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U. S. NUCLEAR REGULATORY COMMISSION
REGION 1

Report No. 50-293/84-36
Docket No. 50-293
License No. DPR-35 Category C

Licensee: Boston Edison Company
800 Boylston Street
Boston, Massachusetts 02199

Facility: Pilgrim Nuclear Power Station

Dates: November 1, 2, and 7, 1984

Inspectors: G.W. Meyer 11/9/84
for J. Johnson, Sr. Resident Inspector date

G.W. Meyer 11/9/84
for M. McBride, Resident Inspector date

Approved By: G.W. Meyer 11/9/84
for L. Tripp, Chief, Reactor Projects Section date
No. 3A, Projects Branch No. 3

Inspection Summary:
Inspection on November 1, 2, and 7, 1984 (Report No. 50-293/84-36)

Areas Inspected: Special unannounced safety inspection of plant operations including a review of refueling activities and followup of events involving core alterations with a Source Range Monitor bypassed and later with the Source Range Monitors unmonitored. The inspection involved 31 inspector-hours by two resident inspectors.

Results: Two apparent violations were identified (Failure to maintain an SRM in the "B" quadrant operable while moving fuel and control rods and failure to follow procedure 4.3 for continuous monitoring of the SRMS while moving fuel). In addition, a concern was identified regarding the failure to conduct adequate shift turnover activities.

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DETAILS

1. Persons Contacted

Within this report period, interviews and discussions were conducted with members of the licensee staff and management to obtain the necessary information pertinent to the subjects being inspected.

2. Background, Scope, Acceptance Criteria

The licensee shut down the plant on December 10, 1983 to conduct a major refueling, maintenance, and modification outage. The core was off loaded and reactor coolant system piping was replaced. On October 30, 1984, the Onsite Review Committee granted permission to perform core alterations and reinsert the fuel assemblies into the core from the spent fuel pool. The first fuel assembly was placed in the core at 10:24 pm on October 30, 1984.

As of 9:00 am on November 1, 1984, the licensee had installed about 75 (of the 580 total) fuel assemblies into the core, while at 8:45 a.m. on November 7, 1984, the licensee had installed about 360 fuel assemblies. The inspector reviewed the licensee's activities surrounding these events to determine whether the actions performed were in accordance with the facility Technical Specifications and the licensee's procedures. This review included discussions with licensed control room operators, technicians, and station management personnel, an observation of equipment condition and status, and a review of logs and records.

3. Core Alterations with Source Range Monitor Bypassed

a. Review of Activities

On November 1, 1984, at approximately 9:00 am, the inspector toured the control room and noted that the "B" Source Range Monitor (SRM) control rod block function was bypassed. No fuel was being moved at that time.

Later that morning at 11:00 am, the inspector again noted the "B" SRM was bypassed and asked the Watch Engineer the reason for the bypass. The Watch Engineer immediately cleared the "B" SRM bypass condition and asked the control room supervisor (Operating Supervisor) and the licensed operator at the 905 control panel why the SRM rod block function was bypassed. They were not aware that the "B" SRM rod block function had been bypassed. The licensee was loading fuel into the vessel at this time.

The licensee notified the NRC via the ENS telephone line at 11:30 am on November 1, 1984 that fuel had been moved into the "B" SRM quadrant while the monitor's rod block function was bypassed, in apparent violation of Technical Specification 3.10.B.

At 11:45 am, the licensee suspended fuel loading, pending a review of the incident. The licensee subsequently stated that the "B" SRM rod block had been bypassed at 1:00 am that morning, on a previous shift. Rod blocks were occurring at that time, and the SRM rod block functions were sequentially bypassed in an attempt to locate the source of the rod blocks. The licensee stated that the licensed operator in charge of the 905 panel at that time forgot to clear the "B" SRM rod block function.

The bypassed channel was not logged and the subsequent shift was not informed.

Seven fuel assemblies were loaded into the "B" SRM quadrant while the channel was bypassed between 1:00 am and 11:00 am on November 1, 1984. Seven control rod movements (full-in to full-out to full-in) involving five rods in the "B" SRM quadrant were also made while the channel was bypassed.

Subsequently, the licensee stated that each operating shift would be briefed on the importance of walking down the control room panels carefully during shift turnover and on the importance of the SRM's during fuel reload activities. The licensee issued verbal reprimands to the Licensed Operators at the 905 panel, the Operating Supervisors, and the Watch Engineers on the two shifts where fuel was moved with the "B" channel bypassed.

The licensee also modified the shift turnover sheets for the Operating Supervisor and the Licensed Operators (OPER 38C and OPER 38D). The revised turnover logs require both the offgoing and the oncoming personnel to fill out a checklist of operable equipment for fuel loading activities. This check list includes checks on SRM operability.

The licensee subsequently resumed fuel movement at 6:52 pm on November 1, 1984, after the operating shift had been briefed on the incident and the procedures modified.

b. Conclusions and Findings

The Pilgrim Final Safety Analysis Report (FSAR) Section 7.7.4.3.2 specifies that one function of the control rod block protective signal while in the Refuel mode is to assure that no control rod is withdrawn unless all SRM detectors are properly inserted when they must be relied upon to provide the operator with neutron flux level information. Further, this FSAR section indicates that a rod block is initiated whenever any SRM inoperable alarm occurs to assure that no control rod is withdrawn unless proper neutron monitoring capability is available in that all SRM channels are in service or properly bypassed.

Technical Specification 3.10.B requires that two SRMs be operable during core alterations when fuel is in the vessel: one in the quadrant where fuel or control rods are being moved and one in an adjacent quadrant.

The "B" SRM rod block function was bypassed between 1:00 am and 11:00 am on November 1, 1984. Although normal neutron flux level information was available in the control room, this action made the SRM inoperable because it was not capable of performing the function described by the FSAR and stated above. During this period of time, seven fuel assemblies and five control rods were moved in the quadrant with the bypassed SRM. This is an apparent violation (50-293/84-36-01).

In addition to the licensed operator who placed the "B" SRM in bypass, two licensed operators who subsequently were on duty on the control room boards also did not note this abnormal condition. Other supervisory licensed operators also did not notice this off-normal condition. The bypass condition was not entered in a log nor on the shift turnover sheets, and no caution tag was used to highlight this off normal condition. The licensee acknowledged the inspector's concerns in these areas and took actions to counsel the personnel involved and to require additional shift turnover checks to be performed. The adequacy of shift turnovers and noting off normal conditions will be reviewed in a future inspection (50-293/84-36-02).

4. Core Alterations with SRMs Unmonitored

a. Review of Activities

On November 7, 1984 at approximately 8:45 a.m., the inspector noted that the SRMs on the 905 panel in the control room were not continuously monitored while a fuel assembly was being loaded into the core. The licensed reactor operator at the 905 panel had been informed by personnel on the refueling bridge that an assembly was about to enter the core, but he left the 905 panel to answer annunciators at other panels. He continued to check instruments and annunciators on other panels while the assembly was inserted into the core occasionally glancing at the 905 panel. When asked, the operator indicated that his other responsibilities in the control room prevented him from watching the SRMs continuously.

The inspector then asked the Senior Reactor Operator in charge of the control room (the Nuclear Operating Supervisor, NOS) why the SRMs were not being continuously monitored. The NOS reviewed procedure 4.3 and stated that the SRMs did not have to be continuously "watched" but continuously "monitored." He stated that this requirement could be fulfilled if the operator at the 905 panel intermittently checked the SRMs. He indicated that the operator had other responsibilities in the control room and could not be spared to watch the SRMs full time.

The inspector then notified the onshift Watch Engineer and the Chief Operating Engineer of concerns regarding the adequacy of SRM monitoring during fuel loading. Both supervisors stated that the SRMs must be continuously (not intermittently) watched while fuel enters the core. They indicated that a second operator would be immediately assigned to

the control room to ensure personnel were available to properly monitor the SRMs during further fuel loading activities. The Watch Engineer indicated that the NOS now properly understood the SRM monitoring requirement.

b. Findings and Conclusions

Procedure 4.3, "Fuel Handling," requires that the control room operator "continuously monitor the Source Range Monitor Level instrumentation" from the time a fuel assembly is about to enter the core until the refueling platform returns to the spent fuel pool. Failure to continuously monitor the SRMs on November 7, 1984 while a fuel assembly was entering the core is a violation of procedure 4.3 (50-293/84-36-03).

5. Management Meeting

During the inspection, licensee management was notified of the preliminary findings by the resident inspectors. A summary was also provided at the conclusion of the inspection and prior to report issuance. No written material was provided to the licensee during this inspection.