

EDO Principal Correspondence Control

FROM: DUE: 08/19/10

EDO CONTROL: G20100454  
DOC DT: 07/19/10  
FINAL REPLY:

Mary Lampert  
Duxbury, Massachusetts

TO:

Borchardt, EDO

FOR SIGNATURE OF :

\*\* GRN \*\*

CRC NO:

Leeds, NRR

DESC:

ROUTING:

2:206 - Inadequate of Entergy's Management of  
Non-Environmentally Qualified Inaccessible Cables  
& Wiring at Pilgrim (EDATS: OEDO-2010-0589)

Borchardt  
Weber  
Virgilio  
Ash  
Mamish  
OGC/GC  
Dapas, RI  
Burns, OGC  
Mensah, NRR  
Scott, OGC  
Kotzalas, OEDO

DATE: 07/20/10

ASSIGNED TO:

CONTACT:

NRR

Leeds

SPECIAL INSTRUCTIONS OR REMARKS:

Template: EDO-001

E-RIDS: EDO-01

# EDATS

Electronic Document and Action Tracking System

**EDATS Number:** OEDO-2010-0589

**Source:** OEDO

## General Information

**Assigned To:** NRR

**OEDO Due Date:** 8/19/2010 11:00 PM

**Other Assignees:**

**SECY Due Date:** NONE

**Subject:** 2.206 - Inadequacy of Entergy's Management of Non-Environmentally Qualified Inaccessible Cables & Wiring at Pilgrim

**Description:**

**CC Routing:** RegionI; OGC; Tanya.Mensah@nrc.gov; Catherine.Scott@nrc.gov

**ADAMS Accession Numbers - Incoming:** NONE

**Response/Package:** NONE

## Other Information

**Cross Reference Number:** G20100454

**Staff Initiated:** NO

**Related Task:**

**Recurring Item:** NO

**File Routing:** EDATS

**Agency Lesson Learned:** NO

**OEDO Monthly Report Item:** NO

## Process Information

**Action Type:** 2.206 Review

**Priority:** Medium

**Signature Level:** NRR

**Sensitivity:** None

**Urgency:** NO

**Approval Level:** No Approval Required

**OEDO Concurrence:** NO

**OCM Concurrence:** NO

**OCA Concurrence:** NO

**Special Instructions:**

## Document Information

**Originator Name:** Mary Lampert

**Date of Incoming:** 7/19/2010

**Originating Organization:** Citizens

**Document Received by OEDO Date:** 7/20/2010

**Addressee:** R. W. Borchardt, EDO

**Date Response Requested by Originator:** NONE

**Incoming Task Received:** Letter

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

**BEFORE THE U.S. NUCLEAR REGULATORY COMMISSION**

July 19, 2010

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

**RE: Pilgrim Watch 2.206 Petition Regarding Inadequacy of Entergy's Management of Non-Environmentally Qualified Inaccessible Cables & Wiring at Pilgrim Station**

**INTRODUCTION**

Pursuant to §2.206 of Title 10 in the Code of Federal Regulations, Pilgrim Watch requests that the Nuclear Regulatory Commission (NRC) initiate a proceeding pursuant to §2.202 of Title 10 in the Code of Federal Regulations. The Petitioner requests the NRC to issue a Demand for Information (DFI) Order that Entergy demonstrate that all inaccessible cables at Pilgrim NPS are capable of performing their required function be it safety or non-safety related.

It is further requested that the NRC certifies that all cables (accessible and inaccessible) (i) have been identified as to their location, age and repair history to both the NRC and public at Pilgrim Station; and (ii) monitored by the licensee prior to continued operation to demonstrate that the cables can perform their design functions when called upon for their function. (iii) The monitoring program going forward incorporates at minimum: the recommendations of SAND 96-0344, Section 6 (Aging Management Guideline for Commercial Nuclear Power Plants-Electrical Cable and Termination, prepared by DOE and sponsored by DOE and EPRI, Sept. 1996); recommendations in NRC Generic Letter 2007-01; and Staff recommendations in NRC Handout, Regulatory Issue Resolution Protocol, "Cable Performance Issues at Nuclear Power Plants, 2009-08-25 ( NRC Electronic Library, Adams Accession No. ML092220419), Attachment A. (iv) NRC commits to verifying during the license renewal period Entergy's

implementation through routine Baseline inspections, and commits to a timely upgrade of Regulatory Guidance to provide guidance for maintaining the cable qualification and verification that the cables can perform their design functions when called upon.

## **BASIS**

1. Pilgrim Nuclear Power Station (PNPS), like all other nuclear plants, has thousands<sup>1</sup> of submerged/underground electrical wires<sup>2</sup> throughout the plant.

### Significance

2. Almost every active safety and non safety system at Pilgrim Nuclear Power Station (PNPS) is dependent upon electrical power to perform its function to prevent major accidents. If an accident occurs, electrical power is required to prevent a reactor meltdown with major radioactive releases to the environment.

3. Pilgrim has had a long history of cables being submerged and/or wetted and there has been no verification of the long-term operability that provides reasonable assurance of continued operability of these cables.

4. Nuclear plants are designed to cope for a short period, typically four hours, without alternating current<sup>3</sup> (AC) electrical power. During this short period, electrical power from batteries<sup>4</sup> can be used to control steam-driven pumps that cool the reactor core; once the batteries are depleted, if workers have not restored AC electrical power from the onsite emergency diesel generators or the offsite electrical grid, the plant then proceeds towards a reactor meltdown.

5. Loss of electrical power increases the likelihood for a major release of radioactive material to the environment.

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<sup>1</sup> Estimated to be many miles of internal wiring and cables

<sup>2</sup> In this context, wires and cables are considered to be the same components

<sup>3</sup> Similar to the power in homes and other facilities

<sup>4</sup> Direct Current (Similar to car batteries)

6. NRC knows the above is true. NRC's *Regulatory Issue Resolution Protocol, Inaccessible or Underground Cable Performance Issues at Nuclear Power Plants*, August 19, 2009 (Adams ML092460425) says that,

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. (At 10)

8. The Electric Power Research Institute (EPRI) issued two formal reports in June, 2010 discussing these potential failures. EPRI reports that the problem needs to be addressed. These reports were well circulated within the nuclear industry including NRC and Entergy.

9. Entergy and the NRC have ignored regulations<sup>5</sup> that provide reasonable assurance that these wires will function when required during reactor emergencies.

#### NRC Regulations

10. NRC's regulations<sup>6</sup> require that plant owners ensure that electrical wiring is qualified to perform in the environmental conditions experienced during normal operation and during accidents. Specifically, the regulations require plant owners to qualify the electrical wires for "*The environmental conditions, including temperature, pressure humidity, radiation, chemicals, and submergence at the location where the equipment must perform...*" Federal regulations explicitly require that electrical wires be assured to function even if they are submerged during normal operation and/or under accident conditions.

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<sup>5</sup> General design criterion 4 within Appendix A to 10 CFR Part 50 and §50.49 of 10 CFR.

<sup>6</sup> 10 CFR 50.49, "Environmental qualification of electric equipment important to safety for nuclear power plants," available online at <http://www.nrc.gov/reading-rm/doc-collections/cfr/part050/part050-0049.html>; for a list of Guidance Documents see *NRC's Regulatory Issue Resolution Protocol, Inaccessible or Underground Cable Performance Issues at Nuclear Power Plants*, August 19, 2009 (Adams ML092460425), Appendix A.

## Degradation Conduits and Submerged/Underground Wires

11. Moisture: It is basic that water and moisture cause corrosion; neither the coating on the wires nor the conduits containing the wires are specified to operate in a moist or submerged environment.

Conduits: Many of the wires used to supply power to vital and non-vital electrical equipment are contained within conduits. The conduits themselves that function to isolate the wires from the environment are made of materials that are subject to degradation, especially as they age and are exposed to Pilgrim's moist salt water environment. Corroded conduits and manholes allow moisture inside. The wires and possibly connections and splices inside the conduits are only designed to operate properly in a dry environment and were not designed or specified to operate in a moist or wet environment. While the wires may work if wet and/or submerged, there is no assurance they will not fail if wet or submerged or previously experienced exposure to moisture.

Most electrical cables at Pilgrim Nuclear Power Station have been exposed to significant moisture over the past 40 years since initial construction in the 1960's. This is because: (a) Pilgrim is located on low land directly beside Cape Cod Bay. (b) The FEIS describes the soil as sandy, silt and clay – soil types that retain moisture. (c) Plymouth's climate<sup>7</sup> is characterized by frequent showers, thunderstorms, high humidity in the spring and summer; and summer winds typically are weak from the southwest or southeast and bring warm, moist air that can contribute to fog formation. Storms: spring and summer southwesterly winds may drive hurricanes northward with the potential to flood shores where cables are buried; and the storms of autumn or winter, "nor'easters," also have particularly strong winds and may drive winter storms into northeastern-facing shores with storm/tidal surges. Snow storms generally occur in winter. Melting snow, rains, tidal surges etc result in moisture percolating downwards wetting and degrading conduits and wiring below. (d) Water travels downward from leaks inside the reactor following along wires to collect below. (e) Manhole covers may not be watertight; and the water table is high in seasonal cycles and the tidal surges accompanying storms. (f) Storms and higher tides are increasingly common and therefore the conduits may get refilled soon after purging. (g)

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<sup>7</sup> [http://www.mass.gov/czm/oceanmanagement/waves\\_of\\_change/pdf/troceancc.pdf](http://www.mass.gov/czm/oceanmanagement/waves_of_change/pdf/troceancc.pdf)

Condensation is an additional factor caused by changes in temperature in the climate. The foregoing increases the potential for conduit and insulation degradation.

12. Age: Pilgrim is one of the oldest operating commercial reactors in the county. Pilgrim Watch understands that the majority of the conduits and wires at PNPS were installed during initial construction in the 1960's and possible some at subsequent plant updates. This data is not available, although it should be available to both the NRC and public. Corrosion increases with age - a phenomenon known as the "Bathtub Curve of Aging."

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>8</sup> wires degrade with age and the most susceptible to degradation are the oldest wires. There are no existing methods to assure operability short of visual inspection and/or replacement with cables designed for operation in a wet or submerged environment.

NRC agrees<sup>9</sup> and said,

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

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<sup>8</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."

<sup>9</sup> NRC Regulatory Issue Resolution Protocol-Inaccessible or Underground Cable Performance Issues at Nuclear Power Plants (August 19, 2009) available NRC Electronic Library, Adams Accession No. ML092460425

resulted in plant transients and shutdowns, loss of safety redundancy, entry into limiting conditions for operation, and undue challenges to plant operators. (Slide 10)

13. Installation & Manufacturing Defects: During installation these wires were likely damaged,<sup>10</sup> meaning scrapes and other damage likely occurred in the surface of the insulation and possibly deeper. 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 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.

14. Operating Experience<sup>11</sup>: The NRC mailed Information Notice 2002-12, "Submerged Safety-Related Electrical Cables,"<sup>12</sup> to plant owners on March 21, 2002. The NRC alerted owners to recent wiring failures at Oyster Creek, Pilgrim, Brunswick, and Davis-Besse. Although alerting owners to the hazard posed by submerged electrical wires, the NRC did not require that owners do anything to lessen that hazard. We are not aware if the NRC even issues a violation for the misuse of these unqualified wires.

NRC inspection reports for the last 10 years identified cable performance issues at various facilities. It identified violations of NRC regulations 10 CFR 50, Appendix B, Criterion III, "Design Control," Criterion V, "Instructions, Procedures, and Drawings," Criterion, XI, "Test Control," Criterion XVI, "Corrective Actions," 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," and other performance issues

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<sup>10</sup> Some plants during construction, actually connected wires to cables and trucks to pull wires through the buried pipes

<sup>11</sup> List of inspection reports, provided in Attachment B

<sup>12</sup> Available online at <http://www.nrc.gov/reading-rm/doc-collections/gen-comm/info-notices/2002/in02012.html>

(Green/White findings). See NRC *Regulatory Issue Resolution Protocol-Inaccessible or Underground Cable Performance Issues at Nuclear Power Plants* (August 19, 2009) Appendix B for List of Inspection Reports.

15. PNPS has no program today as required by NRC regulations<sup>13</sup> to assure operability of these submerged and/or wetted wires. There are no tests that can reliably detect these incipient failures.

**License Renewal - Pilgrim's Aging Management Program (AMP) - insufficient**

16. Pilgrim's Aging Management Program going forward from 2012-2032 is insufficient. It does not provide the public with reasonable assurance. The AMP is a carbon copy of Indian Point's and EVY's, all owned and operated by Entergy. New York's Attorney General has filed formal legal opposition to the relicensing of Indian Point on this issue.<sup>14</sup> The NRC's Atomic Safety and Licensing Board (ASLB) accepted the contentions. Pilgrim Watch did not learn about this issue in time to file a contention to intervene or request reopening the hearing; however this does not mean the issue does not pose a significant threat to public safety and thereby require the NRC's attention and actions.

17. Pertinent Sections of Pilgrim's LRA include:

**A.2.1.21 Non-EQ Inaccessible Medium-Voltage Cable Program says that,**

"In the Non-EQ Inaccessible Medium-Voltage Cable Program, in scope medium-voltage cables, not designed for, but exposed to significant moisture and voltage are tested at least once every ten years to provide an indication of the condition of the conductor insulation. The specific test performed is a proven test for detecting deterioration of the insulation system due to wetting, such as power factor, partial discharge, polarization index, or other testing that is state-of-the-art at the time the test is performed. Significant moisture is defined as periodic exposures that last more than a few days. Significant voltage exposure is defined as being subjected to system

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<sup>13</sup> 10 CFR 54, 10 CFR 50.65 and 10 CFR 50.36

<sup>14</sup> Docket No 50-247 LR and 50-286-LR, Contention 6 & 7, filed November 30, 2007

voltage for more than 25% of the time. Inspections for water collection in cable manholes and conduit occur at least once every two years.”

**A.2.1.23 Non-EQ Insulated Cables and Connections Program** says that,

“The Non-EQ Insulated Cables and Connections Program provide reasonable assurance that intended functions of insulated cables and connections exposed to adverse localized environments caused by heat, radiation and moisture can be maintained consistent with the current licensing basis through the period of extended operation. An adverse localized environment is significantly more severe than the specified service condition for the insulated cable or connection. A representative sample of accessible insulated cables and connections in adverse localized environments is visually inspected at least once every 10 years for cable and connection jacket surface anomalies such as embrittlement, discoloration, cracking or surface contamination.”

**Section B.1.19 Non-EQ Inaccessible Medium-Voltage Cable** says that, “The Non-EQ Inaccessible Medium-Voltage Cable Program at PNPS will be comparable to the program described in NUREG-1801, Section XI.E3, Inaccessible Medium-Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements. In this program, periodic actions will be taken to prevent cables from being exposed to significant moisture, such as inspecting for water collection in cable manholes and conduit, and draining water, as needed. In scope medium-voltage cables exposed to significant moisture and voltage will be tested at least once every ten years to provide an indication of the condition of the conductor insulation. The specific type of test performed will be determined prior to the initial test. The program will be initiated prior to the period of extended operation.” [Emphasis added]

**Section B.1.21** says that, “Non-EQ Insulated Cables and Connections provides that a representative sample of accessible insulated cables and connections within the scope of license renewal will be inspected visually for embrittlement, discoloration, cracking, surface contamination, and other cable and connection jacket surface anomalies. The technical basis will be determined in accordance with EPRI TR-109619, “Guideline for the Management of Adverse Localized Equipment Environments. A representative sample of *accessible* insulated cables and

connections within the scope of license renewal will be visually inspected for cable and connection jacket surface anomalies such as embrittlement, discoloration, cracking or surface contamination. The technical basis for sampling will be determined using EPRI document TR-109619, "Guideline for the Management of Adverse Localized Equipment Environments. The program will be initiated prior to the period of extended operation." [Emphasis added]

PW Comment:

a. One- time inspection in 10 years is too infrequent. 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. First, corrosion/degradation is a rate process and the rate is *NOT* constant with time. Therefore, the probability 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.

b. The programs lack specificity. "Periodic actions," "as needed," "representative sample" - such language is too vague to provide reasonable assurance.

c. A.2.1.21 Non-EQ Inaccessible Medium-Voltage Cable Program's "Inspections for water collection in cable manholes and conduit occur at least once every two years" does not provide for the fact that not all inaccessible cables are capable of inspection by manholes.

d. SAND96-0344, *Aging Management Guideline for Commercial Nuclear Power Plants – Electrical Cable and Terminations*, prepared by Sandia National Laboratories for the U.S. Department of Energy, September 1996, and sponsored by the Department of Energy and EPRI. The Sandia study contains numerous recommendations related to the management of aging of cables and terminations with specific emphasis on 10 C.F.R. Part 54 and meeting the requirements of the regulation; section 6 of the Sandia report contains (18) pages of recommendations and conclusions that specifically relate to the aging management of cables and terminations. The LRA Appendices A and B fail to address or commit to any of the specific recommendations of SAND 96-0344. Further the Sandia study (at page 6.4) states: "No currently available technique was identified as being effective at monitoring the electrical aging of

medium-voltage power 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.”

e. The Non-EQ inaccessible & accessible cable programs at PNPS are *new programs* for which there is no operating experience (LRA B-68). Therefore there is no basis to assume their capability to provide reasonable assurance.

f. The main difference between the cables discussed in B. 1.19 and B.1.21 is accessibility, which in light of the comparable safety significance of both types of cables and the risk of aging damage and exposure to wetness to both types of cables is not technically defensible basis for treating the two types of Non-EQ Medium voltage Cables differently. The NRC Staff has recognized the importance of an aging management program for cables, even if they are inaccessible: NRC Generic Letter 2007-01: Inaccessible or Underground Power Cable Failures That Disable Accident Mitigation Systems or Cause Plant Transients (February 7, 2007) .The Generic Letter suggests several procedures that could be implemented to address the degradation of inaccessible cables. For example, it says that some licensees have detected cable degradation prior to failures through techniques for measuring and trending the condition of cable insulation. Licensees can assess the condition of cable insulation with reasonable confidence using one or more of the following testing techniques: partial discharge testing, time domain reflectometry, dissipation factor testing, and very low frequency AC testing. Licensees can replace faulty cables during scheduled refueling outages prior to cable failure that would challenge plant safety. (At 4)

*None of these measures are included in the AMP for Non-EQ Inaccessible Medium-Voltage Cables*

g. The NRC and PNPS did not require or include a program in its License Renewal Application (LRA) 10 CFR 54, to manage low voltage cables for the present period and/or the period of proposed extended operation. There is no evidence presented that “low voltage cables” are of

“low” safety significance. We ask also in this petition that the Commission provide to us such evidence or explain the justification for the omission if no evidence exists.

**Appendix A: PNPS License Renewal Commitments (A-7)** Implementation of the Non-EQ Insulated Cables & Connections Program as described in LRA Section B.121 will not go into effect until June 8, 2012- the date the original license expires.

PW Comment:

Entergy says that they fully intend to commit to the program, and the NRC Staff in the Final SER accepted that; however that commitment does not demonstrate now that the effects of aging are, or will, be adequately managed.

**Pilgrim’s Safety Evaluation Report (SER) NUREG-1891<sup>15</sup>**

18. PNPS’ SER Final Report (November 2007) does not provide reasonable assurance either, for the following reasons.

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 ensuring that cabling exposed to "significant moisture" is designed and qualified to operate under that condition (as required by the safety regulations), PNPS’ SER accepts under-designed and unqualified cabling as long as one periodically checks from time to time that the cables still work (at that moment). 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

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<sup>15</sup> SER, NUREG 1891  
[http://adamswebsearch2.nrc.gov/idmws/doccontent.dll?library=PU\\_ADAMS^PBNTAD01&ID=071800054](http://adamswebsearch2.nrc.gov/idmws/doccontent.dll?library=PU_ADAMS^PBNTAD01&ID=071800054)

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 specific test type 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 looks 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. The 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.

A recent report by the NRC Office of Inspector General (OIG), *Office of Inspector General's Audit of NRC's License Renewal Program*<sup>16</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.

The OIG's audit revealed that, among other failures, the NRC Staff's license renewal review process is weak. In Section C of the report, the OIG concluded that,

most audit team members do *not conduct independent verification* of operating experience, instead relying on license-supplied information. This is because program managers have not established requirements and controls to standardize the conduct and depth of such reviews. *In the absence of conducting independent verification of plant-specific operating experience*, license renewal auditors may not have adequate assurances that relevant operating experience was captured in the licensee's renewal application of NRC's consideration. [OIG-07-A-15, at 18] (Emphasis added)

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<sup>16</sup> *Office of Inspector General's Audit of NRC's License Renewal Program*, OIG-07-A-15, September 6, 2007. NRC ADAMS ML072490486

There was no evidence to conclude that Pilgrim's SER does not fit this description - no manhole cover was lifted for inspection for water or other independent verification occurred. Instead the SER at Pilgrim as described at 3-18 says that, the staff reviewed the operating experience presented in the LRA and interviewed the applicant's technical personnel to confirm that the AMP complied with the GALL. In other words, the staff simply reviewed what was in the LRA, asked the licensee a couple of clarifying questions and went away satisfied. Examples:

#### 3.0.3.1.5 Non-Environmental Qualification Inaccessible Medium-Voltage Cable Program

a. The staff asked the applicant to explain how it had considered operating experience for manhole inspection frequency. Entergy responded that, "... the applicant revised the program evaluation report to include the following: The inspection will be based on actual plant experience with water accumulation in the manholes and the frequency of inspection will be adjusted based on the results of the evaluation, but the frequency will be at least once every 2 years. (3-19) Although NRC Staff was satisfied with this response, Entergy did not explain how often the inspections will occur or what procedure will be used. Will inspections be based on happenstance, convenience, or some random time period between 1-24 months?

b. The Staff also asked the applicant whether it inspects water in manholes under specific procedures for such inspections and, if so, for a copy of the procedures. The applicant responded that it has no formal procedure. The Staff was satisfied that Entergy in Commitment No. 15- committed to develop a formal procedure to prevent cable exposure to significant moisture. However commitments do not provide details – when will it be established and what will it do? The time frame and/or procedure could be unsatisfactory. At this point in time neither the NRC Staff nor the public knows.

c. The Staff asked the applicant to revise the AMP B.1.19 program evaluation report and define significant moisture for consistency with the GALL Report's scope or to explain how inaccessible medium-voltage cable exposed to significant moisture more than a few days and less than a few years is not susceptible to water treeing. In its response, the Applicant revised the program evaluation report and said that, "Significant moisture is defined as periodic exposure to moisture that last more than a few days (e.g., cable in standing water). Periodic exposure to

moisture that lasts less than a few days (i.e., normal rain and drain) is not significant.” Based on its review, the staff finds the applicant’s response acceptable because the scope of the program is consistent with that of the GALL Report. However, that definition does not provide reasonable assurance and NRC knows this to be true.

NRC Regulatory Issue Resolution Protocol Inaccessible or Underground Cable System Performance Issues at Nuclear Power Plants, January 21, 2010, Slide 4 (NRC Electronic Library, Adams Accession No ML100150850) Staff comments say in contrast that,

Cable Aging Management Program Guides should address... All cables subjected to any level of wetting or submergence. [Emphasis added]

3.0.3.1.7 Non-Environmental Qualification Insulated Cables and Connections Program: To The Staff’s satisfaction, the applicant revised LRA Section B.1.19 program description to read,

This program addresses cables and connections at plants whose configuration is such that most cables and connections installed in adverse localized environments are accessible. This program can be thought of as a sampling program. Selected cables and connections from accessible areas will be inspected and represent, with reasonable assurance, all cables and connections in the adverse localized environments. If an unacceptable condition or situation is identified for a cable or connection in the inspecting sample, a determination will be made as to whether the same condition or situation is applicable to other accessible cables or connections. The sample size will be increased based on an evaluation per the corrective program.

PW fails to understand how this provides reasonable assurance and satisfied Staff. First, and most important, there is no reason to believe that accessible cables are representative of inaccessible cables. In fact it is likely that inaccessible cables have a greater probability of being degraded. Further, for the described accessible cable program, no information is provided on what basis the “determination will be made”

## Conclusion

19. Compliance with NRC' s regulations is intended to provide reasonable assurance that an electrical wire failure will neither initiate an accident (e.g., cause a closed valve to open that drains or diverts cooling water from the reactor) nor make an accident triggered by another cause worse (e.g., prevent an emergency makeup pump from running).

20. The failure of wires could either start an accident or make an accident more severe.

21. Non-compliance with NRC s regulations at Pilgrim Nuclear Power Station exposes innocent people to increased risk. In my opinion, this undue hazard is unnecessary and unacceptable. PNPS should operate in compliance with federal safety regulations, or not at all.

22. Therefore, we respectfully request that NRC certifies that all cables (accessible and inaccessible) (i) have been identified as to their location, age and repair history to both the NRC and public at Pilgrim Station; (ii) monitored by the licensee prior to continued operation to demonstrate that the cables can perform their design functions when called upon for their function. (iii) the monitoring program going forward incorporates at minimum the recommendations of SAND 96-0344, Section 6 (Aging Management Guideline for Commercial Nuclear Power Plants-Electrical Cable and Termination, prepared by DOE and sponsored by DOE and EPRI, Sept. 1996) and recommendations in NRC Generic Letter 2007-01; and (iv) NRC commits to verifying during the license renewal period Entergy's implementation through routine Baseline inspections, and commits to a timely upgrade of Regulatory Guidance to provide guidance for maintaining the cable qualification and verification that the cables can perform their design functions when called upon.

Respectfully submitted,

Mary Lampert, Pilgrim Watch, Director  
148 Washington Street -Duxbury, MA 02332  
*[Original signed]*

Joining Pilgrim Watch: Rebecca Chin on behalf Town of Duxbury Nuclear Advisory Committee  
Town Hall, Tremont Street, Duxbury, MA 02332

## ATTACHMENT A

NRC Handout, Regulatory Issue Resolution Protocol, "Cable Performance Issues at Nuclear Power Plants, (2009-08-25) NRC Electronic Library, Adams Accession No. ML 092220419

### 4. Implementation Phase (At 5)

#### Staff Recommendations

1. Licensees must be in full compliance with NRC regulatory requirements specified above for cable systems.
2. If cable systems (cables, splices, connections, trays, supports, enclosures, etc.) have been exposed to conditions for which they are not designed or qualified, the licensees must demonstrate its qualification for plant-specific application. Licensees then must demonstrate, through adequate testing or condition monitoring, that the cables can perform their intended design function for the duration of its expected service life.
3. Nuclear industry to develop and implement a cable monitoring program to comply with Commissions regulatory requirements.
4. NRC verifies licensees' implementation through routine Baseline inspections.
5. Issue a NUREG report that identifies the essential elements for a cable condition monitoring program.
6. Issue a Regulatory Guide that provides guidance for maintaining the cable qualification and verifying that the cables can perform their design functions when called upon.

## ATTACHMENT B

### Appendix B- List of NRC Inspection Reports

NRC Handout, Regulatory Issue Resolution Protocol, "Cable Performance Issues at Nuclear Power Plants, (2009-08-25) NRC Electronic Library, Adams Accession No. ML 092220419

1. Inspection Report No: 05000346/2004-017
2. Inspection Report Nos. 50-269/99-12, 50-270/99-12
3. Inspection Report No: 05000263/ 2008-009
4. Inspection Report No: 05000482/2008-003
5. Inspection Report No: 05000286/2003-002
6. Inspection Report Nos: 05000266/2002-013, 05000301/2002-013
7. Inspection Report No: 05000302/2002-003
8. Inspection Report Nos: 05000250/2000-006, 0500025/2000-006
9. Inspection Report Nos: 05000280/2000-007, 05000281/2000-007
10. Inspection Report No: 05000482/2006-010
11. Inspection Report No: 05000287/2004-011
12. Inspection Report No: 05000286/2001/009
13. Inspection Report No: 05000293/2001-005
14. Inspection Report No: 05000247/2000-008
15. Inspection Report No: 05000266 /2008-007 (2 findings)
16. Inspection Report Nos: 05000313/2005-003, 05000368/2005-003
17. Inspection Report No: 05000416/2009-06
18. Inspection Report Nos: 05000335/2008-004, 05000389/2008-004
19. Inspection Report No: 05000482/2008-004

20. Inspection Report No: 05000247/2008-002

21. Inspection Report No: 05000461/2007-008

22. Inspection Report Nos: 05000259/2007-007, 05000260/2007-007, 05000296/2007-007

23. Inspection Report No: 05000331/2007-007

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A recent example, 7/12/10, following Appendix B's listing:

Event Number 46086 (07/12/2010) Fuel Cycle Facility, FABRICATION Region: 2 -City: ERWIN State: TN-County -Emergency Class: NON EMERGENCY -10 CFR Section: 70.50(b)(2) - SAFETY EQUIPMENT FAILURE

Event Text

ELECTRICAL FAULT DISABLED PUBLIC ADDRESS SYSTEM WHICH SUPPORTS VARIOUS ALARM ANNUNCIATORS

"At approximately 1200 hours (EST) on 7/12/2010, an electrical fault was identified in the fire alarm system. This fault disabled the public address portion of the system which supports annunciation of plant alarms including the following: fire alarm, criticality alarm, take-cover alarm, [carbon dioxide] discharge alarms. Trouble shooting of the problem is continuing. There is no impact to actual detection, suppression, etc. systems. Compensatory measures include the following: stop SNM handling and movement, fire patrols, restriction of hot work, notification to facility personnel, evacuation of nonessential personnel from production areas, fire brigade on standby and radios provided to fire brigade officers and some fire brigade members.

**"It is believed that the condition was associated with heavy rainfall and possible water intrusion."**

"There were no actual safety consequences to workers, the public, or the environment associated with the event. Potential consequences to workers, the public, or the environment are mitigated by compensatory measures."

The licensee notified the NRC Resident Inspector.

**\* \* \* UPDATE FROM RANDY SHACKELFORD TO JOHN KNOKE AT 1628 ON 7/15/10 \* \* \***

"The public address portion of the plant alarm system was restored on 7/13/2010. **It appears that recent rain storms caused some wiring to develop short circuits.** These short circuits were corrected. The system is continuing to be monitored and wiring may be identified that requires replacement. It was confirmed that the criticality alarm portion of the plant alarm system was not impacted during the recent outage."

The licensee notified the NRC Resident Inspector. Notified R2 DO (Seymour), NMSS EO (Hiltz), Fuels Grp [Emphasis added.]

**Simonian, Niry**

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**From:** Mary Lampert [mary.lampert@comcast.net]  
**Sent:** Monday, July 19, 2010 10:11 AM  
**To:** Docket, Hearing  
**Subject:** Pilgrim Watch 2.206 Petition Regarding Inadequacy of Entergy's Management of Non-Environmentally Qualified Inaccessible Cables & Wiring at Pilgrim Station  
**Attachments:** 2.206 Petition - Inadequacy Entergy's Management of Non-Environmentally Qualified Inaccessible Cables & Wiring at PNPS.pdf

Hello

Please find Pilgrim Watch 2.206 Petition Regarding Inadequacy of Entergy's Management of Non-Environmentally Qualified Inaccessible Cables & Wiring at

Pilgrim Station, two copies were sent by mail.

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

Thank-you and have a good day.

Mary

Received: from mail1.nrc.gov (148.184.176.41) by OWMS01.nrc.gov  
(148.184.100.43) with Microsoft SMTP Server id 8.1.393.1; Mon, 19 Jul 2010  
10:11:28 -0400

X-Ironport-ID: mail1

X-SBRS: 4.5

X-MID: 18501613

X-fn: 2.206 Petition - Inadequacy Entergy's Management of Non-Environmentally  
Qualified Inaccessible Cables & Wiring at PNPS.pdf

X-IronPort-AV: E=Sophos;i="4.55,226,1278302400";  
d="scan'208,217";a="18501613"

Received: from qmta08.westchester.pa.mail.comcast.net ([76.96.62.80]) by  
mail1.nrc.gov with ESMTP; 19 Jul 2010 10:11:27 -0400

Received: from omta24.westchester.pa.mail.comcast.net ([76.96.62.76]) by  
qmta08.westchester.pa.mail.comcast.net with comcast id  
jnHA1e0021ei1Bg58qBUsp; Mon, 19 Jul 2010 14:11:28 +0000

Received: from MaryXPS ([75.67.93.158]) by  
omta24.westchester.pa.mail.comcast.net with comcast id  
jqBS1e00P3R0XA33kqBTR1; Mon, 19 Jul 2010 14:11:28 +0000

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

To: <hearingdocket@nrc.gov>

Subject: =?US-ASCII?Q?\_Pilgrim\_Watch\_2.206\_Petition\_Regarding\_Inadequacy\_of\_Enterg?=  
=?US-ASCII?Q?y's\_Management\_of\_Non-Environmentally\_Qualified\_Inaccessible?=  
=?US-ASCII?Q?\_Cables\_&\_Wiring\_at\_Pilgrim\_Station?=>

Date: Mon, 19 Jul 2010 10:11:21 -0400

Message-ID: <000a01cb274c\$43dcc250\$cb9646f0\$@lampert@comcast.net>

MIME-Version: 1.0

Content-Type: multipart/mixed;  
boundary="-----\_NextPart\_000\_000B\_01CB272A.BCCB2250"

X-Mailer: Microsoft Office Outlook 12.0

Thread-Index: AcsnTEN0EHMgN1lwSG2v5PbtQsHKRQ==

Content-Language: en-us

Return-Path: mary.lampert@comcast.net