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TURKEY POINT PLANT
UNITS 3 AND 4
SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
JULY 1986 THROUGH DECEMBER 1986

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

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FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT UNITS 3 AND 4
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
SUPPLEMENTAL INFORMATION
JULY 1986 THROUGH DECEMBER 1986 .

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 $2 \times 10^{-4} \mu\text{Ci/ml}$.
- 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

The maximum permissible concentrations for liquid and airborne releases are described in Sections 1.1-a and 1.2-a of this report.

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.

4.1 Liquid Effluents

Aliquots of representative pre-release samples were either isotopically analyzed for gamma emitting isotopes on a multichannel analyzer, or evaporated and analyzed for gross beta-gamma activity in a 2π gas flow proportional counter. The efficiency of the gas flow proportional counter is adjusted so that the activity determined by gross beta-gamma analysis approximates the isotopic activities determined by gamma spectrum analysis and selected beta determinations, exclusive of tritium and dissolved gases.

The above procedure was followed for all releases from the waste disposal system and for secondary system batch releases. 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.

At least one representative batch of liquid effluent from the waste disposal system was analyzed monthly for dissolved fission and activation gases by use of gamma spectrum analysis. The resulting isotope concentrations were multiplied by the total volume released for the month in order to estimate the total dissolved gases released. If more than one batch of effluent was analyzed, the concentrations were weighted in an appropriate manner.

4.2 Gaseous Effluents

Airborne releases to the atmosphere occurred from: release of gas decay tanks, the instrument bleedline, containment purges, and sporadic 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 sporadic 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. However, during July and August of 1986, all short lived gaseous effluents were allocated to Unit 3 alone. This is due to Unit 4 being shut down during these months, and thus not contributing short lived isotopes.

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	$\pm 5\%$	$\pm 13\%$
Gaseous	$\pm 6\%$	$\pm 12\%$

5.0 BATCH RELEASES**5.1 Liquid**

	<u>Unit 3</u>	<u>Unit 4</u>	
a) Number of batch releases	<u>1.27 E+02</u>	<u>1.27 E+02</u>	
b) Total time period of batch releases	<u>1.19 E+04</u>	<u>1.19 E+04</u>	Minutes
c) Maximum time period for a batch release	<u>1.40 E+02</u>	<u>1.40 E+02</u>	Minutes
d) Average time period for a batch release	<u>9.37 E+01</u>	<u>9.37 E+01</u>	Minutes
e) Minimum time period for a batch release	<u>5.50 E+01</u>	<u>5.50 E+01</u>	Minutes
f) Average stream flow during periods of release of effluent into a flowing stream	<u>1.38 E+06</u>	<u>1.38 E+06</u>	GPM

5.2 Gaseous

a) Number of batch releases	<u>4.50 E+00</u>	<u>5.50 E+00</u>	
b) Total time period of batch releases	<u>1.28 E+04</u>	<u>5.55 E+02</u>	Minutes
c) Maximum time period for a batch release	<u>6.00 E+02</u>	<u>2.40 E+02</u>	Minutes
d) Average time period for a batch release	<u>2.83 E+02</u>	<u>1.01 E+02</u>	Minutes
e) Minimum time period for a batch release	<u>3.00 E+01</u>	<u>3.00 E+01</u>	Minutes

6.0 UNPLANNED RELEASES**6.1 Liquid**

a) Number of releases	<u>0.00 E+00</u>	<u>0.00 E+00</u>	
b) Total activity released	<u>0.00 E+00</u>	<u>0.00 E+00</u>	Curies

6.2 Gaseous

a) Number of releases	<u>0.00 E+00</u>	<u>0.00 E+00</u>	
b) Total activity released	<u>0.00 E+00</u>	<u>0.00 E+00</u>	Curies

6.3 See attachments (if applicable) for:

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

- 7.0 The assessment of radiation dose from radioactive effluents to the general public due to their activities inside the site boundary 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. These dose calculations were made using averaged hourly 1986 meteorological data.

**VISITOR DOSE SUMMATION
JANUARY 1986 THROUGH DECEMBER 1986
UNITS 3 AND 4**

Age Group: Adult

Location: Red Barn

Inhalation

Dose (mRem)

Bone	3.02 E-06
Liver	1.11 E-03
Thyroid	1.55 E-03
Kidney	1.11 E-03
Lung	1.11 E-03
GI-LLI	1.10 E-03
Total Body	1.11 E-03

NOBLE GAS EXPOSURE

Gamma Air Dose	3.05 E-03 mRads
Beta Air Dose	8.88 E-03 mRads

8.0 Offsite Dose Calculation Manual Revisions:

There were no ODCM revisions during this reporting period.

9.0 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.

10.0 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 1986 THROUGH DECEMBER 1986

UNIT 3 TABLE 1
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

Units	Quarter 3	Quarter 4
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A. Fission and Activation Products

1. Total Release (not including tritium, gases, alpha)	Ci	4.64 E-02	3.51 E-02
2. Average diluted concentration during period	μCi/ml	7.00 E-11	4.87 E-11

B. Tritium

1. Total Release	Ci	7.50 E+01	1.35 E+02
2. Average diluted concentration during period	μCi/ml	6.04 E-06 ^Δ	8.11 E-06 ^Δ

C. Dissolved and Entrained Gases

1. Total Release	Ci	3.80 E-02	3.76 E-02
2. Average diluted concentration during period	μCi/ml	5.70 E-11	5.20 E-11

D. Gross Alpha Radioactivity

1. Total Release	Ci	<1.01 E-08*	<8.64 E-09*
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E. Volume of Waste Released (prior to dilution)	Liters	1.87 E+06	1.37 E+06
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F. Volume of Dilution Water Used During Period	Liters	6.65 E+11	7.20 E+11
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Δ Based on Cooling Canal Tritium Concentration

* MDA value in μCi/ml

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1986 THROUGH DECEMBER 1986

UNIT 3 TABLE 2
LIQUID EFFLUENTS

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Ag-110m	Ci			4.10 E-04	2.25 E-05
Co-57	Ci			4.85 E-05	3.90 E-05
Co-58	Ci			1.11 E-02	4.08 E-03
Co-60	Ci			1.45 E-02	1.44 E-02
Cr-51	Ci			1.42 E-03	2.68 E-04
Cs-134	Ci			5.10 E-04	1.08 E-03
Cs-137	Ci			1.62 E-03	2.99 E-03
Fe-55	Ci			8.20 E-03	2.73 E-03
I-131	Ci			1.01 E-03	1.20 E-03
I-133	Ci			3.55 E-05	4.90 E-05
La-140	Ci			2.28 E-04	2.59 E-04
Mn-54	Ci			3.34 E-04	1.86 E-03
Mo-99/Tc-99m	Ci			5.25 E-05	1.85 E-05
Na-24	Ci			--	5.85 E-05
Nb-95	Ci			4.37 E-04	--
Ru-103	Ci			5.15 E-05	--
Sb-125	Ci			6.35 E-03	6.00 E-03
Sr-89	Ci			<3.00E-08	<2.00 E-08
Sr-90	Ci			<5.00E-09	<4.00 E-09
Te-132	Ci			--	4.50 E-06
Zn-65	Ci			5.20 E-05	--
Zr-95	Ci			9.40 E-05	--
	Ci				
	Ci				
	Ci				
Unidentified	Ci				
Total for Period Above	Ci			4.64 E-02	3.51 E-02

(NOTE: -- Indicates Less than detectable activity)

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1986 THROUGH DECEMBER 1986
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
Xe-131m	Ci			7.10 E-04	--
Xe-133	Ci			3.68 E-02	3.49 E-02
Xe-133m	Ci			1.95 E-04	8.70 E-04
Xe-135	Ci			2.69 E-04	1.79 E-03
	Ci				
	Ci				
	Ci				
	Ci				
Total for Period Above	Ci			3.80 E-02	3.76 E-02

(NOTE: -- Indicates Less than detectable activity)

LIQUID EFFLUENTS - DOSE SUMMATION
JANUARY 1986 THROUGH DECEMBER 1986
UNIT 3

Age Group: Teenager

Location: Cooling Canal

Shoreline Deposition

Dose (mRem)

% of Annual Limit

Total Body

3.27 E-03

1.09 E-01

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1986 THROUGH DECEMBER 1986

UNIT 3 TABLE 3
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

Units	Quarter 3	Quarter 4
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A. Fission and Activation Gases

1. Total Release	Ci	7.30 E+02	8.64 E+02
2. Average Release Rate for Period	μCi/sec	9.29 E+01	1.10 E+02

B. Iodines

1. Total Iodine-131	Ci	3.06 E-03	1.25 E-02
2. Average Release Rate for Period	μCi/sec	3.89 E-04	1.59 E-03

C. Particulates

1. Particulates T - 1/2 > 8 Days	Ci	4.77 E-04	1.50 E-03
2. Average Release Rate for Period	μCi/sec	6.07 E-05	1.91 E-04
3. Gross Alpha Radioactivity	Ci	5.05 E-08	5.08 E-08

D. Tritium

1. Total Release	Ci	8.60 E+01	1.28 E+02
2. Average Release Rate for Period	μCi/sec	1.09 E+01	1.63 E+01

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1986 THROUGH DECEMBER 1986

UNIT 3 TABLE 4
GASEOUS EFFLUENTS

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

1. Fission and Activation Gases

Ar-41	Ci	1.59 E-01	2.27 E-01	2.61 E+00	1.91 E-01
Kr-85	Ci	--	2.10 E-01	--	--
Kr-85m	Ci	6.91 E-02	1.20 E-01	7.04 E-02	1.23 E-01
Kr-87	Ci	2.19 E-03	--	--	--
Kr-88	Ci	4.66 E-02	9.46 E-02	6.12 E-02	1.21 E-01
Xe-131m	Ci	9.66 E-01	3.17 E+00	1.60 E+00	3.03 E+00
Xe-133	Ci	5.39 E+02	5.31 E+02	1.80 E+02	3.17 E+02
Xe-133m	Ci	1.36 E+00	2.64 E+00	1.36 E+00	2.51 E+00
Xe-135	Ci	1.08 E+00	1.93 E+00	1.13 E+00	1.77 E+00
	Ci				
	Ci				
Unidentified	Ci				
Total for Period Above	Ci	5.43 E+02	5.39 E+02	1.87 E+02	3.25 E+02

2. Iodines

I-131	Ci	3.06 E-03	1.25 E-02
I-133	Ci	2.80 E-03	3.46 E-03
	Ci		
Total for Period Above	Ci	5.86 E-03	1.60 E-02

(NOTE: -- Indicates Less than detectable activity)

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1986 THROUGH DECEMBER 1986
UNIT 3 TABLE 4 (Continued)
GASEOUS EFFLUENTS

Nuclides Released	Units	Continuous Mode	
		Quarter 3	Quarter 4

3. Particulates

Ba-140	Ci	5.85 E-05	1.59 E-04
Co-58	Ci	3.55 E-05	2.75 E-05
Co-60	Ci	7.20 E-06	1.70 E-06
Cs-134	Ci	6.50 E-05	4.42 E-04
Cs-136	Ci	2.33 E-05	1.63 E-04
Cs-137	Ci	2.38 E-04	5.20 E-04
I-131	Ci	1.38 E-05	4.26 E-05
La-140	Ci	2.63 E-05	1.03 E-04
Mn-54	Ci	5.70 E-06	1.27 E-05
Sr-89	Ci	3.84 E-06	2.14 E-05
Sr-90	Ci	<3.79 E-16*	<1.26 E-16*
	Ci		
	Ci		
	Ci		
	Ci		
	Ci		
	Ci		
	Ci		
	Ci		
	Ci		
Unidentified	Ci		
Total for Period Above	Ci	4.77 E-04	1.50 E-03

(NOTE: -- Indicates Less than detectable activity)

* MDA in $\mu\text{Ci/cc}$

APPENDIX 3
(Continued)
FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JANUARY 1986 THROUGH DECEMBER 1986
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 (A)	1.66 E-03	4.24 E-03	2.42 E-01	1.20 E-03	2.30 E-03	2.17 E-03	--	2.67 E-03
Fruit and Veg.(Fresh) (B)	3.34 E-05	4.13 E-04	8.83 E-03	4.16 E-04	3.66 E-04	3.73 E-04	--	3.95 E-04
Ground Plane (C)	1.73 E-04	1.73 E-04	1.73 E-04	1.73 E-04	1.73 E-04	1.73 E-04	1.98 E-04	1.73 E-04
Inhalation (D)	3.13 E-06	9.23 E-04	1.57 E-03	9.23 E-04	9.20 E-04	9.17 E-04	--	9.20 E-04
Unit Totals (mRem)	1.87 E-03	5.75 E-03	2.53 E-01	2.71 E-03	3.76 E-03	3.63 E-03	1.98 E-04	4.16 E-03
% Annual Limit	--	--	1.69 E+00	--	--	--	--	--

DOSE - NOBLE GASES

Gamma Air Dose^(E) 1.83 E-02 mRad 1.83 E-01 % of annual Limit

Beta Air Dose^(E) 5.36 E-02 mRad 2.68 E-01 % of annual Limit

- (A) - Assumed cow 4.5 miles W of plant.
Age Group: Infant
- (B)(C)(D) - Maximally exposed individual at garden (residence assumed), 3.6 miles WNW of plant.
Age Group: Adult
- (E) - Maximum air dose occurs at 0.87 miles NW of plant.

The dose values above were calculated using averaged hourly 1986 meteorological data.

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1986 THROUGH DECEMBER 1986

UNIT 4 TABLE I
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

Units	Quarter 3	Quarter 4
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A. Fission and Activation Products

1. Total Release (not including tritium, gases, alpha)	Ci	4.64 E-02	3.51 E-02
2. Average diluted concentration during period	μCi/ml	7.00 E-11	4.87 E-11

B. Tritium

1. Total Release	Ci	7.50 E+01	1.35 E+02
2. Average diluted concentration during period	μCi/ml	6.04 E-06 ^Δ	8.11 E-06 ^Δ

C. Dissolved and Entrained Gases

1. Total Release	Ci	3.80 E-02	3.76 E-02
2. Average diluted concentration during period	μCi/ml	5.70 E-11	5.20 E-11

D. Gross Alpha Radioactivity

1. Total Release	Ci	<1.01 E-08*	<8.64 E-09*
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E. Volume of Waste Released (prior to dilution)	Liters	1.87 E+06	1.37 E+06
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F. Volume of Dilution Water Used During Period	Liters	6.65 E+11	7.20 E+11
--	--------	-----------	-----------

Δ Based on Cooling Canal Tritium Concentration
* MDA value in μCi/ml

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1986 THROUGH DECEMBER 1986

UNIT 4 TABLE 2
LIQUID EFFLUENTS

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Ag-110m	Ci			4.10 E-04	2.25 E-05
Co-57	Ci			4.85 E-05	3.90 E-05
Co-58	Ci			1.11 E-02	4.08 E-03
Co-60	Ci			1.45 E-02	1.44 E-02
Cr-51	Ci			1.42 E-03	2.68 E-04
Cs-134	Ci			5.10 E-04	1.08 E-03
Cs-137	Ci			1.62 E-03	2.99 E-03
Fe-55	Ci			8.20 E-03	2.73 E-03
I-131	Ci			1.01 E-03	1.20 E-03
I-133	Ci			3.55 E-05	4.90 E-05
La-140	Ci			2.28 E-04	2.59 E-04
Mn-54	Ci			3.34 E-04	1.86 E-03
Mo-99/Tc-99m	Ci			5.25 E-05	1.85 E-05
Na-24	Ci			--	5.85 E-05
Nb-95	Ci			4.37 E-04	--
Ru-103	Ci			5.15 E-05	--
Sb-125	Ci			6.35 E-03	6.00 E-03
Sr-89	Ci			<3.00 E-08	<2.00 E-08
Sr-90	Ci			<5.00 E-09	<4.00 E-09
Te-132	Ci			--	4.50 E-06
Zn-65	Ci			5.20 E-05	--
Zr-95	Ci			9.40 E-05	--
	Ci				
	Ci				
	Ci				
Unidentified	Ci				
Total for Period Above	Ci			4.64 E-02	3.51 E-02

(NOTE: -- Indicates Less than detectable activity)

FLORIDA POWER AND LIGHT COMPANY
 TURKEY POINT PLANT
 SEMIANNUAL REPORT
 JULY 1986 THROUGH DECEMBER 1986
 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
Xe-131m	Ci			7.10 E-04	--
Xe-133	Gi			3.68 E-02	3.49 E-02
Xe-133m	Ci			1.95 E-04	8.70 E-04
Xe-135	Ci			2.69 E-04	1.79 E-03
	Ci				
	Gi				
	Ci				
	Ci				
Total for Period Above	Ci			3.80 E-02	3.76 E-02

(NOTE: -- Indicates Less than detectable activity)

LIQUID EFFLUENTS - DOSE SUMMATION
 JANUARY 1986 THROUGH DECEMBER 1986
 UNIT 4

Age Group: Teenager

Location: Cooling Canal

Shoreline Deposition

Dose (mRem)

% of Annual Limit

Total Body

3.27 E-03

1.09 E-01

FLORIDA POWER AND LIGHT COMPANY
 TURKEY POINT PLANT
 SEMIANNUAL REPORT
 JULY 1986 THROUGH DECEMBER 1986
 UNIT 4 TABLE 3
 GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

Units	Quarter 3	Quarter 4
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A. Fission and Activation Gases

1. Total Release	Ci	5.37 E+01	2.73 E+02
2. Average Release Rate for Period	μCi/sec	6.83 E+00	3.47 E+01

B. Iodines

1. Total Iodine-131	Ci	2.82 E-04	4.87 E-04
2. Average Release Rate for Period	μCi/sec	3.59 E-05	6.20 E-05

C. Particulates

1. Particulates T - 1/2 > 8 Days	Ci	4.62 E-04	1.50 E-03
2. Average Release Rate for Period	μCi/sec	5.88 E-05	1.91 E-04
3. Gross Alpha Radioactivity	Ci	5.05 E-08	5.08 E-08

D. Tritium

1. Total Release	Ci	8.60 E+01	1.28 E+02
2. Average Release Rate for Period	μCi/sec	1.09 E+01	1.63 E+01

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1986 THROUGH DECEMBER 1986

UNIT 4 TABLE 4
GASEOUS EFFLUENTS

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

1. Fission and Activation Gases

Ar-41	Ci	1.29 E-01	2.53 E-01	2.87 E-02	2.06 E-01
Kr-85m	Ci	--	1.93 E-02	--	--
Kr-87	Ci	--	2.17 E-03	--	--
Kr-88	Ci	--	1.68 E-02	--	--
Xe-131m	Ci	--	3.83 E-01	--	---
Xe-133	Ci	5.29 E+01	2.70 E+02	5.48 E-01	2.40 E+00
Xe-133m	Ci	--	2.75 E-01	--	--
Xe-135	Ci	3.91 E-02	3.69 E-01	6.86 E-02	8.20 E-02
	Ci				
	Ci				
	Ci				
Unidentified	Ci				
Total for Period Above	Ci	5.31 E+01	2.71 E+02	6.45 E-01	2.69 E+00

2. Iodines

I-131	Ci	2.82 E-04	4.87 E-04
I-133	Ci	9.90 E-04	3.61 E-04
	Ci		
Total for Period Above	Ci	1.27 E-03	8.48 E-04

(NOTE: -- Indicates less than detectable activity)

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1986 THROUGH DECEMBER 1986
UNIT 4 TABLE 4 (Continued)
GASEOUS EFFLUENTS

Nuclides Released	Units	Continuous Mode	
		Quarter 3	Quarter 4

3. Particulates

Ba-140	Ci	5.85 E-05	1.59 E-04
Co-58	Ci	3.55 E-05	2.75 E-05
Co-60	Ci	7.20 E-06	1.70 E-06
Cs-134	Ci	6.50 E-05	4.42 E-04
Cs-136	Ci	2.33 E-05	1.63 E-04
Cs-137	Ci	2.38 E-04	5.20 E-04
I-131	Ci	--	4.26 E-05
La-140	Ci	2.63 E-05	1.03 E-04
Mn-54	Ci	5.70 E-06	1.27 E-05
Sr-89	Ci	3.84 E-06	2.14 E-05
Sr-90	Ci	<3.79 E-16*	<1.26 E-16*
	Ci		
	Ci		
	Ci		
	Ci		
	Ci		
	Ci		
Unidentified	Ci		
Total for Period Above	Ci	4.62 E-04	1.50 E-03

(NOTE: -- Indicates Less than detectable activity)

* MDA in $\mu\text{Ci/cc}$

APPENDIX 3
(Continued)
FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JANUARY 1986 THROUGH DECEMBER 1986
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 (A)	1.10 E-03	3.59 E-03	2.92 E-02	1.04 E-03	2.30 E-03	2.15 E-03	--	2.29 E-03
Fruit and Veg.(Fresh) (B)	1.72 E-05	3.90 E-04	1.23 E-03	3.76 E-04	3.66 E-04	3.67 E-04	--	3.82 E-04
Ground Plane (C)	1.66 E-04	1.66 E-04	1.66 E-04	1.66 E-04	1.66 E-04	1.66 E-04	1.93 E-04	1.66 E-04
Inhalation (D)	1.88 E-06	9.20 E-04	9.99 E-04	9.20 E-04	9.20 E-04	9.17 E-04	--	9.20 E-04
Unit Totals (mRem)	1.29 E-03	5.07 E-03	3.16 E-02	2.50 E-03	3.75 E-03	3.60 E-03	1.93 E-04	3.76 E-03
% Annual Limit	--	--	2.11 E-01	--	--	--	--	--

DOSE - NOBLE GASES

Gamma Air Dose(E) 5.08 E-03 mRad 5.08 E-02 % of annual Limit

Beta Air Dose(E) 1.46 E-02 mRad 7.30 E-02 % of annual Limit

- (A) - Assumed cow 4.5 miles W of plant.
Age Group: Infant
- (B)(C)(D) - Maximally exposed individual at garden (residence assumed), 3.6 miles WNW of plant.
Age Group: Adult
- (E) - Maximum air dose occurs at 0.87 miles NW of plant.

The dose values above were calculated using averaged hourly 1986 meteorological data.

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1986 THROUGH DECEMBER 1986
UNITS 3 AND 4 TABLE 6A

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL

1. Type of Waste	UNIT	6 MONTH PERIOD	ERROR%
a. Spent Resins, Filter sludges evaporator bottoms, etc.	m ³ Ci	5.72 E0 9.44 E-1	2.0 E+1
b. Dry Compressible Waste	m ³ Ci	1.58 E+2 8.48 E-1	2.0 E+1
c. Irradiated Components Control rods, etc.	m ³ Ci	0.00 E0 0.00 E0	
d. Other	m ³ Ci	0.00 E0 0.00 E0	

2. Estimate of Major Nuclide Composition (by type of waste)

a.	Fe ⁵⁵	%	26
	H ³	%	24
	Co ⁶⁰	%	23
	Co ⁵⁸	%	17
	Ni ⁶³	%	4
	Cs ¹³⁷	%	2
	Mn ⁵⁴	%	1
b.	Co ⁶⁰	%	35
	Cs ¹³⁷	%	23
	Fe ⁵⁵	%	16
	Co ⁵⁸	%	10
	Cs ¹³⁴	%	7
	Ni ⁶³	%	6
	Sb ¹²⁵	%	1
c.	-----	-	--
d.	-----	-	--

3. Solid Waste Disposition

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
10	Sole Use Truck	Barnwell, S.C.

B. IRRADIATED FUEL SHIPMENTS

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
0	N/A	N/A

N/A - Not applicable

GLL/eb/016

FLORIDA POWER & LIGHT COMPANY
 TURKEY POINT PLANT
 SEMIANNUAL REPORT
 JULY 1986 THROUGH DECEMBER 1986
 UNITS 3 AND 4 TABLE 6B
 SOLID WASTE SUPPLEMENT

Waste Classification	Total Volume Ft3	(Note 1) Total Curie Quantity	(Notes 1,2) Principal Radionuclides	(Note 3) Type of Waste	R.G. 1.21 Category	(Note 4) Type of Container	Solidification or Absorbent Agent
Class A	5581	.85	None	PWR Trash	1.b	Non-Spec Strong, Tight Package	N/A
Class A	202	.94	None	PWR Ion Exchange Resins	1.a	NRC Certified LSA > Type A	N/A

FLORIDA POWER & LIGHT COMPANY
TURKEY POINT UNIT NOS. 3 & 4
SEMI-ANNUAL REPORT
JULY 1986 THROUGH DECEMBER 1986
TABLE 6B (CONTINUED)
SOLID WASTE SUPPLEMENT

NOTE 1: The total curie quantity and radionuclide composition of solid waste shipped from the Turkey Point Units 3 & 4 are determined using a combination of qualitative and quantitative techniques. In general, the Turkey Point Plant follows the guidelines outlined in the Low Level Waste Licensing Branch Technical Position (BTP) on Radioactive Waste Classification (5/11/83) for these determinations.

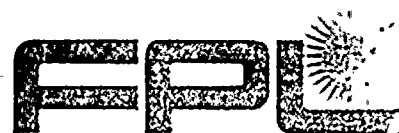
The most frequently used techniques for determining the total curie quantity in a package are the dose to curie methods and the (concentration) x (Volume or Mass) calculations. Where appropriate, engineering type activation analyses may be applied. Since each of the above methodologies involves to some extent qualitative parameters, the total curie quantity is considered to be an estimate.

The composition of radionuclides in the waste is determined by both on-site analyses for principal gamma emitters and periodic off-site analyses for other radionuclides. The on-site analyses are performed either on a batch basis or on a routine basis using reasonably representative samples as appropriate for the waste type. Offsite analyses are used to establish scaling factors or other estimates for radionuclides such as ^3H , ^{14}C , ^{99}Tc , ^{129}I , TRU, ^{241}Pu , ^{242}Cm , ^{63}Ni , and ^{55}Fe .

NOTE 2: "Principal Radionuclides" refer to those radionuclides contained in the waste in concentrations greater than .01 times the concentration of the nuclide listed in Table 1 or .01 times the smallest concentration of that nuclide listed in Table 2 of 10CFR61.

NOTE 3: "Type of Waste" is generally specified as described in NUREG 0782, Draft Environment Impact Statement on 10CFR61 "Licensing Requirements for Land Disposal of Radioactive Waste".

NOTE 4: "Type of Container" refers to the transport package.



MARCH 02 1987
L-87-105

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

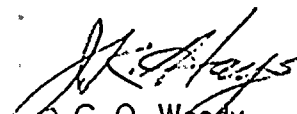
Gentlemen:

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, 1986 through December 31, 1986 for Turkey Point Units 3 and 4, as required by Technical Specification 6.9.4.

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

Very truly yours,


for C. O. Woody
Group Vice President
Nuclear Energy

COW/PLP/gp

Attachment

cc: Dr. J. Nelson Grace, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

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