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EFF-83A(2)

O'REILLY, J.P. Region 2, Office of Director

SUBJECT: "Semiannual Radioactive Effluent Release Rept 830602-30."  
 W/830829 ltr.

June 2 -> June 30, 1983

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NUCLEAR ENERGY

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FLORIDA POWER & LIGHT COMPANY

ST. LUCIE PLANT UNIT NO. 2

LICENSE NO. NPF-16

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

FOR THE PERIOD

June 2, 1983 THROUGH June 30, 1983

8504090517 830630  
PDR ADOCK 05000389  
R PDR

ITEM 6

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EFFLUENT AND WASTE DISPOSAL SUPPLEMENTAL INFORMATION

## 1. Regulatory Limits

## 1.1 For Liquid Waste Effluents

- a. The concentration of radioactive material released from the site shall be limited to the concentrations specified in 10 CFR Part 20, Appendix B, Table II, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to  $2 \times 10^{-4}$  micro curies/ml total activity.
- b. The dose or dose commitment to a MEMBER OF THE PUBLIC from radioactive materials in liquid effluents released, from each reactor unit, to UNRESTRICTED AREAS shall be limited to:
  - During any calendar quarter to  $\leq 1.5$  mrems to the total body and to  $\leq 5$  mrems to any organ, and
  - During any calendar year to  $\leq 3$  mrems to the total body and to  $\leq 10$  mrems to any organ.

## 1.2 For Gaseous Waste Effluents:

- a. The dose rate in UNRESTRICTED AREAS due to radioactive materials released in gaseous effluents from the site shall be limited to:
  - For Noble Gases:  $\leq 500$  mrems/yr to the total body and  $\leq 3000$  mrems/yr to the skin, and
  - For Iodine-131, Iodine-133, Tritium, and all radionuclides in particulate form with half-lives greater than 8 days:  $\leq 1500$  mrems/yr to any organ.
- b. DOSE Limits and Percent of Limits due to Noble Gases to areas at or beyond the SITE BOUNDARY are not applicable to the Semiannual Report since these limits are related to Historical Meteorological Conditions. The Noble Gas Air Doses due to gamma and beta radiations provided in this report were calculated using meteorological conditions concurrent with the time of release.
- c. Dose Limits and Percent of Limits due to Iodine-131, Iodine-133, Tritium, and radionuclides in particulate form to a MEMBER OF THE PUBLIC at or beyond the SITE BOUNDARY are not applicable to the Semiannual Report since these limits are related to Historical Meteorological Conditions. The DOSE from Iodine-131, Iodine-133, Tritium, and radionuclides in particulate form with half-lives greater than 8 days provided in this report were calculated using meteorological conditions concurrent with the time of release.

EFFLUENT AND WASTE DISPOSAL SUPPLEMENTAL INFORMATION  
(continued)

2. Maximum Permissible Concentrations

WATER: As per 10 CFR Part 20, Appendix B, Table II, Column 2, except for entrained or dissolved noble gases as described in 1.1.a of this report.

AIR: Release concentrations are limited to dose rate limits described in 1.2.a of this report.

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

4. Measurements and Approximations of Total Radioactivity

A summary of liquid effluent accounting methods is described in Table 3.1.

A summary of gaseous effluent accounting methods is described in Table 3.2.

4.1 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  $\pm 10\%$ .

b. Analytical Error for Nuclides

<u>Type</u>	<u>Average</u>	<u>Maximum</u>
Liquid	$\pm 9\%$	$\pm 30\%$
Gaseous	$\pm 10\%$	$\pm 35\%$

EFFLUENT AND WASTE DISPOSAL SUPPLEMENTAL INFORMATION

(continued)

## 4.1 Measurements and Approximations of Total Radioactivity (continued)

## 4.1.b (continued)

TABLE 3.1  
RADIOACTIVE LIQUID EFFLUENT SAMPLING AND ANALYSIS

LIQUID SOURCE	SAMPLING FREQUENCY	TYPE OF ANALYSIS	METHOD OF ANALYSIS
Monitor Tank Releases <sup>1</sup>	Each Batch	Principal Gamma Emitters	p.h.a.
	Monthly	H-3	L.S.
	Composite	Gross Alpha	G.F.P.
	Quarterly Composite	SR-90, SR-89 FE-55	C.S.
Continuous Releases	No continuous activity releases for this reporting period		

<sup>1</sup>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 Germanium detectors. All peaks are identified and quantified  
 L.S. - Liquid Scintillation Counting  
 C.S. - Chemical Separation  
 G.F.P. - Gas Flow Proportional Counting

TABLE 3.2  
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.
Containment Purge Releases	Each Purge	Principal Gamma Emitters	(G) - 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 SR-89	C.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

FLORIDA POWER & LIGHT COMPANY  
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EFFLUENT AND WASTE DISPOSAL - SUPPLEMENTAL INFORMATION  
(continued)

5. Batch Releases

5.1 Liquid

a. Number of batch releases:	<u>10</u>
b. Total time period of batch releases:	<u>6880</u> MINUTES
c. Maximum time period for a batch release:	<u>1420</u> MINUTES
d. Average time period for a batch release:	<u>688</u> MINUTES
e. Minimum time period for a batch release:	<u>85</u> MINUTES
f. Average stream flow during periods of release of effluent into a flowing stream:	<u>476175</u> GPM

ALL LIQUID RELEASES ARE SUMMARIZED IN TABLES

5.2 Gaseous

a. Number of batch releases:	<u>23</u>
b. Total time period for batch releases:	<u>3936</u> MINUTES
c. Maximum time period for a batch release:	<u>660</u> MINUTES
d. Average time period for batch releases:	<u>171</u> MINUTES
e. Minimum time period for a batch release:	<u>23</u> MINUTES

ALL GASEOUS WASTE RELEASES ARE SUMMARIZED IN TABLES

6. Unplanned Releases

6.1 Liquid

a. Number of releases:	<u>0</u>
b. Total activity releases:	<u>0</u> CURIES

6.2 Gaseous

a. Number of releases:	<u>0</u>
b. Total activity released:	<u>0</u> CURIES

6.3 See attachments (if applicable) for:

- A description of the event and equipment involved.
- Cause(s) for the unplanned release.
- Actions taken to prevent a recurrence.
- Consequences of the unplanned release.

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(continued)

7. Description of dose assessment of radiation dose from radioactive effluents to the general public due to their activities inside the site boundary will be reported on the January Semiannual Report.

A brief reactor history follows:

The reactor was under construction during the first quarter of 1983 and no radioactive effluents were generated.

During the second quarter of 1983 the reactor attained initial criticality, but did not generate any power until late June. During power operation the power level did not exceed approximately 30% and the durations were short-lived.

8. Offsite Dose Calculation Manual Revisions:

Revision 03 to C-200 was incorporated during the second quarter of the reporting period. This change does not affect dose calculation methodology, but only Appendix E, "Radiological Environmental Surveillance Sample Location and Collection Frequencies" as follows:

Change No. 1: Waterborne Location H15 - Sediment from Shoreline Sample Collection Frequency is now defined as a semiannual frequency. The Surface water (ocean) sample for H15 remains at weekly frequency.

Change No. 2: Waterborne Location \*H59 - Sediment from Shoreline sample collection frequency is now defined as a semiannual frequency. The Surface water (ocean) sample for \*H59 remains at monthly frequency.

Change No. 3: Food products location H52's approximate distance (miles) has been changed from 10-20 to read Approximate Distance of 1 mile.

\* Denotes control sample

This concludes changes to ODCM for Revision 03.

9. Solid Waste and Irradiated Fuel Shipments

The reactor was under construction during the first quarter of 1983. During the second quarter of 1983 the reactor attained initial criticality in late JUNE. No solid waste or irradiated fuel shipments occurred during the second quarter.



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TABLE 3.3  
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

NUCLIDES RELEASED	UNIT	QUARTER #1	QUARTER #2
<b>A. Fission and Activation Products</b>			
1. Total Release (not including tritium, gases, alpha)	CI	0.00E0	2.82E-2
2. Average diluted concentration during period	uCI/ml	0.00E0	2.28E-9.
<b>B. Tritium</b>			
1. Total Release	CI	0.00E0	2.64E-1
2. Average diluted concentration during period	uCI/ml	0.00E0	2.13E-8
<b>C. Dissolved and Entrained Gases</b>			
1. Total release	CI	0.00E0	0.00E0
2. Average diluted concentration during period	uCI/ml	0.00E0	0.00E0
<b>D. Gross Alpha Radioactivity</b>			
1. Total Release	CI	0.00E0	0.00E0
<b>E. Volume of Waste Released (prior to dilution)</b>			
	Liters	0.00E0	1.07E6
<b>F. Volume of Dilution Water Used During Period</b>			
	Liters	0.00E0	1.24E10

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TABLE 3.4  
LIQUID EFFLUENTS

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE		BATCH MODE	
		QUARTER #1	QUARTER #2	QUARTER #1	QUARTER #2
I-131	CI	0.00E0	0.00E0	0.00E0	2.37E-5
I-132	CI				
I-133	CI				
NA-24	CI	0.00E0	0.00E0	0.00E0	5.16E-5
CR-51	CI				
MN-54	CI	0.00E0	0.00E0	0.00E0	5.11E-4
CO-57	CI				
CO-58	CI	0.00E0	0.00E0	0.00E0	2.52E-2
FE-55	CI	0.00E0	0.00E0	0.00E0	0.00E0
FE-59	CI				
CO-60	CI	0.00E0	0.00E0	0.00E0	2.76E-4
ZN-65	CI				
NB-97	CI				
AG-110M	CI				
SN-113	CI				
SB-122	CI				
SB-124	CI				
W-187	CI	0.00E0	0.00E0	0.00E0	3.57E-5
NP-239	CI	0.00E0	0.00E0	0.00E0	1.41E-3
ZR-95	CI				
MO-99	CI				
RU-103	CI				
CS-134	CI				
CS-136	CI				
CS-137	CI				
BA-140	CI				
CE-141	CI				
LA-140	CI	0.00E0	0.00E0	0.00E0	6.13E-5
ZR-97	CI				

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TABLE 3.4  
LIQUID EFFLUENTS  
(continued)

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE		BATCH MODE	
		QUARTER #1	QUARTER #2	QUARTER #1	QUARTER #2
SB-125	CI	0.00E0	0.00E0	0.00E0	0.00E0
CE-144	CI	0.00E0	0.00E0	0.00E0	0.00E0
SR-89	CI	0.00E0	0.00E0	0.00E0	7.61E-5
SR-90	CI	0.00E0	0.00E0	0.00E0	0.00E0
Y-90	CI	0.00E0	0.00E0	0.00E0	0.00E0
TC-99M	CI	0.00E0	0.00E0	0.00E0	6.64E-4
PR-144	CI	0.00E0	0.00E0	0.00E0	0.00E0
UNIDENTIFIED	CI	0.00E0	0.00E0	0.00E0	0.00E0
TOTAL FOR PERIOD ABOVE	CI	0.00E0	0.00E0	0.00E0	2.82E-2

AR-41	CI	0.00E0	0.00E0	0.00E0	0.00E0
KR-85	CI	0.00E0	0.00E0	0.00E0	0.00E0
XE-131M	CI	0.00E0	0.00E0	0.00E0	0.00E0
XE-133	CI	0.00E0	0.00E0	0.00E0	0.00E0
XE-133M	CI	0.00E0	0.00E0	0.00E0	0.00E0
XE-135	CI	0.00E0	0.00E0	0.00E0	0.00E0
KR-85M	CI	0.00E0	0.00E0	0.00E0	0.00E0
XE-138	CI	0.00E0	0.00E0	0.00E0	0.00E0
TOTAL FOR PERIOD ABOVE	CI	0.00E0	0.00E0	0.00E0	0.00E0

NOTE: If no value is entered for a nuclide, the value equals zero Curies.

FLORIDA POWER & LIGHT COMPANY  
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June 2, 1983 THROUGH June 30, 1983

TABLE 3.6  
 GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

NUCLIDES RELEASED	UNIT	QUARTER #1	QUARTER #2
A. Fission and Activation Gases			
1. Total Release	CI	0.00E0	1.45E-1
2. Average Release Rate for Period	uCI/sec	0.00E0	1.84E-2
B. Iodines			
1. Total Iodine-131	CI	0.00E0	0.00E0
2. Average Release Rate for Period	uCI/sec	0.00E0	0.00E0
C. Particulates			
1. Particulates T-1/2 > 8 Days	CI	0.00E0	0.00E0
2. Average Release Rate for Period	uCI/sec	0.00E0	0.00E0
3. Gross Alpha Radioactivity	CI	0.00E0	1.99E-14
D. Tritium			
1. Total Release	CI	0.00E0	9.66E-1
2. Average Release Rate for Period	uCI/sec	0.00E0	1.23E-7

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TABLE 3.7  
GASEOUS EFFLUENTS - GROUND LEVEL RELEASES

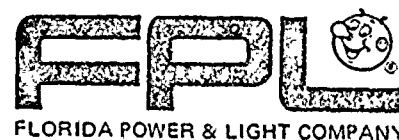
NUCLIDES RELEASED	UNIT	CONTINUOUS MODE		BATCH MODE	
		QUARTER #1	QUARTER #2	QUARTER #1	QUARTER #2
1. FISSION GASES					
AR-41	CI	0.00E0	0.00E0	0.00E0	4.77E-2
KR-85	CI	0.00E0	0.00E0	0.00E0	0.00E0
KR-85M	CI	0.00E0	0.00E0	0.00E0	0.00E0
KR-87	CI	0.00E0	0.00E0	0.00E0	0.00E0
KR-88	CI	0.00E0	0.00E0	0.00E0	0.00E0
XE-131M	CI	0.00E0	0.00E0	0.00E0	0.00E0
XE-133	CI	0.00E0	0.00E0	0.00E0	8.98E-2
XE-133M	CI	0.00E0	0.00E0	0.00E0	2.32E-3
XE-135	CI	0.00E0	0.00E0	0.00E0	4.99E-3
UNIDENTIFIED	CI	0.00E0	0.00E0	0.00E0	0.00E0
TOTAL FOR PERIOD ABOVE	CI	0.00E0	0.00E0	0.00E0	1.45E-1

2. IODINES

I-131	CI	0.00E0	0.00E0	0.00E0	0.00E0
I-133	CI	0.00E0	0.00E0	0.00E0	0.00E0
I-135	CI	0.00E0	0.00E0	0.00E0	0.00E0
TOTAL FOR PERIOD ABOVE	CI	0.00E0	0.00E0	0.00E0	0.00E0

3. PARTICULATES

SR-89	CI	0.00E0	0.00E0	N/A	N/A
SR-90	CI	0.00E0	0.00E0	N/A	N/A
Y-90	CI	0.00E0	0.00E0	N/A	N/A
UNIDENTIFIED	CI	0.00E0	0.00E0	N/A	N/A
TOTAL FOR PERIOD ABOVE	CI	0.00E0	0.00E0	N/A	N/A



August 29, 1983  
L-83-467

Mr. James P. O'Reilly  
Regional Administrator, Region II  
U.S. Nuclear Regulatory Commission  
101 Marietta Street, Suite 2900  
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

Re: St. Lucie Unit 2  
Docket No. 50-389  
Semi-Annual Report of  
Radioactive Effluent Releases.

Please find attached the subject report for the period June 2, 1983, through June 30, 1983, in accordance with Technical Specification 6.9.1.10.

Very truly yours,

Robert E. Uhrig  
Vice President  
Advanced Systems & Technology

REU/PLP/mpc

Attachment

cc: Harold F. Reis, Esquire

IEAS  
enter  
13-128