U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-293/88-15

Docket No. 50-293

License No. DPR-63 Category C

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

Facility Name: Pilgrim Nuclear Power Station

Inspection At: Plymouth, Massachusetts

Inspection Conducted: April 4-8, 1988

Inspectors: Jason C. Jang 4-27-88
J. C. Jang, Sr. Radiation Specialist date

Approved by: W. J. Pasciak 4/27/88
W. J. Pasciak, Chief, Effluents Radiation Protection Section, FRSSB, DRSS date

Inspection Summary: Inspection on April 4-8, 1988 (Inspection Report No. 50-293/88-15

Areas Inspected: Routine, unannounced inspection of the licensee's radwaste systems: liquid radwaste system (FSAR 9.2), solid raswaste system (FSAR 9.3), and gaseous radwaste system (FSAR 9.4). Areas reviewed included: Previously identified items and Safety Evaluations required by 10 CFR 50.59.

Results: No violations were identified.

## Details

1. Individuals Contacted

*R. Anderson, Plant Manager
*R. Canalas, Chief Chemical Engineer
*W. Clancy, System Engineer Division Manager
C. Grevenitz, Senior Chemical Engineer
*P. Hamilton, Compliance Division Manager
K. Highfill, Station Director
*M. Lenhart, Regulatory Affairs
B. Lunn, Senior Compliance Engineer
*P. Mastrangelo, Chief Operations Engineer
*J. Moylan, Technical Specialist
M. Perito, Senior Systems Engineer
*R. Purdy, Radwaste Supervisor
*J. Quinn, Senior QA Engineer
J. Seery, Technical Section Manager
A. Shatas, Chemistry Supervisor
*V. Stagliola, Senior Technical Engineer
*R. Whetsel, Senior Compliance Engineer

Other licensee personnel were contacted or interviewed.

*Denotes attendance at exit meeting on April 8, 1988.

2. Scope of the Inspection

This inspection reviewed the licensee's radwaste systems: liquid radwaste system (FSAR 9.2), solid radwaste system (FSAR 9.3), gaseous radwaste system (FSAR 9.4), and process radiation monitoring (FSAR 7.12). This inspection also reviewed safety evaluations required by 10 CFR 50.59 and management controls in the radwaste areas.

3. Previously Identified Items

(Closed) Violation (50-293/87-35-01): Failure to properly quantify radionuclides contained in radioactive waste shipment. The licensee's actions (as described in the licensee's letter dated December 30, 1987) were reviewed. The licensee's corrective actions were acceptable.

(Closed) Violation (50-293/87-35-02): Failure to properly identify a radionuclide (Fe-55) contained in radioactive shipment No. 86-34. The licensee's corrective actions, as described in the licensee's letter dated December 30, 1987, were reviewed. Procedures 6.9-160, 6.9-200, and 6.9-193 were revised to include Fe-55 in the calculations and on the shipping papers. The licensee's corrective actions were acceptable.

4. Organization and Management Controls

The inspector reviewed the licensee's current organization chart which was approved in March 1988 including responsibilities and qualifications in the areas of radwaste systems. Sections of Technical, Operations, and Radiological have responsibilities to process liquid, gaseous, and solid radwaste systems including radwaste shipments. These Section Managers report to appropriate Plant Department Managers who, in turn, report to the Site Director.

The following position descriptions were reviewed to determine if the scope of responsibility and lines of authority were clearly defined:

- Chief Operating Engineer
- Chief Technical Engineer
- Chief Radiological Engineer
- Senior Supervising Radiological Engineer
- Senior Technical Engineer, and
- Senior Radwaste Engineer

The inspector determined that the position descriptions defined responsibilities, qualifications, and authorities clearly.

Based on the above review, it appeared that all sections (Technical, Operations, Radiological) had adequate staff to operate liquid, solid, and gaseous radwaste systems.

5. Liquid Radwaste System

5.1 Facilities

The inspector toured limited liquid radwaste facilities including the Radwaste Control Room to determine whether the components and installation of the liquid waste system were as described in the FSAR and to determine whether instrumentation and equipment to sample and handle radioactive liquids under normal conditions were adequate and operational.

The evaporator (or concentrator) was inoperable since 1975 and the evaporator and associated components were removed in 1985.

Liquid sampling stations were easily accessible and properly ventilated. Conductivity and tank level indicators in the Radwaste Control Room were operable.

5.2 Preoperational Test Results

The inspector reviewed the following preoperational test procedures and results:

- Preoperational Test No. 15B; Clean Radwaste System, March 28, 1972

- Preoperational Test No. 15C; Chemical Radwaste System, May 23, 1972

- Preoperational Test No. 15D; Miscellaneous Radwaste System, April 6, 1972

The preoperational test of the Clean Radwaste System was to demonstrate the operability of the system including: (1) clean waste receiver tanks and associated process pumps, (2) flatbed filters and associated precoat and transfer pumps, (3) radwaste demineralizer, (4) treated water hold-up tanks and associated transfer pumps for liquid discharges, and (5) radioactive solid waste container level control.

The preoperational test of the Chemical Radwaste System was to demonstrate the operability of the system including: (1) all valves, (2) chemical waste receiver tanks and process pumps, (3) chemical waste filters, (4) radwaste metering pumps, and (4) monitor tank heater control and tank line heater control.

The preoperational test of the Miscellaneous Radwaste System was intended to demonstrate the operability of the Miscellaneous Waste Drain Tank and associated level controls and Miscellaneous Waste Drain Tank Pump.

Based on the above review, the inspector determined that the licensee performed all test items as required by the procedures.

5.3 Liquid Effluent Monitoring

The inspector reviewed the liquid effluent monitoring system against surveillance requirements (liquid radwaste discharge permit) to determine the operability of the monitor. The inspector noted that the background counts of the effluent monitor was predetermined, 4,000 counts per second (CPS), but the "HI ALARM" and "HI HI ALARM/TRIP" settings were used calculated CPS values as required by the ODCM.

The inspector reviewed the liquid radwaste discharge permit No. 88-57, dated March 30, 1988. The inspector noted that the radwaste effluent monitor settings were 4,000 CPS for background, 7,000 CPS for "HI ALARM", and 10,000 CPS for "HI HI ALARM/TRIP". The inspector discussed with the licensee the high background. The

licensee stated that the high background was due to shine dose from the surrounding components. The inspector examined the monitoring panel in the main control room and determined that 4,000 CPS was reasonable minimum ambient background levels for the location. (range; 4,000 CPS - 4,600 CPS)

The inspector calculated the minimum detectable activity (MDA) of the monitor using the background level (4,000 CPS) and the conversion factor (9.86 E6 CPS/µCi/cc). The MDA of the effluent monitor was 4.06 E-4 µCi/cc. The inspector also noted that setting of the alarm points on the monitoring panel in the control room could be difficult due to high background and the 7-decade logarithm scale (See Table 7.12-1 of the FSAR). The settings between background level and "HI ALARM" were close and could result in false alarms.

Section 7.12.6.3 of the FSAR described, in part, that the detector is located in a shielded sampler that is located in a section of the radwaste discharge header to minimize background radiation. The inspector stated that the monitor should be relocated to meet the FSAR commitment. The licensee agreed to review and either change the location of the monitor to be consistent with the FSAR, or change the FSAR to be consistent with the monitor. The inspector stated that the corrective actions will be reviewed in a future inspection (50-293/88-15-01).

6. Solid Radwaste System

The inspector reviewed the following preoperational test procedures and results:

- Acceptance Test No. 15A; Solid Radwaste System, May 25, 1972.
- Acceptance Test No. 15B; Solid Radwaste System - Spent Resin Storage and Transfer System, May 5, 1972.

The acceptance tests of the Solid Radwaste System were intended to demonstrate the operability of the system including:

(1) instrumentation and valves,

(2) cleanup sludge storage tank instrumentation and cleanup sludge transfer pump control,

(3) floc recycle tank instrumentation and inlet valve control,

(4) solid waste filter level instrumentation and floc recycle tank outlet valve control,

(5) solids recovery recycle system and discharge valve control,

(6) cationic and anionic polyelectrolyte addition system,

(7) backwash receiving tank (T-208) instrumentation and valve control, and

(8) system performance.

The acceptance tests of the Spent Resin Storage and Transfer System were intended to demonstrate the operability of the level indicator, all mechanical and electrical equipment, and all valves and piping.

Based on the above review, the inspector determined that the licensee performed all tests as required by the procedures and verified the level indicators, instrumentation, and alarm function as designed.

7. Gaseous Radwaste System

7.1 Facilities

The inspector toured the gaseous radwaste system facilities including the recombiner room, offgas radiation monitor area, offgas sampling station, mechanical vacuum pump room, and augmented offgas room to determine whether the components and installation of the gaseous radwaste system were as described in the FSAR.

There systems were found to be installed as indicated in the FSAR.

7.2 Augmented Offgas System

The inspector reviewed the test procedure and test results for the Augmented Offgas System, during this inspection (Preoperational Test No. 6498-007-74, January 6, 1975). The inspector also reviewed the delay time calculation and decontamination factors for the Augmented Offgas System (performed in April 1976).

The inspector reviewed the Safety Evaluation Reports required by 10 CFR 50.59:

- Safety Evaluation No. 1581; Replacement of Augmented Offgas System valves, S-8-1 and AO-3712, and addition of butterfly valve upstream of AO-3712, September 30, 1983.

- Safety Evaluation No. 2254; Restoration of selected components in the Augmented Offgas System, November 24, 1987.

7.3 Process Radiation Monitoring

The inspector reviewed several process radiation monitoring systems including calibrations of the Main Stack Radiation Monitoring System and the Reactor Building Exhaust Vent Radiation Monitoring System.

Within the scope of this review, no violations were found.

7.4 Testing of Ventilation Systems

The licensee was not able to retrieve preoperational airflow capacity test results for the Standby Gas Treatment System (SBGT) and for the Control Room. The inspector, therefore, reviewed the most recent measurement data for the SBGT and for the control room:

- Procedure No. 8.7.2.6 Rev. 12, SBGT System Operability, January 28, 1987

- Procedure No. 8.7.2.7 Rev. 8, Measure Flow and Pressure Drop across Control Room Environmental System, January 27, 1987.

Through review of these procedures it was determined that air flow capacity test results met Technical Specifications requirements, 4000 CFM for the SBGT and 1000 CFM for the control room. The licensee uses the Pitot tube and manometer to measure air velocity (fpm) in the duct and then calculates velocity pressure (VP) in inches of water using the following equation:

$V=4005\sqrt{VP}$ where; V=Velocity, fpm
VP=Velocity Pressure, inches of water

The licensee calculates flow rate (cfm) and then uses a graph (CRHEAFS; FLOW vs. Differential Pressure) to find the region to allow the operation. This graph has two regions, an unacceptable region and an acceptable region. The data sheet (8.7.2.7 A-1) does not contain enough information to evaluate technical justifications. The inspector stated that the following information should be listed in the data sheet for technical evaluations:

(1) air temperature and barometric pressure to ensure the validity of the above equation which is applicable only at standard air conditions (70 F and 29.92" Hg).

(2) air velocity measurement results using the Pitot tube to evaluate the uniform flow in the duct and measurement errors (e.g; ±15% measurement error at 600 fpm), and

(3) cross-sectional area of duct at the air velocity measurement location.

The licensee initiated the corrective actions during this inspection. The inspector had no further questions in this area at the time of this inspection.

8. Review of the FSAR

The inspector found that there were conflicts between FSAR commitments and current practice during this inspection. The inspector also noted that these conflicts were due to administrative processes rather than technical evaluations.

The inspector reviewed Safety Evalution No. 1874 which involved a change to the FSAR per 10 CFR 50.71(e) and was reportable under 10 CFR 50.59(b). The radwaste concentrator was abandoned in-place in accordance with PDC 76-113 and associated Safety Evaluation No. 413. The Safety Evaluation No. 1874 (PDC 85-45, dated September 25, 1985) proposed a removal of the radwaste concentrator and associated mechanical and electrical components. This Safety Evaluation was performed and a change of the FSAR was recommended on October 9, 1985. The Preliminary FSAR Revision was prepared and attached to the Safety Evaluation on October 9, 1985. The Operations Review Committee (ORC) reviewed the revision and signed it on October 16, 1985 (ORC Meeting Number 85-105). The inspector noted that the implementation of this PDC 85-45 has been suspended. The licensee was not able to find the reasons at the time of this inspection.

Section 9.3.4.2 of the FSAR, Radwaste Disposal System for Reactor Cleanup Sludge, Revision 4 - July 1984, was reviewed. The inspector found some inconsistancies in this section. The inspector noted that PDC 82-18 was prepared in 1982 but it was not approved by the Licensing Group as of April 8, 1988. Therefore, the conflict commitments in the FSAR are still remaining.

The inspector stated that the updating Sections 9.2 and 9.3 of the FSAR will be reviewed during a subsequent inspection (50-293/88-15-02). The inspector, however, noted that in regard to safety these items do not have a significant impact.

9. Exit Interview

The inspector met with the licensee representatives (denoted in Detail 1) at the conclusion of the inspection on April 8, 1988. The inspector summarized the scope of the inspection and the findings.