

December 9, 2008

The Honorable Edward J. Markey
United States House of Representatives
Washington, D.C. 20515

Dear Congressman Markey:

On behalf of the U.S. Nuclear Regulatory Commission (NRC), I am responding to your letter of October 31, 2008, in which you expressed concerns about NRC's fire protection regulations and requested responses to specific questions regarding a fire that occurred at the Pilgrim Nuclear Power Station on October 29, 2008. The protection of nuclear power plants against fire hazards is an important aspect of the agency's regulations and has long been a high NRC priority. Nuclear plant licensees are required to minimize the potential for a fire to occur, maintain fire protection systems, and be ready to respond quickly to fires whenever they occur. Early detection of fires and the ability to dispatch the plant's fire brigade to respond to the scene of a fire are key elements of this readiness.

Although the fire that occurred at the Pilgrim plant occurred in an area that did not include structures, systems, or components important to safety, the NRC initiated a review of the Pilgrim event starting with the resident inspectors' on-site inspection activities on October 29, 2008, following the fire. The NRC inspection activities included an assessment of Entergy's immediate response to the event, monitoring of Entergy's event investigation and root cause determinations, and a review of the corrective actions to confirm that any actions needed to ensure the safe operation of the plant were taken. The results of the inspection will be documented in a publicly-available inspection report by mid-February 2009.

The NRC, through its Reactor Oversight Process, reviews and assesses nuclear plant design, licensing requirements, and performance to ensure that reactors are operating safely and in accordance with applicable regulations. On-site Resident Inspectors inspect fire protection controls and equipment on a quarterly basis, and fire brigade training on an annual basis. Fire protection specialist inspectors also conduct comprehensive fire protection program inspections every 3 years at each operating reactor. Inspectors review fire protection equipment design, operational safety programs, and the control of transient combustibles and ignition sources. They also conduct inspections in response to events and examine the resolution of corrective actions for deficiencies. Fire protection issues identified by NRC inspectors are assessed for safety significance and documented in publicly available inspection reports. Generic fire protection issues are shared with licensees through the NRC's ongoing Operating Experience Program forums.

As noted in the enclosed response to your questions, as well as in prior correspondence to you on fire protection issues, the NRC evaluates its fire protection program in light of industry experience and its ongoing efforts to improve the regulatory process. The NRC staff is implementing actions, as discussed in the second enclosure to this document, to address four recommendations made by the U.S. Government Accountability Office in its report entitled "Nuclear Safety: NRC's Oversight of Fire Protection at U.S. Commercial Nuclear Reactor Units Could Be Strengthened" to manage better NRC oversight of fire protection at U.S. commercial nuclear reactors.

The NRC staff is available to provide a briefing for your staff if you desire. If you have additional questions on this matter, please contact me.

Sincerely,

/RA/

Dale E. Klein

Enclosures:

1. Response to Information Request
2. NRC Response to the GAO Report on Fire Protection (GAO-08-747)

NRC Response to October 31, 2008 Information Request

Question 1:

How did the fire at Pilgrim start? Please fully describe the location of the fire, the fuel which burned, and whether there was human error that may have enabled the fire.

Answer 1:

The root cause of the fire has not yet been conclusively determined. The NRC resident inspector staff will review Entergy's root cause analysis once it has been completed.

The location of the fire was in a Health Physics (HP) instrument calibration laboratory located in the Operations and Maintenance (O&M) building. The O&M building consists mainly of office space and maintenance work areas. There are no vital or nuclear safety equipment areas in this building. The HP instrument calibration laboratory is located in a corner of this building on the ground floor approximately 80 yards away from any vital area buildings.

The materials in the room consisted of HP instruments, various office equipment and book/paper materials, a plastic cart upon which electronic equipment and a laptop computer were positioned, ceiling tiles, and metal lockers and cabinets (which contained some calibration sources of low radioactivity). Preliminary indications are that the fire started on the plastic cart and was fueled by electronic devices with plastic cases (such as a laptop computer).

There was no obvious apparent human error that contributed to the fire; however, Entergy's root cause investigation is ongoing.

Question 2:

According to the Nuclear Regulatory Commission (NRC) Event Notification Report, the Pilgrim fire was "discovered" at 8:50 PM. What does the term "discovered" mean? Who "discovered" it and how? How long was the fire burning before it was "discovered?"

Answer 2:

The term "discovered" means that the specific location of the fire was visually verified following a search of the O&M building. The search of the O&M building started when indications of a fire in the building were received in the control room, the first being a control room alarm on the start of a fire protection system pump to maintain pressure in the system (indicating water was flowing from the system at an unspecified location). Subsequently, the control room received a verbal report of an O&M building fire alarm, which occurred upon fire protection system water flow and smoke detector actuation in the building. The alarm is actuated only in the O&M building, which is typical of an administrative support building that does not house equipment important to nuclear plant safety.

Both floors of the O&M building were searched by the site Fire Brigade and other members of the Operations department to locate the source of the fire. Since the smoke alarm in the O&M building does not display the specific location of a fire, the search initially began on the second floor where smoke was observed; when the fire source could not be located, the search moved to the first floor. Approximately 15 to 20 minutes following the first indication of a potential fire, the fire brigade identified water flowing from the sprinkler system in the HP instrument calibration lab. The licensee has generated a timeline associated with the fire detection, suppression, and response which will be reviewed as part of the NRC followup inspection.

It would be difficult to determine exactly how long the fire was burning before it was visually verified by the fire brigade because the fire would have existed for a period of time before the heat from the fire was sufficient to actuate the individual high-temperature sensitive sprinkler heads. At the time the fire brigade noted water and smoke coming from the laboratory, the automatic suppression system had already extinguished the fire.

Question 3:

The Event Notification Report states that the fire was extinguished at 9:09 PM, which is 19 minutes after it was “discovered.” Why did it take so long to extinguish this fire?

Answer 3:

Upon identification of the fire in the HP calibration laboratory and prior to entering the room, the fire brigade isolated electrical power to the room, shut off the fire suppression system (since it appeared the fire was out), and received a briefing from Health Physics personnel on the radiological material stored in the room. Although it was extinguished earlier, the fire was not declared “extinguished” until the Pilgrim station fire brigade and Plymouth township fire fighting personnel had entered the room, verified that the fire was out, and ensured that there was not a possibility of fire re-flash.

Question 4:

The Event Notification Report states that an off-site fire-fighting unit responded to the fire. Was the on-site fire-fighting unit unable to extinguish the fire? Was the local fire department called because the staffing of the on-site fire fighting unit was insufficient?

Answer 4:

The off-site fire fighting unit was called to the site to aid in the evaluation and, if necessary, in extinguishing the fire. This is a common practice at Pilgrim station. Both the Pilgrim fire brigade and the Plymouth fire department entered the room to verify the fire was out after the suppression system had extinguished the fire. The off-site fire fighting unit was called in as part of a conservative, comprehensive fire response strategy even though the site’s fire protection system, specifically the installed sprinkler system and the on-site fire brigade were sufficient to

deal with this fire. The plant's automatic fire suppression system extinguished the fire without assistance from the response teams.

Question 5:

Please describe the passive fire-protection systems that were installed at or near the location of this fire at the Pilgrim reactor. Did the fire penetrate any passive fire barriers? Were there any malfunctions by these systems?

Answer 5:

The HP instrument calibration laboratory is a non-safety related room approximately 18 feet by 36 feet located on the first floor of the O&M building. The walls are constructed of concrete block, the floor is a concrete slab, the ceiling is suspended from the second floor steel and concrete decking, and there are two metal doors leading from the lab to the nearby maintenance work area. Based on its function, the building is not required by NRC regulations to have safety features such as passive fire barriers. This building is designed as a normal commercial building and is required to meet all applicable local building codes associated with fire protection. The above features (along with the wet pipe suppression system and fire fighter response) prevented the fire from spreading to other areas of the O&M building.

Question 6:

Please describe the active fire-protection systems that were installed at or near the location of this fire at the Pilgrim reactor. Were there any malfunctions by these systems?

Answer 6:

The room contains an automatic fire suppression wet pipe system with sprinkler heads that actuate upon sensing localized high temperature in the room. This system actuated to spray water into the room, which put out the fire. In addition, building fire alarms sounded upon sensing water flow in the fire protection system and upon detecting smoke in the O&M building. In summary, the automatic fire protection systems functioned as designed.

Question 7:

Was the reactor operating at the time of the fire? Did the fire ever threaten the safe operation and safe shutdown of the reactor?

Answer 7:

The reactor was operating at the time of the fire. The fire was located in the non-safety related HP instrument calibration lab located in a far corner of the O&M building, a distance approximately 80 yards from the nearest building containing safety-related equipment, and at no time threatened the safe operation or safe shutdown of the reactor.

Question 8:

Is Pilgrim in full compliance with NRC's fire protection regulations? If not, when will Pilgrim be brought into compliance?

Answer 8:

Pilgrim has an NRC approved Fire Protection Plan as part of its operating license, which describes the provisions installed and implemented to meet NRC fire protection requirements as well as NRC approved exemptions to specific fire protection requirements as listed in question 11 below. The station has also received comprehensive fire protection team inspections on a triennial cycle (i.e., in 2000, 2003 and 2006). Since Entergy acquired the plant in 1999, there have been no violations identified by these team inspections that have not been addressed and resolved by the licensee. Finally, on September 30, 2008, the NRC completed its most recent inspection at the Pilgrim Nuclear Power Station, which identified no findings of significance in the fire protection area.

Question 9:

Is Pilgrim one of the plants transitioning to the recently adopted NFPA 805 option? If so, what is the schedule for this transition and when it be completed?

Answer 9:

Pilgrim is not one of the 48 plants currently planning to adopt voluntarily National Fire Protection Association (NFPA) Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants."

Question 10:

Has the NRC issued any enforcement actions against Pilgrim for any violation of fire protection regulations? If so when, for what, and what was the result?

Answer 10:

A search of our electronic enforcement database going back to 1992 did not identify any significant (i.e., escalated) fire protection violations at Pilgrim. The former licensee (Boston Edison) identified an extensive number of fire barrier deficiencies that were corrected during the 1986-1988 extended plant shutdown prior to restart.

Since Entergy acquired Pilgrim Station, the NRC has conducted three triennial fire protection inspections under the Reactor Oversight Process, which began in 2000. During the 2000 inspection, the NRC identified two findings: 1) a finding related to the lack of emergency lighting units installed to support manual operation of the service water outlet valves for the reactor building closed cooling water heat exchanger, and 2) the lack of adequate fire protection features for the emergency diesel generator watt-meter cables in the cable spreading room. Both of these findings were resolved by Entergy. The 2003 triennial fire protection inspection

identified one finding related to the adequacy of information to confirm whether a manual or automatic action was necessary, or had occurred, during a fire. This finding was also corrected by Entergy. Finally, the 2006 triennial fire protection inspection documented one licensee-identified violation, but identified no other findings. In summary, Entergy has displayed compliance with NRC fire protection regulations at Pilgrim; the findings identified by the NRC involved design features that predated Entergy's ownership of the facility and were corrected by Entergy when identified.

As previously indicated, the most recent NRC inspection at the Pilgrim Nuclear Power Station identified no findings of significance for the fire protection program. The inspection report for this latest inspection was issued on October 28, 2008.

Question 11:

Does Pilgrim currently have an exemption from any fire protection regulations? If so, what exemptions have they been granted and when were they approved? Do any of these exemptions in any way relate to the location, events, or materials surrounding this event, or have anything to do with this fire?

Answer 11:

Pilgrim has a number of exemptions from the NRC's prescriptive fire protection regulations; this is typical of facilities (such as Pilgrim) constructed prior to the publication of 10 CFR Part 50, Appendix R on fire protection in 1980. Such exemptions, as permitted by 10 CFR Part 50.12, represent alternate safe methods acceptable to the NRC to meet the intent of specific fire safety requirements and are necessary since it is impractical to meet some Appendix R requirements after facility construction (e.g., providing large separation distances between redundant equipment in buildings too small to permit such spacing). None of these exemptions are related to the health physics calibration laboratory, surrounding areas, or provisions to extinguish this fire. The following is a comprehensive list of approved NRC exemptions for Pilgrim in the fire protection area:

- 1) Supplemental Safety Evaluation Reports issued on June 19, 1980, October 7, 1980, and December 15, 1980, related to License Amendment 35. These reports are supplements to original Safety Evaluation Report issued on December 21, 1978, related to the new fire protection requirements after the Brown's Ferry fire;
- 2) Safety Evaluation Report issued on May 12, 1980, related to License Amendment 42, proposed Technical Specifications for the alternate shutdown requirements;
- 3) Safety Evaluation Report issued on May 14, 1981, related to Interim Appendix R on alternate shutdown capability;
- 4) Safety Evaluation Report issued November 10, 1981, related to 10 CFR Part 50 Appendix R III.G.3 Exemption Amendment 35, Appendix R III.G.3, installation of a fixed fire suppression system in control room;

- 5) Safety Evaluation Report issued May 14, 1982, related to exemption from schedule requirements of 10 CFR 50.48(c);
- 6) Safety Evaluation Report issued August 5, 1982, related to testing of Emergency Diesel Generators from the alternate shutdown panel;
- 7) Safety Evaluation Report issued January 7, 1983, related to the fire barrier between the turbine building and steam tunnel;
- 8) Safety Evaluation Report issued November 2, 1983, related to 10 CFR Part 50, Appendix R III.G & III.L, design for alternate safe-shutdown in the control room, cable spreading room, steam tunnel, switchgear rooms, and portions of the reactor building;
- 9) Safety Evaluation Report issued August 22, 1984, related to License Amendment 76, fire protection Technical Specifications related to penetration fire;
- 10) Safety Evaluation Report issued November 27, 1984, related to License Amendment 84, Technical Specifications for a Halon fire suppression system in the cable spreading room;
- 11) Safety Evaluation Report issued December 18, 1984, related to exemptions to Appendix R for 6 fire zones in the reactor building and the vital motor-generator (MG) set room;
- 12) Safety Evaluation Report issued June 10, 1985, related to Appendix R III.G.2 Exemptions 5, 7, 8, & 9, corrections to the December 18, 2004 report in Item #11;
- 13) Safety Evaluation Report issued October 6, 1987, related to Appendix R III.L Exemption 17, emergency lighting requirements in an exterior yard area;
- 14) Safety Evaluation Report issued March 8, 1988, related to License Amendment 114, Technical Specifications changes to clarify language and to reflect actual conditions resulting from Appendix R-related plant modifications such as installation of additional suppression systems, additional standpipes and hose stations, and alternate shutdown panels (to help provide for alternate shutdown capability);
- 15) Safety Evaluation Report issued March 24, 1988, related to Appendix R Section III.M Exemption, internal smoke seals for conduits passing through fire barriers between the cable spreading room and the control room;
- 16) Safety Evaluation Report issued March 24, 1988, related to Control Room floor seals adequacy;
- 17) Safety Evaluation Report issued April 14, 1988, related to 10 CFR Part 50, Appendix R III.G Exemption 21 (i.e., hot shutdown/electrical "hot short" repairs);
- 18) Safety Evaluation Report issued May 17, 1988, 10 CFR Part 50, Appendix R III.G. Exemption for irregularities on fire doors (i.e., frame, wall, bolting clearances);
- 19) Safety Evaluation Report issued July 14, 1988, related to Appendix R III.G.2 Exemptions 11, 12, 13, & 14, requirements of fire barriers between the reactor building

torus compartment and the control rod drive quadrant rooms and protection of structural steel in the reactor building torus compartment and reactor building steam tunnel;

- 20) Safety Evaluation Report issued July 20, 1988, related to Appendix R III.G.2 Exemptions 15, 18, and 22, full area fire detection and automatic suppression in radwaste and control buildings and torus water level indication instruments and cable;
- 21) Safety Evaluation Report issued October 13, 1988, related to License Amendment 123 & Appendix R III.G., Exemption 23 (regarding fire barrier requirements), plant-specific circumstances for permitting fire barriers to have less than 3-hour rating; and
- 22) Safety Evaluation Report issued November 16, 1992, License Amendment 143, License Condition 3.F, and relocation of certain fire protection Technical Specifications to Updated Final Safety Analysis Report.

Question 12:

Will the NRC conduct any additional inspections as a result of this fire? If so, what type of inspection, and when will the inspection be concluded? I would appreciate a copy of any inspection report that is issued as a result of this event.

Answer 12:

The NRC resident inspector staff at Pilgrim responded to the site to evaluate Entergy's response to the fire and to assess any impact on the small amount of radioactive materials stored in lockers in the room. In addition, the NRC evaluated the event in accordance with its reactive inspection decision-making process and determined that no additional team inspection was warranted. The resident inspector staff will conduct a follow-up inspection, including a review of the root cause investigation and timelines upon their completion. The results of this follow-up inspection will be documented in the resident inspector's fourth quarter 2008 integrated inspection report, due to be issued in mid-February 2009. A copy of that report will be provided to your office promptly upon issuance.

Question 13:

What steps, if any, does the NRC intend to take in response to the findings and recommendations made by the GAO in its June 2008 report?

Answer 13:

The NRC staff is implementing actions to address four recommendations made by the U.S. Government Accountability Office in its report entitled "Nuclear Safety: NRC's Oversight of Fire Protection at U.S. Commercial Nuclear Reactor Units Could Be Strengthened," to manage better its oversight of fire protection at U.S. commercial nuclear reactors. A copy of the NRC's response to the GAO report is enclosed.