

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report Nos. 50-245/90-18; 50-336/90-20; and 50-423/90-18
Docket Nos. 50-245; 50-336; and 50-423
License Nos. DPR-21; DPR-65; and NPF-49
Licensee: Northeast Nuclear Energy Company
P.O. Box 270
Hartford, Connecticut 06141-0270
Facility Name: Millstone Nuclear Generating Station, Units 1, 2, and 3
Inspection At: Waterford, Connecticut
Inspection Conducted: September 10-14, 1990

Inspector:

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9-27-90
Date

Approved by:

R. J. Borek
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9/28/90
date

Inspection Summary: Inspection on September 10-14, 1990 (Combined Inspection Report Nos. 50-245/90-18; 50-336/90-20; and 50-423/90-18)

Areas Inspected: Routine, unannounced inspection of the Radiological Liquid and Gaseous Effluent Control Programs including: management controls, audits, calibration of radiation monitoring systems, air cleaning system, and implementation of the above programs.

Results: Within the areas inspected, no violations were identified. One unresolved item was identified in the area of radioactive liquid effluent monitor background for the Unit 1 (See Section 5.0 of this report for details). The issuance and implementation of the Radiation Monitor Manuals for all units were an excellent effort to maintain the monitoring system integrity and operability. The licensee is implementing the above programs effectively.

DETAILS

1.0 Individuals Contacted

1.1 Licensee Personnel

R. Beckman, I&C Supervisor, Unit 3
*T. Burns, Chemistry Supervisor, Unit 3
P. Cassidy, Operations, Unit 2
*C. Clement, Director, Unit 3
K. Covin, Operations, Unit 3
R. Crandall, Supervisor, Radiological Assessment Branch
R. Donovan, I&C Engineer, Unit 1
*J. Doroski, Sr. Engineer, Health Physics Support
J. Flannigan, Operations, Unit 1
*J. Glaub, Chemistry Specialist, Unit 1
*H. Haynes, Director, Unit 1
*T. Itteilag, Chemistry Supervisor, Unit 2
*J. Kangley, Senior Engineer, Chemistry
P. Przekop, I&C Manager, Unit 1
M. Ross, Operations, Unit 1
P. Smith, I&C Supervisor, Unit 2
J. Waters, Chemistry Manager
D. Wilkens, Chemistry Supervisor, Unit 1

1.2 NRC Personnel

*W. Raymond, Senior Resident Inspector

*Denotes personnel who attended that exit meeting on September 14, 1990.
Other licensee employees were also contacted or interviewed during this inspection.

2.0 Scope

This routine safety inspection reviewed the licensee's program for the areas of liquid and gaseous effluent controls, including calibration of the effluent/process monitors; air cleaning systems; and implementation of the Offsite Dose Calculation Manual (ODCM).

3.0 Management Controls

3.1 Program Changes

There were no significant changes in the licensee's program for handling liquid and gaseous effluents since the previous inspection conducted in June 1989.

3.2 Audits

The inspector reviewed the licensee's Audit Report Number A-24017, "1989 REMODCM". This audit was performed by the Radiological Assessment Branch (RAB) and conducted in the areas of the implementation of the ODCM and Radiological Effluent Monitoring Manual (REMM) on October 31-December 7, 1989. The audit appeared to be thorough and to be of good technical depth to assess the implementation of the ODCM and REMM. The audit identified several recommendations, none safety significant, and the licensee responded to these recommendations in a timely manner. No violations were identified.

3.3 Review of Semiannual Radioactive Effluent Reports

The inspector reviewed the semiannual radioactive effluent release reports for 1989 and the first half of 1990. No obvious anomalous measurements, omissions or trends were noted. These reports provided total released radioactivity for liquid and gaseous effluents. The licensee also listed as required by the Technical Specifications inoperable effluent radiation monitors for greater than 30 days such as Unit 3 Liquid Waste Discharge Monitor (3LWS-70). This monitor was observed to be operable during this inspection. No violations were identified.

4.0 Radioactive Liquid and Gaseous Effluent Control Programs

The inspector reviewed selected licensee's procedures and radioactive liquid and gaseous discharge permits to determine the implementation of the technical specification requirements (Liquid and Gaseous Effluents, and ODCM) for Units 1, 2, and 3.

The inspector determined that the reviewed licensee's radioactive liquid and gaseous effluent control procedures appeared to be sufficiently detailed to effectively implement the above technical specification requirements. The inspector also determined that the reviewed radioactive liquid and gaseous discharge permits met the requirements for sampling and analyses at the frequencies and lower limit of detections established in the Technical Specifications.

During the review of the Unit 1 Radioactive Liquid Effluent Control Program, the inspector noted that background count rates of the radioactive liquid effluent monitor were high and fluctuated (from 350 counts per second (cps) to 2,000 cps on August 20-31, 1990). The average conversion factor of the monitor was $1.6E-6$ microCi/cc/cps, and the average radioactivity in effluent samples was approximately $5.0E-6$ microCi/cc during this period of time. As of these results, this monitor should indicate about 3 cps ($5.0E-6$ microCi/cc divided by $1.6E-6$ microCi/cc/cps) above background if the monitoring system set for one second integration

time. The inspector, therefore, reviewed the alarm setpoint calculation method contained in the ODCM. Through review of the radioactive discharge permits and the ODCM, the inspector determined that the alarm setpoint calculation appeared to be difficult due to the high background of the monitor and low radioactivity of the liquid discharges. The inspector discussed with the licensee the high background of the monitor and alarm setpoint calculation method. The licensee stated that maintaining a low background count rate on this monitor was very difficult because the liquid effluent line was contaminated after each release. The licensee stated that cleaning of the line was very difficult due to the need to disassemble the heavy shields. The licensee had already moved this monitor to another location to minimize background and shine dose which might also have contributed to the high background. This move was not successful, however, in bringing the background down to a satisfactory level. The inspector stated that the implementation of the alarm setpoint calculation was questionable and he needed more information to determine whether this monitor meet the ODCM requirements due to the high background. The inspector stated that this was an unresolved item (50-245/90-18-01).

The inspector noted that at Unit 3 the radioactive liquid from the waste test tanks passes through demineralizer beds prior to discharge. The licensee routinely sampled the waste test tanks and analyzed them. The licensee used these analytical results for dose assessment to implement the ODCM requirements. The total amount of radioactive materials released from the waste test tanks to the environment was, therefore, not known because the concentration of some radionuclides after leaving the waste test tanks might be reduced or be increased by the demineralizer beds depending on the pH of the waste test tanks liquid. In fact, during the review of the analytical results for the waste test tank and the effluent sample from the demineralizer beds, the inspector noted that the concentration of Cs-137 was reduced but Co-60 was increased in the demineralizer effluent sample. Since the analytical results of the demineralizer effluent samples were not used for the dose assessment, the results of the dose assessment might not be representative. It is likely, however, that the licensee's dose assessment was larger than the actual dose to the public and, therefore, in the conservative direction. The inspector stated that representative samples, either demineralizer effluent samples or the waste test tanks, should be used as the routine samples for the dose assessment to reflect the actual releases. The inspector stated that this was an inspector followup item (50-423/90-20-01).

Notwithstanding the above findings, the inspector determined that the licensee has conducted an effective radioactive liquid and gaseous effluent control programs. The above findings did not impact the environment or the public health and safety. No violations were identified.

5.0 Calibration of Effluent/Process Monitors

The inspector reviewed the licensee's most recent calibration results for the following effluent/process monitors to determine the implementation of the Technical Specification requirements for Units 1, 2, and 3.

- Unit 1 :
 - o Radwaste Effluent Radiation Monitor
 - o Service Water Effluent Radiation Monitor
 - o Reactor Building Closed Cooling Water Radiation Monitor
 - o Main Steam Line Monitors
 - o Air Ejector Offgas Radiation Monitors
 - o Stack Gas Radiation Monitor
 - o Stack High Range Radiation Monitor

- Unit 2:
 - o Steam Generator Blowdown Line Monitors
 - o Clean Liquid Radwaste Monitor
 - o Aerated Liquid Radwaste Process Radiation Monitor
 - o Stack Gaseous Process Radiation Monitor
 - o High Range Stack Gas Radiation Monitor
 - o Main Steam Line Monitors
 - o Steam Jet Air Ejector Radiation Monitor

- Unit 3:
 - o Liquid Radwaste Radiation Monitor
 - o Main Steam Line Monitors
 - o Turbine Building Floor Drain Monitor
 - o Turbine Building Vent Monitor
 - o Engineered Safeguards Building Gaseous Radiation Monitor
 - o Steam Generator Blowdown Radiation Monitor

The I&C Department had the responsibility to perform electronic and radiological calibrations for the above monitors with exception of the Unit 1 Radwaste Effluent Radiation Monitor, Service Water Radiation Monitor, and Stack Gas Radiation Monitor. The Unit 1 Chemistry Section performed the radiological calibration for these monitors.

During the review of the above monitor calibration results for Units 1, 2, and 3, the inspector noted the following good practices.

- o Calibrations were performed as required by the appropriate procedures.
- o Radiological calibrations of several liquid and gaseous effluent radiation monitors were performed as the primary calibration (same geometry with National Institute of Standards and Technology traceable radionuclides).
- o Many of surveillance tests were conducted more frequently than required by the Technical Specifications.

The inspector, however, identified the following items to improve the calibration technique (Inspector Followup Items: 50-245/90-18-02; 50-336/90-20-01; and 50-423/90-18-02).

- o Completion of radiological calibration procedure for the Unit 1 Reactor Building Closed Cooling Water Radiation Monitor. The I&C Department of Unit 1 had a responsibility to complete the procedure.
- o Addition of statistical evaluation (such as linear regression) for the linearity test to appropriate procedures.
- o Increase the number of source check determinations for the linearity test to obtain statistically better and more representative data. The licensee used single determination technique for the test.
- o Conduct thorough plateau checks to determine the operating voltages rather than spot checks for some monitoring systems.
- o Review the strength of the check source for the Unit 3 Liquid Effluent Monitor and replace it with a higher strength check source, if necessary. Evaluate and correct the root cause for electrical spikes. This monitor was inoperable 77% of the time in August, 72% in July, and 50% in June 1990 due to the above reasons.

Based on the above review, although there were some areas to be improved, the inspector determined that the licensee conducted a good program to calibrate the effluent/process radiation monitors. No violations were identified.

6.0 Radiation Monitor Manuals (RMMs)

The licensee's Radiological Assessment Branch (RAB), in 1988, initiated an evaluation of selected radiation monitoring systems for each unit to determine the technical adequacy of the calibration procedures. The RAB expanded this effort for all monitors in 1989. On April 1, 1990, the licensee issued complete RMMs for all units.

The inspector reviewed each unit's RMM for selected effluent monitoring systems during this inspection. The inspector noted that each monitoring system in the RMM contained the following information.

- o Description of the Monitor
- o Monitoring Purpose
- o Regulatory Requirements
- o Monitoring Range
- o Flow Rate to the Monitoring System
- o Setpoint Calculation
- o Conversion Factor (microCi/cc/cps)
- o Calibration Technique

During the review of the Unit 3 RMM for the Liquid Waste Effluent Monitor, the inspector noted that the comparisons between the monitoring results and the grab sample counting results were required. Any significant difference (greater than a factor of 2) in the comparisons required the licensee to investigate the cause. The inspector reviewed these comparisons for April, May, June, July, and August 1990, and noted that the majority of comparisons were within a factor of 2, with exception of those for August 1990. The inspector noted the comparisons for August varied much more than for the other months. The licensee stated that this will be investigated in the near future. The RAB will support the implementation of these RMMs for several months and the responsibility of implementation will then be transferred to the site personnel.

Based on the review of the RMMs, the inspector stated that the issuance and implementation of the RMMs were an excellent effort to upgrade and maintain the monitoring system integrity and operability. The inspector stated that the implementation of the RMMs will be reviewed during a subsequent inspection.

7.0 Air Cleaning Systems

The inspector reviewed the licensee's most recent surveillance test results to determine the implementation of the following technical specification requirements for Units 1, 2, and 3.

- Unit 1: o Standby Gas Treatment System
- Unit 2: o Secondary Containment Enclosure Building Filtration System
 - o Control Room Emergency Ventilation System
 - o Fuel Storage Pool Area Ventilation System
- Unit 3: o Control Room Emergency Ventilation System
 - o Auxiliary Building Filter System
 - o Fuel Building Exhaust Filter System

The following inspection and test results for the above systems were reviewed.

- o Visual inspection
- o In-Place HEPA Leak Tests
- o In-Place Charcoal Leak Tests
- o System Air Flow Tests
- o Pressure Drop Tests
- o Laboratory Tests for the Iodine Collection Efficiencies

All reviewed test results were found to be within the licensee's acceptance criteria. Based on this review, the inspector determined that the licensee implemented the above Technical Specification requirements effectively. No violations were identified.

8.0 Exit Interview

The inspector met with the licensee representatives denoted in Section 1.1 of this inspection report at the conclusion of the inspection on September 14, 1990. The inspector summarized the purpose, scope, and findings of the inspection.