

Owners Want Monticello Reactor to Run 80 Years

By John LaForge

The 52-year-old Monticello nuclear reactor on the Mississippi River in Minnesota, 38 miles northwest of Minneapolis, is owned by Xcel Energy and operated by Northern States Power.

Fired up in 1971, the General Electric Mark I boiling water reactor is identical to the three Fukushima-Daiichi reactors in Japan that suffered complete core meltdowns and four hydrogen explosions in March 2011, leading to the worst accidental radiation releases in history. (Fukushima is often called the second worst nuclear reactor disaster after Chernobyl, but releases of cesium-137 to the ocean from Fukushima far surpass those of Chernobyl.)

In January 2023, Xcel applied to the U.S. Nuclear Regulatory Commission (NRC) for a second extension to its operating license which, if granted, would allow the unit to run for 80 years. The first extension was granted in 2006, allowing the jalopy to generate radioactive waste until 2030, when it will be 60. Monticello's second request, called a Subsequent License Renewal Application, or SLRA, is now in progress, and the NRC, like a rubber stamp, has granted nearly every license extension request it has ever entertained.

The process is complex. After the application is submitted, a License Renewal Process and Environmental Scoping meeting is held; then the NRC conducts an Environmental Review, followed by a Site Environmental Audit which was completed in August 2023. Then a Draft Supplemental Environmental Impact Statement is issued (scheduled for Feb. 24, 2024), at which point interested parties and the public have 90 days to submit comments on the relicensing proposal. A public meeting is then held to discuss the Draft SEIS, and then a Final SEIS is issued. Lastly, the NRC issues a decision. The over-worked citizenry can be excused for not keeping up with this voluminous bureaucratic charade, something the industry desperately counts on.

The risks of operating large power reactors long past their designed retirement date is illustrated by what's called the "bathtub curve." The curve is a schematic description of when, and how likely, major accidents with machinery can be expected due to long-lasting wear-and-tear. (See diagram)

The curve shows that in the life of complicated machines like nuclear reactors, accidents often occur early on — due to extreme heat, heavy vibrations, untested electronics, valves, welds, and associated equipment. After the early mishaps and mistakes there is often a period of time when the number of unplanned events decreases, followed by a steady state of proper operation. Then, in later years, the effects of aging damage the reliability of parts and equipment, especially those subject to decades of intense heat, vibration, corrosion, and

— in the case of nuclear reactors — neutron bombardment and its "embrittlement" of metal parts and structures.

Because of the recent leak of contaminated wastewater from corroded and failed underground piping, the "effects of aging" are given a lot of attention in Xcel's license extension application. An October 23 letter by the NRC says its staff participated in a "hybrid audit" of Monticello August 1-3, 2023, and a "virtual audit" August 15-17, 2023. The two audits were required as part of the license renewal application.

Venting is not always good for you

Following the audits, the NRC sent an October 23, 2023 memo to Xcel titled "Requests for Confirmation of Information." The 18-page memo notes that Monticello, "is currently constructing a groundwater remediation storage pond to store the tritiated groundwater that is being collected in response to the tritium leak. The water will either be reused in plant systems or be evaporated from the pond. If pond evaporation is implemented, it will be the third gaseous point for tritium at the plant."

The public may not realize that radioactive waste gases are routinely released from the reactor to the environment, and that the new holding pond will constitute the third venting point, albeit by evaporation.

Page 6 of the NRC memo says the reactor "currently has two locations of gaseous radioactive effluent discharge: 1. the off-gas stack; and 2. the reactor building ventilation exhaust, both of which are also monitored.... It is an unfortunate fact of nuclear power reactors, that to moderate the operational temperature, pressure, and performance of essential mechanisms, the venting and discharge of radioactive materials to the environment is required. So much for "clean power."

showing the location of the holding tank that spilled on May 21, 2023, and estimates of the volume spilled and the tritium activity concentration of the holding tank at the time of the spill."

How much radiation was released?

The Monticello reactor was forced to make an unplanned shut down in March this year, after Xcel admitted that one or two underground pipes had been corroded and gone un-inspected long enough to leak 400,000 gallons of radioactively contaminated wastewater into the ground. (See Fall 2023 *Quarterly*.)

The company said last summer that the leaked coolant contained 5 million picocuries-per-liter of radioactive tritium, the radioactive form of hydrogen. A picocurie is a small amount of radioactivity, but 5 million picocuries-per-liter is a very high concentration of tritium.

The 400,000 gallons is equal to 1,514,000 liters. If these 1.5 million liters of radioactive wastewater contained (as Xcel said) 5 million picocuries of tritium-per-liter (5,000,000 X 1,500,000 liters), then approximately 7.57 trillion picocuries of tritium were leaked to groundwater near the Mississippi River. This is equal to 7.57 curies of tritium, and a curie is a very large amount of radioactivity. (The partial meltdown at Three Mile Island in 1979 is officially reported to have vented 15 curies of radioactivity and is considered one of the worst radiation accidents in U.S. history.)

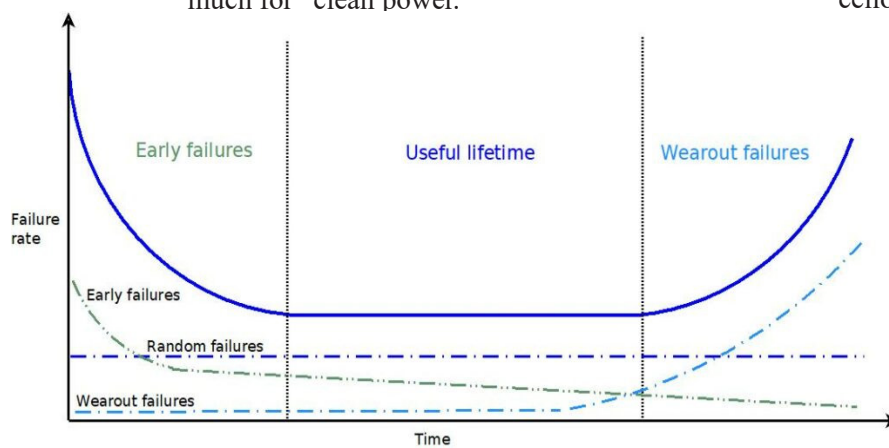
Dr. Arjun Makhijani, president of the Institute for Energy and Environmental Research, says in his new book *Exploring Tritium's Dangers*, "one teaspoon of tritiated water would contaminate about 100 billion gallons of water to the U.S. drinking water limit...." We are left to wonder about the vast volume of groundwater that's been contaminated with Monticello's 400,000 gallons of tritiated water.

Repaired pipes same as the leaking pipes

Answering questions from the NRC about its extended license application, Xcel wrote on October 13 that it must demonstrate to the NRC that it is "managing the effects of aging," and in particular must investigate the function "of structures and components" that the NRC has said "require review." Monticello's leaking pipes fit this bill.

The company notes that "New and replacement coatings for underground components" must meet required standards, and Xcel reported that "Existing coatings for underground components at MNGP [Monticello] were installed per site design specifications."

This claim is dashed by the sentence that follows it: "Site design specifications did not require coatings on underground components..." So, the replacement pipes were uncoated like the originals, and yet the company dares to ask permission to push the reactor's operating life another 28 years, until 2050. What could go wrong?



The "bathtub curve" is a schematic description of when major accidents with complicated machinery can be expected. Most occur early on in a machine's life, and then toward the end of it after years of wear-and-tear.

The October 23 memo also instructed Xcel to provide the NRC with a long list of reports including: "The source, volume, and activity of tritium and other radionuclides (if applicable) released, including how these values were estimated;" "Data that confirm the extent or absence of other radionuclides in groundwater following the November 2022 release;" and "A map

Tritium Leaks: It Ain't Just Hydrogen

continued from page 1

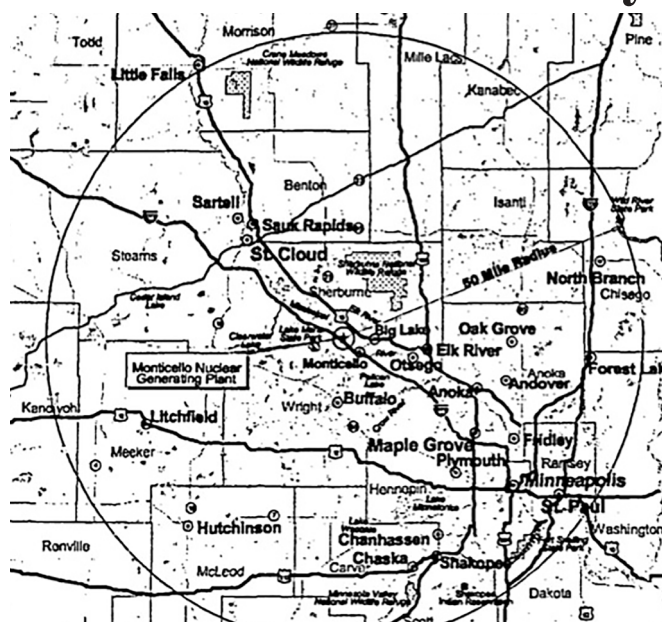
a half times more likely to be born with embryonal cancer and have over double the likelihood of childhood leukemia, caused by standard operation alone. That doesn't include the accidents.

Myth #4

"The tritium radiation does not travel very far in air and cannot penetrate the skin," NRC

Soil, plants, and food grown near nuclear reactors have been found to be contaminated up to 60 miles from the reactor site. In the case of Monticello, this includes the entire Minneapolis/St. Paul metro area, a population of 4 million people.

Tritium is created as a byproduct in the coolant inside the reactor core. While it may not be able to penetrate skin, there are other points of exposure that make a protective layer of skin irrelevant. Tritium



Reactor communities are contaminated by routine airborne releases up to 60 miles away. This includes the entire St. Paul/Minneapolis metropolitan area.

um is released legally by regular operation of all nuclear reactors in the form of radioactive water vapor. As long as people living around the reactor breath, the tritium will be inhaled, easily by-passing the skin. It can also be ingested through consumption of food grown around the reactor.

This article would not have been possible without information collected from radiation classes offered by the Gender & Radiation Information Project and Beyond Nuclear. (genderandradiation.org/classes)

— Sources include: Xcel Energy Monticello Groundwater Status and Background, Nov. 21, 2022; Minn. Public Radio, April 24, 2023; United States Geological Society (USGS) National Ground-Water Monitoring Network 2008, 1998; "Treatise on Geochemistry" published by USGS, 2003