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PLYMOUTH

Discovery in Pilgrim wells fuels debate

In the Matter of Entergy (Pilgrim Nuclear Power Station)
 Docket No. 50-293-LR Official Exhibit No. 38
 OFFERED by: Applicant/Licensee Inter. Pilgrim Watch Ex 26
 NRC Staff Other _____
 IDENTIFIED on 4-10-08 Witness/Panel _____
 Action Taken: ADMITTED REJECTED WITHDRAWN
 Reporter/Clerk Thibault

By Robert Knox, Globe Correspondent | December 20, 2007

The radioactive tritium discovered this month in monitor wells on the grounds of the Pilgrim nuclear power plant in Plymouth was at levels below any reporting requirement, according to federal regulators, and poses no danger to the public.

The tritium was one-seventh the level allowed in drinking water, said Pilgrim spokesman David Tarantino. He also said the finding confirms that the monitoring system is working properly.

But finding a radioactive substance in the ground water demonstrates the need for a more robust monitoring system to protect public safety against leaks from an aging plant, say Pilgrim's critics, who have raised the issue in Pilgrim's license extension review.

Tritium, a hydrogen isotope, is a byproduct of nuclear reactions. But it is also a naturally occurring radioactive form of hydrogen produced in the upper atmosphere, according to the Nuclear Regulatory Commission, and is found in very small amounts in ground water throughout the world. However, since the concentrations found at Pilgrim were above naturally occurring levels, it's logical to assume that some of the tritium was caused by the plant, said Pilgrim spokesman David Tarantino.

The monitor wells were installed at Pilgrim this fall as part of a voluntary program recommended by the Nuclear Energy Institute, an industry group, in the wake of the discovery of tritium at plants in New York, Illinois, and Connecticut, according to NRC spokesman Neil Sheehan and others.

Pilgrim found tritium in the first sampling earlier this month.

The discovery is "an indication that as the reactor ages, things start wearing out," said Mary Lampert of Pilgrim Watch, a regional advocacy group, which has been critical of both the plant and the NRC on the leaks issue.

Last year, in contesting a 20-year license extension for Pilgrim, the Duxbury-based group argued that radiation-contaminated water from buried pipes and tanks that are part of the nuclear reactor's cooling system could end up in coastal waters if a rigorous system for checking on the possibility of underground leaks is not put into place.

An NRC-established panel of nuclear experts agreed this fall that the leaks issue deserved a full hearing, to take place next year as part of Pilgrim's relicensing review process.

Pilgrim Watch also advocates quarterly samplings of the contents of the monitor wells, citing a hydrologist's estimate that leakage could get to Cape Cod Bay in three months or less. And it argues that, to conduct proper monitoring, more than four monitoring wells are needed. Pilgrim Watch recommends wells at "multiple down gradient monitoring points distributed over the area," along with control wells.

But Tarantino defended the number and placement of the plant's four wells, saying the discovery of small amounts of tritium can be looked at as a positive - an indication that more serious contaminants are not present in the ground water and that the wells were properly placed.

"We don't have large amounts of radioactive materials from underground pipes and tanks leaking into the environment. To that extent, it is a good thing," Tarantino said. The placement of the four wells several hundred feet apart within the plant's half-mile of waterfront followed a study by a professional hydrologist, he said.

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Sheehan said Pilgrim's owner, the Entergy Corp., reported the finding even though NRC does not require it. "Entergy decided to notify federal, state, and local officials because even though the levels are low, they crossed the informal notification threshold that has been established," he said.

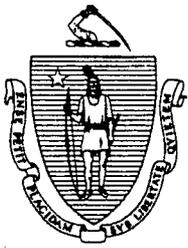
The plant will continue testing, Tarantino said, and send identical samples to the state Department of Public Health.

According to the NRC, the agency has revised its inspection procedures for nuclear power plants to evaluate nuclear facilities' programs to inspect and evaluate the equipment and structures where leaks could occur, following the discovery of tritium at nuclear sites. It has also set up a task force to address unmonitored liquid releases of radioactivity.

Lampert said that along with more wells, Pilgrim needs a thorough and updated study of the ground water flow on its property. New construction, the amount of silt and clay on top of soil, the effects of tidal fluctuations, and seasonal fluctuations can change the direction of the flow, she said. Without a study of these factors, both the number and the placement of the wells are up in the air, Lampert said.

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December 26, 2007

Mr. Robert Walker, Director
MA Department of Public Health
Radiation Control Program
Schrafft Center, Suite 1M2A
529 Main Street
Charlestown, MA 02129

Dear Mr. Walker:

Attached you will find a summary of analysis results for the 4 groundwater samples which were collected at Pilgrim Nuclear Power Station property on November 29, 2007 and submitted to the Massachusetts Environmental Radiation Laboratory (MERL).

MERL performed the gamma spectroscopy analyses of the samples using US EPA Prescribed Procedure Drinking Water for Measurement of Radioactivity in Drinking Water for Gamma Emitting Radionuclides: Method 901.1. Only normal levels of naturally occurring radionuclides were detected. These results are attached in Table 1.

Additionally, tritium analyses were performed on the 4 samples using US EPA Prescribed Procedure Drinking Water for Measurement of Radioactivity in Drinking Water for Tritium: Method 906.0. These results are also considered low in terms of dose. These results are attached in Table 2.

If you have any questions, please do not hesitate to contact me at 617-983-6879.

Sincerely,

Donald J. Buckley
Supervisor, MERL
Radiation Control Program

Attachments (2)

Analysis:

The samples were analyzed with a high purity germanium gamma spectroscopy system utilizing Canberra Genie 2000 software. The detectors were energy and efficiency calibrated for the geometry of the samples. The groundwater samples were transferred to 1 Liter Marinelli beakers and counted for 55,000 seconds. Only normal levels of naturally occurring radionuclides were detected. The attached results (Table 1) are reported in picocuries (pCi) per liter.

All of the analysis results reported reflect the concentration of the radionuclides at the time of sample collection.

The sample analysis results have had background subtracted from the sample plus background counts.

A NDA value reported by MERL can be interpreted to mean that no detectable activity of a radionuclide of interest was found in the sample at the time of analysis.

The following evaluation criteria are used by MERL to report a positive analysis result:

- An analysis result must be three times greater than the one-sigma error value for the radionuclide of interest.

And

- An analysis result must be greater than the detection limit for the radionuclide of interest.

In general, the laboratory's overall uncertainty is ± 15 percent.

Analysis for tritium in the 4 samples followed using a Packard Tri-Carb 2750TR/LL liquid scintillation counter with SpectraGraph Spectrum Analysis Software, luminescence correction on and low level count mode on. The samples were counted for 112 minutes each. The background was 3.22 counts per minute in the 0-18.6 keV region (tritium). The minimum detectable activity for the analysis was less than 300 pCi/Liter.

The attached results (Table 2) are reported in pCi/Liter at 95% confidence (2 sigma error).

**Table 1: Massachusetts Environmental Radiation Laboratory
Gamma Spectroscopy Analysis Results-4 Groundwater
Samples**

MERL ID	Sample ID	Sample Date	Analysis Date	Analysis Results $\pm 1 \sigma$ pCi per liter	MDA
07E0610	MW 201	11/29/2007	12/03/2007	*Bi-214 9.19E1 \pm 3.65E0	2.13E1
				*Pb-214 9.80E1 \pm 3.93E0	1.35E1
07E0611	MW 202	11/29/2007	12/03/2007	*Pb-212 1.51E1 \pm 2.84E0	1.03E1
				*Bi-214 1.03E2 \pm 7.72E0	4.71E1
				*Pb-214 9.87E1 \pm 1.12E1	6.62E1
07E0612	MW 203	11/29/2007	12/04/2007	*Pb-212 1.93E1 \pm 3.84E0	9.69E0
07E0613	MW 204	11/29/2007	12/04/2007	*Pb-212 3.24E1 \pm 4.62E0	1.30E1
				*Bi-214 1.37E2 \pm 1.18E1	6.87E1

* Asterisk denotes radioactivity detected in the sample. Statistically, if the concentration of the radionuclide is greater than three times the standard deviation (1 sigma) of the radionuclide of interest present in the sample and the analysis result is greater than the minimum detectable activity then the radionuclide is present in the sample.

Approved: _____

Date: December 5, 2007

**Table 2: Massachusetts Environmental Radiation Laboratory
Tritium Analysis Results-4 Groundwater Samples**

MERL ID	Sample ID	Sample Date	Analysis Date	Tritium (pCi/Liter) Results $\pm 2 \sigma$	Minimum Detectable Activity (pCi/Liter)
07E0610	MW 201	11/29/2007	12/19/2007	3014 \pm 195	<300
07E0611	MW 202	11/29/2007	12/19/2007	522 \pm 131	< 300
07E0612	MW 203	11/29/2007	12/19/2007	371 \pm 126	< 300
07E0613	MW 204	11/29/2007	12/19/2007	1277 \pm 153	< 300

Tritium Background: 3.22 cpm in the keV region 0-18.6 (tritium) or 0 ± 114 pCi/Liter.

Approved: _____

Date: December 24, 2007