

U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-219/90-13

Docket No. 50-219

License No. DPR-16

Licensee: GPU Nuclear Corporation
P. O. Box 388
Forked River, New Jersey 08731

Facility Name: Oyster Creek Nuclear Generating Station

Inspection At: Forked River, New Jersey

Inspection Conducted: August 20-24, 1990

Inspectors: Louie Peluso 9/4/90
L. Peluso, Radiation Specialist, date
Effluents Radiation Protection Section
(ERPS)

Jason C. Jang 9-4-90
J. C. Jang, Sr. Radiation Specialist, ERPS, date

Approved by: Alexander Bores for 9/6/90
R. J. Bores, Chief, ERPS, Facilities date
Radiological Safety and Safeguards Branch

Inspection Summary: Inspection on August 20-24, 1990 (Inspection Report No. 50-219/90-13)

Areas Inspected: Routine unannounced inspection of the licensee's liquid and gaseous radioactive effluent control programs and radiological environmental monitoring program. Areas reviewed included: management controls; quality assurance audits; effluent control procedures; radiation monitoring system; meteorological monitoring program; and implementation of the above programs.

Results: Within the scope of this inspection, one violation was identified in the area of the effluent radiation monitoring system (See Section 5.5 of this report). The licensee conducted programs of radioactive effluent control, meteorological, and radiological environmental monitoring effectively.

DETAILS

1.0 Individuals Cont. d

1.1 Licensee Personnel

- *G. Busch, Manager, Licensing
- *E. Fitzpatrick, Vice President/Director Oyster Creek
R. Harkleroad, Supervisor, I&C Engineering
- *M. Heller, Licensing Engineer
- *R. Hillman, Manager, Plant Chemistry
R. Murdock, Engineer Assistant Senior III, I&C
- *D. Robillaird, QA Lead Auditor
P. Schwartz, Environmental Scientist, Environmental Controls
M. Slobodien, Manager, Radiation Controls
R. Stoudnour, Senior Engineer, Chemistry
- *J. Vouglitous, Manager, Environmental Controls
- *D. Weigle, Environmental Engineer, Environmental Controls
- *K. Wolf, Radiological Engineering Manager

1.2 State of New Jersey

- *N. DiNucci, Health Physicist, DE^o

1.3 NRC

- *E. Collins, Sr. Resident Inspector

*Denotes those present at the exit interview on August 14, 1990. Other licensee employees were contacted and 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 control and quantify effluent radioactive liquids, gases, and particulates.
- o The licensee's ability to carry out its Radiological Environmental Monitoring Program (REMP).

3.0 Licensee Action on Previous Finding

(Closed) Inspector Followup Item (50-219/88-19-01): Interlaboratory comparison of actual split samples. During a previous inspection, two feed water samples were split between the licensee and the NRC for the purpose of intercomparison of metals analysis results. The samples were

labelled Cation A and Cation B. The analyses were performed by the licensee using routine methods and equipment and by Brookhaven National Laboratory (BNL) for the NRC. The comparison of the results indicated that the licensee values were within 15% of the BNL values. Results within plus or minus 15% or less are typically within the agreement criteria used by the NRC for spiked metals samples, and therefore, these results are acceptable. The NRC has not yet developed criteria for comparing the results of chemical analyses of actual split samples. This item is closed.

Analyte	Cation A		Cation B	
	Licensee	BNL	Licensee	BNL
	Parts per Million (PPM)			
Iron	2.43	sample lost	4.9	4.89 +/- 0.06
Copper	2.24	2.64 +/- 0.10	5.0	5.4 +/- 0
Nickel	2.2	2.4 +/- 0.2	4.7	5.02 +/- 0.12
Chromium	2.2	2.50 +/- 0	4.34	4.83 +/- 0

4.0 Audits

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

- o S-OC-88-09, "Radioactive Waste Management", August 18, 1988 - May 25, 1989
- o S-OC-89-05, "REMP", July 20, 1989
- o O-COM-88-09, "Contractor Laboratory (Teledyne Isotopes)", February 1, 1989
- o O-COM-89-13, "Contractor Laboratory (GPUN Environmental Radioactivity Laboratory)", July 13, 1989

These audits were conducted by the licensee's Quality Assurance Department in the areas of radiological effluents control program, radwaste operations, REMF, and contractor laboratories. All audits appeared to cover the stated objectives and to be of excellent technical depth to assess the licensee's radioactive effluents control program and the REMF. The audits identified a few minor findings and several recommendations; none of safety significance. The appropriate department responded to these findings in a timely manner. No violations were identified in this area.

5.0 Liquid and Gaseous Effluent Control Programs

5.1 Program Changes

There were no significant changes in the licensee's radioactive

liquid and gaseous effluent control programs since the previous inspection in May 1989. The Chemistry Department had responsibility to conduct the liquid and gaseous effluent control programs. The Radiological Control Department had responsibility to conduct the offsite dose assessment requirements.

5.2 Review of Semiannual Reports

The inspector reviewed the semiannual radioactive effluent release reports for 1988 and 1989. No obvious anomalous measurements, omissions or trends were noted. These reports provided total released radioactivity for liquid and gaseous effluents. The licensee also listed inoperable effluent radiation monitors such as the liquid radwaste effluent line monitor. The inspector noted that this monitor has been inoperable since 1982 (See Section 5.5 of this report for details).

5.3 Radioactive Liquid and Gaseous Effluent Controls

The inspector reviewed the licensee's procedures and selected liquid and gaseous discharge permits to determine the implementation of the following Technical Specification (TS) requirements.

- o TS 3/4.6, "Radioactive Effluents"
- o TS 6.19, "Offsite Dose Calculation Manual (ODCM)"

The inspector noted that the reviewed procedures were found to be of sufficient detail to meet the above TS requirements. The reviewed liquid and gaseous discharge permits met the above TS requirements for sampling and analysis at the frequencies established.

The licensee is attempting to minimize the routine release of radioactive liquid from the site during normal operation. In fact, there has been no release of radioactive liquid in 1990 as of the date of this inspection. However, the licensee released radioactive liquid during the 1989 refueling outage.

The inspector noted that the licensee was effectively implementing the ODCM methodology for controlling gaseous effluent releases from the site. The inspector also noted that the licensee carried out trending analyses for accumulative offsite dose commitments. During the review of these trending analyses for 1990, the inspector noted that the offsite dose commitments for noble gases,

iodines and particulates were reduced about 10 times lower than the 1989 commitments due to the effective operation of the Augmented Offgas System.

Based on the above review, the inspector determined that the licensee was implementing TS requirements effectively for the routine liquid and gaseous effluent control programs. No violations were identified.

5.4 Calibration of Effluent/Process Radiation Monitors

The inspector reviewed the most recent calibration results for the following effluent/process monitors to determine the implementation of the TS requirements.

- o Main Steam Line Monitors
- o Service Water Radiation Monitor
- o Domestic Effluent Radiation Monitor
- o Reactor Building Closed Cooling Water Monitor
- o Radwaste Overboard Discharge Radiation Monitor
(Radioactive Liquid Effluent Monitor)
- o Air Ejector Offgas Monitor
- o Main Stack Noble Gas Monitors (RAGEMS, Low and High Range)
- o Turbine Building Noble Gas Monitors (RAGEMS, Low and High Range)

The I&C Department had the responsibility to perform electronic and radiological calibrations for the above monitors. The reviewed calibration results were within the licensee's acceptance criteria. The radwaste overboard discharge radiation monitor has been inoperable since 1982 (See Section 5.5 of this report for details).

During the review of these calibration results, the inspector noted that the licensee did not yet have a complete set of surveillance procedures for the stack and turbine building RAGEMS. Surveillance procedures completed were written based on the startup test procedures and results. The majority of the surveillance procedures were written and calibrations were conducted using these procedures. The inspector reviewed these calibration results. Several surveillance procedures were not written at the time of this inspection. The inspector, therefore, reviewed the calibration results for the startup test surveillance of these monitors. All reviewed calibration and test results for these monitors were within the acceptance criteria. However, the

inspector noted that some functional tests and calibrations for these monitors were past their due dates or were close to the end of the testing and calibration grace periods (an additional 25% of the required time period). The inspector stated that the completion of surveillance procedures and results of calibration and functional tests for the stack and the turbine building RAGEMS will be reviewed during a subsequent inspection. No violations were identified.

5.5 Radwaste Overboard Discharge Radiation Monitor

The inspector reviewed the following procedures and the last calibration results for the radwaste overboard discharge monitor.

621.3.012, "Radwaste Overboard Discharge Radiation Monitoring System Channel Test", Rev. 3, April 12, 1986, Last Test Date; August 26, 1982

621.3.014, "Radwaste Overboard Discharge Radiation Monitoring System Channel Calibration", Rev. 2, June 7, 1985, Last Calibration Date; July 28, 1982

621.4.013, "Radwaste Overboard Discharge Radiation Monitoring System - Daily Check", Rev. 2, February 18, 1985, Last Check Date; August 22, 1982

The inspector noted that results of the above channel test, calibration, and daily check were within the licensee's acceptance criteria. The licensee declared that the monitor was inoperable in October 1982 and submitted the job order for repair in November 1982 (JO #82-0125RI). The inspector noted that there was no evidence of repair or attempt to repair this monitor during this inspection. On October 10, 1984, the licensee removed the calibration requirement of this monitor from the Master Surveillance Schedule based on the Engineering Task #82-632 and the Technical Function TFWR A00292.

On October 6, 1986, the NRC approved the licensee's proposed Radiological Effluent Technical Specifications (RETS). Section 3.3 of the NRC safety evaluation issued on October 6, 1986 states, in part:

The staff (NRC staff) has reviewed the facts concerning the inoperable radioactive liquid and gaseous effluent monitoring instrumentation ... This was done in the meeting with the licensee on August 27 and 28, 1986, on the status of licensing actions for Oyster Creek ... [A]ll the inoperable equipment discussed above will be operable no later than the restart from the Cycle 12R outage. This is acceptable to the staff because the Action statements in the RETS for inoperable equipment are acceptable until this equipment becomes operable.

Therefore, the licensee had responsibility to restore this monitor to implement the requirements of Section 3.15.A of the RETS prior to the Cycle 12R (Cycle 12R restart date: September 30, 1988).

Section 3.15.A.4 of the RETS requires that:

When less than the minimum number of radioactive liquid effluent monitoring instrumentation channels are OPERABLE, take the ACTION shown in Table 3.15.1. Make every reasonable effort to restore the instrument to OPERABLE status within 30 days and, if unsuccessful, explain in the next Semiannual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner.

The ACTION 110 of Table 3.15.1 for the Liquid Radwaste Effluent Line Gross Radioactivity Monitor states that with no channel OPERABLE, effluent may be released provided that: (1) at least two independent samples are taken and analyzed, one prior to discharge and one near the completion of discharge, and (2) before initiating a release qualified personnel must determine the acceptable release rate and proper discharge valving and other qualified personnel independently verify that the release rate and discharge valving are acceptable. The inspector noted that the licensee has been implementing the above ACTION requirements since 1986. The inspector, however, noted that the licensee has not made any reasonable effort to restore the monitor to operable status.

Contrary to the above requirements, the licensee did not meet Section 3.15.A of TS requirements due to the lack of reasonable effort to restore the inoperable radwaste overboard discharge radiation monitor. This is an item of noncompliance of Section

3.15.A of the RETS requirements (50-219/90-13-01). This interpretation of the RETS was confirmed by staff members of the Office of Nuclear Reactor Regulation (NRR).

5.6 Turbine Building Roof Steam Leak

On August 22, 1990, the licensee discovered an unmonitored radioactive steam leak through a pipe (about 2 inches diameter) on the turbine building roof and leaky valves in the turbine building. The detailed pathway of steam is described in Inspection Report Number 50-219/90-16. The inspector, therefore, reviewed the licensee's activities such as sampling technique for iodines, particulates and noble gases; amount of steam release; and dose assessment for the public. The inspector toured the steam leak pathway. During this tour, the licensee demonstrated the sampling technique for noble gases, iodine, and particulates for the event.

The licensee took a grab sample for noble gas analysis near the release pipe using a merinelli beaker. Two spouts of the merinelli beaker filled with water were opened at the sampling point and the beaker was tilted to drain the water through a lower spout. After draining all water, the two spouts were closed and the beaker was counted for noble gases using a gamma spectrometry system. The inspector also observed iodine and particulate sampling stations at the leaky valve area during the tour.

The licensee took steam/air mixture samples for iodines and particulates using a charcoal cartridge and a filter paper on the roof and at leaky valve areas inside of the turbine building. The charcoal cartridge and filter paper were counted for iodines and particulates respectively using a gamma spectrometry system.

The licensee measured steam/air velocity at the end of the pipe on the roof using an anemometer. The measured velocity was about 400 ft/minute. The licensee calculated the radioactive steam release rate at the pipe to be about 10 cubic feet per minute (10 cfm). The total amount of release was not determined because the licensee did not know when the steam leak started. The licensee is investigating this matter.

The inspector also reviewed the gamma counting technique at the Radiological Controls Laboratory including the quality control program. The inspector discussed with the licensee the sampling technique for the steam/air sample using a charcoal cartridge.

Iodines could penetrate the charcoal cartridge (breakthrough) when the iodines are mixed with steam. The inspector stated that the steam could block surface area of the charcoal and distribute iodines uniformly throughout the cartridge. Then, an uniform counting geometry must be used to quantify appropriate activity. It appeared that the licensee was not aware of the phenomena. The inspector reviewed source check data for the gamma spectrometry system and noted that the data were within the licensee's acceptance criteria. The inspector noted the licensee did not use this data for a Quality Control chart (QC chart). A QC chart should be used for counting system integrity and trending.

The inspector reviewed analytical results for iodines (I-131, I-132, I-133, I-134, and I-135), noble gases (Xe-135, Xe-135m, and Xe-138), and particulates (Co-60, Cs-138, Rb-89, Te-132, and Ba-139). The analytical results were below the TS limits.

Based on the above, the inspector determined the following conclusions.

- o The sampling technique for the noble gases should be evaluated to ensure that a representative sample is obtained.
- o The sampling time for iodines should be evaluated to avoid breakthrough.
- o Quality control charts should be utilized at the Radiological Controls Laboratory.
- o The practice of air velocity measurement at the release pipe on the roof was excellent and the determination of the steam release rate was appropriate.
- o There was no impact or danger to the environment and the public health and safety during this event.

6.0 Air Cleaning System

The inspector reviewed the licensee's most recent surveillance test results to determine the implementation of the TS requirements. The following inspection and test results for the Standby Gas Treatment System (SGTS) were reviewed.

- 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 this review, the inspector determined that the licensee implemented the requirements for the SGTS effectively. No violations were identified.

7.0 Radiological Environmental Monitoring Program (REMP)

7.1 Program Changes

The inspector reviewed the licensee's organization for the management of the REMP. There were no significant changes in the licensee's REMP since the previous inspection conducted in May 1989.

7.2 Direct Observations

The inspector examined various environmental sampling stations. These stations include air particulate and iodine samplers, thermoluminescent dosimeter (TLD) stations, and the broad leaf vegetation gardens. All air sampling equipment was operational and TLDs were placed at the specified locations. The broad leaf vegetation samples were available at the garden as specified by the ODCM. The inspector noted that the licensee had their own vegetable gardens to ensure sufficient sample collection at the required frequencies.

7.3 Review of Annual Report

The inspector reviewed the Annual Radiological Environmental Report for 1989. This report provided a comprehensive summary of the results of the REMP around the Oyster Creek site and met the TS reporting requirements. The inspector also reviewed available 1990 analytical data for the REMP. Reviewed available analytical data for 1990 appeared to be reasonable and no anomalous data were noted.

7.4 Implementation of the REMP

The inspector reviewed the licensee's REMP to determine whether the program described in the TS is effectively implemented. The

programs reviewed were maintenance and calibration records of air samplers, sampling frequency, sampling techniques for environmental media, and the REMP-plan. All reviewed programs were within the licensee's acceptance criteria. Based on the above review, the inspector concluded that the licensee implemented the REMP effectively.

7.5 Quality Control Program for the REMP Analytical Measurements

The quality control of analytical measurements is conducted by a contractor laboratory, GPUN Environmental Radioactivity Laboratory (GPUN ERL). GPUN ERL participated in the EPA cross-check program. GPUN ERL also conducted internal quality control programs such as split and blind sample analyses. The inspector reviewed the above quality control data for the REMP and determined that the GPUN ERL conducted an acceptable quality control program for analytical measurements. No violations were identified.

7.6 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 the meteorological tower monitoring system and the meteorological tower front panel check procedures. The inspector also reviewed the most recent calibration results for wind speed, wind direction, and delta temperature at the 33ft and 380ft elevation levels. All results reviewed were within the licensee's acceptance criteria. The inspector noted a malfunction in the backup tower temperature sensor during the tour. The licensee stated that this will be replaced with a new, calibrated sensor as soon as possible. Comparisons of the parameters between the monitoring station at the tower and the control room were conducted and the results were in agreement. No violations were identified in this area.

8.0 Exit Interview

The inspector met with the licensee representatives denoted in Section 1.0 of this inspection report at the conclusion of the inspection on August 24, 1990. The inspector summarized the purpose, scope, and findings of the inspection.