

Tracking The Latest At The Fukushima Nuclear Plant

The situation at Japan's Fukushima Daiichi nuclear plant has been changing rapidly and growing increasingly complex since the earthquake and tsunami hit on March 11. Problems began that day, and each day has brought new, unsettling developments. With unique conditions at each reactor, slightly different responses are required. But the most common response at this point is water. Workers are pumping seawater into the cores of Units 1, 2 and 3 and spray seawater to the spent fuel pools at 3, 4, 5 and 6. Each reactor has a used fuel pool in the upper level of their buildings. Getting water to the spent fuel pools at Units 3 and 4 from the air and ground proved difficult for several days after radiation levels spiked. Safety officials say they continue to be most concerned about the pools at Unit 3 and 4. External power had reached most of the units by March 23. Below is a chart showing the status of each of the six reactors, with the most recent information as possible.

UPDATED: The information below reflects developments through 12:00 p.m. EDT March 23. It will continue to be updated as new information becomes available.



DigitalGlobe

Hydrogen explosion March 12. Primary containment vessel likely not damaged.
Seawater is being pumped into the reactor core.

Reactor
No.1

Fuel Rods Inside Core: Fuel rods damaged and are fully or partially exposed. The containment vessel is not believed to be damaged.

Building: Severely damaged from the March 12 explosion

Spent Fuel Pool: No information.

Hydrogen explosion March 15, which damaged the containment structure and the pressure suppression chamber. This caused the pressure inside the containment vessel to fluctuate.

Reactor
No.2

Seawater is being pumped into the reactor core, and it remains relatively cool, though experts believe radiation has leaked out.

Fuel Rods Inside Core: Fuel rods damaged and still partially exposed. Damage suspected to the containment vessel, though the severity remains unknown.

Building: Slightly damaged

Spent Fuel Pool: No information

Reactor
No.3

Hydrogen explosion March 14. Smoke, followed by release of radiation March 16. On March 21 and 23, smoke was seen billowing from the reactor.

Fuel Rods Inside Core: Damaged and partially exposed.

Building: Severely damaged

Spent Fuel Pool: Damage to the fuel rods is suspected and water levels are low. Japanese helicopters attempted to drop seawater on the top of Reactor No. 3 on March 16 and 17 to cool the spent fuel pool. Emergency fire vehicles have sprayed water on the spent fuel pool daily since March 17.

Hydrogen explosion March 15, then a fire which heavily damaged the building. The Japanese Self Defense Forces began spraying water on March 20 and continued through March 21.

Reactor
No.4

Fuel Rods Inside Core: No fuel rods

Building: A blast on March 15 blew an 86 square-foot hole into the wall of an outer building that houses the reactor. The roof is also severely damaged.

Spent Fuel Pool: Damage to the fuel rods is suspected and water levels are low. Fire trucks are spraying water on the pool.

On March 21, workers switched the reactor to an external power source from the emergency diesel generators. Water is being pumped into the core and the spent fuel pools.

Reactor
No.5

Fuel Rods Inside Core: Not damaged; several feet of water covers the tops of the fuel rods

Building: Not damaged

Spent Fuel Pool: Temperature stable.

Unit 6 is running on its own emergency diesel generator. On March 21, the reactor was connected to an external power source.

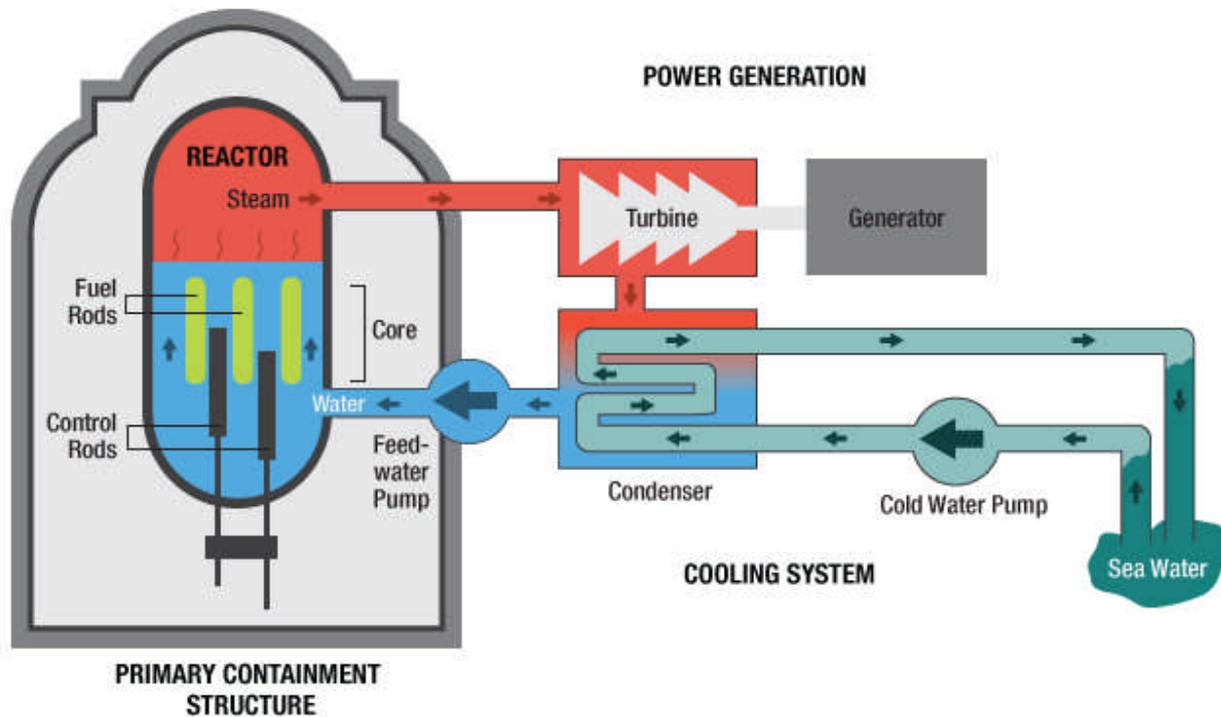
Reactor
No.6

Fuel Rods Inside Core: Not damaged; nearly 6 feet of water cover the tops of the fuel rods.

Building: Not damaged

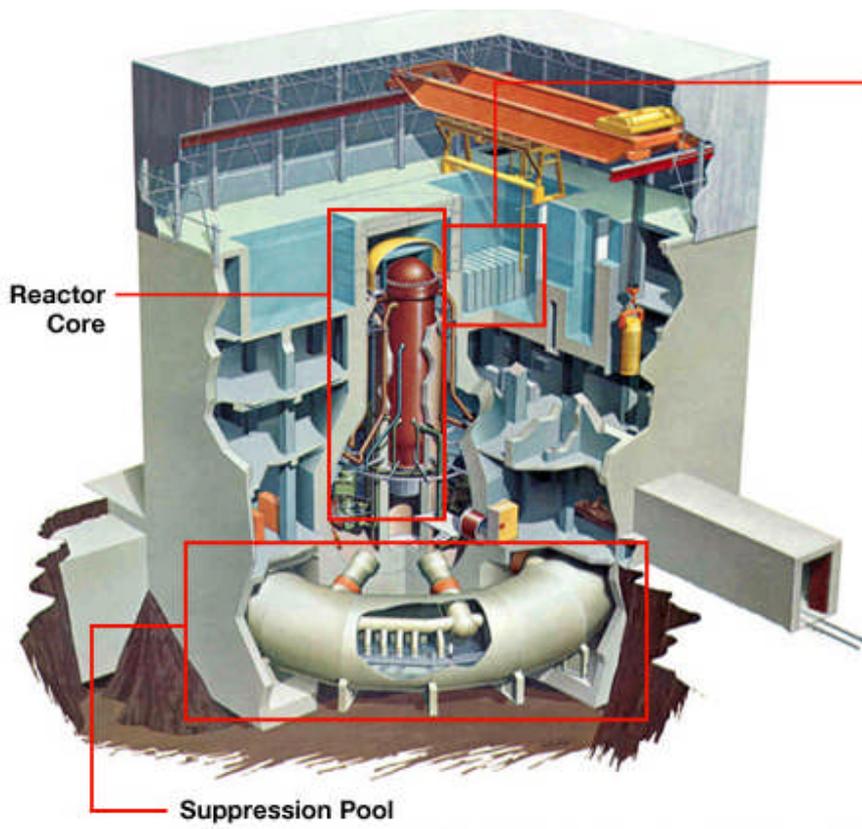
Spent Fuel Pool: Temperature stable.

SOURCES: Japan Atomic Industrial Forum, Toyko Electric Power Co., Nuclear and Industrial Safety Agency, International Atomic Energy Agency



Normally Functioning Boiling Water Reactor (BWR)

The Fukushima Daiichi reactors are boiling-water reactors. Nuclear reactions driven by radioactive uranium inside the **fuel rods** generate heat, boiling water in the **reactor**. The resulting steam turns a **turbine**, which powers a **generator**. When hot steam flows over pipes in the **condenser**, it cools to become water and re-enters the reactor via the **feed-water pump**. A **cold-water pump** draws in **seawater** that keeps the **condenser** pipes cool. Under normal operation, this water does not enter the reactor.



Reactor Core

Spent Fuel Pools

At the No. 4 reactor, fires broke out Tuesday and Wednesday near where spent fuel rods are stored in pools of water. Workers at the plant have been having trouble maintaining water levels in these pools, and experts are concerned about the status of the rods. If the pools drain and the spent rods are exposed, they too can melt, releasing radiation and potentially starting a fire.

Suppression Pool

Officials say the March 15 blast at the No. 2 reactor affected a section known as the **suppression pool**. The suppression pool is used in emergencies to absorb excess heat and steam from the reactor. After the explosion, officials reported a drop in pressure in the No. 2 reactor's suppression pool, indicating a failure of some kind -- potentially a crack or leak. In five of the reactors at the Fukushima Daiichi plant, the suppression pool is located in a large ring-shaped tank surrounding the reactor core.

Source: General Electric via U.S. Nuclear Regulatory Commission

Credit: Adam Cole, Andrew Prince, Maria Godoy, Stephanie d'Otreppe, Nelson Hsu/NPR