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See Environmental Rpt.

SUBJECT: "Semiannul Radioactive Effluent Release Rept Jul-Dec 1989."
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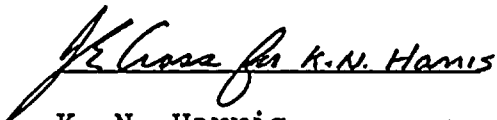
Gentlemen:

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Semi-Annual Radioactive Effluent Release Report

Attached is the Radioactive Effluent Release Report for the period of July 1, 1989, through December 31, 1989, for Turkey Point Units 3 and 4, as required by Technical Specification 6.9.4.

Should there be any questions regarding this information, please contact us.

Very truly yours,



K. N. Harris
Site Vice President
Turkey Point Plant - Nuclear

KNH/DPS/dps

Attachment

cc: Stewart D. Ebnetter, Regional Administrator, Region II,
USNRC Senior Resident Inspector, USNRC, Turkey Point
Plant

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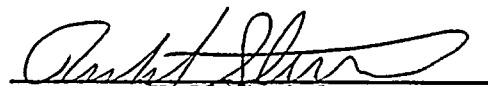
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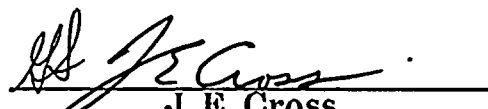
TURKEY POINT PLANT
UNITS 3 AND 4
SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
JULY 1989 THROUGH DECEMBER 1989

SUBMITTED BY
NUCLEAR CHEMISTRY DEPARTMENT
TURKEY POINT PLANT
FLORIDA POWER AND LIGHT COMPANY


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Radiochemist


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Chemistry Supervisor


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Operations Superintendent


J. E. Cross
Plant Manager-Nuclear

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FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT UNITS 3 AND 4
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
SUPPLEMENTAL INFORMATION
JULY 1989 THROUGH DECEMBER 1989

1.0 Regulatory Limits

1.1 Liquid Effluents

- a) The concentration of radioactive material released in liquid effluents to unrestricted areas shall not exceed the concentrations specified in 10CFR20, Appendix B, Table II, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall not exceed 2×10^{-4} $\mu\text{Ci/ml}$.
- b) The dose or dose commitment per reactor to a member of the public from any radioactive materials in liquid effluent released to unrestricted areas shall be limited, during any calendar quarter, to ≤ 1.5 mrem to the total body and to ≤ 5 mrem to any organ, and, during any calendar year, to ≤ 3 mrem to the total body and ≤ 10 mrem to any organ.

1.2 Gaseous Effluents

- a) The dose rate due to radioactive materials released in gaseous effluents from the site to areas at and beyond the site boundary shall be limited to the following:

Less than or equal to 500 mrem/yr to the total body and less than or equal to 3000 mrem/yr to the skin due to noble gases and less than or equal to 1500 mrem/yr to any organ due to I-131, I-133, tritium and for all radioactive materials in particulate form with half lives greater than 8 days.
- b) The air dose per reactor to areas at and beyond the site boundary due to noble gases released in gaseous effluents shall be limited, during any calendar quarter, to ≤ 5 mrad for gamma radiation and ≤ 10 mrad for beta radiation and, during any calendar year, to ≤ 10 mrad for gamma radiation and ≤ 20 mrad for beta radiation.
- c) The dose per reactor to a member of the public, due to I-131, I-133, tritium and to particulates with half-lives greater than 8 days in airborne effluents released to areas at and beyond the site boundary shall not exceed 7.5 mrem to any organ during any calendar quarter and shall not exceed 15 mrem to any organ during any calendar year.

2.0 Maximum Permissible Concentrations

Water: As per 10CFR20 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.

3.0 Average Energy

The average energy of fission and activation gases in gaseous effluents is not applicable.

4.0 Measurements and Approximations of Total Radioactivity

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 Regulatory Guide 1.21 was met or exceeded.

Where alpha, tritium and named nuclides are shown as ----- curies, this should be interpreted as "no activity was detected on the samples using the Plant Technical Specification analyses techniques to achieve required Lower Level of Detection (LLD) sensitivity for radioactive effluents".

4.1 Liquid Effluents

Aliquots of representative pre-release samples were isotopically analyzed for gamma emitting isotopes on a multichannel analyzer.

The above procedure was followed for all releases from the waste disposal system. Frequent periodic sampling and analysis were used to conservatively determine if any radioactivity was being released via the steam generator blowdown system.

Monthly and quarterly composite samples for the waste disposal system were prepared to give proportional weight to each liquid release made during the designated period of accumulation. The monthly composite was analyzed for tritium and gross alpha activity. Tritium was determined by use of liquid scintillation techniques and gross alpha radioactivity was determined by use of a 2π gas flow proportional counter. The quarterly composite was analyzed for Sr-89/90 and Fe-55 by chemical separation.

All radioactivity concentrations determined from analysis of a pre-release composite were multiplied by the total represented volume of the liquid waste released to determine the total quantity of each isotope and of gross alpha activity released during the compositing period.

Aliquots of representative pre-release samples from the waste disposal system were analyzed on a per release basis for dissolved fission and activation gases by use of gamma spectrum analysis. The resulting isotope concentrations were multiplied by the total volume released in order to estimate the total dissolved gases released.

The liquid waste treatment system is shared by both units at the site and generally all liquid releases are allocated on a 50/50 basis to each unit.

4.2 Gaseous Effluents

Airborne releases to the atmosphere occurred from: release of gas decay tanks, the instrument bleedline, containment purges, and releases incidental to operation of the plant. The techniques employed in determining the radioactivity in airborne releases are:

- a) Gamma spectrum analysis for fission and activation gases,
- b) Removal of particulate material by filtration and subsequent gamma-spectrum analysis, Sr-89/90 determination and gross alpha analysis,
- c) Absorption of halogen radionuclides on a charcoal filter and subsequent gamma-spectrum analysis, and
- d) Analysis of water vapor in a gas sample for tritium using liquid scintillation techniques.

All gas releases from the plant which were not accounted for by the above methods were conservatively estimated as curies of Xe-133 by use of the plant vent process monitor recorder chart and the current calibration curve for the monitor.

Portions of the gas waste treatment system are shared by both units and generally all gas releases from the shared system are allocated on a 50/50 basis to each unit.

Meteorological data for the period January, 1989 to December, 1989, in the form of Joint Frequency Distribution Tables is maintained on-site.

4.3 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 to be collectively less than $\pm 10\%$.

b) Analytical Error

Our quarterly Q.C. cross-check program involves counting unknown samples provided by an independent external lab. The errors associated with our analysis of these unknown samples, and reported to us by the independent lab, were used as the basis for deriving the following analytical error terms.

<u>Nuclide Type</u>	<u>Average Error</u>	<u>Maximum Error</u>
Liquid	± 5	± 11
Gaseous	± 9	± 11

5.0 BATCH RELEASES

5.1 Liquid

	<u>Unit 3</u>	<u>Unit 4</u>	
a) Number of batch releases	<u>1.53 E+02</u>	<u>1.53 E+02</u>	
b) Total time period of batch releases	<u>1.11 E+04</u>	<u>1.11 E+04</u>	Minutes
c) Maximum time period for a batch releases	<u>1.65 E+02</u>	<u>1.65 E+02</u>	Minutes
d) Average time period for a batch release	<u>7.25 E+01</u>	<u>7.25 E+01</u>	Minutes
e) Minimum time period for a batch release	<u>3.10 E+01</u>	<u>3.10 E+01</u>	Minutes
f) Average stream flow during period of release of effluent into a flowing stream	<u>1.61 E+06</u>	<u>1.61 E+06</u>	GPM

5.2 Gaseous

a) Number of batch releases	<u>6.00 E+00</u>	<u>9.00 E+00</u>	
b) Total time period of batch releases	<u>2.28 E+02</u>	<u>9.48 E+02</u>	Minutes
c) Maximum time period for a batch release	<u>7.50 E+01</u>	<u>2.40 E+02</u>	Minutes
d) Average time period for a batch release	<u>3.80 E+01</u>	<u>1.05 E+02</u>	Minutes
e) Minimum time period for a batch release	<u>1.50 E+01</u>	<u>1.50 E+01</u>	Minutes

6.0 UNPLANNED RELEASES6.1 Liquid

	<u>UNIT 3</u>	<u>UNIT 4</u>
a) Number of releases	5.00 E-01	5.00 E-01
b) Total activity released	1.02 E-05	1.02 E-05 Curies

6.2 Gaseous

a) Number of releases	0	0
b) Total activity released	0	0 Curies

6.3 See Attachment 1 for:

- a) A description of the event and equipment involved.
- b) Cause(s) for the unplanned release.

7.0 Reactor Coolant Activity

Reactor Coolant activity limits of $100/\bar{E}$ and $1.0 \mu\text{Ci/gm}$ Dose Equivalent I-131 were not exceeded.

- 8.0 The assessment of radiation dose from radioactive effluents to the general public due to their activities inside the site boundry assumes a visitor was on-site at the "Red Barn" recreational area for 12 hours a day, 2 days each week of the year, receiving exposure from both units at Turkey Point. The "Red Barn" is located approximately 0.39 miles NNE of the plant site. Specific activities used in these calculations are the sum of activities in Unit 3, Table 3 and Unit 4, Table 3. These dose calculations were made using historical meteorological data.

**VISITOR DOSE SUMMATION
JANUARY 1989 THROUGH DECEMBER 1989
UNITS 3 AND 4**

Age Group: Adult	Location: Red Barn
<u>Inhalation</u>	<u>Dose (mRem)</u>
Bone	3.43 E-08
Liver	1.75 E-05
Thyroid	3.19 E-05
Kidney	1.76 E-05
Lung	1.78 E-05
GI-LLI	1.75 E-05
Total Body	1.75 E-05

NOBLE GAS EXPOSURE

Gamma Air Dose	2.92 E-03 mRads
Beta Air Dose	8.62 E-03 mRads

9.0 Offsite Dose Calculation Manual Revisions

See Attachment 2

10.0 Solid Waste and Irradiated Fuel Shipments No irradiated fuel shipments were made from the site. Common solid waste from Turkey Point Units 3 and 4 were shipped jointly. A summation of these shipments is given in Table 6 of this report.

11.0 Process Control Program Revisions

There were no changes to the process control program during this reporting period.

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1989 THROUGH DECEMBER 1989
UNIT 3 TABLE 1
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

Units	Quarter 3	Quarter 4
-------	-----------	-----------

A. Fission and Activation Products

1. Total Release (not including tritium, gases, alpha)	Ci	3.97 E-02	4.35 E-02
2. Average diluted concentration during period	µCi/ml	6.47 E-10	5.86 E-10

B. Tritium

1. Total Release	Ci	6.68 E + 01	1.31 E + 02
2. Average diluted concentration during period	µCi/ml	1.09 E-06	1.76 E-06

C. Dissolved and Entrained Gases

1. Total Release	Ci	7.49 E-02	7.69 E-01
2. Average diluted concentration during period	µCi/ml	1.22 E-09	1.03 E-08

D. Gross Alpha Radioactivity

1. Total Release	Ci	<6.95 E-08*	<1.31 E-08*
------------------	----	-------------	-------------

E. Volume of Batch Waste Released (prior to dilution)	Liters	1.37 E + 06	1.63 E + 06
--	--------	-------------	-------------

F. Volume of Continuous Waste Released (prior to dilution)	Liters	0	0
---	--------	---	---

G. Volume of Dilution Water Used During Period	Liters	6.14 E + 10	7.43 E + 10
---	--------	-------------	-------------

*MDA Value in µCi/ml

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1989 THROUGH DECEMBER 1989
UNIT 3 TABLE 2
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Na-24	Ci	-----	-----	4.88 E-06	2.87 E-05
Cr-51	Ci	-----	-----	8.29 E-05	1.60 E-04
Mn-54	Ci	-----	-----	1.46 E-03	1.05 E-03
Fe-55	Ci	-----	-----	1.35 E-02	1.49 E-02
Co-57	Ci	-----	-----	1.40 E-05	-----
Co-58	Ci	-----	-----	1.94 E-03	3.78 E-03
Fe-59	Ci	-----	-----	-----	1.78 E-05
Co-60	Ci	-----	-----	7.91 E-03	1.01 E-02
Zn-65	Ci	-----	-----	1.11 E-05	-----
Sr-90	Ci	-----	-----	6.57 E-05	-----
Nb-95	Ci	-----	-----	1.31 E-05	5.45 E-06
Zr-97	Ci	-----	-----	2.58 E-06	-----
Ag-110	Ci	-----	-----	9.46 E-04	4.72 E-04
Sn-117m	Ci	-----	-----	-----	3.53 E-06
Sb-124	Ci	-----	-----	5.01 E-04	8.94 E-05
Sb-125	Ci	-----	-----	6.73 E-03	1.23 E-02
I-131	Ci	-----	-----	2.49 E-04	1.00 E-04
Cs-134	Ci	-----	-----	1.61 E-03	6.43 E-05
Cs-137	Ci	-----	-----	4.64 E-03	4.62 E-04
Unidentified	Ci				
Total for Period Above	Ci	-----	-----	3.97 E-02	4.35 E-02

FLORIDA POWER AND LIGHT COMPANY
 TURKEY POINT PLANT
 SEMIANNUAL REPORT
 JULY 1989 THROUGH DECEMBER 1989
 UNIT 3 TABLE 2 (Continued)
 LIQUID EFFLUENTS

Liquid Dissolved Gas

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Kr-85	Ci	-----	-----	-----	7.55 E-07
Kr-85m	Ci	-----	-----	-----	3.73 E-05
Xe-131m	Ci	-----	-----	5.18 E-04	1.25 E-02
Xe-133	Ci	-----	-----	7.44 E-02	7.51 E-01
Xe-133m	Ci	-----	-----	7.60 E-06	4.52 E-03
Xe-135	Ci	-----	-----	1.33 E-05	5.55 E-04
Xe-135m	Ci	-----	-----	1.51 E-06	3.34 E-05
Total for Period Above	Ci	-----	-----	7.49 E-02	7.69 E-01

LIQUID EFFLUENTS-DOSE SUMMATION
 JANUARY 1989 THROUGH DECEMBER 1989

UNIT 3

Age Group: Teenager

Location: Cooling Canal

Shoreline Deposition

Dose (mRem)

% of Annual Limit

Total Body

1.93 E-03

6.43 E-02

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1989 THROUGH DECEMBER 1989
UNIT 3 TABLE 3
GAS EFFLUENTS - SUMMATION OF ALL RELEASES

Units	Quarter 3	Quarter 4
-------	-----------	-----------

A. Fission and Activation Products

1. Total Release	Ci	5.79 E + 02	5.47 E + 02
2. Average Release Rate for Period	μCi/sec	7.28 E + 01	6.88 E + 01

B. Iodines

1. Total Iodine-131	Ci	4.22 E-05	6.89 E-05
2. Average Release Rate for Period	μCi/sec	5.31 E-06	8.67 E-06

Particulates

1. Particulates T - 1/2 > 8 Days	Ci	<1.00 E-13*	<1.76 E-14*
2. Average Release Rate for Period	μCi/sec	-----	-----
3. Gross Alpha Radioactivity	Ci	<5.99 E-16*	<7.37 E-16*

D. Tritium

1. Total Release	Ci	1.46 E + 00	2.22 E + 00
2. Average Release Rate for Period	μCi/sec	1.84 E-01	2.79 E-01

* <MDA Values Expressed in μCi/ml

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1989 THROUGH DECEMBER 1989
UNIT 3 TABLE 4
GASEOUS EFFLUENTS

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4

1. Fission Gases

Ar-41	Ci	1.49 E-01	1.36 E-01	-----	2.48 E-01
Kr-85	Ci	-----	1.33 E + 00	-----	3.31 E-01
Kr-85m	Ci	1.44 E-03	3.42 E-03	-----	3.38 E-05
Xe-131m	Ci	9.49 E-02	3.70 E-01	2.89 E-01	2.84 E-01
Xe-133	Ci	5.59 E + 02	5.29 E + 02	1.95 E + 01	1.53 E + 01
Xe-133m	Ci	6.85 E-02	6.81 E-02	8.76 E-02	9.28 E-02
Xe-135	Ci	4.46 E-02	4.74 E-02	6.12 E-03	4.18 E-03
Xe-135m	Ci	-----	-----	-----	-----
	Ci				
Unidentified	Ci				
Total for Period Above	Ci	5.59 E + 02	5.31 E + 02	1.99 E + 01	1.63 E + 01

2. Iodines

I-131	Ci	4.22 E-05	6.89 E-05
I-133	Ci	1.98 E-05	5.60 E-05
	Ci		
Total for Period Above	Ci	6.20 E-05	1.25 E-04

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1989 THROUGH DECEMBER 1989
UNIT 3 TABLE 4 (Continued)
GASEOUS EFFLUENTS

Nuclides Released	Units	Continuous Mode	
		Quarter 3	Quarter 4

3. Particulates

I-131	Ci	<1.00 E-13*	<1.76 E-14*
	Ci		
	Ci		
	Ci		
	Ci		
	Ci		
	Ci		
Unidentified	Ci		
Total for Period Above	Ci	<1.00 E-13*	<1.76 E-14*

* <MDA Values Expressed in $\mu\text{Ci/ml}$

FLORIDA POWER AND LIGHT COMPANY
 TURKEY POINT PLANT
 SEMIANNUAL REPORT
 JULY 1989 THROUGH DECEMBER 1989
 UNIT 3 TABLE 5
 DOSE DUE TO IODINE, H-3, AND PARTICULATES

Pathway	Bone	Liver	Thyroid	Kidney	Lung	GI-LLI	Skin	Total Body
Cow Milk - Infant	1.37 E-05	4.81 E-05	4.67 E-03	1.76 E-05	3.20 E-05	3.24 E-05	-----	4.04 E-05
Fruit & Veg - Fresh	5.75 E-07	3.92 E-05	2.16 E-04	3.94 E-05	3.84 E-05	3.90 E-05	-----	3.89 E-05
Ground Plane	3.46 E-06	3.46 E-06	3.46 E-06	3.46 E-06	3.46 E-06	3.46 E-06	4.05 E-06	3.46 E-06
Inhalation - Adult	2.88 E-08	1.43 E-05	2.64 E-05	1.44 E-05	1.45 E-05	1.43 E-05	-----	1.43 E-05
Unit Totals (mRem)	1.78 E-05	1.05 E-04	4.92 E-03	7.49 E-05	8.84 E-05	8.92 E-05	4.05 E-06	9.71 E-05

% Annual Limit	1.19 E-04	7.00 E-04	3.28 E-02	4.99 E-04	5.89 E-04	5.95 E-04	2.70 E-05	6.47 E-04
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DOSE NOBLE GASES

Gamma Air Does	1.12 E-02 mRad	% of Annual Limit	1.12 E-01 %/Yr
Beta Air Dose	3.31 E-02 mRad	% of Annual Limit	1.65 E-01 %/Yr

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1989 THROUGH DECEMBER 1989
UNIT 4 TABLE 1
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

Units	Quarter 3	Quarter 4
-------	-----------	-----------

A. Fission and Activation Products

1. Total Release (not including tritium, gases, alpha)	Ci	3.97 E-02	4.35 E-02
2. Average diluted concentration during period	μCi/ml	6.47 E-10	5.86 E-10

B. Tritium

1. Total Release	Ci	6.68 E + 01	1.31 E + 02
2. Average diluted concentration during period	μCi/ml	1.09 E-06	1.76 E-06

C. Dissolved and Entrained Gases

1. Total Release	Ci	7.49 E-02	7.69 E-01
2. Average diluted concentration during period	μCi/ml	1.22 E-09	1.03 E-08

D. Gross Alpha Radioactivity

1. Total Release	Ci	<6.95 E-08*	<1.31 E-08*
------------------	----	-------------	-------------

E. Volume of Batch Waste Released (prior to dilution)	Liters	1.37 E + 06	1.63 E + 06
---	--------	-------------	-------------

F. Volume of Continuous Waste Released (prior to dilution)	Liters	0	0
--	--------	---	---

G. Volume of Dilution Water Used During Period	Liters	6.14 E + 10	7.43 E + 10
--	--------	-------------	-------------

*MDA Value in μCi/ml

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1989 THROUGH DECEMBER 1989
UNIT 4 TABLE 2
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Na-24	Ci	-----	-----	4.88 E-06	2.87 E-05
Cr-51	Ci	-----	-----	8.29 E-05	1.60 E-04
Mn-54	Ci	-----	-----	1.46 E-03	1.05 E-03
Fe-55	Ci	-----	-----	1.35 E-02	1.49 E-02
Co-57	Ci	-----	-----	1.40 E-05	-----
Co-58	Ci	-----	-----	1.94 E-03	3.78 E-03
Fe-59	Ci	-----	-----	-----	1.78 E-05
Co-60	Ci	-----	-----	7.91 E-03	1.01 E-02
Zn-65	Ci	-----	-----	1.11 E-05	-----
Sr-90	Ci	-----	-----	6.57 E-05	-----
Nb-95	Ci	-----	-----	1.31 E-05	5.45 E-06
Zr-97	Ci	-----	-----	2.58 E-06	-----
Ag-110	Ci	-----	-----	9.46 E-04	4.72 E-04
m-117m	Ci	-----	-----	-----	3.53 E-06
Mo-124	Ci	-----	-----	5.01 E-04	8.94 E-05
Sb-125	Ci	-----	-----	6.73 E-03	1.23 E-02
I-131	Ci	-----	-----	2.49 E-04	1.00 E-04
Cs-134	Ci	-----	-----	1.61 E-03	6.43 E-05
Cs-137	Ci	-----	-----	4.64 E-03	4.62 E-04
	Ci				
	Ci				
	Ci				
	Ci				
Unidentified	Ci				
Total for Period Above	Ci	-----	-----	3.97 E-02	4.35 E-02

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
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JULY 1989 THROUGH DECEMBER 1989
UNIT 4 TABLE 2 (Continued)
LIQUID EFFLUENTS

Liquid Dissolved Gas

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Kr-85	Ci	-----	-----	-----	7.55 E-07
Kr-85m	Ci	-----	-----	-----	3.73 E-05
Xe-131m	Ci	-----	-----	5.18 E-04	1.25 E-02
Xe-133	Ci	-----	-----	7.44 E-02	7.51 E-01
Xe-133m	Ci	-----	-----	7.60 E-06	4.52 E-03
Xe-135	Ci	-----	-----	1.33 E-05	5.55 E-04
Xe-135m	Ci	-----	-----	1.51 E-06	3.34 E-05
Total for Period Above	Ci	-----	-----	7.49 E-02	7.69 E-01

LIQUID EFFLUENTS-DOSE SUMMATION
JANUARY 1989 THROUGH DECEMBER 1989

UNIT 4

Age Group: Teenager

Location: Cooling Canal

Shoreline Deposition

Dose (mRem)

% of Annual Limit

Total Body

1.93 E-03

6.43 E-02

FLORIDA POWER AND LIGHT COMPANY
 TURKEY POINT PLANT
 SEMIANNUAL REPORT
 JULY 1989 THROUGH DECEMBER 1989
 UNIT 4 TABLE 3
 GAS EFFLUENTS - SUMMATION OF ALL RELEASES

Units	Quarter 3	Quarter 4
-------	-----------	-----------

A. Fission and Activation Products

1. Total Release	Ci	5.89 E + 02	5.50 E + 02
2. Average Release Rate for Period	μCi/sec	7.40 E + 01	6.92 E + 01

B. Iodines

1. Total Iodine-131	Ci	4.22 E-05	6.89 E-05
2. Average Release Rate for Period	μCi/sec	5.31 E-06	8.67 E-06

Particulates

1. Particulates T - 1/2 > 8 Days	Ci	<1.00 E-13*	9.04 E-08
2. Average Release Rate for Period	μCi/sec	-----	1.14 E-08
3. Gross Alpha Radioactivity	Ci	<5.99 E-16*	<7.37 E-16*

D. Tritium

1. Total Release	Ci	1.53 E + 00	2.31 E + 00
2. Average Release Rate for Period	μCi/sec	1.93 E-01	2.91 E-01

*MDA Values Expressed in μCi/ml

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
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JULY 1989 THROUGH DECEMBER 1989
UNIT 4 TABLE 4
GASEOUS EFFLUENTS

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4

1. Fission Gases

Ar-41	Ci	1.03 E-01	2.64 E-01	1.90 E-02	4.24 E-01
Kr-85	Ci	-----	-----	-----	3.31 E-01
Kr-85m	Ci	1.15 E-03	1.74 E-02	2.68 E-03	2.09 E-02
Kr-87	Ci	-----	1.40 E-03	-----	-----
Xe-131m	Ci	6.52 E-02	6.00 E-02	2.89 E-01	2.84 E-01
Xe-133	Ci	5.57 E + 02	5.31 E + 02	3.02 E + 01	1.63 E + 01
Xe-133m	Ci	4.19 E-02	1.24 E-01	1.98 E-01	1.44 E-01
Xe-135	Ci	4.59 E-02	7.04 E-01	8.87 E-02	4.26 E-01
	Ci				
Unidentified	Ci				
Total for Period Above	Ci	5.57 E + 02	5.32 E + 02	3.08 E + 01	1.79 E + 01

2. Iodines

I-131	Ci	4.22 E-05	6.89 E-05
I-133	Ci	1.98 E-05	5.60 E-05
	Ci		
Total for Period Above	Ci	6.20 E-05	1.25 E-04

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
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JULY 1988 THROUGH DECEMBER 1988
UNIT 4 TABLE 4 (Continued)
GASEOUS EFFLUENTS

Nuclides Released	Units	Continuous Mode	
		Quarter 3	Quarter 4

3. Particulates

Co-60	Ci	-----	9.04 E-08
I-131	Ci	<1.00 E-13*	-----
	Ci		
	Ci		
	Ci		
	Ci		
Unidentified	Ci		
Total for Period Above	Ci	<1.00 E-13*	9.04 E-08

* <MDA Values Expressed in $\mu\text{Ci/ml}$

FLORIDA POWER AND LIGHT COMPANY
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 JULY 1989 THROUGH DECEMBER 1989
 UNIT 4 TABLE 5
 DOSE DUE TO IODINE, H-3, AND PARTICULATES

Pathway	Bone	Liver	Thyroid	Kidney	Lung	GI-LLI	Skin	Total Body
Cow Milk - Infant	1.29 E-05	4.89 E-05	4.54 E-03	1.08 E-05	3.30 E-05	3.34 E-05	-----	4.12 E-05
Fruit & Veg - Fresh	5.64 E-07	4.03 E-05	2.12 E-04	4.05 E-05	3.95 E-05	4.01 E-05	-----	4.00 E-05
Ground Plane	3.48 E-06	3.48 E-06	3.48 E-06	3.48 E-06	3.48 E-06	3.48 E-06	4.08 E-06	3.48 E-06
Inhalation - Adult	2.81 E-08	1.48 E-05	2.66 E-05	1.49 E-05	1.50 E-05	1.48 E-05	-----	1.48 E-05
Unit Totals (mRem)	1.70 E-05	1.07 E-04	4.78 E-03	6.97 E-05	9.10 E-05	9.18 E-05	4.08 E-06	9.95 E-05

% Annual Limit	1.13 E-04	7.13 E-04	3.19 E-02	4.65 E-04	6.07 E-04	6.12 E-04	2.72 E-05	6.63 E-04
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DOSE NOBLE GASES

Gamma Air Does	1.12 E-02 mRad	% of Annual Limit	1.12 E-01 %/Yr
Beta Air Dose	3.31 E-02 mRad	% of Annual Limit	1.65 E-01 %/Yr

FLORIDA POWER AND LIGHT COMPANY
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ATTACHMENT 1

On December 18, 1989 B Monitor Tank (B-MT) was inadvertently released instead of B-Waste Monitor Tank (B-WMT) (Reference Florida Power and light Letter L-90-65, dated February 16, 1990).

The inadvertent release of the B-MT liquid waste instead of the B-WMT was personnel error. The Nuclear Operator (NO) made a log entry that the B-WMT was to be released. However, the NO had earlier observed that the B-MT was on recirculation prior to release; the NO upon being notified that the B-WMT was to be released, inadvertently went to the B-MT section of procedure OP-5163.3, Waste Disposal System - Controlled Liquid Release to the Circulating Water, which resulted in the release of the B-MT Tank.

Contributing factors were the similarity in names of the two tanks along with the NO previously observing the B-MT on recirculation. Additionally, the procedure did not require an independent verification of the tank to be released against the Liquid Release Permit.

Corrective steps which have been taken and the results achieved:

- a. The responsible operator was disciplined.
- b. This incident was recorded in the night order book to inform all operations personnel.
- c. Procedures OP-5163.3, Waste Disposal System - Controlled Liquid Release to the Circulating Water and OP-5523.1, Waste Disposal System - Gas Decay Tank, Controlled Release to Atmosphere, have each been revised to include an independent verification to validate the tank to be released against the appropriate Release Permit.
- d. The Liquid Release Permit form was modified by replacing "tank" entry portion of the form with check boxes for each tank. The Gas Release Permit was reviewed and no changes were deemed necessary.

The "B" Monitor Tank had been sampled at 2254 EST on December 17, 1989 in preparation for release after the "B" Waste Monitor Tank. The "B" Monitor Tank sample was well within Technical Specification limits for a legal waste release.



FLORIDA POWER AND LIGHT COMPANY
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ATTACHMENT 2

On November 9, 1989, the Offsite Dose Calculation Manual revision was PNSC approved, clarifying the location of the Steam Generator Blowdown Radiation Monitors (R-3/4-19). No changes to the calculational methods contained in the Offsite Dose Calculation Manual were instituted during this period.

PNSC
APPROVAL

PLT. MGR
APPROVAL

DATE 11/9/89

DATE 11/9/89

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
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ATTACHMENT 2 (Cont'd)

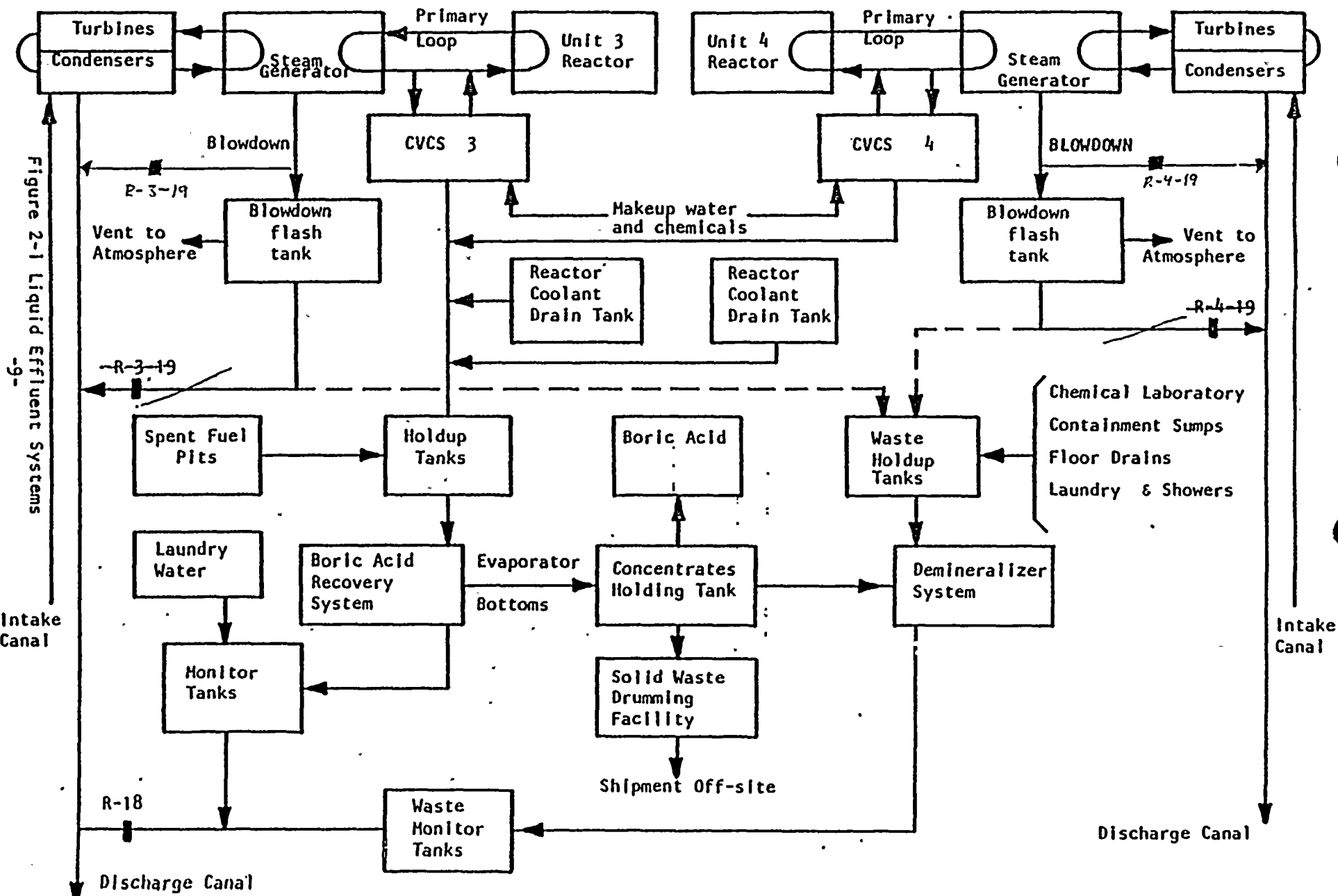


Figure 2-1 Liquid Effluent Systems

Intake Canal

Intake Canal

Discharge Canal

Discharge Canal

07/20/84

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1989 THROUGH DECEMBER 1989
UNITS 3 AND 4 TABLE 6

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL

1.	TYPE OF WASTE	UNIT	6 MO PERIOD		% ERR
a.	Spent resin, filters sludge evaporator (note 1)	m ³ Ci	0.00 0.00	E0 E0	
b.	Dry compressible waste (note 2)	m ³ Ci	6.28 1.51	E1 E-1	20
c.	Irradiated components Control rods, etc.	m ³ Ci	0.00 0.00	E0 E0	
d.	Other non-compressible Waste (Note 3)	m ³ Ci	5.02 3.94	E1 E-1	20

2. ESTIMATE OF MAJOR NUCLIDE COMPOSITION BY TYPE OF WASTE

a.	_____	_____	_____
b.	Co-60	%	60
	Fe-55	%	19
	Ni-63	%	11
	Cs-137	%	3
	Sb-125	%	2
	H-3	%	1
	Co-58	%	1
	Mn-54	%	1
	Cs-134	%	1
	Co-57	%	1
c.	_____	_____	_____
d.	Co-60	%	46
	Cs-137	%	36
	Ni-63	%	12
	Fe-55	%	3
	C-14	%	2
	Ag-110m	%	1



3. SOLID WASTE DISPOSITION

NUMBER OF SHIPMENTS	MODE OF TRANSPORT	DESTINATION
16 (Note 4)	Sole use truck	Oak Ridge, TN

B. IRRADIATED FUEL SHIPMENTS

none

FLORIDA POWER & LIGHT COMPANY
 TURKEY POINT PLANT
 SEMIANNUAL REPORT
 JULY 1989 THROUGH DECEMBER 1989
 UNITS 3 AND 4 TABLE 6
 SOLID WASTE SUPPLEMENT

Waste Classification	Total Volume Ft3	(NOTE 5) Total Curie Quantity	(NOTE 6) Principal Radionuclides	(NOTE 7) Type of Waste	R.G. 1.21 Category	(NOTE 8) Type of Container	Solidification or Absorbent Agent
Class A	4053.7	0.55	None	Compactable and Non-Compactable Trash	1.b,d	Strong, Tight Package	N/A

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1989 THROUGH DECEMBER 1989
UNITS 3 AND 4 TABLE 6

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. SOLID WASTE SHIPMENT OFFSITE FOR BURIAL OR DISPOSAL

- Note 1: Spent resin waste volume indicates volume shipped to a burial site directly from Turkey Point Plant or following volume reduction by a waste processing facility. Volume shipped to the waste processing facility was 16.6 m³.
- Note 2: Dry compressible waste volume indicates volume shipped to burial site following reduction by a waste processing facility. Volume shipped to the waste processing facility was 111.6 m³.
- Note 3: Other noncompressible waste indicates volume shipped to burial site following decontamination and volume reduction by a waste processing facility. Volume shipped to the waste processing facility was 319 m³.
- Note 4: Material transported to Oak Ridge, Tennessee, was consigned to licensed processing facilities for volume reduction and decontamination activities. The material remaining after processing was transported by the processor to Barnwell, South Carolina, for burial.
- Note 5: The total curie quantity and radionuclide composition of solid waste shipped from the Turkey point Plant Units 3 and 4 are determined using a combination of qualitative and quantitative techniques. The Turkey Point Plant follows the guidelines in the Low Level Waste Licensing Branch Technical Position on Radioactive Waste Classification (5/11/83) for these determinations.

The most frequent used techniques for determining the total activity in a package are the dose to curie method and inference from specific activity and mass or activity concentration and volume. Activation analysis may be applied when it is appropriate. The total activity determination by any of these methods is considered to be an estimate.



The composition of radionuclides in the waste is determined by both on-site analysis for principle gamma emitters and periodic off-site analyses for difficult to measure isotopes. The on-site analyses are performed either on a batch basis or on a routine basis using representative samples appropriate for the waste type. Off-site analyses are used to establish scaling factors or other estimates for difficult to measure isotopes.

Note 6: Principle radionuclide refers to those radionuclides contained in the waste in concentrations greater than 0.01 times the concentration of the nuclide listed in Table 1 or 0.01 times the smallest concentration of the nuclide listed in Table 2 of 10 CFR 61.

Note 7: Type of waste is specified as described in NUREG 0782, Draft Environment Impact Statement on 10 CFR 61 "Licensing Requirements for Land Disposal of Radioactive Waste".

Note 8: Type of container refers to the transport package.

RKR/eb/024

