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ENCLOSURE

ENVIRONMENTAL SEMI-ANNUAL RADIOACTIVE EFFLUENT
REPORT FOR THE PERIOD APRIL 22 TO JUNE 30, 1976..

(25 CARBON SIGNED CYS. RECEIVED)
(14 PAGES)

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PLANT NAME: ST. LUCIE # 1

enclosed

SAFETY

FOR ACTION/INFORMATION

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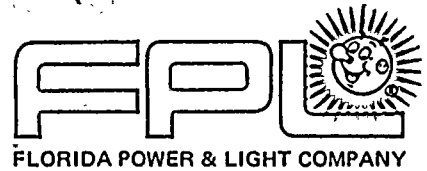
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Regulatory

File 57



August 31, 1976
L-76-318



Norman C. Moseley, Director Mail Section
Office of Inspection & Enforcement Docket Clerk Region II
U. S. Nuclear Regulatory Commission
230 Peachtree Street, N. W. Suite 818
Atlanta, Georgia 30303



Dear Mr. Moseley:

Re: St. Lucie Unit #1, Docket No. 50-335
Semiannual Radioactive Effluent Report

Enclosed herewith are two copies of the St. Lucie Unit 1 Semiannual Radioactive Effluent Report for the period April 22 (initial criticality) to June 30, 1976. This report is submitted in compliance with Environmental Technical Specification 5.6.1.c.

Section 8, Meteorological Data, has been included in this report at the request of the NRC staff. As indicated in the report, meteorological data have been acquired and are now being processed. A supplemental report will be submitted at a later date in the format suggested by Regulatory Guide 1.21.

Meteorological data will not normally be submitted with our Semiannual Radioactive Effluent Reports. Summaries of the data and observations will be available upon request in accordance with Environmental Technical Specification 3.3.

Yours very truly,

Robert E. Uhrig
Vice President

REU/NR/hlc
Enclosures

cc: Director, Office of Inspection & Enforcement (25)
Director, Office of Management Information and
Program Control (2)
Jack R. Newman, Esq.

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FLORIDA POWER & LIGHT COMPANY

ST. LUCIE PLANT UNIT #1

LICENSE #DPR-67

SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

for the period

January 1, 1976 through June 30, 1976

Prepared August 16, 1976

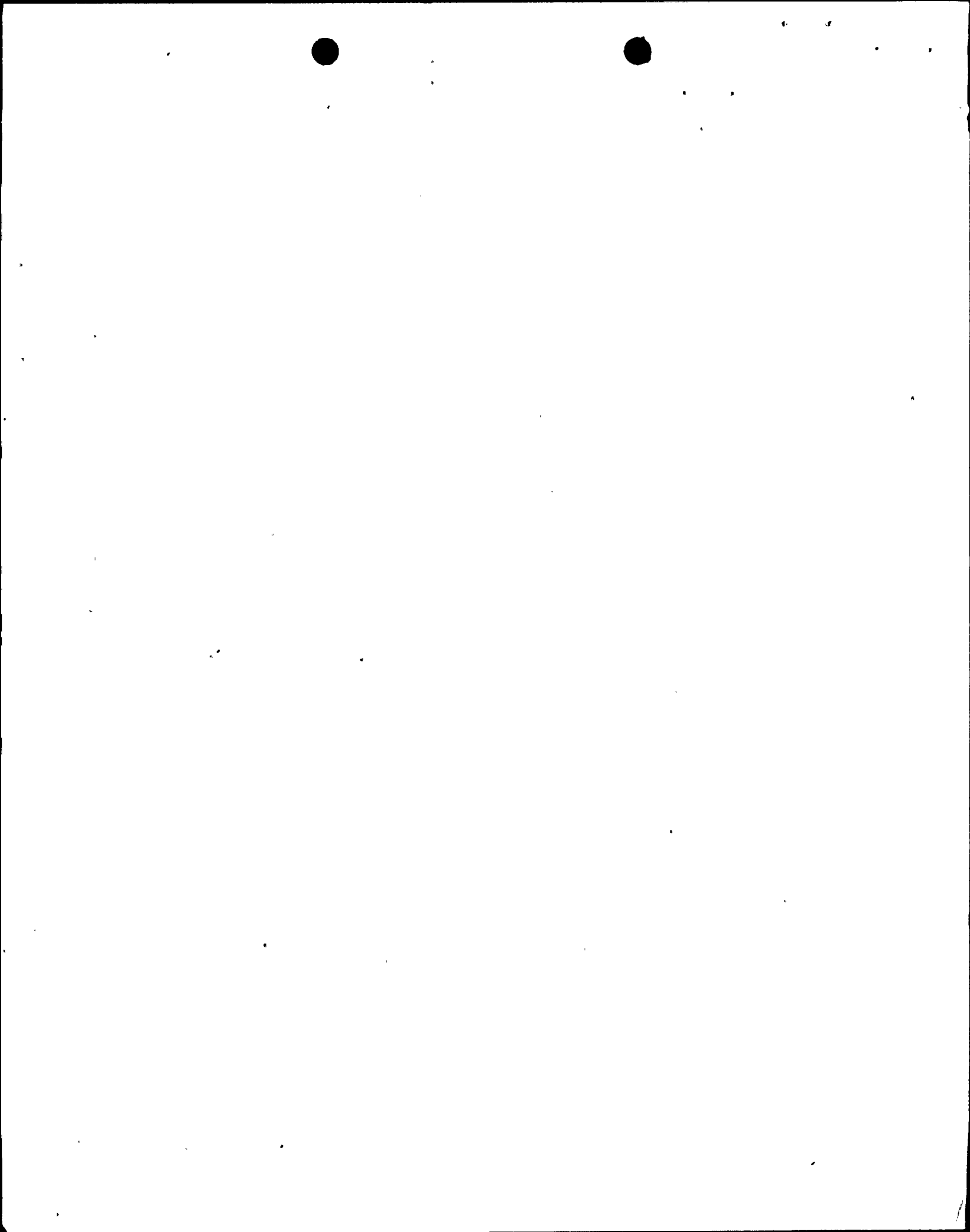
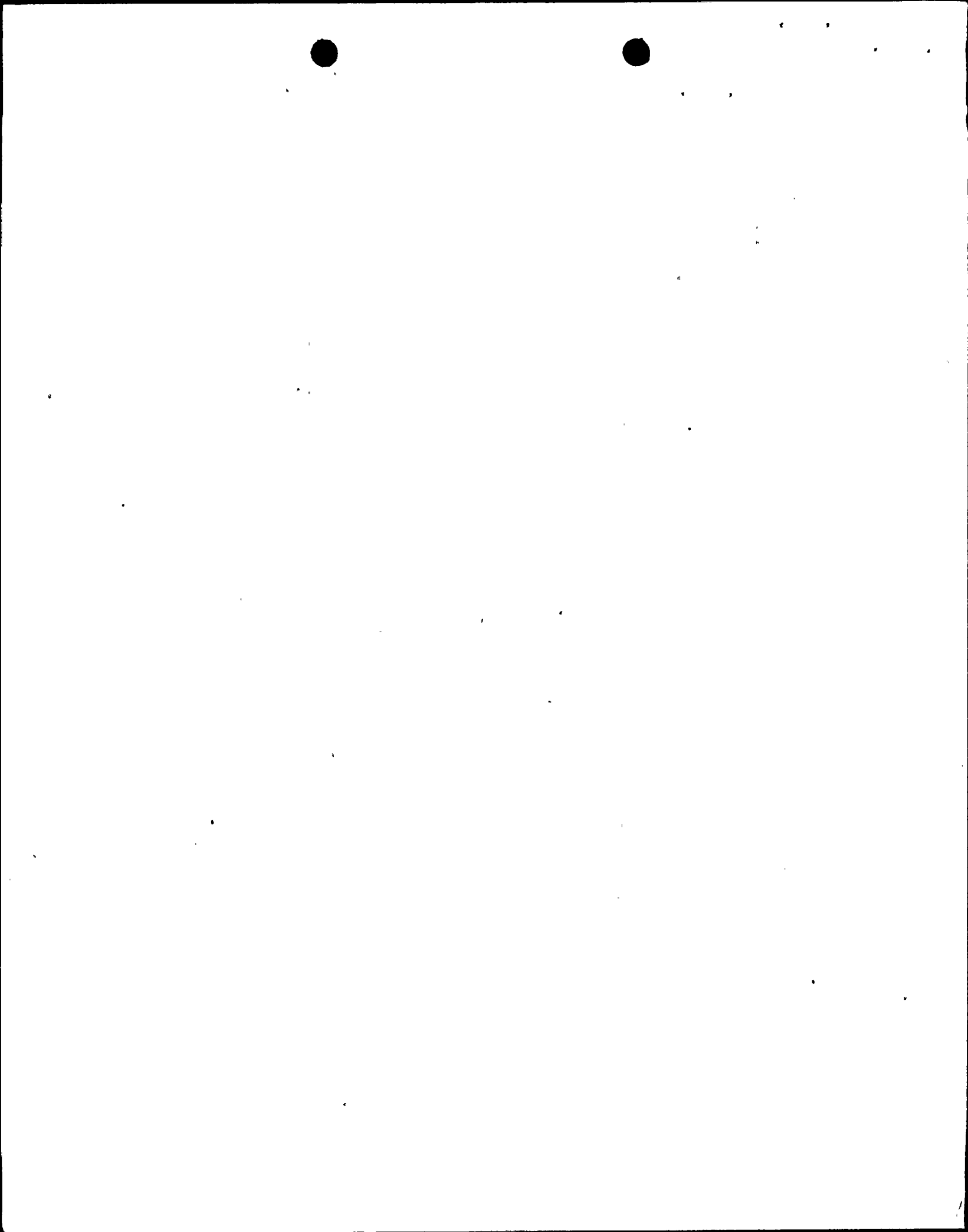


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INTRODUCTION

This report is submitted in accordance with St. Lucie Plant Technical Specification Section 5.6.1.c.

This report gives the data necessary to meet the semiannual reporting requirements for radioactive effluent releases during the period of January 1, 1976 through June 30, 1976.

In submitting this report, we emphasize that St. Lucie Plant did not reach criticality until the second quarter. Therefore, the data presented covers plant releases that have occurred after criticality. None of these releases exceeded regulatory limits.

All liquid and airborne discharges to the environment during this reporting period were analyzed in accordance with Technical Specification requirements. The minimum frequency of analysis as required by these requirements has been met or exceeded.

EFFLUENT + WASTE DISPOSAL SUPPLEMENTAL INFORMATION

1. Regulatory Limits

1.1 For liquid waste effluents

- a. The concentration of radioactive materials released in liquid waste effluents from all reactors at the site shall not exceed the value specified in 10CFR Part 20, Appendix B, Table II, Column 2, for unrestricted areas.
- b. The cumulative release of radioactive materials in liquid waste effluents, excluding tritium and dissolved gases, shall not exceed 10 Ci/reactor/calendar quarter.
- c. The cumulative release of radioactive material in liquid waste effluents, excluding tritium and dissolved gases, shall not exceed 20 Ci/reactor in any 12 consecutive months.

1.2 For gaseous waste effluents

- a. (1) The release rate limit of noble gases from the site shall be such that

$$2.0 (Q_{TV} \bar{K}_V) \leq 1$$

and

$$0.33 (Q_{TV} (\bar{L}_V + 1.1 \bar{N}_V)) \leq 1$$

- (2) The release rate limit of all radioiodines and radioactive materials in particulate form with half-lives greater than eight days, released to the environs as part of the gaseous wastes from the site shall be such that

$$5.5 \times 10^3 Q_V \leq 1$$

- b. (1) The average release rate of noble gases from the site during any calendar quarter shall be such that

$$13 (Q_{TV} \bar{N}_V) \leq 1$$

$$\text{and } 6.3 (Q_{TV} \bar{M}_V) \leq 1$$

Effluent + Waste Disposal Supplemental Information (cont.):

1. Regulatory Limits (cont):

1.2-b(cont)

- (2) The average release rate of gases from the site during any 12 consecutive months shall be

$$25 (Q_{TV} \bar{N}_V) \leq 1$$

and $13 (Q_{TV} \underline{M}_V) \leq 1$

- (3) The average release rate per site of all radioiodines and radioactive materials in particulate form with half-lives greater than eight days during any calendar quarter shall be such that

$$13 (5.5 \times 10^3 Q_V) \leq 1$$

- (4) The average release rate per site of all radioiodines and radioactive materials in particulate form with half-lives greater than eight days during any period of 12 consecutive months shall be such that

$$25 (5.5 \times 10^3 Q_V) \leq 1$$

- (5) The amount of iodine -131 released during any calendar quarter shall not exceed 2 Ci/reactor.
- (6) The amount of iodine -131 released during any period of the 12 consecutive months shall not exceed 4 Ci/reactor.

2. Maximum Permissible Concentrations

AIR- 10CFR Part 20, Appendix B, Table II, Column 1

WATER - 10CFR Part 20, Appendix B, Table II, Column 2

3. Average energy of fission and activation gases in gaseous effluents are not applicable.

4. Measurements and Approximations of Total Radioactivity

A summary of liquid effluent accounting methods is described in Table 4.1.
A summary of gaseous effluent accounting methods is described in Table 4.2.

Effluent + Waste Disposal Supplemental Information (cont.):

4. Measurements and Approximations of Total Radioactivity (cont):

Estimate of Errors

(a) Sampling Error

The error associated with volume measurement devices, flow measuring devices, etc. based on calibration data and design tolerances has been conservatively estimated collectively to be less than +10%.

(b) Analytical Error for Nuclides

<u>Type</u>	<u>Average</u>	<u>Maximum</u>
Liquid	$\pm 9\%$	$\pm 30\%$
Gaseous	$\pm 8\%$	$\pm 25\%$

Table 4.1
Radioactive Liquid Effluent Sampling and Analysis

Liquid Source	Sampling Frequency	Type of Analysis	Method of Analysis
Monitor Tank Releases ¹	Each Batch	Principal Gamma Emitters	P.H.A.
	Monthly Composite	H-3	L.S.
		Gross Alpha	G.F.P.
	Quarterly Composite	Sr-90, Sr-89	C.S. & L.S.
Continuous Releases	No continuous activity releases for this reporting period		

¹ Boric Acid Evaporator condensate is normally recovered to the Primary Water Storage Tank for recycling into the reactor coolant system and does not contribute to liquid waste effluent totals.

P.H.A. - gamma spectrum pulse height analysis using Lithium-drifted Germanium detectors. All peaks are identified and quantified.

L.S. - Liquid Scintillation counting

C.S. - Chemical Separation

G.F.P. - Gas Flow Proportional Counting

Effluent + Waste Disposal Supplemental Information (cont.):

4. Measurements and Approximations of Total Radioactivity (cont.):

(b) cont.

Table 4.2
Radioactive Gaseous Waste Sampling and Analysis

Gaseous Source	Sampling Frequency	Type of Analysis	Method of Analysis
Waste Gas Decay Tank Releases	Each Tank	Principal Gamma Emitters.	(G, C, P) - P.H.A.
		H-3	L.S.
Containment Purge Releases	Each Purge	Principal Gamma Emitters	(G, C, P) - P.H.A.
		H-3	L.S.
Plant Vent	Weekly	Principal Gamma Emitters	(G, C, P) - P.H.A.
		H-3	L.S.
	Monthly Composite (Particulates)	Gross Alpha	P- G.F.P.
	Quarterly Composite (Particulates)	Sr-90, 89	C.S. & L.S.

G - Gaseous Grab Sample

C - Charcoal Filter Sample

P - Particulate Filter Sample

L.S. - Liquid Scintillation counting

C.S. - Chemical Separation

P.H.A. - gamma spectrum pulse height analysis using Lithium Germanium detectors.
All peaks are identified and quantified.

G.F.P. - Gas Flow Proportional Counting.

5. Batch Releases

a. Liquid

1. Number of batch releases: 37
2. Total time period of batch releases: 7837 min
3. Maximum time period for a batch release: 976 min
4. Average time period for batch releases: 211.8 min
5. Minimum time period for a batch release: 23 min
6. Average stream flow during periods of release of effluent into a flowing stream: 392510 gpm

All liquid releases are summarized in TABLES 5.1 and 5.2.

Effluent + Waste Disposal Supplemental Information (cont.):

5. Batch Releases (cont.)

b. Gaseous

1. Number of batch releases: 31
2. Total time period for batch releases: 7533 min
3. Maximum time period for a batch release: 960 min
4. Average time period for batch releases: 243 min
5. Minimum time period for a batch release: 40 min

All gaseous waste releases are summarized in TABLES 5.3 and 5.4.

6. Abnormal Releases

a. Liquid

1. Number of releases: 0
2. Total activity releases: 0.0

b. Gaseous

1. Number of releases: 0
2. Total activity released: 0.0

7. Solid Waste and Irradiated Fuel Shipments

TABLE 7.1 is a summary statement of this waste management activity.

8. Meteorological Data

Cumulative data on frequency distribution of wind speed, wind direction and atmospheric stability have been acquired during this report period. These data are now being processed and will be submitted in the form suggested by Regulatory Guide 1.21 as a Supplemental report.

FLORIDA POWER & LIGHT COMPANY
ST. LUCIE UNIT #1

Semiannual Report Jan. 1 through June 30, 1976

TABLE 5.1: LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

#1 Unit	Quarter #1	Quarter #2
---------	------------	------------

A. Fission and activation products

1. Total release (not including tritium, gases, alpha)	Ci	. E	1.03 E-2
2. Average diluted concentration during period	μCi/ml	. E	8.86 E-10
3. Percent of applicable limit	%	. E	1.03 E-3

B. Tritium

1. Total release	Ci	. E	1.72 E 0
2. Average diluted concentration during period	μCi/ml	. E	1.47 E-7

C. Dissolved and entrained gases

1. Total release	Ci	. E	5.43 E-5
2. Average diluted concentration during period	μCi/ml	. E	4.66 E-12
3. Percent of applicable limit	%	. E	N.A. E

D. Gross alpha radioactivity

1. Total release	Ci	. E	0.00 E 0
------------------	----	-----	----------

E. Volume of waste released (prior to dilution)	liters	. E	1.07 E 6
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F. Volume of dilution water used during period	liters	. E	1.16 E 10
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FLORIDA POWER & LIGHT COMPANY
ST. LUCIE UNIT #1
Semiannual Report Jan. 1 through June 30, 1976

TABLE 5.2: LIQUID EFFLUENTS

Nuclides Released	Unit	CONTINUOUS MODE		BATCH MODE	
		1 ST Quarter	2 ND Quarter	1 ST Quarter	2 ND Quarter
strontium-89	Ci	. E	0.00 E 0	. E	0.00 E 0
strontium-90	Ci	. E	0.00 E 0	. E	0.00 E 0
cesium-134	Ci	. E	0.00 E 0	. E	0.00 E 0
cesium-137	Ci	. E	0.00 E 0	. E	0.00 E 0
iodine-131	Ci	. E	0.00 E 0	. E	1.05 E-4
cobalt-58	Ci	. E	0.00 E 0	. E	4.14 E-3
cobalt-60	Ci	. E	0.00 E 0	. E	2.73 E-5
iron-59	Ci	. E	0.00 E 0	. E	0.00 E 0
zinc-59	Ci	. E	0.00 E 0	. E	0.00 E 0
manganese-54	Ci	. E	0.00 E 0	. E	0.00 E 0
chromium-51	Ci	. E	0.00 E 0	. E	3.86 E-4
zirconium-niobium-95	Ci	. E	0.00 E 0	. E	0.00 E 0
molybdenum-99	Ci	. E	0.00 E 0	. E	2.27 E-5
technetium-99m	Ci	. E	0.00 E 0	. E	0.00 E 0
barium-lanthanum-140	Ci	. E	0.00 E 0	. E	0.00 E 0
cerium-141	Ci	. E	0.00 E 0	. E	0.00 E 0
Other (specify): Fluorine - 18	Ci	. E	0.00 E 0	. E	2.40 E-4
Sodium - 24	Ci	. E	0.00 E 0	. E	1.66 E-3
Tungsten - 187	Ci	. E	0.00 E 0	. E	5.57 E-4
Iodine - 133	Ci	. E	0.00 E 0	. E	2.00 E-4
Antimony - 124	Ci	. E	0.00 E 0	. E	1.51 E-3
Antimony - 122	Ci	. E	0.00 E 0	. E	1.47 E-3
Total for period (above)	Ci	. E	0.00 E 0	. E	1.03 E-2
xenon-133	Ci	. E	0.00 E 0	. E	5.43 E-5
xenon-135	Ci	. E	0.00 E 0	. E	0.00 E 0

FLORIDA POWER & LIGHT COMPANY
ST. LUCIE UNIT #1

Semiannual Report Jan. 1 through June 30, 1976

TABLE 5.3: GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES

	Unit # 1	Quarter 1 ST	Quarter 2 ND
A. Fission & activation gases			
1. Total release	Ci	. E	7.12E 1
2. Average release rate for period	µCi/sec	. E	1.18E 1
3. Percent of Technical specification limit	%	. E	3.87E-2
B. Iodines			
1. Total iodine-131	Ci	. E	3.50E-7
2. Average release rate for period	µCi/sec	. E	5.81E-8
3. Percent of Technical specification limit	%	. E	1.75E-4
C. Particulates			
1. Particulates with half-lives 8 days	Ci	. E	0.00E 0
2. Average release rate for period	µCi/sec	. E	0.00E 0
3. Percent of Technical specification limit	%	. E	0.00E 0
4. Gross alpha radioactivity	Ci	. E	0.00E 0
D. Tritium			
1. Total release	Ci	. E	5.42E-1
2. Average release rate for period	µCi/sec	. E	7.00E-2

FLORIDA POWER & LIGHT COMPANY

ST. LUCIE UNIT #1

Seminannual Report Jan. 1 through June 30, 1976

TABLE 5.4: GASEOUS EFFLUENTS

Nuclides Released	#1 Unit	CONTINUOUS MODE		BATCH MODE	
		Quarter [#] 1	Quarter [#] 2	Quarter [#] 1	Quarter [#] 2
1. Fission gases					
krypton-85	Cl	. E	8.81 E-3	. E	3.63 E-2
krypton-85m	Cl	. E	2.41 E 0	. E	4.78 E-1
krypton-87	Cl	. E	0.00 E 0	. E	1.30 E-3
krypton-88	Cl	. E	0.00 E 0	. E	1.08 E-2
xenon-133	Cl	. E	1.19 E 1	. E	4.91 E 1
xenon-135	Cl	. E	2.36 E 0	. E	3.75 E 0
xenon-135m	Cl	. E	0.00 E 0	. E	1.66 E-4
xenon-138	Cl	. E	0.00 E 0	. E	0.00 E 0
Others (specify)	Cl	. E	0.00 E 0	. E	0.00 E 0
AR-41	Cl	. E	0.00 E 0	. E	8.58 E-1
XE-133m	Cl	. E	0.00 E 0	. E	4.24 E-1
unidentified	Cl	. E	0.00 E 0	. E	0.00 E 0
Total for period	Cl	. E	1.66 E 1	. E	5.46 E 1

2. Iodines

iodine-131	Cl	. E	0.00 E 0	. E	3.50 E-7
iodine-133	Cl	. E	0.00 E 0	. E	1.21 E-6
iodine-135	Cl	. E	0.00 E 0	. E	0.00 E 0
Total for period	Cl	. E	0.00 E 0	. E	1.56 E-6

3. Particulates

strontium-89	Cl	. E	0.00 E 0	. E	0.00 E 0
strontium-90	Cl	. E	0.00 E 0	. E	0.00 E 0
cesium-134	Cl	. E	0.00 E 0	. E	0.00 E 0
cesium-137	Cl	. E	0.00 E 0	. E	0.00 E 0
barium-lanthanum-140	Cl	. E	0.00 E 0	. E	0.00 E 0
Others (specify)	Cl	. E	0.00 E 0	. E	0.00 E 0
	Cl	. E	0.00 E 0	. E	0.00 E 0
	Cl	. E	0.00 E 0	. E	0.00 E 0
unidentified	Cl	. E	0.00 E 0	. E	0.00 E 0

FLORIDA POWER & LIGHT COMPANY
ST. LUCIE UNIT #1
SEMIANNUAL REPORT, JANUARY 1 THROUGH JUNE 30, 1976

TABLE 7.1: SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not irradiated fuel)

1. Type of waste	Unit	6-month Period
a. Spent resins, filter sludges, evaporator bottoms, etc.	m ³	0.00 E 0
	Ci	0.00 E 0
b. Dry compressible waste, contaminated equip., etc.	m ³	0.00 E 0
	Ci	0.00 E 0
c. Irradiated components, control rods, etc.	m ³	0.00 E 0
	Ci	0.00 E 0
d. Other (describe)	m ³	0.00 E 0
	Ci	0.00 E 0

2. SOLID WASTE DISPOSITION

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
None	N/A	N/A

B. IRRADIATED FUEL SHIPMENTS (Disposition)

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
None	N/A	N/A

