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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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Before the Atomic Safety and Licensing Board Panel

OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

In the Matter of)

Entergy Nuclear Generation Company and)
Entergy Nuclear Operations, Inc.)

(Pilgrim Nuclear Power Station))

Docket No. 50-293-LR
ASLBP No. 06-848-02-LR

**ENTERGY'S REPLY TO PILGRIM WATCH'S PROPOSED POST-HEARING
FINDINGS OF FACT AND CONCLUSIONS OF LAW ON CONTENTION 1**

David R. Lewis
Paul A. Gaukler
PILLSBURY WINTHROP SHAW PITTMAN LLP
2300 N Street, NW
Washington, DC 20037-1128
Tel. (202) 663-8000

Counsel for Entergy L.L.C.

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Pursuant to 10 C.F.R. § 2.712 and the Orders of the Atomic Safety Licensing Board (“Licensing Board” or “Board”) dated December 19, 2006¹ and May 12, 2008,² Entergy Nuclear Generation Company and Entergy Nuclear Operations, Inc. (collectively, “Entergy”) hereby reply to the Post-Hearing Findings of Fact Conclusions of Law of Pilgrim Watch.³ In its Findings, Pilgrim Watch seeks to raise new issues, makes broad assertions unsupported by any evidence in the record, and essentially ignores much of the evidentiary record developed on the Contention. As such, Pilgrim Watch’s proposed findings are not reflective of the evidence in the record and provide no basis for a decision.

I. INTRODUCTION AND OVERVIEW

Pilgrim Watch’s proposed findings provide no basis in law or fact for the Board’s decision on Pilgrim Watch Contention 1. In its Findings, Pilgrim Watch continues to rely on material outside of the evidentiary record and broad assertions devoid of any evidentiary support whatsoever. Approximately one-third of Pilgrim Watch’s proposed findings do not contain a single citation to the evidentiary record.

¹ Order (Establishing Schedule for Proceeding and Addressing Related Matters) (Dec. 20, 2006).

² Order (Setting Deadlines for Provisional Proposed Findings and Conclusions on Contention, and for Pleadings related to Pilgrim Watch’s Recent Motion Regarding CUF’s) (May 12, 2008).

³ Pilgrim Watch Post-Hearing Findings of Fact Conclusions of Law (June 9, 2008) (“PW Findings”).

Many of Pilgrim Watch's proposed findings must be rejected as improperly based on new claims that were never raised in the hearing.⁴ For example, for the first time in this proceeding – and without any support in the evidentiary record – Pilgrim Watch argues that the Salt Service Water (“SSW”) system discharge pipe experiences stress caused by thermal expansion and offers simplified calculations from which Pilgrim Watch argues that the metal will “break just as a paper clip eventually snaps.”⁵ No such calculation appears in the record, and Pilgrim Watch presented no testimony or other evidence supporting such findings. Similarly, Pilgrim Watch claims for the first time – again without any support in the record - that ocean water is acidic because of global warming.⁶ Such new claims, never raised at the hearing and unsupported by any evidence in the record, are clearly impermissible under Commission regulations and precedent.⁷

Pilgrim Watch also continues its practice of making broad, unsupported assertions as if they were factual evidence. For example, Pilgrim Watch's Proposed Finding 63 claims, “Pilgrim Watch . . . documented how coatings could be breached exposing the metal underneath and site specific examples of coating failures.”⁸ Proposed Finding 63 contains no citation to the record and Pilgrim Watch presented no documentation at the hearing on specific examples of coating failures or even on how coatings might possibly be breached. Similarly, Pilgrim Watch's Proposed Finding 64 claims that, “[a]s the evidence by Pilgrim Watch shows, coatings eventually deteriorate, especially in moist soils such as Pilgrim's.”⁹ Again, Proposed Finding 64 contains no record citation and Pilgrim Watch presented no such evidence at hearing. In

⁴ Pilgrim Watch presents many new arguments in its proposed findings based on materials outside the evidentiary record. See, e.g., ¶¶ 39, 40, 42-43, 47, 53, 55-56, 103, and 105-06.

⁵ PW Findings at ¶ 56.

⁶ PW Findings at ¶ 55.

⁷ See discussion infra Section II.A.

⁸ PW Findings at ¶ 63.

⁹ PW Findings at ¶ 64.

contrast, Entergy presented extensive, uncontradicted evidence, confirmed by the Staff's expert, that properly applied coatings would protect buried piping for many years, and specifically pointed to applicable experience at the Pilgrim Nuclear Power Station ("Pilgrim" or "PNPS") that showed no degradation of the SSW coatings after more than 25 years of service.¹⁰ Pilgrim Watch's numerous unsupported findings, such as Proposed Findings 63 and 64, are merely the assertions of its representative, Mary Lampert, who is not a qualified witness, and thus carry no weight. The Board must disregard such unsupported findings.

Furthermore, when Pilgrim Watch does refer to evidence in the record, it relies almost exclusively on the evidence of its witnesses and ignores much of the rest of the evidentiary record introduced and developed at hearing. For example, Pilgrim Watch argues, "the older the pipe is, the more likely it is that corrosion and leaks will occur."¹¹ However, as shown by Entergy's and the Staff's evidence, pipe materials not exposed to corrosive environments will not corrode,¹² and for that reason Entergy utilizes materials that are resistant to soil induced corrosion and/or completely coats the pipe with impermeable coatings and liners. Pilgrim Watch does not acknowledge or address in its Findings evidence presented by Entergy and the Staff that a pipe's age is not the determinative factor of its susceptibility to corrosion.¹³

Similarly, Pilgrim Watch's claim in Proposed Finding 34 that it "documented and explained precisely why the soil and ocean water is corrosive" ignores unrebutted evidence in the

¹⁰ See Entergy's Proposed Findings of Fact and Conclusions of Law on Pilgrim Watch Contention 1 (June 9, 2008) ("Entergy Findings") at ¶¶ 52-59.

¹¹ PW Findings at ¶ 27.

¹² Entergy Findings at ¶ 39; see also Exh. 1, Testimony of Alan Cox, Brian Sullivan, Steve Woods, and William Spataro on Pilgrim Watch Contention 1, regarding Adequacy of Aging Management Program for Buried Pipes and Tanks and Potential Need for Monitoring Wells to Supplement Program (Jan. 8, 2008) ("Entergy Test.") (admitted at Tr. 571) at A47, A67, A71 and A90.

¹³ Exh. 2, Rebuttal Testimony of Alan Cox, Brian Sullivan, Steve Woods, and William Spataro on Pilgrim Watch Contention 1, Regarding Adequacy of Aging Management Program for Buried Pipes and Tanks and Potential Need for Monitoring Wells to Supplement Program and Response to Atomic Safety and Licensing Board's Questions of February 21, 2008 (Mar. 6, 2008) ("Entergy Reb. Test.") (admitted at 571) at A16.

record of the non-aggressive soil conditions at the PNPS site. Pilgrim Watch bases Proposed Finding 34 solely on Mr. Gundersen's assertion that "because Pilgrim Station is located adjacent to Cape Cod Bay and at a low elevation, it is readily apparent that the soil surrounding the piping is not 'friendly.'"¹⁴ Mr. Gundersen did not support his speculation with any specific knowledge of the actual soil characteristics at the site. Nor does Mr. Gunderson possess any qualifications that would allow him to provide expert testimony on soil chemistry. In contrast, Pilgrim Watch simply ignores extensive evidence on the measures implemented at Pilgrim to preclude buried piping from being exposed to aggressive soil conditions, and the actual, non-aggressive characteristics of the soil at the PNPS site.¹⁵

Pilgrim Watch faults Entergy for not addressing issues that Pilgrim Watch neither raised nor addressed at the hearing. For example, Pilgrim Watch claims that Entergy failed to carry its burden of establishing the capability of the cured in place pipe ("CIPP") liner because it failed to present any evidence on whether there were problems in the field installation of the CIPP or on the type and sufficiency of the testing performed on the CIPP.¹⁶ Such claims are meritless. Pilgrim Watch was provided, as part of Entergy's disclosures, documents describing the field installation of the CIPP, and never identified any issue with such installation either in its testimony or in its Statement of Position. It is well established under Commission precedent, as discussed in Section II, that Pilgrim Watch bears the burden of going forward with sufficient evidence to require reasonable minds to inquire further. Here, Pilgrim Watch failed to present any evidence at the hearing on the adequacy of the field installation and testing of the CIPP, and thus clearly fell short of meeting its burden of going forward to place these topics in controversy.

¹⁴ Exh. 13, Testimony of Arnold Gundersen Supporting Pilgrim Watch's Contention 1 (Mar. 6, 2008) ("Gundersen Reb. Test.") (admitted at 573) at A12, p. 20.

¹⁵ Compare Entergy Findings at ¶¶ 44-51.

¹⁶ PW Findings at ¶¶ 100-103.

Finally, Pilgrim Watch impermissibly challenges the adequacy of the Staff's review of the Pilgrim License Renewal Application ("LRA") and the Staff's Safety Evaluation Report for the LRA.¹⁷ As the Commission has long stated, however, the sole focus of a hearing is on whether an application satisfies NRC requirements, and not on the adequacy of the Staff's performance.¹⁸ Thus, these challenges are likewise irrelevant to the Board's resolution of Contention 1.

Because Commission regulation and precedent require findings to be based on material contained in the record, Entergy will not respond in this Reply to the numerous asserted findings for which Pilgrim Watch provides no evidentiary or legal basis. Additionally, Entergy will not generally repeat in this Reply responses that Entergy has already made in its Findings to numerous Pilgrim Watch claims. As set forth in Entergy's Findings, the license renewal aging management programs ("AMPs") for buried pipes at the Pilgrim plant provides reasonable assurance that the buried pipes will not develop leaks so great as to prevent those pipes from performing their license renewal intended function. Nothing in Pilgrim Watch's proposed findings of fact and conclusions of law alters this fundamental conclusion.

II. LEGAL STANDARDS

A. Findings of Fact are Confined to Material Presented on the Record.

Commission regulations and precedent require that a party's proposed findings of fact be based on material contained in the record. See Public Service & Gas Co. (Salem Nuclear

¹⁷ PW Findings at ¶¶ 209-23.

¹⁸ "With the exception of NEPA issues, the sole focus of the hearing is on whether the application satisfies NRC regulatory requirements, rather than the adequacy of the NRC Staff performance." Final Rule, Rules of Practice for Domestic Licensing Proceedings – Procedural Changes in the Hearing Process, 54 Fed. Reg. 33,168, 33,171 (Aug. 11, 1989) (citing Pacific Gas & Electric Co. (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-728, 17 N.R.C. 777, 807, review declined, CLI-83-32, 18 N.R.C. 1309 (1983). An Atomic Safety and Licensing Board has no jurisdiction to review the NRC Staff's review process. Sacramento Municipal Utility District (Rancho Seco Nuclear Generating Station), CLI-93-5, 37 N.R.C. 168, 170 (1993); Northeast Nuclear Energy Co. (Montagne Nuclear Power Station, Units 1 and 2), LBP-75-19, 1 N.R.C. 436 (1975).

Generating Station, Unit 1), ALAB-650, 14 N.R.C. 43, 49 (1981) (holding that proposed findings of fact and conclusions of law “must be confined” to issues presented on the record). See also 10 C.F.R. § 1209 (restricting proposed findings of fact and conclusions of law to information “addressed” at the hearing); 10 C.F.R. § 2.712 (restricting proposed findings of fact “to the material issues of fact presented on-the-record, with exact citations to the transcript of record and exhibits in support of each proposed finding” and to “issues . . . placed in controversy”). Accordingly, the Board must reject Pilgrim Watch’s many purported findings of fact that have no basis in the evidentiary record.

B. Pilgrim Watch Bears the Burden of Coming Forward with Sufficient Evidence to Support Its Claims.

It is well established that, although the burden of proof rests with the applicant, the intervenor bears the burden of coming forward with sufficient evidence at the hearing to support its claims. Private Fuel Storage, L.L.C. (Independent Spent Fuel Storage Installation), LBP-05-12, 61 N.R.C. 319, 326 (2005); CFC Logistics, Inc., LBP-04-24, 60 N.R.C. 475, 489-90 & n.26 (2004); Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), LBP-85-12, 21 N.R.C. 644, 698 (1985). The burden of going forward is heavier than that required to get a contention admitted into a proceeding. General Public Utilities (Three Mile Island Nuclear Station, Unit 2), LBP-89-07, 29 N.R.C. 138, 141-43 aff’d, ALAB-926, 31 N.R.C. 1, 15-16 (1990). The intervenor must meet the more stringent task of presenting evidence to “establish” that its concerns are so meritorious that the licensing board should deny or otherwise condition the license. CFC Logistics, LBP-04-24, 60 N.R.C. at 489 (emphasis in original). The intervenor must develop sufficient evidence to require reasonable minds to inquire further. Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 553 (1978); Metropolitan Edison Co. (Three Mile Island Nuclear Station, Unit No. 1), ALAB-697, 16 N.R.C. 1265, 1271 (1982); Public Service Co. of New Hampshire (Seabrook Station, Units 1 and 2), LBP-83-20A, 17

N.R.C. 586, 589 (1983). This means that “*specific evidence meeting scientific/engineering norms will ordinarily be needed to have any chance of prevailing on the merits.*” CFC Logistics, LBP-04-24, 60 N.R.C. at 489-90 (emphasis in original) (footnote omitted). If an intervenor fails to directly address an issue raised in its contention or fails to provide sufficient evidence to require reasonable minds to inquire further, the intervenor has not met its burden of going forward and the applicant prevails. See, e.g., Shoreham, LBP-85-12, 21 N.R.C. at 698. On a contested issue of fact, once the applicant has made a showing that a contention lacks safety significance, the intervenor must rebut the applicant’s showing or the applicant will be found to have met its ultimate burden of proof. Commonwealth Edison Co. (Braidwood Nuclear Power Station, Units 1 and 2), ALAB-890, 27 N.R.C. 273, 287 n.82 (1988).

There are numerous instances where Pilgrim Watch in its proposed findings claims that Entergy has not met its burden of persuasion when in fact Pilgrim Watch never met its burden of going forward. In reality, as demonstrated in Entergy’s Findings and Section III below, Entergy has met its burden of persuasion on every issue that Pilgrim Watch has raised within the scope of Contention 1 as litigated by the parties.

III. DISCUSSION OF PILGRIM WATCH’S PROPOSED FINDINGS

A. No Specified Life for the External Coatings or the CIPP Liner

R1. Pilgrim Watch’s claims that the exterior coatings used on PNPS buried pipe do not have a specified life upon which Entergy may rely¹⁹ are irrelevant and miss the point. Pilgrim Watch refers to the aging management review of the SSW system that states, “[s]ince the coating does not have a specified life, aging effects were evaluated as if the carbon steel was not coated.”²⁰ However, as explained by Entergy’s witness, Mr. Cox, if there were “a

¹⁹ PW Findings at ¶¶ 6, 79-83.

²⁰ Exh. 70, Verification of PNPS License Renewal Project Report, Aging Management Review of the Salt Service Water System, AMRM-11, Revision 1 (Nov. 2, 2007) (“AMRM-11”) (admitted at 746) at 10.

specified life of the coating, a guaranteed life, we would have no aging effects,” and there would be no need for an AMP for the buried exterior surface of SSW discharge pipe.²¹

Mr. Cox goes on to say:

What we've done here is since there is no qualified life of the coating we have said that loss of material of that underlying metal is possible, so we have to have an aging management program. The aging management program in this case is actually relying on the coating and the inspections that we do periodically of the coating to prevent the loss of material from that surface.²²

Thus, because there is no specified, qualified life for the coatings, an AMP must be in place to manage the aging effects of the buried pipe. The AMP is the Buried Piping and Tanks Inspection Program (“BPTIP”) which relies upon the protective coatings and the periodic and opportunistic inspection program, described at paragraphs 25-39, 60-63 of Entergy’s Findings, to provide reasonable assurance that the coatings are remaining in place to protect the buried pipe.

R2. Similarly misplaced is Pilgrim Watch’s claim that the CIPP has no qualified life and that Entergy failed to produce any evidence of a manufacturer’s warranty’s for the 35-year expected life of the CIPP.²³ Again, Entergy is not relying on a specified, qualified life or manufacturer’s warranty for the CIPP.²⁴ Mr. Gundersen’s testimony, upon which Pilgrim Watch relies, on the lack of any qualified life for the CIPP is therefore irrelevant. Because there is no specified, qualified life for the CIPP, Entergy is conducting periodic inspections of the CIPP analogous to the periodic inspections of the exterior coatings to provide

²¹ Tr. at 748 (Cox).

²² Tr. at 748 (Cox) (emphasis added).

²³ PW Findings at ¶¶ 84 and 98.

²⁴ The expected 35-year life of the CIPP liners is based on the professional experience of Entergy’s experts and industry experience and is a reasonable expected life for the CIPP with which the Staff’s expert agrees. See Entergy Findings ¶¶ 90, 91, 95; Tr. at 655 (Sullivan) & 681 (Spataro); Entergy Test. at A43.

reasonable assurance that the CIPP is maintaining its integrity as expected.²⁵ The uncontroverted evidence in the record, provided by both Entergy's witnesses and the Staff's expert, is that the CIPP is significantly superior to the rubber liner which was successfully employed at PNPS for more than 20 years.²⁶ Therefore, the periodic inspections planned by PNPS after the CIPP has been in service for 10 years – well before the end of its expected 35-year life – provide reasonable assurance of the integrity of the CIPP.²⁷

R3. Pilgrim Watch's related claim of limited nuclear experience regarding the use of CIPP, particularly at a seawater plant like Pilgrim, is equally misplaced.²⁸ The experience base relied upon by Entergy's and the Staff's witnesses is not limited to the nuclear industry. CIPP liners have been used "for well over 50 years" in many different type of applications in power plants, public water supply systems, waste water treatment facilities, chemical factories, and any place where there is an aggressive environment.²⁹ Based on this experience, it is well understood what CIPP resins "will withstand and what they will not withstand," and they "are totally immune to all waters," whether it's brackish, fresh, lake, sea, does not matter at all."³⁰ The potential for "saltwater" to degrade or breakdown CIPP liners is "absolutely not" a concern.³¹

R4. Pilgrim Watch's claimed concern about the use of CIPP at a seawater plant ignores this clear, emphatic testimony and is based solely on the testimony of Mr. Gundersen.³²

²⁵ See Entergy Findings at ¶¶ 96-98.

²⁶ See Entergy Findings at ¶¶ 88, 91.

²⁷ Tr. at 648, 774 (Sullivan); Tr. at 775-76 (Cox).

²⁸ See PW Findings at ¶¶ 106-08.

²⁹ Tr. at 683-84, 692, 733 (Spataro); Tr. at 655 (Sullivan).

³⁰ Tr. at 733-34 (Spataro).

³¹ Tr. at 734 (Spataro) (emphasis added).

³² PW Findings at ¶ 108; Tr. at 696, 699 (Gundersen).

However, when directly questioned whether he had any experience regarding the use of CIPP liners in a saltwater environment, Mr. Gundersen was forced to admit, “I don’t have experience on epoxy liners.”³³ Thus, based on the totality of the evidence in the record, we find that the CIPP liners used to protect the interior of the SSW discharge pipes at PNPS are immune to degradation in a saltwater environment.

B. Alleged Vulnerability of the SSW Discharge Piping

R5. Pilgrim Watch has raised various claims asserting the vulnerability of the SSW discharge piping to corrosion based on previous degradation experienced by the original rubber interior liner of the SSW discharge pipes.³⁴ None of these claims has merit.

R6. At the outset, Pilgrim Watch presents no evidence that questions the ability of the SSW buried discharge piping to perform its intended safety function. PNPS successfully monitored the rubber liner using the Service Water Integrity Program that includes surveillance and control techniques to manage the effects of aging on the SSW system, structures and components serviced by the SSW system.³⁵ PNPS monitored the integrity of the original rubber lining as part of the in-service inspection requirements for the SSW developed in response to Generic Letter 89-13 and undertook increasing inspections, as the rubber liner aged, that identified degradation.³⁶ Moreover, PNPS has chosen to protect the carbon steel’s interior with an impermeable CIPP liner to prevent internal corrosion of the

³³ Tr. at 705-06 (Gundersen); see also Tr. at 699 (J. Young); Tr. at 701 (Counsel for Entergy).

³⁴ Pilgrim Watch makes contradictory claims. Pilgrim Watch refers to the 1995 and 1997 inspections that revealed minor age-related degradation of the rubber lining and the subsequent inspection and replacement of two forty foot sections of SSW discharge pipe in 1999 due to delamination of a portion of the rubber liner, and argues that leaks can develop in the SSW discharge buried piping within two years of the loss of liner integrity. PW Findings at ¶¶ 11, 13, and 235. At the same time, Pilgrim Watch claims that there is no proof of when this degradation of the SSW discharge pipe – identified after 27 years of operation – started to occur and because there is no evidence as to how soon after installation the degradation had actually begun, it must be assumed to have begun shortly thereafter. PW Findings at ¶¶ 13, 23, 88, and 163.

³⁵ Entergy Findings at ¶ 116, see also Entergy Test. at A95.

³⁶ Entergy Test. at A98.

carbon steel pipe. Installed in Loop B in 2001 and in Loop A in 2003, the CIPP liner is expected to last at least 35 years.³⁷ Furthermore, inspections to assure the CIPP's continued integrity will be undertaken under the Service Water Integrity Program far in advance of the CIPP reaching the end of its expected life.³⁸ Entergy submitted evidence that provides reasonable assurance that the SSW system safety function will not be lost due to degradation of the CIPP liner, and we find no merit to Pilgrim Watch's claims.

R7. First, the undisputed testimony of Entergy's witnesses shows that the degradation of the rubber liner leading to the corrosion of the SSW discharge pipe occurred after the rubber liner had been in operation beyond its expected 20-year life.³⁹ Entergy's witnesses testified that, in 1995, PNPS visually inspected the rubber liner using a robot crawler fitted with a camera, and found minor age-related degradation.⁴⁰ Thus, it was only after the rubber liner was at the end of its expected life that any potentially significant degradation of the liner had occurred, and Entergy continued its increased inspections under the Service Water Integrity Program.

R8. Second, in addition to the rubber liner, the interior of the buried SSW discharge piping is now protected by the CIPP. As previously stated, the CIPP is significantly superior to the rubber liner and has an expected 35-year life as opposed to the 20-year expected life of the original rubber liner. Among other characteristics, the CIPP's final "configuration is rigid resin composite pipe within the original pipe."⁴¹ It is "literally a pipe within a pipe," that

³⁷ Entergy Findings at ¶ 95, see also Tr. at 655 (Sullivan) & Tr. at 681 (Spataro); Entergy Test. at A43.

³⁸ Entergy Findings at ¶ 83, see also Entergy Test. at A95-A96; Entergy Test. at A44.

³⁹ Entergy Findings at ¶¶ 85-86; see also Tr. at 655, 661, 755 (Sullivan).

⁴⁰ Entergy Findings at ¶ 86, see also Entergy Test. at A42.

⁴¹ Exh. 58, PNPS FSAR - Excerpt - 10.7 "Salt Service Water System" at 10.7-2a, admitted at Tr. 589.

“is not going anywhere.”⁴² Thus, the CIPP is not expected to oxidize and degrade in a water environment,⁴³ nor delaminate from the discharge pipe as did the rubber liner.⁴⁴

R9. Third, PNPS successfully monitored the integrity of the original rubber lining using the Service Water Integrity Program, which proved effective in detecting degradation of the internal rubber lining in the original SSW system carbon steel piping.⁴⁵ Going forward, Entergy will use the Service Water Integrity Program to monitor the CIPP, including complete inspections every 10 years, far in advance of the end of the CIPP’s expected 35-year life, to provide reasonable assurance of the integrity of the CIPP liner.⁴⁶

R10. Finally, fourth, even assuming such corrosion could occur in the future despite the use of the CIPP and the monitoring under the Service Water Integrity Program, both Entergy’s and the Staff’s witnesses testified and explained why the localized corrosion discovered in 1999 would not have led to the failure of the SSW pipe in the event of an earthquake.⁴⁷ Pilgrim Watch again ignores this testimony and points solely to testimony by Mr. Gundersen.⁴⁸ However, Mr. Gundersen had done no analyses and provided no elucidation and explanation of the relevance of the analyses of others to which he referred.⁴⁹

⁴² Tr. at 676 (Spataro).

⁴³ Tr. at 669 (Davis); Tr. at 682-84 Spataro (degradation of CIPP caused by flaking in a dry, hot air environment); at 688 (Spataro) (“In this instance, there is nothing that I can think of that would cause the degradation” of the CIPP.).

⁴⁴ See Tr. at 676-77 (Spataro).

⁴⁵ Entergy Findings at ¶ 96, see also Tr. at 636 (Sullivan); Entergy Test. at A44, A98.

⁴⁶ See Entergy Findings at ¶¶ 96-98; see also Tr. at 669 (Davis) (“frequency of 10 years of inspection seems very reasonable”).

⁴⁷ Tr. at 727-28 (Cox) (“We have had service water pipe leaks” that were “fairly localized,” and “I don’t know of any cases where we found through-wall leaks in piping where there has been a problem with satisfying the seismic criteria with the remaining metal . . .”); at 730 (Chan) (“I have not seen an instance where localized holes have significantly affected the ability of a piping system to withstand a seismic event.”); see also Tr. at 612, 670-71 (Woods); at 671 (Chan).

⁴⁸ PW Findings at ¶¶ 130-34.

⁴⁹ Tr. at 694-96 (Gundersen). Moreover, this testimony of Mr. Gundersen (referenced in PW Finding ¶ 132) was based on an “assumed four-inch diameter hole,” Tr. at 694 (J. Abramson), far more than the actual experienced degradation. Tr. at 737-38 (Spataro).

Moreover, after the testimony of Entergy's and the Staff's witnesses explaining why such localized corrosion would not cause failure, Mr. Gundersen testified that a "three-quarter-inch hole in this pipe . . . would be just fine" and that his concern was "not about a single hole" but "about numerous small holes,"⁵⁰ which was not the condition of the previously degraded SSW discharge pipe.⁵¹

R11. Pilgrim Watch also claims that the redundancy provided by the two loops of the SSW system is irrelevant because degradation had been observed on second discharge loop at the same time.⁵² However, as testified to by Mr. Woods, the degradation identified on the other loop was near the "very end of the discharge [loop]" and only "slightly below the [minimum wall thickness]."⁵³ There is no testimony in the record that the second loop would have been unable to perform its intended safety function because of this limited degradation.

R12. In sum, we find Pilgrim Watch's claims based on the previous degradation of the original rubber liner and corrosion of the SSW discharge pipe to be without merit for the following reasons: (1) The previous degradation experience of the original rubber liner and the SSW discharge pipe is irrelevant because the newly installed CIPP liner is not subject to the degradation mechanisms that had affected the original rubber liner, and indeed is not subject to degradation in a saltwater environment such as that present in the Pilgrim SSW discharge pipes. (2) Entergy properly monitored the integrity of the original rubber lining as it aged and reached the end of its expected life, and there is no evidence that the degradation that did occur would have caused a loss of the SSW system's license renewal

⁵⁰ Tr. at 731 (Gundersen) (emphasis added).

⁵¹ Tr. at 737-38 (Spataro).

⁵² See, e.g., PW Findings at ¶¶ 10, 131, 145.

⁵³ Tr. at 640 (Woods).

intended functions in the event of an earthquake. (3) Entergy will likewise monitor the integrity of the CIPP liners and will aggressively undertake complete inspections of the CIPP liners every 10 years, far in advance of the end of their expected 35-year life, to provide reasonable assurance of their continued integrity. The first such complete examination will occur in 2011 for Loop B, before the period of extended operation commences.⁵⁴

R13. Pilgrim Watch also argues that small leaks in the buried SSW discharge piping are relevant because they have the potential to grow into larger leaks that could challenge the ability of the SSW discharge piping to perform its intended function.⁵⁵ However, Entergy's witnesses testified that lateral degradation is much smaller than penetrating degradation and will proceed slowly.⁵⁶ The Staff's expert, Dr. Davis, agrees and testified that leaks in coated buried pipes generally do not expand substantially beyond the portion of the pipe where the pipe's coating has failed.⁵⁷ Mr. Gundersen acknowledged that the lateral progression of degradation would be impeded beyond the point of the localized failure of the coatings.⁵⁸

R14. Pilgrim Watch also claims, based on testimony of Mr. Gundersen, that prior to the installation of the CIPP, moisture may have found its way between the rubber liner and the carbon steel discharge pipe causing the pipe to corrode despite the coatings,⁵⁹ and that Entergy has not presented sufficient evidence to establish that there is no moisture behind

⁵⁴ Tr. at 648, 774 (Sullivan); Tr. at 776 (Cox).

⁵⁵ PW Findings at ¶¶ 203-04.

⁵⁶ Tr. at 726-27, 737-38 (Spataro).

⁵⁷ NRC Staff Proposed Findings of Fact and Conclusions of Law, and Order in the Form of an Initial Decision (June 9, 2008) ("Staff Findings") ¶ 90, see also Tr. at 729 (Davis).

⁵⁸ Tr. at 732 (Gundersen).

⁵⁹ PW Findings at ¶¶ 90-92.

the rubber liner.⁶⁰ Pilgrim Watch provides no evidence or basis to conclude that this scenario is even possible. Mr. Gunderson is not a coatings expert and he provided only speculation that the 100% inspection performed by Entergy of the rubber liner prior to installing the CIPP may not have been successful in identifying small deformities or holes in the rubber liner.⁶¹

R15. As testified to by the Entergy witnesses, prior to installing the CIPP liner, Entergy inspected 100% of the rubber liner to ensure that it “was intact and in good shape,” and took corrective action for any degradation that was identified.⁶² PNPS performed the inspection, via video camera or an inspector, to determine whether the rubber liner was in good condition and had not separated from the carbon steel interior surface.⁶³ To rebut Entergy’s specific evidence of a thorough 100% inspection of the rubber liner to assure its integrity, Mr. Gundersen makes a general suggestion that video inspection was not as precise as “eyeballs.”⁶⁴ Entergy’s specific witness testimony is much more credible than that of Mr. Gundersen. As Mr. Wood indicated, this inspection identified “one place that was torn,” for which corrective action was taken, and otherwise the “existing rubber liner was at that point complete and intact” with “no evidence of any leaks.”⁶⁵ Moreover, Mr. Gundersen has provided no basis to conclude that any moisture that might have remained between the rubber liner and the steel discharge pipe could cause significant corrosion that could threaten the capability of the SSW system to perform its intended function.

⁶⁰ PW Findings at ¶ 93.

⁶¹ Tr. at 709-11 (Gundersen).

⁶² Tr. at 641 (Woods); see also Entergy Findings at ¶ 93; Tr. at 673 & 676 (Spataro).

⁶³ Entergy Findings at ¶ 93; Tr. at 641, 674 (Woods).

⁶⁴ PW Findings at ¶ 93.

⁶⁵ Tr. at 641 (Woods).

C. The Bathtub Curve

R16. Pilgrim Watch argues that the “bathtub curve” clearly shows that the chances of pipe failure increase as the pipe ages and enters the “wear-out phase” and that “[t]he evidence shows that most of Pilgrim Station’s pipes, wraps and coatings would be in this ‘wear out phase’ during the relicensed period.”⁶⁶ Pilgrim Watch’s generalized claim has no merit and is yet another instance of Pilgrim Watch offering broad, unsupported declarations as factual evidence. The bathtub curve states the obvious – that older components sometimes have a greater risk of failure. However, Pilgrim Watch points to no evidence to show that the Pilgrim’s pipes, wraps and coatings would be in this wear out phase during the relicensing, but only to generalized statements of Mr. Gundersen concerning the general probity of the bathtub curve. As explained by Dr. Davis, “the purpose” of license renewal aging management programs “is to prevent region C of the bathtub curve from occurring.”⁶⁷

R17. Pilgrim Watch also mistakenly claims that “Entergy did not dispute the age of the piping or dispute the validity of the ‘Bathtub Curve’.”⁶⁸ Entergy specifically disputed the relevance of the age of in-scope buried pipes in determining potential corrosion of the pipe. Entergy’s experts testified that “[t]he age of in-scope buried pipes is also irrelevant” because [m]etals do not simply ‘age,’ but instead, if unprotected and susceptible, may degrade at varying rates as a result of electrochemical, thermal, or mechanical conditions.”⁶⁹ Entergy’s experts went on to identify the many “precautions” that it takes under its license renewal aging management programs (“AMPs”) “to prevent such degradation from occurring.” Id. As previously stated, the purpose of the license renewal

⁶⁶ PW Findings at ¶ 28.

⁶⁷ Exh. 41, NRC Staff Response to Initial Presentations on Contention 1, Rebuttal testimony, and Response to Board Questions (Mar. 6, 2008) (“Staff Reb. Test.”) (admitted at Tr. 584) at A9.

⁶⁸ PW Findings at ¶ 31.

⁶⁹ Entergy Reb. Test. at A16.

process and the AMPs is to manage the effects of aging to prevent the “wear-out phase” from occurring. Entergy has provided extensive testimony and presents detailed evidence in its Findings that its AMPs are adequate to effectively manage the potential aging effects of external and internal degradation of buried pipes at PNPS.⁷⁰ Pilgrim Watch has not effectively disputed this wealth of evidence in Entergy’s testimony and Proposed Findings.

R18. The Staff agrees: “Mr. Gundersen’s bathtub curve analysis is limited to generalizations about unspecified pipes and coatings, rather than specific analysis of the actual pipes and coatings being used at Pilgrim.... Absent more specific evidence regarding the specific types of pipes and coatings in question, the Board cannot view Mr. Gundersen’s testimony about the ‘bathtub curve’ as legitimately calling into question the [aging management programs] proposed by Entergy for the buried SSW discharge piping at Pilgrim. We therefore find that this challenge by Pilgrim Watch lacks merit.”⁷¹

D. Alleged Corrosivity of the PNPS Soil Environment

R19. Pilgrim Watch similarly makes broad unsubstantiated claims regarding the corrosivity of the PNPS soil that lack merit.⁷² In its Proposed Finding 34, Pilgrim Watch claims that it “documented and explained precisely why the soil and ocean water is corrosive.” Pilgrim Watch, however, bases this proposed finding solely on Mr. Gundersen’s assertion that “because Pilgrim Station is located adjacent to Cape Cod Bay and at a low elevation, it is readily apparent that the soil surrounding the piping is not ‘friendly.’”⁷³ Mr. Gundersen did not support his speculation with any knowledge of the actual soil characteristics at the

⁷⁰ See Entergy Findings at ¶¶ 25-78 (sufficiency of the BPTIP to manage the aging effects of external degradation of buried piping in the CSS and the SSW system); at ¶¶ 83-103 (sufficiency of the Service Water Integrity Program to manage the aging effects of internal degradation of the SSW discharge buried piping); at ¶¶ 104-113 (sufficiency of the Water Chemistry Control-BWR Program and the One-Time Inspection Program to manage the aging effects of internal degradation of the CSS buried pipe).

⁷¹ Staff Findings at ¶ 111.

⁷² See PW Findings at ¶¶ 32-52.

⁷³ Gundersen Reb. Test. at A12, p.20.

site, or any qualifications that would allow him to provide expert testimony on soil chemistry.⁷⁴ Indeed, Mr. Gundersen had assumed that trees had reappeared in excavated plant areas and were biodegrading when in fact the entire area is covered in asphalt paving.⁷⁵ In contrast, Entergy provided extensive evidence on the measures implemented at Pilgrim to preclude buried piping from being exposed to aggressive soil conditions, and the actual characteristics of that soil demonstrating that the soil environment is non-aggressive.⁷⁶

R20. Pilgrim Watch's reliance on the Brookhaven Report⁷⁷ also does not support its position. Pilgrim Watch cites the Brookhaven Report for the proposition that "[i]t is widely understood" that "[b]uried piping systems can degrade" and that "the rate of degradation of steel buried components is a function of environmental variables, metallurgical variables, and hydrodynamic variables."⁷⁸ However, the Brookhaven Report states that "[c]orrosion varies with the moisture content of the soil" and that "very little corrosion is expected to occur" in dry or low moisture content soil.⁷⁹ At PNPS, actual soil measurements for the SSW system show a low moisture content from 5.5% to 8.1%, which reflects a non-aggressive environment.⁸⁰

R21. Furthermore, the Brookhaven Report makes clear that the degradation being studied, which is a function of environmental, metallurgical, and hydrodynamic variables, assumes no protective coatings or liners on the pipe because the purpose of the study is to develop

⁷⁴ See Gundersen Reb. Test. at A12-A13.

⁷⁵ Entergy Findings at ¶ 50.

⁷⁶ Compare Entergy Findings at ¶¶ 44-51.

⁷⁷ Exh. 21.

⁷⁸ PW Findings at ¶¶ 35, 37.

⁷⁹ Exh. 21 at 26.

⁸⁰ Entergy Test. at A88.

acceptance criteria for the metal pipe and not the coatings.⁸¹ Thus, the Brookhaven report, extensively relied upon by Pilgrim Watch,⁸² is irrelevant here given Entergy's reliance on protective coatings and liners to protect buried pipe.

E. Alleged Susceptibility of Piping with Bends, Welds and Dead Spots, Adequacy of Inspections, and Other Related Claims

R22. Pilgrim Watch claims that "straight piping is less susceptible to failure than welds, elbows and dead spots" and that "elbows are particularly susceptible to corrosion."⁸³ Entergy witnesses addressed this concern raised by Mr. Gundersen in their rebuttal testimony, to which no response was provided at hearing by Mr. Gundersen. We find that Pilgrim Watch's claim lacks merit.

R23. As clearly explained by Entergy's witnesses, "the presence of underlying welds, elbows, or blank flanges are irrelevant in determining whether the coatings remain in place."⁸⁴ As long as the protective coating remains in place, the buried piping is protected from external degradation.⁸⁵ Under the BPTIP, PNPS will conduct inspections both before and during the period of extended operation to determine whether the protective coatings on the buried pipe remain in place to prevent external degradation of the pipe as designed.⁸⁶ Thus, whether or not elbows, welds, or dead spots exist, as long as the coatings remain in place, the buried pipe is not subject to external corrosion.⁸⁷

R24. Entergy has developed a procedure (Procedure No. EN-DC-343, Rev. 0, Buried Piping and Tanks Inspection and Monitoring Program) that specifies the inspection methods for buried

⁸¹ Exh. 21 at 32.

⁸² See, e.g., PW Findings at ¶¶ 15, 19, 27, 35, 37, 39, 42, 44, 46, 54, and 122.

⁸³ PW Findings at ¶¶ 3, 57, 229.

⁸⁴ Entergy Reb. Test. at A16.

⁸⁵ Entergy Test. at A47; see also Entergy Test. at A67, A71, A90.

⁸⁶ Entergy Test. at A75-A77; Tr. at 777 (Cox).

⁸⁷ Entergy Reb. Test. at A16.

pipes (including inspections of buried pipes beyond the scope of the BPTIP).⁸⁸ In its Findings, Pilgrim Watch quotes virtually verbatim from Mr. Gundersen's testimony concerning the alleged inadequacies of the inspections specified by this procedure and the BPTIP.⁸⁹ In doing so, Pilgrim Watch completely ignores the extensive rebuttal testimony of Entergy's experts refuting the myriad claims raised in Mr. Gundersen's testimony,⁹⁰ to which Mr. Gundersen provided no response at hearing. For the reasons summarized in Entergy's Findings at paragraphs 64-78, we find without merit the numerous claims raised by Mr. Gundersen regarding the adequacy of the inspections that will be conducted under the BPTIP.

R25. With respect to susceptibility of welds, elbows and dead spots to internal corrosion, as explained by Entergy's witnesses, there are no flow restrictions, high velocity portions, dead-space or flow disturbances in the buried SSW (or CSS) system piping.⁹¹ The inapplicability of these concerns to the buried piping here was confirmed by the Staff's experts.⁹² Therefore, these concerns expressed by Mr. Gundersen and Pilgrim Watch are likewise not relevant and without merit.

R26. Pilgrim Watch also asserts, based on Mr. Gundersen's testimony, that the AMPs are inadequate to assure that "underground piping and tanks will be able to withstand the stresses of an additional 20-year license extension."⁹³ Like the other claims raised in Mr. Gundersen's testimony, this claim has no substantive basis in fact. As explained by Entergy's experts, the stresses during the period of extended operation are the same as

⁸⁸ Entergy Test. at A78-A79; Exh. 8 (admitted at Tr. 572).

⁸⁹ See, e.g., PW Findings at ¶¶ 147-159, 170-193.

⁹⁰ See Entergy Reb. Test. at A5-A6, A9-A29, A40-A43.

⁹¹ Entergy Reb. Test. at A16.

⁹² See Staff Reb. Test. at A5-A6.

⁹³ PW Findings at 4.

those during the initial license term.⁹⁴ The license renewal AMPs are designed to maintain the condition of buried piping systems such that they can continue to perform their license renewal intended functions. Pilgrim Watch has provided no evidence to the contrary.

F. Alleged Counterfeit of Substandard Parts

R27. Pilgrim Watch also argues that the buried SSW pipe may potentially contain counterfeit or substandard quality materials.⁹⁵ However, as the Staff noted, the NRC issued a Generic Letter requiring licensees to take actions “to avoid using counterfeit and fraudulently marked products using the methods identified in the generic letter.”⁹⁶ While making general claims regarding counterfeit parts, Pilgrim Watch has provided no basis in the evidentiary record to suggest that the actions required of the NRC – or Pilgrim’s response – were in anyway inadequate. Accordingly, Pilgrim Watch has failed its burden of going forward.⁹⁷ Furthermore, the alleged use of counterfeit parts is an issue that was resolved under the current licensing basis and is not an aging management issue.

G. Industry Experience and Alleged Tritium Leaks

R28. In its proposed findings, Pilgrim Watch refers extensively to leakage of radioactively contaminated water at other plants.⁹⁸ However, as explained by this Board in clarifying the issues in its Memorandum and Order on Entergy’s Motion for Summary Disposition of Pilgrim Watch Contention 1:

[L]eakage events at other plants are not directly relevant to the issue at hand. While these events may provide relevant information regarding the potential usefulness of monitoring wells in detecting leaks, what is

⁹⁴ Entergy Reb. Test. at A31.

⁹⁵ PW Findings at ¶¶ 58-61, 114-116, and 185.

⁹⁶ Staff Reb. Test. at A7.

⁹⁷ Pilgrim Watch refers to Pilgrim’s response to NRC Bulletin 88-05 concerning “Nonconforming Materials” (PW Findings at 31 n.15), which Entergy disclosed in the discovery disclosure process, but this document was never admitted into evidence. See Pilgrim Watch Motion to Permit Late Filed Exhibits (Mar. 24, 2008) at 7; denied Order (Ruling on Pilgrim Watch Motion to Permit Late-Filed Exhibits) (Apr. 2, 2008).

⁹⁸ See, e.g., PW Findings at ¶¶ 25, 117-18, 201-202, 203-207, 217-220.

relevant, as Pilgrim Watch appears to agree, is the uniqueness of the Pilgrim plant and what may be required with regard to it.⁹⁹

- R29. In its proposed findings, Pilgrim Watch has made no attempt to explain the relevance of this leakage to the circumstances at Pilgrim. Pilgrim Watch makes no claim that systems in which the leakage occurred at these other plants are the same as the systems at issue in Contention 1, that the systems in question at the other plants were subject to license renewal aging management, or whether the materials, coatings and liners of those systems are the same or similar to the PNPS systems within the scope of Contention 1.
- R30. Furthermore, the only industry experience discussed by Pilgrim Watch's witness, Mr. Gundersen – leakage from the essential service water system at the Byron Nuclear Power Station – is irrelevant to buried pipes at PNPS.¹⁰⁰ The circumstances surrounding this leak at Byron are entirely dissimilar to the buried PNPS piping in that (1) the piping at Byron was not buried, (2) the piping was not wrapped, and (3) there is no indication that the piping at Byron was subject any aging management program.¹⁰¹ Thus, the incident at Byron does not indicate any deficiency in the AMPs for buried piping at PNPS.
- R31. We thus find Pilgrim Watch's references to other plant experience to be of no relevance or use to our adjudication of Contention 1.
- R32. Pilgrim Watch also argues that PNPS has specifically experienced tritium leaks and as a result, baseline data should be collected from the buried SSW discharge pipe.¹⁰² As explained by Entergy, however, there is no indication that the trace levels of tritium in the

⁹⁹ LBP-07-12, Memorandum and Order (Ruling on Entergy's Motion for Summary Disposition of Pilgrim Watch Contention 1, Regarding Adequacy of Aging Management Program for Buried Pipes and Tanks and Potential Need for Monitoring Wells to Supplement Program) (Oct. 17, 2007) at 19 (footnote omitted).

¹⁰⁰ Gundersen Test. at ¶ 15; see also Exh. 25 ("Help Wanted: Dutch Boy at Byron," Union of Concerned Scientists (2007)).

¹⁰¹ Entergy Reb. Test. at A34.

¹⁰² PW Findings at ¶ 228.

monitoring wells are the result of system leakage.¹⁰³ Moreover, in fact, the SSW system does not normally contain any radioactivity, and the SSW system has no history of cross-contamination that would have introduced radioactivity.¹⁰⁴ Regular monitoring of the SSW system discharge has never indicated the presence of radioactivity.¹⁰⁵ Therefore, the discovery of tritium does not indicate any failure of Entergy's AMPs or release from components that may be subject to Contention 1.¹⁰⁶

H. Monitoring Wells

R33. While Pilgrim Watch argues that monitoring wells are necessary,¹⁰⁷ Pilgrim Watch has made no showing that the AMPs that Entergy has in place will be inadequate to ensure that the leaks challenging the license renewal intended function of in-scope buried pipes will not occur. To the contrary, we expressly find, based on the totality of the evidence in the record, that the PNPS AMPs will provide reasonable assurance that leaks challenging the license renewal intended function of in-scope buried pipes will not occur.

R34. Furthermore, even assuming further actions were required, Entergy has submitted significant evidence which shows that monitoring wells would not be more effective in detecting leaks in the SSW system buried piping than are the flow rate tests performed monthly for the SSW system.¹⁰⁸ The monthly flow rate tests on the SSW system are more frequent than sampling from a monitoring well would be, which Dr. Ahfeld indicates would be conducted approximately quarterly.¹⁰⁹ In addition, the SSW system does not

¹⁰³ Entergy Reb. Test. at A37-A38.

¹⁰⁴ Entergy Reb. Test. at A35.

¹⁰⁵ Entergy Reb. Test. at A35.

¹⁰⁶ Entergy Reb. Test at A37.

¹⁰⁷ PW Findings at ¶¶ 238-244.

¹⁰⁸ Entergy Findings at ¶ 116; see also Entergy Test. at A122-A125.

¹⁰⁹ Tr. at 766, 853 (Ahfeld).

normally, and would be very unlikely to, contain radioactivity.¹¹⁰ Therefore, monitoring groundwater wells for radioactivity would not be expected to provide any indication of a leak in the SSW piping. Indeed, the only indication from the monitoring well would be salt water, but the SSW discharge piping runs near the intake embayment and into the discharge canal, both of which contain salt water. Therefore, it would be difficult to discern whether salt levels in a monitoring well are attributable to a leak rather than the influences of the adjacent water bodies.¹¹¹ In addition, the SSW discharge lines are each over 200 feet long, and attempting to use monitoring wells to detect leakage from this span would be difficult and inefficient. Conversely, the monthly SSW system flow rate tests check the water flow through the SSW buried piping. It is a check on the water that flows through the precise buried piping system within the scope of license renewal.¹¹²

R35. Similarly, a monitoring well would not be more effective in detecting a leak in the CSS buried piping than the condensate storage tank (“CST”) water level monitoring program. The CST water level check is performed every four hours, which is substantially more frequent than a sampling program for monitoring wells. Further, depending on the location of the leak, it might take additional time for the radioactivity to reach, and be detectable in, a monitoring well. In addition, the CST water level check would directly detect any leak significant enough to impair the intended functions of the CSS. It is a check on the water that flows into the precise buried piping system that is within the scope of license renewal.¹¹³

¹¹⁰ Entergy Test. at A127; Entergy Reb. Test. at A35.

¹¹¹ Entergy Test. at A127.

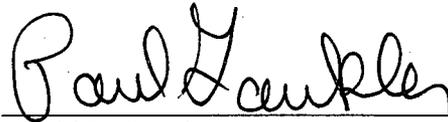
¹¹² Entergy Test. at A127; see also Entergy Test. at A129.

¹¹³ Entergy Test. at A116; see also Entergy Test. at A121, A129.

IV. CONCLUSION

For the foregoing reasons, and those expressed in Entergy's and the NRC Staff's Proposed Findings, Pilgrim Watch's proposed findings of law and conclusions of law provide no basis in fact or law for the Board's decision on Pilgrim Watch Contention 1.

Respectfully Submitted,



David R. Lewis
Paul A. Gaukler
PILLSBURY WINTHROP SHAW PITTMAN LLP
2300 N Street, NW
Washington, DC 20037-1128
Tel. (202) 663-8000
Counsel for Entergy

Dated: June 23, 2008

**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION**

Before the Atomic Safety and Licensing Board

In the Matter of)	
)	
Entergy Nuclear Generation Company and)	Docket No. 50-293-LR
Entergy Nuclear Operations, Inc.)	ASLBP No. 06-848-02-LR
)	
(Pilgrim Nuclear Power Station))	

CERTIFICATE OF SERVICE

I hereby certify that copies of "Entergy's Reply to Pilgrim Watch's Proposed Post-Hearing Findings of Fact and Conclusions of Law on Contention 1," dated June 23, 2008, were served on the persons listed below by deposit in the U.S. Mail, first class, postage prepaid, and where indicated by an asterisk by electronic mail, this 23rd day of June, 2008.

*Administrative Judge
Ann Marshall Young, Esq., Chair
Atomic Safety and Licensing Board
Mail Stop T-3 F23
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
amy@nrc.gov

*Administrative Judge
Dr. Richard F. Cole
Atomic Safety and Licensing Board
Mail Stop T-3 F23
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
rfl1@nrc.gov

*Administrative Judge
Paul B. Abramson
Atomic Safety and Licensing Board
Mail Stop T-3 F23
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
pba@nrc.gov

*Secretary
Att'n: Rulemakings and Adjudications Staff
Mail Stop O-16 C1
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
secy@nrc.gov; hearingdocket@nrc.gov

Office of Commission Appellate
Adjudication
Mail Stop O-16 C1
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Atomic Safety and Licensing Board
Mail Stop T-3 F23
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

*Susan L. Uttal, Esq.
*Marcia Simon, Esq.
*James E. Adler, Esq.
Office of the General Counsel
Mail Stop O-15 D21
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
slu@nrc.gov; jeal@nrc.gov;
Marcia.simon@nrc.gov

*Ms. Mary Lampert
148 Washington Street
Duxbury, MA 02332
mary.lampert@comcast.net

*Sheila Slocum Hollis, Esq.
Duane Morris LLP
505 9th Street, NW
Suite 1000
Washington, DC 20006
sshollis@duanemorris.com

*Martha Coakley, Attorney General
*Matthew Brock, Assistant Attorney General
Commonwealth of Massachusetts
Office of the Attorney General
One Ashburton Place
Boston, MA 02108
Martha.Coakley@state.ma.us
Matthew.Brock@state.ma.us

*Mr. Mark D. Sylvia
Town Manager
Town of Plymouth
11 Lincoln St.
Plymouth, MA 02360
msylvia@townhall.plymouth.ma.us

*Chief Kevin M. Nord
Fire Chief and Director, Duxbury Emergency
Management Agency
688 Tremont Street
P.O. Box 2824
Duxbury, MA 02331
nord@town.duxbury.ma.us

*Richard R. MacDonald
Town Manager
878 Tremont Street
Duxbury, MA 02332
macdonald@town.duxbury.ma.us

*Diane Curran
Harmon, Curran, Spielberg, & Eisenberg, LLP
1726 M Street NW, Suite 600
Washington, DC 20036
dcurran@harmoncurran.com



Paul A. Gaukler