



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA ST., N.W., SUITE 3100
ATLANTA, GEORGIA 30303

Report No. 50-416/81-54

Mississippi Power and Light Company
P. O. Box 1640
Jackson, MS 39205

Facility Name: Grand Gulf Nuclear Station

Docket Nos. 50-416

Inspection at: Port Gibson, MS

Inspectors:

C. D. Evans
C. D. Evans

1/11/82
Date Signed

D. M. Montgomery
D. M. Montgomery

1/12/82
Date Signed

Approved by:

J. P. Stohr
for J. Philip Stohr, Chief, EPPS

1/22/82
Date Signed

SUMMARY

Inspection on December 15-18, 1981

Areas Inspected

This routine unannounced inspection involved 52 inspector-hours on site in the areas of quality control for radiochemistry and chemistry including a review of the quality control program and capability tests for the measurement of radioactive effluents.

Results:

Of the two areas inspected, no violations or deviations were identified in two areas.

DETAILS

1. Persons Contacted

Licensee Employees

- *G. B. Rogers, Plant Manager
- *C. L. Stuart, Asst. Plant Manager
- *R. D. Brown, Plant Chemist
- *D. L. Oltmans, G. E. Startup Chemist
- *J. W. Yelverton, Q.A. Supervisor
- *R. R. Weedon, Chemistry/Radiation Control Supervisor
- D. Ortiz, Lead Lab Chemist

Other licensee employees contacted included three technicians.

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on December 19, 1981 with those persons indicated in paragraph 1 above.

3. Unresolved items were not identified during this inspection.

4. Program for Quality Control of Radioactive Effluent Measurements

Proposed Technical Specification 6.8.1.c requires that written procedures be established, implemented, and maintained for a Quality Assurance program for effluent and environmental monitoring using the guidance in Regulatory Guide 4.15, December 1977. The inspector reviewed the quality assurance program for effluent monitoring with respect to meeting the general guidance of Regulatory Guide 4.15 covering the following areas:

- a. Organizational Structure - The Grand Gulf Nuclear Station (GGNS) Chemistry Section organization is delineated in plant procedure, "Qualification of Chemistry Program". The procedure assigns authorities, duties, and responsibilities of positions within the Chemistry Section from the managerial position of Plant Chemist down to the operational positions of Assistant and Junior Chemist.
- b. Qualifications of Personnel - The qualifications of individuals performing radiological monitoring are specified in plant procedure, "Qualification of Chemistry Personnel". The inspector noted that all members of the Chemistry Section meet the specifications defined in the procedure.

c. Operating Procedures

The inspector verified that written procedures have been established and implemented for activities involved in effluent monitoring and radio-chemical analyses including sample collection frequency, operation and calibration of instrumentation, and quality control checks.

d. Quality Control in the Radiochemistry Laboratory

(1) Calibration of Radiation Measurement Systems

The licensee is using calibration standards that are traceable to NBS for calibration of radiation measurement systems used in quantification of radioactive effluents. The inspector noted that the licensee did not have a procedure for the preparation of the calibration standards from certified standard solutions for the Ge(Li) gamma spectroscopy system. A licensee representative agreed to develop a procedure. The inspector stated that the procedure would be reviewed during a subsequent inspection. (81-54-01)

(2) Performance Checks of Radiation Measurements

Performance checks recommended in Regulatory Guide 4.15 are specified along with frequency in appropriate radiochemical procedures.

(3) Intralaboratory Analyses

Spiked samples and blanks are required to be analyzed on a routine schedule per appropriate radiochemical procedures.

(4) Interlaboratory Analyses

The licensee has not made arrangements to institute a cross-check program with an independent laboratory for radiation measurement comparisons. A licensee representative indicated that consideration was being given to a cross-check program between the licensee and members of the Mid-South Utilities. This area will be reviewed during a subsequent inspection. (81-54-02)

(5) Documentation and Verification of Computer Programs

Documentation and Quality Control of the gamma spectral peak search program is specified in procedure 08-S-04-212, "Germanium Spectroscopy Software". Documentation of the effluent accountability programs was not finalized at the time of inspection. The inspector noted that the documentation of the computer programs

did not include computational verification of the results. A licensee representative stated that the effluent accountability programs were still being developed and would be verified upon completion. This area will be reviewed during a subsequent inspection. (81-54-03)

e. Audits of the Quality Assurance Program

The Grand Gulf Quality Control Staff carries out periodic surveys of the chemistry and radiochemistry program as specified in 12-S-01-4, "Conduct of Program Reviews". These surveys include a review of compliance with Technical Specifications and Operating Procedures. Administrative Procedure 01-S-03-2, "Plant Quality Deficiency Reports" provide guidelines for reporting and correcting adverse conditions that are identified by these surveys.

Proposed Technical Specification 6.5.2.8.o requires that an audit be performed of activities required by the Quality Assurance Program to meet the criteria of Regulatory Guide 4.15, at least once per 12 months. The individuals performing the audit shall be qualified in radiochemistry and should not have direct responsibilities in the GGNS Chemical Section. A licensee representative indicated that provision for the annual audit has not been made by the Corporate Quality Assurance staff. This area will be reviewed during a subsequent inspection. (81-54-04)

5. Audits

The inspector reviewed Quality Assurance Monitoring Audit Report 81/97. The audit addressed the capability of the GGNS Chemistry Section to support pre-operational testing of plant service and makeup water systems. This audit was not intended to meet criteria of Regulatory Guide 4.15 as discussed in paragraph 4.e.

6. Review of Chemical and Radiochemical Procedures

Technical Specification 6.8.1 requires that written procedures be established, implemented, and maintained for the activities recommended in Appendix "A" of Regulatory Guide 1.33, Revision 2, February 1978. Appendix "A" specifies the need for chemical and radiochemical control procedures.

The inspector reviewed applicable procedures that had been finalized at the time of inspection. However, procedures for strontium-89, strontium-90, and iron-55 were under revision at the time of inspection. A licensee representative stated that these procedures were in the review stage and would be completed prior to plant operation. These procedures will be reviewed during a subsequent inspection. (81-54-05)

The inspector reviewed the following procedures and had no further questions:

- a. 08-S-04-200, Operation of Ge(Li) Counting System
- b. 08-S-04-212, Germanium Spectroscopy Software
- c. 08-S-04-203, Off-gas Vial Sampling
- d. 08-S-04-209, Charcoal and Particulate Vent Sampling
- e. 08-S-04-14, Sample Preparation for Counting
- f. 08-S-04-207, Operation of Tri-Carb 460C Liquid Scintillation
- g. 08-S-03-10, Chemistry Sampling Program
- h. 06-CH-SV41-M-003, Radwaste Building Ventillation Exhaust Gaseous Tritium
- i. 06-CH-SV41-M-0013, Radwaste Building Building Ventillation Exhaust Gaseous Isotopic
- j. 06-CH-1B21-W-0002, Reactor Coolant Routine Chemistry
- k. 08-S-03-1, Rev. 2, Qualification of Chemistry Program
- l. 08-S-04-2, Rev. 1, Qualification of Chemistry Personal
- m. 08-S-04-216, Liquid Tritium Samples
- n. 08-S-04-400, Chemical Additions to Plant
- o. 08-S-04-214, Operation of Well Counter
- p. 08-S-04-311, Gaseous Tritium
- q. 08-S-03-3, Document Control
- r. 08-S-04-213, Quality Control Software
- s. 06-CH-IN62-H-005, Off Gas Hydrogen Concentration

7. Radioanalytical Instrumentation

The inspectors toured the counting room and verified that the counting room instrumentation is adequate to perform required radioactive effluent measurements. Instrumentation included: three Ge(Li) detectors interfaced to two computer-based multichannel analyzer systems; two low background gas flow proportional counters; and an automatic liquid scintillation spectrometer.

In conjunction with review of radiochemical procedures, the inspector determined that the licensee has the capability to meet the Technical Specifications for sensitivity in effluent measurements.

8. Capability Tests

The inspector provided the licensee with a simulated charcoal cartridge and particulate filter for analysis by gamma-ray spectroscopy. The licensee was also provided with a simulated liquid waste sample prepared by the NRC contract laboratory for gamma spectroscopy, tritium, and strontium 89 and 90 analyses. These analyses serve to verify the licensee's capability to measure radionuclides in effluent samples. The results of the licensee's gamma spectroscopy analyses and comparison to NRC values are presented in Table 1 with the acceptance criteria in attachment A. The results show "agreement" for all radionuclides. The licensee had not completed the tritium and strontium 89 and 90 analyses for the simulated liquid waste sample, but agreed to submit results to NRC:II upon completion. The results will be reviewed during a subsequent inspection. (81-54-06)

TABLE 1
RESULTS OF CONFIRMATORY MEASUREMENTS AT GRAND GULF, DECEMBER 15-19, 1981
Concentration, Microcuries

<u>Sample</u>	<u>Isotope</u>	<u>Grand Gulf</u>	<u>NRC</u>	<u>Ratio</u>	<u>Resolution</u>	<u>Comparison</u>
Spiked Charcoal Cartridge	Ba-133	5.64 E-2	6.01±.1 E-2	.93	55	Agreement
Spiked Particulate Filter	Co-57	6.91 E-4	6.3±.2 E-4	1.10	31	Agreement
	Cs-134	1.57 E-3	1.40±.05E-3	1.12	28	Agreement
	Cs-137	4.60 E-3	4.1±.1E-3	1.13	44	Agreement
	Co-60	2.45 E-3	2.13±.06E-3	1.15	34	Agreement
		Concentration, Microcuries/ml.				
DOE Simulated Liquid Waste	Co-57	1.16 E-4	1.13±.03E-4	1.02	38	Agreement
	Cs-134	1.99 E-3	1.81±.03E-3	1.10	60	Agreement
	Co-60	3.75 E-3	3.52±.09E-3	1.06	39	Agreement

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 judgment 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.

$$\text{RATIO} = \frac{\text{LICENSEE VALUE}}{\text{NRC REFERENCE VALUE}}$$

<u>Resolution</u>	<u>Agreement</u>	<u>Possible Agreement A</u>	<u>Possible Agreement B</u>
<3	0.4 - 2.5	0.3 - 3.0	No Comparison
4 - 7	0.5 - 2.0	0.4 - 2.5	0.3 - 3.0
8 - 15	0.6 - 1.66	0.5 - 2.0	0.4 - 2.5
16 - 50	0.75 - 1.33	0.6 - 1.66	0.5 - 2.0
51 - 200	0.80 - 1.25	0.75 - 1.33	0.6 - 1.66
>200	0.85 - 1.18	0.80 - 1.25	0.75 - 1.33

"A" criteria are applied to the following analyses:

Gamma Spectrometry where principal gamma energy used for identification is greater than 250 Kev.

Tritium analyses of liquid samples.

"B" criteria are applied to the following analyses:

Gamma Spectrometry where principal gamma energy used for identification is less than 250 Kev.

⁸⁹Sr and ⁹⁰Sr Determinations.

Gross Beta where samples are counted on the same date using the same reference nuclide.