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UPDATED May 1, 2011

## Status of the Nuclear Reactors at the Fukushima Daiichi Power Plant

None of the six reactors at the plant have operated since the earthquake. But explosions have damaged four of the buildings, and fuel in the reactors and spent fuel stored in the buildings has partially melted, releasing radioactive materials. Updated as of April 29, 4 p.m. EDT. All reactor status updates are listed in Japan time.

### Reactor 1

APRIL 29, 11:36 AM A remote-controlled robot goes into the reactor building and finds no significant water leakage from the primary containment vessel.

APRIL 29, 10:14 AM The water injection rate in the reactor is reduced to about 1,600 gallons an hour from 2,600 gallons.

APRIL 28, 9:00 AM The water injection rate in the reactor is set at about 2,600 gallons an hour.

APRIL 27, 10:02 AM In an effort to determine the proper water injection rate into the reactor to cool it, operators gradually increase the rate to about 3,700 gallons an hour from about 1,600 gallons an hour.

APRIL 26, 11:35 AM Radiation readings taken by a remote-control robot inside the reactor building are substantially the same as several days earlier and still too high for workers. The robot finds that there is no significant water leakage from the primary containment vessel.

APRIL 17, 4:00 PM A remote-control robot finds radiation levels inside the reactor building are as high as 49 millisieverts per hour, which is too high to allow people to work inside it. (The limit for American workers is 50 per year.)

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There was a partial meltdown of the reactor's fuel assemblies (about 55 percent of the fuel was damaged, according to latest estimates) and radioactive materials have leaked into the environment, in large but unknown quantities. The steel reactor core may have been breached by molten fuel.



### Reactor 2

APRIL 28, 10:15 AM Water is injected into the spent fuel pool until 11:28 AM.

APRIL 25, 10:12 AM Fresh water is injected in the spent fuel pool for just over an hour.

APRIL 21 Workers finish putting grout in a crack in a pit where cables are stored. Highly radioactive water had poured from the crack for several days earlier in the month. Though the leak had been plugged, the crack had continued to be a concern. The pit continues to be filled with highly radioactive water.

APRIL 19, 4:08 PM Water is sprayed on the spent fuel pool for 80 minutes.

APRIL 19 About 1,850 gallons of liquid glass are injected into the power cable trench that leaked radioactive water earlier in the month.

APRIL 19, 10:08 AM Workers begin to pump 10,000 tons of highly contaminated wastewater water from the turbine building to a radiation treatment facility in another part of the plant.

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There was a partial meltdown of the reactor's fuel assemblies (about 35 percent was damaged, according to the latest estimates) and molten fuel may have breached the reactor's steel core. An explosion has damaged part of the primary containment vessel around the core, allowing large amounts of highly radioactive water used to cool the reactor to leak out.



Reuters

Digital Globe

### Reactor 3

APRIL 27 To prevent the spread of radioactive material, dust inhibitor is sprayed over almost 81,000 square feet of ground near the sea.

APRIL 26, 12:25 PM Water is sprayed on the spent fuel pool. The spraying ends at 2:02 PM

APRIL 22, 2:19 PM Water is sprayed on the spent fuel pool. The spraying ends at 3:40 PM

APRIL 22, 1:40 PM Fresh water is injected into the spent fuel pool for 20 minutes.

APRIL 18, 2:17 PM Water is sprayed on the spent fuel pool for 45 minutes.

APRIL 17, 11:30 AM A remote-control robot finds radiation levels inside the reactor building are as high as 57 millisieverts per hour, which is too high to allow people to work inside it. (The limit for American workers is 50 per year.)

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The reactor used uranium and plutonium, which produces more toxic radioactivity. There was a partial meltdown of the reactor's fuel assemblies (about 30 percent was damaged, according to the latest estimates) and the reactor containment vessel may have been damaged. The spent fuel pool may also have become uncovered.



Reuters

TEPCO

### Reactor 4

APRIL 27, 12:18 PM Water is sprayed on the spent fuel pool until 3:15 PM.

APRIL 26, 4:50 PM Water is sprayed on the spent fuel pool until 8:35 PM.

APRIL 25, 6:15 PM Water is sprayed on the spent fuel pool for more than six hours.

APRIL 24, 12:25 PM Water is sprayed on the spent fuel pool. The spraying ends at 5:07 PM.

APRIL 23, 12:30 PM Water is sprayed on the spent fuel pool. The spraying ends at 4:44 PM.

APRIL 21, 5:14 PM Water is sprayed on the spent fuel pool. The spraying ends at 9:20 PM.

APRIL 20, 5:08 PM Water is sprayed on the spent fuel pool. The spraying ends at 8:31 PM.

APRIL 19, 10:17 AM Water is sprayed on the spent fuel pool for more than an hour.

APRIL 17, 5:39 PM Water is sprayed on the spent fuel pool. The spraying ends at 9:22 PM.

APRIL 17 A pool of stagnant radioactive water is discovered in the basement

APRIL 15, 2:30 PM Sandbags containing a radioactive absorption material (zeolite) are put into screen pump rooms between reactors No. 3 and 4.

APRIL 15, 2:30 PM Water is sprayed on the spent fuel pool for four hours.

APRIL 14 The power company says that it found high levels of radioactive iodine and cesium in the spent fuel pool from samples gathered on April 12.

APRIL 13, 1:50 PM To prevent run-off of radioactive water to the sea, workers install a silt fence in front of a screen going to the reactor building.

APRIL 13, 12:30 AM Begin spraying water on the spent fuel pool. The operation ends at 6:57 AM.

APRIL 9, 5:07 PM Water is sprayed on the spent fuel pool from a concrete pump truck. The spraying ended at 7:24 PM.

APRIL 7 Workers knock holes in the wall of the turbine building to run drainage hoses to another facility in the plant.

APRIL 7, 6:23 AM Operators spray water on the spent fuel pool.

APRIL 5, 5:35 PM Water is sprayed for about an hour from a concrete pump truck on to the spent fuel pool.

APRIL 4, 9:22 AM The water level in a trench pit of Reactor No. 3 rises 6 inches, creating an overflow concern. Operators suspend pumping water to the turbine building of Reactor No. 4, which halts the rise of the water in the pit.

APRIL 3, 5:14 PM Begin spraying water from a concrete pump truck on to the spent fuel pool. The spraying ends at 10:16 PM.

APRIL 1, 8:28 AM Begin spraying water on the spent fuel pool using a concrete pump truck. The spraying ends at 2:14 PM.

MARCH 30, 3:25 PM Two employees who had been missing since shortly after the earthquake and tsunami on March 11 are found dead in the basement of the turbine room.

MARCH 30, 2:04 PM Operators begin spraying water into the spent fuel pool.

MARCH 29, 11:50 AM Power is restored to main control room and lights are turned on.

MARCH 28 Radioactive materials are found in puddles in the turbine building.

MARCH 27, 4:34 PM Water is sprayed on the spent fuel pool for almost three hours.

MARCH 26, 8:00 AM White smoke being emitted continuously from the building.

MARCH 25, 7:05 PM Trucks spray water on the building.

MARCH 26, 8:00 AM White smoke continues to rise from the building.

MARCH 25, 6:20 AM White smoke is rising from the building. Seawater is run into the spent fuel pool from 6:05 AM until 10:20 AM.

MARCH 25, 6:05 AM Start of about 4 hours of injecting seawater into the spent fuel pool.

MARCH 24, 2:35 PM Water spray to cool the spent fuel pool resumes; the water temperature is 212 degrees Fahrenheit. The spraying ends at 5:30 PM.

MARCH 23, 10:00 AM A truck is used to pump water to the spent fuel pool for approximately three hours.

MARCH 22: 11:00 PM Like the day before, radioactive isotopes of cobalt, iodine and cesium are found in seawater near the discharge canal of the reactor.

MARCH 22, 5:17 PM Water is sprayed on to the building to cool the spent fuel pool. The spraying ends at 8:30 PM.

MARCH 22, 10:35 AM Power is restored to the building.

MARCH 21, 9:40 PM Radioactive isotopes of cobalt, iodine and cesium are found in seawater near the discharge canal of the reactor.

MARCH 21, 3:00 PM Workers finish laying a cable in an effort to restore power.

MARCH 21, 6:30 AM Trucks begin spraying water on the building. They finish at 8:40 AM.

MARCH 20, 6:30 PM Trucks spray water on the building for more than an hour.

MARCH 20, 8:21 AM Trucks begin spraying the building to cool the spent fuel.

MARCH 17 Engineers say the spent fuel pool appears to be leaking as water is disappearing too quickly to be only caused by evaporation.

MARCH 17, 5:00 AM The chairman of the U.S. Nuclear Regulatory Commission says the water covering the spent fuel rods may have boiled off.

MARCH 16, 5:45 AM A fire is reported in the building. An inspection 30 minutes later finds no sign of a fire.

MARCH 15, 7:00 PM Temperature in the spent fuel pool is 183 degrees Fahrenheit (normal is 77 degrees).

MARCH 15, 6:00 AM A hydrogen-gas explosion created by chemical reactions with the spent fuel rods damages the building. A fire also breaks out.

MARCH 14, 7:08 PM Temperature in the spent fuel pool is 183 degrees Fahrenheit.

MARCH 11, 2:46 PM An earthquake hits just off the coast, sparking a tsunami. The reactor was already shut down for maintenance.

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The reactor was empty at the time of the earthquake, but the fuel was in a spent fuel pool that may have been uncovered, causing a partial meltdown and the release of radioactive materials. An explosion and fire have damaged the building.



**Reactor 5**

APRIL 28 To prevent the spread of radioactive material, dust inhibitor is sprayed over almost 49,000 square feet of ground near the reactor.

APRIL 25, 10:30 AM Dust inhibitor is sprayed on the ground, around the administration building and near other buildings to prevent diffusion of radioactive materials. In total, about 41,000 square feet is covered.

APRIL 24, 11:30 AM Dust inhibitor is sprayed on the ground over more than 9,200 square feet to prevent diffusion of radioactive materials.

APRIL 9, 6:52 PM After five days, the discharge of slightly radioactive water from the sub-drain pits of Reactors 5 and 6 is completed. The discharge is 1,320 tons, instead of 1,500 tons, as the original estimate said it would be.

APRIL 4, 9:00 PM In order to prevent equipment from being damaged, the plant's operator begins releasing into the ocean 1,500 tons of water contaminated with low levels of radioactive waste that has accumulated in the sub-drain pits of Reactors 5 and 6.

APRIL 2, 2:00 PM Temperature in the spent fuel pool is 99 degrees Fahrenheit (normal is 77 degrees).

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The reactor is shut down and the building is not damaged. As power has been restored, concern about that this part of the facility has abated.



**Reactor 6**

APRIL 19, 11:00 AM Wastewater that has accumulated in the basement of the turbine building is pumped to a condenser. The operation takes four hours.

APRIL 9, 6:52 PM After five days, the discharge of slightly radioactive water from the sub-drain pits of Reactors 5 and 6 is completed. The discharge is 1,320 tons, instead of 1,500 tons, as the original estimate said it would be.

APRIL 4, 9:00 PM In order to prevent equipment from being damaged, the plant's operator begins releasing into the ocean 1,500 tons of water contaminated with low levels of radioactive waste that has accumulated in the sub-drain pits of Reactors 5 and 6.

APRIL 2, 2:00 PM Temperature in the spent fuel pool is 78 degrees Fahrenheit (normal is 77 degrees).

MARCH 25, 3:40 PM Power for the unit's cooling system is switched from temporary to permanent.

MARCH 22, 7:17 PM Power, which had been supplied from an emergency diesel generator, is now coming from an external source.

MARCH 20, 7:27 PM Reactor is "cold shut down," meaning temperatures and pressures in the core have returned to normal.

MARCH 20, 2:00 PM Temperature in the spent fuel pool is 86 degrees Fahrenheit.

MARCH 19, 10:14 PM A second pump system begins operating to cool the spent fuel pool.

MARCH 19, 6:00 PM Temperature in the spent fuel pool is 153 degrees Fahrenheit.

MARCH 19, 9:00 AM Temperature in the spent fuel pool is 152 degrees Fahrenheit.

MARCH 19, 4:22 AM Repair on one of the diesel electricity generators is completed and the cooling system begins working again.

MARCH 18, 3:00 AM Temperature in the spent fuel pool is 144 degrees Fahrenheit.

MARCH 16, 12:00 PM Temperature in the spent fuel pool is 140 degrees Fahrenheit.

MARCH 15, 7:00 PM Temperature in the spent fuel pool is 137 degrees Fahrenheit.

MARCH 14, 7:08 PM Temperature in the spent fuel pool is 136 degrees Fahrenheit.

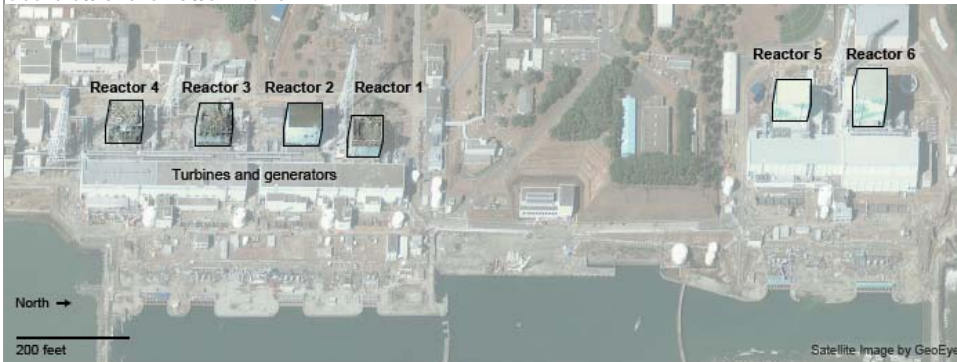
MARCH 11, 2:46 PM An earthquake hits just off the coast, sparking a tsunami. The reactor was already shut down for maintenance.

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The reactor is shut down and the building is not damaged. As power has been restored, concern about that this part of the facility has abated.



**Overview of the Power Plant**



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