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Tokyo Electric Tries to Cool Unstable Atomic Reactor, Thousands Evacuated

By Yuji Okada, Tsuyoshi Inajima and Yuriy Humber - Mar 12, 2011

Japanese officials battling to prevent a meltdown at a nuclear power station after yesterday's record earthquake are using seawater to try and cool a reactor and prevent damage to the chamber holding its radioactive core.

[Tokyo Electric Power Co.](#) said an explosion near the No. 1 reactor at its Fukushima Dai-Ichi nuclear power station destroyed the walls of the reactor building and injured four people. A hydrogen leak caused the blast, which didn't damage the steel chamber, Chief Cabinet Secretary Yukio Edano said.

Radiation levels in the area dropped after the blast and have "now settled at a low level," Edano said at a briefing in Tokyo today. Asia's biggest utility "has decided to fill the containment with seawater."

Thousands were evacuated as workers vented radioactive gas from the plant in Fukushima, 220 kilometers (140 miles) north of Tokyo, and three people were hospitalized after being exposed to radiation. The death toll from a tsunami that swept over the northern coastline after the quake topped 600 and an estimated 4,000 were stranded in evacuation centers.

Global Impact

"If they cannot get the nuclear reactor back under control during the day, this may end up being the biggest problem of all," said Ken Courtis, former vice chairman of [Goldman Sachs Group Inc.](#) in Asia. "A meltdown, which would cause massive immediate damage, would also set the nuclear industry back decades. This would have vast implications for the global energy equation and perforce the world economy."

Japan's central bank yesterday pledged to ensure financial stability after the temblor forced [Toyota Motor Corp.](#) to shut some plants, shut down oil refineries and sparked a plunge in stocks.

The disaster may curb Japan's recovery from an economic slump in the fourth quarter as Prime Minister [Naoto Kan](#) struggles to convince investors about his ability to tackle the world's largest

public-debt burden. While the Finance Ministry said it's too soon to gauge the quake's economic impact, the Nikkei 225 Stock Average dropped 1.7 percent yesterday.

Tokyo Electric took almost two years to restart power generation at the Kashiwazaki Kariwa nuclear plant in the country's northwest after a 6.8 magnitude temblor on July 16, 2007, caused a fire and radiation leaks at the world's biggest atomic energy station.

Fukushima Dai-Ichi

The reactor at the Fukushima Dai-Ichi plant may remain shut for a year, Seth Grae, chief executive officer of Lightbridge Corp., a nuclear energy consulting firm whose staff previously inspected the Fukushima plant, said March 11 in an interview with Pimm Fox on Bloomberg Television's "Taking Stock."

"If they do lose several of those plants for a few months it could have a significant effect on Japan's economy," he said. "A trickle down could hit factories, slowing down Japan's production."

Nuclear energy provides almost 30 percent of Japan's electricity, with total capacity of about 47,000 megawatts, with plans to increase that to 40 percent by 2017, according to the World Nuclear Association. The nation's first reactor began operating in 1966 and there are 54 reactors in the country. A nuclear plant traditionally operates as many as 8 reactors.

Japan's nuclear companies have been in talks to sell technology abroad, while Toshiba Corp. controls Westinghouse Electric Co., a U.S. maker of light-water nuclear reactors, which also has orders from China. Toshiba is bidding to build Turkey's second nuclear power plant. A Japanese group in October also won a contract to build a nuclear plant in Vietnam.

Fuel Rods

Fuel rods at the reactor may be melting after radioactive Cesium material left by atomic fission was detected near the site, Nuclear and Industrial Safety Agency spokesman Yuji Kakizaki said by phone earlier today.

"If the fuel rods are melting and this continues, a reactor meltdown is possible," Kakizaki said. A meltdown refers to a heat buildup in the core of such intensity it melts the floor of the reactor containment housing.

Tokyo Electric started releasing radioactive gas and steam into the atmosphere about 9 a.m. local time to reduce pressure in the containment housing after yesterday's magnitude 8.9 earthquake,

company spokesman Akitsuka Kobayashi said. The utility has also started preparing to vent gas from containment areas of four reactors at the nearby Fukushima Dai-Ni nuclear plant, he said.

Evacuation Zone

[Winds](#) in the area of the Fukushima plant are blowing at less than 18 kilometers per hour mostly in an offshore direction, according to a 4 p.m. update from the Japan Meteorological Agency.

The government earlier today widened the evacuation zone around the reactor to 10 kilometers from 3 kilometers, affecting thousands of people. The evacuation zone will be maintained at 10 kilometers from Dai-Ni plant and will be extended to 20 kilometers from Dai-Ichi plant, said Toshihiro Murakami, spokesman for the Fukushima prefecture government.

“When the pressure starts building up, the emergency procedure is to start venting,” [Dave Lochbaum](#), director of the nuclear safety project at the Union for Concerned Scientists, said in a telephone interview. “They’ve essentially entered a beat the clock game. As long as there is no fuel damage, there will be radioactivity, but it will be very low.”

The plant’s operators need to connect to the electricity grid, fix emergency diesel generators or bring in more batteries to power a backup system that pumps the water needed to cool the reactor, said Lochbaum, a nuclear engineer who has worked at nuclear power plants for 17 years.

Nuclear Meltdown

The air cooling system in the containment building probably failed due to the power loss, allowing pressure to increase inside, Lochbaum said.

Lack of adequate cooling for a reactor may cause a core meltdown, the most dangerous kind of nuclear power accident, according to the U.S. Nuclear Regulatory Commission.

A meltdown could potentially breach a reactor’s containment building, releasing massive amounts of radiation, according to information on the agency’s [website](#). The 1979 accident at the Three Mile Island reactor in Pennsylvania resulted in a partial meltdown, without a breach in the containment building, according to the commission.

The 1986 Chernobyl accident in Ukraine caused the release of at least 5 percent of the radioactive reactor core, according to the [World Nuclear Association](#), which represents the industry.

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