U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report/License No.: 50-271/94-27/DPR-28

Licensee: **Vermont Yankee Nuclear Power Corporation**
RD 5, Box 169
Ferry Road
Brattleboro, Vermont 05301

Facility Name: **Vermont Yankee Nuclear Power Station**

Inspection At: **Vernon, Vermont**

Inspection Conducted: **November 14-18, 1994**

Inspector: Laurie Peluso
Laurie Peluso, Radiation Specialist

Approved by: Richard K. Strucinski for
Jason C. Jang, Chief
Effluents Radiation Protection Section
Facilities Radiological Safety and Safeguards Branch

Areas Inspected: Announced safety inspection of the Radioactive Liquid and Gaseous Effluent Control Programs and Radiological Environmental Monitoring Program including: management controls, quality assurance audits, control of liquid and gaseous effluents, calibration of radiation monitoring systems, air cleaning systems, quality control program for analytical measurements, meteorological monitoring program, and implementation of the above programs and the Offsite Dose Calculation Manual (ODCM).

Results: Within the areas inspected, the licensee's effluent control programs and radiological environmental monitoring program continued to be effective. No safety concerns or violations of NRC requirements were identified.

DETAILS

1.0 INDIVIDUALS CONTACTED

1.1 PRINCIPAL LICENSEE EMPLOYEES

D. Farquharson, Chemistry Assistant
R. Gerdus, Chemistry Engineer, Chemistry Department
* J. Geyster, Acting Radiation Protection Manager
* E. Lindamood, Acting Technical Support Services Superintendent
S. McAvoy, Chemistry Assistant
* J. Meyer, Projects Engineer, Operations Support Department
* S. Skibniowsky, Chemistry Manager
* R. Wanczyk, Plant Manager
M. Watson, Instrument and Control Manager

1.2 NRC EMPLOYEES

* H. Eichenholz, Senior Resident Inspector
P. Harris, Resident Inspector

* Denotes those present at the exit meeting on November 18, 1994.

The inspector also interviewed other licensee and contractor personnel.

2.0 PURPOSE OF INSPECTION

The purpose of this inspection was to review the licensee's programs in the following areas.

(1) The licensee's ability for measuring and quantifying radioactive liquid and gaseous effluents during normal and emergency operations.

(2) The licensee's ability to implement the Radiological Environmental Monitoring Program (REMP) and the Meteorological Monitoring Program (MMP).

3.0 MANAGEMENT CONTROLS

3.1 ORGANIZATION CHANGES

The inspector reviewed and discussed the licensee's organization and inquired if any changes were made since the last inspection conducted in October 1993. There were no changes in the licensee's organization to implement the Radioactive Liquid and Gaseous Effluent Control Programs, REMP, and MMP.

3.2 QUALITY ASSURANCE (QA) AUDITS

The inspector reviewed the QA Audit report (VY-94-02) for the Radioactive Liquid and Gaseous Effluent Control Programs and REMP to determine implementation of Technical Specification (TS) requirements.

The audit was conducted by the Quality Assurance Audit Group and technical specialists. The audit was of sufficient technical depth to assess the effluent control programs and the REMP. The audit probed for programmatic weaknesses and assessed the quality of the programs. Three deficiencies and four observations/recommendations were identified and documented in the audit report. The findings were assigned to the appropriate departments. All three deficiencies had been closed and one of the four observations remained open and will be closed January 1995. The inspector noted that the findings were not safety significant issues. Responses were timely and corrective actions were good.

3.3 SEMIANNUAL EFFLUENT RELEASE REPORTS AND ANNUAL ENVIRONMENTAL REPORT

The inspector reviewed the Semiannual Effluent Release Reports for the second half of 1993 and first half of 1994. The reports reflected offsite releases and projected doses to the public. The inspector determined that projected doses were well below TS limits. There were no obvious anomalous measurements, omissions, or trends noted in these reports.

The inspector reviewed the Annual Radiological Environmental Surveillance Report for 1993, as well as selected analytical data for 1994. The report provided a comprehensive summary of the analytical results of the REMP around the Vermont Yankee site and met Section 6.7.C.3 TS reporting requirements. Records of the analytical results indicated that all samples were collected and analyzed as required and the lower limits of detection specified in the licensee's TS were met. No obvious omissions or trends were identified.

4.0 RADIOACTIVE LIQUID AND GASEOUS EFFLUENT CONTROL PROGRAMS

The inspector reviewed the radioactive effluent control procedures and selected radioactive release permits to determine implementation of TS requirements. The inspector noted that the procedures were of sufficient detail to conduct the radioactive liquid and gaseous effluent control programs.

4.1 RADIOACTIVE LIQUID EFFLUENT CONTROL PROGRAM

The inspector noted that the licensee continued to process and recycle liquid radwaste. Because of this program, there were no planned radioactive liquid releases, therefore, there were no liquid release permits issued during 1994.

During the previous inspection, the inspector noted that the water sampled from the South Storm Drain was slightly contaminated with tritium at levels above the minimum detection capabilities of the contractor laboratory (Yankee Atomic Environmental Laboratory). The licensee conducted an extensive investigation and analyzed samples from all manholes from the drain system on site.

During this inspection, the inspector noted that the licensee identified that the source of the tritium was through the station chiller air conditioner condenser drains. The licensee plans to redirect the condensate from the chiller to Radwaste for processing. This will be reviewed during a subsequent inspection.

4.2 RADIOACTIVE GASEOUS EFFLUENT CONTROL PROGRAM

The inspector reviewed the gaseous effluent controls via the weekly iodine and particulate sample analysis results and the monthly grab sample results for noble gases from the stack. The inspector noted that the results indicated that samples were collected, as required, and the results were below TS limits. The inspector observed the licensee exchange the charcoal cartridges and particulate iodine filters at the main stack. The inspector noted that the licensee performed this task according to the appropriate procedure.

During the review of the gaseous effluent control program, the inspector noted that the Chemistry Department personnel conducted an air balance investigation using air tritium (as an indicator) in the Turbine and Service Buildings. The licensee analyzed the tritium using condensate water samples collected through the chillers in these buildings. The analytical results of these condensate samples were higher than background (approximately 1E-7 uCi/cc as compared to 1E-11 uCi/cc), but well below permissible concentrations for occupational exposure. The trending analysis of the tritium was performed by the Chemistry Department personnel. The inspector reviewed the trending results and determined that the responsible personnel had excellent knowledge in the areas of (1) tritium sampling and analysis, (2) air movement (air balance) in the plant, and (3) safety perspective for the investigation. The inspector stated that the air balance investigation using air tritium was excellent and the trending analysis will be reviewed during subsequent inspections.

4.3 WEST COOLING TOWER BASIN SILT

During the previous inspection, the inspector noted that the licensee detected Co-60 and Cs-137 in the west cooling tower basin silt. The inspector reviewed the licensee's actions for the cleanup and stabilization of the silt. The licensee was to collect the silt and cover the pile with a heavy gauge plastic sheet to avoid runoff. The licensee intended to apply to the NRC for permission to dispose of the silt on site in accordance with 10 CFR 20.2002 (formerly, 10 CFR 20.302).

During this inspection, the inspector discussed the status of the licensee's permit application. The licensee stated that the application had not been submitted as of this inspection because the licensee planned to discuss with NRC Headquarters representatives the possibility of combining this application request with a previously approved 10 CFR 20.302 permit. The inspector toured the west cooling tower basin and verified that the licensee covered the silt pile with a heavy gauge

plastic sheet to avoid runoff. The inspector stated that this issue will be reviewed during a subsequent inspection.

Based on the above reviews (Sections 4.1, 4.2, and 4.3) and discussions with licensee personnel, the inspector determined that the licensee met TS requirements and continued to implement the effluent control programs effectively.

5.0 CALIBRATION OF RADIATION MONITORING SYSTEMS (RMS)

The inspector reviewed the most recent quarterly functional tests including electronic alignments and monthly source check results for the following effluent and process RMS to determine implementation of TS requirements.

- o Main Stack Noble Gas Monitor (Normal Range)
- o Augmented Offgas Radiation Monitor
- o Air Ejector Offgas Monitor
- o Main Steam Line Monitors

Members of the I&C Department had the responsibility to perform electronic alignments and functional tests for the above RMS and members of the Chemistry and Radiation Protection Departments had the responsibility to perform monthly source checks. All reviewed results were within the licensee's acceptance criteria.

The calibration frequency of the above RMS is once every operating cycle. All calibration results were reviewed during the previous inspection conducted in October 1993. The next calibrations will be performed during the outage in March 1995 and calibration results will be reviewed during a subsequent inspection.

Based on the above review, the inspector determined that the licensee had an effective calibration program for the effluent and process radiation monitors.

5.1 RMS UPGRADE PROJECT

During the previous inspection, the inspector discussed with the licensee a project to upgrade the main stack normal range RMS. The upgrade included replacing the detectors and the 6-decade logarithmic scale panel in the control room with a digital panel. Although, the licensee performed primary calibrations on the RMS, reading the 6-decade logarithmic scale panel had been difficult, resulting in high reading errors and a less accurate conversion factor than would be obtained from a digital panel.

During this inspection, the inspector discussed with the licensee the status of the upgrade project. The inspector noted that the licensee also included the augmented offgas (AOG) RMS in the upgrade project. The project (installation of detectors and digital panels) will be completed before or during the 1995 refuel outage. Then the licensee

will perform the primary calibration and the secondary calibration for these RMS. The inspector stated that the completion of the project, including calibrations, will be reviewed during a subsequent inspection.

6.0 MODIFICATION OF TURBINE BUILDING VENTS

During the previous inspection conducted in October 1993, three issues were discussed: (1) location of the isokinetic sampling probe based on the new main stack flow, (2) accurate quantification of the air volume released to the environment (reliability of the main stack flow monitoring device), and (3) use of a second charcoal sample from the main stack for I-133 measurement during unusual plant operations (e.g., bypass of standby gas treatment system during containment purge and during high primary and secondary leaks). The first charcoal cartridge collects samples of any iodine that may be present in a sample period of one week during normal operations to meet the TS requirements. These issues were raised because the turbine building vents were rerouted to the main stack and resulted in higher main stack flow.

During this inspection, the inspector reviewed EDCR 92-407, Turbine Building Roof Ventilation Re-Route. The final tests commenced November 24, 1993 and were completed on June 23, 1994. All tests were within the licensee's acceptance criteria. The inspector had no further questions in this area.

With regard to the first and second items above, the inspector reviewed PDCR 92-013, Stack Flow Monitor Upgrade. The licensee noted that the stack flow instrumentation readings, when compared to actual measured air flows, were approximately 25% higher than the actual flow rate. The licensee installed a new flow monitor on June 30, 1994 based on safety reviews and assessments (e.g., isokinetic sampling probe) contained in PDCR 92-013 which were performed by members of I&C, Engineering, and other departments. The licensee's Quality Assurance Department audited the surveillance tests of the new flow monitoring system on July 18, 1994. No deficiencies or observations were noted during the QA audit. Based on the review of PDCR 92-013, the inspector determined that the licensee completed the first and second items.

With regard to the third item above, the inspector reviewed Procedure OP 2611, Gaseous Radwaste (Revision 32, issued on August 25, 1994) and noted that the licensee updated its procedure to ensure that appropriate actions (e.g., communication between the Operation and Chemistry Departments) would be conducted during unusual plant operations. The inspector also verified that the licensee uses a second charcoal cartridge to collect samples at the main stack for I-133 measurement during unusual plant operations. Based on this review the inspector determined that the licensee's actions were appropriate and the licensee completed the third item.

Based on the above reviews and discussions with licensee personnel, the inspector determined that the licensee's actions were excellent to protect the public health and safety and the environment.

7.0 AIR CLEANING SYSTEMS

The inspector reviewed the licensee's surveillance test procedures and most recent test results to determine implementation of TS requirements for the Standby Gas Treatment System.

- Visual Inspections
- In-Place HEPA Tests
- In-Place Charcoal Tests
- Air Capacity Tests
- Pressure Drop Tests
- Laboratory Tests for the Iodine Collection Efficiencies.

All reviewed test results were within the licensee's TS acceptance criteria.

The inspector also reviewed pressure drop test results for the AOG and Radwaste Buildings and noted that the test results were within the licensee's acceptance criteria. The inspector reviewed Operating Procedure 4501 Filter Testing and noted that the HEPA tests results for the AOG and Radwaste Buildings were within the administrative limits specified in the procedure.

Based on the above review, the inspector determined that the licensee had effectively implemented the surveillance program for the air cleaning systems.

8.0 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)

8.1 DIRECT OBSERVATIONS

The inspector examined selected sampling stations to determine whether samples were being obtained from the locations designated in the TS and the ODCM. These sampling stations included air samplers for particulates and airborne iodines, the composite water sampling station, several milk sampling stations, vegetation, and a number of thermoluminescent dosimeter (TLD) stations for measurement of direct ambient radiation. All observed air sampling equipment and the composite water sampler were operational at the time of the inspection. Milk samples and vegetation appeared to available at the sampling locations. TLDs were placed at the designated monitoring stations.

8.2 REMP PROCEDURES

The inspector reviewed the Operating Procedure-4605, Environmental Radiological Sampling and Analysis, to determine implementation of the REMP according to TS and the ODCM. The procedure included air, milk, sediment, and water sampling methods, dry gas meter calibration calculations for the air samplers, and a method for conducting the land use census. The procedure provided the required guidance for implementing an effective REMP.

The inspector reviewed the calibration results of the dry gas meters. The calibrations were performed according to the above procedure and the results were within the licensee's acceptance criteria.

Based on the above reviews in Sections 4.1 and 4.2 and discussions with the licensee, the inspector noted that members of the Chemistry Department continued to implement an effective REMP.

9.0 QUALITY ASSURANCE AND QUALITY CONTROL FOR ANALYTICAL MEASUREMENTS

The inspector reviewed the licensee's programs for quality assurance (QA) and quality control (QC) to determine whether the licensee had adequate control with respect to sampling, analyzing, and evaluating data for the implementation of the REMP.

The quality control program for analysis of environmental samples was conducted by the contractor, Yankee Atomic Environmental Laboratory (YAEL). The laboratory participated in the EPA-cross check program and had in place internal QA programs such as a blind duplicate program and an intralaboratory quality control program. The inspector reviewed the YAEL Semi-Annual QA Status Reports for the second half of 1993 and the first half of 1994 which contained the results from the above programs. The inspector noted that the analytical results were in agreement, with few exceptions. The responsible person reviewed all results and investigated disagreements.

The inspector noted that the licensee continued to maintain a good quality assurance program to ensure that the REMP sample results are thoroughly reviewed by the Chemistry Assistant-Environmental. Any results that appear suspect are either recounted or reanalyzed.

Based on the above reviews and discussions with the licensee, the inspector determined that the licensee had very good QA and QC programs.

10.0 METEOROLOGICAL MONITORING PROGRAM (MMP)

The inspector reviewed the licensee's MMP to determine whether the instrumentation and equipment were operable, calibrated, and maintained. The Instrument and Control (I&C) Department maintained all sensors at the main and backup towers. A contractor performed the semiannual channel calibrations according to TS requirements using the licensee's procedures.

The inspector reviewed the calibration results of the wind speed, wind direction, and delta temperature instrumentation located at the primary and backup towers. The inspector noted that the calibration results were within the licensee's acceptance criteria. The inspector also noted that the instrumentation and chart recorders were operable at the time of the inspection.

During discussions with I&C personnel and a Yankee representative from Bolton, the inspector noted that the licensee had approved a proposal to

upgrade or replace sensor equipment, electronics and chart recorders on both the primary and backup towers. The licensee anticipates the upgrade will commence during 1995.

Based on the above inspector observations, record review and discussions with the licensee personnel, the inspector determined that the licensee continued to implement the MMP effectively.

11.0 EXIT MEETING

The inspector met with the licensee representatives denoted in Section 1.1 of this inspection report at the conclusion of the inspection on November 18, 1994. The inspector summarized the purpose, scope, and findings of the inspection. The licensee acknowledged the inspection findings.