Xcel is cleaning up radioactive water spill at Minnesota plant

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A broken pipe at Xcel Energy's Monticello Nuclear Generating Plant leaked about 400,000 gallons of water containing radioactive tritium, and the utility is working to clean up the contaminated plume, state

regulators said Thursday.

Both Xcel and the Minnesota Pollution Control Agency said there was no risk to drinking water from the spill, which was traced to a pipe connecting two buildings across just a half-inch space. The spill was first reported to state and federal regulators on Nov. 22, 2022. The source was found Dec. 19 and patched soon after, according to the MPCA.

Xcel and the state are actively managing the site to make sure an underground plume of tritium doesn't begin to drift beyond the property, including to the nearby Mississippi River, said Kirk Koudelka, an assistant commissioner at MPCA. Water is being pumped out of wells on site both to remove the contamination and control its underground flow. Xcel is paying for sampling, pumping and temporary treatment, Koudelka said.

"Our goal is to remove the source, the contamination that is down there as much as possible," he said.

Once the leak was discovered, Xcel began diverting the water to an in-plant water treatment system—a step that is continuing.

"We were able to contain it so that no more water was leaking," said Christopher Clark, Xcel's president for Minnesota. Clark estimated the remediation work would take about one year; the company does not yet have a cost estimate.

Koudelka said the MPCA was announcing the leak almost three months after it was patched because "we have now sufficient information to be able to share it out to a wider group."

A high level of tritium in groundwater was reported to the Nuclear Regulatory Commission when first discovered, which published the

"nonemergency" report in its public list of nuclear events the next day. The listing said the source of the tritium was being investigated.

Tritium is a mildly radioactive form of hydrogen that occurs occasionally in nature but more commonly from human activities such as nuclear power generation, according to the NRC's website. Tritium is at times intentionally released from power plants under NRC rules.

Like regular hydrogen, the odorless, colorless gas can react with oxygen to create water, known as tritiated water. It is used in some scientific work, including as a tracer in biochemical research, according to the Environmental Protection Agency. The EPA has a limit for the amount of tritium that can be present in drinking water—20,000 picocuries per liter—to protect people from radiation.

"We are well above the 20,000 picocuries per liter EPA standard," Clark said. In water directly below the plant, the picocurie-per-liter count was in the millions.

However, those high levels are quickly reduced as tritium dilutes in groundwater. "This does not present a public health or drinking water issue," Clark said. The company is monitoring the plume in two dozen wells.

Tritiated water can't harm someone just by proximity, said Daniel Huff, assistant commissioner for health protection at the Minnesota Department of Health. The only way a person could be exposed to radiation is by drinking or breathing it, he said.

People are regularly exposed to small amounts radiation from medical procedures and even activities such as sunbathing or flying on a plane, Huff said. But the health effects are cumulative, making it important to limit contact when possible.

"The public's exposure from a nuclear power plant should be zero," Huff said.

In a statement, the city of Monticello indicated that its drinking water was not affected and that the leak happened outside the area where it draws groundwater for municipal wells.

Xcel said it would examine the pipe that caused the leak to understand how it failed.

Tritium levels from the Monticello leak are well below safety thresholds set by the NRC, and the plant is not breaking regulations, said Viktoria Mitlyng, an NRC spokeswoman. Tritium leaks, she added, "are not uncommon for nuclear plants."

Leaks are an issue for aging plants because tritium so easily mixes into water, said Edwin Lyman, director of nuclear power safety at the Union of Concerned Scientists. So, anywhere water might escape from a nuclear plant, tritium could, too, he said.

There have been unintended tritium releases at several power plants over the years.

Xcel monitored groundwater near the Monticello plant for tritium long before the recent spill, and in 2009, it found tritium levels at 21,300 picocuries per liter in a newly dug well at Monticello, according to a report from MPR.

The company typically samples water from 18 wells, ranging from every month to every year, according to a January Xcel filing with the NRC. One well at Monticello has had elevated tritium levels since 2009.

There already was a more diluted plume of tritium before the spill, Xcel

said in the NRC filing. "The plume appears to be stagnant under the turbine building." The tritium "migrated" through the turbine building's concrete floor, the filing said.

Despite that seepage, the highest level of tritium that Xcel has found since 2016 was less than half the federal drinking water limit, the filing said.

In 2012, Xcel released 27 gallons of tritium-tainted water from its Prairie Island nuclear plant near Red Wing after a condenser system leak. That leak reportedly contained 15,000 picocuries per liter of tritium.

In 2019, Xcel announced plans to extend the Monticello plant's life span for at least ten years beyond 2030, when its current NRC license expires. Two months ago, the company filed a formal application with the NRC to extend Monticello's licenses for another 20 years.

The tritium leak "does have some implication for their license renewal," Lyman said. Managing an aging facility is "clearly one of the key issues."

The Monticello plant opened in 1971, though Xcel has spent tens of millions of dollars keeping the plant up to date over the years.

The company says that extending the lives of both Monticello and Prairie Island by 20 years is critical to meeting a new state law mandating fully carbon-free electricity by 2040. Federal licenses for Prairie Island's two reactors expire in 2033 and 2034.