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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.)

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 14, 3:56 PM Water is sprayed on the spent fuel pool until 4:32 PM.

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 12, 4:26 PM Water is sprayed on the spent fuel pool for 50 minutes.

APRIL 11, 5:16 PM An earthquake of 7.1 magnitude cuts the off-site power and water injection into the reactor stops. Power is restored and water injection resumes at 6:04 PM.

APRIL 10, 5:15 PM Water is sprayed on the spent fuel pool for two hours.

APRIL 8, 5:06 PM Water is sprayed on the spent fuel pool by a concrete pump truck. The spraying ends at 8 PM.

APRIL 7, 6:53 AM Begin spraying water from a concrete pump truck on the spent fuel pool. The spraying ends at 8:53 AM.

APRIL 4, 5:03 PM Begin spraying water on to the spent fuel pool using a concrete pumping truck. The spraying ends at 7:19 PM.

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, 12:18 PM Begin injecting water from a motor-driven pump that is powered by electricity from a source outside the plant.

APRIL 2, 9:53 AM Begin spraying water on the spent fuel pool. The spraying ends at 12:54 PM.

MARCH 31, 4:30 PM Begin spraying water on the spent fuel pool using a concrete pump truck. The spraying lasts for three hours.

MARCH 31, 8:40 AM Operators finish pumping water from the condenser storage tanks to storage tanks used with the suppression pool.

MARCH 30, 5:40 PM Operators begin pumping water from the condenser into a storage tank so that contaminated water in the turbine building can be pumped through the condenser.

MARCH 29, 4:45 PM Operators begin pumping water from the condenser storage tank into another type of storage tank so that more contaminated water in the turbine building can be pumped through the condenser.

MARCH 29, 2:17 PM Plant operators switch to injecting fresh water instead of seawater into the reactor. The operation continues for four hours.

MARCH 28, 8:30 PM More power is restored and the plant operators switch from using a fire hose pump to a temporary electrical pump to inject water into the reactor.

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

MARCH 27, 3:30 PM Water contaminated with low-levels of radioactivity is found in a tunnel leading from the reactor.

MARCH 27, 12:34 PM Water is injected into the reactor for two hours, ending at 2:36 PM.

MARCH 26, 8:00 AM White smoke being emitted continuously. Freshwater injection continues.

MARCH 25, 6:02 PM Freshwater is being injected into the reactor. There are concerns that aggressive saltwater use may be dislodging highly radioactive cobalt and molybdenum.

MARCH 25, 4:44 PM The three workers exposed to high levels of radiation, who are fully conscious and ambulatory, are transferred to the National Institute of Radiological Sciences for monitoring.

MARCH 25, 4:00 PM Fire trucks sprayed water on the building for two and a half hours.

MARCH 25 Officials say that the reactor vessel may have been damaged. A senior nuclear executive who insisted on anonymity said that there was a long vertical crack running down the side of the vessel.

MARCH 24 Three contract workers suffer radiation exposure of roughly 170 millisieverts after radioactive water gets into their boots while they are laying a new cable. Two are taken to a hospital with radiation burns.

MARCH 24, 5:35 AM With no fresh sign of smoke, water injection into the spent fuel pool resumes and continues for more than 10 hours. Power is restored to the control room for the first time since the earthquake.

MARCH 23, 11:30 PM Smoke seems to have stopped coming from the building. A check at 4:50 AM on March 24 also finds no new evidence of smoke.

MARCH 23, 4:20 PM Light black smoke begins belching from the building. Readings in and around the reactor remain stable, but employees are evacuated as a precaution.

MARCH 23, 11:00 AM Seawater is injected into the spent fuel pool for more than two 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, 3:10 PM Trucks begin spraying water on to the building to cool the spent fuel pool. The operation lasts for 50 minutes.

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, 3:55 PM Smoke begins rising from the Southeast corner of the damaged building. Employees and crews working around the building are evacuated. The smoke ends by 6 PM.

MARCH 20, 9:39 PM Trucks begin spraying water on the building again to cool down the reactor and the spent fuel pool. The spraying continues until 4 AM on Monday, March 21.

MARCH 20, 11:00 AM Pressure rises in the primary containment vessel and plans are made to vent radioactive steam. But then the pressure drops and the venting is cancelled.

MARCH 20, 2:10 AM Trucks begin spraying water on the plant. They finish at 3:40 AM.

MARCH 19, 1:30 PM Pressure within the reactor containment vessel appears to be stable.

MARCH 19, 12:30 AM Trucks hose down the building for 40 minutes.

MARCH 18, 7:15 PM Japanese authorities raise the assessment of severity of the accident to a 5 out of 7 on the international nuclear event scale.

MARCH 18, 2:00 PM Trucks are again used to try to hose down the building and the spent fuel pool.

MARCH 17, 7:35 PM Water cannon trucks spray water on the reactor building for an hour, though it is unknown if it has any effect.

MARCH 17, 9:48 AM Helicopters make four passes to dump water on the building in an effort to cover the spent fuel, which may have been exposed to the air.

MARCH 14, 11:01 AM An explosion damages the reactor building and the primary containment vessel. Eleven workers are injured.

MARCH 13, 9:00 AM Plant operators detect increasing levels of radioactive material.

MARCH 13, 6:00 AM Injection of water fails and officials warn that an explosion is possible.

MARCH 12, 8:25 PM A safety valve is opened to reduce pressure and seawater containing boric acid is injected in the reactor.

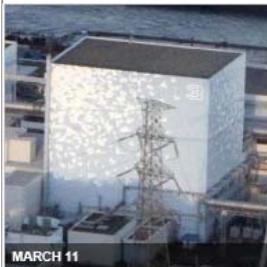
MARCH 12, 3:48 AM Operators start injecting water into the reactor to cool it.

March 11, 3:41 PM Backup diesel generators for running the plant's cooling systems fail.

MARCH 11, 2:46 PM An earthquake sparks a tsunami. The reactor shuts down automatically, though its fuel continues to produce large amounts of heat.

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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.

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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.



Reuters



TEPCO

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.



Associated Press



Digital Globe

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.

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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.



Associated Press



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Overview of the Power Plant



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