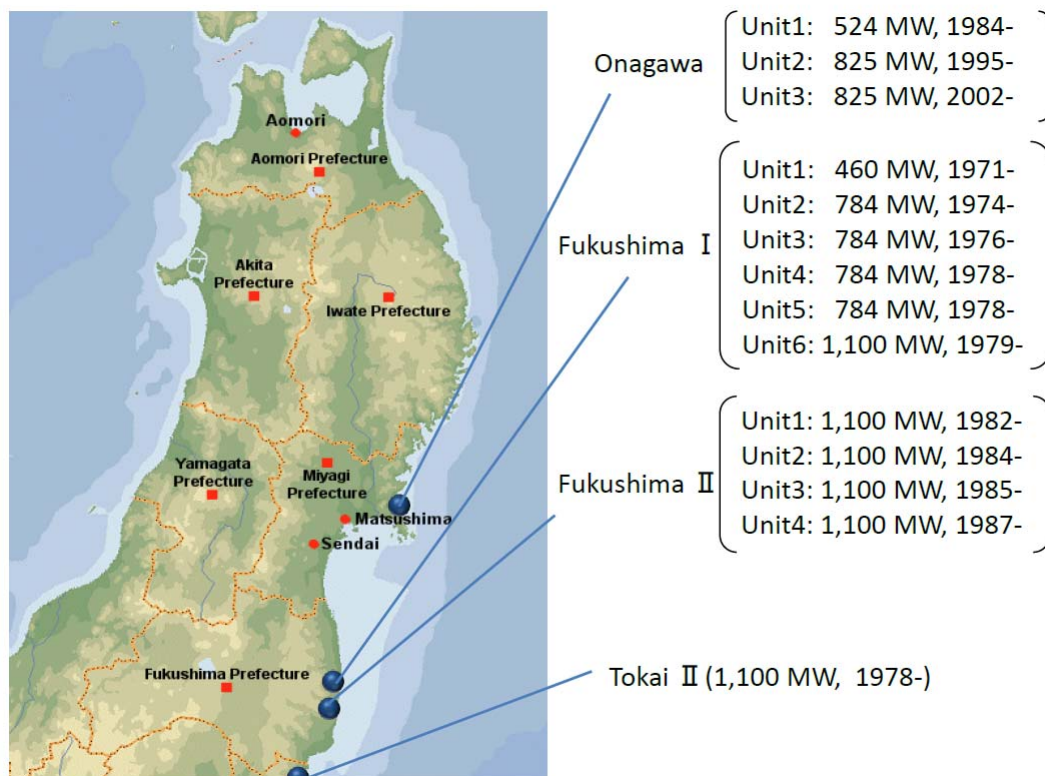


## Tohoku Pacific Earthquake and the seismic damage to the NPSs

11. 03. 18 As of 14:00

Ministry of Economy, Trade and Industry

### Earthquake occurrence and automatic shut-down of nuclear reactors



The Tohoku Pacific Earthquake of magnitude 9.0 struck the northeastern part of Japan at 2:46 pm on March 11th, 2011.

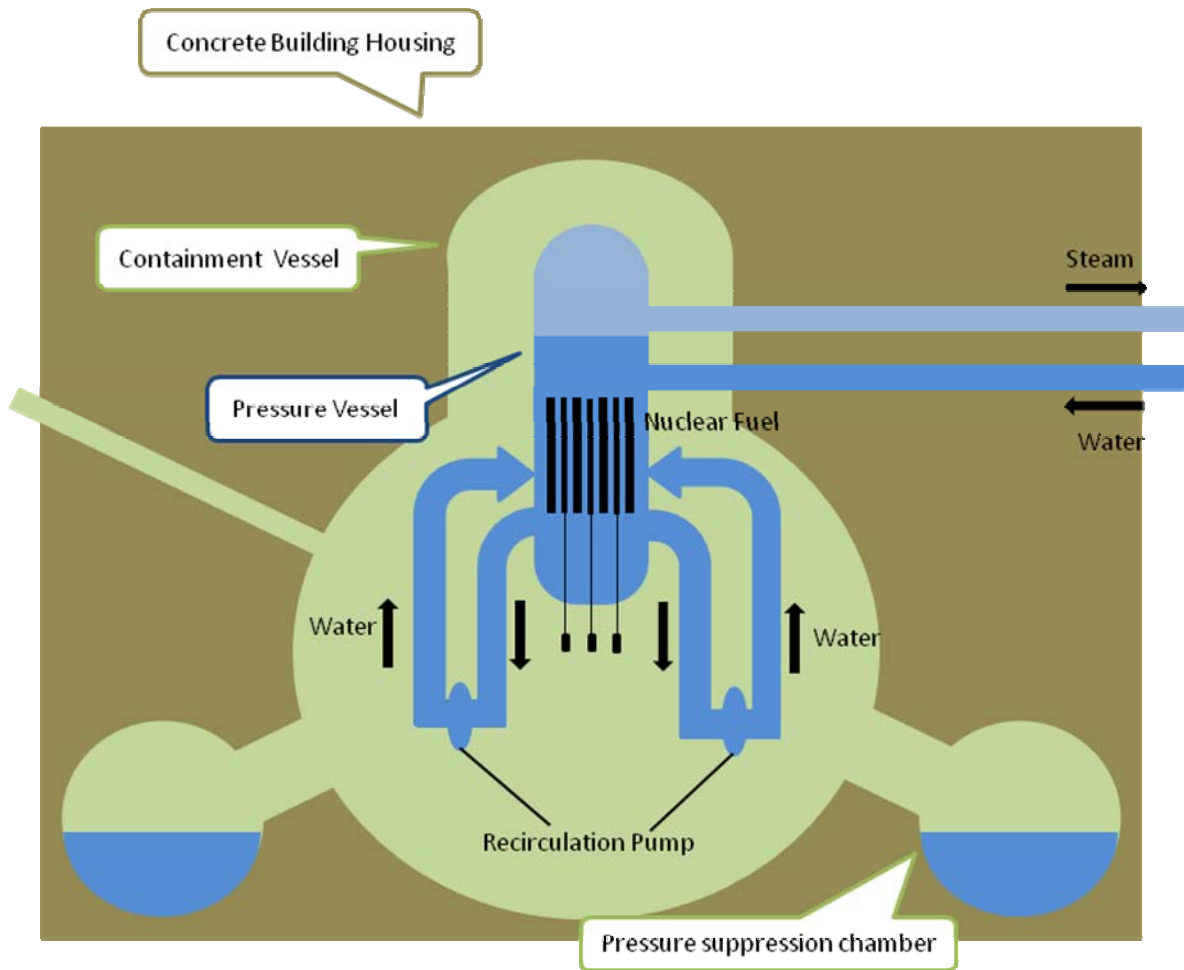
While 3 reactors (Fukushima Dai-ichi (I) Unit 4,5,6) were under periodic inspection, 11 reactors (Onagawa Unit 1,2,3; Fukushima Dai-ichi (I) 1,2,3; Fukushima-Dai-ni (II) Unit 1,2,3,4; and Tokai Dai-ni (II)) were automatically shut-down.

After the automatic shut-down, the Unit 1-3 at Onagawa Nuclear Power Station, the Unit 3 at Fukushima II Nuclear Power Station, and the Unit at Tokai II Nuclear Power Station have been cold shut down safely. As for the unit 1,2,4 at Fukushima II Nuclear Power Station the operator of the station reported NISA nuclear emergency situation, but afterward the three units have been cold shut down.

Outline of the Fukushima I Nuclear Power Station



(Fukushima Dai-ichi nuclear power station)



(Structure of BWR)

**Report concerning incidents at Unit1, 2, 3 and 4 at the Fukushima I NPS**

***Unit 1 Seawater is being injected into the reactor pressure vessel as of 6:30 March 18th.***

- On March 11th, after the automatic shut-down of the reactor, the temperature of the reactor core went up, because the seawater pump which is necessary to operate cooling systems lost its water supply function due to the devastating Tsunami.
- On March 12th, water levels inside the pressure vessel dropped and the reaction of cladding metal of fuel and water generated hydrogen. The hydrogen leaked outside of the containment vessel and caused the explosion at the upper-part of a concrete building housing at 15:36 on March 12,
- Currently, seawater is being injected into the reactor pressure vessel. There is no risk of a hydrogen explosion in the containment vessel because there is no oxygen in it. There is no high probability of leaking large amount of radioactive material currently.

***Unit 2 Seawater is being injected into the reactor pressure vessel as of 17:30 March 17th.***

- After the automatic shut-down of the reactor, the water injection function was sustained, but the reactor water level tended to decrease.
- At 6:10 on March 15th, TEPCO reported that there was an explosion sound at Unit 2. Given the fact that the pressure in the suppression chamber of Unit 2 decreased. It is presumed that the possibility of certain damage on the suppression chamber.
- Currently, seawater is being injected into the reactor pressure vessel. White smoke is running from reactor building through blowout panel.

***Unit 3 Several counter measures are being used to cool down Unit 3 as of 17:30 March 17th.***

- After the automatic shut-down of the reactor, on March 13<sup>th</sup> fresh water and subsequently seawater were injected into the reactor pressure vessel through the fire extinguishing system line.
- The explosion took place around the reactor building of Unit 3 at 11:01 on March 14th.
- At 8:30 on March 16th, white smoke like steam was generated from Unit 3. Because of the possibility that the containment vessel of Unit 3 was damaged, the operators evacuated from the central control room of Unit 3 and 4 at 10:45 on March 16th. Thereafter, the operators returned to the room and restarted the operation for water injection into the reactor pressure vessel at 11:30 on March 16th.
- Helicopters and water cannon trucks of Self Defense Forces discharged water to Unit 3 from sky and ground on March 17<sup>th</sup>. Riot police also shot water from ground. Currently, seawater is being injected into the reactor pressure vessel.

***Unit 1,2 &3***

- As Cesium and Iodine were detected, it was believed that a part of nuclear fuel was damaged and a small amount of radioactive material was leaked into core cooling water.

***Unit 4 There are no fuel in the reactor pressure vessel due to replacement work of a shroud.***

- It was confirmed that a part of wall of the operation floor of the reactor building of Unit 4 was damaged on March 15th. A fire took place at Unit 4 at 9:38 on March 15th, but the fire was extinguished spontaneously.
- At 5:45 on March 16th, it was reported that a fire occurred at Unit 4; however, no

fire was confirmed by TEPCO staff on the ground at 6:15 on March 16th.

- The temperature of water in the spent fuel storage pool went up.

***Unit 5&6 Back up power of Unit 6 is in working condition and power supply to Unit 5&6 is maintaining as of March 17<sup>th</sup>***

- Fresh water is being injected into reactor pressure vessels and spent fuel pools by Make-Up Water Condensate system.

#### **Current Situation**

- Evacuation as far as 20 kilometers from Fukushima I NPS and 10 kilometers from Fukushima II was almost completed (see the diagram below). The residents in the areas from 20 kilometers to 30 kilometers radius from Fukushima I NPS are directed to stay in-house.
- On March 16th, the Local Emergency Response Headquarter issued “the direction to administer the stable Iodine during evacuation from the evacuation area (20 km radius)” to the Prefecture Governors and the heads of cities, towns and villages.

\*The data of Monitoring Post out of 20 Km Zone of Fukushima Dai-ichi NPP is available at the following website.

[http://www.mext.go.jp/a\\_menu/saigaijohou/syousai/1303726.htm](http://www.mext.go.jp/a_menu/saigaijohou/syousai/1303726.htm)

