

Tritium Leaks into Groundwater at U.S. Nuclear Plants

The U.S. nuclear industry has contaminated the groundwater at nuclear power plant sites across the country by leaking radioactive hydrogen known as tritium. Tritium leaks at nuclear plants garnered increased media attention in 2006 when Exleon, owner of the largest nuclear fleet in the U.S., was forced to acknowledge that several of its reactors were leaking tritium into the ground water and off the nuclear plant site in Illinois.¹

Since 2006, the trickle of nuclear plants acknowledging that they've contaminated the ground water at their sites has grown into a deluge. Nuclear plants that have admitted leaking tritium into the groundwater include: Braidwood, Byron & Dresden in Illinois; Indian Point & Fitzpatrick in New York; Yankee Rowe & Pilgrim in Massachusetts; Three Mile Island & Peach Bottom in Pennsylvania; Callaway in Missouri; Oyster Creek in New Jersey; Hatch in Georgia; Palo Verde In Arizona; Perry in Ohio; Point Beach in Wisconsin; Salem in Delaware; Seabrook in New Hampshire; Watts Bar in Tennessee; Wolf Creek in Kansas; Connecticut Yankee and most recently Vermont Yankee.²

Tritium is radioactive hydrogen. It is a radioactive waste produced in nuclear reactors and has a half-life of 12 years. Tritium is found in the triggers of nuclear weapons and in luminescent exit signs; its not supposed to be found leaking into the groundwater at U.S. nuclear plants.³ Tritium poses a health risk if it is taken into the body. The most common form of ingestion is as tritiated water. Since tritiated water behaves the same regular H₂O, "a significant fraction of the inhaled and ingested tritium is directly absorbed into the bloodstream. The health hazard of tritium is associated with cell damage caused by the ionizing radiation that results from radioactive decay, with the potential for subsequent cancer induction."⁴

Both the U.S. Nuclear Regulatory Commission (NRC) and the U.S. Environmental Protection Agency (EPA) have regulatory authority over the radioactive pollutant. The NRC limits the dose of radiation to any individual to 100 millirems per year.⁵ While the EPA limits the amount of tritium in drinking water to 20,000 PicoCuries Per Liter (pCi/L).⁶ Based upon these standards the NRC allows tritium to be released to the air and water on a constant basis. However, the corporations running nuclear reactors do NOT have the legal authority to release radioactive wastes such as tritium into ground water.⁷

The nuclear industry and the NRC have attempted to downplay public concerns about tritium leaks at nuclear plants. While Vermont Yankee's advertisements claim nuclear power is clean and safe, the U.S. Nuclear Regulatory Commission acknowledges that there is no such thing as a safe dose of radiation. And Entergy should realize that while radioactive contamination is invisible that doesn't make it clean. According to the U.S. Nuclear Regulatory Commission, "the radiation protection community conservatively assumes that any amount of radiation may pose some risk for causing cancer and hereditary effect, and that the risk is higher for higher radiation exposures."⁸

In 2006, Greenpeace joined the Union of Concerned Scientists (UCS) and dozens of other environmental groups to petition the NRC to take action on the tritium contamination at U.S. reactor sites. UCS' petition detailed a series of NRC regulations that that were being violated by the tritium releases to the ground water because these releases of radiation were neither controlled nor monitored as required by NRC regulations.⁹ As with most petitions to the NRC, the public's concerns were virtually ignored and the petition summarily denied.¹⁰ Despite the fact that tritium releases to groundwater violate the terms of the nuclear plant's license the NRC has failed to exercise its regulatory authority. Instead, NRC has allowed the Nuclear Energy Institute (NEI) to create a voluntary industry program to deal with the tritium contamination.¹¹

However by handing the issue over to the industry, the NRC has only further undermined public confidence. Then-Illinois Senator, Barack Obama stated that, "(w)hile it's encouraging that the nuclear industry recognizes it has a special responsibility to keep communities informed of tritium leaks, the voluntary guidelines recommended by the Nuclear Energy Institute would still allow tritium leaks to occur without the public ever finding out about it," he said. "The nuclear industry already has a voluntary policy, and it hasn't worked,"¹² Obama's statement now seems prophetic. Since only after the NRC re-licensed the Oyster Creek nuclear plant did its owner acknowledge that the site was contaminated by tritium leaks.¹³

The NRC's rationale for failing to regulate radioactive leaks has shifted over time. Originally, when the NRC denied UCS' petition the nuclear bureaucrats claimed the radioactive contamination posed no threat to the public health and safety.¹⁴ Despite the NRC claims, the nuclear industry's attorneys have cautioned their nuclear clients not to make such broad claims. The firm Morgan Lewis has advised its clients that "If you have tritium, do not state that it poses no adverse health consequences. Better to state that it does not result in a significant increase in health consequences (or something similar) as applicable."¹⁵ The nuclear industry and its attorneys claim that the real risk from tritium contamination is not the potential dose to the public but the legal risk when groundwater flows off site contaminating private property.¹⁶

Even after the NRC acknowledged that tritium leaks at nuclear plant sites exceeded the EPA's limits for safe drinking water, the agency failed to act. The NRC has refused to regulate the nuclear leaks because, "the water that has leaked from degraded buried piping is not intended for consumption"¹⁷

The nuclear industry is incapable of preventing tritium from leaking into groundwater and the NRC refuses to regulate. But Vermont has a solution! Tell your State Senators & Representatives to vote against the Certificate of Public Good and shut down Vermont Yankee!

¹ Wald, Matt, "Nuclear Plants Found to Be Leaking Radioactive Water," New York Times March 17, 2006, <http://www.nytimes.com/2006/03/17/national/17nuke.html>

² Hemingway, Sam, "Tritium leaks a problem at many plants," Burlington Free Press, Jan 24, 2010.

³ <http://www.burlingtonfreepress.com/article/20100124/NEWS02/100123013/Tritium-leaks-a-problem-at-many-plants>

⁴ U.S. Nuclear Regulatory Commission Fact Sheet : Tritium, <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/tritium-radiation-fs.html>

⁵ Argonne National Laboratory, Human Health Fact Sheet, Aug. 2005 <http://www.ead.anl.gov/pub/doc/tritium.pdf>

⁶ Radiation Dose Limits for Individual Members of the Public, 10CFR Part 20, Subpart D. <http://www.nrc.gov/reading-rm/doc-collections/cfr/part020/part020-1301.html>

⁷ U.S. Nuclear Regulatory Commission, Fact Sheet on Tritium, Radiation Protection Limits, and Drinking Water Standards, <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/tritium-radiation-fs.html>

⁸ Jones, C.G., PWR Tritium Issues, Constellation Energy, <http://meetings.ile.rochester.edu/Tritium/documents/3.ppt> see also Union of Concerned Scientists 2.206 Petition on Long Standing Leakage of Contaminated Water, Jan. 25, 2006.

http://www.ucsusa.org/nuclear_power/solutions/petition-for-longstanding.html

⁹ U.S. Nuclear Regulatory Commission, Fact Sheet on Biological Effects of Radiation <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/bio-effects-radiation.html>

¹⁰ Union of Concerned Scientists, 2.206 Petition on Long Standing Leakage of Contaminated Water, Jan. 25, 2006.

http://www.ucsusa.org/nuclear_power/solutions/petition-for-longstanding.html

¹¹ U.S. Nuclear Regulatory Commission, Directors Decision 06-03, Nov. 2, 2006.

http://adamswebsearch2.nrc.gov/idmws/doccontent.dll?library=PU_ADAMS^PBNTAD01&ID=063110113.

¹² Nuclear Energy Institute "Fact" Sheet www.nei.org/.../Industry_Closely_Monitors_Controls_Tritium_at_Nuclear_Power_Plants0609_5.pdf

¹³ Dardick, Hal, "Obama Still to Press Spill Bill Despite Nuclear Industry Plan," Chicago Tribune, 10 May 2006.

¹⁴ Hemingway, Sam, "Tritium leaks a problem at many plants," Burlington Free Press, Jan 24, 2010.

<http://www.burlingtonfreepress.com/article/20100124/NEWS02/100123013/Tritium-leaks-a-problem-at-many-plants>

¹⁵ U.S. Nuclear Regulatory Commission, Directors Decision 06-03, Nov. 2, 2006.

http://adamswebsearch2.nrc.gov/idmws/doccontent.dll?library=PU_ADAMS^PBNTAD01&ID=063110113.

¹⁶ Poindexter, Thomas C., Stuart, Glen R. "Tritium: Managing the Regulatory and Litigation Challenges," Morgan Lewis, April 3, 2006.

www.docstoc.com/docs/8885677/Final-Tritium-webcast-slidesppt

¹⁷ Jones, C.G., PWR Tritium Issues, Constellation Energy, <http://meetings.ile.rochester.edu/Tritium/documents/3.ppt>

¹⁸ U.S. NRC, Staff Progress in Evaluation of Buried Piping at Nuclear Reactor Facilities, SECY-09-174, Enclosure, p. 6. <http://www.nrc.gov/reading-rm/doc-collections/commission/secys/2009/secy2009-0174/2009-0174scypdf>