

Current Status of Units 1 to 4 at Fukushima Daiichi NPS (as of noon, March 17, 2011)

Following the giant M9.0 earthquake that struck Japan in the afternoon of March 11 – one of the largest oceanic earthquakes in history – the Fukushima I (Daiichi) Nuclear Power Station (NPS), owned and operated by the Tokyo Electric Power Co. (TEPCO), lost external as well as internal emergency power, as unexpected events occurred one after another. The Japanese government and TEPCO have been working continuously to control the situation after the quake, officially designated the “2011 Tohoku-Pacific Ocean Earthquake.”

At the Fukushima Daiichi NPS (TEPCO), Fukushima II (Daini) NPS (TEPCO), Onagawa NPS (Tohoku Electric Power Co.) and Tokai Daini NPS (Japan Atomic Power Co.), all 11 units that had been in operation when the earthquake struck automatically shut down, with control rods inserted in each reactor.

At the Fukushima Daiichi NPS, 14 emergency diesel generators all automatically activated once external power became unavailable. But a large tsunami, far beyond the maximum expected height of 5 meters, hit the site at around 3:20 p.m., causing all the AC power sources for Units 1, 2 and 3 (those that had been in operation) to be lost. The occurrence of a specific incident, pursuant to Article 10 of the Special Law of Emergency Preparedness for Nuclear Disaster, was reported to the government. At almost the same time, the oil tanks at the site were washed away by a tsunami.

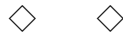
Thereafter, utilizing emergency DC power sources, steam in the reactor was cooled using an emergency condenser, and water was injected at Units 2 and 3, using the Reactor Core Isolation Cooling (RCIC) systems.

During that period, power supply vehicles were connected to internal bus bars, but that did not work well. Although emergency batteries kept providing electricity, they gradually weakened.

At 4:36 p.m. on March 11, water injection failed to function in the Emergency Core Cooling Systems (ECCS) at Units 1 and 2, and it was unknown how much water had been injected. Determining that the situation fell under Article 15 of the Special Law of Emergency Preparedness for Nuclear Disaster, the government issued a "Declaration of Nuclear Emergency" for Fukushima Daiichi.

In anticipation of the loss of function of emergency batteries, TEPCO started diesel fire pumps at 9:00 p.m. on March 11, and got ready to inject water when the reactor pressure had lowered.

The Emergency Task Force for TEPCO's Fukushima Daiichi concluded that the reactor water level would fall as low as the top of the fuel rods by 9:40 p.m. on March 11, and that, because cooling of the core was insufficient, core damage would occur from around 10:20 p.m. The Fukushima prefectural government first issued a directive at 8:50 p.m. for consideration by the residents (totaling 1,864 people) living within a 2-km radius of Fukushima Daiichi unit 1. At 9:23 p.m., Prime Minister Naoto Kan directed residents living within a 3-km radius of Fukushima-I to evacuate, and those living within a 10-km radius to take shelter in their homes.



On March 12, as of 12:30 a.m., although fuel rods in the cores of Units 1, 2 and 3 were submerged sufficiently under water, pressure rose in the upper area of the containment vessel at Unit 1. It was decided that, in order to lower pressure and avoid damage to the vessel, a pressure relief valve would be opened to release gas containing a minute amount of radioactivity.

Later, fuel rods in the cores of Units 1, 2 and 3 became exposed due to shortages of coolant, and seawater mixed with boric acid was injected intermittently, eventually into all three reactors, by fire pumps.

In addition to damage by hydrogen explosions at Units 1, 2 and 3, another hydrogen explosion occurred in the morning of March 15 at the reactor building of Unit 4, which had been undergoing a periodic inspection, and damaged the upper part of the building. That was attributed to a spent fuel pool not being cooled sufficiently.

In the morning of March 17, Self-Defense Force helicopters began dropping seawater from the air onto Units 3 and 4.

(See AIJ information titled "Sequence of Developments at Nuclear Power Stations Affected by the Earthquake" for your reference)



With the exceptions of NPP Units 1 through 3 at the Fukushima-I (Daiichi) Nuclear Power Station (NPS), all the other nuclear power plants (NPPs) affected by the huge earthquake of March 11 were able to achieve states of cold shutdown, with their water temperature falling below the boiling point of 100 degrees C.

Although a tsunami had halted emergency diesel generation at all four units at the TEPCO's Fukushima-II (Daini) NPS, all were able to achieve states of cold shutdown (water below 100 degrees C) using external power sources: Unit 1 at 5 p.m. on March 14; Unit 2 at 6 p.m. on March 14; Unit 3 at 12:15 p.m. on March 12; and Unit 4 at 7:15 a.m. on March 15.

Further north, all units at the Onagawa NPS, owned and operated by the Tohoku Electric Power Co., achieved or were in states of cold shutdown: Unit 1 at 12:58 a.m. on March 12; Unit 2, in cold shutdown when the earthquake occurred; and Unit 3 at 1:17 a.m. on March 12.

The Tokai Daini NPS, owned and operated by the Japan Atomic Power Co. (JAPC), achieved cold shutdown at 12:40 a.m. on March 15. JAPC is now working to restore a seawater pump for an emergency diesel generator that had been affected and stopped by a tsunami.

The three power utilities will now carry out inspections on all pieces of equipment to ascertain their soundness.

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