

U. S. NUCLEAR REGULATORY COMMISSION
REGION I

DOCKET/REPORT NO: 50-293/95-22
LICENSEE: Boston Edison Company
Plymouth, Massachusetts
FACILITY: Pilgrim Nuclear Power Station
LOCATED AT: Plymouth, Massachusetts
INSPECTION DATES: October 2-6, 1995

INSPECTOR: W. H. Harrison 12/28/95
Leanne Harrison, Reactor Engineer
Electrical Engineering Branch
Division of Reactor Safety
Date

APPROVED BY: William H. Ruiland 12/28/95
William H. Ruiland, Chief
Electrical Engineering Branch
Division of Reactor Safety
Date

Areas Inspected: Routine Fire Protection Program.

REPORT DETAILS FOR THE FIRE PROTECTION INSPECTION NO. 50-293/95-22

1.0 FIRE PROTECTION PROGRAM REVIEW (64704)

The purpose of this inspection was to assess the overall effectiveness of the fire protection program for providing assurance that a fire will not prevent the performance of necessary safe shutdown plant functions. The inspection scope included an evaluation of procedures and program controls for technical adequacy.

These verifications were completed in accordance with the guidance provided in NRC Inspection Procedure No. 64704.

The inspector's assessments were based on document reviews, interviews, and observations. In addition, management oversight of the program was addressed. Essential objectives, requirements and controls, and responsibilities for implementation and maintenance of the program were appropriately established by BECo in Nuclear Organization Procedure (NOP) 83FPI, Revision 3.

2.0 FIRE PROTECTION PROGRAM REVIEW

Independent NOPs and various Pilgrim Nuclear Power Station (PNPS) procedures administratively controlled and provided guidance for implementation of these objectives. Selected fire protection procedures, listed in Attachment 2 of this report, were reviewed by the inspector. This review was made to verify that adequate guidance had been developed and established to implement the fire program strategy and philosophy of defense-in-depth.

2.1 Permit Processes For Fire Risk

The inspector reviewed the administrative processes for control of ignition sources and combustible materials to validate that attributes had been established to prevent fires and protect safety-related equipment. Attributes included special authorization requirements for the use of combustible, flammable, or hazardous explosive material and hot work activities involving welding, cutting, grinding, open flame, or other ignition sources, and proper safeguard.

The inspector reviewed log record books for combustible material and hot work permits and held discussions with fire protection and maintenance personnel to assess their knowledge of program attributes and requirements regarding fire risk and fire control. The inspector found that training and procedures had been developed to minimize the probability of fire from activities that introduce sources of ignition into the plant. These activities included smoking, welding, flame cutting, and grinding for hot work control. BECo minimized the probability of fire by administratively limiting the quantity, form, characteristics, containment, or other aspect of combustible material to an acceptable level. Personnel were found to be very knowledgeable of program

requirements and of their expected responsibilities for maintaining program controls. The inspector considered the knowledge of the fire protection staff to be a major contributor for maintaining program effectiveness. However, the inspector noted that, although no safety issues had been identified regarding any actual fireloading exceeding maximum permissible amounts, weak procedural control existed.

This weakness involved the use of multiple fire area/building blanket permits created as a convenience for maintenance staff work groups. These blanket permits alleviated the need to complete individual combustible material permits for each job task and were valid for use for an extended 12-month period. Although limitations had been placed on quantities of combustibles introduced to intended plant areas via the blanket permit, to prevent unnecessary fire risk, governing Procedure 1.4.3, Revision 20, did not address such use nor provide additional means for monitoring the culmination of quantities or inter-reactive qualities of materials. In addition, the procedure did not require the expected personnel actions to notify the fire protection department prior to the performance of any work. Conformance with administrative controls of the procedure was validated by periodic tours performed by fire protection personnel.

In addition, very limited permit information was found to be retained by the fire protection staff. No copies of open combustible material permits were found to be readily available for review in the log book, and all closed permits were retained for only the previous calendar year. Similar concerns were identified for hot work permits. The licensee stated that open combustible material permit information was posted and maintained in the field and permit process enhancements were in progress. Enhancements included better integration with the chemical control permit process for evaluating and controlling the interaction of combustible, flammable, and oxidizing materials. BECo did not consider such permits as records required for retention as defined in the Boston Edison Company Quality Assurance Manual (BEQAM). BECo agreed to reevaluate the requirements and make changes as necessary for retaining such information. The inspector had no safety concerns based on the acceptable combustible loads exhibited throughout the plant.

Overall, the inspector concluded that good measures had been implemented by BECo personnel for minimizing fire risk due to the introduction of ignition sources and combustibles. The inspector noted a few procedural weaknesses associated with the permit processes; however, no safety issues had been identified based on the controls implemented. Good program performance was attributed to the knowledge of the fire protection staff.

2.2 Facility Tour

The inspector toured accessible vital and non-vital areas of the site to assess actual implementation of the fire protection program including the adequacy of the installed fire protection systems, fire hazard controls including housekeeping, and readiness of fire brigade equipment. The inspector compared actual fireloading values of selected plant fire areas within the process buildings including various elevations within the reactor,

turbine, and screenhouse buildings, and observed the hot work areas for two maintenance jobs. The alignment of emergency lights and fire suppression system valves were also addressed by the inspector during this tour.

The inspector found the material conditions of the plant and fire protection equipment to be good. No discrepancies were identified regarding: the proper closure and latching of fire doors; condition of fire hoses and fire brigade turn-out gear; outside hose house inventories; fire extinguisher charging; access to fire suppression devices; or alignment of valves and emergency lights.

The inspector noted that transient equipment and materials from the recent outage remained within and adjacent to plant areas since June 1995. Deficiencies included improperly stored and improperly contained paint in a flammable liquids cabinet located on the turbine deck. Oily rag receptacles had not to have been emptied daily as intended. The licensee issued a problem report for the improperly stored paint and agreed to review all flammable cabinet permits with the requirements of Procedure 1.4.3 and resolve all identified deficiencies. The inspector also noted that, although housekeeping inspections were being performed weekly in accordance with National Fire Protection Association (NFPA) Code 803, "Fire Protection for Nuclear Power Plants," BECo's Procedures 8.B.20, Revision 3, and NOP 8304, dated 5/19/88, only required monthly inspections.

The inspector found inconsistencies among site work groups when preparing work areas for hotwork activities. Maintenance job request (MR), 1950-1383, related to trimming of turbine rotor blades. The maintenance work group appropriately established the precautionary measures and firewatch requirements for this hotwork activity. MR 1950-1538 involved grinding in the screenhouse. The maintenance work group assigned for this job repeatedly failed to establish the provisions of the hotwork procedure and assigned hotwork permit. Specifically, the required access restrictions, fire extinguisher, and firewatch were not put in place prior to fire protection staff inspection. This job was appropriately canceled prior to work due to the poor work area preparation.

The inspector concluded that the material conditions of fire protection equipment were good. Appropriate control of combustibles and fireloading was maintained within analyzed quantities. Minor deficiencies involving housekeeping and inconsistencies regarding hot work area preparation were noted.

2.3 Modifications

The inspector reviewed BECo's established controls for performing plant modifications to verify that potential impact evaluations on fire protection were performed prior to modification installation. Nuclear Engineering Services Department Procedure 3.02, Revision 37, provided guidance for performing modifications and appropriately required assessment of the potential impact of the change on fire protection during the preliminary engineering phase. BECo Procedure 8.B.14, Revision 18, provided guidance for compensatory measure firewatches, as required by the FSAR.

The inspector reviewed open Plant Design Change (PDC) 93-06 involving a modification to the ventilation system in the 'B' emergency switchgear room. This modification necessitated the removal of two 10 CFR Part 50, Appendix R, required emergency lights from service. These lights were installed to provide light on the 4160 V circuit breakers associated with alternate shutdown panels for safety-related equipment. These breakers are operated during a plant shutdown from outside the control room. The inspector found that the safety evaluation for the modification recognized the lighting inoperability and established the compensatory measures required by the Technical Specifications for inoperable alternate shutdown panels. These measures included the establishment of a roving firewatch. However, no compensatory measures had been implemented for the emergency lights. Following this, further evaluation performed by the licensee, as documented in the disposition to problem Report No. 95.9336.01, recognized the unavailability of the lights and considered flashlights carried by operators in the field as an acceptable compensatory measure until the lights became restored to service.

The inspector questioned the adequacy of such compensatory measures since BECo failed to consider the operator actions required at the switchgear. The inspector's review of BECo's alternate safe shutdown Procedure 2.4.143 and discussions with senior operations personnel and management did not identify any operator actions that specifically required use of both hands to complete necessary actions in the specific area of the switchgear where the lights were out of service. However, the inspector found that a thorough review had not been performed by BECo to justify the adequacy of the compensatory measures established. In addition, this review had not been performed prior to removing the lights from service. The inspector further noted that neither Procedure 8.B.14 nor any other procedure addressed any compensatory actions for emergency lights removed from service.

The inspector did not identify a safety concern associated with the removal of these lights from service for the modification. However, the inspector found that no guidance existed for establishing specific compensatory measures when Appendix R lights become inoperable and considered this a weakness.

3.0 QUALITY ASSURANCE AUDITS

The inspector reviewed the effectiveness of BECo's application of quality assurance (QA) program measures to the fire protection program. These measures included the incorporation of standards and practices for plant activities and the completion of documentation of these measures as presented in program assessment audits.

The inspector reviewed the most recently completed annual, biennial, and triennial audit reports as listed in Attachment 2 of this report. The inspector found that the assessment scope, findings, and recommendations of these reports were good and effectively completed. Program attributes reviewed were assessed comprehensively in accordance with requirements presented in the BEQAM. Reviews focused on different program areas with each

type of audit, and were clearly documented. The inspector noted that findings were well supported and programmatic and organizational changes within the fire program were included. The audit findings indicated that BECo maintained appropriate program control in excess of regulatory requirements.

The inspector concluded that QA had been appropriately applied to program activities and audit reports properly satisfied the Technical Specification requirements. Audit scopes were good and effectively verified QA and fire program requirements.

4.0 TRAINING/QUALIFICATION OF FIRE BRIGADE

The inspector reviewed the program requirements, training provided, and medical approvals for fire brigade members. This review verified the completion and adequacy of the type and frequency of qualification training of fire brigade personnel.

The inspector reviewed lesson and pre-fire plans, completed training rosters, and approved physical records for selected fire brigade members to verify their qualification for fire brigade duty. An interview was held with the nuclear training specialist who performs the classroom training and post-fire drill critiques at Pilgrim. The inspector found that the training material presented was of excellent quality and the specialist thoroughly familiar and very knowledgeable of the material and fire program requirements. The inspector found qualification records to be complete, well-organized, and maintained for auditability.

The inspector observed an announced drill to assess the readiness and abilities of the fire brigade when encountering fires within the plant. The inspector found the brigade to be well-organized, careful, and knowledgeable of the proper fire attack approach for the simulated fire scenario. The inspector noted effective communications during the drill.

The inspector concluded that the training provided to fire brigade members was effective and appropriately prepared the brigade for fighting fires. Training material was of high quality and presented by knowledgeable staff. Fire brigade members demonstrated effective fire fighting techniques and appropriately satisfied the drill objectives.

5.0 MANAGEMENT OVERSIGHT

The inspector reviewed the effectiveness of the organizational oversight arrangement provided for the fire protection program. This review examined the measures used by management personnel to assess the status and condition of the program and for receiving such information to better understand problems and issues.

The fire protection staff reports to the Lead Balance of Plant System Engineer to the Civil/Structural/Mechanical Department Manager. Monthly system status reports prepared by the fire protection staff provided management and with information and feedback used for assessing program performance. Indicators used included the quantity of firewatches utilized, open maintenance requests, operator workarounds, and problem reports initiated.

The inspector found that these performance indicators were narrowly focused for assessing overall program vigor. Additionally, the inspector did not identify a trending mechanism for further review of deficiencies for similar cause, such as those deficiencies identified during this inspection.

The inspector concluded that acceptable management oversight had been afforded to the fire protection program. However, the inspector found that management focused more on the number of tasks needed to be completed rather than review of the tasks themselves for assessing program oversight.

6.0 EXIT MEETING

The inspector met with BECo personnel, denoted in Attachment 1 of this report, at the end of the inspection on October 6, 1995. The scope and results of the inspection were summarized. During this meeting, the licensee acknowledged the findings and confirmed their plans to review all flammable cabinet permits, as detailed in report Section 2.2. The licensee stated that further review of the deficiencies identified by the inspector would be performed to determine root causes and needed corrective actions. The inspector received proprietary material during the inspection and used the material only for technical reference. No part of the material was knowingly disclosed in this inspection report.

Attachments:

1. Persons Contacted
2. Documents Reviewed

ATTACHMENT 1

Persons Contacted

Boston Edison Electric Company

*S. Burke	Senior Mechanical Engineer
J. Dawicki	Nuclear Training Specialist
*N. Desmond	Regulatory Relations Group Manager
M. DiMeo	Nuclear Engineering Services
*D. Ellis	Compliance Supervisor (Acting)
J. Gerety	NEG Department
*P. Kahler	Senior Licensing Engineer
*J. Keene	Regulatory Affairs
*W. Kline	Nuclear Engineering Services Manager
*R. MacKinnon	Fire Protection Technical Specialist
*C. McMorrow	Fire Protection Officer
*H. Oheim	General Manager - Technical
*L. Oliver	Vice President Nuclear Operations
*W. Riggs	Deputy Plant Manager
*J. Sullivan	Senior Quality Assurance Engineer
*T. White	Mechanical Department Manager

United States Nuclear Regulatory Commission

*B. Korona	Resident Inspector, Pilgrim Station
*R. Laura	Senior Resident Inspector, Pilgrim Station

* Indicates those in attendance at the exit meeting held on October 6, 1995.

ATTACHMENT 2

Documents Reviewed

Procedures (No./Revision/Title):

8.B.20	3	Fire Hazard(s) Inspection
1.4.3	20	Combustible Controls For Pilgrim Station
1.5.5	21	Hotwork Fire Safety
5.5.2	18	Special Fire Procedure
5.5.1	14	General Fire Procedure
8.B.3.2	16	Fire Hose Station Equipment Inspection
1.4.23	16	Fire Brigade Training Drill
2.4.143	16	Shutdown From Outside Control Room
3.M.3-49	7	Emergency Lighting Battery Maintenance/ Preventive Maintenance Procedure
8.B.21	14	Emergency Lighting Units (Fixed)
8.B.4	32	Smoke And Heat Detection Systems
8.B.6	28	Pre-Action/Deluge Sprinkler System
8.B.7	14	Fixed Dry Chemical Fire Protection Systems
8.B.9	27	Wet Pipe And Dry Pipe Sprinkler System

Lesson Plans:

C-FB-02-05-04	3	Plant Emergency Fire Procedures
-03	2	Plant Communications
Manual 5.4	23	Fire Watch
Manual 5.3.2	25	Fire Brigade

Completed Surveillances:

8.B.19	10	Fire Brigade Equipment Inspection	10/4/95, 10/25/94
8.B.2	31	Fire Water Supply Shutoff Valve Inspect	3/30/95, 10/21/94
8.B.17.2	1	Inspection Of Fire Damper Assemblies	2/11/94, 6/17/93, 2/16/95

SI-FP.2003	1	Inspection Of Fire Barriers For The Electrical Equipment Rooms	11/15/93, 6/10/93, 8/3/95
8.B.9	27	Wet And Dry Pipe Sprinkler System	6/26/95, 11/9/94
8.B.1	41	Fire Pump Test	7/28/95, 8/11/95

QA Audits Reviewed:

94-12	Annual Fire Protection Audit
93-12A	Triennial Fire Protection Audit
94-14	Biennial Fire Protection Audit