

**UNITED STATES OF AMERICA**  
**NUCLEAR REGULATORY COMMISSION**  
**BEFORE THE ATOMIC SAFETY AND LICENSING BOARD**

In the Matter of

Docket # 50-293-LR

Entergy Corporation

Pilgrim Nuclear Power Station

License Renewal Application

February 24, 2011

**Pilgrim Watch Reply to Entergy's and the NRC Staff's Oppositions to  
Pilgrim Watch's Request for Hearing on a New Contention.**

**I. INTRODUCTION**

In their oppositions to Pilgrim Watch's Request for Hearing on a New Contention, Entergy and the NRC Staff have again joined forces and opposed PW's request for essentially the same reasons, although the Staff did so in far fewer words.

Because Entergy's and the Staff's arguments are essentially the same, Pilgrim Watch will reply to both here.

The purported bases for their oppositions can fairly quickly be summarized. They say:

- a. PW has not met the standards for reopening a closed record because, among other things, it has not raised a significant safety issue (see Entergy, pgs., 1,15 ; and Staff pgs., 1,7)

b. PW’s request for hearing is untimely and does not meet the standards for a late-filed contention, e.g., it is not justified by new or materially different information (see Entergy, pg., 26; and Staff, pg.,11 ), and

c. There are no material facts in dispute (see Entergy, pg.,36).

All of these assertions are wrong, for a number of reasons:

First, Pilgrim Watch’s request for hearing is not a motion to reopen, and even if it were Pilgrim Watch’s request meets the standards for reopening – it is timely and addresses a significant safety issue

Second, PW’s request for hearing does meet the standards for a late-filed contention – PW showed “good cause” for not filing earlier (one of the factors considered under 10 C.F.R. §3.309(c)), and even Entergy and the Staff seem to agree that all of the other factors favor PW.

Third, PW’s request meets the factual showing required for a new contention – e.g., it plainly “make[s] a minimal showing that material facts are in dispute, thereby demonstrating that an ‘inquiry in depth’ is appropriate.” 54 Fed. Reg. 33, quoted by Entergy at 36.<sup>1</sup>

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<sup>1</sup> In the portion of their briefs dealing with 10 C.F.R. §2.236(a)(3), Entergy (at 22) and the Staff (at 6) cite *Private Fuel Storage*, CLI-05-12, and quote a statement to the effect that a party seeking to reopen a closed record must back its claim with enough evidence to avoid summary disposition. The Staff neglected to tell the Board that *Private Fuel Storage* involved the standards for reopening.

Both Entergy and the Staff neglected to quote from the following sentence: “the information must be significant and plausible enough to require reasonable minds to inquire further;”and there can be no question but that the risks presented by unsafe, inaccessible, non-qualified cables are both significant and plausible.

## II. PW'S REQUEST IS NOT A MOTION TO REOPEN

Pilgrim Watch does not seek to “reopen” anything. It does not ask to reopen Contention 1; neither does it seek to add anything to still pending Contention 3. Rather, PW’s new contention is directed to an issue – submerged unqualified inaccessible cables – that was not part of, and that was not and could not have been litigated in connection with, either Contention 1 or Contention 3. The record in Contention 1 may be closed, and the scope of Contention 3 limited, but in *Vermont Yankee*, CLI-10-17, the Commission could not have made more clear that the record in this proceeding has not: “the proceeding will remain open during the pendency of the remand.” CLI-10-17, 10, n37.

In short, this is not “a motion to reopen a closed record.” Neither is it an attempt to show that “a materially different result would be or would have been likely had the newly proffered evidence been considered initially.” 10 C.F.R. § 2.326(a)(3).<sup>2</sup> The “results” in Contention 1 and Contention 2 would not be affected for the simple reason that nothing in PW’s new contention relates to either of those contentions, and PW does not ask that the record in either be reopened.

What Pilgrim Watch does seek is a hearing on a new contention that raises an issue that was not been litigated, and could not have been litigated, as part of either Contention 1 or Contention 3.

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<sup>2</sup> 10 C.F.R. § 2.326(a)(3) reinforces that § 2.326 deals only with motions to reopen the record in some part of a proceeding that has been closed. It is directed to whether the new evidence sought to be presented after reopening would have likely changed the result in a decision that had already been reached. It has no application to contentions, such as PW’s new contention that PNPS’ failing cables present a serious safety risk, that have nothing to do with and could not in any way affect a decision in either decided Contention 1 nor still-pending Contention 3.

Although both Entergy and the Staff seek to combine the two, the NRC's rules themselves set one standard for reopening a closed contention to take new evidence about an issue that has already been heard ( see "10 C.F.R § 2.326 Motions to Reopen), and different standards for a request to add a new contention that raises a new material issue (see "10 C.F.R § 2.309 Hearing requests, petitions to intervene, requirements for standing, and contentions").

A principal reason that the two are, and must be, different, is that the standards for reopening may not be properly applied to the new material contentions that deal with unlitigated issues. *Union of Concerned Scientists v. NRC*, 735 F.2d 1437, 1443-44 & n. 11 (D.C. Cir. 1984: the opportunity to request reopening was an inadequate substitute for the opportunity to request a hearing and the stringency of the reopening standards properly cannot be applied to new material contentions that deal with un-litigated issues). See also *Commonwealth of Mass. v. NRC*, 924 F.2d 311, 334 (D.C. Cir. 1991: "under section 189(a), the NRC may not unjustifiably require that a material contention satisfy the heightened evidentiary standards for reopening a closed record"); *Union of Concerned Scientists v. NRC*. 920 F.2d 50, (DC Cir. 1990: if the NRC were to construe its rules to prevent parties from ever raising a material issue, the aggrieved party could bring an as-applied challenge to the validity of the rules); and *Deukmajian v. NRC*, 751 F.2d 1287, 1316-17 (D.C. Cir. 1984), *vacated in part*, 760 F.2d 1320 (D.C. Cir. 1985) (en banc), *and aff'd* 789 F.2d 26 (D.C. Cir. 1985) (en banc), *cert. denied*, 479 U.S. 923 (1986).

The Staff and Entergy's arguments that PW's Requests for Hearing on its new contentions are motions to reopen ignore: (i) the title of 10 C.F.R § 2.326 ("Motions to reopen"), (ii) the basic provision of clause (a) ("A motion to reopen a closed record") and

(iii) the import of clause (a)(3) (“a materially different result would be or would have been likely had the newly proffered evidence been considered initially”),<sup>3</sup> all of which show that § 2.326 simply does not apply to PW’s new contention.

The Staff and Entergy mention none of this. The fact that 10 C.F.R § 2.326 applies, and properly can apply, only to a motion to reopen something that has already been decided, and not to new material contentions, is not changed by either clause (d) or the Commission and Board decisions in *Vermont Yankee*, CLI-10-17 and LBP-10-19 on which Entergy and the Staff’s place their reliance.<sup>4</sup>

As part of the rule dealing with “Motions to Reopen,” and to be consistent with the Court of Appeals decisions discussed above, 10 C.F.R § 2.326(d) says nothing more than a “new contention” that is in reality a motion to reopen something that has already been decided, must meet both the “reopening” and the “new contention standards.”

*Vermont Yankee* does not support Entergy’s contention that a new contention directed to issues that have not been litigated and decided, and that could not have been litigated in connection with any other contention “must address and satisfy the standards for reopening in 10 C.F.R § 2.326(d).” (Entergy, 16).

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<sup>3</sup> As pointed out above, 10 C.F.R § 2.326(a)(3) is directed to whether the new evidence sought to be presented after reopening would have likely changed the result in a decision that had already been reached, and reinforces that § 2.326 deals only with motions to reopen the record in some part of a proceeding that has been decided and closed.

<sup>4</sup> In opposing PW’s earlier contention, The staff relied on *Amergen Energy Co. LLC* (Oyster Creek Nuclear Generating Station), CLI-09-7, 69 NRC 235, 274 (2009). Although perhaps incorporated by reference (Staff 7, n. 20), the Staff chose not to repeat that argument here, likely for two reasons. First, Oyster Creek is directed to reopening a closed record on an already litigated issue; it is not concerned with the entirely different situation involved here – a record that is not closed, and a new contention directed to an issue that has not been litigated. Second, the jury in Oyster Creek is still out; the NRC’s Oyster Creek decision is now before the Third Circuit Court of Appeals.

*Vermont Yankee* presented a factual situation that is very different from that present here. Properly understood, *Vermont Yankee* supports PW's position that 10 C.F.R § 2.326 does not apply here.

In *Vermont Yankee*, LBP-10-19, the Board did not "den[y] a motion to reopen the record to admit a contention similar to the one at issue here" (Staff, 7). In *Vermont Yankee*, CLI-10-17, the Board did not "make clear that ... a new contention unrelated to the remanded issues ... must address and satisfy the standards for reopening. (Entergy, 16)

The critical fact in *Vermont Yankee* is that NEC's "new" contention 2C was not a truly new contention directed to entirely new issues, but was in reality a motion to reopen already decided Contention 2. Both the Board and the Commission found that the "new" contention did nothing more than rehash what the Board had already addressed in considering existing Contention 2 (CLI-10-17, 61, 67). Thus, the Commission concluded that Contention 2C was subject to 10 C.F.R § 2.326 because it was not a new contention, but rather an effort to reopen the record with respect to Contention 2 that had already been considered and decided. Nonetheless, the Commission ordered the Board to permit NEC and Vermont to amend their original contention 2; and on remand the Board said "the motion to reopen this proceeding fails to satisfy 10 C.F.R. § 2.326(a)(1) and (3)."

But because NEC's revised contention was directed to issues raised by old Contention 2, and not to entirely different issues that had not previously been litigated, the Board decision in LPB-10-19 has nothing to do with PW's submerged inaccessible cables contention.

The Commission's decision in CLI-10-17, similarly does not hold that "if an intervenor were to seek raise a new contention unrelated to the remanded issues, it must address and satisfy the standards for reopening." (See *Entergy*, 16, underlining added). Completely consistent with Rule 2.236(d), the Commission simply held that the standards for reopening must be satisfied if an intervenor's "new contention" in substance seeks to reopen only to address new issues and information that are related to a previously decided contention.

In short, *Vermont Yankee* is simply an example of an application of Rule 2.236 that is consistent with the words of the Rule and also complies with the standards set by the Court of Appeals decisions discussed above. *Vermont Yankee* involved nothing more than a motion to reopen a contention that has already been decided, to which the "stringent" requirements and "heightened evidentiary standards for reopening a closed record" may properly apply. See *Union of Concerned Scientists v. NRC*, 735 F.2d (D.C. Cir. 1984) and *Commonwealth of Mass. v. NRC*, 924 F.2d 311 (D.C. Cir. 1991) above.

But those "stingent" requirements and "heightened evidentiary standards" cannot be applied to new material contentions that deal with un-litigated issues; and Rule 2.326 quite properly does not require them to be. PW's new contention was filed "during the pendency of the remand" (*Vermont Yankee*, CLI-10-17, 10), and it has nothing to do with, and does not seek to reopen any aspect of, either its Contention 1 or Contention 3.

### III. PILGRIM WATCH'S REQUEST FOR HEARING IS TIMELY

Entergy and the NRC Staff continue to miss the point of PW's Request for Hearing on its new contention. Pilgrim Watch did not say in its December 13, 2010 Request for Hearing that it did not know that buried unqualified cables were a problem or that Entergy had previously submitted an Aging Management Program.

PW did say is that the NRC, since 2006, has produced a flurry of paper recognizing that there is a serious problem with Inaccessible Non-EQ electric cables,<sup>5</sup> and indicating that the NRC was doing something to address it.

PW also said that it was not until December 2, 2010 that, even though the NRC knew of the problem and risks, the NRC had now decided to not require the industry to do anything to significantly and properly address them.

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<sup>5</sup> E.g.:

- 2006: The NRC began a detailed review of underground electrical power cables after moisture-induced cable failures were identified at some plants. "The cables were exposed to submergence in water, condensation, wetting, and other environmental stresses. Because these cables are not designed or qualified for submerged or moist environments, the possibility that more than one cable could fail has increased; this failure could disable safety-related accident mitigation systems." (Cited in NRC Information Notice 2010-26, page 6.)
- The NRC issued GL 2007-01 to gather information on inaccessible or underground power cable failures for all cables within the scope of the Maintenance Rule. The NRC staff identified 269 cable failures based on its review of responses from all licensees (65 sites and 104 reactor units). These failure data indicated an increasing trend in underground cable failures, and the predominant contributing factor was submergence or moisture intrusion that degraded the insulation. Summary Report GL 2007-01 (ML 082760385)
- NUREG/CR 7000, January 2010: "Electric cables are one of the most important components in a nuclear plant because they provide the power needed to operate safety-related equipment and to transmit signals to and from the various controllers used to perform safety operations in the plant." (Forward) "In-service testing of systems and components does not provide specific information on the status of cable aging degradation processes and the physical integrity and dielectric strength of its insulation and jacket materials." (5.1 Conclusions)

The NRC Staff and Entergy have cite numerous papers to show why everyone should have known of this problem; but they ignore that these papers, quite reasonably and understandably, led PW and the public to assume (as the NRC and industry wanted them to) that the NRC would seriously address the issue. Are Entergy and the Staff really arguing that, despite how much the NRC cries “wolf,” PW should have know that the NRC really wouldn’t do anything to force Entergy and PNPS to catch the wolf?

As a matter of practicality late filed contentions are often based in part upon new information and in part upon information that was known at the time of the initial deadline. The United States Nuclear Regulatory Commission Staff Practice and Procedure Digest - March 2010 says that, “The answer to the ‘good cause’ factor may involve more than looking at the dates on the various documents submitted by the petitioners. Instead, the inquiry turns on a more complex determination about when, as a cumulative matter, the separate pieces of the new information “puzzle” were sufficiently in place to make the particular concerns espoused reasonably apparent. Yankee Atomic Electric Co. (Yankee Nuclear Power Station), LBP-96-15, 44 NRC 8, 26 (1996), emphasis added. As there said:

[I]f the new and material information was revealed in a piecemeal fashion, and where the foundation for the contention is not reasonably available until the later pieces fall into place. In such cases, the licensing board must determine when, as a cumulative matter, the separate pieces of the information puzzle were sufficiently in place to make the particular concerns readily apparent. Vermont Yankee, LBP-06-14, 63 NRC at 57

The important piece of the information puzzle, that despite all of its previous statements the NRC really wasn’t going to require licensees to do anything seriously about their unsafe, unqualified, inaccessible cables, was not

in place until December 2, 2010. Subsequently the NRC's revised GALL and Entergy's commitments reinforced that neither NRC or Entergy were not seriously and adequately addressing the detrimental effects of aging on electric cables within scope critical to the functioning of safety systems.

#### **IV. PILGRIM WATCH'S REQUEST INCLUDES THE REQUIRED FACTUAL SHOWING**

As they have done several times in the past, Entergy and the NRC legal Staff continue to confuse what an Intervenor must show to have a contention admitted, and what it will be required to show at the summary disposition or hearing stage. This Board has repeatedly recognized the difference; Entergy and the NRC legal staff continue to refuse to do so.

Rule 2.309(f)(1) could hardly be clearer that critical requirements for a hearing request are that it include:

- v. "a concise statement of alleged facts or expert opinions which support the requestor's/petitioner's position on the issue," and
- vi. "sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of law or fact."

The issue at the Pleading stage is not whether PW's or Entergy's allegations are correct, but whether, if all of PW's factual assertions and expert opinions are taken as

true, they provide a basis for this contention; or said in the Federal Rules of Civil Procedure, whether PW has stated a claim upon which relief can be granted.

The NRC Staff Practice and Procedure Digest (“NRC Digest) could hardly be clearer:

Intervenors are not asked to prove their case at the contention stage, or to provide an exhaustive list of possible bases, but simply to provide sufficient alleged factual or legal bases to support the contention, and to do so at the outset.” (NRC Digest, Prehearing Matters, pg. 16).

Commission Rules of Practice make no provision for motions for orders of dismissal for failing to state a legal claim. However, the Federal Rules of Civil Procedure do in Rule 12(b) (6), and Licensing Boards occasionally look to federal cases interpreting that rule for guidance. In the consideration of such dismissal motions, which are not generally viewed favorably by the courts, all factual allegations of the complaint are to be considered true and to be read in a light most favorable to the nonmoving party. Sequoyah Fuels Corp. and General Atomics (Gore, Oklahoma Site Decontamination and Decommissioning Funding), LBP-94-17, 39 NRC 359, 365 (1994)” (NRC Digest, Hearings, 80)

The clearest evidence that PW’s Request for Hearing meets the requirements of 10 C.F.R. §2.309 is the length of Entergy’s attempts to show that it does not.

Entergy’s and the NRC legal staff’s arguments show that important facts are disputed. Entergy’s and the NRC legal staff’s oppositions spend many pages trying to show that there are no material facts in dispute. But as discussed below in more detail, those material facts presented by PW facts remain in dispute despite everything that Entergy and the Staff may say; whether their version of the facts or PW’s is correct is not an issue that can or should be resolved at this stage.

Even Entergy seems to agree that all a new contention must do is “make a minimal showing that material facts are in dispute, thereby demonstrating that an ‘inquiry in depth’ is appropriate.” 54 Fed. Reg. 33, quoted by Entergy at 36.

The issue at this stage is not whether summary disposition should be granted. Indeed, even if the perhaps higher standard applicable to a party seeking to reopen did apply (which it does not), PW has also met that standard. As said in *Private Fuel Storage*, cited and relied on by Entergy and PW, even in reopening the issue is whether “the information [is] significant and plausible enough to require reasonable minds to inquire further;” and the information that PW has been provided showing the risks presented by unsafe, inaccessible, non-qualified cables meets that test. The factual issues before the Board cannot be resolved now, or without giving PW an opportunity to present all the evidence at the appropriate time. Under any test, including at the later summary judgment stage, “[i]f there is any possibility that a litigable issue of fact exists or any doubt as to whether the parties should have been permitted or required to proceed further, the motion must be denied.” (NRC Digest, Hearings 64, 65, underlining added; see also, 10 C.F.R. § 2.710(d) (2)).

What Entergy and the Staff seem to say is that the disparate “material facts” are not really in dispute because Entergy and the Staff don’t agree with PW’s assertions. As discussed below, these material facts remain in sharp dispute.

Two fundamental “facts” deserve some discussion here. One is whether failing, unqualified, submerged cables are a safety issue; the other is the effect of Entergy’s “commitment” to follow GALL.

## A. Safety

Here, the Staff continues to rely on the conclusory declaration of Mr. Roy Matthew. (Staff, 9)

Mr. Matthew's statement ignores numerous NRC documents going back at least to 1996 saying that unqualified, inaccessible cables are a significant safety issue, and showing that the risks that they create remain:

- IN 1989-63: Possible submergence of electric circuits located above the flood level because of water intrusion and lack of drainage.
- IN 2002-12: Submerged Safety Related Electric Cables (ML020790238) Reviewed, for example, cable failures at the Oyster Creek NPS and Davis-Besse NPS that resulted from submerged safety-related cables in manholes and duct banks that were subjected to long-term flooding problems.
- 2002 to 2004: The NRR staff reviewed available operating experience of cable failures and observed that some cables at nuclear power plants, which were qualified for 40 years through licensees' equipment qualification programs, were failing before the end of the qualified life of the cables. The staff identified 23 licensee event reports and two morning reports from 1988 to 2004 that described failures of buried medium-voltage alternating current and low-voltage direct current power cables that resulted from insulation failure. In most of the reported cases, the failed cables had been in service for 10 years or more. (Cited in NRC Information Notice 2010-26, page 6.)
- 2006: The NRC began a detailed review of underground electrical power cables after moisture-induced cable failures were identified at some plants. "The cables were exposed to submergence in water, condensation, wetting, and other environmental stresses. Because these cables are not designed or qualified for submerged or moist environments, the possibility that more than one cable could fail has increased; this failure could disable safety-related accident mitigation systems." (Ibid)
- GL 2007-01 Inaccessible or Underground Power Cable Failures That Disable Accident Mitigation Systems of Cause Plant Transients (ML70360665) The NRC issued GL 2007-01 to gather information on inaccessible or underground power cable failures for all cables within the scope of the Maintenance Rule. The NRC staff identified 269 cable

failures based on its review of responses from all licensees (65 sites and 104 reactor units). These failure data indicated an increasing trend in underground cable failures, and the predominant contributing factor was submergence or moisture intrusion that degraded the insulation. Summary Report GL 2007-01 (ML 082760385)

- NUREG/CR 7000, January 2010: The Forward says that, “Electric cables are one of the most important components in a nuclear plant because they provide the power needed to operate safety-related equipment and to transmit signals to and from the various controllers used to perform safety operations in the plant.” 5.1 Conclusions: “In-service testing of systems and components does not provide specific information on the status of cable aging degradation processes and the physical integrity and dielectric strength of its insulation and jacket materials.”
- IN-2010, December 2, 2010: “Some of the cable failures have resulted in plant transients and shutdowns, loss of safety redundancy, entries into limiting conditions for operation, and challenges to plant operators. Cables not designed or qualified for, but exposed to, wet or submerged environments have the potential to degrade. Cable degradation increases the probability that more than one cable will fail on demand because of a cable fault, lightning surge, or a switching transient. Although a single failure is within the plant design basis, multiple failures of this kind would be challenging for plant operators. Also, an increased potential exists for a common-mode failure of accident mitigating system cables if they are subjected to the same environment and degradation mechanism for which they are not designed or qualified for.”

It also ignores that on August 10, 2010, not long before Mr. Matthews submitted his declaration to support the NRC legal staff’s position that failing cables were not a safety issue, Mr. Matthews made a technical presentation that is squarely at odds with the declaration presented by the NRC legal staff. In his technical presentation, Mr. Matthews could not have been clearer that electric cables are one of the most important components needed to mitigate the effects of an accident and preserve plant safety:



## Technical Basis

- Electric cables are one of the most important components in a nuclear plant to provide the various plant systems function to mitigate the effects of an accident and preserve the safety of the plant during normal, abnormal, and anticipated operational occurrences.
- If cable degradation from aging or other mechanisms remain undetected, it can lead to deterioration of cable performance or result in cable failure when it is relied on to mitigate design bases accidents and transients.
- In response to Generic Letter 2007-01, licensees provided data showing that the number of cable failures is increasing with plant age, and that cable failures are occurring within the plants' 40-year licensing periods. These cable failures have resulted in plant transients and shutdowns, loss of safety redundancy, entry into limiting conditions for operation, and undue challenges to plant operators.

NRC Public Meeting "Inaccessible or Underground Cable Performance Issues at Nuclear Power Plants," August 10, 2010, chaired by Mr. Roy Mathew, NRC/NRR , Slide 10 (ML092460425)

Nothing the NRC Staff has said or presented can or does hide the facts that NRC documents say that these cables present a serious safety risk, that Mr. Matthews technical presentation say that they do, and that Mr. Blanch agrees.<sup>6</sup>

Entergy's argument that there is no safety risk essentially does nothing more than disagree with Mr. Blanch's opinion that there are no recognized testing methods, and assert that PW and Mr. Blanch "ignore the fact that Pilgrim AMP's are based on, and consistent with, recommendations in the GALL Report." (Entergy, 20-21)

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<sup>6</sup> In its Request (59-60) PW said that the NRC Staff Practice and Procedure Digest says that "*sua sponte* reopening is required when a Board becomes aware, from any source, of a significant unresolved safety issue...." A footnote in Entergy's response says that the cases summarized in the "Digest have been superseded by Commission regulation. (Entergy, 16, n. 36)

That may be so; the specific procedure outlined in the cited cases may have been superseded by new Rule 2.340(a). But the NRC's inclusion of these cases and the principle that they reflect in the current version of the Digest makes clear that the principle behind them has not been superseded in any way. That principle - *the Board cannot ignore serious safety issues of which is aware* - is central to the NRC's statutory obligations, and important to public safety.

All that the new rules change is that it is now the presiding judge, here Judge Young, who is required to act, and under Rule 2.340(d) to refer any significant unresolved safety issue to the Commission. Inaccessible, unqualified electric cables provide the power to major PNPS safety systems; the fact that these cables are failing because they cannot withstand being submerged in water, is a significant unresolved safety issue.

With respect to the first, Entergy ignores NUREG/CR 7000, January 2010: “In-service testing of systems and components does not provide specific information on the status of cable aging degradation processes and the physical integrity and dielectric strength of its insulation and jacket materials.”

As for the second, the Commission has not held that a commitment provides unassailable “reasonable assurance that the target aging effect will be adequately managed.” Entergy 21 Rather, and as discussed below, the Commission has held precisely the contrary.

B. Commitments

In *Vermont Yankee*, CLI-10-17, the Commission squarely rejected the argument, made by Entergy here, that, because a licensee has made a “commitment,” PW cannot challenge whether that “commitment” is in fact sufficient to protect the public health and safety:

Vermont also argues that the GALL Report is merely “a guidance document and compliance with it does not foreclose a challenge to the adequacy of the GALL[-] approved program any[ ]more than failing to comply with the GALL[-]approved program is sufficient to demonstrate that an application is deficient.” Vermont likewise asserts that, at most, Entergy’s “commitment to comply with the GALL provision related to metal fatigue, [may] satisf[y] the Staff but [it] does not and cannot prevent the Board from reviewing the substance of the commitment and . . . explor[ing] any deficiencies alleged in that commitment to the extent they are raised by an intervenor.” *Vermont is correct on both of these counts .... [and] of course, any AMP is subject to challenge before a board in a license renewal proceeding.* (italics added)

Entergy's and the Staff's other argument to preclude PW's challenge is that "contentions challenging the adequacy of the Staff's SER" (Entergy, 49) or that "claim inadequacies in the Staff's safety review are inadmissible" (Staff, 13). Both are wide of the mark.

PW may have, and the NRC's Office of Inspector General<sup>7</sup> has expressed, their views as to the adequacy of the Staff's safety review, but it is not those views that are issue here. The issue is whether PW has the right to challenge Entergy's AMP, and the clear answer is "Yes."

## V. ISSUES OF MATERIAL FACT IN DISPUTE

Entergy incorrectly claims that Pilgrim Watch's Request "fails to meet the standards for an admissible contention because it is vague, unsupported, impermissibly challenges NRC rules, fails to demonstrate a genuine dispute with the application, and makes a number of claims beyond the scope of this proceeding." (Entergy pg., 1) Not so.

- The issues of material fact show very clearly that instead it is Entergy's responses that are vague and represent unsupported statements of opinion; whereas Pilgrim Watch's disputes are fully supported by their expert's factually based statements and specific reference to government and industry documents.
- Second, Pilgrim Watch does not challenge NRC rules, instead it is Entergy that draws its mistaken conclusion by failing either to read or understand pertinent NRC regulations required to assure that the effects of aging will be adequately managed so that the intended functions outlined in 54.4 (a)(i)-(iii) (e.g., providing power to critical safety components) will be maintained consistent with the CLB.

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<sup>7</sup> *Office of Inspector General's Audit of NRC's License Renewal Program*, OIG-07-A-15, September 6, 2007  
NRC ADAMS ML072490486

Entergy's incorrect argument that there are no material facts in dispute is based upon the Declaration of V. Fallacara (PNPS engineer) and R. Rucker, Entergy consultant. (Entergy, pgs., 22-26, summary). But all these do is emphasize the dispute.

Pilgrim Watch's analysis below shows beyond any doubt that we have demonstrated a genuine dispute with the application appropriate for this stage of the proceeding.

**1. Commitment to the GALL Report – dispute regarding sufficiency of program** (Entergy Ans., pg. 25)

Entergy and their experts imply that compliance with the GALL somehow insulates them from challenge when they said that, “The Application is committed to an AMP for Non-EQ Inaccessible Medium-Voltage Cable that is consistent with Rev. 1 of the GALL Report, taking no exceptions. (Entergy Decl. at ¶¶ 6-7)

Pilgrim Watch understands that whether or not Entergy's AMP and January 7 commitments comply with GALL is irrelevant to this proceeding. The issue here is whether the AMP is sufficient to provide reasonable assurance; and the Commission supports PW's right to dispute this issue. Our position is supported by the following:

a. As discussed above, the Commission made clear in CLI 10-17 that the Petitioner's (Vermont) argument was correct that the GALL Report is simply a guidance document and compliance with it does not foreclose a challenge to the adequacy of the GALL program; the Applicant's commitment to comply with the GALL does not prevent the Board from reviewing the substance of the commitment; and any AMP is subject to challenge in a license renewal proceeding.

Vermont also argues that *the GALL Report is merely “a guidance document and Compliance with it does not foreclose a challenge to the adequacy of the GALL[-] approved program any[ ]more than failing to comply with the GALL[-]approved program is sufficient to demonstrate that an application is deficient.”* Vermont likewise asserts that, at most, *Entergy’s “commitment to comply with the GALL provision related to metal fatigue, [may] satisf[y] the Staff but [it] does not and cannot prevent the Board from reviewing the substance of the commitment and . . . explor[ing] any deficiencies alleged in that commitment to the extent they are raised by an intervenor.” Vermont is correct on both of these counts .... [and] of course, any AMP is subject to challenge before a board in a license renewal proceeding.* (Italics added)

b. A "commitment" to comply with GALL is not relevant. 10 CFR 50.4 is the regulation. If GALL were the final document, and all an applicant had to do was simply make the statement that we are in compliance with GALL, then 10 CFR 50.4 would be rendered largely useless, and (as Entergy and the Staff would like) an Intervenor could essentially never commence a proceeding such as this one. It is also worth noting that 10 CFR 54 addresses ALL cables, not just the ones with a probability of failure, and that it does not distinguish between operating voltage.

c. PW’s January 20<sup>th</sup> Request for hearing provided detailed facts to support the overall dispute that the AMP is insufficient. (PW Request for Hearing, January 20, 2011, ¶¶ 46-79) For example, among the facts presented by PW, and still in dispute, were:

i. “Significant moisture” is defined to eliminate most of what could be truly significant.

- ii. Simply looking to see whether a system is “functional” before a predicted heavy rain or flooding event hardly provides any protection against the unpredicted.
- iii. Whether something is functional before something happens does not answer whether it remains functional during a wetting or submergence, and tells nothing about wetting or submergence either before or after - the dikes in New Orleans provide an example.
- iv. Undefined testing once over the next 20+ years using an unproved test system shows nothing.
- v. Inspections for water accumulation, i.e., what can I see, is insufficient on its face; at least absent testing for water accumulation, present or in the past, in places that cannot be seen simply by removing a manhole cover.
- vi. Even if “significant moisture” were adequately defined, looking to see if a cable “is exposed to significant moisture” fails even to ask if it has been significantly exposed in the past and the effect of past exposures to its aging and future operability.
- vii. There is no requirement that “all” high and low voltage cables will be tested; the word “all” is used only in reference to medium voltage cables prior to entering the PEO.
- viii. And, consistently with the entire AMP, there is no mention of what will be done if a test shows deterioration.
- ix. Entergy never commits to, or even mentions, replacing Non-EQ cables exposed to any submergence. (Request ¶ 49)
- ix. The “commitment” ignores cables carrying less than 400 Volts (See Blanch Decl., 27-29)
- x. Frequency inspections insufficient: It ignores that degradation is a rate process and the rate is *NOT* constant with time.<sup>8</sup> Therefore, the *probability*

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<sup>8</sup> Entergy’s unsupported assertion that corrosion/degradation is not a time dependent process ignores all of the evidence to that effect that was put before the Board in connection with Contention 1.

would have to be adjusted with age, or the risk becomes a function of age. As a consequence, the entire risk management in the AMP is totally misguided.

xi. Sampling: The program is silent on sampling; there is no indication that the entire component, or indeed what components, will be examined. We need to know the size of the sample; whether different samples will be taken at different times, whether any testing is in fact a requirement and if so what it is; the locations of samples; and the rationale for the sampling protocol. Because the Applicant has failed to show that they have identified both the location and extent of Non-EQ Inaccessible Cables (and any splices) in use at Pilgrim and the current groundwater flow, they have not, and cannot, have any basis for determining where and what must be sampled if that sample is to be meaningful. (Request ¶ 63)

**2. NRC Staff Review- dispute regarding whether it serves to provide reasonable assurance (Ibid)**

Entergy regularly repeats its argument that because “the NRC Staff reviewed this AMP and found it acceptable; (Entergy Decl. ¶ 8) therefore there is no dispute regarding its sufficiency.

This is not a "fact," it is what Entergy wishes the law was and what, under Vermont Yankee, it clearly is not.

In addition to what it has said at page 16, above, Pilgrim Watch disputed this “fact,” in the Request for Hearing (¶ 80). For example:

a. General Design Criterion 4 in Appendix A to 10 CFR Part 50 requires safety equipment to be designed for the environmental conditions it is subjected to during normal operation and postulated accidents. 10 CFR 50.49 requires electrical equipment to be qualified for the environmental conditions it experiences during normal operation and

postulated accidents. Rather than ensuing that cabling exposed to "significant moisture" is designed and qualified to operate under that condition (as required by NRC Regulations), PNPS' SER accepts under-designed and unqualified cabling as long as one periodically checks from time to time to see that the cables still work (at that moment), or are not then wet, submerged or degraded. The most troubling aspect of the SER is on page 3-18:

In this program, periodic inspections and drainage, as needed, for water collection in cable manholes and conduit prevent cable exposure to significant moisture. The condition of the conductor insulation for in-scope medium-voltage cables exposed to significant moisture will be tested at least every ten years; the specific test type to be determined before the initial test. The program will start prior to the period of extended operation.

The AMP's statement that "the specific test type[is] to be determined before the initial test" means that no test type is now specified. It's an important test. When water accumulation is found, the test must look for damage to the in-scope medium-voltage cables exposed to that water. Because the test is not specified now, it's hard to conclude whether it is adequate or inadequate. Entergy's test might involve a mere visual examination of a dime-sized section of the cable insulation, assuming all other parts of the insulation are equally sound. Or it might be a more meaningful test. Absent a solid test, this whole exercise ends up little more than a water safari. We fail to see much assurance that a useful determination that exposure to "significant moisture" has not damaged the medium-voltage cables. That is, or should be, the whole point of it all.

b. A recent report by the NRC Office of Inspector General (OIG), *Office of Inspector General's Audit of NRC's License Renewal Program*<sup>9</sup> made clear that neither the NRC nor the public can rely on the SER's conclusion that aging will be adequately managed so that the intended functions will be maintained consistent with the CLB over the extended period of operations

### 3. Entergy's Commitments- dispute sufficiency (Ibid)

Entergy, in response to GALL Rev. 2, enhanced the AMP so that it now includes low-voltage (400 V to 2 kV) power cable, and increased the minimum frequency of manhole inspections and cable insulation testing. (Entergy Decl. at ¶ 10)

Pilgrim Watch does not dispute what Entergy's new AMP actually says; instead, the dispute regards what Entergy should do, the sufficiency of this enhancement to the AMP. For example the dispute was supported in the Request by PW's factual showing:

a. The "commitment" ignores cables carrying less than 400 Volts and cables with voltage less than 400 V serve important safety functions. (See Blanch Decl., 27-29)

b. (i) Inspections in Entergy's Commitment still remain too infrequent, citing, NUREG/CR-7000 BNL-NUREG-90318-2009 at 4-18 (Request ¶ 52) (ii) The frequency of inspection is based on a false assumption regarding degradation. The probability of corrosion is not constant with time and therefore cannot be characterized with a number and entered as such into a "Rule" - such as if we inspected yesterday we don't need to inspect again for 10 years (Request ¶ 53) (iii) The frequency of inspections is not

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<sup>9</sup> *Office of Inspector General's Audit of NRC's License Renewal Program*, OIG-07-A-15, September 6, 2007. NRC ADAMS ML072490486

sufficient especially in consideration of Pilgrim’s location on the shores of Cape Cod Bay; soil types (sand, silt and clay) that retain moisture (PNPS’ FEIS); a climate characterized by rain, snow, twice daily high tides, tidal surges, and the presence of contaminants that hasten degradation. (Request ¶ 55) (iv) The frequency is not based on a baseline study of cables today in comparison to condition as new to assess proper inspection frequency going forward. (v) The frequency is not justified by Entergy (Entergy Decl. ¶ 22)

#### **4. Cable with Voltage below 400 V not in AMP – dispute they should be included**

(Ibid)

Entergy claims that cable with voltages below 400 V are not included in the AMP for non-EQ inaccessible cable because the operating experience across all operating units has not indicated any significant frequency of water-induced failure. They opine that this reflects the fact that degradation of cable insulation is generally a function of both the voltage and the presence of water (i.e., the voltage level contributes to the degradation). Id. at ¶ 26.

Pilgrim Watch, in contrast, maintains otherwise. 10 CFR 54 does not exclude failures because the licensee says they are not probable. Further, Mr. Blanch explained that (Blanch Decl., ¶¶ 27-29)

Commitment 15 thus excludes numerous cables that “perform a license renewal intended function and are potentially exposed to significant moisture.” Mr. Blanch says specifically that Entergy has arbitrarily redefined the scope of its cables monitoring programs thereby eliminating the majority of vital cables within the scope of 10 CFR 54.4 and 10 CFR

54.21. There are miles of cables<sup>10</sup> operating at voltages of less than 400 volts that meet the requirements defined in 10 CFR 54, yet Entergy and the NRC has failed to address any requirements for aging management for these cables and wires.” (Blanch Decl., ¶ 28)

#### **5. Inaccessible Cable Splices –dispute (Ibid)**

Entergy says “there are no inaccessible cable splices at Pilgrim. The Pilgrim AMP described in LRA App. B § B.1.34 manages the effects of aging on cable splices. Id. at ¶ 13.”

Pilgrim Watch’s expert challenges this bald unsupported statement based on his personal experience witnessing cable installation at Millstone 2 and 3. Mr. Blanch said after reviewing Entergy’s document that, “I believe this to be an unsupportable statement based on no physical evidence whatsoever. Every nuclear plant that I am familiar with has splices that are undocumented and exposed to water. This fact could also result in corrosion of underground cables.”

Regarding Entergy’s statement that, “The Pilgrim AMP described in LRA App. B § B.1.34 manages the effects of aging on cable splices,” this can only be the case for those that are accessible.

#### **6. Actions to Minimize Exposure of Cable Significant Moisture- dispute their sufficiency (Ibid)**

Entergy says that “the AMP for non-EQ inaccessible cable requires periodic actions to minimize exposure of cable significant moisture, such as inspecting for water collection

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<sup>10</sup> The exact amount, function and location of these cables needs to be determined during the proceedings.

in cable manholes containing in-scope cables, and draining water as needed. These inspections will occur at least once every year, with more frequent inspections performed if necessary based on trending and evaluation of inspection results. Id. at ¶ 10. For example, with respect to the only two manholes that are near the water table, Entergy conducts these inspections bi-weekly. Id. at ¶¶ 23, 37.”

Pilgrim Watch agrees that "periodic actions" are required, but disputes the ability of the measures advanced by Entergy to provide reasonable assurance.

For example, IN 2010-26 at 7 pointed out that:

Some licensees have attempted to periodically drain the accumulated water from the cable surroundings to avoid cable failures. In some cases, the water quickly refilled the cavity in areas in which the water table was above the base level of a cable trench or underground vault. In other cases, water accumulated seasonally (e.g., because of snowfall or rain), filling conduit or raceways. In both cases, periodic draining could slow the rate of insulation degradation, but it may not prevent cable degradation. [Emphasis added]

Further, before that Generic Letter 2007-01, “Inaccessible or Underground Power Cable Failures That Disable Accident Mitigation Systems or Cause Plant Transients”: Summary Report (MI082760385), said the exact same thing.

**7. Testing to Provide an Indication of the Condition of the Cable Insulation – dispute (Ibid)**

Entergy says that the AMP for non-EQ inaccessible cable requires testing at least every six years to provide an indication of the condition of the cable insulation, and the results will be evaluated to determine the need for increasing the test frequency. Id. at ¶ 10.

The AMP may say this, but Pilgrim Watch disputes its sufficiency because, among other things, Entergy omits testing of cables < 400 V. These cables serve a safety function and it is inconsistent with 10 CFR 54 to exclude them. Also Entergy simply provides a listing of tests; Entergy never claims, or provides a rationale, that they are proven tests to detect all types of cable degradation. Also they refer to an Entergy program that does not appear to be publicly available for analysis.

#### **8. “Proven Tests”- dispute (Ibid)**

Entergy says that “multiple proven tests exist for determining the degradation of cable insulation from different aging mechanisms. The types of tests specified in Section XI.E3 of the GALL Report and in the revised Pilgrim AMP for non-EQ inaccessible cable are all identified in NUREG/CR-7000 as tests that have the ability to indicate the condition of cable insulation. Id. at ¶¶ 11, 13, 15.”

Pilgrim Watch disputes that there are “proven tests” for detecting cable deterioration. EPRI, Sandia and Brookhaven have concluded there is not any “proven” technology to detect degradation (Blanch Decl., 29-33); and NUREG/CR 7000 agrees. PW’s Request for Hearing provided support for its position, unlike Entergy. For example:

- a. The Sandia Study (SAND 96-0344) at 6.4 says:

No currently available technique was identified as being effective at monitoring the electrical aging of medium-voltage cables. Some methods may be effective at detecting severe electrical degradation or monitoring certain types of degradation (such as thermal aging); however, correlation of

these measurements with the expended or remaining life of these cables has not been demonstrated.

Mr. Blanch (Blanch Decl., Jan 14, 2011; at 44) correctly points out that “While this Sandia document may be 14 years old, however its conclusions have not been superseded by additional research including extensive EPRI and NRC studies (Request ¶ 65)

b. NUREG/CR 7000 (5.1 Conclusions) admits and confirms that in-service testing is not sufficient: (PW Request ¶66)

In-service testing of safety-related systems and components can demonstrate the integrity and function of associated electric cables under test conditions. However, in-service tests do not provide assurance that cables will continue to perform successfully when they are called upon to operate fully loaded for extended periods as they would under normal service operating conditions or under design basis conditions. In-service testing of systems and components does not provide specific information on the status of cable aging degradation processes and the physical integrity and dielectric strength of its insulation and jacket materials. (Emphasis added)

c. Entergy’s Commitment No. 15 that says, “Cables will be tested for cable insulation degradation... using a proven, commercially available test for detecting cable insulation deterioration” is meaningless statement. What is “a proven ... test?” Entergy offers no facts to show that any of the tests it lists are “proven;” much less that the proposed scope and frequency of the tests are statistically significant or reliable. As for the “proven ... test” itself, no information is provided indicating: who approved any test, whether they had a vested interest in the results; when any tests were performed; whether

the test applied to the specific circumstances at Pilgrim, whether any components tested were the same age as Pilgrim's and located in a wetted salt environment. Neither is there any information regarding methodology such as the sample size and statistical significance of proof provided and so on. (PW Request ¶ 67)

d. At 33, Mr. Blanch summarizes, "Entergy infers they have a "proven method" for detecting cable deterioration yet NRC, EPRI, NEMA, NEC, Sandia and Brookhaven have concluded there is not any "proven" technology to detect cable and splice degradation due to periodic submergence in a saltwater and otherwise chemically contaminated environment." (PW Request ¶ 68)

e. In addition Mr. Blanch says that, "10 CFR 50 Appendix A and B require testing and corrective actions however the fact that these failures are increasing with age indicates that proper corrective actions are not being implemented by the licensees. There is no recognized testing that can provide reasonable assurance that these cables can perform "their intended functions." (Blanch Decl., 49) (PW Request ¶ 69)

#### **11. List of Tests For Detecting Cable Insulation Degradation –dispute (Ibid)**

Entergy lists tests identified in the AMP for detecting cable insulation degradation include: dielectric loss (dissipation factor/power factor); insulation resistance and polarization index; AC voltage withstand; partial discharge; step voltage; time domain reflectometry; and line resonance analysis. Id. at ¶¶ 10-11.

Pilgrim Watch says that Entergy simply provides a listing of tests that may be performed; but failed to indicate and support the claim that they are proven tests to detect all types of cable/splice degradation.

**12. Consistency EPRI demonstrates sufficiency- dispute (Ibid)**

Entergy says that “the manhole inspections and cable insulation tests required under Pilgrim’s AMP are consistent with recommendations for such inspections and tests developed by the Electric Power Research Institute (“EPRI”). Id. at ¶ 17.”

Pilgrim Watch disputes Entergy’s implication that general consistency with the recommendations for inspections and tests developed by EPRI provides any reasonable assurance for detecting cable and/or splice degradation. For example:

- a. EPRI makes no claim, nor does Entergy show that they do provide reasonable assurance, or that their recommendations individually or in combination will detect all age related degradation of NonEQ inaccessible cables at Pilgrim Station.
- b. Entergy’s experts quote an EPRI Report 1020805 that says,  
  
If practicable, manholes and vaults should be kept clear of water that could submerge cables and cable accessories.

An overly vague recommendation such as this does not provide reasonable assurance. It does not provide any direction as to how and how often, manholes and vaults should be kept clear, or what should be done to prevent cables from failing when it is not “practicable” to keep them clear of water.

The EPRI quote goes on to say that,

Cables within the scope of the medium-voltage cable aging management program that are or have been subjected to long-term wet environments should be assessed for condition.

This is a laudable goal but totally worthless as to what should be done to provide reasonable assurance. Lofty goals about what "should be done," absent specific NRC regulations/requirements requiring that it be done, do not justify Entergy's aging management program.

### **13. Baseline Inspections – dispute (Ibid)**

Entergy says that “while there is no regulatory requirement for baseline inspections, the initial testing of the non-EQ medium- and low-voltage inaccessible cable will provide baseline results. All in-scope medium-voltage cable will be tested before the period of extended operation, and all in-scope, inaccessible low-voltage cable will be tested within the first six years of extended operation. Id. at ¶¶ 28-29.”

Pilgrim Watch disputes Entergy's excuse that it need not conduct baseline inspections because there is no "regulatory requirement" and its apparent claim that its proposed testing will provide reasonable assurance. Reasonable assurance is not provided, for at least the following reasons:

#### Base-line Inspections

a. PW explained in its Request for Hearing that, “The frequency of inspection cannot be properly determined absent a lack of a commitment to perform a baseline inspection of all components, not just some. Commitment 15 says in the Program

description of B.1.19 (Entergy Letter No. 2.11.001, Attachment 1, page 9) “All in-scope medium voltage cables will be tested *prior to* entering the PEO and low-voltage cables will be tested *within* six years of entering the PEO.” (Emphasis added) They fail to say if the purpose is to establish a baseline; and there is no reason to exclude low-voltage cables from an inspection *prior to* permission for extended operations. The program is not adequate without a commitment to perform a baseline review of all cables within scope to determine the condition of the submerged Non-EQ cables, *prior* to license extension and compare their present condition to what it was when installed. Absent a baseline, there is no way to assess the adequacy of the AMP and to trend degradation over time. (Blanch Decl., 42)

b. Entergy's initial testing can only show the condition of the cable after it had been installed for 40 years. The cable condition should be compared to "new" qualified cables.

#### Aging - dispute

b. Entergy's Decl. ¶29 justification for postponing testing low voltage cables to sometime within the first six years of extended operation is flawed. They put forward two excuses: (1) the Gall program is “new” so that somehow we are supposed to believe that they cannot do a baseline in the next 16-17 months; and, (2) that insulation degradation is a slow process where the potential for degradation increases with voltage, so there is no rush. What they overlook is that wetness and age are the leading cause of failure according to government documents and Entergy overlooks preexisting weaknesses such as manufacturing defects and nicks and scrapes during installation – another dispute.

PW Explained in its December 13<sup>th</sup> Request for Hearing that,

¶ 26. Corrosion increases with age. The aging degradation of wires is commonly the result of deterioration of the wiring insulation. Aging causes insulation to become less and less pliable, making it easier for cracks and tears to form and grow larger. Residual defects in the insulation, leftover from blemishes during manufacturing and nicks and scrapes during installation, are pre-existing weaknesses exploited by aging. According to the recently issued EPRI reports,<sup>11</sup> wires degrade with age and the most susceptible to degradation are the oldest wires.

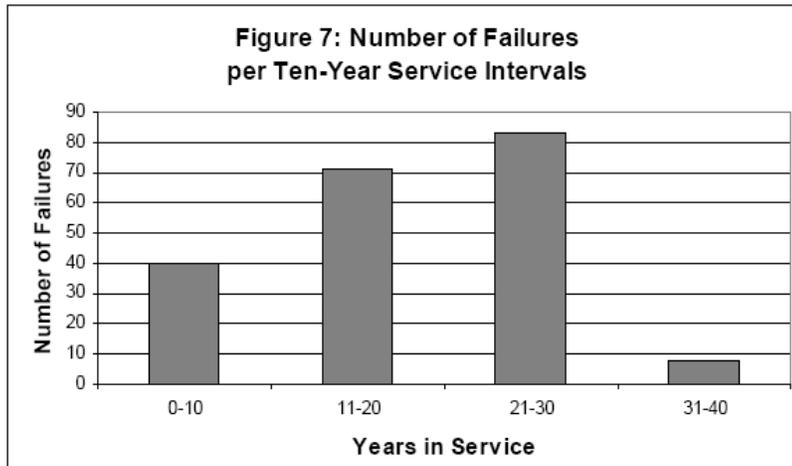
PW explained in its Jan 20<sup>th</sup> Request for hearing that,

¶ 58. Age: Frequency of inspection apparently has not been linked, as it should have been, to the age of the component. The likelihood of failure increases over time as the cable insulation degrades and/or is exposed to water. (IN 2010-26, at 5)

¶ 59. Mr. Blanch (Decl., 47) said that, “It is very clear that the number of cable failures is rapidly increasing with age as shown from the following graph copied from the NRC’s own study titled “Inaccessible Or Underground Power Cable Failures That Disable Accident Mitigation Systems Or Cause Plant Transients”

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<sup>11</sup> Plant Support Engineering: Aging Management Program Development Guidance for AC and DC Low-Voltage Power Cable Systems for Nuclear Power Plants, “Regulatory and management concern regarding the reliability of low-voltage power cable systems at nuclear plants has been increasing for the past 5–10 years. The staff of the United States Nuclear Regulatory Commission are concerned that wetted (up to and including submergence) low-voltage power cable circuits may be degrading to the point at which multiple cable circuits may fail when called on to perform functions affecting safety. Utility managers are concerned that cables may fail, causing adverse safety consequences and/or plant shutdowns. This document provides guidance for developing and implementing a cable aging management program for low-voltage power cable circuits in nuclear power plants.”



¶60. As said earlier, It may appear that the number of failure decreases after 30 years, but this is misleading. Very few plants have been operating for more than 30 years; and the number of failures per plants of various age is not stated. There is no reason to suspect that the likelihood of failure will magically decrease after age 30 unless NRC assures the requirements of 10 CFR 50.49 are put in place. It is recognized that many inaccessible cables are being subjected to design basis events that include conditions of normal operation defined by 10 CFR 50.49. (Blanch Decl., 48 )

¶61. Mr. Blanch concludes that, “[R]isk will increase with continued age as clearly shown by the NRC’s own published data unless the NRC is willing to implement the recommendations of industry studies and independent organizations including NEMA and NEC and its own regulations (10 CFR 50.49).” (Blanch Decl.,52 )

**14. Corrosion/Degradation- dispute (Ibid)**

Entergy makes the petty comment that “corrosion is not an aging effect applicable to cable insulation because cable insulation is non-metallic and therefore not subject to corrosion. Id. at ¶ 31.

Pilgrim Watch answers this in two ways. (i) First, we simply point out that the Thesaurus for “corrosion” lists “deterioration” and “decomposition,” and that was the sense in which Pilgrim Watch used the term. To avoid confusing Entergy, in the future we will try not use the every-day usage but instead to call what is happening to Entergy's cables “degradation.” (ii) Second, even taking Entergy's definition of “corrosion,” Entergy’s statement is not true. There are splices and possibly connectors that may contain dissimilar metals subject to what Entergy calls corrosion.

**15. Site Specific Characteristics – disputes (Ibid)**

Entergy’s multiple arguments regarding site specific factors relating to degradation (Entergy’s Answer at 25), unlike Pilgrim’s environment, do not hold water.

Pilgrim Watch disputes not simply what Entergy says but, as important, what they avoid mentioning, especially the exact location of cables within scope that is needed to understand their proximity to the water table, tidal surges, and twice daily tides high. For example, Entergy’s expert Decl. ¶ 37 says

The upper extreme of the water table does reach the bottoms of two manholes that contain non-safety related cables with a license renewal intended function. The water table at these manholes reaches approximately 15 feet above sea level during the rainy season, and the bottom of the manhole is 13.5 feet above sea level, providing 18 inches of water above the bottoms of the manholes. Water is detected in these two manholes on a seasonal basis because of the proximity of the water table. Water has been found in other manholes only after a significant rainfall.”

What is missing from this analysis is a listing of cables not accessible by manholes. Further PW is unaware of a “rainy season” in Plymouth; instead moisture results from storms, rains throughout the year, snow melt, tidal surges, and twice daily high tides.

#### Hydrological Surveys- dispute

a. Entergy says that “There is no regulatory requirement to perform a hydrological survey of the Pilgrim site for license renewal purposes. Nevertheless, Pilgrim performed such a survey in 2007 as part of the industry’s groundwater protection initiative. The survey confirms that Pilgrim cables are installed above the groundwater table. Id. at ¶¶ 35-36.”

Pilgrim Watch: (i) PW does not dispute the fact that there is not a requirement. In fact Pilgrim Watch’s contention is based upon the lack of NRC requirements in IN 10-20. However, the dispute on this point is that a thorough and up-to-date hydrological survey is an important part in designing Pilgrim’s AMP to determine the appropriate frequency of inspections and tests. An everyday example is that a doctor will set a schedule for lung X-rays and tests dependent on the patient’s personal history of smoking, occupational exposure history and previous tests. Pilgrim has not shown that they have performed either an updated subsurface hydrological geological survey over the entire site to know precisely the current groundwater flow over the property today or superimposed on that informational map the locations of all the cables (PW Request paragraph 57)

(ii) Entergy says that they performed a survey at Pilgrim in 2007 as part of the industry’s groundwater protection initiative. The dispute is whether that was only a partial survey of the area targeted specifically to install the new monitoring wells or a survey of the entire

site. Second Entergy avoids mention of later surveys<sup>12</sup> done by their contractor Environmental Resources Management (ERM) in order to place additional monitoring wells to determine where the persistent findings of tritium are coming from. PW's hydrologist, Dr. Ahlfeld currently is reviewing these more recent surveys to determine their adequacy for cables and tracking radioactive leaks. The fact Entergy is silent on these studies becomes obvious - they serve to support Pilgrim Watch's, not Entergy's position.

#### Subsurface Environment - dispute

##### Water table- dispute

Entergy says that "The Pilgrim site grade elevation is 23 feet above mean sea level" (Entergy Answer, pg., 25)

Pilgrim Watch: This is flatly contradicted by Entergy's own ERM May 2010 report, Figure 3-Groundwater Elevations and Contour May 2010.

Legend: Blue rectangle indicates groundwater elevations collected in May 2010 (feet above mean sea level); blue lines indicate Groundwater Elevation Contour (dashed where inferred)

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<sup>12</sup> Groundwater Monitoring Well Installation Report, Pilgrim Nuclear Power Station Plymouth, Massachusetts Entergy Nuclear Operations, Inc., Environmental Resources Management (ERM), Boston MA, June 11, 2010; Groundwater Investigation Report, Pilgrim Nuclear Power Station Plymouth, Massachusetts Entergy Nuclear Operations, Inc., Environmental Resources management (ERM), Boston MA, November 1, 2010. Upon request either Pilgrim Watch or Entergy can provide a copy at the Hearing, March 9, 2011.



Consistent with U.S. Coast Geological Survey maps, Entergy’s document shows that near the Bay the constour line is 3.5 feet; proximate to the main reactor building, 7-9 feet; and up the hill to Rocky Hill Road distant from PNPS’ site structures, the lines range from 13-15 feet.

### Flooding- dispute

Entergy says “Pilgrim has not been subject to flooding.” (Ibid)

Pilgrim Watch disputes this assertion and notes that Entergy has failed to provide any factual support. In contrast PW supports our factual claim as follows:

The Commonwealth of Massachusetts State Hazard Mitigation Plan 2007<sup>13</sup> considers coastal storms a hazard with flooding. We do not believe Pilgrim, located directly on the coast, has been immune. The Commonwealth's Hazard Mitigation Plan 2007 says that,

Coastal storms are an intricate combination of events that impact a coastal area. A coastal storm can occur any time of the year and at varying levels of severity. One of the greatest threats from a coastal storm is coastal flooding due to storm surge. This is the inundation of land areas along the oceanic coast and estuarine shoreline by seawaters over and above normal tidal action. Also common to coastal storms are high winds, erosion, heavy surf and unsafe tidal conditions, and fog. Some or all of these processes can occur during a coastal storm, resulting in an often detrimental impact on the surrounding coastline. (Emphasis added)

In addition, the Hazard Report says ( at 56) that, "Nor'easters are a common winter occurrence in New England and repeatedly result in flooding.

Further the Southeastern Regional Planning & Economic Development District (SRPEDD) Region Natural Hazard Disaster Mitigation Plan, 2004<sup>14</sup> (at 34) shows, that flood related hazards, coastal storms, Nor'easters, winter storms are all highly likely.

Again we do not believe Pilgrim manages to dodge every bullet.

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<sup>13</sup> [http://www.mass.gov/Eeops/docs/mema/disaster\\_recovery/state\\_plan\\_2007\\_rvn4.pdf](http://www.mass.gov/Eeops/docs/mema/disaster_recovery/state_plan_2007_rvn4.pdf)

<sup>14</sup> [http://www.srpedd.org/news\\_reports/mitplan.pdf](http://www.srpedd.org/news_reports/mitplan.pdf)

<b>Natural Hazard</b>	<b>Likelihood/ Frequency</b>	<b>Impact Area Assessment</b>	<b>Severity/ Magnitude</b>	<b>Hazard Index</b>
<b><i>FLOOD RELATED HAZARDS</i></b>    Riverine    Coastal    Erosion    Dam Failures    Thunderstorms    Winter Storms    Coastal Storms/ Nor'easters    Hurricanes	Highly Likely (3)	Medium (2)	Limited (1)	6 Pts.* Rank #1
<b>WIND RELATED HAZARDS</b> <input type="checkbox"/> Hurricanes <input type="checkbox"/> Coastal Storms/ Nor'easters <input type="checkbox"/> Winter Storms	Highly Likely (3)	Medium (2)	Limited (1)	6 Pts.* Rank #1

It is important to make note also of the fact that due to global warming and climate change, it is predicted that storms will increase over the license renewal period along with a rise in sea level.

Climate Change Ignored- dispute

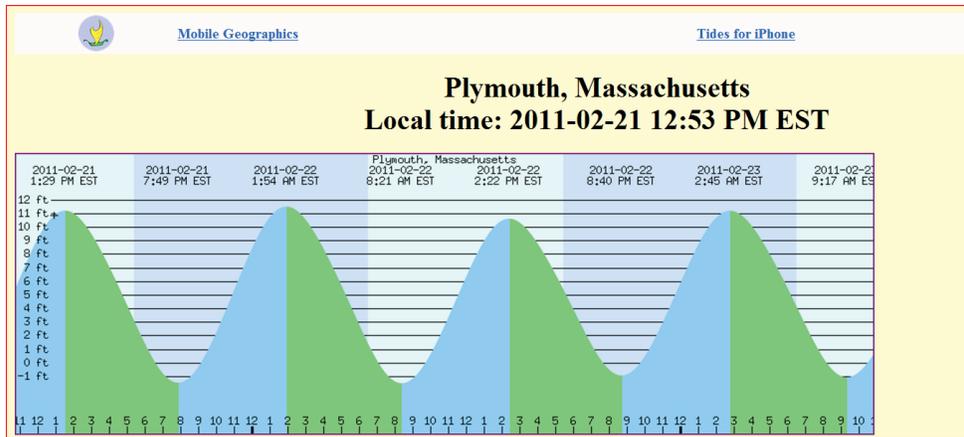
Climate change over the license renewal period has a clear impact on wetness and salinity in Pilgrim's subsurface resulting from increased storms, tidal surges and sea level rise.

Tides Ignored - dispute

Tide is an important site specific factor contributing to salt water wetness of subsurface components. This is ignored by Entergy. There is a 10-12 foot tide in Plymouth Massachusetts.<sup>15</sup> Twice each day, the sea level is 5 to 6 feet higher than ASL- Average Sea Level.

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<sup>15</sup> <http://mobilegeographics.com:81/locations/4737.html>



Entergy’s ERM Report (November 1, 2010 4.0 Key Findings, 29) said that with one exception that, “all wells monitored exhibit changes in groundwater elevation that reflect the effects of tidal fluctuations. In general, the amplitude of the elevation fluctuation at each well decreases with distance from the shoreline.

In addition storm surges are predicted as a result of climate change and obviously will increase wetness in Pilgrim’s subsurface.<sup>16</sup>

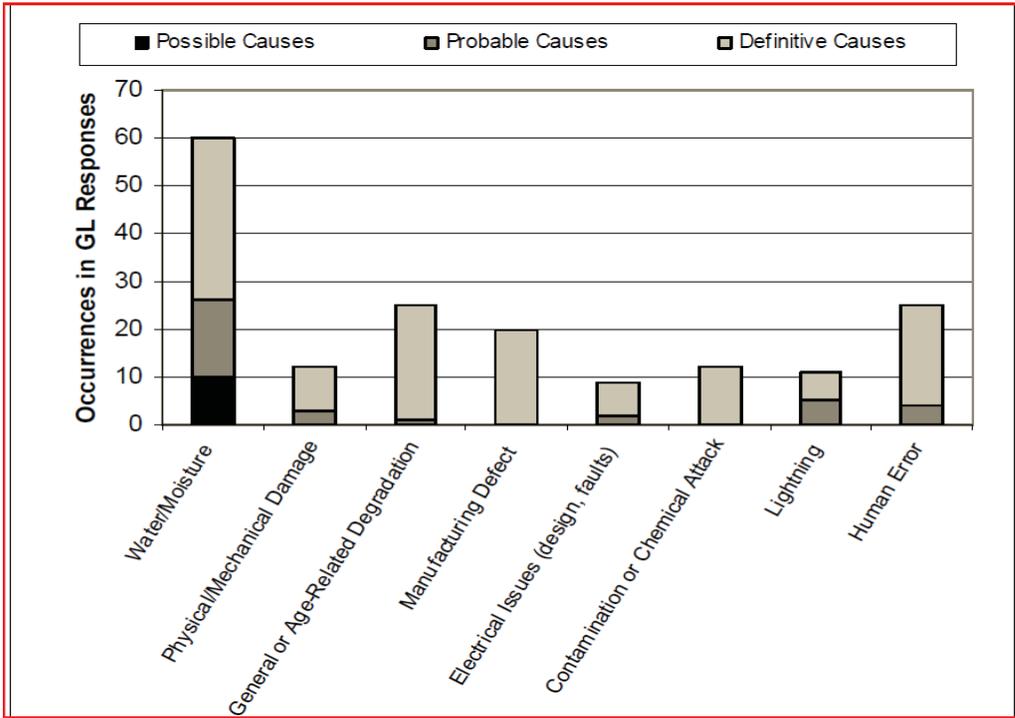
#### Contaminants- dispute

Although water and aging are the top factors causing degradation impurities can play a contributing role. For example, Generic Letter 2007-01, “Inaccessible or Underground Power Cable Failures That Disable Accident Mitigation Systems or Cause Plant Transients”: Summary Report (MI082760385) asked licensees to identify causes of cable failures. Figure 22 summarizes their findings.

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<sup>16</sup> Global Warming Solutions Reports Environment America Research & Policy Center, Tony Dutzik, Frontier Group, Nathan Willcox, Environment America, Research & Policy Center September 2010 <http://www.environmentamerica.org/home/reports/report-archives/global-warming-solutions/global-warming-solutions/global-warming-and-extreme-weather-the-science-the-forecast-and-the-impacts-on-america>

**Figure 22: Causes and Causal Factors for All Cable Failures**



Pilgrim Watch explained in the January Request for Hearing at ¶ 56 that contaminants, such as salt, increase degradation (Blanch Decl., 23) and therefore the need for more frequent inspections. A NEMA manufacturer quoted by Mr. Blanch also said that degradation was particularly acute if salt water was involved.

When wire and cable products are exposed to water or excessive moisture, the components may be damaged due to mildew or corrosion. This damage can result in insulation or termination failures. *This problem can be more severe if the components have been subjected to salt water...or high concentrations of chemicals, oils, fertilizers etc.*” [Blanch 20, Emphasis added]

Entergy incorrectly disputes this fact. For example:

### Salt- dispute

Entergy says that “Groundwater flows into Cape Cod Bay; sea water does not flow in reverse direction.” (Entergy Answer pg., 25) leading the reader to believe that contamination from salt in the groundwater or in the soils surrounding the cables is not an issue.

Pilgrim Watch: The statement may be technically true, but it is misleading. It ignores the effect of tidal surges from storms, twice daily high tides, and predicted impacts global warming. For example Entergy’s ERM June 2010 Report, Table 2 Summary of Well Development Data reported salinity, parts per million, that ranged from 260 to 3210 parts per million, no samples were taken at high tide. However Entergy’s readings make little sense; we need additional factual data. Seawater has a salinity of about 3%, that is 30 g salt per liter. Tap water has a salinity of less than 200 ppm (Government regulations), that is less than 2 parts per thousand (compare that to Entergy’s range that exceed to over 3 parts per thousand). 200 mg per liter, or 0.2 g/L. Reducing the salinity by a other factor of 100,000, i.e. from 200 mg/L to 2 microgram per liter, or 2 ppb, is truly high tech. Water of this purity is likely feed water; and if such is found in the wells, then PNPS has a real problem with underground leaks on safety related pipes.

However, Pilgrim Watch has another problem with Entergy’s numbers. If this ultra pure water had been in contact with the soil only for a second, it would have lost its purity completely. Hence we cannot imagine how one can do a hydro-geo survey and find that kind of water in the ground. Therefore we dispute Entergy claim that salinity is not an issue and we dispute their analyses. In short, going back to lessons learned from

Contention 1, Entergy's Exhibit 5, at 27, PW's Exhibit 14, says that, "Another of the most important conditions for corrosion to occur is the chloride ion (Cl)...". Chloride is naturally abundant in seawater. Pilgrim sits at the shoreline of Cape Cod Bay.

Climate changes over the license renewal period will increase the salinity in the subsurface water and soils on site. For example in the report Coastal Zones and Sea Level Rise (<http://www.epa.gov/climatechange/effects/coastal/index.html>) it says very clearly that, Rising sea level increases the salinity of both surface water and ground water through salt water intrusion. This is repeated in numerous other studies.

#### pH- dispute

The pH or acidity in the water and soil is another contributing factor to degradation. The pH scale goes from 0 to 14 with pH 7 as the neutral point; as the amount of hydrogen ions in the soil increases the soil pH decreases thus becoming more acidic. From pH 7 to 0 the soil is increasingly more acidic. Soils tend to become acidic as a result of: (1) rainwater leaching away basic ions (calcium, magnesium, potassium and sodium); (2) carbon dioxide from decomposing organic matter and root respiration dissolving in soil water to form a weak organic acid; (3) formation of strong organic and inorganic acids, such as nitric and sulfuric acid, from decaying organic matter; and (4) pollution –acid rain and increased acidity in ocean water.<sup>17</sup>

Entergy says that " the average pH results from tests on water collected from storm drains and manholes is essentially neutral and does not indicate the presence of any contaminants that might adversely impact cable insulation." (Entergy Answer, pg., 25)

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<sup>17</sup> Soil pH, [http://en.wikipedia.org/wiki/Soil\\_pH](http://en.wikipedia.org/wiki/Soil_pH); Tr. Exh., 21, Brookhaven Report at 3.4]

Pilgrim Watch disagrees. Entergy's own November 1, 2010 ERM Report, p 25 said "The pH of groundwater ranged from 4.76 to 6.76 standard pH units. The lower pH measurements were associated with (a) well...located in the eastern portion of the site." First this shows every measured pH was acidic not neutral; and second that pH varies around a site – it is not a constant number. However Entergy's numbers make little sense. Ultra pure water with the salinity quoted has a pH of 7 - pH 6.76 is just about acceptable. A pH reading of 4.76 indicates some acid present, but then the salinity number makes no sense again. More factual information is required from Entergy, not simply the unsupported assertions provided.

pH was an important consideration in Contention 1 as a contributor to degradation as it also would be for subsurface cables. Ms. Pine Dubois, Jones River Watershed Association testified at the public hearing, April 9, 2008 and provided factual data to the Board specifically on the high acidity in local soils. Further we remember that Entergy's Prefiled Expert Testimony, at A83, attempted to downplay the role the pH factor would play at PNPS. They said that, "During construction of PNPS, the site was excavated for the construction of various buildings. During excavation, all rock over six inches, shrubs and trees were removed from the soil...plants biodegrade, release compounds that may increase soil pH. (This) precaution serve(s) to reduce corrosivity of the soil environment." However the site was constructed in the 1960's, plants reappear in less than 35 or 40 years. It rains in Plymouth; and New England receives carbon pollution from the mid-west resulting in increased acidity in our environment. Further we doubt their numbers because soil acidity varies – over time and over a small geographic area.

Also, a pH level of around 6.3-6.8 is the optimum range preferred by most bacteria in soil – bacteria cause degradation.

### Oil

Mr. Blanch referenced NEMA saying that damage can result in insulation or termination failures and that this problem “*can be more severe if the components have been subjected to salt water...or high concentrations of chemicals, oils, fertilizers etc.*” [Blanch 20, Emphasis added] Entergy makes no effort to provide factual support that these other contaminants are not an issue at Pilgrim. We know that they have a large parking lot with inevitable vehicle oil spills and the potential of oils leaking from or spilled from the fire system, diesel generators. Oil spills are of record.

### Soil- dispute

Entergy neglects to consider the impact of moist soils surrounding the cables causing degradation. Pilgrim’s FEIS describes the soil as sandy, silt and clay – soil types that retain moisture.<sup>18</sup> Moisture increases from rain and snow percolating downwards. Water in the soil travels both vertically and horizontally; and it is obvious that the adjacent ocean and tides provides a very moist environment. Additionally, sand and soil particles move in the subsurface and are abrasive; eventually over the years this can contribute to damaging insulation.

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<sup>18</sup> **Topography source: Pilgrim Nuclear Power Station, Boston Edison** Company Docket No. 50-293, May 1972 –U.S. Atomic Energy Commission, Division of Radiological and Environmental Protection, Final EIS “The station site is along the rocky western shoreline of Cape Cod Bay. The geology of the site is recognized as primarily glacial deposits. The natural surface stratum in the station area consists of approximately 20 feet of silty and clayey fine sands with scattered boulders. Bedrock is about 30 to 90 feet below mean sea level.” P. 9 “Surface topography is such that surface drainage from the station is seaward and surface water will not leave the Station property otherwise” P.10, TR EX 26, Exhibit 13.

**16. Mild versus Harsh Environment- dispute** (Entergy Ans, pg., 25)

The dispute here revolves around the applicability of 10 C.F.R. § 50.49 to inaccessible Non-EQ electric cables. Entergy claims that 50.49 does not apply, giving two reasons.

a. Entergy says that “Pilgrim’s inaccessible cables are located in a “mild environment” as defined in the NRC rules and, therefore, the environmental qualification requirements of 10 C.F.R. § 50.49 do not apply to them. Id. at ¶¶ 39-41.

Pilgrim Watch disputes Entergy’s claim because if you read 10 C.F.R. § 50.49 it does not discuss “harsh environment;” instead it does discuss the environment for which the equipment is to be qualified – these include aging (50.49 (d)(5), submergency (50.49 (d) (6), and chemical effects (50.49 (d) (3).

10 CFR 50.49 clearly states that submergence, aging and moisture are not a mild environment. From 10 CFR 50.49:

(d) The applicant or licensee shall prepare a list of electric equipment important to safety covered by this section. In addition, the applicant or licensee shall include the information in paragraphs (d)(1), (2), and (3) of this section for this electric equipment important to safety in a qualification file. The applicant or licensee shall keep the list and information in the file current and retain the file in auditable form for the entire period during which the covered item is installed in the nuclear power plant or is stored for future use to permit verification that each item of electric equipment is important to safely meet the requirements of paragraph (j) of this section.

(1) The performance specifications under conditions existing during and following design basis accidents.

(2) The voltage, frequency, load, and other electrical characteristics for which the performance specified in accordance with paragraph (d)(1) of this section can be ensured.

(3) The environmental conditions, including temperature, pressure, humidity, radiation, chemicals, and submergence at the location where the equipment must perform as specified in accordance with paragraphs (d)(1) and (2) of this section.

(e) The electric equipment qualification program must include and be based on the following:

(1) *Temperature and pressure.* The time-dependent temperature and pressure at the location of the electric equipment important to safety must be established for the most severe design basis accident during or following which this equipment is required to remain functional.

(2) *Humidity.* Humidity during design basis accidents must be considered.

(3) *Chemical effects.* The composition of chemicals used must be at least as severe as that resulting from the most limiting mode of plant operation (e.g., containment spray, emergency core cooling, or recirculation from containment sump). If the composition of the chemical spray can be affected by equipment malfunctions, the most severe chemical spray environment that results from a single failure in the spray system must be assumed.

(4) *Radiation.* The radiation environment must be based on the type of radiation, the total dose expected during normal operation over the installed life of the equipment, and the radiation environment associated with the most severe design basis accident during or following which the equipment is required to remain functional, including the radiation resulting from recirculating fluids for equipment located near the recirculating lines and including dose-rate effects.

(5) *Aging.* Equipment qualified by test must be preconditioned by natural or artificial (accelerated) aging to its end-of-installed life condition. Consideration must be given to all significant types of degradation which can have an effect on the functional capability of the equipment. If preconditioning to an end-of-installed life condition is not practicable, the equipment may be preconditioned to a shorter designated life. The equipment must be replaced or refurbished at the end of this designated life unless ongoing qualification demonstrates that the item has additional life.

(6) *Submergence* (if subject to being submerged).

Second, PW in the discussion above (§ 15) demonstrated that Pilgrim's environment is not mild now and predictions for the future are for an increasingly harsher environment due to global warming and climate change.

b. Entergy's second argument is that 50.49 applies to simply design basis accidents. PW disputes this.

Entergy's expert at ¶ 41 says that, “The requirement in 10 C.F.R. § 50.49(e)(6) refers to those cables important to safety that may be subjected to submergence as a result of a design basis accident, such as a loss of coolant accident or high energy line break.”

Pilgrim Watch finds this argument meaningless. In 10 C.F.R. § 50.49 (C)(2) design basis events are defined as conditions of normal operation, including anticipated operational occurrences, design basis accidents, external events, and natural phenomena for which the plant must be designed to ensure functions (b)(1)(i) (A) through (C) of this section.

### **17. PNPS’ Cables Procured For Wet Locations & Tests Show No Evidence Premature Aging or Degradation - Dispute**

Entergy says that, “For electrical equipment located in mild environments, such as Pilgrim’s non-EQ inaccessible cables, compliance with the provisions of GDC 4 are generally achieved and demonstrated by proper incorporation of all relevant environmental conditions into the design process, including the equipment specification. Id. at ¶ 42. Pilgrim’s inaccessible cables were procured for installation in wet locations. Id. at ¶ 43. Test results of samples taken from underground, 4 kV Pilgrim medium-voltage cable over 30 years old showed no evidence of premature aging or degradation. Id. at ¶ 29”

Pilgrim Watch finds this is yet one more unsubstantiated assertion by Entergy. Absent producing facts - guarantees, test results etc – we have no basis for believing there is “reasonable assurance” that these were infact procured and guaranteed to perform in a

wet environemnt. The main point that Entergy refused to admit is that Pilgrim is not a “mild environment” as shown in the foregoing.

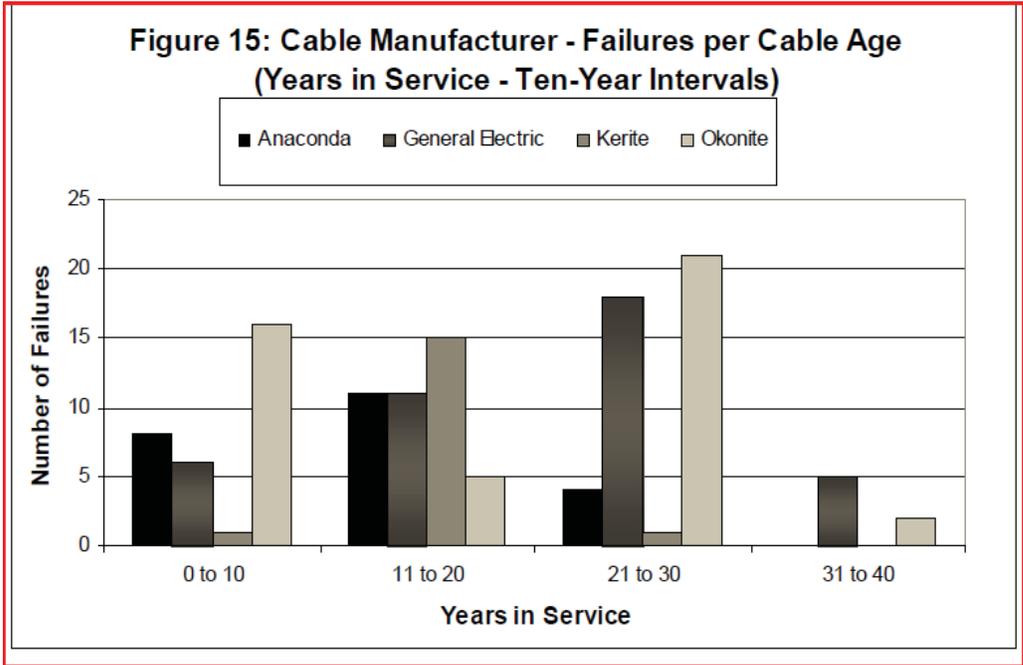
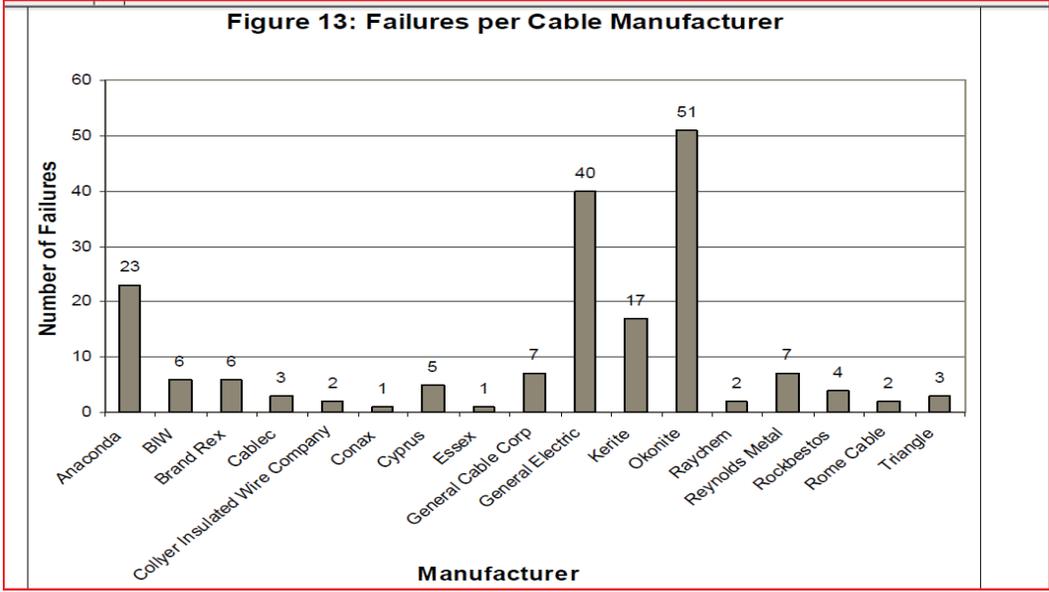
### **18. Manufacturer Pilgrim’s Medium-Voltage Cables (Kerite)- dispute quality**

Entergy’s expert at ¶ 43 says that Kerite is the manufacturer of PNPS’ medium voltage cables. Entergy’s expert slips this in but makes no reference to the question raised by the NRC regarding the company’s track record. Instead Entergy simply says that “the manufacturer of Pilgrim’s medium-voltage cables (Kerite) states that it has yet to see the start of an age-related failure mechanism after more than half a century of applications. ”

Pilgrim Watch finds Entergy’s claims truly remarkable. Based on Generic Letter 2007-01, “Inaccessible Or Underground Power Cable Failures That Disable Accident Mitigation Systems Or Cause Plant Transients”: Summary Report (M1082760385) that summarized the number of failures per cable manufacturer and found that Kerite were among the top four cables to have the most failures, Figure 13; and the data in Figures 14 and 15 show that the majority of failures of these manufacturers’ cables appears to be occurring in the range of 11 to 30 years of service, although there was some inconsistency among manufacturers.<sup>19</sup>

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<sup>19</sup> The GL asked licensees to identify the manufacturers of the failed cables. The relative percentage of cables from a given manufacturer that experienced failures is unknown. Thus, if one manufacturer had twice as many failures as the next higher example but had 10 times the total cable-feet of exposure, a report of the raw number of failures by manufacturer may be misleading. In this context, the following figures show the number of cable failures per cable manufacturer. Licensees did not identify the manufacturer for 89 of the cable failures. This number includes cables for which the licensee provided a list of possible manufacturers of the cables. From these data, the NRR staff noted that a variety of manufacturers’ cables were susceptible to failure. Figure 13 shows that **Anaconda, General Electric, Kerite, and Okonite cables appeared to have the most failures;** however, as stated above, the relative percentage of cables from a given manufacturer that experienced failures is unknown. The data in Figures 14 and 15 show that



the majority of failures of these manufacturers' cables appears to be occurring in the range of 11 to 30 years of service, although there was some inconsistency among manufacturers.

**17. Commercial Industry Standards- dispute relevance (Ibid)**

Entergy says that “The commercial industry standards cited by Mr. Blanch (e.g., National Electrical Manufacturers Association (“NEMA”), National Electric Code (“NEC”)), do not apply to underground power cables installed at Pilgrim. Id. at ¶¶ 44-47.

- Pilgrim does not use “inside wiring not intended to get wet,” i.e., there is no NM-B cable in use as underground cable. Id. at ¶¶ 48-49.

Pilgrim Watch Mr Blanch responds that while technically true, these are the only accepted industry standards for cable design and installation. The NRC has not imposed any accepted standards for the design and installation of cables and splices. Mr. Blanch was referring to accepted standards adopted by more than 45 states in the US,

**18. Common Mode Failures- Safety Significance (Ibid)**

Entergy incorrectly claims that “Cable failures will not result in common mode failures because the likelihood of simultaneous cable insulation failure is extremely low in light of the long time period required to make a cable susceptible to voltage surges that can lead to cable failure, and the fact that voltage surges are random. Id. at ¶¶ 59-60.”

Pilgrim Watch : First, “likelihood” has little or nothing to do with whether failures will in fact occur. Second, Mr. Blanch disagrees with Entergy’s assertion, and says unequivocally that one cable can cascade into multiple failures due to overcurrent. And, NRC also disagrees with Entergy. For example:

a. IN-2010-26 warns that it is not simply a single failure that is of concern. They say, “Cables not designed or qualified for, but exposed to, wet or submerged environments have the potential to degrade. Cable degradation increases the probability that more than one cable will fail on demand because of a cable fault, lightning surge, or a switching transient. Although a single failure is within the plant design basis, multiple failures of this kind would be challenging for plant operators. Also, an increased potential exists for a common-mode failure of accident mitigating system cables if they are subjected to the same environment and degradation mechanism for which they are not designed or qualified for.” (IN 2010-26, at 7; and Blanch Decl., 45) (PW January Request ¶17)

b. Generic Letter 2007-01, “Inaccessible Or Underground Power Cable Failures That Disable Accident Mitigation Systems Or Cause Plant Transients”: Summary Report (MI082760385) says that,

Although nuclear plant safety-related electrical systems are designed to be single-failure proof, undetected degradation of cables, especially when the cables are subjected to wet environments, can result in multiple equipment failures. For example:

- The failure of power cables that connect the offsite power to a safety bus can prevent offsite power recovery for far longer than the coping time originally considered for station blackout conditions. An incipient failure of these cables may be hard to detect because in some plants these cables remain deenergized during power generation, or not loaded if energized, and are not periodically energized for testing.
- The failure of the power cables from an Emergency Diesel Generator (EDG) to the safety buses can prevent recovery of standby power from the EDG and result in the unavailability of one train of accident mitigation systems during a loss-of-offsite-power event.
- The failure of the power cables to an emergency service water (ESW) or component cooling water pump can disable one train of emergency core cooling systems unless redundant pump(s) are available in the same train and lined up to supply sufficient cooling for the entire train. If the EDGs are

cooled by ESW or service water, the cable failure can disable the EDG and cause the loss of one train of emergency standby

Cables not qualified for, but exposed to, wet environments have the potential to degrade. Cable degradation increases the probability that more than one cable will fail on demand because of a cable fault, lightning surge, or a switching transient. While a single failure is within the plant design basis, multiple failures of this kind would be challenging for plant operators

## **VI. THE ISSUES RAISED ARE MATERIAL, INSIDE SCOPE, AND PRESENT NO CHALLENGE TO NRC REGULATIONS**

A. Entergy argues that the new contention raises issues that are immaterial and outside the scope of this proceeding. (Entergy Ans., 32) They focus on PW's expert declaration that says that the requirements of 10 C.F.R. § 50.49 apply to Pilgrim's inaccessible low- and medium-voltage cables because the outdoor environmental is allegedly harsh. Entergy claims instead that Pilgrim's environment is not "harsh" and therefore Pilgrim Watch's challenge is outside the scope of this proceeding and impermissibly challenges NRC regulations. They come to this bizarre conclusion by choosing to misread 10 C.F.R. § 50.49. NRC regulations are not being challenged; what is challenged is that these cables are in a harsh environment and should be under 10 C.F.R. § 50.49.

### The Right And Wrong Definition Of A Mild /Harsh Environment

Entergy claims that a "mild environment is defined as an environment that would at no time be significantly more severe than the environment that would occur during normal plant operations, including operational occurrences. Pilgrim Watch's claim that non-EQ cable must be qualified under 10 C.F.R. § 50.49 because it may be exposed to

weather or other normally occurring conditions is inconsistent with, and therefore an impermissible challenge to, these rules. (NRC, pg., 32-3)”

First Entergy’s argument completely ignores that, as a site specific matter, PNPS is in a harsh, not a mild, environment.

Second, Pilgrim Watch relies on the language in the actual rule, 10 C.F.R. § 50.49 says that:

(d) The applicant or licensee shall prepare a list of electric equipment important to safety covered by this section. In addition, the applicant or licensee shall include the information in paragraphs (d)(1), (2), and (3) of this section for this electric equipment important to safety in a qualification file. The applicant or licensee shall keep the list and information in the file current and retain the file in auditable form for the entire period during which the covered item is installed in the nuclear power plant or is stored for future use to permit verification that each item of electric equipment is important to safely meet the requirements of paragraph (j) of this section.

(1) The performance specifications under conditions existing during and following design basis accidents.

(2) The voltage, frequency, load, and other electrical characteristics for which the performance specified in accordance with paragraph (d)(1) of this section can be ensured.

(3) The environmental conditions, including temperature, pressure, humidity, radiation, chemicals, and submergence at the location where the equipment must perform as specified in accordance with paragraphs (d)(1) and (2) of this section.

(e) The electric equipment qualification program must include and be based on the following:

(1) *Temperature and pressure*. The time-dependent temperature and pressure at the location of the electric equipment important to safety must be established for the most severe design basis accident during or following which this equipment is required to remain functional.

(2) *Humidity*. Humidity during design basis accidents must be considered.

(3) *Chemical effects*. The composition of chemicals used must be at least as severe as that resulting from the most limiting mode of plant operation (e.g., containment spray, emergency core cooling, or recirculation from containment sump). If the composition of the chemical spray can be affected by equipment malfunctions, the most severe chemical spray environment that results from a single failure in the spray system must be assumed.

(4) *Radiation*. The radiation environment must be based on the type of radiation, the total dose expected during normal operation over the installed life of the equipment, and the radiation environment associated with the most

severe design basis accident during or following which the equipment is required to remain functional, including the radiation resulting from recirculating fluids for equipment located near the recirculating lines and including dose-rate effects.

(5) Aging. Equipment qualified by test must be preconditioned by natural or artificial (accelerated) aging to its end-of-installed life condition. Consideration must be given to all significant types of degradation which can have an effect on the functional capability of the equipment. If preconditioning to an end-of-installed life condition is not practicable, the equipment may be preconditioned to a shorter designated life. The equipment must be replaced or refurbished at the end of this designated life unless ongoing qualification demonstrates that the item has additional life.

(6) Submergence (if subject to being submerged). (Emphasis added)

Pilgrim Watch factually supported why Pilgrim’s environment is neither “mild” today not expected to be “mild” during the years of license renewal due to climate change predictions for coastal southeastern Massachusetts. (¶ 15, above)

**B.** Entergy throws out a laundry list of other facts presented by PW that they incorrectly label as lacking support and/or outside the scope (Entergy pg., 35). For example:

1. Entergy says that “Pilgrim Watch also asserts (without any support) that ‘Pilgrim has a history of submerged and/or wetted cables’ (PW Request at 8)”

Pilgrim Watch’s Request (¶40) showed otherwise. We cited for example, NRC Integrated Inspection Report 05000293/2010003, 1RO6 Flood Protection Measures, July 29, 2010, Pilgrim shows that NRC inspectors looked in to three cable vaults, and observed partially and fully submerged medium voltage cables” in all three; indeed Entergy admitted that two of the three were “*always* found submerged.”(Report, pp.7-8, emphasis added) The report made clear that flooding is a recurring, if not rampant, problem; and demonstrates that both NRC oversight and Entergy’s compliance are and

have been inadequate to provide “reasonable assurance” that these electric wires will function as required either now or over the license renewal period, leaving protection of public safety to chance. The Report’s main finding describes a sample taken on April 28, 2010, where the inspectors observed water in the three (3) manholes and vaults inspected:

On April 28, 2010, the inspectors observed water in each of the manholes and vaults listed above. The inspectors noted that no dewatering or drainage systems existed in the manholes. Entergy procedure EN-DC-346, Revision 0, "Cable Reliability Program," was issued and effective on December 31, 2009. This procedure discusses manhole inspections and dewatering, and requires, in part, "If manual inspections and pumping are used to maintain a cable system dry, the intervals must be sufficient to keep the cables dry. Adjust intervals as necessary, based on inspection results." Discussions with Entergy personnel involved with these inspections indicated that *cables in Manhole 2A were periodically found submerged or partially submerged, and that cables in Manholes 4 and 5 were always found submerged*. The cables that were submerged included cables that were installed from the 4160V, non-safety related startup transformer and connected to the A2 and A4 non-safety related busses. The inspectors identified that *Entergy had previously identified submerged cables in August and September of 2009, however, corrective actions were not sufficient to preclude these cables from being submerged*. The inspectors also determined that *The inspectors identified that Entergy had previously identified submerged cables in August and September of 2009, however, corrective actions were not sufficient to preclude these cables from being submerged* (Pg., 8, emphasis added)

2. Entergy says that “Pilgrim Watch also asserts (without any support) that “[t]here is no basis upon which anyone can assume that most inaccessible electrical cables at

[Pilgrim] have not been exposed to significant moisture over the past 40 years since initial construction in the 1960's" (PW Request at 17)"

Pilgrim Watch based that statement on: (i) NRC inspectors finding after looking in three cable vaults, and observed "partially and fully submerged medium voltage cables" in all three; and indeed Entergy admitted that two of the three were "*always* found submerged."(Report, pp.7-8) PW recognizes that Entergy has not proven that all submerged electric cables are accessible by those three manholes, or by any manholes for that matter-an outstanding issue; (ii) Pilgrim's site specific characteristics that lead to wet environmental subsurface conditions; (iii) Entergy has not factually demonstrated that Pilgrim's subsurface cables are environmentally qualified to operate in submerged moist/wet conditions by showing the original design requirements and testing results; and (iv) Entergy has not factually demonstrated the age of the cables and their precise locations superimposed on hydro-geological survey data.

3. Entergy says that "Pilgrim Watch also asserts (without any support) that "[t]here is no basis for assuming that none of these cables were likely damaged during their installation at Pilgrim, meaning scrapes and other damage likely occurred in the surface of the insulation and possibly deeper." Elsewhere, Pilgrim Watch references the potential for other installation related damage. (PW Request 13-14, 19, 21-22) All of these relate to the current period of Pilgrim's operation, not the period of extended operation or the programs identified in the Application that will be in place to manage the effects of aging, and are therefore beyond the scope of this proceeding." (Entergy, pg., 34)"

Pilgrim Watch makes two important points in response. (i) Entergy's comment is patently absurd on its face. Obviously, the condition of Pilgrim's submerged non-EQ

qualified electric cables going into license renewal is a key factor in determining the sufficiency or insufficiency of Pilgrim's AMP program going forward. If Entergy proved that Pilgrim Station had essentially new submerged environmentally qualified electric cables and that documentation and a fair sampling of cables showed no installation errors then our analysis of the AMP would be very different. (ii) Regarding manufacturing errors, PW indeed supported its statement. For example:

- PW Request (¶ 37, Fn.,14) quoted directly from Entergy's response to NRC Generic Letter 2007-01 that said, "Cable failed during service due installation damage." (Emphasis added) <sup>20</sup>
- PW Response referenced IN 2010-26 that said (at 5) "Cable failures have a variety of causes, including manufacturing defects, damage caused by shipping and installation. (and) The likelihood of failure...increases over time as the cable insulation degrades and/or is exposed to water."
- PW Response ¶ 38 said "There is no basis for assuming that none of these cables were likely damaged during their installation at Pilgrim,<sup>21</sup> meaning scrapes and other damage likely occurred in the surface of the insulation and possibly deeper, unless Entergy can prove otherwise. Manufacturing defects cannot be ignored either. These coating defects permit moisture to infiltrate the wiring. Moisture/submergence increases the probability of failure should an accident occur. Failure of the wires assures failure of connected components (emergency

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<sup>20</sup> Response to NRC Generic Letter 2007-0, Attachment 1 to Entergy Letter No. 2.07.034, Generic Letter 2007-01 Response (ML071300361) Request 1 Provide a history of inaccessible or underground power cable failures for all cables that are within the scope of 10 CFR 50.65 (the Maintenance Rule) and for all voltage levels

<sup>21</sup> Some plants during construction, actually connected wires to cables and trucks to pull wires through the buried pipes

diesel generators, emergency reactor cooling motors and pumps, valves, etc.) If these wires have any surface defects/degradation due to installation, other unknown defects or normal aging, there is no assurance that they are capable of performing their designated safety functions when required if they have experienced submergence and/or moisture exposure.”

4. Entergy ( at 34) mischaracterizes Pilgrim Watch statements in its Request that the AMP going forward must provide reasonable assurance that requirements deemed necessary to protect public health and safety are incorporated into the AMP. In other words the AMP cannot provide an “escape hatch” allowing the Applicant to avoid complying with pertinent regulations such as 10 CFR 50, Appendix A (Criterion 4) and 10 CFR 50.49. Entergy says that Pilgrim Watch “asserts that the NRC has “utterly failed to take the critical next step in any aging/failed component management program: failed or failing cables must be replaced or otherwise updated to bring the cables into compliance with NRC Regulations” (PW Request at 15); the NRC has “not required PNPS to take any action” to address submergence of inaccessible cables (PW Request at 12); and the NRC has not ordered any corrective action (PW Request at 14-15). All of these issues pertain to Pilgrim’s CLB and say nothing of the AMPs identified in the Application (34)”

Pilgrim Watch is not challenging NRC regulations. What is being challenged is the fact that these cables are now recognized to be located in a harsh environment and belong within the scope of 10 CFR 50.49 requirements going forward from 2012-32. The public deserves assurance that during license renewal any Non-EQ cables cannot be in violation of NRC regulation because the AMP gives them a “pass.” NRC's regulatory requirements

are clearly delineated in General Design Criterion 4 within Appendix A to 10 CFR Part 50.<sup>22</sup> It says:

*Criterion 4--Environmental and dynamic effects design bases.* Structures, systems, and components important to safety shall be designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents. These structures, systems, and components shall be appropriately protected against dynamic effects, including the effects of missiles, pipe whipping, and discharging fluids, that may result from equipment failures and from events and conditions outside the nuclear power unit. (Emphasis added)

### **Current Licensing Basis (CLB)**

The Aging Management Program (AMP) does not provide reasonable assurance that submerged electric cables and their intended safety functions will comply with the applicable current licensing basis (“CLB”) during license renewal.<sup>23</sup> We ask the Board to consider the standards set by the CLB and ensure that the Aging Management Plan includes a program that assures all inaccessible cables are in compliance with existing NRC Regulations.<sup>24</sup>

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<sup>22</sup> Available online at <http://www.nrc.gov/reading-rm/doc-collections/cfr/part050/part050-appa.html>

<sup>23</sup> PW recognizes that the LRA is predicated on conforming to the CLB in the period of extended operations (PEO). PW asserts that the CLB will NOT be maintained in the PEO with the current AMP. Further we understand that the Reactor Oversight Process (ROP) is presumed a success in maintaining the CLB; however nowhere in the ROP is there reference to aging phenomena expected in the PEO; to the best of our knowledge, there is no inspection module in the ROP that addresses aging phenomena with specificity and particularity.

<sup>24</sup> 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 2, —Design Bases for Protection Against Natural Phenomena.

10 CFR Part 50, Appendix A, General Design Criterion (GDC) 4, —Environmental and Dynamic Effects Design Bases.

10 CFR Part 50, Appendix A, GDC 17, —Electric Power Systems.

Section 3 of 10 C.F.R § 54.21 says that, “For each structure and component identified in paragraph (a)(1) of this section, [Pilgrim must] demonstrate that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation.”

Also, 10 C.F.R. § 54.29 is clear that renewed license can only be issued “if there is reasonable assurance that the activities authorized by the renewed license will continue to be conducted in accordance with the CLB” during the renewed license term.

10 C.F.R. § 54.29 and the CLB require all in-scope components comply with the license and all NRC regulations over the license extension period, 2012-2032. Entergy cannot ignore all other issues NRC regulations that pertain to important safety components. Regulations are not like a menu where the Board and licensees can choose what they want to order a la carte. The CLB has to be met over the license renewal period and the Board must assure that the AMP will do so.

The Commission supports our position as to Inaccessible Non-EQ cables and splices within scope that provide power to critical safety components. For example CLI-10-14 (Memorandum and Order) at 16 explains that

10 C.F.R. § 54.21 “explains what has to be looked at in an aging management review of components once they are determined to be within scope” of license renewal.”

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10 CFR Part 50, Appendix A, GDC 18, —Inspection and Testing of Electric Power Systems.

10 CFR 50.65(a)(1), —Maintenance Rule.

10 CFR 50.49, —Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants.

10 CFR 50.49, —Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants,

10 CFR Part 50, Appendix B, Criterion III, —Design Control.

10 CFR Part 50, Appendix B, Criterion V, —Instructions, Procedures, and Drawings

10 CFR Part 50, Appendix B, Criterion V, —Instructions, Procedures, and Drawings

Section 54.21 requires

For those structures or components requiring an aging management review (pursuant to § 54.21(a)(1)), there must be a demonstration that the effects of aging will be adequately managed “so that the *intended function(s)* will be maintained consistent with the CLB.”

54.21 plainly states that what is meant by the phrase “intended functions” are those functions “described in § 54.4.” Similarly, § 54.4(b) makes clear that the “intended functions” that SSCs “must be shown to fulfill” in the aging management review required by § 54.21 “*are those functions . . . specified in paragraphs (a)(1)-(3)*” of § 54.4.

Submerged electric cables provide power to critical safety components. Hence, we ask the Board to consider the applicable standards set by the CLB.

## **VII. CONCLUSION**

The Commission has long said (Fed. Register, Vol. 63, No. 150, August 5, 1998, repeated in the 2010 Edition of the NRC Digest) that

the Commission's objectives are to provide a fair hearing process,... and to produce an informed adjudicatory record that supports agency decision making on matters related to the NRC's responsibilities for protecting public health and safety, the common defense and security, and the environment,

and that “the opportunity for hearing should be a meaningful one that focuses on genuine issues and real disputes....”

The most recent edition of the NRC Digest says that “Public participation through intervention is a positive factor in the licensing process and Intervenors perform a valuable function and are to be complimented and encouraged.” (Prehearing Matters, 11).

PW trusts that the NRC means what it has said, and that the Intervenor here will be permitted to perform their indisputably “valuable function,” and help insure that the NRC will fulfill its “responsibilities for protecting public health and safety, the common defense and security, and the environment.”

Respectfully Submitted,

Signed Electronically

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