TROUBLE on the WATER

829,000-Gallon Radioactive Wastewater Leak & Xcel's Response Must Disqualify License Extension for Monticello Reactor

A Nukewatch Factsheet

MONTICELLO, Minnesota — Xcel Energy owns the Monticello reactor on the Mississippi River, 40 miles northwest of Minneapolis. This General Electric reactor is 54 years old, among the three oldest in the United States. Dresden 2 in Illinois, and Nine Mile Point in New York are both 55.

On Nov. 22, 2022, Xcel reported it found radioactivity in groundwater from an onsite monitoring well. While Xcel's brief notice had no information about the volume of leaked waste, its source, or the radioactivity it contained, it did assert that "There was no impact on the health and safety of the public or plant personnel."[1]

The company also noted then that 400,000 gallons contaminated with radioactive tritium had leaked into the ground. The public was not informed of the leak until March 2023, four months later. This number would change dramatically in December 2023.

Xcel reported that the concentration of radioactive tritium in the leaked wastewater was ***5-million*** "pico-curies-per-liter" or "pCi/l", a very high amount. Very few tritium leaks from reactors in the United States had more tritium-per-liter.[2]

A "pico-curie" — a small amount of radioactivity — is one-trillionth of a curie. A curie, which is a large amount of radioactivity, is 37 billion radioactive disintegrations-per-second.

At 400,000 gallons (1,761,953 liters), with 5-million pico-curies of tritium per-liter, the first reported leak contained roughly eight curies of radioactivity, a very large amount.

This tritium is a direct threat to the Mississippi River and the people and animals that rely on it, because, as the Nuclear Regulatory Commission (NRC) says: "After a radioactive leak or spill, tritium is generally the first radionuclide to be identified in groundwater. This is because tritium travels as a form of water through the soil faster than other radionuclides." [3]

Tritium, a radioactive form of hydrogen, is a gas in its elemental form. But, like ordinary hydrogen, tritium combines with oxygen to make water, called tritiated water, with the crucial difference that tritiated water is radioactive. As radioactive water, tritium can cross the placenta, posing some risk of birth defects and early pregnancy failures. Ingestion of tritiated water also increase cancer risk.

On July 20, 2023, WCCO staff reported for CBS Minnesota: "Xcel Energy: Small amount of leaked water may have reached the Mississippi River."[4]

The city of Minneapolis proudly declares, "Our water comes from the Mississippi River. Roughly 21 billion gallons of water are pumped from river each year, and 57 million gallons of drinking water delivered every day."[5] Drinking water for the city of Saint Paul also comes from the Mississippi, as well as many more downstream.

Leak Estimate *Doubled*

On Dec. 18, 2023, Xcel reported to the NRC that its first leak estimate was grossly in error. Xcel now estimated that 829,000 gallons of radioactive water had leaked into the ground — not 400,000. Xcel also reported that leaking had started earlier than first thought, and that the leak's volume was far greater than it had earlier estimated.[6] Xcel's noted that its estimate of radioactivity leaked into the groundwater was now 14 curies.

Excel also confirmed in a May 10, 2023 letter to the NRC, [7] that more radioactive materials than tritium is in its 829,000-gallon leak. Xcel said samples from Monticello's laboratory "detected *iodine-131*, *iodine-133*, *iodine-135*, *xenon-133*, and *xenon-135…"* [Emphasis added] Xcel's May 10 letter also said, "The highest iodine-131 concentration seen" in the samples "was 61.6 pCi/l on 12/20/2022."

Xcel's Old, Corroded, Uninspected Pipes

The radioactive wastewater leaked from two corroded underground pipes going from the reactor building to the turbine building, which were later replaced. The company announced in March 2023 that the leak had been stopped, but later it admitted that the first fix failed when a collection system overflowed, dumping tritium-contaminated water into the ground again.

Xcel reported in a Nov. 9, 2023 letter to the NRC [8] (https://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber=ML23313A158), that "The visual examination of the removed [carbon steel] piping sections showed that both of the CRD [control rod drive] pipes experienced severe corrosion of the external surfaces in the regions exposed to the ground water present between the buildings" and "[b]oth CRD pipes … were replaced with uncoated stainless-steel piping."

Xcel's Nov. 9 letter reported on its plans for inspecting thousands of its underground pipes, and said, "MNGP (Monticello Nuclear Generating Plant) will inspect the underground stainless-steel piping … once every 10 years thereafter."

In December 2023, Xcel Energy was fined $14,000 by the Minnesota Pollution Control Agency for not obtaining a permit before pumping contaminated groundwater into temporary storage holding tanks.[9]

In January 2023, 11 months before the 829,000-gallon leak correction was made public, Xcel applied to the NRC for an operating license extension to run Monticello until it is 80.[10] This GE Mark I reactor is identical to three melted and exploded Fukushima units in Japan. It was designed and engineered to last 40 years. Its original license expired in 2010, but in 2006 was extended until 2030, when the machine will be 60 years old. ###

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See updated license extension plan schedule at NRC: https://www.nrc.gov/reactors/operating/licensing/renewal/applications/monticello-subsequent.html

Notes

[1] U.S. NRC Operations Center, EVENT REPORTS for 11/22/2022 - 11/23/2022, Event Number: 56236, Facility: Monticello, Region: 3m State: MN, Unit: [1], NRC, Notified By: Jacob Styrbicky, HQ OPS Officer: Ian Howard, Notification Date: 11/22/2022

[2] Brunswick (NC) had 19 million pCi/L in 2010; Salem (New Jersey) had 15 million pCi/L in 2003; Dresden (Illinois) had10.3 million pCi/L in 2004; Quad Cities (Illinois) had 7.5 million pCi/L in 2008; and Hatch (Georgia) had 6.8 million in 2011. Source: NRC document title: "List Of Leaks And Spills At Operating U.S. Commercial Nuclear Power Plants", 11 October 2023, https://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber=ML23284A164

[3] "NRC List of Leaks and Spills at Operating U.S. Commercial Nuclear Power Plants", https://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber=ML23284A164

[4] CBS Minnesota, WCCO Staff, "Xcel Energy: Small amount of leaked water may have reached the Mississippi River", July 20, 2023;, https://www.cbsnews.com/minnesota/news/xcel-energy-small-amount-of-leaked-water-may-have-reached-the-mississippi-river/

[5] www.minneapolismn.gov, Treatment and Delivery Process, "Our water comes from the Mississippi River," https://www2.minneapolismn.gov/government/departments/public-works/water-treatment-distribution/treat-deliver/

[6] Xcel Energy, "Subsequent License Renewal Application Response to Request for Additional Information and Request for Confirmation of Information - Set 1 Part 2", p. 6, Dec. 18, 2023, https://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber=ML23352A081; and *The Monticello Times*, "Xcel groundwater recovery enters final phase", Dec. 21, 2023, https://www.hometownsource.com/monticello_times/xcel-groundwater-recovery-enters-final-phase/article_7e834ce8-9ea3-11ee-8e03-9f36a6b5d962.html

[7] Xcel, "MNGP 2022 Annual Radioactive Effluent Release Report", page 16, Xcel letter, 10 May 2023, https://www.nrc.gov/docs/ML2313/ML23130A190.pdf

[8] Xcel letter, "Monticello Nuclear Generating Plant - Subsequent License Renewal Application Response to Request for Additional Information Round 2 - Set 1", 9 November 2023, https://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber=ML23313A158

[9] CBS Minnesota, WCCO TV, "Xcel Energy fined $14,000 after leaks of radioactive tritium from its Monticello plant in Minnesota", 15 December 2023; https://www.cbsnews.com/minnesota/news/xcel-energy-fined-radioactive-leak-monticello-plant

[10] Jeffrey Hage, Monticello TIMES, January 25, 2023, https://www.hometownsource.com/monticello_times/news/xcel-energy-applies-to-extend-monticello-nuclear-plant-license/article_11faad62-9cda0-11ed-891c-fb12bdd5694b.html

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