Nuclear Power, Tritium, and the Threat to Drinking Water - Minnesota Press Conference

Statement of Christina Mills, joining Environment Minnesota press conference.

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My name is Christina Mills. I am a staff scientist and policy analyst with the Institute for Energy and Environmental Research (IEER) which provides policymakers, journalists, and the public with understandable and accurate scientific and technical information on energy and environmental issues.

IEER's aim is to bring scientific excellence to public policy issues in order to promote the democratization of science and a safer, healthier environment.

As the report "Too Close to Home" discusses, nuclear power plants pose a threat to the drinking water of millions of Americans. Unfortunately many Americans have been and continue to be exposed to radioactive drinking water as the result of routine operations at the country's nuclear reactor fleet. Tritium, a form of radioactive hydrogen, is routinely released by reactors across the country, including the Prairie Island reactors here in Red Wing. Additionally, as the report highlights, leaks of tritium can go undetected and are likely to increase as reactors age and the infrastructure wears down.

There have been two tritium leaks at Prairie Island, including one unmonitored leak of 3,700 gallons of water on November 30, which was not reported until February 1. This is unacceptable, especially since the NRC report acknowledged that there was potential for the liquid to contaminate local groundwater. And recently a smaller leak was reported, but this time the concentration of tritium was much higher at 15,000 picocuries per liter. Unfortunately these events fit into a pattern of tritium leaks at many reactor sites, despite which the NRC and the reactor operators have not yet put in place an adequate system of reporting or monitoring.

Stronger federal standards on tritium are needed.

Tritium, like all radioactive substances, is a known carcinogen. Every exposure to radiation produces a corresponding cancer risk – a low exposure produces low risk, and that risk increases with exposure. There is no threshold below which there is zero risk. Tritium can replace one or both of the hydrogen atoms in a molecule of water (the H's in H_2O) and if released as a gas can combine with rainfall and contaminate groundwater. Measurements of rainwater are not taken and the NRC does not require monitoring of surface or groundwater that may be contaminated by tritiated rainfall. Tritium can also become incorporated into food, replacing hydrogen in organic molecules and can become part of our genetic material.

The EPA's current limit for tritium in public drinking water is 20,000 picocuries per liter (A picocurie is a unit of radiation. A liter is just under one-fourth of a gallon.) which corresponds to a lifetime fatal cancer risk of about one in 25,000 for a person drinking two liters a day for a lifetime. This is far less protective than a one-in-a-million risk level, the most stringent standard for cleanup for a single pollutant at Superfund sites containing radioactive waste. Additionally, the present tritium limit fails to account for

health risks such as early failed pregnancies, malformations, and other non-cancer outcomes. For instance, if a pregnant woman drinks tritiated water, tritium can cross the placenta, become incorporated into the embryo/fetus, and irradiate rapidly dividing cells, thereby raising the risk of malformations and early failed pregnancies. Given that all of a woman's ova get made while she is still in *her* mother's womb, the risks can be multi-generational.

Because the reporting is not consistent for plants that have more than one reactor, like Prairie Island, it is difficult to accurately determine the risk of tritium exposure to communities near these plants. For instance, in 2005 Prairie Island's reactors had a combined release of 516 picocuries per liter of tritium, but the individual amounts for each reactor are not known.

Further these samples are taken at various intervals and measurements from times that tritium is discharged are averaged with measurements from times that it is not. The NRC does not verify when the samples are taken and there is no independent way for communities and the public to verify what discharges are occurring, which leaves opportunity for leaks to go unreported for extended periods of time.

Some states have adopted more protective tritium guidelines or public health goals – though they cannot legislate enforceable radiation standards. California's public health goal is 400 picocuries per liter (1 in 1 million lifetime fatal cancer risk). Colorado's surface water tritium standard for Rocky Flats clean up, made in agreement with the Federal government is 500 picocuries per liter. New Mexico has set a notification guideline for public health in the Rio Grande section from which drinking water is drawn of 4,000 picocuries per liter (1 in 100,000 lifetime fatal cancer risk).

Residents and communities around nuclear power plants are at risk. As we have just witnessed here in Minnesota, it does not take a large-scale disaster to cause leaks of radioactive water from nuclear reactors.

Thank you.

- Christina Mills (Institute for Energy and Environmental Research)
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