



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

Report No. 50-335/82-14

Licensee: Florida Power and Light Company
P. O. Box 529100
Miami, FL 33152

Facility Name: St. Lucie 1

Docket No. 50-335

License No. DPR-67

Inspection at St. Lucie site near Ft. Pierce, FL

Inspector: *D. M. Montgomery for* 5-20-82
C. D. Evans Date Signed

Accompanying Personnel: P. E. McPhail

Approved by: *D. M. Montgomery* 5-20-82
D. M. Montgomery, Chief Date Signed
Independent Measurements and
Environmental Protection Section
EPOS Division

SUMMARY

Inspection on April 19-22, 1982

Areas Inspected

This routine, unannounced inspection involved 30 inspector-hours on site in the areas of quality control and confirmatory measurements including: review of the laboratory quality control program; review of chemistry and radiochemistry procedures; airborne effluent sampling and accountability; and comparison of the results of split samples analyzed by the licensee and the NRC RII Mobile Laboratory.

Results

Of the 5 areas inspected, no violations or deviations were identified in 5 areas.

8206220581 820524
PDR ADOCK 05000335
Q PDR

DETAILS

1. Persons Contacted

Licensee Employees

- *N. G. Rous, Quality Control Supervisor
- *D. A. Sager, Operations Supervisor
- *A. W. Bailey, Quality Assurance Operations Supervisor
- *R. P. Frechette, Chemistry Supervisor
- *R. E. Cox, Chemistry Foreman

Other licensee employees contacted included one technician.

NRC Resident Inspector

- *S. A. Elrod

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on April 22, 1982, with those persons indicated in paragraph 1 above.

3. Licensee Action on Previous Inspection Findings

(Closed) Unresolved (335/81-07-02) Retention of instrument performance checks. The inspector was informed by licensee representatives that they have no regulatory requirements or procedural requirements to retain instrument performance checks. The inspector stated that performance checks should be maintained for the period between recalibration, as a minimum. The inspector also noted during this inspection that gamma spectral analysis data associated with grab samples from plant effluent releases are not kept as part of the permanent radioactive release records. The inspector stated that the discarding of the gamma spectral analysis data prevents evaluating possible discrepancies that might result later concerning effluent releases. The inspector noted that the licensee is meeting regulatory requirements for record retention and this item is considered closed.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Laboratory Quality Control Program

The inspector reviewed the licensee's quality control program for chemical and radiochemical measurements in the following areas:

a. Assignment of Responsibility to manage and conduct the QC Program.

The requirements for the chemistry quality control program are given in QI 12 PR/PSL-5, "Chemistry Measuring and Testing Equipment." The responsibility for managing the quality control program is assigned to the Chemistry Supervisor who is responsible for the following:

- (1) In-calibration status of chemistry and environmental M&TE, reference standards, test standards and reference sources according to approved procedures.
- (2) Identification in listings, logs, or schedules all M&TE, reference standards, and reference sources.
- (3) Maintenance of current records, calibration data, and status of items listed in (2).
- (4) Establishment of calibration cycles and a recalibration program.
- (5) Investigation, where possible, of the consequences due to the use of nonconforming M&TE and reference standards.
- (6) Training chemistry personnel in proficient use of items (1) through (5).

The specific requirements for test calibrations are detailed in Chemistry Operating Procedure C-02, "Schedule for Test Calibrations." This procedure provides instructions for scheduling and performing calibrations and calibration checks as well as the management system to ensure that the schedules are met.

b. Provisions for Audits/Inspections

Procedure QI 18-PR/PSL-2, "Quality Control Surveillances", provides that surveillances be carried out to assure that the plant systems or equipment are tested, operated, controlled or maintained according to approved plant procedures, technical specifications, regulatory requirements and FP&L Quality Assurance Manual requirements. The Quality Control Supervisor is responsible for scheduling and carrying out Quality Assurance Surveillances.

c. Methods for Assuring Deficiencies and Deviations in the Program are Recognized, Identified, and Corrected.

The Chemistry Supervisor is responsible for identifying and correcting deficiencies that are identified by the Quality Control program. In addition, the Quality Control Surveillances that are carried out by the Quality Control personnel provide for documentation of all nonconforming or deficient items. Procedure QI 18-PR/PSL-2 also provides for assuring that corrective actions are carried out, reviewed and verified prior to close out.

d. Review of Quality Assurance Audits

The inspector reviewed the most recent audit report (No. QAO-PSL-81-09-229) conducted by the Corporate Quality Assurance Department of the Radiochemistry Department. The scope of the audit was to verify implementation of applicable onsite portions of the St. Lucie Unit 1 radiological effluent technical specifications. No items of non-compliance were identified in the audit. The inspector noted that the audit does not address laboratory quality controls that would insure valid radiological effluent measurements.

6. Review of Chemistry and Radiochemistry Procedures

a. The inspector reviewed the following procedures:

- (1) C-48A, "Operation of the ND 6685 Computer Based Counting System," 11-11-81.
- (2) C-40, "Determination of Tritium", 1-15-82.
- (3) C-37, "Determination of Gases N₂, O₂, H₂)", 3-12-82
- (4) C-38, "Calibration of Flow Measuring Devices", 4-4-80.
- (5) C-01, "Schedule for Periodic Tests", 1-15-81.
- (6) C-41, "Determination of Iodine", 6-5-81.
- (7) C-72, "Processing Gaseous Wastes", 8-31-81.
- (8) C-16, "Determination of Hydrazine", 4-8-82.
- (9) C-42, "Chemical Separation of Strontium and Barium", 1-10-79.

The procedure review was discussed with licensee representatives as discussed in paragraphs 6b-6d.

- b. The inspector reviewed Procedure C-72, "Processing Gaseous Wastes" and noted that decay corrections for radioiodine were made at the midpoint of the sampling period. This closes a previously identified item (335/81-07-02).
- c. This inspector noted that Procedure C-72 specified an efficiency of 75% for the collection of tritiated vapor by the gas sampling impinger. The inspector noted that this valve was probably conservative and that tests to determine a more representative valve of sampling conditions should be done. Licensee representatives agreed to perform an evaluation of the collection efficiency of the gas sampling impinger. This area will be reviewed in a subsequent inspection (50-335/82-14-01).

- d. The inspector reviewed Procedure C-40, "Determination of Tritium", and noted that liquid composite samples were distilled to separate the tritiated water from interfering radionuclides prior to analysis. This closes a previously identified item (335/81-07-03).

7. Review of Records and Logs

- a. The inspector reviewed the following records and logs:

- (1) Geometry Calibration Curves

- (a) 4-liter marinelli, 6-10-81.
- (b) RCS 16 ml. glass vial, 2-9-82.
- (c) 4600 ml. gas marinelli beaker, 3-18-82.
- (d) 95 ml. gas chamber, 3-19-82.

- (2) Waste Gas Decay Tank Release Permits 82-14 through 82-17, 3-27-82 to 4-9-82.

- (3) Daily Ge(Li) Resolution and Response Checks, 3-31-82 to 4-16-82.

- (4) Daily Tritium Efficiency Determination, 3-25-82 to 4-10-82.

- (5) Beer's Law Calibration Curves for Spectronic 70.

- (a) Silica, 12-22-81.
- (b) Chromate, 1-26-81.
- (c) Hydrazine, 9-8-80.

- b. The inspector noted that the calibration curve for the determination of hydrazine by absorption measurements using the Spectronic 70 spectrophotometer was more than a year old. The inspector was informed by a licensee representative that no recalibration had been done as this analysis is used only during start-up when hydrazine is added to the primary coolant for oxygen control. The inspector expressed concern that there may not be adequate procedural control to insure a recalibration before the next start-up. Licensee representatives indicated they would evaluate the concern identified by the inspector. This area will be reviewed in a subsequent inspection (50-335/82-19-02).
- c. The inspector determined from discussions with licensee representatives that the charcoal cartridges used for radioiodine sampling were not TEDA impregnated and may not be as efficient for organic radioiodine species. The inspector noted that collection efficiencies for cartridges in use should be tested or documented for the radioiodine species actually released or expected to be released. Licensee representatives indicated that they would evaluate the area of concern identified by the inspector. This area will be reviewed in a subsequent inspection (50-385/82-14-03).

8. Confirmatory Measurements

- a. Liquid and gaseous samples were collected during this inspection and counted by the licensee and the NRC RII Mobile Laboratory to verify the licensee's capability to measure radionuclides in effluent and reactor coolant samples. Samples were analyzed by gamma ray spectroscopy and included: a liquid waste holdup tank sample, reactor coolant sample, crud filter sample, containment gas sample, and a containment charcoal cartridge. The crud filter was counted in lieu of a particulate filter since a particulate filter with sufficient activity for analysis was not available. The comparisons of licensee and NRC results are presented in Table 1 with acceptance criteria in Attachment 1. The results show agreement for all samples. An aliquot of the liquid sample was sent to the NRC contract laboratory for tritium and radiostrontium analyses. The results will be compared to licensee results in a subsequent inspection report (50-388/82-14-04).

- b. The inspector reviewed licensee results for H-3, Sr-89 and Sr-90 analyses of a spiked sample prepared by the NRC contract laboratory. The comparison of licensee results with the values of the spiked sample are given in Table 2, with acceptance criteria in Attachment 1. The comparisons shows "possible agreement" for H-3, "agreement" for Sr-89, and "disagreement" for Sr-90. No reason could be found to explain the 32% higher value for H-3 reported by the licensee. The inspector noted that the efficiency determination in Procedure C-42, "Chemical Separation of Strontium and Barium", did not involve the preparation of separate standards for Sr-89, Sr-90, and Sr-90/Y-90 in the same geometry as the separated sample which may attribute to the "disagreement" for Sr-90. A licensee representative agreed to evaluate the methodology for the efficiency determination and to analyze another spiked sample to be provided by the NRC. This area will be reviewed in a subsequent inspection report (50-335/82-19-05).

TABLE 1

RESULTS OF CONFIRMATORY MEASUREMENTS AT ST. LUCIE, APRIL 19, 1982

SAMPLE	NUCLIDE	CONCENTRATION, MICROCURIES/CC. LITRE/SEC	NRC	RATIO	RESOLUTION	COMPARISON
Reactor Coolant Millipore Filter	Co-60	1.07 E-04	1.04 ± .02 E-04	1.03	52	Agreement
	Co-58	5.62 E-04	4.76 ± .04 E-04	1.18	119	Agreement
	Cr-51	4.20 E-04	3.71 ± .10 E-04	1.13	37	Agreement
	Nb-95	2.93 E-05	2.63 ± .12 E-05	1.11	22	Agreement
	Zr-95	3.70 E-05	2.74 ± .17 E-05	1.35	16	Possible Agreement
Waste Gas Holdup Tank Gas Vial	Xe-133	2.41 E-00	2.33 ± .003 E-00	1.03	776	Agreement
	Xe-133m	1.66 E-02	1.44 ± .04 E-02	1.15	36	Agreement
	Xe-135	1.96 E-04	1.88 ± .23 E-04	1.04	8	Agreement
Containment Gas Gas Marinelli	Xe-133m	8.74 E-06	8.49 ± .40 E-06	1.03	21	Agreement
	Xe-133	8.74 E-04	8.63 ± .02 E-04	1.01	431	Agreement
	Xe-135	1.61 E-05	1.43 ± .01 E-05	1.12	143	Agreement
	Xe-131m	1.02 E-05	6.29 ± 1.3 E-06	1.61	5	Agreement
	Mn-54	N.D.	1.40 ± .55 E-06	N.C.	3	N.C.
Liquid Waste Holdup Tank	Co-58	3.33 E-05	3.40 ± .09 E-05	.98	38	Agreement
	Co-60	1.40 E-04	1.48 ± .02 E-04	.94	74	Agreement
	I-131	N.D.	7.22 ± 4.8 E-07	N.C.	2	N.C.
	Cs-137	1.13 E-04	1.07 ± .01 E-04	1.06	1.07	Agreement
	Cs-134	5.30 E-05	4.87 ± .11 E-05	1.09	44	Agreement
Reactor Coolant Unit 1	I-131	3.60 E-02	2.99 ± .04 E-2	1.20	75	Agreement
	I-133	2.89 E-02	2.42 ± .04 E-2	1.19	61	Agreement
	I-135	1.31 E-02	1.20 ± .2 E-2	1.09	6	Agreement
	Cs-137	1.31 E-02	1.21 ± .2 E-2	1.08	6	Agreement
Plant Vent Charcoal Cartridge	I-131	1.05 E-02	1.10 ± .01 E-02	0.95	110	Agreement

ND - Not Detected
 NC - No Comparison

TABLE 2
RESULTS OF SPIKED SAMPLE ANALYSES

SAMPLE	ISOTOPE	CONCENTRATION, MICROCURIES/CC.		ST. LUCIE/NRC	RESOLUTION	COMPARISON
		ST. LUCIE	NRC			
RESL Spike	H-3	8.25 E-3	6.22±0.06 E-3	1.32	104	Possible Agreement
	Sr-89	7.7 E-3	7.38±.08 E-3	1.04	92	Agreement
	Sr-90	8.2 E-5	5.87±.24 E-04	.15	24	Disagreement

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.