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

APR 7 1980

In Reply Refer To:
RII:DMM
50-335/80-1

Florida Power and Light Company
ATTN: R. E. Uhrig, Vice President
Advanced Systems and Technology
P. O. Box 529100
Miami, FL 33152

Gentlemen:

This refers to the inspection conducted by D. M. Montgomery of this office on February 25 through March 13, 1980 of activities authorized by NRC License No. DPR-67 for the St. Lucie facility, and to the discussion of our findings held with J. H. Barrow at the conclusion of the inspection.

Areas examined during the inspection and our findings are discussed in the enclosed inspection report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector.

The Region II Mobile Laboratory was also brought to your site and used by the inspector to make certain independent measurements. The basic purpose of these independent measurements is to verify your capability for analyzing radioactive effluents and to achieve and maintain comparable methods of analyses between your facility and the NRC. The complete data from these measurements will be reported in a subsequent Inspection Report.

Within the scope of this inspection, no items of noncompliance were disclosed.

In accordance with Section 2.790 of the NRC's "Rules of Practice", Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room. If this report contains any information that you (or your contractor) believe to be proprietary, it is necessary that you make a written application within 20 days to this office to withhold such information from public disclosure. Any such application must include a full statement of the reasons on the basis of which it is claimed that the information is proprietary, and should be prepared so that proprietary information identified in the application is contained in a separate part of the document. If we do not hear from you in this regard within the specified period, the report will be placed in the Public Document Room.

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APR 7 1980

Florida Power and Light Company

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Should you have any questions concerning this letter, we will be glad to discuss them with you.

Sincerely,


J. Philip Stohr, Chief
Fuel Facility and Materials
Safety Branch

Enclosure:
Inspection Report No. 50-335/80-1

cc w/encl:
C. M. Wethy, Plant Manager
P. O. Box 128
Ft. Pierce, FL 33450

Nat Weems, Assistant QA Manager
P. O. Box 128
Ft. Pierce, FL 33450



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

Report No. 50-335/80-01

Licensee: Florida Power and Light Company
 9250 West Flagler Street
 Miami, FL 33101

Facility Name: St. Lucie Unit 1

Docket No. 50-335

License No. DPR-67

Inspection at St. Lucie Site near Ft. Pierce, Florida

Inspected by: *G.R. Jenkins*
 for D. M. Montgomery

4/3/80
 Date Signed

for *G.R. Jenkins*
 G. T. Gibson

4/3/80
 Date Signed

Approved by: *G.R. Jenkins*
 G. R. Jenkins, Section Chief, FF&MS Branch

4/3/80
 Date Signed

SUMMARY

Inspection on February 25-26, 1980 and March 10-13, 1980.

Areas Inspected

This routine, unannounced inspection involved 50 inspector-hours onsite in the areas of quality control and confirmatory measurements; including review of chemical and radiochemical procedures; and comparison of radiochemical analyses of split samples by the licensee and the NRC Region II Mobile Laboratory.

Results

Of the three areas inspected, no items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

Licensee Employees

C. M. Wethy, Plant Manager
*J. H. Barrow, Assistant Plant Manager
*R. J. Frechette, Chemistry Supervisor
*R. E. Cox, Chemist
L. Large, Day Shift Health Physics Supervisor
G. Vaux, QC Supervisor
R. R. Jennings, Technical Supervisor
N. Roos, Quality Control

Other licensee employees contacted included 3 technicians.

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on March 13, 1980, with those persons indicated in Paragraph 1 above. The licensee agreed to perform analyses referred to in paragraph 8.b and report the results to NRC:RII.

3. Licensee Action on Previous Inspection Findings

Not inspected.

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 or certification 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. Adequacy of the Quality Control Program for Laboratory Instrumentation.

The inspector reviewed the Quality Control Program for the gamma spectroscopy system as detailed in Chemistry Procedure C-48, "Gamma Spectrum Analysis for Liquids and Gases". The inspector noted the following weaknesses in the quality control program:

- (1) Results of daily performance checks are not recorded.

(2) Background checks or counts are not performed.

(3) Energy Resolution Checks are not made.

A licensee representative agreed to record daily performance checks and to include provisions for examining spectra for evidence of background problems and making background counts when necessary. The licensee representative agreed to review the adequacy of the quality control checks for the gamma spectroscopy systems and address the necessity for energy resolution checks (335/80-01-01).

e. Requirements for Purchased or Contracted Services

A licensee representative stated that there are no purchased or contracted services for chemical or radiochemical analyses.

6. Review of Chemistry Procedures

a. The inspector reviewed the following procedures:

- (1) C-01 "Schedule for Periodic Tests", Rev. 5
- (2) C-02 "Schedule for Test Calibrations", Rev. 3
- (3) C-12A, "Determination of Chloride-Mercuric Nitrate Method (0-0.5 ppm) Rev. 5
- (4) C-13, "Determination of Fluorides", Rev. 4
- (5) C-19B, "Determination of Dissolved Oxygen (Indigo Carmine), Rev. 1
- (6) C-35, "Determination of Boron", Rev. 3
- (7) C-40, "Determination of Tritium", Rev. 5
- (8) C-42, "Chemical Separation of Strontium and Barium", Rev. 2.
- (9) C-45, "Determination of Gross Beta Radioactivity", Rev. 5
- (10) C-45B, "Determination of Gross Activity", Rev. 4
- (11) C-46, "Determination of Gross Alpha Activity", Rev. 3
- (12) C-47, "Determination of the Average Beta-Gamma Energy (E) of Reactor Coolant", Rev. 1
- (13) C-48, "Gamma Spectrum Analysis for Liquids and Gases", Rev. 1

The inspector discussed the results of the procedure review with licensee representatives as noted in paragraph 6.b.

- b. The inspector noted that Procedure C-48 did not include instructions for preparing standard sample geometries. A licensee representative agreed to include instructions for source preparation in Procedure C-48 (335/80-01-02). The inspector noted that Procedure C-48 allowed for counting samples by gamma spectroscopy with analyzer deadtime as great as 25 percent. The inspector noted that counting at deadtimes in excess of 10 percent with no correction for pulse pileup could introduce nonconservative errors. The licensee agreed to evaluate the effect of counting samples when the deadtime of the analyzer exceeds 10 percent (335/80-01-03).

7. Review of Instrument Records and Logs

The inspector reviewed the following records and logs and had no further questions.

- a. RCS Periodic Tests, October 1979 - March 1980.
- b. RCS Technical Specifications for Chloride, Fluoride, Dissolved Oxygen, and Gross Activity, February 9, 1980 - March 11, 1980.
- c. Calibration of pH Meter, January 30, 1980 - March 10, 1980
- d. Gross Alpha Activity Calibration Records, December 1978 - March 1980.
- e. Calibration of Gamma Spectroscopy Systems, December 1977 - January 1980.
- f. Calibration Certificates for Ge and Geli Gamma Spectroscopy Systems, January 1980.
- g. Quality Control Surveillance Reports for Chemistry, January 1979 - March 1980.

8. Confirmatory Measurements

- a. The results of the previous sample split on January 29, 1979, were reviewed and discussed with the licensee (335/79-05-02). The results for a liquid waste sample, gas decay tank sample, particulate filter and charcoal cartridge are given in Table 1. The results showed agreement or possible agreement for all radionuclides in the particulate filter, gas, and charcoal cartridge. The comparison for the liquid waste showed disagreement for Mn-54, Co-60, Nb-95 and Sb-125. There was no apparent reason for the discrepancy. Since liquid samples from previous inspections and this inspection showed reasonable agreement, there may have been a problem associated with obtaining a representative sample. Item 335/79-05-02 is considered closed.
- b. Liquid and gaseous samples were collected during this inspection and counted by the licensee and the NRC Region II Mobile Laboratory to verify the licensee's capability to measure radionuclides in effluent

samples. Samples were analyzed by gamma ray spectroscopy and included samples from: a liquid waste tank, reactor coolant, waste gas decay tank and containment air (particulate filter and charcoal cartridge). An aliquot of the liquid waste tank sample was sent to the NRC Contract Laboratory for H-3, Sr-89, Sr-90 analyses. The results will be compared to licensee results in a later inspection report.

The comparisons of the licensee and NRC analyses by gamma ray spectroscopy are given in Table II with the acceptance criteria in Attachment 2. The results show agreement for all radionuclides in all samples except for Rb-88 in the reactor coolant sample. One source of the difference between the NRC and licensee was the gamma ray abundance used in the analysis. If the same gamma ray abundance had been used, the results would have been in agreement. The inspector noted that the licensee's nuclide libraries did not appear to have the most recent nuclear data. The licensee agreed to review and update their radionuclide libraries (335/80-01-04).

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.

TABLE 1

RESULTS OF CONFIRMATORY MEASUREMENTS AT ST. LUCIE PLANT, JANUARY 29, 1980

1979

Sample	Isotope	Concentration, microcuries/cc		Ratio St. Lucie/NRC	Comparison
		St. Lucie	NRC		
Liquid Waste 1/29/79 @ 1200	H-3	3.7E-2	3.58E-2	.97	Agreement
	Sr-89	1.6E-7	2 ± 1E-8	--	No Comparison
	Sr-90	3.2E-8	1 ± 2E-9	--	No Comparison
	Cr-51	3.8E-5	2.78 ± 0.05E-5	1.36	Possible Agreement
	Mn-54	2.8E-6	1.5 ± 0.02E-6	1.86	Disagreement
	Co-58	4.8E-5	3.68 ± 0.12E-5	1.29	Agreement
	Fe-59	5.1E-6	3.8 ± 0.8E-6	1.34	Agreement
	Co-60	2.5E-5	1.17 ± 0.05E-5	2.13	Disagreement
	Sb-124	3.4E-6	3.3 ± 0.4E-6	1.03	Agreement
	Zr-95	4.0E-6	3.0 ± 0.05E-6	1.33	Possible Agreement
	Nb-95	6.0E-6	3.0 ± 0.02E-6	2.0	Disagreement
	Sb-125	9.2E-6	2.8 ± 0.4E-6	3.3	Disagreement
	Cs-134	9.6E-7	1.0 ± 0.06E-6	.96	Agreement
	Cs-137	9.2E-7	1.2 ± 0.2E-6	.77	Agreement
Decay Gas 1/30/79 @ 1100	Xe-133	2.15E-1	1.71 ± 0.06E-1	1.25	Agreement
Charcoal Cartridge 1.29/79 @ 1200	I-131	1.67E-2	1.46 ± 0.05E-2	1.15	Agreement
Particulate Filter 1/29/79 @ 1200	I-131	1.14E-2	7.9 ± 0.3E-3	1.44	Possible Agreement
	Cr-51	2.4E-1	1.9 ± 0.06E-1	1.26	Agreement
	Mn-54	2.7E-2	2.3 ± 0.07E-2	1.17	Agreement
	Co-57	1.0E-3	7.9 ± 0.4E-4	1.26	Agreement
	Co-58	4.12E-1	3.3 ± 0.1E-1	1.24	Agreement
	Fe-59	1.5E-2	1.3 ± 0.05E-2	1.15	Agreement
	Co-60	2.2E-1	1.8 ± 0.05E-1	1.22	Agreement
	Sr-113	2.8E-3	1.8 ± 0.1E-3	1.55	Possible Agreement
	Sb-124	1.7E-3	1.1 ± 0.1E-3	1.54	Possible Agreement
	Zr-95	3.5E-2	2.9 ± 0.09E-2	1.21	Agreement
	Nb-95	4.7E-2	3.6 ± 0.1E-2	1.30	Agreement
	Cs-134	4.2E-3	3.9 ± 0.2E-3	1.08	Agreement
	Cs-137	6.4E-3	5.0 ± 0.2E-3	1.28	Agreement

TABLE 2

RESULTS OF CONFIRMATORY MEASUREMENTS AT ST. LUCIE PLANT, FEBRUARY 25 - MARCH 13, 1980

Sample	Isotope	Concentration, microcuries/cc		Ratio St. Lucie/NRC	Comparison
		St. Lucie	NRC		
Reactor Coolant 2/26/80 @ 1328	Co-58	1.8E-3	1.92 ± 0.1E-3	0.94	Agreement
	Rb-88	1.64E-1	1.08 ± 0.04E-1	1.51	Disagreement
	I-131	1.03E-2	1.16 ± 0.02E-2	.89	Agreement
	I-132	1.34E-2	1.23 ± 0.03E-2	1.09	Agreement
	I-133	1.7E-2	1.81 ± 0.02E-2	.94	Agreement
	I-134	1.7E-2	1.61 ± 0.04E-2	1.06	Agreement
	I-135	1.6E-2	1.94 ± 0.06E-2	.82	Agreement
	Cs-134	3.6E-3	2.78 ± 0.08E-3	1.29	Agreement
	Cs-137	4.8E-3	3.63 ± 0.09E-3	1.32	Agreement
Liquid Waste Tank 3/1/80 @ 1200	Cr-51	1.61 ± 0.08E-5	1.48 ± 0.18E-5	1.09	Agreement
	Mn-54	1.08 ± 0.02E-5	1.12 ± 0.05E-5	0.96	Agreement
	Co-58	2.78 ± 0.02E-5	2.71 ± 0.06E-5	1.03	Agreement
	Co-60	1.57 ± 0.01E-4	1.63 ± 0.01E-4	0.96	Agreement
	Zn-65	2.6 ± 0.5E-6	ND		NC
	Sn-113	1.1 ± 0.2E-6	ND		NC
	Sb-124	2.3E-7	ND		NC
	I-131	1.2 ± 0.1E-6	1.2 ± 0.6E-6	1.0	Agreement
	Zr-95	2.96E-6	2.9 ± 0.7E-6	1.02	Agreement
	Sb-125	1.9 ± 0.3E-6	ND		NC
	CS-134	5.58 ± 0.02E-5	5.8 ± 0.5E-6	.96	Agreement
	Cs-137	1.03 ± 0.02E-5	1.04 ± 0.05E-5	.99	Agreement
	Nb-95	4.77E-6	4.4 ± 0.4E-6	1.08	Agreement

NC = Not detected, detection limit for analyses varied between NRC and licensee due to differences in counting times and sample geometry.

NC = No Comparison

TABLE 2 (Cont'd)

Sample	Isotope	Concentration, microcuries/cc		Ratio St. Lucie/NRC	Comparison
		St. Lucie	NRC		
Charcoal Cartridge Containment Air	I-131	7.93 ± 0.03E-2	8.58 ± 0.02E-2	.93	Agreement
	I-132	1.86E-3	ND	--	NC
	I-133	3.85 ± 0.02E-2	3.86 ± 0.02E-2	1.0	Agreement
	I-135	8.8 ± 0.4E-3	9.7 ± 0.3E-3	.91	Agreement
	Br-82	8.8 ± 0.2E-3	8.0 ± 0.1E-3	1.1	Agreement
	Cs-137	2.60 ± 0.01E-3	2.61 ± 0.06E-3	1.0	Agreement
	Co-60	5.9 ± 0.8E-4	5.5 ± 0.05E-4	1.07	Agreement
Particulate Filter 3/11/80 @1200	Na-24	1.83 ± 0.11E-3	1.78E-3	1.02	Agreement
	Mn-56	5.5 ± 1.1E-4	ND	--	NC
	Co-58	8.3 ± 0.6E-4	7.0 ± 0.2E-4	1.18	Agreement
	Co-60	2.97 ± 0.58E-4	2.56 ± 0.3E-4	1.16	Agreement
	Sb-122	3.74 ± 0.58E-4	3.15 ± 0.2E-4	1.19	Agreement
	Sb-124	1.17 ± 0.39E-3	ND	--	NC
	W-187	6.4 ± 0.2E-3	5.9 ± 0.1E-3	1.08	Agreement
	I-131	8.8 ± 0.4E-4	7.9 ± 0.2E-4	1.11	Agreement
	I-133	7.9 ± 0.6E-4	5.6 ± 0.3E-4	1.41	Possible Agreement
	Rb-88	4.46 ± 0.04E-1	ND	--	NC
	Cs-134	2.69 ± 0.08E-3	2.31 ± 0.04E-3	1.16	Agreement
	Cs-137	3.64 ± 0.09E-3	3.11 ± 0.04E-3	1.17	Agreement
	Waste Gas Decay Tank 3/12/80 @1200	Xe-133	2.35E-1	2.34 ± 0.01E-1	1.0
Xe-133M		7.2 ± 0.7E-4	1.26 ± 0.2E-3	0.6	Agreement
Kr-85		ND	2.6 ± 0.5E-3	--	NC