

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-213/91-02

Docket No. 50-213

License No. DPR-61

Licensee : Connecticut Yankee Atomic Power Company
P.O. Box 270
Hartford, Connecticut 06101

Facility Name: Haddam Neck Plant

Inspection At: Haddam Neck Site and Production Operation Services Laboratory

Inspection Conducted: January 7-11, 1991

Inspectors:

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1/22/91
date

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Inspection Summary: Inspection on January 7-11, 1991 (Inspection Report Number 50-213/91-02)

Areas Inspected: Routine, unannounced inspection of the Radiological Environmental Monitoring and Radiological Effluents Control Programs, including management controls, environmental sample collection, control of contractor laboratory activities, meteorological monitoring, radioactive gaseous and liquid effluents controls, calibration of effluent/process radiation monitors, audits, the radiological environmental annual report, and semiannual effluent reports.

Results: Within the scope of this inspection, no violations were identified. The licensee was implementing excellent radiological environmental monitoring and effluent control programs.

DETAILS

1.0 Individuals Contacted

1.1 Connecticut Yankee, Haddam Neck Plant

G. Bouchard, Unit Director
G. Concarovs, Chemist
P. Lenk, ISI Supervisor
*B. Luthanen, Chemist
*M. Quinn, Chemistry Manager
*D. Ray, Nuclear Services Director
*J. Stetz, Station Director

1.2 Northeast Utilities Service Company

**R. Crandall, Supervisor, Radiological Engineering Section
**W. Eakin, Senior Engineer, Radiological Assessment
*H. Siegrist, Supervisor, Radiation Protection Section

1.3 Production Operation Services Laboratory (POSL)

**G. Martel, Supervisor
R. Nejfelt, Environmental Technician A
**R. Parker, Environmental Specialist
**P. Staehly, Engineer
R. Waggoner, Environmental Technician A

1.4 NRC

*A. Asars, Resident Inspector

* Attended the exit meeting on January 11, 1991

** Attended the exit meeting on January 8, 1991

Other licensee employees were also contacted or interviewed during this inspection.

2.0 Purpose

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

- o The licensee's ability to measure liquid and gaseous radioactive effluents during normal and emergency operations.
- o The licensee's ability to conduct the Radiological Environmental Monitoring Program (REMP) and the Meteorological Monitoring Program.

3.0 Previously Identified Item

(Closed) Inspector Followup Item (50-213/89-14-01) Modification of the Test Tank Effluent Monitoring System to reduce the background count rate. The licensee completed the modification and the system was operable on September 27, 1990. This item is closed.

4.0 Radiological Environmental Monitoring Program (REMP)

4.1 Program Changes

The inspector reviewed the organization of the REMP and discussed with the licensee any changes made since the last inspection of this area. The inspector determined that the REMP has not changed since the last inspection conducted in October 1989.

4.2 Direct Observations

The inspector examined selected environmental monitoring stations. These stations included thermoluminescent dosimetry (TLD) stations for direct ambient radiation measurement, air sampling stations for iodines and particulates, and milk farms. All air sampling equipment was operable and calibrated as required at the time of the inspection. TLDs were placed at the specified locations and milk samples appeared to be available at milk farms as specified by the Offsite Dose Calculation Manual.

4.3 Review of Annual REMP Report

The inspector reviewed the Annual Radiological Environmental Report for 1989 as well as the available 1990 analytical data for the REMP. The reports provided a comprehensive summary of the analytical results of the REMP around the Haddam Neck site and met the Technical Specification requirements. Reviewed analytical data for 1990 appeared to be reasonable and no anomalous data were noted.

4.4 QA Audits

The inspector reviewed the following 1990 audit reports for the REMP.

- o NRB Audit No. A25030
- o Internal Audits: POSL and Radiological Assessment Branch (RAB)
- o Contract Audits: Teledyne Isotopes and Yankee Atomic Environmental Laboratory

The inspector noted that the scope and technical depth of the audits were excellent to assess the REMP and the findings and recommendations were thorough and of excellent quality. The appropriate department

responded to these findings in a timely manner. No violations were identified in this area.

4.5 Implementation of the QC Program and the REMP

The inspector reviewed the following procedures to determine the implementation of the REMP and QC program for the REMP.

- o RAB 3-1, "Quality Control of Radiological Environmental TLD Monitoring Program"
- o RAB 3-2, "Quality Control of Radiological Environmental Monitoring Program"
- o RAB 3-3, "Radiological Chemistry Analysis Data Check"
- o RAB 4-1, "Contractor's Analytical Detection Limit and Data Reporting Procedures"

The inspector noted that the results of the QC analytical data were generally in good agreement between the contractor laboratories and the licensee's spike, split and blind samples. The inspector discussed with the licensee several false positive results analyzed and reported by the contractor laboratory (Teledyne Isotopes, inc.). The licensee, upon examination of the results, requested this contractor laboratory to provide an explanation, reanalysis, or recheck. Also analytical results of gross beta for air particulates were approximately 20% lower than expected. The inspector noted that the licensee was following these anomalies closely and was taking appropriate actions to resolve them.

Based on the above review, the inspector determined that the licensee has implemented an excellent QC program and REMP.

4.6 Environmental Dosimetry

The U S. Nuclear Regulatory Commission (NRC) Direct Radiation Monitoring Network is operated by the NRC Region I to provide continuous measurements of the ambient radiation levels around nuclear power plants throughout the United States. Each site is monitored by arranging approximately 30 to 50 TLD stations in two concentric rings extending to about five miles from the nuclear power plant. The monitoring results are published in NUREG-0837 quarterly.

One purpose of this program is to serve as a basis of comparison with similar programs conducted by individual utilities which operate nuclear power plants. Therefore, at least four (4) NRC TLDs are collocated with the licensee's TLD stations at each utility site.

The licensee monitors the environmental radiation levels monthly (2 TLDs each station) using EG&G TLDs (Model TL-34, CaF₂:Mn) and Victoreen TLD readers (Models 2800 and 2810). During this inspection the monitoring results of collocated TLDs were compared and the results are listed in

Table 1. Although there are some differences between the NRC and licensee's programs, such as monitoring period, starting date of the quarter, and monitoring height, results are generally in good agreement.

5.0 Meteorological Monitoring Program

The inspector reviewed the Meteorological Monitoring Program including procedures and calibration results for wind speed, wind direction, and temperature at the 33ft, 120ft, and 200ft-elevation levels of meteorological monitoring tower. Calibrations were performed on a quarterly basis and the system checks were performed weekly. The inspector reviewed the following calibration and surveillance results.

- o ES 201, "Wind Direction System Calibration"
- o ES 203, "Temperature/Delta Temperature System Calibration"
- o ES 205, "Wind Speed System Calibration"
- o ES 211, "Meteorological Tower Equipment Surveillance"

The inspector noted that all calibration results were within the licensee's acceptance criteria. The licensee also performed monitoring comparisons between the meteorological equipment room at the meteorological tower and the control room. The inspector reviewed these results and noted that comparisons were in good agreement. Based on the above review, the inspector determined that the licensee implemented excellent calibration and surveillance programs. No violations were identified in this area.

6.0 Radiological Effluents Control Program

6.1 Program Changes

There were no significant changes in the licensee's radioactive liquid and gaseous effluent control programs since the previous inspection conducted in September 1989.

6.2 Radiological Semiannual Effluent Reports

The inspector reviewed the semiannual radioactive effluent release reports for 1989 and the first half of 1990, and determined that the licensee met the Technical Specification requirements. No anomalous measurements, omissions or trends were noted. No violations were identified.

6.3 Radioactive Liquid and Gaseous Effluent Controls

The inspector examined selected radioactive liquid and gaseous release permits and reviewed the following procedures to determine the implementation of the Technical Specifications.

- o CHDP 1.2-3, "Gaseous Discharges Permits"
- o CHDP 6.4-2, "Calculations of Gaseous Permits by Hand"
- o CHDP 1.2-3, "Liquid Discharges Permits"
- o CHDP 1.3-3, "Particulate Discharges Permits"

Based on the reviews of release permits and the above procedures, the inspector determined that the licensee implemented the radioactive gaseous and liquid effluent control programs effectively.

During the review of the licensee's QA/QC program, the inspector noted that the Electric Council of New England (ECNE) Nuclear Power Facilities (9 Member Stations and 7 Associate Stations) published the Quality Assurance Manual for the chemistry laboratory. The Manual (ECNE Laboratory Control Manual) contains the following vital QA policies for the chemistry laboratory.

- o Responsibilities
- c Training and Certification
- o Chemical/Reagent Control
- o Instrumentation Control
- o Analytical Control
- o Software Control
- o Communication Control
- o Quality Audits
- o Control of Documentation
- o Statistical Methods

The inspector reviewed the QA Manual and discussed with the licensee the implementation of the Manual at Haddam Neck. The licensee stated that this Manual will be implemented in the very near future. It should be noted that the licensee has implemented an excellent QA Program in the chemistry laboratory. It should also be noted that the licensee is one of the Member Stations of the ECNE.

6.4 Radiological Assessment of Refueling Water Storage Tank

On September 14, 1990, the leakage of the refueling water storage tank (RWST) was discovered by the licensee. The leak rate was determined to be about 5 gallons per day (GPD). The licensee's radiological assessment of this leakage was reviewed by a NRC Region I based inspector on September 24, 1990. The total gamma (fission and activated nuclides) and tritium activities in the RWST were $9.57E-3$ microCi/cc and $7.28E-3$ microCi/cc, respectively (See Inspection Report No 50-213/90-15 for details).

During this inspection, the inspector reviewed the licensee's radiological assessment of the RWST leak. The leak rate was determined to be about 55 GPD for last three weeks. This is the maximum leak rate since the discovery of the leak in September. The leak rate was about

20 GPD on December 12, 1990. The inspector reviewed the radioanalytical results of January 8, 1991 RWST grab samples. The total gamma and tritium activities in the RWST were $6.36E-3$ microCi/cc and $8.81E-3$ microCi/cc, respectively.

Based on the radioactivity in the RWST and on the analytical results between September 24, 1990 and January 8, 1991, there was no significant change in the dose assessments. The leak rate, however, has increased by a factor of 11. It should be noted that the dose assessment results were based on the worst case situation. There has been no release to the environment. It should also be noted that there were no negative impacts on the environment and/or the public health and safety as a result of this event. In fact, the licensee took good actions to prevent the releases to the environment.

6.5 Calibration of Effluent and Process Monitors

The inspector reviewed the most recent quarterly calibration results for the following effluent/process monitors.

- o R-12, "Reactor Containment Gas Monitor"
- o R-14A, "Main Stack Monitor"
- o R-14B, "Wide Range Primary Vent Stack Gas Monitor"
- o R-16B, "Steam Generator Blowdown Monitor"
- o R-17, "Component Cooling Water Monitor"
- o R-18, "Liquid Effluent Monitor"
- o R-22, "Test Tank Effluent Release Monitor"

All reviewed calibrations were performed as required and results were within the licensee's acceptance criteria. Based on these reviews, the inspector determined that the licensee implemented the TS requirements effectively. No violations were identified.

7.0 Air Cleaning System

The inspector reviewed the licensee's most recent surveillance test results to determine the implementation of the Technical Specification (TS) and non-TS requirements. The following inspection and test results for the Spent Fuel Building Exhaust, Primary Auxiliary Building Exhaust, Emergency Offsite Facility Fan Test, and Containment Air Recirculation Fans.

- o Visual Inspections
- o In-Place HEPA Leak Tests
- o In-Place Charcoal Leak Tests
- o System Air Flow 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 these reviews, the inspector determined that the licensee implemented the requirements for the above systems effectively. No violations were identified in this area.

8.0 Exit Interview

The inspector met with the licensee representatives denoted in Sections 1.1, 1.2, and 1.3 of this inspection report at the conclusion of the inspection on January 8, 1991 at the POSL and January 11, 1991 at the Haddam Neck Site. The inspector summarized the purpose, scope, and findings of the inspection.

Table 1
Environmental Monitoring Results for Collocated TLDs

Reporting Unit = (mR +/- s.d.) / 90days

Yr/Q	1989				1990
	1	2	3	4	1
NRC-4	17.5+/-0.7	15.9+/-0.7	18.1+/-0.8	17.1+/-0.7	18.6+/-0.6
HN-43B	17.1+/-0.9	16.9+/-0.0	17.3+/-0.1	16.7+/-0.1	16.5+/-0.0
NRC-7	12.8+/-0.7	16.6+/-0.7	19.3+/-0.8	17.4+/-0.7	18.6+/-0.6
HN-7	14.0+/-0.9	14.6+/-1.3	14.9+/-0.6	13.7+/-0.0	17.3+/-0.9
NRC-22	16.6+/-0.6	MISSING	19.6+/-0.8	15.4+/-0.6	15.0+/-0.7
HN-8	17.1+/-0.7	17.11+/-0.7	17.1+/-0.9	17.3+/-0.4	17.3+/-0.6
NRC-24	15.9+/-0.6	16.3+/-0.6	16.5+/-0.8	15.4+/-0.6	17.4+/-0.7
HN-12A	14.4+/-0.7	14.0+/-0.7	14.1+/-0.4	14.5+/-0.4	14.2+/-0.7
NRC-30	15.7+/-0.6	15.6+/-0.7	16.5+/-0.7	16.2+/-0.6	18.4+/-0.6
HN-9	15.4+/-0.9	14.9+/-0.5	15.7+/-0.6	15.2+/-0.4	14.8+/-0.4
NRC-32	20.0+/-0.7	18.6+/-0.8	20.8+/-0.9	18.4+/-0.7	20.3+/-0.7
HN-10	19.7+/-0.3	18.5+/-0.2	18.2+/-0.3	17.5+/-0.3	18.1+/-0.3
NRC-40	18.3+/-0.7	17.0+/-0.7	17.4+/-0.8	16.9+/-0.7	17.9+/-0.6
HN-11A	19.9+/-0.8	19.9+/-1.0	19.7+/-0.3	19.8+/-0.4	19.9+/-0.4

NRC: Panasonic TLD, Quarterly Monitoring

HN: Haddam Neck EG&G TLD, Monthly Monitoring