### Status of nuclear power plants in Fukushima as of 10:00 March 20

(Estimated by JAIF)

<table>
<thead>
<tr>
<th>Power Station</th>
<th>Fukushima Daiichi Nuclear Power Station</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Electric / Thermal Power output (MW)</strong></td>
<td>460 / 1380</td>
</tr>
<tr>
<td><strong>Type of Reactor</strong></td>
<td>BWR-5</td>
</tr>
<tr>
<td><strong>Operation Status at the earthquake occurred</strong></td>
<td>In Service -&gt; Automatic Shutdown</td>
</tr>
<tr>
<td><strong>Core and Fuel Integrity</strong></td>
<td>Damaged</td>
</tr>
<tr>
<td><strong>Reactor Pressure Vessel Integrity</strong></td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>Containment Vessel Integrity</strong></td>
<td>Not Damaged</td>
</tr>
<tr>
<td><strong>Core cooling requiring AC power</strong></td>
<td>Not Functional</td>
</tr>
<tr>
<td><strong>Core cooling not requiring AC power</strong></td>
<td>Not Functional</td>
</tr>
<tr>
<td><strong>Building Integrity</strong></td>
<td>Severely Damaged</td>
</tr>
<tr>
<td><strong>Water Level of the Reactor Pressure Vessel</strong></td>
<td>Fuel exposed partially or fully</td>
</tr>
<tr>
<td><strong>Pressure of the Reactor Pressure Vessel</strong></td>
<td>Stable</td>
</tr>
<tr>
<td><strong>Containment Vessel Pressure</strong></td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>Water injection to core (Accident Management)</strong></td>
<td>Continuing (Seawater)</td>
</tr>
<tr>
<td><strong>Water injection to Containment Vessel (AM)</strong></td>
<td>Continuing (Seawater) to be decided (Seawater)</td>
</tr>
<tr>
<td><strong>Containment venting (AM)</strong></td>
<td>Temporarily stopped</td>
</tr>
<tr>
<td><strong>Fuel Integrity in the spent fuel pool</strong></td>
<td>Water injection to be considered (No info)</td>
</tr>
</tbody>
</table>

### Remarks

- Immediate threat is damage of the fuels in the fuel pool outside the containment vessel. The operation for filling the pool with water has been conducted since March 17 at Unit-3 and certain effect was confirmed. Also operation for filling the pool with water started around 8:20 in March 20.
- Attempting to receive external power supply, TEPCO is laying a power cable between the transmission line. The line to Unit-1 and 2 was connected, and external power supply are scheduled tomorrow. Unit 3 to 6 are scheduled to be connected until March 20.

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**Power Station**

- **Unit**
- **Type of Reactor**
- **Electric / Thermal Power output (MW)**
- **Operation Status at the earthquake occurred**
- **Status**
- **Remarks**

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**Source**

Governmental Emergency Headquarters: News Release (-3/19 17:00), Press conference
TEPCO: Press Release (-3/19 18:00), Press Conference

**Significance judged by JAIF**

- Low
- High
- Severe (Need immediate action)

**Abbreviations**

INES: International Nuclear Event Scale
NISA: Nuclear and Industrial Safety Agency
Parameters in the Table
JANAF 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: Shut down
- Cooling: Design base cooling capability
- Containment
  - Fifth barriers
    - Fuel Pellet
    - Cladding Tube
    - Reactor Pressure vessel
  - Containment Vessel
  - Reactor Building

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

- Alternative Cooling operation
  - Operation for containment vessel breach prevention
  - Water injection to core (AM)
  - Water injection to Containment Vessel (AM)
  - Containment venting (AM)

- Operation Status at the earthquake occurred
  - Core cooling requiring AC power
  - Core cooling not requiring AC power

Parameters in the Table
- 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

- Fuel Integrity in the spent fuel pool (Temp, Level, Fuel integrity)
- Environmental effect (Radiation Monitor)
- Evacuation (Order, Evacuated Area)
1. Latest Major Incidents and Actions

14:03 Ground-based water discharge (7 times) by SDF (~14:38)
14:24 Ground-based water discharge (once) by TEPCO using US forces’ water cannon truck (~14:45)
17:50 NISA announced that Fukushima Dai-ichi 1, 2 and 3 has been rated as 5 on the INES scale, and that Fukushima Dai-ichi 4, Fukushima Dai-ni 1, 2 and 4 as 3

MARCH 19
00:30 Ground-based water discharge by Tokyo Fire Department (~01:10)

A pump restarted cooling water circulation in the spent fuel pools of Unit 5.

01:11 A pump restarted water circulation in the spent fuel pools of Unit 6 (not cooling).

2. Status of Nuclear Power Stations

(1) Fukushima Dai-ichi NPS

<table>
<thead>
<tr>
<th>Unit 1</th>
<th>Unit 2</th>
<th>Unit 3</th>
<th>Unit 4</th>
<th>Unit 5, 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>15:42 Report IAW Article 10* (Loss of power)</td>
<td>15:42 Report IAW Article 10* (Loss of power)</td>
<td>04:08 Water temperature in Spent Fuel Storage Pool increased at 84°C</td>
<td>atmosphere is not cooling</td>
<td>00:00 Start venting</td>
</tr>
</tbody>
</table>

*The Act on Special Measures Concerning Nuclear Emergency Preparedness

11th 15:42 Report IAW Article 10* (Loss of power)
11th 15:42 Report IAW Article 10* (Loss of power)
14th 07:44 Event falling under Article 15* occurred (Loss of reactor cooling function)
14th 22:50 Report IAW Article 15* (Loss of core cooling function)

(2) Fukushima Dai-ni NPPs

All units are cold shutdown (Units 1, 2, 4 have been recovered from a event falling under Article 15*)

3. State of Emergency Declaration

11th 19:03 State of nuclear emergency was declared (Fukushima Dai-ni NPS)
12th 07:45 State of nuclear emergency was declared (Fukushima Dai-ichi NPS)

4. Evacuation Order

11th 21:23 PM direction: for the residents within 3km radius from Fukushima I to evacuate, within 10km radius from Fukushima I to stay in-house
12th 05:44 PM direction: for the residents within 10km radius from Fukushima I to evacuate
12th 17:39 PM direction: for the residents within 10km radius from Fukushima II to evacuate
12th 18:25 PM direction: for the residents within 20km radius from Fukushima I to evacuate
15th 11:06 PM direction: for the residents within 20-30km radius from Fukushima I to stay in-house
Status of the Nuclear Power Plants after the Earthquake

Every efforts and measures have been taken at Fukushima Daiichi nuclear power plants. Other nuclear power plants in Japan are in normal operation or safely shutdown.