U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Report No. 50-309/92-05

Docket No. 50-309

License No. DF.2-36

Licensee:

Maine Yankee Atomic Power Company 83 Edison Drive Augusta, Maine 04336

Maine Yankee Atomic Power Station

Facility Name:

Inspection At: Wiscasset, Maine

Inspection Conducted:

April 6-10, 1992

Inspector:

Laurie Veluso

Laurie Peluso, Radiation Specialist Effluents Radiation Protection Section (ERPS) Facilities Radiological Safety and Safeguards Branch (FRS&SB)

Approved by:

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Robert J. Bores, Cnief, ERPS, FRS&SB Division of Radiation Safety and Safeguards

5/06/92 Date

5/6/92

Date

<u>Areas Inspected</u>: Announced safety inspection of the radioactive liquid and gaseous effluent control programs an radiological environmental monitoring program (REMP) including: management controls, audits, meteorological monitoring program, quality control program for analytical measurements, air cleaning systems, calibrations of effluent/process radiation monitoring systems, and implementation of the Offsite Dose Cauculation Manual (ODCM).

<u>Results:</u> Within the areas inspected, the licensee has effectively implemented the REMP and radioactive liquid and gaseous effluent control programs. No violations were identified, however, one unresolved item has been identified with respect to the radiation monitoring system calibration program (See Section 5.0 of this report for details).

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DETAILS

1.0 Individuals Contacted

- 1.1 Licensee Personnel Maine Yankee Station
 - *R. Bickford, Maintenance
 - *R. Blackmore, Plant Manager
 - *A. Coyia, Manager, Operations
 - *J. Frothingham, Manager, Quality Programs
 - C. Giggey, Engineering
 - *D. Lemieux, Instrument and Controls (I&C)
 - R. O'Clair, Environmental Specialist
 - *P. Radsky, Chemistry
 - *J. Weast, Licensing
 - P. Woodhams, Lead I&C Technician

1.2 Licensee Personnel - Corporate

- *S. Evans, Emergency Preparedness & Invironmental Engineering Section Head
- *S. Nichols, Manager, Licensing and Engineering Support
- *D. Sturniolo, Nuclear Engineering Licensing

1.3 NRC Personnel

R. Bores, USNRC, Chief, Effluents Radiation Protection Section

P. Nessen, USNRC, Health Physicist

- C. Marschall, USNRC, Senior Resident Inspector
- W. Olsen, USNRC, Resident Inspector

1.4 State of Maine

P. Dostie, Nuclear Safety Inspector

Denotes those present at the exit meeting on April 10, 1992.
Other licensee employees were contacted and interviewed during this inspection.

2.0 Previously Identified Items

(Open) Unresolved (50-309/91-20-01) As a result of NRC inspection 50-309/91-14, the following four actions regarding the Primary Vent Stack (PVS) flow were to be taken by the licensee: (1) Evaluate the impact of the PVS flow on continuous releases, (2) Revise and submit semi-annual effluent release report, (3) Evaluate sample nozzle used to verify isokinetic sampling, and (4) Revise software of the offsite dose calculation program (METPAC) to accept flow instrumentation data.

The inspector reviewed the licensee's PVS Flow Closeout Fr 1-014, April 8, 1992, Rev. 5, which included, among other items, the four above concerns. The inspector determined that the plan appeared to be adequate. The licensee stated that the plan is expected to be implemented in May 1992. The inspector noted that the licensee had completed the evaluation of the impact of the PVS flow on continuous releases, however this remains open until the closeout plan has been implemented in May, 1992. Based on the PVS flow evaluation, the licensee submitted a revised semi-annual effluent release report. The inspector reviewed the updated report and determined that the gaseous effluent release results reflected the expected values which were calculated with the corrected PVS flow rate of 100,000 cubic feet per minute (cfm). This area of concern is closed.

Upon review of the licensects the pout plan, the inspector noets that the licensee is still in the process of evaluating the sample nozzle to verify isokinetic sampling and that this concern would be completed by the implementation date of the closeout plan. In addition, the inspector noted that evaluations of PVS flow on dosc dections were also still in progress. The licensee representatives stated that they were in the final stages of upgrading the METPAC software. Changes were made to the offsite dose calculation program (METPAC) to accept flow instrumentation data and the program was expected to be implemented in May 1992.

3.0 Purpose

The purpose of this inspection was to review the licensee's capability to implement the REMP and the radioactive liquid and gaseous effluent control programs during normal and emergency operations.

4.0 Management Controls

4.1 Program Changes

The inspector reviewed the organization and administration of the REMP and the radioactive liquid and gaseous effluent control programs and discussed with the licensee any changes since the last inspection which was conducted in June 1990. The inspector noted that one addition in the chain of command for the REMP had occurred since the last inspection. The Environmental Specialist now reports through the Principal Engineer (for assistance only) to the newly established Emergency Preparedness & Environmental Engineering Section Head, who in turn, reports to the Manager, Licensing & Engineering Support at Maine Yankee Atomic Power Company - Corporate. The licensee stated that management support has increased because the Principal Engineer had oversight for three other areas, namely, Chemistry, Radiation Controls and Radioactive Waste. There were no changes in the oversight of the effluent controls programs since the previous inspection. The inspector had no further question in this area.

4.2 Audits

The inspector reviewed the licensee's 1991 QA Audit, Report No. MY-91-02, Functional Area Audited: Chemistry/Radiological Effluent Technical Specifications (RETS)/REMP/ODCM, issued on June 25, 1991. The audit, conducted on May 13-17, 1991, was performed by members of the Quality Programs Department and technical specialists. This audit appeared to be thorough and of excellent technical depth to assess the REMP, Chemistry, and RETS. The inspector also reviewed the Audit Schedule Status for 1992, the Two-Year Audit Plan and the schedule for coverage of Technical Specification requirements, which had been implemented after the last inspection in June 1990.

The inspector noted that the audit identified three deficiencies, two observations and one recommendation. The inspector noted that two of the deficiencies had been closed and the corrective actions appeared to be timely and adequate. The Corrective Action Request (CAR) is still open with respect to one deficiency. The response to the corrective action was timely and the follow up is being monitored by members of the Quality Programs Department. One observation had been closed and the other observation, which remained open, concerned the isokinetic flow of the Primary Vent Stack effluent which was discussed in Section 2 of this report. A CAR had been assigned so that response and corrective actions would be timely.

4.3 Review of the Annual and Semiannual Effluent Reports

The inspector reviewed the Annual Radiological Environmental Operating keport for 1990 as well as the available 1991 and 1992 data for the REMP. The report provided a comprehensive summary of the analytical results of the REMP around the Maine Yankee site, and met the Technical Specification reporting requirements. The reviewed results indicated that all samples were collected as required. No obvious omissions or anomalous data were identified.

The inspector also reviewed the Semiannual Radioactive Effluent Release Reports for the second part of 1990 and the first part of 1991, and determined that the licensee met the Technical Specification reporting requirements. These reports provided total released radioactivity for liquid and gaseous effluents. The inspector also reviewed the revised report to verify that the results reflect expected values when calculated with the corrected PVS flow of 100,000 cubic feet per minute. No obvious anomalous measurements, omissions or trends were noted.

5.0 Radioactive Liquid and Gaseous Effluent Control Programs

The inspector reviewed selected radioactive liquid and gaseous discharge permits, and the following procedures, as part of the examination of the implementation of the Technical Specification requirements.

-Chemistry 3-7-1-1, "Liquid Radioactive Waste Discharge" -Chemistry 3-7-1-2, "Gaseous Radioactive Waste Discharge"

The inspector noted that the above procedures were found to be detailed and well written. The release permits met Technical Specification requirements for sampling and analysis a the established frequencies.

As part of the inspection, the inspector compared the results of the gaseous release ith the radwaste gas Radiation Monitoring System (RMS) to determine the cite of the monitor. The results were in good comparison.

above reviews and discussion with the licensee, the inspector determined msee was implementing effective radioactive liquid and gaseous effluent grams.

6.0 Campration of Effluent/Process Radiation Monitors

The inspector reviewed the calibration procedures and the most recent calibration results for the following effluent/process monitors to determine the implementation of those Technical Specification requirements. The inspector also inspected the installation of several of these monitors.

- o Liquid Radwaste Effluent Line Monitor
- o Service Water System Effluent Line Monitor
- o Steam Generator Blowdown Line Monitors
- o Main Steam Line Monitors
- o Waste Gas Holdup System Menitor
- o Plant Vent Stack Monitor
- o Condenser Air Ejector Monitor

The Instrument and Controls (I&C) Department had the responsibility to perform the electronic and radiological calibrations for the above monitors.

The inspector reviewed the calibration procedures for the Primary Vent Stack (PVS), Liquid Radwaste, and Waste Gas Monitors. The inspector noted that the electronic and radiological calibration procedures were generally well written and detailed, however, these procedures had some weaknesses as described in the following paragraphs.

During the review of the calibration results, the inspector noted that the licensee performed the primary calibration for the liquid radwaste monitors using three different calibration sources (Cd-109, Cs-137, and Co-60). Then the licensee used a Cs-137 source for the transfer calibration (secondary calibration). The licensee measured the monit \circ response to the Cs-137 secondary source using an unattenuated and attenuated source to measure different count rates. This technique provided only two calibration points. Two points are not sufficient to determine linearity of the monitor response and to adequately determine RMS sensitivity. Good industry practice requires the use of several different source strengths to construct the calibration curve [source strengths (μ Ci) versus monitoring results (counts per minute)]. The licensee had generated good primary calibration and generated good secondary data from the transfer calibration. However, as further discussed below, the licensee did not calculate the sensitivity from the slope of the response vs. source strength curve, nor relate that slope to that of the primary calibration.

The inspector noted that the licensee performed the primary calibrations for the Waste Gas Monitors and the PVS using three Xe-133 sources of different strengths, purchased from Analytics and traceable to the National Institute of Standards and Technology (NIST). The licensee calculated the detector sensitivity at each data point and then calculated an average value for the detector sensitivity (µCi/cc/cpm) using the measured activity (µCi/cc) and the corresponding average count rate (cpm) of the monitor. Further, the standards used for the PVS calibration were several orders of magnitude stronger than the highest concentration peaks during effluent release. This was not considered good practice because the detector response at the higher concentrations may not be representative of the detection response at the operating concentration range. Additionally, the licensee should plot the concentration (µCi/cc) vs. count rate (cpm) data points and then fit the slope of these points using statistical analysis (i.e., linear regression) to extrapolate the sensitivity through the operating range. The slope of the line of the calibration curve is the sensitivity of the monitor. The inspector also noted that the licensee performed the transfer (secondary) calibrations using three different Cs-137 source strengths. The licensee collected good data, but again did not construct the calibration curve for the secondary calibration, calculate a slope and correlate the results from the transfer calibration to the primary calibration.

Because of the above uncertainties in the calibration of the PVS monitor, the inspector stated that the current calibration of the PVS monitor would be considered an unresolved item pending recalibration with primary standards to ensure proper operation through the normal and emergency operating range (50-309/92-05-01).

The inspector also discussed with the licensee the following items.

1. Ensuring electronic alignment and monitor calibration extends through the rormal and emergency operating ranges.

- Use of statistical analysis to determine the linearity and the monitor sensitivity in the operating range.
- 3. Comparison of monitor sensitivities (slopes of the calibration curves) between the primary calibration and the transfer calibration (secondary calibration).

The licensee stated that these areas would be reviewed and implemented in the future as appropriate. The licensee also stated that the Primary Vent Stack Monitor calibrations are scheduled for May 1992. The inspector requested that the licensee provide to the NRC the results of this calibration and that the licensee review the other effluent and process monitors and inform the NRC of any additional monitors for which calibration in the operating range could not be determined.

7.0 Air Cleaning Systems

The inspector reviewed the licensee's most recent surveillance test results to determine the implementation of the Technical Specifications for the (1) control room recirculation and breathing air ventilation system, (2) spent fuel pool ventilation system, (3) containment ventilation/purge system. The inspector reviewed the most recent test results of the following inspections and surveillances for the above air cleaning systems.

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

The inspector also toured the air cleaning system areas. Based on the above reviews and discussion with the licensee, the inspector determined that the licensee was implementing Technical Specification requirements effectively.

8.0 Radiological Environmental Monitoring Program (REMP)

8.1 Direct Observations

The inspector examined selected environmental sampling stations with respect to the requirements of the Offsite Dose Calculation Manual (ODCM), and appropriate procedures. These sampling stations included air samplers for airborne iodines and particulates, a composite water sampling station, a milk sampling station, and a number of thermoluminescent dosimetry (TLD) stations for direct ambient radiation measurements. All selected air sampling equipment and the composite water sampler were operable at the time of the inspection. The cow milk samples appeared to be available at the locations specified in the ODCM and the TLDs were placed at the designated monitoring stations. Sample collection was performed according to the appropriate procedures and sample schedule.

8.2 Implementation of the REMP Procedures

The inspector reviewed the following procedure manual as part of the evaluation of the implementation of the REMP in accordance with the Technical Speci tions and ODCM.

-Procedure No. 26-301, Rev. 4, "Environmental Media Sample Collection Methods", January 11, 1991

The manual included airborne, water, and milk sampling methods, TLD exchanging methods for direct monitoring, land use census, calibration procedures for the air sampling equipment, and the TLD program. The inspector noted that some of the procedures within the manual were in the process of revision and upgrading. The reviewed procedures were detailed and provided the required direction and guidance for implementing the REMP.

The inspector reviewed the most recent calibration results for the gas meters for air sampling and noted that the licensee performs calibrations annually. All reviewed calibration results were within the licensee's acceptance criteria.

Based on the above record reviews and discussions with the licensee's representatives, the inspector determined that the licensee implemented the REMP effectively.

9.0 Quality Assurance/Quality Control for Analytical Measurements

The quality assurance and quality control program for analyses of environmental samples is conducted by the Yankee Atomic Environmental Laboratory (YAEL), located in Framingham, MA. The laboratory conducts a blind duplicate program, an interlaboratory quality control program, and participates in the EPA cross-check program to verify the quality of laboratory analysis. The inspector reviewed selected results from these programs and noted that the reviewed results were within the licensee's acceptance criteria. Based on the above reviews and discussions with the licensee, the inspector determined that the licensee had a very good quality assurance program.

10.0 Meteorological Monitoring Program

The inspector reviewed the licensee's meteorological monitoring program to determine whether the instrumentation and equipment were operable, calibrated and maintained. The inspector reviewed several detailed calibration procedures and the most recent

calibration results for the meteorological parameters wind speed, wind direction, and delta temperature. Calibrations were performed quarterly and the reviewed results were within the licensee's acceptance criteria. The inspector compared the meteorological parameters between the analog chart recorder and the computer outputs located in the control room and determined that the results of this comparison were in good agreement. The inspector noted that the instrumentation and the chart recorders were operable at the time of the inspection. Based on the review of the program and discussions with the licensee's representatives, the inspector determined that the licensee has implemented the Meteorological Monitoring Program effectively.

11.0 Exit Interview

The inspector met the licensee representatives denoted in Section 1.0 at the conclusion of the inspection on April 10, 1992. The inspector summarized the purpose, scope, and findings of the inspection.