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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.)
  - APRIL 17, 11:15 AM Sandbags containing a radioactive absorption material (zeolite) are put in the screen pump rooms between reactors No. 1 and 2.
  - APRIL 14, 12:20 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 The temperature at a nozzle near the top of the reactor that is injecting water into it continues to improve; the temperature is 403 degrees Fahrenheit. But that is still well above the normal temperature (203 degrees) if the reactor were in cold shut down.
  - 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. Injection of nitrogen to prevent a hydrogen explosion resumes at 11:34 PM.
  - APRIL 11, 10:45 AM Workers install a 120-meter wide fence around a breakwater to the South of the plant (which is near Reactor No. 1) to prevent radioactive water from spilling into the sea.
  - APRIL 10 The temperature at a nozzle near the top of the reactor that is injecting water into it is 455 degrees Fahrenheit.
  - APRIL 10, 9:30 AM Finish transferring water from the condenser to a storage tank, freeing up the condenser to process radioactive water.
  - APRIL 7, 1:31 AM Begin injecting nitrogen into the reactor containment vessel to reduce the risks of an explosion from hydrogen that might be building up in the reactor.
  - APRIL 6, 11:30 AM Highly levels of radioactivity are found in water in the basement of the turbine building.
  - APRIL 6, 9:00 AM Concerns rise that hydrogen, which is highly explosive when it combines with oxygen, is building up in the reactor containment vessel. Operators begin to consider injecting nitrogen, which is an inert gas that can displace oxygen, reducing the risk of an explosion.
  - APRIL 5, 11:00 PM The temperature at a water nozzle injecting water into the reactor is 453 degrees Fahrenheit. Though the reactor is still warmer than if it were in a cold shut down, the temperature has fallen steadily over the last few days.
  - APRIL 4, 9:15 PM The temperature at a nozzle that injects water into the reactor is 469 degrees Fahrenheit.
  - APRIL 3, 1:55 PM Begin transferring water from the condenser's storage tanks to storage tanks connected to the water suppression pool.
  - APRIL 3, 12:02 PM Begin injecting water from a motor-driven pump that is powered by electricity from a source outside the plant.
  - APRIL 2, 3:30 PM Operators finish pumping water from the condenser's storage tanks to storage tanks of the suppression water pool.
  - APRIL 2, 2:00 PM The temperature at a nozzle that injects water into the reactor is 499 degrees Fahrenheit, up from 491 degrees the day before.
  - APRIL 1, 6:00 AM The temperature at a nozzle that injects water into the reactor is 491 degrees Fahrenheit, which is below the operating temperature of the reactor, but much warmer than if the reactor was shut down.
  - MARCH 31, 1:03 PM Begin injecting water into the reactor using a concrete pumping vehicle.
  - MARCH 31, 12:00 PM Water is pumped from the condenser's storage tanks to storage tanks connected to the suppression pool in order to create more space to drain water from the turbine building.
  - MARCH 31, 9:20 AM Water accumulated in the vertical shaft of the reactor is transferred to a reservoir in the centralized environmental facility of the power plant. The transfer take two hours.
  - MARCH 30, 2:00 PM Temperature at a nozzle feeding water to the reactor has dropped to 518 degrees Fahrenheit, which remains higher than the normal operating temperature of the reactor.
  - MARCH 29 Traces of niobium, tellurium, ruthenium, iodine and cesium — all products of fission — are found in the water trench under the reactor.

MARCH 29, 12:00 PM Temperature at a nozzle feeding water to the reactor is 589 degrees Fahrenheit.

MARCH 29, 8:20 AM Plant workers switch from fire engines to an electrical pump to inject fresh water into the reactor.

MARCH 29, 7:30 AM After draining water for more than four days into the condenser from the basement of the turbine buildings, the operation is suspended as the storage tank on the condenser nears capacity.

MARCH 29, 6:00 AM Temperature at a nozzle feeding water to the reactor has risen to 614 degrees Fahrenheit, which is more than 100 degrees above the regular operating temperature of the reactor.

MARCH 28, 11:30 PM Pumping of contaminated water from the basement of the turbine building to the main condenser is underway.

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

MARCH 27, 10:30 PM Temperature at the bottom of the reactor is 288 degrees Fahrenheit, which is warm for a reactor that has shut down.

MARCH 27, 6:00 PM As part of the efforts to restore power, workers begin to pump water from the turbine building to the main condenser.

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

MARCH 27 High levels of radioactive iodine and cesium are found in pools of stagnant water on the floor of the turbine building.

MARCH 27, 9:00 AM Temperature at a nozzle feeding water to the reactor has risen to 437 degrees Fahrenheit, which is within the zone of regular operating temperatures, but very warm for a reactor that has shut down.

MARCH 27, 6:00 AM Temperature at a nozzle feeding water to the reactor is 415 degrees Fahrenheit.

MARCH 26, 11:30 PM Temperature within the reactor has dropped to 291 degrees Fahrenheit, which is still above "cold" shutdown temperatures of less than 100 degrees.

MARCH 26, 8:00 AM Freshwater injection continues. White smoke continues to emanate from the building.

MARCH 25, 3:37 PM Freshwater is now being injected into the reactor. There have been reports that the use of saltwater in Reactor 3 may be dislodging highly radioactive cobalt and molybdenum.

MARCH 25, 6:20 AM White smoke being emitted continuously.

MARCH 24, 6:05 PM Temperature within the reactor has dropped to 424 degrees. White smoke continues to rise from the unit.

MARCH 24, 11:30 AM Lights in the main control room are restored, which is an important step in restoring power to the building.

MARCH 24, 10:50 AM White, fog-like steam is seen rising from the reactor building.

MARCH 24, 1:00 AM Temperature within the reactor has dropped to 469 degrees Fahrenheit, but remains well above temperature if it was in "cold" shut down.

MARCH 23, 6:00 PM The reactor temperature is approximately 580 degrees Fahrenheit (normal is around 500 degrees, if it were operating; shut down temperature is cooler).

MARCH 23, 2:33 AM Temperature in the reactor is about 750 degrees Fahrenheit. The amount of injected water is increased.

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, 7:30 AM Seawater continues to be injected into the reactor to cool it.

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

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

MARCH 18, 9:45 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 The plant expects to run a power cable to the reactor by Saturday to restart water pumps needed to cool fuel rods.

March 12, 8:20 PM Workers start flooding the reactor with seawater in a desperate effort to cool it.

MARCH 12, 5:00 PM Radioactive materials, including an isotope of iodine, are detected.

March 12, 3:36 PM An explosion blows the roof and top walls off the reactor building. The reactor containment vessel is not significantly damaged.

March 12, 5:22 AM The pressure-suppression pool stops working properly.

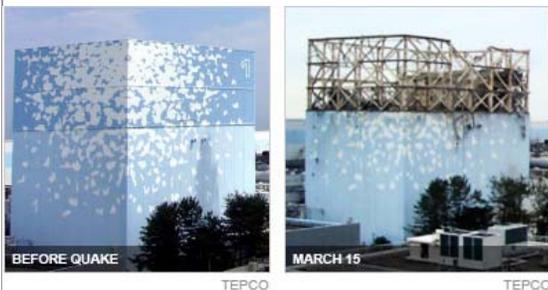
March 12, 3:48 AM Operators start injecting water into the reactor to cool it.

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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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**

APRI 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.

APRIL 18 About 4,500 gallons of liquid glass are injected into the power cable trench that leaked radioactive water earlier in the month.

APRIL 18, 1:42 PM A remote-control robot in the reactor building finds high levels of radiation.

APRIL 17 Water samples taken from a surge tank near the reactor are found to have high levels of radioactive cesium and iodine. The water is from the spent fuel pool.

APRIL 17 Radioactive levels of water in a tank attached to the spent fuel pool spike.

APRIL 17, 11:15 AM Sandbags containing a radioactive absorption material (zeolite) are put in the screen pump rooms between reactors No. 1 and 2 and rooms between No. 2 and 3.

APRIL 16, 10:13 AM More fresh water is pumped into the reactor to try to keep it cool. Water is also sprayed on the spent fuel pool until 11:54 AM.

APRIL 14, 12:20 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 The temperature at the bottom of the reactor vessel is found to be 406 degrees Fahrenheit. (The temperature had not been available previously.) The normal temperature if the reactor were in a "cold" shut down is less than 203 degrees.

APRIL 13, 1:15 PM Begin spraying fresh water on the spent fuel pool. The operation ends at 2:55 PM.

APRIL 12 and 13 To try to prevent further run-off of radioactive water to the sea, workers install three iron plates in front of a screen to the reactor buildings.

APRIL 12, 7:35 PM Begin transferring highly radioactive water in the trench under the turbine building to the reactor's condenser.

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, 11:10 AM A worker wearing protective gear becomes sick while laying a hose to discharge water. He is taken to a hospital; no radiation is found on him.

APRIL 10, 10:37 AM A motor driven pump is used to spray water on the spent fuel pool. The spraying ends two hours later.

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

APRIL 7, 1:29 PM Begin spraying water on the spent fuel pool using a motor-driven pump. The spraying ends an hour later.

APRIL 6 The United States Nuclear Regulatory Commission says that some of reactor has probably leaked from the steel pressure vessel and on to the floor of the containment structure.

APRIL 6, 5:38 AM A leak in a maintenance pit that was spilling highly radioactive water into the ocean is sealed after workers inject sodium silicate, a sealant also known as liquid glass, into gravel below pipes near the pit. Water is also no longer leaking into the turbine building.

APRIL 5, 3:07 PM Workers inject sodium silicate, a sealant also known as liquid glass, into gravel below pipes near the pit that is leaking highly radioactive water into the ocean. The leak slows, but does not stop. Workers also begin to stack sandbags on the pier to prevent wastewater from the building to the ocean.

APRIL 4, 7:00 PM The plant's operator begins releasing into the ocean 10,000 tons of water contaminated with low levels of radioactive waste from a containment facility so that it can store more radioactive water that has accumulated in the turbine building.

APRIL 4, 11:05 AM Begin using a temporary electric pump to inject fresh water into the spent fuel pool. The spraying ends at 1:37 PM. Temperature in the spent fuel pool is 122 degrees Fahrenheit (normal is 77 degrees).

APRIL 4, 9:00 AM Efforts to stem a leak in a maintenance of highly radioactive water that is flowing into the ocean have still had no success.

APRIL 4, 7:08 AM Begin injecting tracer into water in a shaft near the reactor in order to figure out the origin of water leaking into the ocean from a large crack in a maintenance pit.

APRIL 3 Workers begin injecting a polymer mixed with other materials into a crack in a maintenance pit from which radioactive water is pouring. At least initially, the efforts to stem the leak are unsuccessful.

APRIL 3, 12:12 PM Begin injecting water from a motor-driven pump that is powered by electricity from a source outside the plant.

APRIL 3, 6:00 AM Temperature in the spent fuel pool is 158 degrees Fahrenheit.

APRIL 2, 2:00 PM Temperature in the spent fuel pool is 162 degrees Fahrenheit, up more than 40 degrees from the day before.

APRIL 2, 12:20 PM After reaffirming that water is spilling out of a crack in the pit near the reactor, workers begin to inject concrete into the crack to try to seal it, but the patch does not work. Experts and equipment are summoned from Tokyo to use a different method to seal the leak. They are expected to begin working on April 3.

APRIL 2, 9:30 AM An 8-inch crack is found on a pit where cables are stored. The pit is near the water intake channel to the reactor and water is found to be spilling out into the ocean. Measurements show that the water has a radiation level of more than 1,000 millisieverts an hour, meaning it is quite toxic.

APRIL 1, 2:56 PM Begin injecting water into the spent fuel pool using a motor driven pump. The spraying ends at 5:05 PM.

APRIL 1, 11:50 AM Operators finish pumping water from the storage tanks of the condenser to storage tanks attached to the suppression pool.

APRIL 1, 6:00 AM Temperature in the spent fuel pool is 118 degrees Fahrenheit.

MARCH 31, 11:50 PM Injection of freshwater in the reactor ends after more than a day.

MARCH 30, 7:05 PM After suspending spraying of water into the spent fuel pool for six hours because of a tear in a hose, spraying resumes.

MARCH 30, 9:25 AM Operators begin injecting freshwater into the spent fuel pool with a motor-driven pump, but it malfunctions and they switch to a fire fighting pump after 20 minutes.

MARCH 30, 2:00 PM Temperature at a nozzle feeding water to the reactor, which has slowly been creeping up, is 346 degrees Fahrenheit, which is within normal parameters if the reactor were operating, but is much warmer than if the reactor were shut down properly.

MARCH 30, 4:00 AM Temperature in the spent fuel pool is 115 degrees Fahrenheit.

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, 4:30 PM Plant operators switch to a motor-driven pump to inject water into the reactor. The operation continues for two hours.

MARCH 29, 6:00 AM Temperature in the spent fuel pool is 113 degrees Fahrenheit.

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

MARCH 28, 2:00 PM Temperature in the spent fuel pool is 121 degrees Fahrenheit.

MARCH 27, 3:30 PM Radiation measuring 1,000 millisieverts per hour was detected in water in an overflow tunnel outside the reactor. The maximum dose allowed for workers at the plant is 250 millisieverts in a year.

MARCH 27, 6:00 AM Temperature in the spent fuel pool has risen to 158 degrees Fahrenheit from 135 degrees.

LATE MARCH 26 A worker measuring radiation levels of puddles of water near the reactor finds the readings exceed the scale of the instrument (meaning the level is extremely toxic) and is forced to leave the area immediately.

MARCH 26, 4:46 PM Power is restored to the main control room.

MARCH 26, 11:00 AM Temperature in the spent fuel pool is 135 degrees Fahrenheit.

MARCH 26, 10:00 AM Freshwater is now being injected into the reactor.

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

MARCH 25, 12:30 PM Seawater is run into the spent fuel pool for roughly two hours. Seawater injection into the reactor continues.

MARCH 25, 06:20 AM White smoke is rising from the building.

MARCH 24, 1:00 AM Temperature in the spent fuel pool is 126 degrees Fahrenheit.

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, 3:30 PM Temperature in the spent fuel pool is 122 degrees Fahrenheit.

MARCH 22, 4:07 PM Trucks spray 18 tons of seawater on to the building to cool the spent fuel pool.

MARCH 22, 11:00 AM Temperature in the spent fuel pool is 127 degrees Fahrenheit.

MARCH 22, 7:30 AM Temperature in the spent fuel pool is 123 degrees Fahrenheit.

MARCH 22, 7:11 AM White smoke rising from the building has almost completely ceased.

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 Though power is partly restored, engineers discover that they do not have enough of it to fully run the cooling and pressure systems.

MARCH 21, 6:22 PM White smoke starts rising from the building.

MARCH 20, 3:46 PM Power is restored to the building.

MARCH 20, 3:05 PM Forty tons of seawater is pumped into the building to cool the spent fuel pool.

MARCH 19, 1:30 PM Power line from an external power substation is connected.

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 There is an uncontrolled steam release from the reactor. The plant expects to run a power cable to the reactor by Saturday.

MARCH 15, 6:14 AM An explosion near the pressure suppression pool damages the containment vessel around the reactor.

MARCH 14, 1:18 PM Water level in the reactor is found to have fallen and continues to fall over next few hours.

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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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 a 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.



**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).

MARCH 24, 4:14 PM A replacement pump for the cooling system is started and at 4:35 PM, cooling of the reactor resumes.

MARCH 23, 5:24 PM The cooling system is broken. Officials say they will repair the pump in the morning.

MARCH 21, 11:36 AM Power, which had been supplied from an emergency diesel generator, is now coming from an external source.

MARCH 20, 2:30 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 95 degrees Fahrenheit.

MARCH 19, 6:00 PM Temperature in the spent fuel pool is 119 degrees Fahrenheit.

MARCH 19, 9:00 AM Temperature in the spent fuel pool is 156 degrees Fahrenheit.

MARCH 19, 5:00 AM Pumps and cooling system in the spent fuel pool is restarted.

MARCH 18, 3:00 AM Temperature in the spent fuel pool is 150 degrees Fahrenheit.

MARCH 17, 12:00 PM Temperature in the spent fuel pool is 148 degrees Fahrenheit.

MARCH 16, 12:00 PM Temperature in the spent fuel pool is 145 degrees Fahrenheit.

MARCH 15, 7:00 PM Temperature in the spent fuel pool is 141 degrees Fahrenheit.

MARCH 14, 7:08 PM Temperature in the spent fuel pool is 139 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.



**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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