

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

Report No. 50-352/88-18

Docket No. 50-352

License No. NPF-39 Priority - Category C

Licensee: Philadelphia Electric Company  
2301 Market Street  
Philadelphia, Pennsylvania 19101

Facility Name: Limerick Nuclear Generating Station Unit 1

Inspection At: Limerick, Pennsylvania

Inspection Conducted: August 16-19, 1988

Inspectors: A. Krasopoulos 9/23/88  
A. Krasopoulos, Reactor Engineer date

A. Krasopoulos for 9/23/88  
J. F. Lara, Reactor Engineer date

Approved by: C. J. Anderson 9/23/88  
C. J. Anderson, Chief, Plant Systems date  
Section

Inspection Summary: Inspection on August 16-19, 1988 (Report No. 50-352/88-18)

Areas Inspected: Routine unannounced inspection of the Fire Protection/Prevention Program including: program administration and organization; administrative control of combustibles; administrative control of ignition sources; other administrative controls; equipment maintenance, inspection and tests; fire brigade training; periodic inspections and quality assurance audits; and facility tours.

Results: Of the areas inspected, no violations were identified.

## DETAILS

### 1.0 Persons Contacted

#### 1.1 Philadelphia Electric Company (PECO)

- \*G. M. Leitch, Vice President, Limerick Generating Station
- \*M. J. McCorminck, Jr., Plant Manager
- \*G. Sproat, Project Manager
- \*D. Noff, Licensing Engineer
- \*S. Thilker, Commitment Tracking Licensing
- \*C. Endriss, Regulatory Engineer
- \*P. J. Duca, Jr., Technical Support
- \*J. M. Corcoran, Manager, Quality
- \*D. Feaster, Fire Protection Supervisor
- J. Conway, Fire Protection Assistant

#### 1.2 U. S. Nuclear Regulatory Commission (NRC)

- \*L. Scholl, Resident Inspector

\* Denotes those present at the exit interview.

### 2.0 Follow-up of Previous Inspection Findings

#### (Closed) Violation (50-352/87-27-01)

Flow switches in Fire Suppression System may disable all emergency diesels, in violation of Appendix R Requirements.

The licensee discovered and reported the following non-conformance from the Appendix R requirements. The non-conformance was that a fire in the service water (SW) tunnel had the potential of disabling all four Emergency Diesel Generators (EDGs) thus endangering the plant's safe shutdown capability.

The EDGs could be disabled by a trip signal from relays connected to flow switches in the fire suppression systems. The NRC held an Enforcement Conference on October 22, 1987 during which the licensee explained the reasons for the violation and the planned corrective action. The corrective actions specified and taken by the licensee included a redesign and a modification to remove the fire suppression flow switch trip signal. The licensee also initiated a review of the electrical schematic drawings to verify that this non-conforming design condition was an isolated case.

The inspector reviewed the above described licensee actions and found them acceptable. This violation is closed.

### 3.0 Fire Protection/Prevention Program (64704)

The inspector reviewed several documents in the following areas of the program to verify that the licensee had developed and implemented adequate procedures consistent with the Fire Hazard Analysis (FHA), Final Safety Analysis Report (FSAR), and Technical Specifications (TS). The documents reviewed, the scope of review, and the inspection findings for each area of the program are described in the following sections.

#### 3.1 Program Administration and Controls for Ignition Sources and Combustible Materials

The inspector reviewed the following administrative procedures to verify that the Fire Protection Program, as described in the FSAR and other licensing documents, is properly implemented.

The documents reviewed were:

- Technical Specifications, Section 6, Administrative Control
- Procedure A-92, Plant Fire Protection Program Responsibilities, Revision 0.
- Procedure A-12, Ignition Source Control, Revision 1.
- A-12.1, Procedure for Controlling Technical Specification
- Firewatch and Firewatch Patrols, Revision 0.
- A-12.2, Control of Combustible Materials, Revision 1.
- Procedure A-12.3, Control of Fire Protection Impairments (Draft).

The scope of the review was to ascertain that:

- Personnel were designated for implementing the program at site;
- Qualifications were delineated for personnel designated to implement the program;
- Special authorization for the use of combustible, flammable or explosive hazardous material in safety-related areas;
- Prohibition on the storage of combustible, flammable or explosive hazardous material in safety-related areas;
- The removal of all wastes, debris, rags, oil spills or other combustible materials resulting from the work activity or at the end of each work shift, whichever is sooner;
- All wood used in safety-related areas to be treated with flame retardant;

- Periodic inspection for accumulation of combustibles;
- Transient combustibles to be restricted and controlled in safety-related areas;
- Housekeeping to be properly maintained in areas containing safety-related equipment and components;
- Requirements for special authorization (work permit) for activities involving welding, cutting, grinding, open flame or other ignition sources and that they are properly safeguarded in areas containing safety-related equipment and components;
- Prohibition on smoking in safety-related areas, except where "smoking permitted" areas had been specifically designated by plant management;
- Work authorization, construction permit or similar arrangement is provided for review and approval of modification, construction and maintenance activities which could adversely affect the safety of the facility;
- Fire brigade organization and qualifications of brigade members are delineated;
- Fire reporting instructions for general plant personnel are developed;
- Periodic audits are to be conducted on the entire fire protection program; and
- Fire protection/prevention program is included in the licensee's QA Program.

The review of these documents and the inspection of the areas described did not identify any unacceptable conditions. However, the procedures reviewed need to be revised to reflect the new management organization in place since January 1988. The licensee management was appraised of this concern during the exit interview with the inspector and committed to revise all administrative procedures by December 31, 1988. The licensee also stated and the inspector verified that the administrative procedures to implement the fire protection program are already in the process of being revised.

### 3.2 Equipment Maintenance, Inspection and Tests

The inspector reviewed the following randomly selected documents to determine whether the licensee had developed adequate procedures which established maintenance, inspection, and testing requirements for the plant fire protection equipment.

In addition to reviewing these documents, the inspector also reviewed the maintenance/inspection/test records of the items, to verify compliance with Technical Specifications and established procedures.

The documents reviewed were:

Procedure - ST-7-002-323-0, Halon System Operability Verification  
 Procedure - ST-7-022-251-0, Fire Pump Operability Verification  
 Procedure - ST-7-022-353-0, Halon System Inventory  
 Procedure - ST-7-022-370-0, Fire Door Daily Position Check  
 Procedure - ST-7-022-550-0, Triennial Fire Drill  
 Procedure - ST-7-022-920-0, Fire Rated Assembly Inspection  
 Procedure - ST-7-022-921-0, Fire Damper Inspection  
 Procedure - ST-7-022-924-0, Fire Rated Assembly/Sealing Devices  
 Inspection  
 Procedure - ST-7-022-954-0, Yard Fire Hydrant Visual Inspection

No unacceptable conditions were identified.

The inspector also reviewed the corrective maintenance request list to determine whether there is a significant number of fire protection equipment inoperable. The review of this list determined that there are 71 outstanding requests. Sixty of these requests are less than one year old. The F.P. equipment that requires maintenance has only a minor impact on plant safety. No unacceptable conditions were identified.

### 3.3 Fire Brigade Training

#### 3.3.1 Procedure Review

The inspector reviewed the following licensee documents:

RT-6-022-980-0	Fire Brigade Member Annual Physical Verification, Revision 0
RT-7-022-980-0	Fire Brigade Training Review, Revision 1
RT-7-022-981-0	Quarterly Fire Brigade Meeting Review, Revision - 2
RT-7-022-983-0	Fire Brigade Drill Review, Revision 1
ST-7-EP-550-0	Fire Drill, Revision 3

The scope of review was to verify that the licensee had developed administrative procedures which included:

- a. Requirements for announced and unannounced drills;
- b. Requirements for fire brigade training and retraining at prescribed frequencies;
- c. Requirements for at least one drill per year to be performed on a "back shift" for each brigade; and,
- d. Requirements for maintenance of training records.

No unacceptable conditions were identified.

### 3.3.2 Records Review

The inspector reviewed the training records of the fire brigade members for 1988 to ascertain that they had attended the required quarterly training and participated in a quarterly drill, and received the annual hands-on fire extinguishment practice.

No unacceptable conditions were identified.

The inspector also monitored an announced fire drill and listened to the drill critique. The drill was successful in that the full fire brigade responded promptly and went through the exercise with competence. The follow-up critique was thorough with emphasis on both weaknesses and strengths. The inspector commented to the licensee management that the area where the fire fighters get and don their protective gear is not equipped with emergency lighting. Emergency lights would facilitate the brigade's response to the fire if the fire also caused a station black-out. The licensee management during the exit interview committed to review this concern.

### 3.4 Periodic Inspections and Quality Assurance Audits

The licensee's T.S. require that annual, biennial and triennial audits of the fire protection program are conducted. The NRC has in recent inspections reviewed the latest annual and biennial audits. During this inspection the inspector reviewed the following triennial audit conducted in accordance with T.S.6.5.2.8.J. This audit also satisfies T.S.6.5.2.8.1 which requires that an audit of the fire protection program is performed annually. The audit reviewed was AL87-158PL. The outside consultant engaged to assist in the audit was Professional Loss Control, Inc.

The review of this audit did not identify any unacceptable conditions.

### 3.5 Licensee Event Report (LER's)

The inspector reviewed the following fire protection program related LERs:

- LER 87-55 - Non-conformance with fire safe shutdown requirements of LGS Fire Protection Evaluation Report.
- LER 87-63 - Fire Suppression Water System Technical Specification Violation due to personnel error.
- LER 88-06 - Inoperability of Fire Protection Water Curtain Systems due to a design deficiency discovered during an engineering review.
- LER 88-08 - Revision 0 and Revision 1, Non-compliance with Technical Specifications due to missing and incorrectly installed fire rated penetration conduit seal.

With regard to LER 87-55, the NRC reviewed the deficiency in a special inspection documented in Report 50-352/87-27 and determined that the deficiency was a violation of the 10 CFR 50 Appendix R requirements. A review of the licensee's corrective actions to this violation is documented in Section 2 of this report (Follow up of previous inspection findings).

With regard to LER 87-63, the licensee inadvertently isolated for more than four hours, several fire suppression systems, without compensatory fire protection for the areas affected, as required by the Technical Specifications. In as much as this violation was of minor safety significance because other fire suppression systems were available, and because it was an isolated incident that was reported and corrected promptly the NRC will not issue a violation. The corrective actions taken by the licensee included a memo to all shift personnel reminding them about the importance of adhering to procedures and a revision to the requalification lesson plans to emphasize concerns with blocking permits.

With regard to LER 88-06, the licensee discovered that three water curtain sprinkler systems installed to provide fire separation between redundant shutdowns trains were inadequately sized and would not provide the design density of .3 gallons per minute per square foot (gpm/ft<sup>2</sup>) at the floor level. The licensee has since established compensatory measures (fire watches for two affected areas) and implemented a design change to increase the water density. The modifications proposed in the design change are currently under way. The NRC will not issue a violation for this deficiency because the

deficiency was of a minor safety significance, was reported, was promptly addressed and it is believed to be an isolated incident. The actions being taken by the licensee are adequate.

With regard to LER 88-08, this concerns the discovery of three degraded penetration seals from fire barriers. This licensee could not determine the reason for the degraded penetrations other than postulate that this condition existed since the plant was built. The licensee has since corrected the problem and for the reasons cited in the previous paragraph, the NRC will not issue a violation. The actions taken by the licensee are acceptable.

### 3.6 Facility Tour

The inspector examined fire protection water systems, including fire pumps, fire water piping and distribution systems, post indicator valves, hydrants and contents of hose houses. The inspector toured accessible vital and nonvital plant areas and examined fire detection and alarm systems, automatic and manual fixed suppression systems, interior hose stations, fire barrier penetration seals, and fire doors. The inspector observed general plant housekeeping conditions and randomly checked tags of portable extinguishers for evidence of periodic inspections. No deterioration of equipment was noted. The inspection tags attached to extinguishers indicated that monthly inspections were performed.

During the facility tour, the inspector observed that tamper switches were installed on the isolation valves of the supervisory air system associated with the preaction system deluge valves. The inspector also noted that there were two more isolation valves on the same header and these valves were not provided with tamper switches. The inspector questioned the licensee personnel about the usefulness of the tamper switches since not all system isolation valves were provided with them.

The licensee agreed with the inspector that the tamper switches as installed did not provide a useful function. However, they stated that there is no requirement to have tamper switches on these valves because if the valves were inadvertently closed, the preaction system would still work as designed. The inspector verified that this statement was accurate.



#### 4.0 Exit Interview

The inspector met with licensee management representatives (see Section 1.0 for attendees) at the conclusion of the inspection on August 19, 1988. The inspector summarized the scope and findings of the inspection at that time. The inspector also confirmed with the licensee that the report will not contain any proprietary information. The licensee agreed that the inspection report maybe placed in the Public Document Room without prior licensee review for proprietary information. (10 CFR 2.790).

At not time during this inspection was written material provided to the licensee by the inspector.