

# Japan races to contain nuclear threat after quake

The logo for Associated Press, featuring the letters 'AP' in a bold, red, sans-serif font, followed by the words 'Associated Press' in a smaller, black, sans-serif font.

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SOMA, Japan – Dangerous levels of radiation leaking from a crippled nuclear plant forced Japan to order 140,000 people to seal themselves indoors Tuesday after an explosion and a fire dramatically escalated the crisis spawned by a deadly tsunami.

In a nationally televised statement, Prime Minister Naoto Kan said radiation had spread from the four stricken reactors of the Fukushima Dai-ichi nuclear plant along Japan's northeastern coast. The region was shattered by Friday's 9.0-magnitude earthquake and the ensuing tsunami that is believed to have killed more than 10,000 people, plunged millions into misery and pummeled the world's third-largest economy.

Japanese officials told the International Atomic Energy Agency that the reactor fire was in a fuel storage pond — an area where used nuclear fuel is kept cool — and that "radioactivity is being released directly into the atmosphere." Long after the fire was extinguished, a Japanese official said the pool might still be boiling, though the reported levels of radiation had dropped dramatically by the end of the day.

Late Tuesday, officials at the plant said they were considering asking for help from the U.S. and Japanese militaries to spray water from helicopters into the pool.

That reactor, Unit 4, had been shut down before the quake for maintenance.

If the water boils, it could evaporate, exposing the rods. The fuel rods are encased in safety containers meant to prevent them from resuming nuclear reactions, nuclear officials said. But they acknowledged that there could have been damage to the containers. They also confirmed that the walls of the storage pool building were damaged.

Experts noted that much of the leaking radiation was apparently in steam from boiling water. It had not been emitted directly by fuel rods, which would be far more virulent, they said.

"It's not good, but I don't think it's a disaster," said Steve Crossley, an Australia-based radiation physicist.

Even the highest detected rates were not automatically harmful for brief periods, he said. "If you were to spend a significant amount of time — in the order of hours — that could be significant," Crossley said.

Less clear were the results of the blast in Unit 2, near a suppression pool, which removes heat under a reactor vessel, said plant owner Tokyo Electric Power Co. The nuclear core was not damaged but the bottom of the surrounding container may have been, said Shigekazu Omukai, a spokesman for Japan's nuclear safety agency.

Though Kan and other officials urged calm, Tuesday's developments fueled a growing panic in Japan and around the world amid widespread uncertainty over what would happen next.

In the worst case scenario, one or more of the reactor cores would completely melt down, a disaster that could spew large amounts of radioactivity into the atmosphere.

"I worry a lot about fallout," said Yuta Tadano, a 20-year-old pump technician at the Fukushima plant, who said he was in the complex when the quake hit.

"If we could see it, we could escape, but we can't," he said, cradling his 4-month-old baby, Shoma, at an evacuation center.

The radiation fears added to the catastrophe that has been unfolding in Japan, where at least 10,000 people are believed to have been killed and millions of people were facing a fifth night with little food, water or heating in near-freezing temperatures and snow as they dealt with the loss of homes and loved ones. Up to 450,000 people are in temporary shelters.

Hundreds of aftershocks have shaken Japan's northeast and Tokyo since the original offshore quake, including one Tuesday night whose epicenter was hundreds of miles (kilometers) southwest and inland.

Officials have only been able to confirm a far lower toll — about 3,300 killed — but those who were involved in the 2004 Asian tsunami said there was no question more people died and warned that, like the earlier disaster, many thousands may never be found.

Asia's richest country hasn't seen such hardship since World War II. The stock market plunged for a second day and a spate of panic buying saw stores running out of necessities, raising government fears that hoarding may hurt the delivery of emergency food aid to those who really need it.

In a rare bit of good news, rescuers found two survivors Tuesday in the rubble left by the tsunami that hit the northeast, including a 70-year-old woman whose house was tossed off its foundation.

The Fukushima Dai-ichi nuclear complex, along that battered coastline, has been the focus of the worries. Workers there have been desperately trying to use seawater to cool the fuel rods in the complex's three reactors, all of which lost their cooling ability after Friday's quake and tsunami.

On Tuesday, the complex was hit by its third explosion since Friday, and then a fire in a separate reactor.

Afterward, officials in Ibaraki, a neighboring prefecture just south of the area, said up to 100 times the normal levels of radiation were detected Tuesday. While those figures are worrying if there is prolonged exposure, they are far from fatal.

Tokyo reported slightly elevated radiation levels, but officials said the increase was too small to threaten the 39 million people in and around the capital, about 170 miles (270 kilometers) away.

Further south of the capital, air monitoring equipment on the aircraft carrier USS George Washington detected low levels of radioactivity as it sat pier-side at Yokosuka, a U.S. 7th Fleet spokesman said.

Cmdr. Jeff Davis said there was no danger to the public. But military personnel at Yokosuka and Naval Air Facility Atsugi were advised to limit their time outside and seal ventilation systems at their homes.

Amid concerns about radiation, Austria moved its embassy from Tokyo to Osaka.

Meanwhile, Air China and China Eastern Airlines canceled flights to Tokyo and two cities in the disaster area. Germany's Lufthansa airlines is also diverting its two daily flights to Tokyo to other Japanese cities. None mentioned radiation concerns, instead giving no explanation or citing the airports' limited capacities.

Closer to the stricken nuclear complex, the streets in the coastal city of Soma were empty as the few residents who remained there heeded the government's warning to stay indoors.

Kan and other officials warned there is a danger of more leaks and told people living within 20 miles (30 kilometers) of the Fukushima Dai-ichi complex to stay indoors to avoid exposure that could make people sick.

The government also imposed a no-fly zone over that area for commercial traffic.

Some 70,000 people had already been evacuated from a 12-mile (20-kilometer) radius from the Dai-ichi complex. About 140,000 remain in the larger danger zone.

"Please do not go outside. Please stay indoors. Please close windows and make your homes airtight," Chief Cabinet Secretary Yukio Edano told residents in the danger zone.

"These are figures that potentially affect health. There is no mistake about that," he said.

Weather forecasts for Fukushima were for snow and wind Tuesday evening, blowing southwest toward Tokyo, then shifting and blowing east out to sea. That's important because it shows which direction a possible nuclear cloud might blow.

The U.S. Navy said several helicopter crews involved in relief efforts were exposed to low levels of radiation Tuesday. Like 17 crew members exposed the previous day, the personnel had to go through a decontamination process, which can involve a simple scrubdown with soap and water.

The Navy also said it was sending some of its ships to operate off the country's west coast instead of the east to avoid hazards from debris dragged into the sea by the tsunami and to be farther away from any radiation.

Officials said 70 workers were at the nuclear complex, struggling with its myriad problems. The workers, all of them wearing protective gear, are being rotated in and out of the danger zone quickly to reduce their radiation exposure.

Another 800 staff were evacuated. The fires and explosions at the reactors have injured 15 workers and military personnel and exposed up to 190 people to elevated radiation.

Temperatures in at least two of the complex's reactors, units 5 and 6, were also slightly elevated, Edano said.

"The power for cooling is not working well and the temperature is gradually rising, so it is necessary to control it," he said.

Fourteen pumps have been brought in to get seawater into the other reactors. They are not yet pumping water into Unit 4 but are trying to figure out how to do that.

In Tokyo, slightly higher-than-normal radiation levels were detected Tuesday but officials insisted there are no health dangers.

"The amount is extremely small, and it does not raise health concerns. It will not affect us," Takayuki Fujiki, a Tokyo government official said.

Edano said the radiation readings had fallen significantly by the evening.

Japanese government officials are being rightly cautious, said Donald Olander, professor emeritus of nuclear engineering at University of California at Berkeley. He believed even the heavily elevated levels of radiation around Dai-ichi are "not a health hazard." But without knowing specific dose levels, he said it was hard to make judgments.

"Right now it's worse than Three Mile Island," Olander said. But it's nowhere near the levels released during Chernobyl.

On Three Mile Island, the radiation leak was held inside the containment shell — thick concrete armor around the reactor. The Chernobyl reactor had no shell and was also operational when the disaster struck. The Japanese reactors automatically shut down when the quake hit and are encased in containment shells.

The impact of the earthquake and tsunami dragged down stock markets. The benchmark Nikkei 225 stock average plunged for a second day Tuesday, nose-diving more than 10 percent to close at 8,605.15 while the broader Topix lost more than 8 percent.

To lessen the damage, Japan's central bank made two cash injections totaling 8 trillion yen (\$98 billion) Tuesday into the money markets after pumping in \$184 billion on Monday.

Initial estimates put repair costs in the tens of billions of dollars, costs that would likely add to a massive public debt that, at 200 percent of gross domestic product, is the biggest among industrialized nations.

The Dai-ichi plant is the most severely affected of three nuclear complexes that were declared emergencies after suffering damage in Friday's quake and tsunami, raising questions about the safety of such plants in coastal areas near fault lines and adding to global jitters over the industry.

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Yuasa reported from Tokyo. Associated Press writer Elaine Kurtenbach contributed to this report.

