### Status of countermeasures for restoring from the accident at Fukushima Daiichi Unit 1 through 4. As of June 9th, 2011. (Estimated by JAF)

#### Reactor cooling

**Goal of STEP 1 (April through June)**
- **Stable cooling** (circulating injection cooling releasing accumulated water)

**Status of measures**
- Cooling by minimum injection rate: Successful injection of seawater via feed water line at 5m³/h
- Establishment of circulating injection cooling
- Nitrogen gas injection into PCV
- Flooding of PCV after leaking seals
- High temperature in the receiving facility
- Improving work environment

**Goal of STEP 2 (May through June)**
- **Ensuring heat exchange function**
- **Improving work environment**

**Status of measures**
- Cooling by minimum injection rate: Successful injection of seawater via feed water line at 5m³/h
- Establishment of circulating injection cooling
- Nitrogen gas injection into PCV
- Flooding of PCV after leaking seals
- High temperature in the receiving facility
- Improving work environment

- **Cooling by minimum injection rate**: Injecting seawater via feed water line at 5m³/h
- **Establishment of circulating injection cooling**: Cooling from seawater via feed water line at 5m³/h
- **Nitrogen gas injection into PCV**: Injection continued (4/6-5/17)
- **Flooding of PCV after leaking seals**: Studying
- **Securing heat exchange function**: Work for sea water cooling system
- **Improving work environment**: High radiation circumstance is hampering the work to restore reactor cooling. Preparation work such as lifting radioactive debris, radiation monitoring is underway in each unit. TPCO decided to plan to reinforce and shift the unit in the 2nd R/B to reduce its radiactivity and then open the door to decrease the humidity in the building, which also helps turn down the Unit 2.

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<th>Radioactivity in seawater (Bq/cm³)</th>
<th>Radioactivity in air (μSv/h)</th>
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#### Accumulated water

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<th>Total volume</th>
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<td>Unit 2</td>
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<td>91,800m³</td>
<td>(Approx. 105,000m³ including the wastewater transferred to the Centralized Radiation Waste Treatment Facility)</td>
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<td>Unit 4</td>
<td>W.B.4</td>
<td>91,000m³</td>
<td>(Approx. 100,000m³)</td>
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**Accumulated water**
- **Water storage place**: Unit 2, Unit 4
- **Type of plant**: W.B.3, W.B.4
- **Total volume**: 91,800m³, 91,000m³

**Notes**
- No severe damage suspected?
- **Accumulated water**
- **Water storage place**: Unit 2, Unit 4
- **Type of plant**: W.B.3, W.B.4
- **Total volume**: 91,800m³, 91,000m³

**Notes**
- No severe damage suspected?

### Environmental efficacy in the vicinity of the station

**Radiation exposure of the workers**
- Nuclear fuel rods (Pu, Am Cm) and Sr has been detected in the soil sampled at the site.
- Radioactive materials have been detected in samples corrected from underground water and also seawater at or near the site.

**Radioactivity in seawater (Bq/cm³)**
- High radiation circumstance is hampering the work to restore reactor cooling. Preparation work such as lifting radioactive debris, radiation monitoring is underway in each unit. TPCO decided to plan to reinforce and shift the unit in the 2nd R/B to reduce its radiactivity and then open the door to decrease the humidity in the building, which also helps turn down the Unit 2.

**Radioactivity in air (μSv/h)**
- High radiation circumstance is hampering the work to restore reactor cooling. Preparation work such as lifting radioactive debris, radiation monitoring is underway in each unit. TPCO decided to plan to reinforce and shift the unit in the 2nd R/B to reduce its radiactivity and then open the door to decrease the humidity in the building, which also helps turn down the Unit 2.
1. TEPCO’s analysis [announced on 5/15, 23]
2. TEPCO estimated that there was no severe damage to the fuel in the Unit 4 SFP based on the concentration of radioactive materials in the pool and the pictures of the pool. [4/13, 28, 29]
3. Rough estimate by TEPCO [announced on 5/31]

[Source]
NISA: News Release, Press conference
TEPCO: Press Release, Press Conference

[Abbreviations]
SFP: Spent Fuel Storage Pool
EDG: Emergency Diesel Generator
RPV: Reactor Pressure Vessel
PCV: Primary Containment Vessel
R/B: Reactor Building
T/B: Turbine Building
RW/B: Radioactive Waste Disposal Building
RHR: Residual Heat Removal system
CST: Condensate water Storage Tank
Hx: Heat exchanger
NPS: Nuclear power station

[Significance judged by JAIF]
- Low
- High
- Severe (Need immediate action)

[Progress of countermeasures]
- Completed
- Under construction
- To be done (including studying and manufacturing)