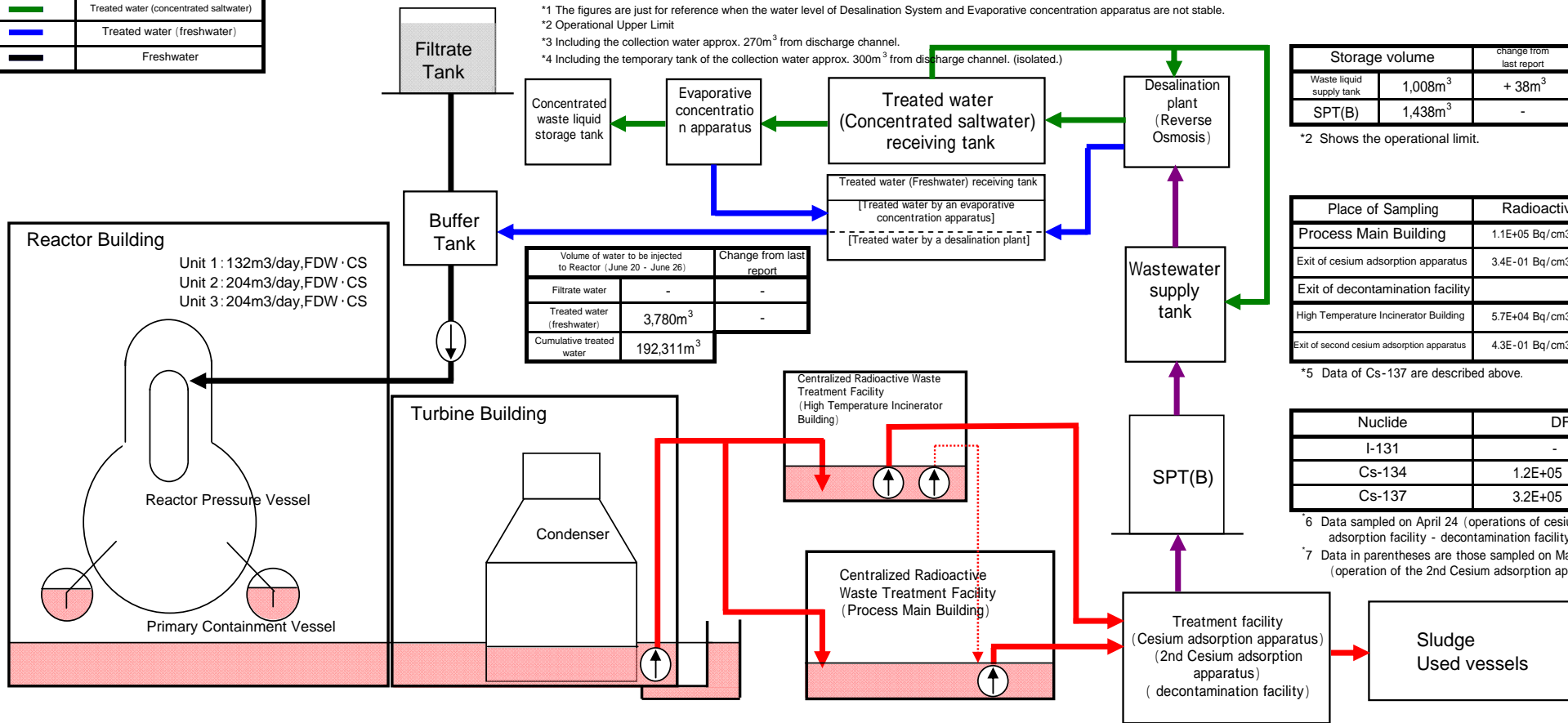
| Place of Sampling                          | Radioactivity density *5         |
|--|----------------------------------|
| Process Main Building                      | 1.1E+05 Bq/cm3 (Sampled on 6/19) |
| Exit of cesium adsorption apparatus        | 3.4E-01 Bq/cm3 (Sampled on 6/19) |
| Exit of decontamination facility           | -                                |
| High Temperature Incinerator Building      | 5.7E+04 Bq/cm3 (Sampled on 6/19) |
| Exit of second cesium adsorption apparatus | 4.3E-01 Bq/cm3 (Sampled on 6/19) |

\*5 Data of Cs-137 are described above.

| Nuclide | DF *6,7             |
|---------|---------------------|
| I-131   | - ( - )             |
| Cs-134  | 1.2E+05 ( 6.0E+04 ) |
| Cs-137  | 3.2E+05 ( 1.3E+05 ) |

\*6 Data sampled on April 24 (operations of cesium adsorption facility - decontamination facility)

\*7 Data in parentheses are those sampled on May 22 (operation of the 2nd Cesium adsorption apparatus)



| Volume of water to be injected to Reactor (June 20 - June 26) |                       | Change from last report |
|---|-----------------------|-------------------------|
| Filtrate water  | -                     | -                       |
| Treated water (freshwater)                                    | 3,780m <sup>3</sup>   | -                       |
| Cumulative treated water                                      | 192,311m <sup>3</sup> | -                       |

| Facility     | Storage volume                    | Change from last report | Water level in T/B |
|--------------|-----------------------------------|-------------------------|--------------------|
| Unit 1       | Approx.14,500m <sup>3</sup>       | + 300m <sup>3</sup>     | OP.3,264           |
| Unit 2       | Approx.22,300m <sup>3</sup>       | -200m <sup>3</sup>      | OP.3,110           |
| Unit 3       | Approx.24,800m <sup>3</sup>       | + 700m <sup>3</sup>     | OP.3,206           |
| Unit 4       | Approx.19,400m <sup>3</sup>       | + 700m <sup>3</sup>     | OP.3,190           |
| <b>Total</b> | <b>Approx.81,000m<sup>3</sup></b> |                         |                    |

| Storage Facility                      | Storage volume                    | Change from last report | Water level | Treated volume (6/20-6/26) | Cumulative treated           | Waste produced            | Change from last report | Storage capacity     |
|---------------------------------------|-----------------------------------|-------------------------|-------------|----------------------------|------------------------------|---------------------------|-------------------------|----------------------|
| Process Main Building                 | Approx.13,740m <sup>3</sup>       | -100m <sup>3</sup>      | OP.3,712    | Approx.7,580m <sup>3</sup> | Approx.371,420m <sup>3</sup> | Sludge: 597m <sup>3</sup> | -                       | 700m <sup>3</sup> *2 |
| High Temperature Incinerator Building | Approx.3,860m <sup>3</sup>        | -180m <sup>3</sup>      | OP.2,613    |                            |                              | Used vessels: 423 *9      | + 4                     | 1,137 *10            |
| <b>Total</b>                          | <b>Approx.17,600m<sup>3</sup></b> |                         |             |                            |                              |                           |                         |                      |

\*2 Shows the operational limit.

\*10 Including approx. 6,590m<sup>3</sup> (cumulative treated volume: approx.213,580m<sup>3</sup>) of treated volume by the 2nd Cesium adsorption apparatus.

\*11 Including 46 used vessels of 2nd Cesium adsorption apparatus.

\*12 Storage capacity will vary according to stored used vessels of 2nd Cesium adsorption apparatus.

**Note:**

- The previous update: June 19, 2012.
- Water transfer from Unit 2 to High Temperature Incinerator Building is under operation.
- On June 23, water transfer from Unit 3 to High Temperature Incinerator Building was stopped. On June 25, water transfer from Unit 3 to Process Main Building was restarted.
- The two line operation was conducted for Cesium Adsorption Apparatus and 2nd Cesium Adsorption Apparatus(Availability factor for Cesium Adsorption Apparatus:11.8%(Projected:10%),2nd Cesium Adsorption Apparatus:78.5%(Projected:75%) )
- On June 21, Cesium Adsorption Instrument was stopped.
- On June 25, water transfer from On-site Bunker Building to Process Main Building was conducted.

# Storage and treatment of high level radioactive accumulated water (July 3, 2012)

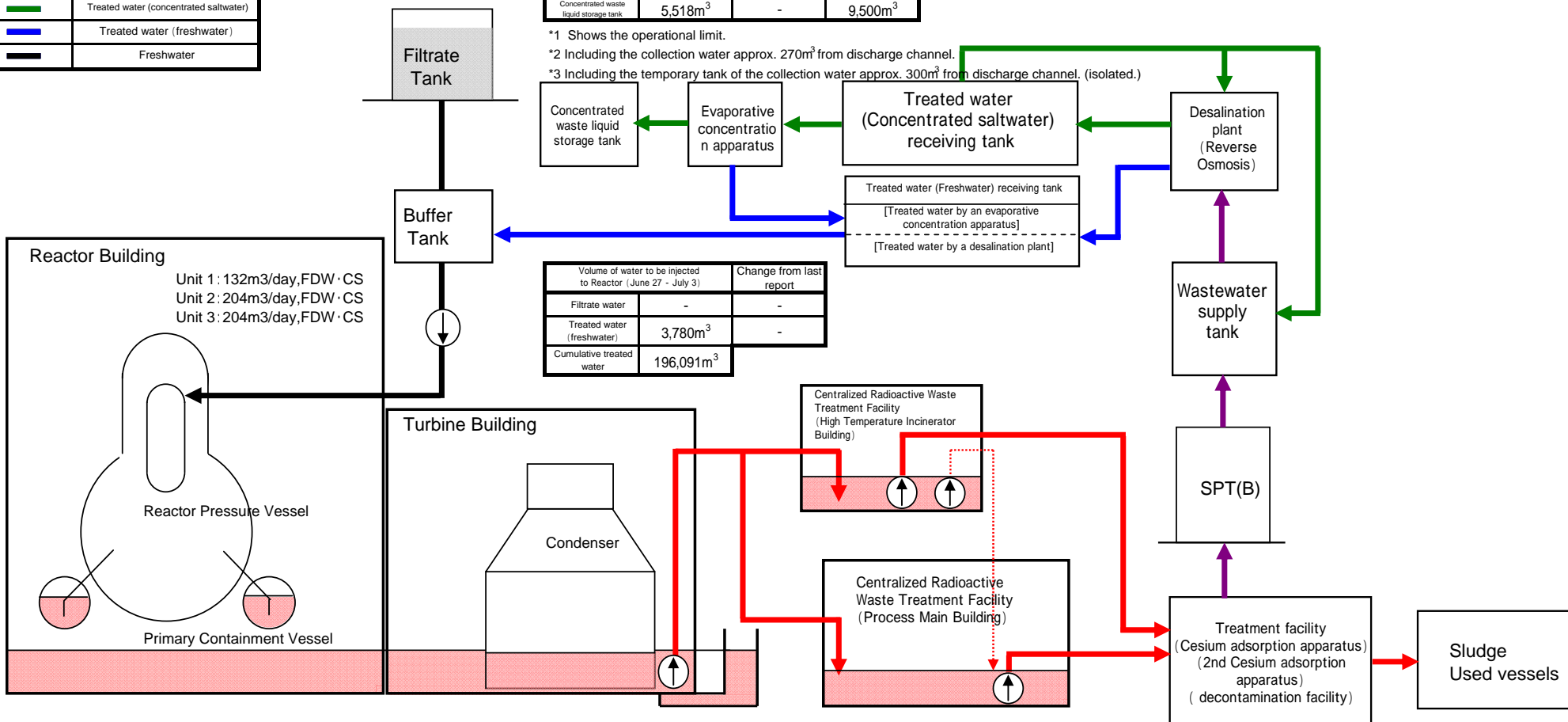
| Classification                        |  |
|---------------------------------------|--|
| <span style="color: red;">█</span>    | High level radioactive water           |
| <span style="color: purple;">█</span> | Treated water (saltwater)              |
| <span style="color: green;">█</span>  | Treated 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  | 149,812m <sup>3</sup>   | + 2,100m <sup>3</sup>   | 163,500m <sup>3</sup>   |
| Freshwater receiving tank              | 18,042m <sup>3</sup> *2 | + 420m <sup>3</sup>     | 25,100m <sup>3</sup> *3 |
| Concentrated waste liquid storage tank | 5,518m <sup>3</sup>     | -                       | 9,500m <sup>3</sup>     |

\*1 Shows the operational limit.

\*2 Including the collection water approx. 270m<sup>3</sup> from discharge channel.

\*3 Including the temporary tank of the collection water approx. 300m<sup>3</sup> from discharge channel. (isolated.)



| Volume of water to be injected to Reactor (June 27 - July 3) |                       | Change from last report |
|--|-----------------------|-------------------------|
| Filtrate water   | -                     | -                       |
| Treated water (freshwater)                                   | 3,780m <sup>3</sup>   | -                       |
| Cumulative treated water                                     | 196,091m <sup>3</sup> |                         |

| Facility     | Storage volume                    | Change from last report | Water level in T/B   |
|--------------|-----------------------------------|-------------------------|----------------------|
| Unit 1       | Approx.14,100m <sup>3</sup>       | -400m <sup>3</sup>      | OP.3,243 (Unit2 T/B) |
| Unit 2       | Approx.23,200m <sup>3</sup>       | + 900m <sup>3</sup>     |                      |
| Unit 3       | Approx.24,300m <sup>3</sup>       | -500m <sup>3</sup>      | OP.3,135 (Unit3 T/B) |
| Unit 4       | Approx.18,900m <sup>3</sup>       | -500m <sup>3</sup>      |                      |
| <b>Total</b> | <b>Approx.80,500m<sup>3</sup></b> |                         |                      |

| Storage Facility                      | Storage volume                    | Change from last report | Water level | Treated volume (6/27-7/3)     | Cumulative treated              | Waste produced    |              | Change from last report | Storage capacity |
|---------------------------------------|-----------------------------------|-------------------------|-------------|-------------------------------|---------------------------------|-------------------|--------------|-------------------------|------------------|
|                                       |                                   |                         |             |                               |                                 | Sludge            | Used vessels |                         |                  |
| Process Main Building                 | Approx.14,120m <sup>3</sup>       | + 380m <sup>3</sup>     | OP.3,877    | Approx.6,300m <sup>3</sup> *4 | Approx.377,720m <sup>3</sup> *4 | 597m <sup>3</sup> | -            | 700m <sup>3</sup> *1    |                  |
| High Temperature Incinerator Building | Approx.4,890m <sup>3</sup>        | + 1,030m <sup>3</sup>   | OP.3,466    |                               |                                 | 425 *5            | + 2          | 1,137 *6                |                  |
| <b>Total</b>                          | <b>Approx.19,010m<sup>3</sup></b> |                         |             |                               |                                 |                   |              |                         |                  |

\*1 Shows the operational limit.

\*4 Including approx. 6,300m<sup>3</sup> (cumulative treated volume: approx.219,880m<sup>3</sup>) of treated volume by the 2nd Cesium adsorption apparatus.

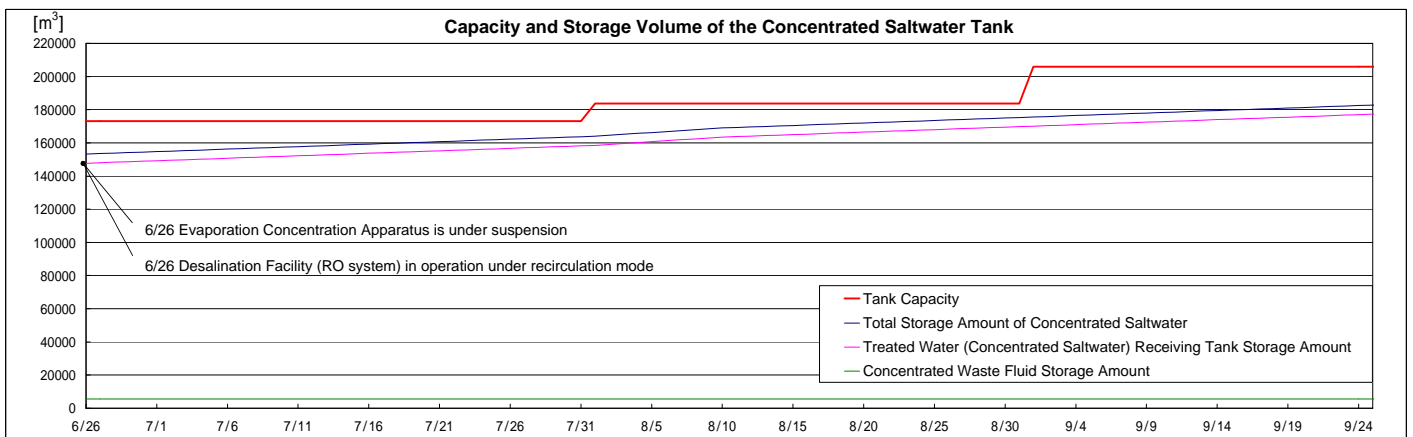
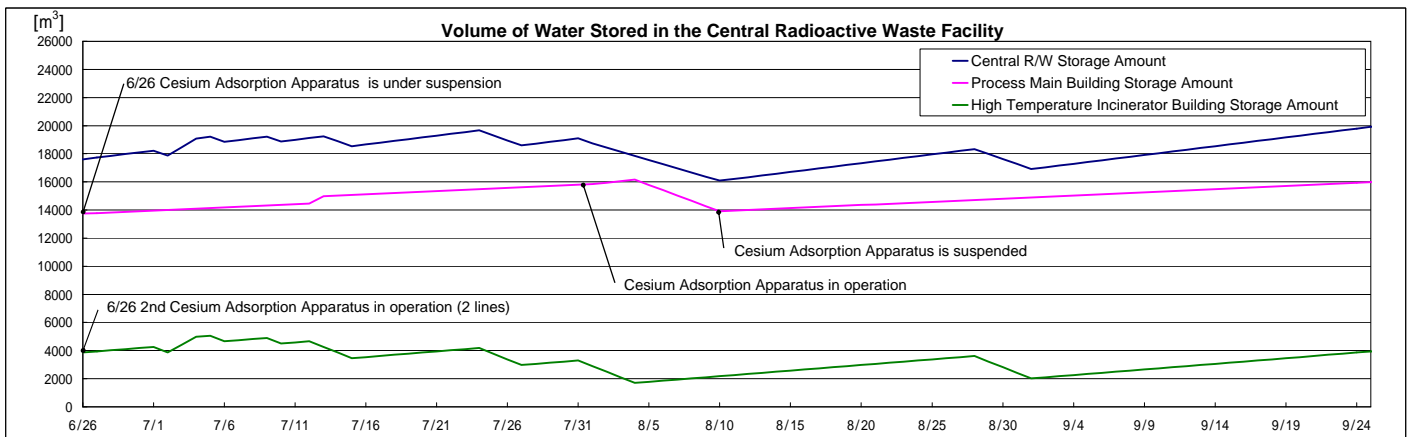
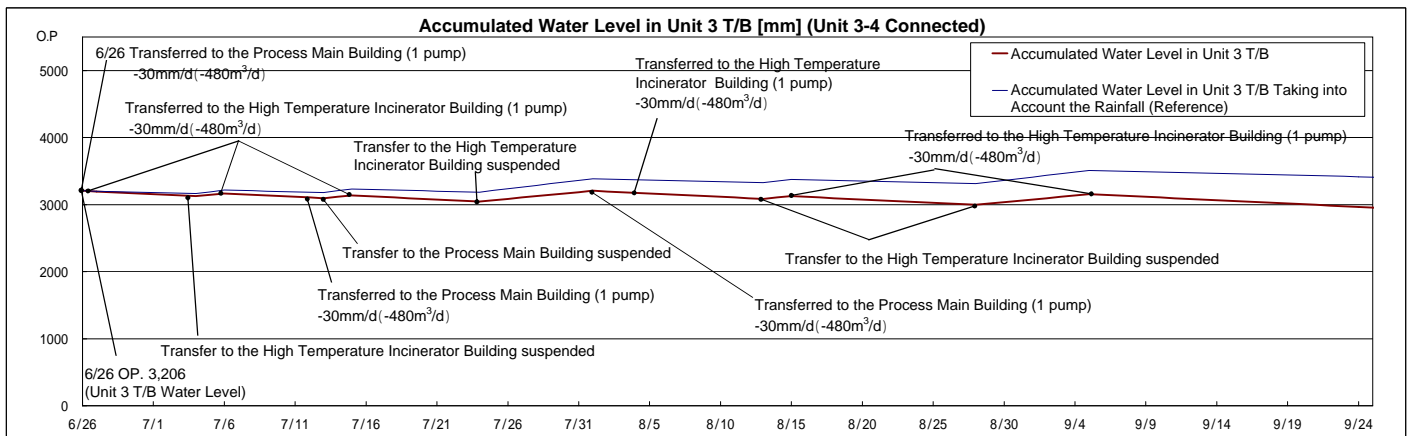
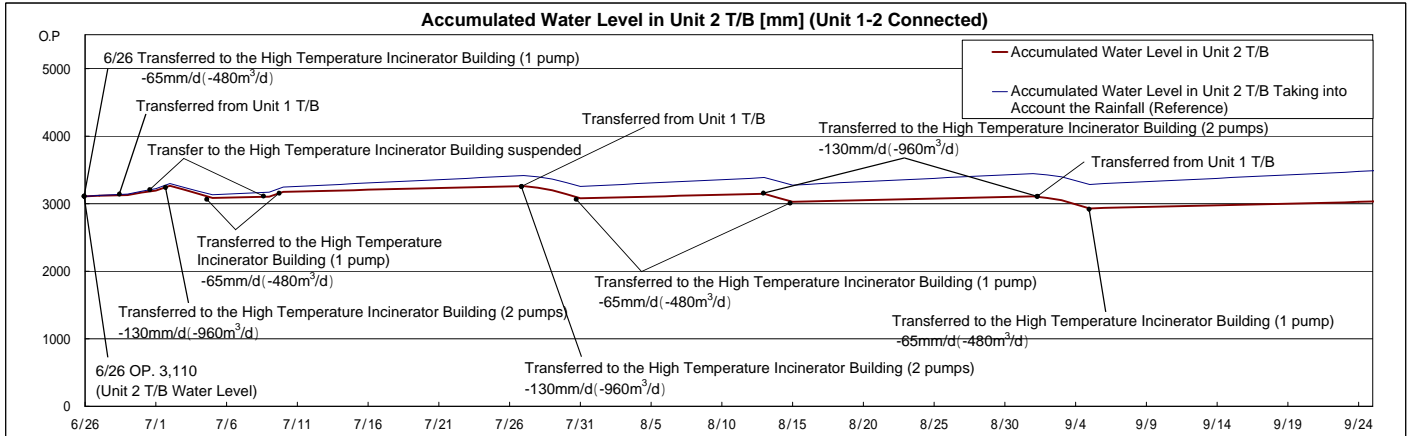
\*5 Including 48 used vessels of 2nd Cesium adsorption apparatus.

\*6 Storage capacity will vary according to stored used vessels of 2nd Cesium adsorption apparatus.

**Note:**

- Water transfer from Unit2 to High Temperature Incinerator Building will be temporarily stopped.
- Water transfer from Unit3 to Process Main Building was switched to High Temperature Incinerator Building.
- Operation of 2nd Cesium Adsorption Apparatus is scheduled: Availability Factor 75% (Projected)
- Cesium Adsorption Apparatus is continuously suspended.
- Water transfer from Unit1 Turbine Building to Unit2 Turbine Building is scheduled.

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



**Note**

- The treated water volume is assumed to be 900m<sup>3</sup>/d (Subject to change depending on the level of water accumulated in T/B).
- 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)