

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 50-293/80-09

Docket No. 50-293

License No. DPR-35 Priority -- Category C

Licensee: Boston Edison Company

800 Boylston Street

Boston, Massachusetts 02199

Facility Name: Pilgrim Nuclear Power Station

Inspection at: Plymouth, Massachusetts

Inspection conducted: March 3-21, 1980

Inspectors: Jon R Johnson for
D. Kehoe, Reactor Inspector

6/12/80
date signed

Jon R Johnson for
K. Roberts, Reactor Inspector

6/12/80
date signed

_____ date signed

Approved by: T. T. Martin
T. T. Martin, Chief, RPS #3, RO&NS
Branch

6/12/80
date signed

Inspection Summary:

Inspection on March 3-21, 1980 (Report No. 50-293/80-09)

Areas Inspected: Routine, unannounced inspection by two region based inspectors (240 hours) of Plant Operations, Short Term Lessons Learned Implementation and Followup to the Fuel Handling Event of March 8, 1980. Plant tours were conducted.

Noncompliances: Of the three areas inspected, no items of noncompliance were identified in two areas and four items of noncompliance in one area. (Violation - movement of irradiated fuel without secondary containment integrity; Infraction - failure to implement the requirements of the station fuel handling procedure; Infraction - failure to operate the emergency electrical power systems with an approved procedure; Deficiency - failure to log plant evolutions as required by station procedures - Paragraph 3).

DETAILS

1. Persons Contacted

- J. Aboltin, Reactor Engineer
- G. Andognini, Manager Nuclear Operations Department
- R. Atkins, Chief Electrical Engineer
- *E. Cobb, Chief Operating Engineer
- M. Hensch, Chief Radiological Engineer
- E. Kearney, Operations and Construction Quality Control Group Leader
- R. Machon, Assistant Station Manager
- *C. Mathis, Methods, Training and Compliance Group Leader
- *P. McGuire, Station Manager
- W. Olsen, Training Supervisor
- W. Sides, Quality Assurance Manager
- R. Silva, Chief Maintenance Engineer
- *G. Whitney, Plant Engineer

Other Persons

F. Archibald, Commonwealth of Massachusetts
Industrial Radiation Control Supervisor

The inspectors also interviewed other licensee employees including members of the technical, engineering, and operations staff.

*Denotes those present at the exit interview.

2. Small Break Loss of Coolant Accident Procedure and Training Reviews

a. References:

- 5.3.16, Loss of Coolant Accident with no Pipe Break, Revision 1, October 10, 1979
- 5.4.2, Pipe Break Inside the Primary Containment, Revision 5, December 20, 1979
- 5.4.4, Pipe Break Inside the Reactor Building, Revision 5, December 20, 1979
- 5.4.5, Pipe Break Outside Secondary Containment, Revision 6, December 20, 1979

b. Procedure Review

The inspector reviewed the procedures referenced in paragraph 2.a against the General Electric guidelines which had been approved by the Office of Nuclear Reactor Regulation (NRR). The following portions of the procedures were reviewed for clarity with respect to operator actions and precautions, flow with respect to the initiation of those actions and consistency with the guidelines.

- Symptoms
- Automatic Actions
- Immediate Actions
- Subsequent Actions
- Precautions

The following comments represents the inspector's concerns relative to the above review.

- (1) Procedure 5.3.16 was considered by the licensee not to be a small break loss of coolant accident (LOCA) procedure. The inspector stated that the symptoms which would cause this procedure to be used were very similar to that of his small break LOCA procedures and could lead to confusion. Further, the subsequent actions of this procedure contained a discussion of how to vent the torus air space to the Augmented Off Gas (AOG) System which was not in sufficient detail for reliable performance. The licensee acknowledged the inspectors comments and stated that he felt a need to have a procedure for venting the air space of the torus to the AOG. The licensee further stated that the procedure would be revised to specify ORC chairman approval to use the venting procedure and that this procedure would be reviewed in conjunction with the small break LOCA procedures and during this review it would be emphasized when to use this procedure. The inspector had no further comments.
- (2) The inspectors noted that three (3) of the required precautions from the guidelines were not included in the small break LOCA procedures (5.4.2, 5.4.4 and 5.4.5). The licensee acknowledged the inspectors comments and stated that these procedures would be revised to include the precautions. Prior to the end of the inspection, the inspector did review draft revisions of the above procedures with the specified changes. The inspectors had no further comments.

c. Training Review

The inspectors reviewed the training program utilized by the licensee to train the operations personnel to the small break LOCA procedures. The inspector noted that training relative to the small break LOCA procedures was to be conducted in two phases. Phase I was a walk through of the procedures by the shift supervisor with the operations personnel on that shift. The inspectors reviewed documentation and held discussions with operators to verify that this had occurred. The adequacy of this training will be discussed in paragraph 2.d. The second phase of this training is to be formal classroom training between the Chief Operating Engineer or his designate and the operations personnel. This classroom training would be conducted during the next requalification training for the operators and would be completed prior to January 1, 1981.

d. Operator Interviews

The inspectors interviewed five (5) licensed operators (one staff SRO, one Watch Engineer SRO, one Operations Supervisor SRO, and, two Control Room Operators RO's) to determine the effectiveness of the walk through training by virtue of the extent of the operators knowledge and comprehension of the procedures; and, to determine the operators professional opinion concerning the training received and the usability of the procedures.

The inspectors noted that the individuals interviewed demonstrated a good knowledge of the procedures including procedure selection, immediate actions, and subsequent actions. The inspectors did note several areas where additional emphasis would be warranted. The licensee acknowledged the inspectors comments and stated that these areas would be reemphasized in a special training session between the shift supervisors and the operations personnel prior to startup.

Feedback from the operators relative to training on the small break LOCA procedures and to their useability was favorable. The individuals considered the procedures to be clear, concise and comprehensive.

e. Plant Specific Review

The Office of Nuclear Reactor Regulation had approved the GE Guidelines for dealing with a small break LOCA. The inspector reviewed plant specifics such as systems, logic, and instrumentation to ensure that the requirements of the guidelines could be implemented with the plant specifics associated with Pilgrim Nuclear Power Station.

The inspectors reviewed the following:

- The instrumentation required by the guidelines against the instrumentation available or planned to be available at the plant.
- Redundancy of instrumentation such that there would always be sufficient instrumentation to comply with the guidelines, even if a total loss of offsite power concurrent with the loss of a diesel were to occur.
- The logic associated with drywell and torus sumps on a containment isolation such that these sumps would not auto-start on a containment isolation signal reset.
- Procedures for switchover between condensate storage tank and the suppression pool were in place and adequate to preclude a loss of a source of water to the safety systems.

Based upon the above review, the inspectors found the plant specifics at Pilgrim Nuclear Power Station to be consistent with the GE Guideline requirements.

3. Fuel Handling Event

On March 8, 1980, Pilgrim Nuclear Power Station commenced irradiated fuel movement within the spent fuel pool without secondary containment and with the auto close feature of both diesel generator output breakers bypassed. At approximately 3:00 PM on March 8, 1980, the licensee realized that irradiated fuel movement had occurred in violation of Technical Specification 3.7.C.1. At this time, the NRC was notified of the event via the Emergency Notification System telephone and the licensee placed an administrative hold on further fuel movement. On March 10, 1980, the project inspector arrived onsite to evaluate the conditions which led to the above event; at this time the hold on fuel movement was still in place.

After a preliminary evaluation, the inspector determined that the refueling floor SRO had accomplished the fuel movement without being fully knowledgeable of plant conditions, without informing the "on-duty" Watch Engineer and without the associated procedure. The inspector interviewed the two involved licensed individuals, who confirmed these facts.

Upon completion of fuel movement, the "on-duty" Watch Engineer had been notified of the occurrence. The "on-duty" Watch Engineer did not realize that the technical specifications and the procedure (4.3, Fuel Handling) had been violated. The inspector also noted that neither the movement of fuel nor the NRC notification had been logged in the station operating log.

The inspector determined that Secondary Containment Integrity had been demonstrated at the beginning of the refueling outage, prior to off-loading the core to the spent fuel pool. Subsequently, holes were drilled through the Secondary Containment wall for the installation of new piping, Secondary Containment isolation valves were repaired, Reactor Building sumps providing loop seals were drained, and Secondary Containment seams were re-caulked. Secondary Containment Integrity was not verified following these activities, prior to irradiated fuel movement on March 8, 1980. Further, it took the licensee until March 21, 1980, to find and repair all leaks which prevented demonstration of Secondary Containment Integrity.

The inspector determined that at the time of the event all four 4160v busses were cross connected and being supplied from the 23 Kv line; in lieu of the 345 kv offsite power lines, which were down for maintenance. In support of this lineup, the auto close feature on both diesel generator output breakers were bypassed to prevent their closing on the bus out of phase with the 23 Kv lines, which had no under voltage protection. Also, there was no procedure for the existing electrical lineup.

Based upon the above information the licensee was issued an immediate action letter, which required the following prior to recommencing fuel movement.

- The electrical lineup be returned to normal and the auto close feature of the diesel generator output breakers be verified.
- Secondary Containment be established and verified.
- All operations personnel be trained in the event and those actions taken to preclude recurrence.
- NRC confirmation that the above had been accomplished.

The inspectors physically observed the satisfactory completion of the above items and then with concurrence of Region I, released the licensee from the NRC hold on fuel movement.

Technical Specification 3.7.C.1 requires that secondary containment integrity be maintained when moving irradiated fuel. The movement of irradiated fuel without secondary containment is a violation level item of noncompliance. (50-293/80-09-01)

Technical Specification 6.8.A requires that procedures shall be established and implemented. Procedure 1.3.4, "Procedures", states that procedures shall be used. Contrary to the above, the station electrical lineup was not covered by procedure and procedure 4.3, "Fuel Handling," was not used to move the irradiated fuel. These are infraction level items of noncompliance. (50-293/80-09-02 and 80-09-03)

Procedure 1.3.7, "Records", requires the Operating Supervisor and Control Room Operator to log in the Station Operations Log a minute by minute account of the operation of the plant and that this should include everything that is happening in the plant. The failure to log the movement of irradiated fuel in the spent fuel pool on March 8, 1980, once the Reactor

Building Refueling Floor Senior Licensed Operator notified the "on-duty" Watch Engineer of the completed operation, and the additional failures to log the recognized violation of T.S. 3.7.C.1 and the notification of NRC, later that day, is a deficiency level item of noncompliance. (50-293/80-09-04)

4. Review of Plant Operations

a. Plant Tours

The inspectors conducted tours of the accessible plant areas listed below at various times to observe the status of plant systems and the activities in progress. The plant areas toured included the control room, the secondary alarm station, the 4160v switchgear room, the battery rooms, the cable spreading room, the chemistry lab, the turbine building, the auxiliary bay, the transverse incore probe room, the torus and torus room, the reactor building, refueling floor, the pumphouse, and the protected area perimeter. The following were among the items observed.

- Radiation controls properly established;
- Housekeeping, including attention to the elimination of fire hazards;
- No fluid leaks of significance;
- The condition of hangers and seismic restraints;
- Status of preselected jumpers;
- Equipment tagging for compliance with administrative requirements;
- Control room and refueling floor manning in accordance with technical specification requirements;
- Inspection tags on fire extinguishers, no obstruction of fire hoses, etc.

No items of noncompliance were identified.

b. Review of Operating Records

The inspector reviewed the following logs and records:

- Chief Operating Engineers Log, February 15, 1980 to March 20, 1980.

- Station Operations Log, December 15, 1979 to March 20, 1980.
- Jumper and Lifted Leads Log, all active entries.
- Watch Engineers Tagout Log, all active entries and all tags cleared between February 15, 1980 and March 15, 1980.
- Plant Tagout Log, all active entries and all cleared tagouts between February 15, 1980 and March 15, 1980.
- Refueling Floor Log, January 10, 1980 to March 20, 1980.
- Failure and Malfunction Reports, December 1, 1979 to March 10, 1980.

The logs and records were reviewed to verify that:

- Log sheet entries were properly filled out.
- Operating orders do not conflict with the intent of technical specifications.
- Log reviews were being conducted by the staff.
- Jumper log entries do not conflict with technical specifications.
- NRC reporting requirements are being satisfied.
- Plant operations are in conformance with the Limiting Conditions for Operations (LCO's) of the technical specifications.

The failure to comply with several of the requirements listed above were identified in conjunction with the fuel handling event and are discussed in Paragraph 3; other than these, no items of noncompliance were identified.

5. Short Term Lessons Learned Implementation Meeting

During the course of the inspection, a meeting was held at the station between the Office of Nuclear Reactor Regulation and Boston Edison Company to discuss the plans for implementing the category A requirements of NUREG-0578, Short Term Lessons Learned, at Pilgrim Nuclear Power Station. The

inspector did attend the meeting and provided plant specific information to the NRC staff. The tentative conclusion reached by the NRC staff as a result of the meeting was that BECo's implementation of NUREG-0578 as proposed was acceptable with the exception of containment isolation reset and post accident sampling. The inspector was informed subsequent to the inspection that BECo and the NRC staff had tentatively determined an acceptable proposal for containment isolation reset and post accident sampling. Further, the BECo staff agreed to provide a written submittal of the proposal for implementing NUREG-0578 approximately two weeks prior to startup.

6. Jet Pump Holddown Bar Ultrasonic Testing

On March 3, 1980 the inspector informed the licensee of a reported jet pump failure at Dresden Unit 3. The licensee was already aware of the failure and the conditions which led to its identification. The inspector further stated that the failure was a result of a fractured holddown bar. The licensee acknowledged the inspectors statement.

On March 18, 1980, the inspector was informed that Dresden Unit 3 had completed an Ultrasonic Test (UT) of their jet pump holddown bars and had identified indications of up to 20 mils in six of the nineteen jet pumps, Quad City Unit 2 which had similiar results also had a through wall crack. It was further noted that a visual examination would not have identified these cracks. The inspector was requested to obtain a schedule for UT of jet pump holddown bars at Pilgrim.

The inspector presented the above information to the licensee and requested the licensee's position relative to performing the UT. The licensee stated that he had performed a 100% visual inspection during the existing outage and in his opinion that was sufficient. The licensee was subsequently informed that there would be a bulletin forthcoming which would require all jet pump plants in the refueling mode to perform this UT. The licensee acknowledged the statement and stated that he would perform the UT prior to startup.

On March 27, 1980 the licensee completed the above testing and stated that there were three holddown bars with indications and the plant had four holddown bars on order and intended to replace these three prior to startup. The inspector had no further questions at this time.

7. Exit Interview

The inspector met with the licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on March 21, 1980. The inspector summarized the purpose, scope and findings of the inspection.