EDO Principal Correspondence Control

FROM:

DUE: 12/16/10

Mary Lampert Pilgrim Watch

Rebecca Chin Town of Duxbury Nuclear Advisory Committee

TO:

Borchardt, EDO

FOR SIGNATURE OF :

\*\* GRN \*\*

CRC NO:

EDO CONTROL: G20100689

FINAL REPLY:

DOC DT: 11/15/10

Leeds, NRR

DESC:

Pilgrim Nuclear Power Station - Petitioner's Request for Review of the Petition Review Board Denial 2.206 Regarding Request Require Hydrological-Geological Subsurface Study (EDATS: OEDO-2010-0929)

DATE: 11/16/10

ASSIGNED TO: CONTACT:

NRR Leeds

SPECIAL INSTRUCTIONS OR REMARKS:

Ref. G20100527.

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### UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION BEFORE THE EDO, U.S. NUCLEAR REGULATORY COMMISSION November 15, 2010

R. William Borchardt Executive Director for Operations U.S. Nuclear Regulatory Commission Washington, DC 20555-0001 Via Mail: Office of Secretary Via Email hearingdocket@nrc.gov

## PILGRIM NUCLEAR POWER STATION- PETITIONER'S REQUEST FOR REVIEW PRB DENIAL 2.206 PETITION REGARDING REQUEST REQUIRE HYDROLOGICAL-GEOLOGICAL SUBSURFACE STUDY AT PNPS

#### Background

Pilgrim Watch ("PW" herein after) filed pursuant to §2.206 of Title 10 in the Code of Federal Regulations, a request that the Nuclear Regulatory Commission (NRC) initiate a proceeding pursuant to §2.202 of Title 10 in the Code of Federal Regulations, August 13, 2010 and a Supplement to the petition October 26, 2010.

The petition asked that NRC issue an order that requires Entergy to immediately perform an updated hydro-geologic analysis. Pilgrim Watch presented facts demonstrating that this is necessary (1) to provide reasonable assurance that leaks are not occurring so that piping and other buried components are able to perform their intended safety function by supplying sufficient fluid flow and to maintain inadvertent releases below technical specifications or other applicable limits which apply at the site boundary; (2) for Entergy to be in compliance with the Industry Ground Water Protection Initiative at Pilgrim Station that they agreed to follow; and (3) to determine where underground cable flooding may be occurring; (4) to ensure that all submerged cables, splices, connectors and wiring at Pilgrim NPS are capable of performing their required function in compliance with regulation.

NRC denied the petition November 10, 2010. We were told by NRC that the denial was based on their satisfaction that the issue was resolved based upon based upon NRC's INSPECTION REPORT 05000293/2010004 (October 16, 2010).

Although we understand that "The Commission will not entertain requests for review of a director's decision; however, on its own, it may review a decision within 25 calendar days." We ask the Commission to review the decision based upon the fact that the bases of the Petition Review Board's decision (the NRC Integrated Inspection Report, GPI Objective 1.1-Site Hydrology and Geology) lacks substance.

A review of the relevant section of the Pilgrim Nuclear Power Station - NRC Integrated Inspection Report 05000293/2010004 (October 16, 2010), pgs., 18-21 below clearly indicates that it provides no reasonable assurance or demonstration of the NRC's willingness to exercise its role as a regulator. Our analysis of the complete report is attached. Our comments are inserted in the original report.

## NRC's INSPECTION REPORT 05000293/2010004 (October 16, 2010)

### **GPI Objective 1.1 - Site Hydrology and Geology**

### **Report**

The inspectors verified that a hydrology and geologic study was performed by an outside contractor to determine the predominant groundwater flow characteristics and gradients. The inspectors verified the study was reviewed by a knowledgeable utility employee. The inspectors verified that potential pathways have been identified for groundwater migration from on-site locations to off-site locations through groundwater. The inspectors verified that a five (5) year frequency has been established in Pilgrim procedures for periodic review of the hydrogeologic studies. The inspectors verified that no changes were required to the Updated Final Safety Analysis Report.

### **PW Comment**

- The report says that, "The inspectors verified that a hydrology and geologic study was performed by an outside contractor to determine the predominant groundwater flow characteristics and gradients." However it provides <u>no information</u> when the report was done. Is the report referring to the 1967 pre-operational hydro-geo report done before construction; was it a subsurface report, over the entire site, and one that followed standard design practice? Absent answers to these questions there is no assurance, reasonable or otherwise.
- 2. The report says that, "The inspectors verified the study was reviewed by a knowledgeable utility employee." This is an irrelevant comment unless it is meant to imply that there are ignorant utility employees. The question remains is whether NRC employees with expertise in groundwater flow reviewed the study?

- 3. The report says that, "The inspectors verified that potential pathways have been identified for groundwater migration from on-site locations to off-site locations through groundwater." What is absent is information on the basis that the inspectors verified that the potential pathways have been identified for groundwater migration. Please provide the basis and explain how Dr. David Ahlfeld's (University Massachusetts, Amherst) groundwater flow expert and Mass Dept. of Public Health's ground water specialists came to the opposite conclusion. (Dr. Ahlfeld's report is found on NRC's Electronic Library, ADAMS Accession No.ML080740410, see Exhibit 2, complete Exhibit list pg.,104; MDPH's report was included with Pilgrim Watch's 2.206 Petition)
- 4. The report said that, "The inspectors verified that a five (5) year frequency has been established in Pilgrim procedures for periodic review of the hydrogeologic studies." Does this mean that Entergy finds the report in a cabinet, dust it off, and re-read it?
- 5. The report concludes that, "The inspectors verified that no changes were required to the Updated Final Safety Analysis Report." Absent addressing the above-mentioned concerns, no basis is provided.

### Conclusion

It should be clear that the PRB's decision to base denial on the Inspection Report is without merit. The Inspection Report, itself, is totally lacking in substance. Reasonable assurance that public health and safety are protected is not provided. The need persists for NRC to require a thorough subsurface hydro-geological analysis over Pilgrim's entire site and provide assurance that the study is made available to the Commonwealth and public. We are simply asking NRC, at all levels, to do its job and prioritize the public's interest. We deserve better.

#### Respectfully submitted,

Mary Lampert Pilgrim Watch, Director 148 Washington Street Duxbury, MA 02332

Joining Pilgrim Watch Rebecca Chin Town of Duxbury Nuclear Advisory Committee, Vice Chair 31 Deerpath Trl. North-Duxbury, MA 02332

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# PILGRIM NUCLEAR POWER STATION - NRC INTEGRATED INSPECTION REPORT 05000293/2010004 (October 16, 2010), Pages, 18-21 *Pilgrim Watch Analysis*

The entire report lacks substance. It provides neither a basis for either denying the 2.206 Petition nor any reason for the public to have an ounce of confidence in NRC's oversight. The following step-by-step analysis makes this clear.

### Report

#### 40A5 Other Activities

.1 (Closed) Temporary Instruction 2515/173, Review of the Implementation of the Voluntary Industry Groundwater Protection Initiative IGPI)

a. Inspection Scope

During the period July 12,2010, through July 15, 2010, an NRC assessment was performed of Pilgrim's GPI program to determine whether Pilgrim implemented the voluntary Industry Groundwater Protection Initiative, dated August 2007 (Nuclear Energy Institute (NEI) 07-07, ADAMS Accession Numbers ML07261 0036 and ML072600292). The inspectors interviewed personnel, performed walkdowns of selected areas as needed and reviewed documentation.

### **GPI Objective 1.1 - Site Hydrology and Geology**

### Report

The inspectors verified that a hydrology and geologic study was performed by an outside contractor to determine the predominant groundwater flow characteristics and gradients. The inspectors verified the study was reviewed by a knowledgeable utility employee. The inspectors verified that potential pathways have been identified for groundwater migration from on-site locations to off-site locations through groundwater. The inspectors verified that a five (5) year frequency has been established in Pilgrim procedures for periodic review of the hydrogeologic studies. The inspectors verified that no changes were required to the Updated Final Safety Analysis Report.

### **GPI Objective 1,1- Site Hydrology and Geology**

#### PW Comment

1. The report says that, "The inspectors verified that a hydrology and geologic study was performed by an outside contractor to determine the predominant groundwater flow characteristics and gradients." However it provides no information when the report was

done. Is the report referring to the 1967 pre-operational hydro-geo report done before construction; was it a subsurface report, over the entire site, and one that followed standard design practice? Absent answers to these questions there is no assurance, reasonable or otherwise.

- 2. The report says that, "The inspectors verified the study was reviewed by a knowledgeable utility employee." This is an irrelevant comment unless it is meant to imply that there are ignorant utility employees. The question remains is whether NRC employees with expertise in groundwater flow reviewed the study?
- **3.** The report says that, "The inspectors verified that potential pathways have been identified for groundwater migration from on-site locations to off-site locations through groundwater." What is absent is information on the basis that the inspectors verified that the potential pathways have been identified for groundwater migration. Please provide the basis and explain how Dr. David Ahlfeld's (University Massachusetts, Amherst) groundwater flow expert and Mass Dept. of Public Health's ground water specialists came to the opposite conclusion. (Dr. Ahlfeld's report is found on NRC's Electronic Library, ADAMS Accession No.ML080740410, see Exhibit 2, complete Exhibit list pg.,104; MDPH's report was included with Pilgrim Watch's 2.206 Petition)
- 4. The report said that, "The inspectors verified that a five (5) year frequency has been established in Pilgrim procedures for periodic review of the hydrogeologic studies." Does this mean that Entergy finds the report in a cabinet, dusts it off, and re-reads it?
- 5. The report concludes that, "The inspectors verified that no changes were required to the Updated Final Safety Analysis Report." Absent addressing the above-mentioned concerns, no basis is provided.

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### **GPI Objective 1.2 - Site Risk Assessment**

### Report

The inspectors verified that Pilgrim has identified structures, systems, and components (SSCs) that involve or could reasonably be expected to involve licensed material and for which there is a credible mechanism for licensed material to reach groundwater. The inspectors verified that the Pilgrim corrective action program will be used to identify and track corrective actions.

### PW Comment

## Please provide complete list. GPI Objective 1.3 - On-Site Groundwater Monitoring

### Report

The inspectors verified Pilgrim has considered the placement of monitoring wells down gradient from the plant but within the site boundary. The inspectors verified that Pilgrim considered placing sentinel wells closer to structures, systems or components (SSCs) that have the highest potential for inadvertent releases that could reach groundwater. The inspectors verified that Pilgrim has established sampling and analysis protocols, including analytical sensitivity in site procedures. The inspectors verified that a formal written program has been established for long term groundwater monitoring. The inspectors verified that the Offsite Dose Calculation Manual has not been revised to include groundwater monitoring as the monitoring locations are not included in the Radiological Environmental Monitoring Program (REMP). The inspectors verified that the analytical capabilities are periodically reviewed as part of the analytical cross check program. The inspectors verified that a longterm program has been established in Pilgrim procedures for the groundwater monitoring wells. The inspectors verified a frequency has been established in Pilgrim procedures for the periodic review of the groundwater monitoring program.

### PW Comment

- The report says that, "The inspectors verified Pilgrim has considered the placement of monitoring wells down gradient from the plant but within the site boundary. The inspectors verified that Pilgrim considered placing sentinel wells closer to structures, systems or components (SSCs) that have the highest potential for inadvertent releases that could reach groundwater." However "considered" does not imply action, timely or otherwise; and there is no basis to assume what Pilgrim "considered" will be implemented to (shall) provide reasonable assurance to the public.
- 2. The report says that, "The inspectors verified that Pilgrim has established sampling and analysis protocols, including analytical sensitivity in site procedures." However the inspectors did not verify, nor provide basis for verification, that the sampling protocol is adequate to assess and identify all the isotopes that may be leaking.

Pilgrim Watch believes that limiting analysis to gamma particles would miss radionuclides significant to public health and does not suit today's waste streams and technology. We understand from NRC documents that today, as a result of better fuel performance, and improved radioactive source term reduction programs that the new liquid radioactive effluent source term is made up of a lower fraction of gamma emitting radionuclides and a higher fraction of beta emitters. Therefore analysis also should include beta and alpha particles.<sup>1</sup> The limits of detection should be lowered. We understand by reading NRC documents that<sup>2</sup> many licensees, now, have enhanced detection capability and routinely analyze

environmental samples at much lower radioactivity levels than required by regulatory guidance and license conditions. We expect that Entergy, too, is in the forefront now; and we are talking about agreeing to analytical detection capability in the future, 2012-2032. Last, we would like any non-radioactive data reported as they could serve as a tracer of a leak.

**3.** The report says that, "The inspectors verified that a formal written program has been established for long term groundwater monitoring." However, what is important, but neither said nor analyzed, is whether the "formal written program" provide reasonable assurance that public health and safety shall be protected.

<sup>&</sup>lt;sup>1</sup> The NRC's Groundwater Contamination at Nuclear Plants Task Force, Final Report (September 1, 2006) noted that, The radiological effluent and environmental monitoring program requirements and guidance largely reflect radioactive waste streams that were typically from nuclear plant operation in the 1970s. The issues that were important then, i.e. principal gamma emitters giving the significant dose, while still important today, have been joined by new issues. Today, as a result of better fuel performance, and improved radioactive source term reduction programs, a new radioactive waste source term has evolved. The new liquid radioactive effluent source term is made up of a lower fraction of gamma emitting radionuclides and a higher fraction of weak beta emitters." (page 21.) For example, experience at Connecticut Yankee and Indian Point and others shows Sr-90 (beta) and Cs-137 (beta) of significance.

<sup>&</sup>lt;sup>2</sup> "The radiation detection capabilities specified in the BPTP are the 10970s state-of-the-art for routine environmental measurements in laboratories. More sensitive radiation detection capability exists today, but there is no regulatory requirement for plants to have this equipment. As a practical matter, many licensees so have the enhanced detection capability and routinely analyze environmental samples at much lower radioactivity levels than required by the regulatory guidance and license conditions. This capability has provided increased precision in quantifying the typically small doses attributed to any abnormal releases." NRC's Groundwater Contamination at Nuclear Plants Task Force, Final Report, September 1, 2006, page 18

- 4. The report says that, "The inspectors verified that the Offsite Dose Calculation Manual has not been revised to include groundwater monitoring as the monitoring locations are not included in the Radiological Environmental Monitoring Program (REMP)." However what is left out is NRC's requirement to assure that the information shall be included and by what date.
- 5. The report says that, "The inspectors verified that the analytical capabilities are periodically reviewed as part of the analytical cross check program." However what is important and left unsaid is who "periodically reviews," the "analytic capabilities," and what "periodic" precisely means.
- 6. The report says that, "The inspectors verified a frequency has been established in Pilgrim procedures for the periodic review of the groundwater monitoring program." However without knowing the "frequency" there is absolutely no basis for determining reasonable assurance.

### **GPI Objective 1.4 - Remediation Process**

### Report

The inspectors verified that written procedures have been established outlining the decision making process for the remediation of leaks and spills or other instances of inadvertent releases. The inspectors verified that an evaluation was performed of the potential for detectible levels of licensed material from planned releases of liquids and/or airborne materials.

### PW Comment

The report says that, "The inspectors verified that written procedures have been established outlining the decision making process for the remediation of leaks and spills or other instances of inadvertent releases." However absent is any evaluation of the written procedures - as there should be in an inspection of any substance or worth.

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### **GPI Objective 1.5 - Record Keeping**

### Report

The inspectors verified that a record keeping program has been established to meet the requirements of 10 CFR 50.75 (g)

#### <u>PW Comment</u>

The report says that "The inspectors verified that a record keeping program had been established to meet the requirements of 10 CFR 50.75 (g)." (However) The salient issue of whether the NRC or the public sees those reports is not addressed. It is sadly apparent that NRC learned no lessons from their own NRC *Groundwater Contamination (Tritium) at Nuclear Power Plants Task Force, Final Report* 

The report reviewed Reporting Requirements [pg., 19],

No specific regulatory requirements for licensees to conduct routine onsite environmental surveys and monitoring for potential abnormal spills and leaks of radioactive liquids. However, 10CFR 50.72(g) requires that licensees keep records of information important to the safe and effective decommissioning of the facility. These records include information about *known* spills [PW added emphasis to the key word "known"].

There is nothing to assure that spills and leaks will be "known" It is commonsense to recognize that it is not in the interest of the licensee to be caught with the "smoking gun." That is why we need regulators to regulate.

The rule does not define the magnitude of the spills and the leaks that need to be documented by the licensee. Also the rule does not define "significant contamination" that needs to be recorded after the cleanup process. There is no requirement that this information must be submitted to the NRC. However, the records are available for review by NRC inspectors. (Task Force, pg., 19)

### **GPI Objective 2.1 - Stakeholder Briefings**

#### Report

The inspectors verified by discussion with Pilgrim staff and review of documentation that initial briefings have been conducted with designated State and Local officials of the site specific GPI program. The inspectors verified Pilgrim has considered including additional information or updates on groundwater protection in the annual reports for the State and local officials.

### <u>PW Comment</u>

- 1. The report says that, inspectors verified (that) initial briefings have been conducted with designated State and local officials." However it did not indicate the nature of those discussions and the initial lack of willingness by Entergy to make important documents available to MDPH. For example, Entergy was at first unwilling to produce the 1967 Hydro-Geo Dames and Moore study to the State.
- 2. The report went on to say that, "The inspectors verified Pilgrim has considered including additional information or updates on groundwater protection in the annual reports for the State and Local officials." However what Entergy "considered" is irrelevant; what is important is what they are committed to do and what NRC will do if the renege on commitments.

### **GPI Objective 2.2 - Voluntary Communications**

#### Report

The inspectors verified that Pilgrim procedures establish communication protocols for communicating leaks and spills to State and Local officials. The inspectors verified that the ODCM establishes communication protocols for groundwater samples exceeding REMP reporting criteria.

#### PW Comment

- 1. The report says that "the inspectors verified that Pilgrim procedures establish communication protocols for communicating leaks and spills to State and local officials." However it is unclear what leaks and spills are considered significant in order to require communication with state and local officials. (See Comment to GPI Objective 1.5, above)
- 2. The report goes on to say that, "The inspectors verified that, "The ODCM establishes communication protocols for groundwater samples exceeding REMP reporting criteria." Does this mean that the communication protocol is only when samples exceed REMP reporting criteria?

### **GPI Objective 2.3 - Thirty Day Reports**

#### Report

The inspectors verified that groundwater samples are analyzed and compared to the standards and limits contained in the ODCM. The inspectors verified that no thirty day special reports for groundwater monitoring have been submitted to the Nuclear Regulatory Commission (NRC).

### PW Comment

MDPH and Dr. Ahlfeld commented in their reports that the persistent findings, although not alarming, were disturbing and that because there is not a clear understanding of groundwater flow that the monitoring wells may not be appropriately located and that the wells are merely picking up the tail of a plume or missing all together a release. Second the results (MW205) have shown reading > 20,000 pCi/L. In order for NRC to assess the issue, it is necessary to obtain sufficient data to monitor trends- not simply wait until the "horse is well out of the barn."

### **GPI Objective 2.4 - Annual Reporting**

### Report

The inspectors verified that appropriate changes have been made to appropriate Pilgrim procedures to support the 2006 performance. The inspectors verified that all groundwater sample results are included in the Annual Radiological Effluent Release Report (ARERR). The inspectors verified that no groundwater samples taken as part of the GPI are part of the REMP program. The inspectors verified that, at the time of this inspection, no water sample results exceeded REMP reporting thresholds since the implementation of the GPI. Enclosure

#### PW Comment

The report says that, "no water sample results exceeded REMP reporting thresholds since the implementation of the GPI." However what the report fails to focus upon is the following (a) Samples exceeded 20,000 pCi/L (the EPA limit far exceeds the pCi/L goal of California, Colorado, and Ontario); (b) results of tritium findings at PNPS vary and are persistent.

This is especially striking given: (a) the inadequate number of monitoring wells for a large industrial complex with a mile of shoreline; (b) wells were placed not in accordance with (i) standard monitoring well design, (ii) a recent and complete subsurface hydrological-geological survey over the entire site has not been done to provide a basis for well placement, and (iii) the buried components are made of corrosive materials, most are old, and components are buried in a site specific environment conducive to corrosion.

### GPI Objective 3.1 - Perform a Self Assessment of the GPI Program

### <u>Report</u>

The inspectors verified that an independent individual performed the initial self assessment of the groundwater program prior to the implementation of the GPI and another self assessment performed in 2009. The inspectors verified that self assessments are specified every five years per Pilgrim procedures. The inspectors verified that the self assessmentincluded an evaluation of all of the GPI objectives. The inspectors verified the self assessments are documented in accordance with Pilgrim procedures.

#### **PW** Comment

- 1. The report says that, "The inspectors verified that an independent individual performed the initial self assessment of the groundwater program prior to the implementation of the GPI and another self assessment performed in 2009. However a so-called "independent verification" provides no assurance that it was a fair, accurate and thorough assessment. Typically when the licensee hires a contractor, the licensee provides the work project scope and assumptions that, in turn, determines the results. This often results in getting the answer that was paid for.
- The report says that, "The inspectors verified that self assessments are specified every five years per Pilgrim procedures." However self-assessments or more honestly selfinterested, self assessments are no substitute for qualified NRC evaluations – evaluations going beyond parroting back what the licensee says.

Second, although every 5 years is an inadequate time –frame, NRC is silent. It is inadequate because, for example: There is no requirement to shorten a subsequent inspection/self assessment based upon the degree of corrosion discovered at the time of the prior inspection. Absent from this procedure is the prudent and practical guidance to conduct the inspection provisions of this procedure when opportunities present themselves, regardless of the inspection intervals in the BPTIMP's Table 4. (NRC Electronic Library, ADAMS Accession No. ML080740410, see Exhibit 14, complete Exhibit list pg.,104) For example, if a section of buried piping categorized as having "Low" inspection priority is excavated for other reasons, this excavation procedure

should direct/require workers to take advantage of the opportunity and perform inspections- corrosion is neither linear nor constant across the component's length.

### GPI Objective 3.2 - Review the Program Under the Auspices of NEI

#### <u>Report</u>

The inspectors verified an independent individual performed an initial review after the initial assessment. The inspector verified that Pilgrim procedures require a periodic review of the GPI program every five years.

### <u>PW Comment</u>

Same as comment above (GPI Objective 3.1)

### **b.** Findings and Assessments

No findings were identified. Implementation of the Industry GPI is voluntary. Under the final Initiative, each site was to have developed an effective, technically sound groundwater protection program by August 2008. The inspectors identified that, at the time of this inspection, Pilgrim had not taken action on all groundwater initiative objectives (as outlined in the Temporary Instruction) as follows:

### PW Comment

 The report says that, "Implementation of the Industry GPI is voluntary." This is the heart of the problem – an abdication by NRC of the agency's responsibility to protect public health and safety by assuring that its own regulations are followed. In other words to be the cops posted along the highways to assure traffic laws are adhered to and the public not endangered.

NRC regulations require licensees to have in place an effective program for monitoring radiation on-site and off-site: the release of unmonitored material is against regulation.<sup>3</sup>

10 C.F.R. § 20.1302 Compliance with dose limits for individual members of the public: (a)(b)

10 C.F.R. § 50 Appendix A: Criterion 60--Control of releases of radioactive materials to the environment. The nuclear power unit design shall include means to control suitably the release of radioactive materials in gaseous and liquid effluents and to handle radioactive solid wastes

<sup>&</sup>lt;sup>3</sup> NRC's Liquid Radioactive Release Lessons Learned Task Force, Final Report, September 1, 2006, Section 3.2.1.2, Existing Regulatory Framework

While leaks of radioactively contaminated water into the ground for extended periods may not have been operational occurrences anticipated when Pilgrim was initially designed and licensed, they can scarcely be "unanticipated" following the series of such occurrences around the country, most discovered by happenstance and usually remained undetected for an extended period of time permitting larger amounts of contaminated water to enter the ground or air around the facilities.

Pertinent regulations also include 10 C.F.R § 50 Appendix B, Quality Assurance Criteria; it requires that leaks be "promptly identified and corrected." Therefore, in order to comply with this regulation and its CLB, Entergy must identify leaks (not simply leaks that are "too great") and promptly fix them when found. This regulation makes absolute sense. Unidentified leaks in the buried pipes and tanks may not only result in excessive radiation doses, they also may jeopardize the design and intended functions of safety related systems and components at the Pilgrim Nuclear Power Station. Further, corrosion cannot be assumed gradual; in fact, Dr. Davis, NRC Staff expert, said at the License Renewal adjudicatory Hearing, "once corrosion starts it goes quickly" [Tr., page 729]. Also the older the component, the more likely it is for leakage to occur;<sup>4</sup> and corrosion is especially likely in Pilgrim's site specific environment. Pilgrim is located in New England, a moist climate and on the shores of Cape Cod's salt water bay; soil tests provided by Entergy in the LR adjudication procedure were neither current nor comprehensive.<sup>5</sup> Last, looking forward, there is no experience with either the LR AMP or with reactors operating beyond 40 years.

2. The report says that, "Pilgrim had not taken action on all groundwater initiative objectives (as outlined in the Temporary Instruction)" and identifies a couple of issues

<sup>4</sup> Pilgrim Watch Post Hearing Finding of Facts and Conclusion of Law, June 9, 2008, Facts 24-31

<sup>5</sup> Ibid, Fact 42-52.

produced during normal reactor operation, including anticipated operational occurrences. Sufficient holdup capacity shall be provided for retention of gaseous and liquid effluents containing radioactive materials, particularly where unfavorable site environmental conditions can be expected to impose unusual operational limitations upon the release of such effluents to the environment. *Criterion 64--Monitoring radioactivity releases*. Means shall be provided for monitoring the reactor containment atmosphere, spaces containing components for recirculation of loss-of coolant accident fluids, effluent discharge paths, and the plant environs for radioactivity that maybe released from normal operations, including anticipated operational occurrences, and from postulated accidents.

in GPI 1.2 and 1.4 below. However NRC Staff fail to critically evaluate the effectiveness of the Entergy's GPI (A.K.A. BPTIMP) that is prerequisite to exercising NRC's duty to provide "reasonable assurance" that public health and safety are being protected. For example, based on the expert testimony provided by Arnold Gundersen for Pilgrim Watch (Pilgrim LRA Hearing, Contention 1, NRC's Electronic Library, ADAMS Accession No. ML080740410, see Exhibit 1 (complete Exhibit list pg.,104)

<u>Section 5.0, subsection [1]</u> at page 7 acknowledges right at the beginning that "The risk of a failure caused by corrosion, directly or indirectly, is probably the most common hazard associated with buried piping and tanks."[Ibid]

Steps required in building a risk assessment tool are discussed in <u>Section 5.0</u>, <u>subsection [2]</u> <u>on page 7</u>. However, the program fails in that it does not require a complete baseline review. There is no indication that the entire component is supposed to be examined; instead escape hatches are provided to the licensee - such as [at 2a] "the size of each section shall reflect practical considerations of operation, maintenance, and cost of data gathering with respect to the benefit of increased accuracy." Any program worth its salt would require a thorough baseline inspection along the entire length of the pipe.[Ibid]

<u>Section 5.2, Scope Program subsection [3]</u> at page 8 acknowledges the validity of Pilgrim Watch's initial contention that, "The program shall include buried or partially buried piping and tanks that, if degraded, could provide a path for radioactive contamination of groundwater. Some examples are: Buried piping containing contaminated liquids." Entergy agrees that "radioactive contamination of groundwater" is an important issue and belongs in the Buried Piping and Tanks Inspection and Monitoring Program. [Ibid]

Section 5.4 Identification of Buried Piping and Tanks to be Inspected and Prioritized, page 9, Subsection [1] directs the licensee to develop a list of all systems containing buried piping and tanks and to identify those sections, collecting physical drawings, piping/tank installation specifications, piping design tables and other data needed to support inspection activities. The criteria must specify other key parts of the components, for example: wall thickness; number and location of welds, elbows, flow restrictions; blank flanges; high velocity

portions; whether the component has substandard parts; the age of the components parts; cathodic protection; last inspection date and report number; and manufacturer's warranty, if any. This information is the type of information that is needed when the NRC Staff conducts their safety evaluation so that the SER Report will be meaningful; unfortunately it was not available. The license application decision should be delayed until the information is available and critically reviewed. [Ibid]

<u>Subsection [4]</u> categorizes the piping into high, medium and low impact. High impact components require prompt attention. The Board agrees that they should require prompt attention however Entergy's definition of "prompt" allows considerable delay – high impact buried sections shall be examined within 9 months of issuance of the procedure; and no date is given when the procedure shall be initiated. The impact assessment lists radioactive contamination as "High Risk," confirming the validity of Pilgrim Watch's initial contention that radioactive contamination should be part of this adjudication process. Note Table 1 below:

	High	Medium	Low
Safety (Class per EN-DC-167)	Safety Related	Augmented QP and Fire Protection	Non-Safety Related
Public Risk	Radioactive Contamination e.g. Tritium	Chemical/Oil Treated System gases	Untreated Water SW, Demin Water
Economics (Cost of buried equipment failure to plant)	>\$1M or Potential • Shutdown	>\$100K<\$1M	<\$100K
Notes: 1. Any buried section rating.	n with at least one High	Impact rating gets an ov	rerall High Impact
2. Any buried section	n with no High Impact R	ating but at least one Me	edium Impact rating

#### Table 1 Impact Assessment

<u>Section 5.5, Table 4 on page 13</u>, "Inspection Intervals vs. Inspection Priority" reflects the outcome from an assessment of the risks from buried piping and tanks.

Buried piping and tanks having high risk are specified as having an initial inspection period of <u>5 years</u> with a re-inspection interval of 8 years. The time interval is too long [Ibid]

The Table does not tell how much of the component will be inspected.

There is no requirement to shorten a subsequent inspection based upon the degree of corrosion discovered at the time of the prior inspection. [Ibid]

Absent from this procedure is the prudent and practical guidance to conduct the inspection provisions of this procedure when opportunities present themselves, regardless of the inspection intervals in Table 4. For example, if a section of buried piping categorized as having "Low" inspection priority is excavated for other reasons, this excavation procedure should direct/require workers to take advantage of the opportunity and perform inspections-corrosion is neither linear nor constant across the component's length. [Ibid]

In <u>subsection [5], the</u> determination of inspection locations may also consider the "ease of access to inspection point." However, ease of location and lack of corrosion do not necessarily go together. A component that is difficult to access may never been inspected – all the more reason that it should be inspected now. [Ibid]

<u>Section 5.6</u>, Parameters to be Inspected, page 13, lists: external coatings and wrapping condition; pipe wall thickness degradation; tank plate thickness degradation; and cathodic protection system performance, if applicable. The attributes that must be considered in tabulating risk are too narrow. They include: (a) soil resistivity measurement; (b) drainage risk weight; (c) material risk weight; (d) cathodic protection/coating risk weight. [Ibid]

The list in Section 5.6 should be expanded to include, for example, the age of the component's parts; the number of high risk corrosion areas in component such as welds, dead spots etc; counterfeit or substandard part not replaced. The list is silent on internal corrosion even though corrosion from the inside can bring about a failure. [Ibid]

Section 5.6 also is silent on the size of the sample required, its location, and the rational for the sampling protocol - if, in fact, a sample is taken and not an inspection of the entire component. [Ibid]

Section 5.7, on page 13, provides vague remarks about acceptance criteria for any degradation of external coating, wrapping and pipe wall or tank plate thickness. It says that

they should be based on current plant procedures; and if not covered by plant procedures then new procedures need to be developed before the inspections. The pass/fail grade should be clearly defined. For example what precisely constitutes an "unacceptable" from an "acceptable" degraded external wrapping? The LLTF was very specific that "significant" and other such descriptions need definition. [Ibid]

<u>Section 5.8, Corrective</u> Actions, page 14, says that "a condition report (CR) shall be written if acceptance criteria are not met. Any and all inspections should generate a written 'condition report' regardless of what is or is not found to maintain a permanent paper trail of all inspections. [Ibid]

The Section also says that corrective actions *may* include engineering valuations, scheduled inspections, and change of coating or replacement of corrosion susceptible components, and those components that do not meet acceptance criteria shall be *dispositioned* by engineering. [Emphasis added]. This provides no assurance to public safety for the following reasons. [Ibid]

The corrective actions *may* include engineering valuations, scheduled inspections, and change of coating or replacement of corrosion susceptible components; but they also "may not." These should be required.

The licensee's own engineering department will deal with it; but there is no clear definition of how they will deal with it. There should be layers of supervision and that the NRC should have an oversight role in this program?

Who sees the Condition Reports – or to put it another way, where are the reports kept, who has access to those reports, do they have to be sent to the NRC and if so under what conditions and time schedule? A more basic issue is that Condition Reports are unlikely to be written or, if they are written, to actually say anything as explained directly below.

<u>Section 5.12 Inspection Methods and Technologies/Techniques</u>, subsection [1] on page 15 specifies steps to be taken for Visual Inspections of buried piping and tanks. Step (g) directs the workers: "A CR [condition report] shall be initiated if the acceptance criteria are not

met." A review of steps (a) through (f) reveal a lack of objective, or even subjective, acceptance criteria that could trigger a condition report:

When opportunities arise, buried sections of piping and tanks "should be examined to quantify deposit accumulation...and those results documented." As long as exposed piping is examined and damage chronicled, the acceptance criteria are met - no condition report.

"Look for signs of damaged coatings or wrapping defects"-as long as workers look the acceptance criteria are met. Only not looking would fail to meet the acceptance criterion and trigger a condition report.

"The interior of piping may be examined by divers, remote cameras, robots or moles when appropriate." The combination of "may" and "when appropriate" means the acceptance criterion is met when examinations are performed or not.

"Use holiday tester to check excavated areas of piping for coating defects." When coating defects are found for exposed area of piping using a holiday tester, the acceptance criteria is met and no condition report is written.

If visual inspection reveals coatings or wrappings not to be intact, further inspection of piping for signs of pitting, MIC, etc is required. If the additional inspection is performed, the acceptance criterion is satisfied then (and) no condition report is warranted whether damage is found or not.

Inspect below grade concrete for indication of cracking and loss of material. As long as the inspection is performed, the acceptance criterion is satisfied whether damage is found or not. [Ibid]

<u>Section 5.12 subsection</u> [2] on page 16 specifies the steps to be taken for Non-Destructive Testing of buried piping and tanks. No steps direct workers to initiate condition report(s) regardless of how extensive the piping and/or tank damage is identified. [Ibid]

### **GPI Objective 1.2**

#### Report

Pilgrim has identified SSCs that involve or could reasonably be expected to involve licensed material and for which there is a credible mechanism for licensed material to reach

groundwater. However, Pilgrim has not identified work practices that involve or could reasonably be expected to involve licensed material and for which there is a credible mechanism for licensed material to reach groundwater. Pilgrim has not established a relative risk for the SSCs identified. Pilgrim has not identified existing leak detection methods for each SSC and work practice that involve or could reasonably be expected to involve licensed material and for which there is a credible mechanism for licensed material to reach groundwater.

Pilgrim has not identified potential enhancements to leak detection systems or programs. Pilgrim has not identified potential enhancements to prevent spills or leaks from reaching groundwater. Pilgrim has a written long term program; however, it has not been formalized.

### PW Comment

Please refer to comment 2, directly above.

### **GPI Objective 1.4**

#### Report

Pilgrim has not documented an evaluation of the decommissioning impacts resulting from remediation activities or the absence of remediation activities. However, a draft procedure has been written about the subject.

In the 2007/2008 period, in accordance with the voluntary Groundwater Protection Initiative (NEI-07-07), Pilgrim installed four monitoring wells (MW-201, 201, 203, and 204) that were located to detect potential radioactive material leakage from underground structures, systems, and components (SSCs). These wells, and two other existing monitoring wells (MW-3 and MW-4), were incorporated into Pilgrim's groundwater protection program, and have been sampled on a quarterly basis. The samples are split with the Massachusetts Department of Public Health (MDPH). These wells have not indicated any condition perceived as an indicator of leakage from any SSC.

In May 2010, Pilgrim installed six additional groundwater monitoring wells in response to an independent self-assessment that Entergy conducted relative to Pilgrim's implementation of the NEI-07-07 objectives. These wells were identified as MW-202(I), 205, 206, 207, 208(S), and 208(1). [Note: S and I refer to Shallow and Intermediate depth). On May 16, 2010, the first sample results for these six wells were reported. All indicated typically expected results, with the exception of MW-205, which indicated 5,300 picocuries per liter (pCi/l), tritium (H-3). Subsequent sampling on June 11 indicated 8,600 pCi/l; on June 21 indicated 11,000 pCi/l; and on June 30 indicated 8,400 pCill. Since that time, sample results from MW-205 have continued to vary; and the highest concentration measured to-date has been approximately 25,000 pCi/l.

Entergy has been keeping the Massachusetts Emergency Management Agency (MEMA) and the MDPH informed of these conditions, and has issued notifications to the NRC in accordance with 10 CFR 50.72. The licensee has frequently met with representatives of MEMA, MDPH, and NRC to discuss its plans and investigation process for determining the source of the tritium contamination. Additionally, NRC resident inspectors and region-based inspectors have been closely monitoring the licensee's plans, process, and progress in determining the cause and source of the contamination.

The NRC confirmed that Entergy established a technical team dedicated to the resolution of this matter, and has implemented appropriate and reasonable actions to determine the source and to resolve the condition. Frequent sampling of existing wells, development of additional monitoring wells, application of ground penetrating radar surveillance, implementation of leak detection techniques on suspected underground SSCs that are in the vicinity of MW-205, and development of additional hydrological data are continuing. NRC resident inspectors are closely following the licensee's onsite activities, and the licensee is frequently communicating its plans and progress to NRC and to appropriate representatives of the State of Massachusetts.

The NRC will continue to follow the licensee's performance closely to assure conformance with regulatory requirements, and to assure that public health and safety is maintained. Based on information reviewed to-date, the groundwater condition at Pilgrim has not, nor is expect to, result in any public health and safety consequence

### **PW Comment**

- The report says that, "Pilgrim has not documented an evaluation of the decommissioning impacts resulting from remediation activities or the absence of remediation activities. However, a draft procedure has been written about the subject." But there is no description/analysis/evaluation of the "draft procedure," as there should be. This is important, for example, so that there is a record available for NRC and the public to provide assurance that the decommissioning fund is adequate for cleanup and that the Commonwealth will not get unfairly stuck with several hundred million dollars to cover the shortfall, as was the case when Connecticut Yankee closed.
- 2. Paragraphs two forward describe the GPI from November 2007 a description not an analysis. An actual substantive analysis is provided by MDPH, the type of analysis that the public deserves to receive from NRC in Inspection Reports. Please see <a href="http://www.mass.gov/?pageID=eohhs2terminal&L=6&L0=Home&L1=Consumer&L2=Community+Health+and+Safety&L3=Environmental+Health&L4=Environmental+E xposure+Topics&L5=Radiation+Control&sid=Eeohhs2&b=terminalcontent&f=dph\_e nvironmental\_radiationcontrol\_c\_environmental\_monitoring&csid=Eeohhs2; and attachment.</p>

21

3. Paragraph 5 says that, "The NRC confirmed that Entergy established a technical team dedicated to the resolution of this matter, and has implemented appropriate and reasonable actions to determine the source and to resolve the condition 10CFR 50.72(g) requires that licensees keep." But there is no evidence of a subsurface hydro-geo study to be performed over the entire site, with a reasonable target for completion; nor is there a commitment by Entergy to be transparent. In other words their willingness to show the study to the State and public so that its methodology and results can be verified. Absent transparency, there will be no public confidence.

Fortunately we learned from MDPH, the actions Entergy committed to October 2010 – otherwise the public would be in the dark. They include: (1) <u>Dve testing</u>: Entergy staff reported their contractor is onsite and has begun the necessary background work to initiate dye testing in early December. Dye testing will be used to evaluate several possible sources including the roof drains for the reactor building and the radioactive waste truck dock, the rad waste drain line, and the French drain system located near the condensate storage tanks. (2) <u>UT</u>: Entergy reported that they will be conducting ultrasonic testing of condensate storage tank drain lines to further evaluate anomalies detected with ground penetrating radar. Although Entergy currently believes these anomalies are not potential leak sources, they are doing the ultrasonic testing to confirm this. The testing is expected to begin in November 2010. (3) <u>Roof Air Conditioning</u>: In response to a request from the NRC, Entergy plans to further explore the possibility that condensate generated from their roof air conditioning systems may concentrate permitted air emissions of tritium into storm water, which may ultimately impact tritium levels in groundwater.

They are essentially plume-chasing measures. That is, they appear to have a problem. Let's try to find out where that tritium is and going and looking for it, which is a good thing to do but is somewhat different than a hydrogeologic assessment where we're really trying to understand the behavior over the whole site. (Dr. David Ahlfeld, 2.206 Teleconference (08/13/10) Transcript, pg., 20) <u>Rain</u>: Absent in the NRC Inspection Report also is a discussion/analysis of Entergy's theory that when it rains it rains tritium – but mysteriously only on selected onsite monitoring wells. In a October 13, 2010 to William Dean, Region I, Director, and Donald Jackson, Region I, Branch Chief, Pilgrim Watch and the Town of Duxbury Nuclear Advisory Committee made the following remarks in response to NRC comments in the Patriot Ledger, October 13<sup>th</sup>.

If Neil Sheehan's statement in the October 13, 2010 Patriot Ledger regarding elevated levels of Tritium found in samples at Pilgrim NPS monitoring wells is correct in that tritium being discharged from Pilgrim's very tall stack is concentrating to levels above the EPA drinking water standard due to rain, NRC is conceding that the existing basis for release limits is invalid and that Pilgrim is in reality exceeding allowable release limits. Therefore NRC must require Pilgrim to reduce power to come into compliance. The existing basis assumes the radioactivity in the gaseous effluent mixes fairly uniformly with the air, resulting in a negligible dose to the public located offsite. But if rain impedes that mixing/dilution effect, all bets are off.

Assuming NRC staff buys into Neil Sheehan's expressed notion, in addition to requiring Pilgrim to reduce power, NRC would have to back up that position by also requiring more extensive monitoring of pools, ponds, lakes, rivers, and drinking wells off the owner controlled areas. After all, it does not rain just on the plant. NRC's guarantee of "reasonable assurance" cannot be met otherwise.

An analysis sent to NRC by David Lochbaum, Tritium Contamination Via Precipitation (October 15, 2010) attached, he explained that if the rain theory held one would expect tritium deposited by rain at other locations. But Entergy's PNPS REMPs year after year reported "no radiation attributable to Pilgrim Station was detected in any samples."

### CONCLUSION

The foregoing step-by-step analysis makes clear that the entire report lacks substance. It provides neither a basis for either denying the 2.206 Petition nor any reason for the public to have an ounce of confidence in NRC's oversight. The public deserves better.

Respectfully prepared by,

Joining Pilgrim Watch,

Mary lampert Pilgrim Watch, Director 148 Washington Street Duxbury, MA 02332 Respectfully prepared by, Rebecca Chin Town of Duxbury Nuclear Advisory Committee 41 Deerpath Trl North Duxbury, MA 02332

## ATTACHMENT

• David Lochbaum, Tritium Concentration Via Precipitation, October 15, 2010

(



## Union of Concerned Scientists

Citizens and Scientists for Environmental Solutions

October 15, 2010

William Dean, Administrator U.S. Nuclear Regulatory Commission Region I 475 Allendale Road King of Prussia, PA 19406-1415

### **SUBJECT:**

### **Tritium Contamination via Precipitation**

Dear Mr. Dean:

In an article titled "Pilgrim tritium levels back above federal drinking water standards" that appeared in the October 13, 2010, issue of *The Patriot-Ledger*, reporter Jon Chesto attributes the following information to Neil Sheehan on your staff:

Neil Sheehan, a spokesman for the Nuclear Regulatory Commission, said his agency is satisfied that Entergy is taking the right steps to solve the mystery at Pilgrim. Sheehan said the volatility in tritium levels could indicate that the problem isn't an underground leak or spill. He said an alternative theory is that the radioactive isotopes are being swept off the rooftop at the plant's spent fuel building by rain, which could explain the fluctuations.

Mr. Sheehan and/or the NRC staff seem fond of this 'tritium precipitation' theory, having trotted it out in the past. For example, Mr. Sheehan used it earlier this year to suggest that tritium detected on the Oyster Creek site may actually be a legacy issue caused by rainfall following a 2005 event.

Having followed the recurring tritium leakage issue since January 2006, I have explored this 'tritium precipitation' theory as a possible explanation for at least some of the reported tritium detections. My due diligence for Pilgrim (and for Oyster Creek) leads to my conclusion that it is extremely unlikely that 'tritium precipitation' contributed in any meaningful way to the detections of tritium by monitoring wells and other sampling systems at Pilgrim.

I concede that precipitation may be a factor in the detection of tritium at Pilgrim and other nuclear plant sites, but not in the manner suggested by Mr. Sheehan. Rather than scrubbing tritium in gaseous form out of the air and depositing it in the soil, precipitation more likely serves. to accelerate the transportation of tritium in water leaking from underground piping and components from the leak to the monitoring wells and sampling points.

www.ucsusa.org | Two Brattle Square - Cambridge, MA 02238-9105 - TEL: 617.547-5552 - FAX: 617.864-9405 1825 K Street NW - Suite Boo - Washington, BC 20006-1232 - TEL: 202.223.6133 - FAX: 202.223.6162 2397 Shattuck Avenue - Suite 203 - Berkeley, CA 94704-1567 - TEL: 510.843.1872 - FAX: 510.843.3785 One North LaSalle Street - Suite 1904 - Chicago, 1L 60602-4064 - TEL: 312-578-1750 - FAX: 312-578-1751 Since the NRC continues to recycle its 'tritium precipitation' theory, I respectfully request that you direct your staff to publicly issue some form of justification, evaluation, or statement explaining why they believe this notion and all evidence they relied upon in reaching their conclusion. I have expended considerable time looking for evidence suggesting that the theory might be credible, but have not yet found any. Along the way, I have come across plenty of evidence indicating the theory is more fiction than fact as detailed in the attachment. I am putting the basis for my conclusions on the record and simply ask that the NRC staff publicly back up its assertions, too.

I look forward to the NRC's staff's basis for its 'tritium precipitation' theory.

Sincerely,

Davis a Fullan

David Lochbaum Director, Nuclear Safety Project PO Box 15316 Chattanooga, TN 37415 (423) 468-9272

Attachment: "Tritium Precipitation at Pilgrim" (4 pages)



## **TRITIUM PRECIPITATION AT PILGRIM**

Tritium concentrations measured in samples drawn from monitoring wells at the Pilgrim nuclear plant near Plymouth, Massachusetts have fluctuated over a wide range. It has been suggested that large increases in the tritium concentrations may be caused by precipitation washing tritium off building roofs into the soil where it then migrates to the monitoring wells.

Some facts support this tritium precipitation theory. According to radiological release information submitted by Pilgrim's owner each year to the NRC, approximately 98 percent of the tritium in gaseous form is discharged from the plant via ground-level release points. Only about 2 percent of the gaseous tritium is discharged via the 300-plus feet tall stack at Pilgrim.



The drawing of the ventilation system for Pilgrim's reactor building (available in NRC's ADAMS library under Accession No. ML060470360) shows that water evaporating from the spent fuel pool inside the reactor building is normally exhausted from a vent mounted to the building's roof. The spent fuel pool water contains tritium in high concentrations.

Collectively, this information indicates that the majority of the nearly 400 curies of tritium discharged in gaseous form by the Pilgrim plant in the five year period from 2005 to 2009 left through the vent on the reactor building roof.

Even a small portion of that released tritium collecting on the reactor building roof until rainfall washed it down to the surrounding soil could easily account for the tritium concentrations measured in the monitoring wells. These facts lend credence to the tritium precipitation theory.

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October 15, 2010

But for the theory to have validity, the rest of the discharged tritium would have to be detected elsewhere. After all, the tritium does not come to rest only on the reactor building roof and rain does not fall only on that rooftop. Pilgrim's owner routinely samples surface water and other locations in the proximity of the plant. If the tritium precipitation theory held water, one would expect to detect tritium deposited by rainfall in other locations. Perhaps not to as high a level as measured in locations receiving roof run-off, but certainly to levels above background.

Table 2.2-1 from the owner's annual submittals shows that surface water is sampled from three locations ranging from 0.2 kilometers (656 feet) to 13 kilometers (8 miles) away. As reported in Tables 2.12-1 from the owner's annual submittals for 2004 to 2008, detectable levels of tritium have never been found in all of these surface water samples. Not once from any location near or far. (NOTE: LLD in Tables 2.12-1 means "lower limit of detection" which for tritium is 3,000 picocuries per liter).

Table 2.2-1 (continued)								
Routine Radiological Environmental Sampling Locations								
	Pilgrim Nuclear Power Station, Plymouth, MA							
Description	Description No Code Distance Direction							
Surface \	Surface Water							
Discharge	Discharge Canal 11 DIS 0.2 km N							
Bartlett P	Bartlett Pond				BP	2.7	km	SE
Powder F	Powder Point Control				PP	13	km 👘	NNW
			Table 2.1	2-1				
			Surface Water Radioa	ctivity /	Analyses			
	Radiological Environmental Program Summary Pilgrim Nuclear Power Station, Plymouth, MA (January - December 2004)							
		l.	MEDIUM: Surface Water (WS	<u>5) U</u> İ	NITS: pCi/kg			
Dedienvelide	Indicator Stations Station with Highest Mean Control Stations   No. Analyses Required Range Station: Mean ± Std.Dev. Mean ± Std.Dev.							trol Stations n ± Std.Dev. Range
H-3	Hadionuclide Non-routine" LLD Fraction>LLD Fraction>LLD Fraction>LLD Fraction>LLD Fraction>LLD Fraction>LLD							
					<lld< td=""></lld<>			
			0/8		0/4	_		0/4
	Table 2.12-1   Surface Water Radioactivity Analyses							
Radiological Environmental Program Summary Pilgrim Nuclear Power Station, Plymouth, MA (January - December 2005)								
MEDIUM: Surface Water (WS) UNITS: pCi/kg								
Badionuclide	Indicator Stations Station with Highest Mean Control Stations   No. Analyses Required Range Station: Mean ± Std.Dev. Mean ± Std.Dev.   No. Analyses Required Range Range Range							
H-3	12	3000				+	F Id	
	0		<ld< td=""><td></td><td><lld< td=""><td></td><td></td><td><ld< td=""></ld<></td></lld<></td></ld<>		<lld< td=""><td></td><td></td><td><ld< td=""></ld<></td></lld<>			<ld< td=""></ld<>
			0/8		0/4			0/4

	Table 2.12-1   Surface Water Radioactivity Analyses							
	Radiological Environmental Program Summary Pilgrim Nuclear Power Station, Plymouth, MA (January - December 2006)							
	MEDIUM: Surface Water (WS) UNITS: pCi/kg							
	Radionuclide	No. Analyses Non-routine*	Required	Indicator Stations Mean ± Std.Dev. Range Fraction>LLD	Station with Highest Mean Station: Mean ± Std.Dev. Range Fraction>LLD	Control Stations Mean ± Std.Dev. Range Fraction>LLD		
		0		<lld< td=""><td><lld< td=""><td><lld< td=""></lld<></td></lld<></td></lld<>	<lld< td=""><td><lld< td=""></lld<></td></lld<>	<lld< td=""></lld<>		
	<u> </u>			0/8	0/4	0/4		
•	Table 2.12-1 Surface Water Radioactivity Analyses							
	Radiological Environmental Program Summary Pilgrim Nuclear Power Station, Plymouth, MA (January - December 2007)							
	MEDIUM: Surface Water (WS) UNITS: pCi/kg							
	Radionuclide	No. Analyses Non-routine*	Required LLD	Indicator Stations Mean ± Std.Dev. Range Fraction>LLD	Station with Highest Mean Station: Mean ± Std.Dev. Range Fraction>LLD	Control Stations Mean ± Std.Dev. Range Fraction>LLD		
	н-3	12	3000	<lld< td=""><td><lld< td=""><td><lld< td=""></lld<></td></lld<></td></lld<>	<lld< td=""><td><lld< td=""></lld<></td></lld<>	<lld< td=""></lld<>		
		0		<lld< td=""><td><lld< td=""><td><lld< td=""></lld<></td></lld<></td></lld<>	<lld< td=""><td><lld< td=""></lld<></td></lld<>	<lld< td=""></lld<>		
				0/8	0/4	0/4		
		÷ ,		Table 2.12	2-1			
				Surface Water Hadioa	ctivity Analyses			
	Radiological Environmental Program Summary Pilgrim Nuclear Power Station, Plymouth, MA (January - December 2008)							
	MEDIUM: Surface Water (WS) UNITS: pCi/kg							
[	Radionuclide	No. Analyses	Required	Indicator Stations	Station with Highest Mean	Control Stations		
Į	4-3	12	3000	<lld< td=""><td><lld< td=""><td><lld< td=""></lld<></td></lld<></td></lld<>	<lld< td=""><td><lld< td=""></lld<></td></lld<>	<lld< td=""></lld<>		
-		0		<lld< td=""><td><lld< td=""><td><lld< td=""></lld<></td></lld<></td></lld<>	<lld< td=""><td><lld< td=""></lld<></td></lld<>	<lld< td=""></lld<>		
				0/8	0/4	0/4		

Year after year Pilgrim's owner informs the NRC that "*No radioactivity attributable to Pilgrim Station was detected in any of the samples collected*" as shown in Figure 2. The owner further reported that the surface water sample results were similar to results obtained from samples taken before the reactor began operating.

Tritium has a 12-year half-life, meaning that half of the tritium released 12 years ago and one-fourth of the tritium released 24 years ago is still around today. Despite the hundreds of curies of tritium in gaseous form released from Pilgrim and all the rainfall near the site, no surface water sample has detected tritium levels above 3,000 picocuries per liter.

### 2.12 Surface Water Radioactivity Analyses

Figure 2

Samples of surface water are routinely collected from the discharge canal, Bartlett Pond in Manomet and from the control location at Powder Point Bridge in Duxbury. Grab samples are collected weekly from the Bartlett Pond and Powder Point Bridge locations. Samples of surface water are composited every four weeks and analyzed by gamma spectroscopy and low-level iodine analysis. These monthly composites are further composited on a quarterly basis and tritium analysis is performed on this quarterly sample.

A total of 36 samples (3 locations \* 12 sampling periods) of surface water were collected and analyzed as required during 2008. Results of the analyses of water samples are summarized in Table 2.12-1. Naturally-occurring potassium-40, radium-226, and actinium/thorium-228 were detected in several of the samples, especially those composed primarily of seawater. No radioactivity attributable to Pilgrim Station was detected in any of the samples collected during 2008, and results of any detectable naturally-occurring radioactivity were similar to those observed in the preoperational monitoring program.

Tritium released from Pilgrim in gaseous form is <u>not</u> being detected in surface water sampled around the plant. This strongly suggests that tritium is not falling to the ground, either on its own or with raindrops, and then transported by run-off into creeks and streams to the surface water being sampled. One of those samples points is within 700 feet of the reactor building. The compelling evidence against tritium precipitation contaminating offsite surface water is equally compelling evidence against tritium precipitation contaminating the onsite monitoring wells.

The tritium detected in the onsite monitoring wells at Pilgrim is most likely coming from leaks from buried piping and components. Precipitation could play a role, but not in the roof run-off scenario. Precipitation soaking into the soil at Pilgrim could accelerate the migration of tritium leakage from its source to the monitoring well locations.

What difference does it make where the tritium came from? When tritium is falsely perceived to be caused by rainfall washing it off building rooftops, the search for – and more importantly, the stoppage of – tritium leaking from buried piping can be delayed.

Absent solid, compelling evidence to the contrary, detection of tritium in monitoring wells at Pilgrim and other nuclear plant sites should be considered indications of underground leakage. Theories like roof runoff, tritium fairies sprinkling tritium dust about, or terrorists sneaking onsite to spike the wells must not distract the search for the real-life cause of the leakage.

Prepared by: David Lochbaum Director, Nuclear Safety Project Union of Concerned Scientists

## Jaegers, Cathy

From:	Mary Lampert [mary.lampert@comcast.net]
Sent:	Monday, November 15, 2010 1:22 PM
То:	Docket, Hearing
Cc:	Guzman, Richard
Subject:	Request To Commission To Review PRB Decision Denying Pilgrim Watch's 2.206 Petition
	Regarding Hydrologic Assessment at PNPS
Attachments:	2 206 -Petitioner's Response RE Denial 2 206 Hydo-Geo Study 11 15 10.pdf; RAIN THEORY LETTER LOCHBAUMTO NRC REG I 1015 10.pdf

Hello

Attached please find a request to the Commission to review the PRB decision denying Pilgrim Watch's 2.206 Petition Regarding Hydrologic

Assessment at PNPS.

If you have any difficulty in opening the documents, please call Mary Lampert at 781-934-0389.

1

Thank-you and have a good day.

Mary

Received: from mail2.nrc.gov (148.184.176.43) by OWMS01.nrc.gov (148.184.100.43) with Microsoft SMTP Server id 8.1.393.1; Mon, 15 Nov 2010 13:22:52 -0500

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X-IronPort-AV: E=Sophos;i="4.59,201,1288584000";

d="pdf"?scan'208,217";a="29488789"

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From: Mary Lampert <mary.lampert@comcast.net>

To: "Docket, Hearing" <Hearing.Docket@nrc.gov>

CC: "Guzman, Richard" <Richard.Guzman@nrc.gov>

Subject: =?us-

ascii?Q?Request\_To\_Commission\_To\_Review\_PRB\_Decision\_Denying\_Pilgrim?=

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Date: Mon, 15 Nov 2010 13:22:26 -0500

Message-ID: <002a01cb84f2\$0e84b000\$2b8e1000\$@lampert@comcast.net> MIME-Version: 1.0

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Content-Language: en-us

Return-Path: mary.lampert@comcast.net