

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-333/93-01
Docket No. 50-333
License No. DPR-59
Licensee: New York Power Authority
P.O. Box 41
Lycoming, New York 13093
Facility Name: James A. FitzPatrick Nuclear Power Plant
Inspection At: J.A. FitzPatrick Nuclear Power Plant, Lycoming, New York
Inspection Conducted: January 25-29, 1993

Inspector:

Jason C. Jang
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Effluents Radiation Protection Section (ERPS)
Facilities Radiological Safety
and Safeguards Branch (FRS&SB)

2-3-93
Date

Approved by:

Marie T. Miller
Marie T. Miller, Chief, ERPS, FRS&SB,
Division of Radiation Safety and Safeguards

2-4-93
Date

Areas Inspected: Announced safety inspection of the radioactive liquid and gaseous effluent control programs including: management controls, audits, air cleaning systems, calibration of effluent/process radiation monitoring systems, and implementation of the above programs.

Results: Within the areas inspected, the licensee implemented excellent radioactive liquid and gaseous effluent control programs. The responsible individuals in the Chemistry Department had excellent knowledge to implement the above programs. No safety concerns or violations were identified.

DETAILS

1.0 Individuals Contacted

1.1 Licensee Personnel

- * R. Barrett, General Manager-Operations
- * M. Colomb, General Manager-Support Services
- * C. Gannon, Manager, Radiological & Environmental Services
- W. Hamblin, Chemistry/Radiochemistry Supervisor
- * J. Heddy, Licensing
- * D. Kieper, I&C Manager
- J. Loeffert, Chief Technician, Chemistry Department
- A. Macks, Chief Technician, Chemistry Department
- * J. McCarty, Quality Assurance
- * A. McKeen, Chemistry General Supervisor
- * E. Mulcahey, Sr. Technical Advisor, Operations Review Group (ORG)
- G. Re, Radiological Engineering Supervisor, Corporate Office
- * H. Salmon, Resident Manager
- S. Smith, Respiratory Technician, Radiological Engineering
- K. Wells, Chief Technician, Chemistry Department
- * A. Yost, I&C
- * A. Zaremba, ORG/Licensing Manager

1.2 NRC

W. Cook, Sr. Resident Inspector
J. Tappert, Resident Inspector

- * Denotes those present at the exit interview on January 29, 1993. Other licensee employees were contacted and interviewed during this inspection.

2.0 Purpose

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

- (1) The licensee's ability to control and quantify effluent radioactive liquids, gases, and particulates.
- (2) The licensee's ability to calculate projected doses to the public from radioactive liquid and gaseous (airborne) effluent releases during normal operation.

3.0 Management Controls

3.1 Program Changes

The inspector reviewed the organization and administration of the radioactive liquid and gaseous effluent control programs and discussed with the licensee any changes made since the last inspection conducted on December 2-6, 1991. The inspector determined that the radioactive effluent control programs remained the same as at the time of the last inspection. The Chemistry Department has the responsibility to conduct the radioactive liquid and gaseous effluent control programs.

3.2 Audits

The inspector reviewed the following QA Audit Reports to determine the implementation of the Technical Specification requirements.

- (1) Audit No. 771, "Radiological Effluent Technical Specifications"
April 6-17, 1992
- (2) Audit No. 776, "Regulatory Guide 1.21 Commitment Compliance"
May 12-15, 1992

The inspector noted that the scope and technical depth of the above audits were excellent in assessing the radioactive liquid and gaseous effluent control programs. The auditors did not focus on administrative controls but technical aspects to assess the effluent control programs. Therefore, the responsible departments (e.g., I&C and Chemistry) incorporated findings and recommendations to enhance the programs. The inspector noted that the above audits identified few findings, none of safety significance, and several recommendations. The appropriate department responded to these findings and recommendations in a timely manner.

3.3 Review of Semiannual Effluent Reports

The inspector reviewed the semiannual radioactive effluent release reports for the second part of 1991 and the first part of 1992, and the 1991 dose assessment results to the public from radioactive liquid and gaseous effluents. The inspector determined that the licensee met the Technical Specification requirements. There were no anomalous measurements, omissions or trends in these semiannual effluent reports.

4.0 Radioactive Liquid and Gaseous Effluent Control Programs

The inspector reviewed selected radioactive liquid and gaseous discharge permits and associated procedures. The inspector also discussed effluent control programs with the Chemistry Department personnel regarding the implementation of the following Technical Specification (TS) requirements.

- o TS 2.0, "Liquid Effluents"
- o TS 3.0, "Gaseous Effluents"
- o TS 7.2, "Offsite Dose Calculation Manual"

The inspector also reviewed the new chapter of the licensee's Chemistry Manual, "Conduct of Chemistry Operations." The licensee prepared this chapter of the Manual as general guidance for the Chemistry Department personnel. This chapter was approved by the Manager of Radiological and Environmental Services. The inspector was informed that this chapter would also be reviewed by and require approval of the Resident Manager. The inspector noted it contained the following useful sections for the Chemistry Department personnel.

- o Communication
- o Performance Monitoring
- o Chemistry Monitoring
- o Quality Control of Laboratory performance
- o Chemistry Data Evaluation
- o Chemistry Control
- o Training and Qualification of Chemistry Personnel
- o Assessment of Chemistry Program Effectiveness
- o Chemistry Goals

During the discussion with the Chemistry Department staff members, the inspector noted that the responsible individuals had excellent knowledge in the areas of: (1) radioactive liquid and gaseous effluent controls, (2) effluent/process Radiation Monitoring Systems (RMS), (3) quantifying the total amount of liquid and gaseous effluent release using the RMS, (4) protection of the public health and safety and the environment, and (5) ODCM requirements.

Based on the review of discharge permits, procedures, the new chapter of the Chemistry Manual, and discussion with the licensee, the inspector determined that the licensee was implementing excellent radioactive liquid and gaseous effluent control programs. In fact, the licensee's performance exceeded the TS requirements in the implementation of these programs.

5.0 Radiation Monitoring Systems (RMS)

5.1 Calibration of Effluent/Process RMS

The inspector reviewed the results of the most recent calibrations for the following effluent and process RMS as part of the implementation of Technical Specification requirements.

- o Liquid Radwaste Discharge Monitor
- o Service Water Discharge Monitor
- o Main Steam Line Radiation Monitors
- o Reactor Building Closed Loop Cooling Radiation Monitor
- o Main Stack - Normal and High Range Noble Gas Monitors
- o Refuel Floor Exhaust Radiation Monitor
- o Reactor Building Exhaust Radiation Monitor
- o Turbine Building Exhaust - Normal and High Range Monitors
- o Radwaste Building Exhaust - Normal and High Range Monitors
- o Offgas Radiation Monitor
- o Main Control Room Air Supply Radiation Monitor

The I&C and the Chemistry Departments had the responsibility to perform electronic and radiological calibrations, respectively, for the above effluent/process radiation monitors. All reviewed calibration results were within the licensee's acceptance criteria.

During the previous inspection conducted in December 1991, the inspector noted that the licensee had difficulty in meeting the calibration acceptance criteria for several gaseous effluent radiation monitors (e.g., Radwaste Building Exhaust Normal Range Monitor). The inspector also noted that the high voltage drifted for the gaseous effluent radiation monitors. This might be an indication of age-related problems with these RMS. The inspector discussed with the licensee representatives (Chemistry General Supervisor at the site and Radiological Engineer Supervisor from the corporate office) the operability and reliability of the RMS. The licensee representatives stated that an independent assessment of the RMS would be performed by a contractor during the first quarter of 1992. Based on that independent assessment, the licensee would establish appropriate corrective actions and programs as necessary.

During this inspection, the inspector reviewed the draft of the aforementioned independent assessment. The review is described in Section 5.2 of this

inspection report. The independent assessment was also being reviewed by the licensee at the time of this inspection.

5.2 Upgrading of RMS

The independent assessment of the RMS was performed by a contractor. The inspector noted that the independent assessment was performed in the areas of: (1) reliability and maintainability of RMS, (2) calibration procedures, (3) establishment of QA/QC, (4) establishment of tracking and trending analyses for the RMS, (5) replacement of RMS components, as necessary, and (6) assignment of an RMS System Engineer.

Through discussions with the licensee, the inspector noted that the licensee's planned corrective actions, based on the independent assessment, were inconclusive since the assessment was still being reviewed by the licensee. The inspector, however, noted that the several areas (e.g., assignment of the RMS System Engineer and completion of draft calibration procedures for several RMS) were already in place. The inspector stated that the assignment of the RMS System Engineer should enhance the RMS reliability tracking program.

The licensee's Operations Review Group (ORG) reviewed RMS deficiency reports from July 1 through November 30, 1992. The ORG analyzed them and concluded that the RMS had more than a reasonable number of failure reports based on the number of components of the effluent/process RMS. The inspector noted that the ORG analyzed the deficiency reports in depth. The inspector also noted that the ORG's reviews and recommendations will enhance the improvement of the RMS reliability and operability.

Based on the review of the independent assessment, discussions with the licensee, and the ORG report review, the inspector determined that the licensee was taking appropriate actions in order to upgrade the RMS. The inspector stated that the evolutions of the RMS upgrading will be reviewed during subsequent inspections.

7.0 Air Cleaning Systems

The inspector reviewed the licensee's most recent surveillance results as part of the examination of the implementation of the Technical Specification requirements and FSAR commitments for the following systems.

- o Standby Gas Treatment Systems
- o Control Room Ventilation Systems
- o Technical Support Center Systems
- o Radwaste Building Air Cleaning Systems

The following surveillance results were reviewed and all reviewed test results were within the licensee's Technical Specification acceptance criteria.

- o In-Place HEPA Leak Tests
- o In-Place Charcoal Leak Tests
- o Air Capacity Tests

The following surveillance results, however, were not reviewed during this inspection because the licensee had not received the surveillance results from the contractor. Therefore, these surveillance results (Visual Inspection, Pressure Drop Tests, and Laboratory Tests for the Iodine Collection Efficiencies) will be reviewed during a subsequent inspection.

Based on the above reviews, the inspector determined that the licensee was implementing Technical Specification requirements as well as FSAR commitments effectively.

8.0 Comparisons of the Projected Dose Calculation Program

During this inspection, the inspector performed an independent verification of the licensee's capability for calculating projected doses to the public resulting from discharges of radioactive liquids and gases to the environment. The licensee calculated the projected dose to the public prior to discharge of radioactive liquids and/or gases based on the data incorporated into the radioactive liquid and gaseous discharge. The inspector also used the same parameters contained in the discharge (e.g., dilution factor, total amount of radioactivity released, meteorological data, etc.) to calculate the maximum projected doses to the public for intercomparison. The licensee used its computer code and the NRC used the "PCDOSE code".

The PCDOSE code was developed by Idaho National Engineering Laboratory (EG&G Idaho, Inc.) for the U.S. Nuclear Regulatory Commission. The code was designed to calculate the maximum projected radiation dose to an individual and the average dose to the population due to radionuclides in radioactive liquid and airborne effluent releases from a nuclear power plant. The code was designed for normal operation rather than for emergency situations. The code was developed from the methodology found in both NUREG-0133 and Regulatory Guide 1.109 (Revision 1). The PCDOSE

code serves as a basis of comparison with similar programs conducted by individual utilities which operate nuclear power plants.

During this inspection, the inspector reviewed the Offsite Dose Calculation Manual (ODCM) for site specific parameters and current methodology for the noble gas, liquid, and particulates release pathways. The ODCM exactly coincides with the licensee's computer code, which follows the NRC Regulatory Guide 1.109 for all parameters.

The inspector evaluated the licensee's computer code by assuming site specific parameters and release information. The intercomparison results for the noble gas, liquid, and, particulates release pathways are listed in Tables 1, 2 and 3, respectively.

The comparison results of the noble gas release pathway were based on six radionuclides for the main stack, one radionuclides for the vent, and specific meteorological values. The comparison results for the vent release were slightly better than the main stack release as shown in Table 1. The reasons for these differences were due to specific meteorological data and the manner in which they were used in the calculation for the main stack. This site specific calculation is an acceptable method to the NRC. The intercomparison results using site specific parameters were in very good comparison as shown in Table 1.

The comparison results of the liquid release pathway were based on four radionuclides. The intercomparison results were excellent as illustrated in Table 2.

The comparison results of the particulates release pathway were based on five radionuclides. The intercomparison results were excellent as shown in Table 3.

Based on the above comparison results and reviews, the inspector determined that the licensee conducted an excellent projected dose calculation program. The inspector noted that the responsible individual had excellent knowledge to implement the effluent control programs.

9.0 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 January 29, 1993. The inspector summarized the purpose, scope, and findings of the inspection.

Table 1. Noble Gas Dose Projection Comparisons

Release Source		Total Body (mrem)	Skin (mrem)	Gamma-Air (mrad)	Beta-Air (mrad)
Vent	NRC	2.41E-7	5.29E-7	2.56E-7	3.28E-7
	Licensee	2.41E-7	5.33E-7	2.58E-7	3.30E-7
Main Stack	NRC	2.75E-5	3.15E-5	2.86E-5	3.53E-6
	Licensee	2.69E-5	3.06E-5	2.79E-5	3.54E-6

Table 2. Dose Projection Comparisons for Liquid Release

Adult Organ Dose Unit = mrem	NRC	Licensee
Bone	6.53E-7	6.53E-7
Liver	2.26E-6	2.26E-6
Total Body	1.09E-6	1.09E-6
Thyroid	4.24E-8	4.24E-8
Kidney	1.46E-8	1.46E-8
Lung	4.24E-8	4.24E-8
GI-LLI	2.42E-6	2.42E-6

Table 3. Dose Projection Comparisons for Tritium, Iodine, and Particulates

Adult Organ Dose Unit = mrem	NRC	Licensee
Bone	4.37E-8	4.37E-8
Liver	1.87E-8	1.90E-8
Total Body	2.81E-8	2.89E-8
Thyroid	1.82E-6	1.81E-6
Kidney	1.97E-8	2.08E-8
Lung	3.44E-8	3.44E-8
GI-LLI	2.16E-6	2.16E-6