

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-219/84-17

Docket No. 50-219

License No. DPR-16 Priority - Category C

Licensee: GPU Nuclear Corporation
Madison Avenue at Punch Bowl Road
Morristown, New Jersey 07960

Facility Name: Oyster Creek Nuclear Generating Station

Inspection At: Forked River, New Jersey

Inspection Conducted: June 4-8, 1984

Inspectors: J. J. Kottan
for C. Jang, Radiation Specialist

6-27-84
date

Approved by: J. J. Kottan
for W. J. Pasciak, Chief, Effluents
Radiation Protection Section,
Radiological Protection Branch

6-27-84
date

Inspection Summary: Inspection on June 4-8, 1984 (Report No. 50-219/84-17)

Areas Inspected: Routine, unannounced inspection of the licensee's chemistry and radiochemistry programs using laboratory assistance provided by DOE Radiological and Environmental Sciences Laboratory. Areas reviewed included: program for quality control of analytical measurements, training, management controls, audit results, and analytical procedures for chemistry and radiochemistry. The inspection involved 32 inspector-hours onsite by one NRC regionally based inspector.

Results: Of the five areas inspected, no items of noncompliance were identified.

DETAILS

1. Individuals Contacted

- D. Chen, Chemistry Group Supervisor
- *P. Fiedler, Vice President/Director of Site Operations
- *C. Halbfoster, Manager-Plant Chemistry
- R. Hillman, Chemistry Group Supervisor
- *B. Hohman, Licensing Engineer
- J. Knight, Sr. Chemist
- R. Mockridge, Chemistry Technical Analyst
- J. Perline, Chemistry Instructor, Training Department
- R. Pleva, Chemistry Technician
- R. Stoudnour, Sr. Chemical Engineer
- *J. Sullivan, Plant Operations Director
- *C. Tracey, QA-Manager-MOD/OPS

The inspector also interviewed other licensee employees.

*Denotes those present at exit interview on June 8, 1984.

2. Licensee Action On Previous Inspection Findings

(Closed) Noncompliance (219/82-24-01): Failure to follow Procedures 807.1, 807.6, 807.7, 807.9, 809.3, 809.5, and 908.2. The inspector reviewed modified procedures, verified records and determined that corrective actions were adequate.

(Closed) Noncompliance (219/82-24-02): Improperly calibrated Ge(Li) detector. The inspector reviewed new calibration results and found corrective actions to be adequate.

(Closed) Followup Items (219/82-24-03 and 219/82-24-05): Retrieval of tritium counting data. The tritium counting data are attached to the activity calculation sheet.

(Closed) Followup Item (219/82-24-04) Malfunctioning of the Single Channel Analyzer. The licensee issued a new procedure (Procedure Number 826.3) including instrument function check and the acceptance criteria.

(Closed) Noncompliance (219/82-24-06): Failure to review and approve vendor procedures for tritium and strontium analyses. The licensee reviewed and approved vendor's procedures for tritium and strontium analyses.

(Closed) Noncompliance (219/82-24-07): Failure to review and approve health physics Ge(Li) System. Procedures for operation and calibration of health physics gamma spectrometry system were reviewed and approved as required.

3. Management Controls

The inspector reviewed the organization for administration of the Chemistry Operations. The Chemistry Group was transferred from Plant Engineering to Plant Operations on May 12, 1982. The licensee developed Procedure 106.6, "Conduct of Chemistry Operations", and issued it on August 30, 1982. On November 17, 1983, Revision 3 was issued and Procedure 106.6 was in effect on February 24, 1984 to provide general rules and responsibilities for all chemistry personnel.

The Chemistry Group consists of the Plant Chemistry Manager, Senior Chemist, Senior Chemical Engineer, Chemistry Technical Analyst, two Chemistry Group Supervisors, and sixteen technicians. Six supervisory/engineer personnel have B.S. Degrees and two supervisory personnel have M.S. degrees. At the present time all positions are filled. All Chemistry personnel report to the Plant Chemistry Manager and the Plant Chemistry Manager reports to the Plant Operations Director who reports to the Vice President/Director of Site Operations.

The inspector reviewed a report "Chemistry Upgrade Program Report", dated June 1, 1984. This report provides substantial information relating to management controls for the Chemistry Operations including in-house audit program, daily inspection of the chemistry laboratory, management observations of sampling and analysis, daily review of chemistry data, and on-the-job training.

No items of noncompliance were identified.

4. Audit Results

The inspector reviewed Audit Number S-OC-83-09 performed by the Site Audit Group on October 4, 1983. Areas audited were the chemistry organization, chemistry program, instrument calibration, qualification of technicians, and audit followups. The inspector also reviewed audit check lists, preparations, findings, and recommendations and determined that the audit findings and recommendations were appropriate.

No items of noncompliance were identified in this area.

5. Training Program

The licensee's training program for chemistry personnel was reviewed. The licensee has two training programs: class and laboratory training given by the Training Department, and on-the-job training given by the qualified personnel.

The inspector toured the chemistry laboratory which was established in January 1984 for training. The Training Department has responsibilities to maintain the chemistry training laboratory. The following instruments are kept in the laboratory: ion chromatograph, total organic carbon analyzer, pH meter, spectrophotometer, analytical balance, turbidimeter, conductivity bridge, hood, glassware, emergency shower, and teaching aids

such as overhead projector and video tapes. A gamma spectrometry system will be added during June 1984 for training. A counting laboratory is shared with the health physics training program. The training program requires that technicians pass selection examinations and procedure qualifications. Every two years technicians take a requalification training course and are also required to pass written and oral examinations.

The inspector also reviewed selected on-the-job training materials and found them to be adequate.

No items of noncompliance were identified.

6. Laboratory QC Program

The inspector discussed with the licensee the program for the quality control of analytical measurements. The adequacy and effectiveness of the licensee's nonradiological and radiological chemistry quality control programs were reviewed including the following procedures:

- 822.2 Quality Control-Instrumentation,
- 822.3 Quality Control-Chemicals and reagents,
- 822.4 Quality Control-Analytical Method,
- 822.5 Quality Control-Analyst Performance, and
- 822.6 Quality Control-Vendor Laboratory.

Quality control programs require instrument performance checks, QC samples for intralaboratory and interlaboratory comparisons, and review of analytical results. The inspector reviewed instrument performance checks for the liquid scintillation counter, the proportional counter, and the gamma spectrometry system. The inspector noted that the licensee did not keep a QC log book and control charts for the gamma spectrometry system as there was no requirement, but the acceptance criteria for the counting efficiencies, full width at half maximum, and energy gain were stored by computer and are flagged if there are outliers. Four supervisory personnel reviewed the QC data for the gamma spectrometry system daily. The inspector discussed the importance of the QC log and control charts and Regulatory Guide 4.15, Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment with the licensee. The licensee stated that procedures to the gamma spectrometry system will be reviewed and modified to assure that the QC log book and control charts are appropriately updated. All other QC requirements were implemented in the laboratory.

The inspector reviewed the first quarter report for 1984 in the area of chemistry quality control during this inspection. This report had five major sections: instrumentation, chemical and reagents, analytical methods, analyst performance, and vendor laboratory. Interlaboratory and intralaboratory comparisons were also included in the report. The inspector found that the QC Quarterly Report was a valuable aid in the review of the QC activities of the Chemistry Program.

No items of noncompliance were identified.

7. Analytical Procedures

The inspector reviewed the licensee's analytical chemistry procedures. The inspector noted that the majority of procedures were rewritten since the last inspection. All rewritten procedures generally followed the ANSI N18.7-1976 recommended format.

In reviewing Procedure 803.47, "Sampling for Total Tritium Content in Air", dated April 3, 1978 the inspector noted that the collection efficiency for tritium was not specified. The inspector, therefore, discussed the collection efficiency with the licensee. The licensee purchased a tritium gaseous effluent sampler recently (SAI Model ACT-100) which will be in use once the procedure is approved. The tritium collection efficiency for the SAI Model ACT-100 is $99\pm 1\%$.

The inspector observed chloride analysis and noted that the technician followed the procedure as written.

No items of noncompliance were identified.

8. Confirmatory Measurements

One liquid sample was obtained for analyses of gross alpha, tritium, and Sr-90. This sample was sent to the NRC reference laboratory, Department of Energy, Radiological and Environmental Sciences Laboratory. The analytical results will be compared with the licensee's results when received at a later date, and will be documented in a subsequent inspection report.

The results of an effluent sample split between the licensee and NRC:I during a previous inspection on October 5-8, 1982 (Inspection Number 82-24) were compared during this inspection and are listed in Table 1. The results of tritium and Sr-90 were in agreement and Sr-89 was in disagreement under the new criteria used for comparing results (See Attachment 1). The licensee vendor laboratory did not perform gross alpha analysis. In reviewing Sr-89 analytical raw data the inspector noted that the licensee's vendor laboratory used an incorrect sampling date for the decay correction. The licensee, therefore, corrected for decay using the correct sampling date but the result was still in disagreement. The ratios (Sr-89/Sr-90) of the NRC and the licensee's values were 2.5 and 1.1, respectively.

The inspector stated that the low ratio would not likely be obtained for actual in-plant samples. The licensee stated that strontium analytical results will be reviewed thoroughly in the future.

The licensee had a new vendor laboratory contract and the inspector reviewed strontium procedure which is used by the new vendor laboratory and found that the procedure was adequate. The inspector had no further questions in this area.

No items of noncompliance were identified in this area.

8. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on June 8, 1984. The inspector summarized the purpose and scope of the inspection and the inspector findings.

The licensee agreed to perform the analyses listed in Paragraph 7 and report the results to the NRC. At no time during this inspection was written material provided to the licensee by the inspector.

TABLE 1

<u>SAMPLE</u>	<u>ISOTOPE</u>	<u>NRC VALUE</u>	<u>LICENSEE VALUE</u>	<u>COMPARISON</u>
<u>RESULTS IN MICROCURIES PER MILLIMETER</u>				
Drywell Sump 10-6-82 1330	H-3	(5.42±0.02)E-3	(4.86±0.49)E-3	Agreement
	Sr-90	(9.5±0.8)E-8	(1.01±0.10)E-7	Agreement
	Sr-89	(2.4±0.2)E-7	(1.14±0.11)E-7	Disagreement
	Gross Alpha	(4.2±0.5)E-9	Not Performed	No Comparison

ATTACHMENT 1

Criteria for Comparing Analytical Measurements

This attachment provides criteria for comparing results of capability tests and verification measurements. The criteria are based on an empirical relationship which combines prior experience and the accuracy needs of this program.

In these criteria, the judgement limits are variable in relation to the comparison of the NRC Reference Laboratory's value to its associated uncertainty. As that ratio, referred to in this program as "Resolution", increases the acceptability of a licensee's measurement should be more selective. Conversely, poorer agreement must be considered acceptable as the resolution decreases.

$$\text{Resolution} = \frac{\text{NRC REFERENCE VALUE}}{\text{REFERENCE VALUE UNCERTAINTY}}$$

$$\text{Ratio} = \frac{\text{LICENSEE VALUE}}{\text{NRC VALUE}}$$

<u>Resolution</u>	<u>Agreement</u>
<3	0.4 - 2.5
4-7	0.5 - 2.0
8-15	0.6 - 1.66
16-50	0.75 - 1.33
51-200	0.80 - 1.25
>200	0.85 - 1.18