Measures for Reinforcing Safety at the Ohma Nuclear Power Plant

Electric Power Development Co., Ltd. (“J-POWER”) hereby gives notice that J-POWER has concluded formulation of measures for reinforcing safety at the Ohma Nuclear Power Plant.

Based on the new safety standards, measures for reinforcing safety have been examined, including design reviews.

For design basis to prevent severe accidents, J-POWER will further strengthen earthquake and tsunami resistant measures, and for the newly established measures against severe accidents, J-POWER will incorporate measures to prevent core damage and containment vessel failure, and install a specified severe accident response facility as a countermeasure to terrorist attacks such as airplane crash.

(Main premises)
- Standard seismic motion: 650 cm/s² (previously 450 cm/s²)
- Design basis tsunami:  
  - Highest sea water level: T.P. +6.3 m (previously +4.4 m),
  - Lowest sea water level: T.P. -4.1 m (previously -3.8 m)

In the Ohma Nuclear Power Plant, all measures are being implemented during construction, including the specified severe accident response facility which is subject to transitional measures for five years after the regulations are enforced, to create a safe power plant.

The construction works for measures for reinforcing safety that have been formulated this time are scheduled to commence in November 2015 toward completion in December 2020. The planned construction budget is approximately 130 billion yen.

(The construction plan is based on J-POWER’s projections, which incorporate estimations of examination and permit process durations by the Nuclear Regulatory Authority.)

Please note that explanations on the outline of the measures for reinforcing safety have been made today to Aomori Prefecture, the town of Ohma and others.

Further, this project does not affect earnings for the current period.

[Attachment]
Outline of Measures for Reinforcing Safety at Ohma Nuclear Power Plant
Overview of Ohma Nuclear Power Plant

<table>
<thead>
<tr>
<th>Location</th>
<th>Ohma-machi, Shimokita-gun, Aomori Prefecture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>1,383MW</td>
</tr>
<tr>
<td>Type of nuclear reactor</td>
<td>Advanced Boiling Water Reactor (ABWR)</td>
</tr>
<tr>
<td>Fuel</td>
<td>Enriched uranium and uranium-plutonium mixed oxide (MOX)</td>
</tr>
<tr>
<td>Commencement of operations</td>
<td>To be determined</td>
</tr>
</tbody>
</table>
Outline of Measures for Reinforcing Safety at Ohma Nuclear Power Plant

1. Responding to new safety standards

   <Pre-existing safety standards>

   - Standard seismic motion: 650 cm/s² (previously 450 cm/s²)
   - Design basis tsunami: Highest sea water level: T.P. +6.3 m (previously +4.4 m), Lowest sea water level: T.P. -4.1 m (previously -3.8 m)

2. Construction plan

   - Start of Construction: November 2015 (scheduled)
   - End of Construction: December 2020 (scheduled)

*2 Specified severe accident response facility

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*Main premises*

- We report on plans that have been drawn up regarding measures for reinforcing safety at the Ohma Nuclear Power Plant.
- Based on the new safety standards, measures for reinforcing safety have been examined, including design reviews.
- Including the specified severe accident response facility which is subject to transitional measures for five years after the regulations are enforced, all measures will be implemented during construction to create a safe power plant at the Ohma Nuclear Power Plant.

(Main premises)

- Standard seismic motion: 650 cm/s² (previously 450 cm/s²)
- Design basis tsunami: Highest sea water level: T.P. +6.3 m (previously +4.4 m), Lowest sea water level: T.P. -4.1 m (previously -3.8 m)

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1. Responding to new safety standards

   <New safety standards>

   - Response to intentional aircraft crash (Counterterrorism)
   - Measures to suppress radioactive materials dispersal
   - Measures to prevent containment vessel failure
   - Measures to prevent core damage (Postulate multiple failures)
   - Consideration of internal flooding
   - Consideration of natural phenomena (Volcanic eruptions, tornadoes and forest fires, etc.)
   - Fire protection
   - Reliability of power supply
   - Function of other SSCs*1
   - Seismic/tsunami resistance

*1 SSCs: Structure, Systems and Components

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Installation of specified severe accident response facility*2:

- Install as measures to facilitate the cooling of the containment vessel and other facilities even in situations where large-scale destruction has rendered equipment widely unusable, for example as a result of intentional aircraft crashes or other terrorist attacks, and separate to the below design basis measures

Measures to prevent containment vessel failure:

- Measures to contain the accident in the event that core damage occurs

Measures to prevent core damage:

- Maintaining cooling of the reactor and fuel pools
- Ensuring alternative water injecting function, alternative power sources, water sources

Measures to prevent damage due to external impact:

- Volcanic eruption: Assess feasibility of volcanic ash, etc., reaching the site
- Tornado: Impact assessment of wind speed of tornado, flying objects
- External fires: Impact assessment of fires such as forest fires, and fires caused by aircraft crashes

Measures to prevent damage from earthquakes:

- Based on latest findings and research on past earthquakes and active faults around Ohma, formulating standard seismic motion of 650 cm/s² (previously 450 cm/s²), implementing seismic resistant designs

Measures to prevent damage from tsunamis:

- Based on latest findings on the 2011 off the Pacific coast of Tohoku Earthquake Tsunami (simultaneous ruptures, slips), formulating the following design basis tsunami, implementing tsunami-resistant designs:
  - Highest sea water level (site) approx. T.P. +6.3 m (previously T.P. +4.4 m)
  - Lowest sea water level (front of intake port) approx. T.P. -4.1 m (previously T.P. -3.8 m)

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2. Construction plan

- Construction plan for measures mentioned above
  - Start of Construction: November 2015 (scheduled)
  - End of Construction: December 2020 (scheduled)

*The construction plan is based on our projections, which incorporate estimations of examination and permit process durations by the Nuclear Regulatory Authority.
Outline of measures for reinforcing safety at Ohma Nuclear Power Plant
1. Earthquakes

- Earthquakes for investigation

Earthquakes listed below have been investigated by each earthquake type

<table>
<thead>
<tr>
<th>Earthquake type</th>
<th>Earthquake for investigation</th>
<th>Magnitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interplate earthquakes</td>
<td>Northern Sanriku-oki Earthquake</td>
<td>Mw8.3</td>
</tr>
<tr>
<td>Oceanic intraplate earthquakes</td>
<td>Urakawa-oki oceanic intraplate Earthquake</td>
<td>M7.5</td>
</tr>
<tr>
<td></td>
<td>Tokachi-oki oceanic intraplate Earthquake</td>
<td>M8.2</td>
</tr>
<tr>
<td>Inland crustal earthquakes</td>
<td>Earthquake occurring in Negishi-seiko</td>
<td>M7.5</td>
</tr>
<tr>
<td></td>
<td>Fault59</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Earthquake occurring in F-14 Fault</td>
<td>M6.7</td>
</tr>
</tbody>
</table>

**1:** Evaluation considering uncertainty of simultaneous rupture of north-off Sanriku area and off Tokachi and off Nemuro areas along Kuril trench (Mw9.0), based on experience of the 2011 off the Pacific coast of Tohoku Earthquake

**2:** Newly taken into consideration after review of seismic evaluation based on latest findings of researches

- Based on latest findings and research on past earthquakes and active faults around Ohma, formulating standard seismic motion

  Standard seismic motion
  
<table>
<thead>
<tr>
<th>Movement</th>
<th>Acceleration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal</td>
<td>650 cm/s²</td>
</tr>
<tr>
<td>Vertical</td>
<td>435 cm/s²</td>
</tr>
</tbody>
</table>

2. Tsunamis

- Tsunami source models based on the latest knowledge such as the 2011 off the Pacific coast of Tohoku Earthquake Tsunami

- Estimated earthquakes larger than ever considered as tsunami sources at the eastern margin of the Japan sea, from off Sanriku to off Nemuro, off Chile and offshore active faults

- Taking into consideration of non-earthquake-oriented tsunami (caused by land slide, submarine slide, sector collapse of volcano)

- The ground level of compound is T.P. +12 m, which is higher than the highest sea water level by design basis tsunami (T.P. +6.3 m), so there is no concern about design basis tsunami reaching and flowing into the site from ground level

- Additional measures for tsunamis that are greater than design basis tsunami shall be implemented to further improve reliability

- The seawater pump is situated within turbine building that is highly robust and watertight

- In case of the lowest sea water level by design basis tsunami (T.P. -4.1 m), the sea water level recedes slightly below the foundation height of the front of the intake port, but seawater stored within the intake passage (about 6,600 m³) provides sufficient intake volumes for the nuclear reactor auxiliary machine cooling sea water system