Situation of Storage and Treatment of Accumulated Water including Highly Concentrated Radioactive Materials at Fukushima Daiichi Nuclear Power Station (65th Release)

September 19, 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 September 18, 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 September 25, 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.
Storage and treatment of high level radioactive accumulated water (as of September 18, 2012)

**Table 1: Storage and Treatment of High Level Radioactive Accumulated Water**

<table>
<thead>
<tr>
<th>Facility</th>
<th>Storage Volume</th>
<th>Change from last report</th>
<th>Water Level</th>
<th>Cumulative Treated Volume</th>
<th>Waste Produced</th>
<th>Change from last report</th>
<th>Storage Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before/After Desalination</strong></td>
<td><strong>Storage Volume</strong></td>
<td><strong>Capacity</strong></td>
<td><strong>Volume</strong></td>
<td><strong>Addition</strong></td>
<td><strong>Total</strong></td>
<td><strong>Volume</strong></td>
<td><strong>Addition</strong></td>
</tr>
<tr>
<td>Waste facility</td>
<td>1,049m³</td>
<td>1,200m³</td>
<td>-69m³</td>
<td>1,200m³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPT(B)</td>
<td>1,371m³</td>
<td>3,100m³</td>
<td>+205m³</td>
<td>3,305m³</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Diagram: Storage and Treatment Flowchart**

1. **Filtrate Tank**
   - Concentrated waste liquid storage tank
   - Evaporative concentration apparatus
   - Treated water (Concentrated saltwater) receiving tank
   - Desalination plant (Reverse Osmosis)
   - Treated water (Freshwater)
   - Sludge
   - Used vessels

2. **Buffer Tank**
   - Volume of water to be supplied to Reactor: 183,600m³
   - Change from last report: +2,639m³

3. **Turbine Building**
   - Reactor Building: Unit 1 - 120m³/day, FDW-CS
   - Unit 2 - 168m³/day, FDW-CS
   - Unit 3 - 168m³/day, FDW-CS

4. **Centralized Radioactive Waste Treatment Facility (Process Main Building)**
   - Cs-137: 3.2 × 10^5 Bq/cm^3
   - Nuclides: I-131, Cs-134

5. **Secondary Cesium Adsorption Apparatus**
   - Availability factor: 73.3% (Projected: 75%)

6. **Storage Capacity**
   - Total: Approx. 78,200m³
   - Unit 1: Approx. 14,100m³
   - Unit 2: Approx. 23,100m³
   - Unit 3: Approx. 24,500m³
   - Unit 4: Approx. 23,100m³

**Note:**
- The previous update: September 11, 2012.
- The figures are for reference when the water level of Desalination System and Evaporative concentration apparatus are not stable.
- Change from last report: Storage capacity.
- Operational Upper Limit:
- *3 Data of Cs-137 are described above.
- *4 Data sampled on June 19 (operations of cesium adsorption facility – decontamination facility).
- *5 Data in parentheses are those sampled on August 21 (operation of the 2nd Cesium adsorption apparatus).
- *6 Including approx. 6.160m³ (cumulative treated volume approx. 287,740m³) of treated volume by the 2nd Cesium adsorption apparatus.
- *7 Including 54 used vessels of 2nd Cesium adsorption apparatus.
- *8 Storage capacity will vary according to stored used vessels of 2nd Cesium adsorption apparatus.

**Diagram Details:**
- Reactor Building
- Buffer Tank
- Turbine Building
- Primary Containment Vessel
- Condenser
- Centralized Radioactive Waste Treatment Facility (Process Main Building)
- Treatment facility (Cesium adsorption apparatus) (decontamination facility)
- Centralized Radioactive Waste Treatment Facility (High Temperature Incinerator Building)
- 2nd Cesium Adsorption Apparatus is under operation.
- Since August 13, Cesium Absorption Apparatus has been under suspension.
Storage and treatment of high level radioactive accumulated water  (September 25, 2012)

<table>
<thead>
<tr>
<th>Facility</th>
<th>Storage volume</th>
<th>Change from last report</th>
<th>Water level</th>
<th>Treatment volume (9/19 - 9/25)</th>
<th>Cumulative treated</th>
<th>Waste produced</th>
<th>Change from last report</th>
<th>Storage capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 1</td>
<td>Approx.14,200m³</td>
<td>+100m³</td>
<td>OP.3,217</td>
<td>Approx.1.25m³</td>
<td>455,040m³</td>
<td>Sludge 597m³</td>
<td>—</td>
<td>700m³*1</td>
</tr>
<tr>
<td>Unit 2</td>
<td>Approx.23,000m³</td>
<td>—800m³</td>
<td>Unit 2 T/B</td>
<td>Approx.4.41m³</td>
<td>455,040m³</td>
<td>Used vessels 438</td>
<td>+3</td>
<td>1,137*4</td>
</tr>
<tr>
<td>Unit 3</td>
<td>Approx.24,700m³</td>
<td>+200m³</td>
<td>OP.3,187</td>
<td>Approx.1.54m³</td>
<td>455,040m³</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Unit 4</td>
<td>Approx.16,700m³</td>
<td>+200m³</td>
<td>OP.3,071</td>
<td>Approx.1.54m³</td>
<td>455,040m³</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Total</td>
<td>Approx.78,600m³</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1 Shows the operational limit.
*2 Including approx.6,300m³ (cumulative treated volume:approx.293,540m³) of treated volume by the 2nd Cesium adsorption apparatus.
*3 Including 54 used vessels of 2nd Cesium adsorption apparatus.
*4 Storage capacity will vary according to stored used vessels of 2nd Cesium adsorption apparatus.

Note:
1. Water transfer from Unit 2 to Unit 3 Turbine Building will be restarted, and will be temporarily stopped.
2. Water transfer from Unit 3 to the Process Main Building will be restarted.
3. On September 18, water transfer from Unit 4 to the High Temperature Incinerator Building was switched to the Process Main Building, and will be stopped.
4. Operation of 2nd Cesium Absorption Apparatus is scheduled: Availability Factor 75% (Projected)
5. Cesium Adsorption Apparatus will be suspended continuously.
6. On September 18, water transfer source of 2nd Cesium Adsorption Apparatus was switched from the High Temperature Incinerator Building to the Process Main Building.
7. Storage capacity of the concentrated saltwater receiving tank is increased by adding tanks.
Simulation Results of Accumulated Water Treatment in Unit 1-4 T/B

9/18 Transferring is under suspension

Accumulated Water Level in Unit 2 T/B (Unit 1-2 Connected)

-65mm/32/1 (480m3/d)

-130mm/32/1 (690m3/d)

-130mm/32/1 (960m3/d)

9/18 OP. 3,225 (Unit 2 T/B Water Level)

Transferred from Unit 1 T/B

Transferred to Unit 3 T/B (1 pump)

-65mm/32/1 (480m3/d)

Transferred to Unit 3 T/B (2 pumps)

-130mm/32/1 (690m3/d)

-130mm/32/1 (960m3/d)

Transferred to Unit 3 T/B (2 pumps)

-46mm/32/1 (640m3/d)

Transfer to Unit 3 T/B is suspended

9/18 Transferring is under suspension

Accumulated Water Level in Unit 3 T/B (Unit 3-4 Connected)

-30mm/32/1 (480m3/d)

Transfer to the Process Main Building is suspended

-30mm/32/1 (480m3/d)

-30mm/32/1 (480m3/d)

9/18 OP. 3,153 (Unit 3 T/B Water Level)

Transferred from Unit 1 T/B

Transferred from Unit 4 T/B to the High Temperature Incinerator Building (1 pump)

-30mm/32/1 (480m3/d)

Transferred to the Process Main Building (1 pump)

-30mm/32/1 (480m3/d)

Transferred from Unit 4 T/B to the Process Main Building (1 pump)

-30mm/32/1 (480m3/d)

Transfer from Unit 4 T/B to the High Temperature Incinerator Building is suspended

9/18 Cesium Adsorption Apparatus is under suspension

9/18 2nd Cesium Adsorption Apparatus in operation (2 lines)

2nd Cesium Adsorption Apparatus is suspended (2 lines)

Cesium Adsorption Apparatus is suspended

2nd Cesium Adsorption Apparatus is suspended (2 lines)

Cesium Adsorption Apparatus in operation

2nd Cesium Adsorption Apparatus in operation (2 lines)

12th Cesium Adsorption Apparatus is suspended (2 lines)

9/18 Desalination Facility (RO system) in operation under recirculation mode

Note:
- The treated water volume is assumed to be 900m3/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 fluctuation 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).