

# ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

## REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9103060077 DOC. DATE: 90/12/31 NOTARIZED: NO DOCKET #  
 FACIL: 50-250 Turkey Point Plant, Unit 3, Florida Power and Light C 05000250  
 50-251 Turkey Point Plant, Unit 4, Florida Power and Light C 05000251  
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SUBJECT: "Semiannual Radioactive Effluent Release Rept Jul-Dec 1990."  
 W/910226 ltr.

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L-91-063  
10 CFR 50.36(a)(2)  
Tech. Spec. 6.9.1.4

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
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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, 1990, through December 31, 1990, for Turkey Point Units 3 and 4, as required by Technical Specification 6.9.1.4 and 10 CFR 50.36(a)(2).

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

Very truly yours,

T. F. Plunkett  
Vice President  
Turkey Point Plant - Nuclear

TFP/DPS/ds

Attachment

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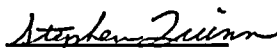
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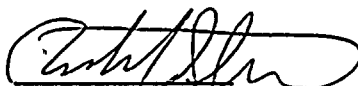
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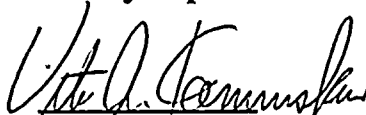
**TURKEY POINT PLANT**  
**UNITS 3 AND 4**  
**SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT**  
**JULY 1990 THROUGH DECEMBER 1990**  
**SUBMITTED BY**  
**NUCLEAR CHEMISTRY DEPARTMENT**  
**TURKEY POINT PLANT**  
**FLORIDA POWER AND LIGHT COMPANY**



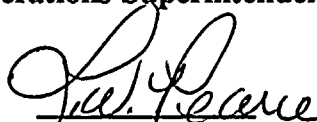
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**FLORIDA POWER AND LIGHT COMPANY  
TURKEY POINT UNITS 3 AND 4  
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT  
SUPPLEMENTAL INFORMATION  
JULY 1990 THROUGH DECEMBER 1990**

**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 concentration 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  $2.0 \text{ E-04 } \mu\text{Ci/ml}$ .
- 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 less than or equal to 1.5 mrem to the total body and to less than or equal to 5 mrem to any organ, and, during any calendar year, to less than or equal to 3 mrem to the total body and less than or equal to 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/year to the total body and less than or equal to 3000 mrem/year to the skin due to noble gases and less than or equal to 1500mrem/year 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 less than or equal to 5 mrad for gamma radiation and less than or equal to 10 mrad for beta radiation and, during any calendar year, to less than or equal to 10 mrad for gamma radiation and less than or equal to 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.





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## 2.0 Maximum Permissible Concentrations

Water: As per 10CFR20, 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 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 and the storm drain 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  $2\pi$  gas flow proportional counter and a solid state scintillation system. 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 SPING-4 radiation monitor and 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 1990 to December 1990, 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	$\pm 5$	$\pm 8$
Gaseous	$\pm 10$	$\pm 11$

## 5.0 Batch Releases

### 5.1 Liquid

#### Unit 3

#### Unit 4

a)	Number of batch releases	<u>1.73 E+02</u>	<u>1.73 E+02</u>
b)	Total time period of batch releases, minutes	<u>1.40 E+04</u>	<u>1.40 E+04</u>
c)	Maximum time period for a batch release, minutes	<u>1.40 E+02</u>	<u>1.40 E+02</u>
d)	Average time period for a batch release, minutes	<u>8.12 E+01</u>	<u>8.12 E+01</u>
e)	Minimum time period for a batch release, minutes	<u>3.00 E+00</u>	<u>3.00 E+00</u>
f)	Average stream flow during period of release of effluent into a flowing stream, LPM	<u>9.42 E+05</u>	<u>9.42 E+05</u>

### 5.2 Gaseous

#### Unit 3

#### Unit 4

a)	Number of batch releases	<u>2.30 E+01</u>	<u>2.90 E+01</u>
b)	Total time period of batch releases, minutes	<u>1.13 E+03</u>	<u>2.57 E+03</u>
c)	Maximum time period for a batch release, minutes	<u>2.40 E+02</u>	<u>2.40 E+02</u>
d)	Average time period for a batch release, minutes	<u>4.91 E+01</u>	<u>8.86 E+01</u>
e)	Minimum time period for a batch release, minute	<u>2.00 E+01</u>	<u>2.00 E+01</u>

## 6.0 Unplanned Releases

6.1	<u>Liquid</u>	<u>Unit 3</u>	<u>Unit 4</u>
a)	Number of releases	0	0
b)	Total activity released, curies	0	0
6.2	<u>Gaseous</u>		
a)	Number of releases	0	0
b)	Total activity released, curies	0	0
6.3	See Attachment 1, if applicable, for:		
a)	A description of the event and equipment involved.		
b)	Cause(s) for the unplanned release.		

## 7.0 Reactor Coolant Activity

### 7.1 Unit 3

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

### 7.2 Unit 4

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

## 8.0 Site Radiation Dose

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. 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 1990 THROUGH DECEMBER 1990  
UNITS 3 AND 4

Age Group : Adult	Location: Red Barn
<u>Inhalation</u>	<u>Dose (mRem)</u>
Bone	3.59 E-07
Liver	1.63 E-04
Thyroid	3.11 E-04
Kidney	1.63 E-04
Lung	1.64 E-04
GI-LLI	1.63 E-04
Total Body	1.63 E-04

NOBLE GAS EXPOSURE

Gamma Air Dose	1.19 E-03 mRads
Beta Air Dose	3.31 E-03 mRads

9.0 Offsite Dose Calculation Manual Revisions

There were no ODCM revisions during this reporting period.

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 (pg. 21) of this report.

11.0 Process Control Program Revisions

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



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LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES**

**UNIT 3 TABLE 1**

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

**A. Fission and Activation Products**

1. Total Release(not including tritium, gases, alpha)	Ci	2.76 E-02	2.09 E-02
2. Average diluted concentration during period	μCi/ml	6.16 E-10	6.63 E-10

**B. Tritium**

1. Total Release	Ci	7.85 E+01	7.65 E+01
2. Average diluted concentration during period	μCi/ml	1.75 E-06	2.43 E-06

**C. Dissolved and Entrained Gases**

1. Total Release	Ci	7.25 E-03	1.31 E-02
2. Average diluted concentration during period	μCi/ml	1.62 E-10	4.16 E-10

**D. Gross Alpha Radioactivity**

1. Total Release	Ci	<2.22 E-08*	<5.73 E-08*
------------------	----	-------------	-------------

E. Volume of Batch Waste Released (prior to dilution)	Liters	1.66 E+06	1.71 E+06
-------------------------------------------------------	--------	-----------	-----------

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

G. Volume of Dilution Water Used During Period	Liters	4.48 E+10	3.15 E+10
------------------------------------------------	--------	-----------	-----------

\*MDA Values in μCi/ml.



**FLORIDA POWER & LIGHT COMPANY  
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**UNIT 3 TABLE 2**

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Cr-51	Ci	----	----	1.05 E-05	1.00 E-04
Mn-54	Ci	----	----	8.65 E-03	5.60 E-03
Fe-55	Ci	----	----	5.05 E-03	5.15 E-03
Co-58	Ci	----	----	5.65 E-03	1.28 E-03
Co-60	Ci	----	----	6.80 E-03	5.10 E-03
Sr-89	Ci	----	----	----	----
Sr-90	Ci	----	----	----	----
Nb-95	Ci	----	----	1.58 E-05	1.33 E-06
Zr-97	Ci	----	----	4.40 E-07	----
Ag-110	Ci	----	----	2.78 E-04	4.48 E-04
Sb-124	Ci	----	----	1.83 E-05	2.31 E-04
Sb-125	Ci	----	----	4.31 E-04	2.47 E-03
I-131	Ci	----	----	1.77 E-05	9.75 E-06
I-133	Ci	----	----	----	5.40 E-06
Cs-134	Ci	----	----	1.51 E-04	1.15 E-04
Cs-137	Ci	----	----	5.15 E-04	3.35 E-04
La-140	Ci	----	----	5.75 E-06	1.64 E-05
Ce-144	Ci	----	----	----	3.68 E-06
Unidentified	Ci	----	----	----	----
Total for period	Ci	----	----	2.76 E-02	2.09 E-02



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LIQUID EFFLUENTS**

**UNIT 3 TABLE 2 (Continued)**

**Liquid Dissolved Gas**

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Kr-85	Ci	----	----	----	----
Xe-131m	Ci	----	----	----	----
Xe-133	Ci	----	----	7.25 E-03	1.31 E-02
Xe-133m	Ci	----	----	----	----
Xe-135	Ci	----	----	----	----
Xe-135m	Ci	----	----	----	----
Total for Period	Ci	----	----	7.25 E-03	1.31 E-02

**LIQUID EFFLUENTS-DOSE SUMMATION**

**JANUARY 1990 THROUGH DECEMBER 1990**

**UNIT 3**

Age Group: Teenager    Location: Cooling Canal

Shoreline Deposition	Dose (mRem)	% of Annual limit
Total Body	1.43 E-03	4.77 E-02

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GAS EFFLUENTS-SUMMATION OF ALL RELEASES**

**UNIT 3 TABLE 3**

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

**A. Fission and Activation Products**

1. Total Release	Ci	1.14 E+02	5.27 E+01
2. Average Release Rate for Period	μCi/sec	1.43 E+01	6.63 E+00

**B. Iodines**

1. Total Iodine-131	Ci	1.96 E-04	3.68 E-05
2. Average Release Rate for Period	μCi/sec	1.21 E-05	4.63 E-06

**C. Particulates**

1. Particulates T-1/2 > 8 days	Ci	1.19 E-05	1.49 E-06
2. Average Release Rate for Period	μCi/sec	1.50 E-06	1.87 E-07
3. Gross Alpha Radioactivity	Ci	<5.74 E-16*	<1.92 E-15*

**D. Tritium**

1. Total Release	Ci	1.11 E+01	6.69 E+00
2. Average Release Rate for Period	μCi/sec	1.40 E+00	8.42 E-01

\*MDA Values in μCi/ml.

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GASEOUS EFFLUENTS**

**UNIT 3 TABLE 4**

**A. Fission Gases**

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Ar-41	Ci	2.19 E-01	5.27 E-01	----	1.23 E-01
Kr-85	Ci	----	----	3.76 E-04	----
Kr-85m	Ci	----	2.83 E-05	----	1.19 E-03
Kr-87	Ci	----	----	----	----
Xe-131m	Ci	6.39 E+00	7.58 E-02	4.44 E-02	1.34 E-01
Xe-133	Ci	1.03 E+02	3.09 E+01	2.91 E+00	1.62 E+01
Xe-133m	Ci	2.44 E-03	1.36 E-02	2.27 E-02	2.10 E-01
Xe-135	Ci	3.18 E-01	3.96 E+00	5.84 E-03	5.51 E-01
Xe-135m	Ci	----	----	----	----
Total for Period	Ci	1.10 E+02	3.55 E+01	3.98 E+00	1.72 E+01

**B. Iodines**

Nuclides Released	Units	Continuous Mode	
		Quarter 3	Quarter 4
Br-82	Ci	6.30 E-05	3.47 E-05
I-131	Ci	1.95 E-04	3.68 E-05
I-133	Ci	2.46 E-04	5.55 E-06
Total for Period	Ci	5.04 E-04	7.71 E-05

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**UNIT 3 TABLE 4 (Continued)**

**C. Particulates**

Nuclides Released	Units	Continuous Mode	
		Quarter 3	Quarter 4
Co-58	Ci	----	1.49 E-06
I-131	Ci	1.37 E-06	----
Cs-134	Ci	4.05 E-06	----
Cs-136	Ci	9.45 E-07	----
Cs-137	Ci	5.50 E-06	----
Cs-138	Ci	3.41 E-09	----
	Ci		
	Ci		
Total for Period	Ci	1.19 E-05	1.49 E-06

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UNIT 3 TABLE 5

DOSES DUE TO IODINE, H3, AND PARTICULATES

PATHWAY	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
Cow milk-Infant	2.09 E-04	5.95 E-04	7.16 E-02	2.08 E-04	3.48 E-04	3.54 E-04	----	4.77 E-04
Fruit & Veg-Fresh	8.59 E-06	4.28 E-04	3.11 E-03	4.31 E-04	4.16 E-04	4.21 E-04	----	4.24 E-04
Ground Plane	1.99 E-05	1.99 E-05	1.99 E-05	1.99 E-05	1.99 E-05	1.99 E-05	2.33 E-05	1.99 E-05
Inhalation-Adult	4.07 E-07	1.57 E-04	3.31 E-04	1.57 E-04	1.57 E-04	1.56 E-04	----	1.56 E-04
Unit Totals (mRem)	2.38 E-04	1.20 E-03	7.51 E-02	8.16 E-04	9.41 E-04	9.51 E-04	2.33 E-05	1.08 E-03
% Annual Limit	1.59 E-03	8.00 E-03	5.01 E-01	5.44 E-03	6.27 E-03	6.34 E-03	1.55 E-04	7.20 E-03

DOSE NOBLE GASES

Gamma Air Dose	<u>4.85 E-03 mRad</u>	% of Annual Limit	<u>4.85 E-02 %/Yr</u>
Beta Air Dose	<u>1.37 E-02 mRad</u>	% of Annual Limit	<u>6.85 E-02 %/Yr</u>

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LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES**

**UNIT 4 TABLE 1**

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

**A. Fission and Activation Products**

1. Total Release(not including tritium, gases, alpha)	Ci	2.76 E-02	2.09 E-02
2. Average diluted concentration during period	μCi/ml	6.16 E-10	6.63 E-10

**B. Tritium**

1. Total Release	Ci	7.85 E+01	7.65 E+01
2. Average diluted concentration during period	μCi/ml	1.75 E-06	2.43 E-06

**C. Dissolved and Entrained Gases**

1. Total Release	Ci	7.25 E-03	1.31 E-02
2. Average diluted concentration during period	μCi/ml	1.62 E-10	4.16 E-10

**D. Gross Alpha Radioactivity**

1. Total Release	Ci	<2.22 E-08*	<5.73 E-08*
------------------	----	-------------	-------------

E. Volume of Batch Waste Released (prior to dilution)	Liters	1.66 E+06	1.71 E+06
-------------------------------------------------------	--------	-----------	-----------

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

G. Volume of Dilution Water Used During Period	Liters	4.48 E+10	3.15 E+10
------------------------------------------------	--------	-----------	-----------

\*MDA Values in μCi/ml.



**FLORIDA POWER & LIGHT COMPANY  
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LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES**

**UNIT 4 TABLE 2**

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3.	Quarter 4	Quarter 3	Quarter 4
Cr-51	Ci	---	---	1.05 E-05	1.00 E-04
Mn-54	Ci	---	---	8.65 E-03	5.60 E-03
Fe-55	Ci	---	---	5.05 E-03	5.15 E-03
Co-58	Ci	---	---	5.65 E-03	1.28 E-03
Co-60	Ci	---	---	6.80 E-03	5.10 E-03
Sr-89	Ci	---	---	---	---
Sr-90	Ci	---	---	---	---
Nb-95	Ci	---	---	1.58 E-05	1.33 E-06
Zr-97	Ci	---	---	4.40 E-07	---
Ag-110	Ci	---	---	2.78 E-04	4.48 E-04
Sb-124	Ci	---	---	1.83 E-05	2.31 E-04
Sb-125	Ci	---	---	4.31 E-04	2.47 E-03
I-131	Ci	---	---	1.77 E-05	9.75 E-06
I-133	Ci	---	---	---	5.40 E-06
Cs-134	Ci	---	---	1.51 E-04	1.15 E-04
Cs-137	Ci	---	---	5.15 E-04	3.35 E-04
La-140	Ci	---	---	5.75 E-06	1.64 E-05
Ce-144	Ci	---	---	---	3.68 E-06
Unidentified	Ci	---	---	---	---
Total for period	Ci	---	---	2.76 E-02	2.09 E-02

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LIQUID EFFLUENTS**

**UNIT 4 TABLE 2 (Continued)**

**Liquid Dissolved Gas**

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Kr-85	Ci	---	---	---	---
Xe-131m	Ci	---	---	---	---
Xe-133	Ci	---	---	7.25 E-03	1.31 E-02
Xe-133m	Ci	---	---	---	---
Xe-135	Ci	---	---	---	---
Xe-135m	Ci	---	---	---	---
Total for Period	Ci	---	---	7.25 E-03	1.31 E-02

**LIQUID EFFLUENTS-DOSE SUMMATION**

**JANUARY 1990 THROUGH DECEMBER 1990**

**UNIT 4**

Age Group: Teenager    Location: Cooling Canal

Shoreline Deposition	Dose (mRem)	% of Annual limit
Total Body	1.43 E-03	4.77 E-02

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GAS EFFLUENTS-SUMMATION OF ALL RELEASES**

**UNIT 4 TABLE 3**

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

**A. Fission and Activation Products**

1. Total Release	Ci	1.06 E+02	6.26 E+01
2. Average Release Rate for Period	μCi/sec	1.33 E+01	7.88 E+00

**B. Iodines**

1. Total Iodine-131	Ci	1.96 E-04	3.68 E-05
2. Average Release Rate for Period	μCi/sec	1.21 E-05	4.63 E-06

**C. Particulates**

1. Particulates T-1/2 > 8 days	Ci	1.19 E-05	1.49 E-06
2. Average Release Rate for Period	μCi/sec	1.50 E-06	1.87 E-07
3. Gross Alpha Radioactivity	Ci	<5.74 E-16*	<1.92 E-15*

**D. Tritium**

1. Total Release	Ci	6.95 E+00	5.85 E+00
2. Average Release Rate for Period	μCi/sec	8.74 E-01	7.36 E-01

\*MDA Values in μCi/ml.

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**UNIT 4 TABLE 4**

**A. Fission Gases**

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Ar-41	Ci	2.46 E-01	1.81 E-01	1.61 E-01	2.69 E-02
Kr-85	Ci	----	----	3.76 E-04	1.15 E-03
Kr-85m	Ci	4.57 E-03	1.84 E-03	2.04 E-02	3.24 E-03
Kr-87	Ci	1.01 E-03	----	----	----
Xe-131m	Ci	4.92 E-02	6.54 E-02	1.46 E-01	3.40 E-01
Xe-133	Ci	9.24 E+01	3.19 E+01	1.17 E+01	2.56 E+01
Xe-133m	Ci	4.28 E-02	4.06 E-02	1.46 E-01	2.91 E-01
Xe-135	Ci	3.77 E-01	3.97 E+00	3.10 E-01	1.32 E-01
Xe-135m	Ci	----	----	----	----
Total for Period	Ci	9.31 E+01	3.62 E+01	1.25 E+01	2.64 E+01

**B. Iodines**

Nuclides Released	Units	Continuous Mode	
		Quarter 3	Quarter 4
Br-82	Ci	6.30 E-05	3.47 E-05
I-131	Ci	1.95 E-04	3.68 E-05
I-133	Ci	2.46 E-04	5.55 E-06
Total for Period	Ci	5.04 E-04	7.71 E-05



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**UNIT 4 TABLE 4 (Continued)**

**C. Particulates**

Nuclides Released	Units	Continuous Mode	
		Quarter 3	Quarter 4
Co-58	Ci	----	1.49 E-06
I-131	Ci	1.37 E-06	----
Cs-134	Ci	4.05 E-06	----
Cs-136	Ci	9.45 E-07	----
Cs-137	Ci	5.50 E-06	----
Cs-138	Ci	----	----
	Ci		
	Ci		
Total for Period	Ci	1.19 E-05	1.49 E-06

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UNIT 4 TABLE 5

DOSES DUE TO IODINE, H3, AND PARTICULATES

PATHWAY	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
Cow milk-Infant	9.64 E-05	3.69 E-04	2.87 E-02	1.34 E-04	2.55 E-04	2.56 E-04	----	3.06 E-04
Fruit & Veg-Fresh	4.78 E-06	3.11 E-04	1.39 E-03	3.11 E-04	3.04 E-04	3.07 E-04	----	3.09 E-04
Ground Plane	1.91 E-05	1.91 E-05	1.91 E-05	1.91 E-05	1.91 E-05	1.91 E-05	2.24 E-05	1.91 E-05
Inhalation-Adult	1.89 E-07	1.14 E-04	1.86 E-04	1.14 E-04	1.15 E-04	1.14 E-04	----	1.14 E-04
Unit Totals (mRem)	1.20 E-04	8.13 E-04	3.03 E-02	5.78 E-04	6.93 E-04	6.96 E-04	2.24 E-05	7.48 E-04
% Annual Limit	8.00 E-04	5.42 E-03	2.02 E-01	3.85 E-03	4.62 E-03	4.64 E-03	1.49 E-04	4.99 E-03

DOSE NOBLE GASES

Gamma Air Dose	<u>4.26 E-03 mRad</u>	% of Annual Limit	<u>4.26 E-02 %/Yr</u>
Beta Air Dose	<u>1.17 E-02 mRad</u>	% of Annual Limit	<u>5.85 E-02 %/Yr</u>



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FLORIDA POWER AND LIGHT COMPANY  
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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 MONTH PERIOD		%ERR
a. Spent resin, filters	m <sup>3</sup>	1.91	E1	
sludge, evaporator bottoms	Ci	3.86	E2	20
b. Dry Compressible waste	m3	5.27	E1	
(note 1)	Ci	1.08	E1	20
c. Irradiated components	m <sup>3</sup>	0.00	E0	
Control rods, etc.	Ci	0.00	E0	
d. Other non-compressible	m <sup>3</sup>	8.10	E0	
Waste (Note 2)	Ci	3.01	E-2	20

2. ESTIMATE OF MAJOR NUCLIDE COMPOSITION BY TYPE OF WASTE

a.	Co-60	%	69
	Ni-63	%	20
	Cs-137	%	6
	Fe-55	%	2
	Cs-134	%	1
	Mn-54	%	1
	Sb-125	%	1
b.	Fe-55	%	37
	Co-60	%	31
	Ni-63	%	15
	Cs-137	%	9
	Co-58	%	2
	Cs-134	%	2
	Cr-51	%	1
	Ag-110m	%	1
	Sb-125	%	1
	Nb-95	%	1

c. \_\_\_\_\_

d.	Fe-55	⊗	37
	Co-60	⊗	31
	Ni-63	⊗	15
	Cs-137	⊗	9
	Co-58	⊗	2
	Cs-134	⊗	2
	Cr-51	⊗	1
	Ag-110m	⊗	1
	Sb-125	⊗	1
	Nb-95	⊗	1

### 3. SOLID WASTE DISPOSITION

NUMBER OF SHIPMENTS	MODE OF TRANSPORT	DESTINATION
9 (Note 3)	Sole use truck	Oak Ridge, TN
5	Sole use truck	Barnwell, SC

### B. IRRADIATED FUEL SHIPMENTS

None

RKR/eb/055

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UNITS 3 & 4 TABLE 6  
SOLID WASTE SUPPLEMENT

Waste Classification	Total Volume Ft3	(NOTE 4) Total Curie Quantity	(NOTE 5) Principal Radionuclides	(NOTE 6) Type of Waste	R.G. 1.21 Category	(NOTE 7) Type of Container	Solidification or Absorbent Agent
Class A	2148.8	10.77	None	Compactable and Non- Compactable Trash	1.b,d	Strong, Tight Package, Cask Type A LSA	N/A
Class A	404.2	5.17	None	Dewatered Bead Resin	1.a	Cask >Type A LSA	N/A
Class B	271.6	381	Co-60, Cs-137 Ni-63, Sr-90 C-14, Pu-241 Tru	Dewatered Bead Resin	1.a	Cask >Type A LSA	N/A

RKR/eb/056

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UNITS 3 AND 4 TABLE 6

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. SOLID WASTE SHIPMENT OFFSITE FOR BURIAL OR DISPOSAL

- Note 1: 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 507.4 m<sup>3</sup>.
- Note 2: 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 108.7 m<sup>3</sup>.
- Note 3: 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 4: 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 5: 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 6: 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 7: Type of container refers to the transport package.

RKR/eb/058

10-10-10