Radioactive Groundwater Under Fukushima Nears Sea

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TOKYO (AP) — Deep beneath Fukushima's crippled nuclear power station a massive underground reservoir of contaminated water that began spilling from the plant's reactors after the 2011 earthquake and tsunami has been creeping slowly toward the sea.

In this Aug. 21, 2013 photo, Tokyo Electric Power Co.'s Executive Vice President Zengo Aizawa bows in apology for a leak of highly radioactive water at the crippled Fukushima nuclear power plant, during a press conference at the company's headquarters in Tokyo. Deep beneath Fukushima's crippled nuclear power station a vast underground reservoir of highly contaminated water that began spilling from the plant's reactors during the 2011 earthquake and tsunami has been creeping slowly toward the sea. **(AP Photo/Kyodo News)**

Now, 2 1/2 years later, experts fear it is about to reach the Pacific and greatly worsen what is fast becoming a new crisis at Fukushima: the inability to contain vast quantities of radioactive water.

The looming crisis is potentially far greater than the discovery earlier this week of a

leak from a tank used to store contaminated water used to cool the reactor cores. That 300-ton (80,000 gallon) leak is the fifth and most serious since the disaster of March 2011, when three of the plant's reactors melted down after a huge earthquake and tsunami knocked out the plant's power and cooling functions.

But experts believe the underground seepage from the reactor and turbine building area is much bigger and possibly more radioactive, confronting the plant's operator, Tokyo Electric Power Co., with an invisible, chronic problem and few viable solutions. Many also believe it is another example of how TEPCO has repeatedly failed to acknowledge problems that it could almost certainly have foreseen — and taken action to mitigate before they got out of control.

It remains unclear what the impact of the contamination on the environment will be because the radioactivity will be diluted as it spreads further into the sea. Most fishing in the area is already banned, but fishermen in nearby Iwaki City were hoping to resume test catches next month following favorable sampling results. Those plans have been scrapped after news of the latest tank leak.

"Nobody knows when this is going to end," said Masakazu Yabuki, a veteran fisherman in Iwaki, just south of the plant where scientists say contaminants are carried by the current. "We've suspected (leaks into the ocean) from the beginning ... TEPCO is making it very difficult for us to trust them."

To keep the melted nuclear fuel from overheating, TEPCO has rigged a makeshift system of pipes and hoses to funnel water into the broken reactors. The radioactive water is then treated and stored in the aboveground tanks that have now developed leaks. But far more leaks into the reactor basements during the cooling process — then through cracks into the surrounding earth and groundwater.

Scientists, pointing to stubbornly high radioactive cesium levels in bottom-dwelling fish since the disaster, had for some time suspected the plant was leaking radioactive water into the ocean. TEPCO repeatedly denied that until last month, when it acknowledged contaminated water has been leaking into the ocean from early in the crisis. Even so, the company insists the seepage is coming from part of a network of maintenance tunnels, called trenches, near the coast, rather than underground water coming from the reactor area.

"So far, we don't have convincing data that confirm a leak from the turbine buildings. But we are open to consider any possible path of contamination," said TEPCO spokesman Yoshimi Hitosugi.

The turbine buildings at the Fukushima Dai-ichi plant are about 150 meters (500 feet) from the ocean. According to a Japan Atomic Energy Agency document, the contaminated underground water is spreading toward the sea at a rate of about 4 meters (13 feet) a month.

At that rate, "the water from that area is just about to reach the coast," if it hasn't already, said Atsunao Marui, an underground water expert at the National Institute of Advanced Industrial Science and Technology who is on a government committee

studying the contaminated water problem. "We must contain the problem as quickly as possible."

TEPCO, nationalized and burdened with the astronomical cleanup costs, has been criticized for repeatedly lagging in attempts to tackle leakage problems. As a precautionary step, it has created chemical blockades in the ground along the coast to stop any possible leaks, but experts question their effectiveness. After a nearly two-year delay, construction of an offshore steel wall designed to contain contaminated water has begun.

The utility has also proposed building frozen walls — upside down comb-shaped sticks that refrigerate surrounding soil — into the ground around the reactor areas, but that still has to be tested and won't be ready until 2015 if proved successful.

Prime Minister Shinzo Abe earlier this month announced the government would intervene and provide funding for key projects to deal with the contaminated water problem.

"This is a race against the clock," said Toyoshi Fuketa, a commissioner on the Nuclear Regulation Authority.

Compounding TEPCO's problems is the new leak discovered this week. Most of the 300 tons is believed to have seeped into the ground, but some may have escaped into the sea through a rainwater gutter, said Zengo Aizawa, the company's executive vice president.

That, too, may be a harbinger of more problems ahead.

Some 1,000 steel tanks built across the plant complex contain nearly 300,000 tons (300 million liters, 80 million gallons) of partially treated contaminated water. About 350 of them have rubber seams intended to last for only five years. Company spokesman Masayuki Ono said it plans to build additional tanks with welded seams that are more watertight, but will have to rely on rubber seams in the meantime.

Shinji Kinjo, a regulatory official in charge of the Fukushima disaster, said the rubber-seam tanks are mostly built in a rush when the contaminated water problem started, and often lacked adequate quality tests and require close attention.

Workers have already spotted two more questionable tanks during inspection Thursday.

"It's like a haunted house, one thing happening after another," said Nuclear Regulation Authority Chairman Shunichi Tanaka, referring to the spate of problems at the plant. "But we must take any steps that would reduce risks to avoid a fatal accident."

Leaks of highly contaminated water from the aboveground tanks aggravate the groundwater problem.

"Any contamination in the groundwater would eventually flow into the ocean. That is very difficult to stop even with barriers," said Ken Buesseler, a marine chemist at the Woods Hole Oceanographic Institution in Massachusetts. He found that radioactive cesium levels in most fish caught off the Fukushima coast hadn't declined in the year following the March 2011 disaster, suggesting that the contaminated water from the reactor-turbine areas is already leaking into the sea.

But TEPCO hasn't provided the details he and other scientists need to further assess the situation.

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