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

At the time of the earthquake occurrence, 3 reactors (Units 4, 5 and 6 at Fukushima Dai-ichi (I) Nuclear Power Station of Tokyo Electric Power Co. Inc.(TEPCO)) were under periodic inspection outage, and 11 reactors (Units 1, 2 and 3 at Onagawa Nuclear Power Station of Tohoku Electric Power Co. Ltd.; Units 1, 2 and 3 at Fukushima Dai-ichi (I) Nuclear Power Station of TEPCO; Units 1, 2, 3 and 4 of Fukushima-Dai-ni (II) Nuclear Power Station of TEPCO; and an unit of Tokai Dai-ni (II) Nuclear Power Station of Japan Atomic Power Co. Ltd.) were automatically shut-down.

After the automatic shut-down, Units 1, 2 and 3 at Onagawa, Unit 3 at Fukushima II, and the Unit at Tokai II have been cold shut down safely. As for the Units 1, 2 and 4 at Fukushima II, TEPCO operator of the station reported the nuclear emergency situation to Nuclear and Industrial Safety Agency (NISA), but afterward the three units have been cold shut down.
The massive earthquake triggered the devastating Tsunami wiping away houses, buildings, cars along the widespread areas of the northeast coast. The Tsunami also knocked out the emergency power generators and the pumps supplying seawater to the cooling system and disabled other function necessary for cooling down the reactor cores of Units 1, 2, and 3 as well as spent fuel kept in the pools inside reactor buildings of all units at Fukushima I. Consequently, the pressure and temperature of reactor cores and the water temperature of spent fuel storage pools went up.

For counter measures, seawater is being injected into the reactor pressure vessels of Units 1, 2 and 3. At the same time, police, fire brigade and the Self Defense Force are attempting to pour water into the spent fuel storage pool of Unit 3 by spraying seawater from helicopters, water cannon trucks and fire engine. Further, TEPCO engineers are working to restore external power supply by installing the electricity cable connecting to the transmission line of Tohoku Electric Power Co. Ltd. and other transmission route.

**Unit 1  Seawater is being injected into the reactor pressure vessel as of 8:00 March 19th.**

- After the reactor was automatically shut-down and the Tsunami disabled the equipments, the temperature of the reactor core went up and the water level 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.

- 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 8:00 March 19th.**

- 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. The work to recover external power supply is underway as of 22:00 on March 18th.

**Unit 3**  
Several counter measures are being used to cool down Unit 3 as of 8:00 March 19th.

- After the automatic shut-down of the reactor, fresh water and subsequently seawater were injected into the reactor pressure vessel through the fire extinguishing system line. However, the pressure in the primary containment vessel rose up unusually and 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.

- Currently, seawater is being injected into the reactor pressure vessel. At the same time, to pour water into the spent fuel storage pool, helicopters and water cannon trucks of Self Defense Forces discharge water to Unit 3 from sky and ground. Riot Police and Hyper Rescue Unit of Tokyo Fire Department sprayed water.

**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. At 4:08 on March 14th, the temperature in the spent fuel storage pool of Unit 4 was 84 degree centigrade.

**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 19th.**

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

- The temperature of water in the spent fuel storage pool went up. At 6:00 on March 19th, the temperature in the spent fuel storage pool of Unit 5 and Unit 6 were 68.8 degree centigrade and 66.5 degree centigrade, respectively.

- The pump C of residual heat removal system for Unit 5 started up and cooling of spent fuel storage pool started at 5:00 on March 19th.

**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.
1) The data of Monitoring Post out of 20 Km Zone of Fukushima Dai-ichi NPP is available on the following website:
http://www.mext.go.jp/a_menu/saigaijohou/syousai/1303726.htm

2) The real-time radiation data collected via the System for Prediction of Environment Emergency Dose Information (SPEEDI) is available on the following website:
http://www.bousai.ne.jp/eng/
Outline of the Fukushima I Nuclear Power Station

(Fukushima Dai-ichi nuclear power station)

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Concrete Building Housing

Containment Vessel

Pressure Vessel

Nuclear Fuel

Recirculation Pump

Pressure suppression chamber

Steam

Water

(Structure of BWR)
Location of Fukushima I and II in Japan