### Status of nuclear power plants in Fukushima as of 16:00 March 29 (Estimated by JAIF)

<table>
<thead>
<tr>
<th>Power Station</th>
<th>Fukushima Dai-ichi Nuclear Power Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Electric / Thermal Power output (MW)</td>
<td>460 / 1380</td>
</tr>
<tr>
<td>Type of Reactor</td>
<td>BWR-3</td>
</tr>
</tbody>
</table>

#### Operation Status at the earthquake occurred

<table>
<thead>
<tr>
<th>Fuel assemblies loaded in Core</th>
<th>In Service</th>
<th>Shut down</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core and Fuel Integrity</td>
<td>Damaged</td>
<td>Damaged</td>
</tr>
<tr>
<td>Reactor Pressure Vessel Integrity</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>Containment Vessel Integrity</td>
<td>Not Damaged</td>
<td>Damage and Leakage Suspected</td>
</tr>
<tr>
<td>Core cooling requiring AC power 1</td>
<td>Not Functional</td>
<td>Not Functional</td>
</tr>
<tr>
<td>Containment Vessel Integrity</td>
<td>Not Damaged</td>
<td>Not Damaged</td>
</tr>
<tr>
<td>Core cooling requiring AC power 2</td>
<td>Not Functional</td>
<td>Not Functional</td>
</tr>
<tr>
<td>Building Integrity</td>
<td>Severely Damaged (Hydrogen Explosion)</td>
<td>Slightly Damaged</td>
</tr>
<tr>
<td>Water Level of the Reactor Pressure Vessel</td>
<td>Fuel exposed partially or fully</td>
<td>Fuel exposed partially or fully</td>
</tr>
<tr>
<td>Pressure / Temperature of the Reactor Pressure Vessel</td>
<td>No significant change / Decreased after Increase</td>
<td></td>
</tr>
<tr>
<td>Containment Vessel Pressure</td>
<td>Stable</td>
<td></td>
</tr>
<tr>
<td>Water injection to core (Accident Management)</td>
<td>Continuing (Switch from seawater to Freshwater)</td>
<td></td>
</tr>
<tr>
<td>Water injection to Containment Vessel (AM)</td>
<td>(To be confirmed)</td>
<td></td>
</tr>
<tr>
<td>Containment Venting (AM)</td>
<td>Temporarily stopped</td>
<td></td>
</tr>
<tr>
<td>Fuel assemblies stored in Spent Fuel Pool</td>
<td>292</td>
<td>587</td>
</tr>
<tr>
<td>Fuel Integrity in the spent fuel pool</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>Cooling of the spent fuel pool</td>
<td>Water injection to be considered</td>
<td>Seawater spray continue and certain effect was confirmed</td>
</tr>
<tr>
<td>Main Control Room Habitability &amp; Operability (Lighting working in the control room)</td>
<td>Poor due to loss of AC power</td>
<td></td>
</tr>
<tr>
<td>Environmental effect</td>
<td>Radiation level: 116.6 μSv/h at the West gate at 07:50, Mar. 29</td>
<td></td>
</tr>
<tr>
<td>Radioactive material was detected from milk and agricultural products from Fukushima and neighboring prefectures. The government issue order to limit shipment and intake for some products from some areas.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclear Safety Commission of Japan released prediction of radioactive material spread caused by the accident. This prediction was based on the calculation using computer code called SPEEDI (System for Prediction of Environmental Emergency Dose Information). &quot;<a href="http://www.nsc.go.jp/info/110323_top_siryo.pdf">http://www.nsc.go.jp/info/110323_top_siryo.pdf</a>&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiation dose higher than 1000 mSv was measured at the surface of water accumulated in the tunnel for laying piping outside Unit 2 turbine building on Mar. 28th. The concentration of plutonium measured is as little as in normal environment, almost the same as measured in Japan when the nuclear bomb tests were conducted in the atmosphere in the past, and not harmful to human body.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INES (estimated by NISA)</td>
<td>Level 5</td>
<td>Level 5</td>
</tr>
<tr>
<td>Remarks</td>
<td>●Progress of the work to recover injection function</td>
<td></td>
</tr>
<tr>
<td>Radiation makes difficult the work to restore originally installed pumps for injection.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High radiation makes difficult the work to restore originally installed pumps for injection.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>It is presumed that radioactive material inside the reactor vessel would have leaked outside the containment vessel at unit-1, 2 and unit-3, based on the investigation of the water sampled at turbine building.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**[Significance judged by JAIF]**
- Low
- High
- Severe (Need immediate action)
## Power Station

<table>
<thead>
<tr>
<th>Power Station</th>
<th>Unit</th>
<th>Electric / Thermal Power output (MW)</th>
<th>Type of Reactor</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onagawa Nuclear Power Station</td>
<td>1</td>
<td>1100</td>
<td>BWR-5</td>
<td>In Service ➔ Automatic Shutdown</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3293</td>
<td>BWR-5</td>
<td>All the units are in cold shutdown.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>4</td>
<td>BWR-5</td>
<td>Level 3</td>
<td></td>
</tr>
</tbody>
</table>

### Remarks
- Unit 1, 2, 3 & 4, which were in full operation when the earthquake occurred, all shutdown automatically.
- External power supply was available after the quake. While injecting water into the reactor pressure vessel using make-up water system, TEPCCO recovered the core cooling function and made the unit into cold shutdown state one by one.
- Latest Monitor Indication: 6.2 µSv/h at 07:58, Mar. 29 at NPS border.
- Evacuation Area: 10km from NPS.

### Information compilation policy
This JAIF-compiled information chart represents the situation, phenomena, and operations in which JAIF estimates and guesses the reactors and related facilities are, based on the latest data and information directly and indirectly made available by the relevant organizations when JAIF’s updating works done. Consequently, JAIF may make necessary changes to descriptions in the chart, once (1) new developments have occurred in the status of reactors and the facilities and (2) JAIF has judges so needed after reexamining the prior information and judgments.
Parameters in the Table
JAIF picks up these parameters to evaluate safety condition of the nuclear plants during this accident from the viewpoint of the principles of nuclear power plant safety, which are "Shutdown", "Cooling" and "Containment". Then we create the chart. The following diagram is to show the correspondence relation of these parameters in the table to nuclear power plant safety.

Nuclear Power Plant Safety and related items

- Reactor Safety
  - Shutdown
  - Cooling
    - Design base cooling capability
  - Containment
    - Design base containment function
    - 6 Barriers
      1. Fuel Pellet
      2. Cladding Tube
      3. Reactor Pressure Vessel
      4. Containment Vessel
      5. Reactor Building

<Accident Management: AM>
(Operation beyond design base accident)

- Alternative Cooling operation
- Operation for containment vessel protection against burst

Parameters in the table

- Operation Status at the earthquake
  - Core cooling requiring AC power1
    (Large volumetric freshwater injection)
  - Core cooling requiring AC power2
    (Cooling through Heat Exchangers)

- Water level of the Reactor Pressure Vessel
- Pressure of the Reactor Pressure Vessel

- Core and Fuel Integrity
  - Reactor Pressure Vessel Integrity
  - Containment Vessel pressure
  - Containment Vessel Integrity
  - Building Integrity
  - Injection to core (AM)
  - Injection to Containment Vessel (AM)
  - Containment Venting (AM)

- Safety of the spent fuel pool
  - Fuel Integrity in the spent fuel pool
    (Fuel Damage)
  - Cooling of the spent fuel pool
    (Water injection, pool temp, water level)

- Work environment in main control room
- Main Control Room Habitability and Openability
  (ventilation, Lights, Indicator)

- Environmental effect
- Environmental effect
  (Radiation Monitor, Contamination)

- Evacuation
- Evacuation (Order, Evacuated Area)
### 1. Major Incidents and Actions

**<March 27th>**

07:30 TEPCO is working to send highly radioactive water accumulated in the basement of turbine building to the condenser at unit-1. Same work is to be done at unit-2 and 3.

PM: TEPCO conducted sparing sea water to the spent Fuel Pools at unit-3 and unit-4.

**2. Chronology of Nuclear Power Stations**

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#### 5. Major Data

- **Reactor Water level**
  - Reactor Water level (A) -1500mm (B) -1650mm (29th 01:00)
  - Reactor Water level (A) -1500mm (29th 01:00)
  - Reactor Water level (A) -1800mm, (B) -2250mm (29th 00:00)

- **Reactor pressure**
  - Reactor pressure (A) 0.394MPaG, (B) 0.500MPaG (29th 01:00)
  - Reactor pressure (A) -0.027MPaG, (B) -0.029MPaG (29th 01:00)
  - Reactor pressure (A) 0.029MPaG, (B) -0.092MPaG (29th 00:00)

- **CV pressure**
  - CV pressure 0.290MPaabs (29th 01:00)
  - CV pressure 0.100MPaabs (29th 01:00)
  - CV pressure 0.1073MPaabs (29th 00:00)

- **Water temperature of SFP**
  - Water temperature of SFP 46℃ (28th 17:30)

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**Accidents of Fukushima Dai-ichi and Fukushima-Dai-ni Nuclear Power Stations**

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Status of the Nuclear Power Plants after the Earthquake

The accident that brings environmental impact is going on at several units in Fukushima Daiichi nuclear power Station after the earthquake occurred on March 11th. Other nuclear power plants in Japan are in normal operation or safely shutdown.

- **Accident with Nuclear Fuel Damage Suspected**
- **Accident without Nuclear Fuel Damage Suspected**
- **Safe**
- **Safe (Not affected by the quake)**