

TURKEY POINT PLANT
UNITS 3 AND 4

SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

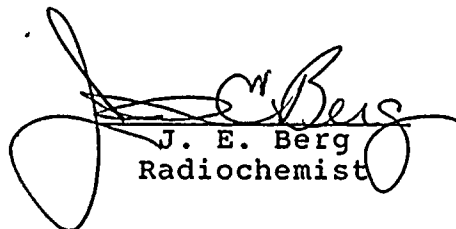
JULY 1991 THROUGH DECEMBER 1991

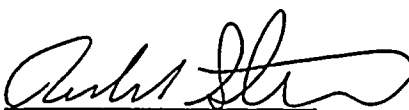
SUBMITTED BY


NUCLEAR CHEMISTRY DEPARTMENT


TURKEY POINT PLANT

FLORIDA POWER AND LIGHT COMPANY


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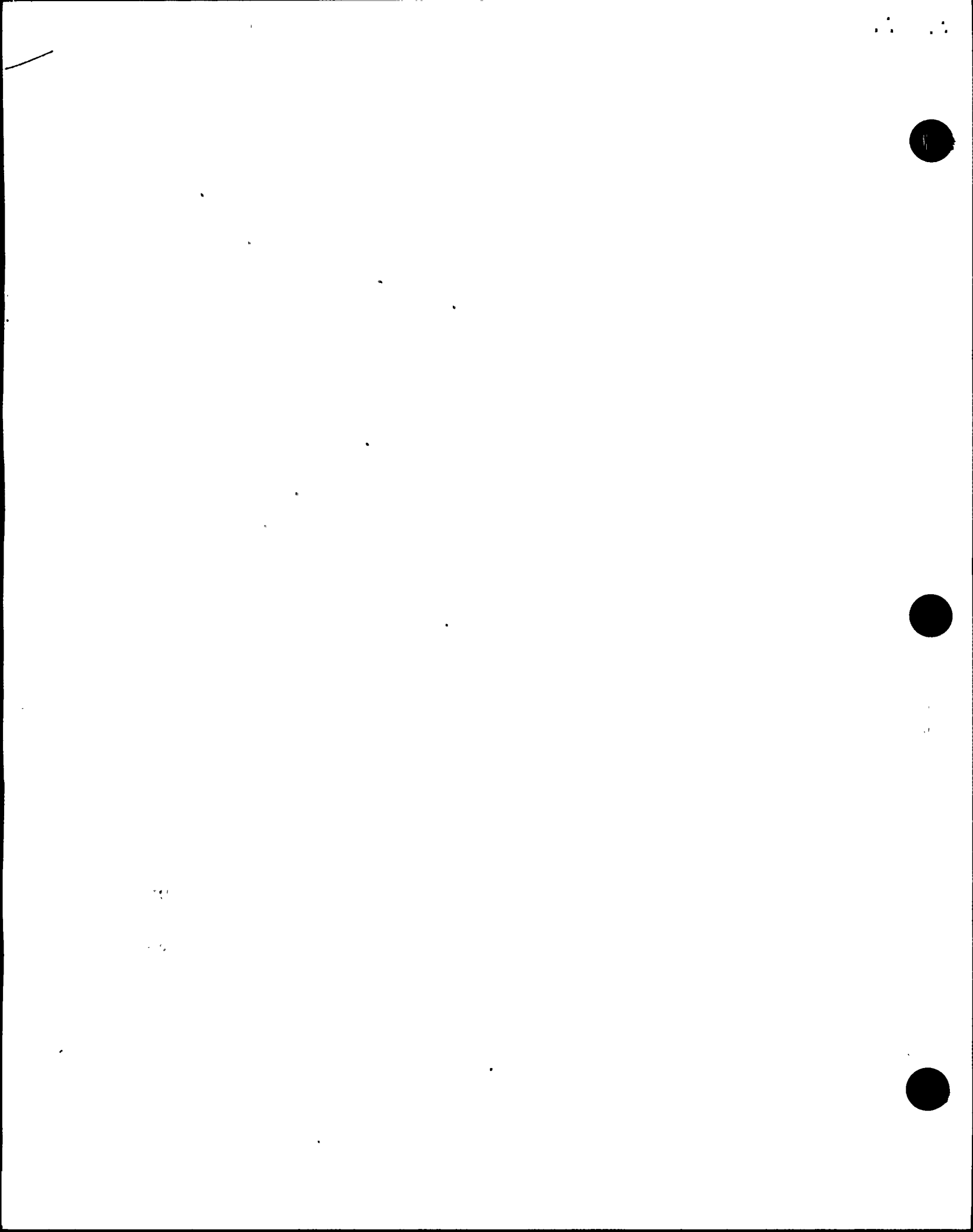

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INDEX

1.0	Regulatory Limits	
1.1	Liquid Effluents	1
1.2	Gaseous Effluents	1
2.0	Maximum Permissible Concentration	2
3.0	Average Energy	2
4.0	Measurements and Approximation of Total Radioactivity	2
4.1	Liquid Effluents - Discussion	3
a.	Unit 3 Liquid Effluents Summation	8
b.	Unit 4 Liquid Effluents Summation	14
4.2	Gaseous Effluents - Discussion	4
a.	Unit 3 Gaseous Effluents Summation	11
b.	Unit 4 Gaseous Effluents Summation	17
4.3	Estimate of Error	4
5.0	Batch Releases	
5.1	Liquid	5
5.2	Gaseous	5
6.0	Unplanned Releases	6
7.0	Reactor Coolant Activity	6
8.0	Site Radiation Dose	6
9.0	Offsite Dose Calculation Manual Revisions	7
10.0	Solid Waste and Irradiated Fuel Shipments	7
11.0	Process Control Program Revisions	7



FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT UNITS 3 AND 4
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
SUPPLEMENTAL INFORMATION
JULY 1991 THROUGH DECEMBER 1991

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 E-04 microcuries per milliliter.
- 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 as follows:

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.

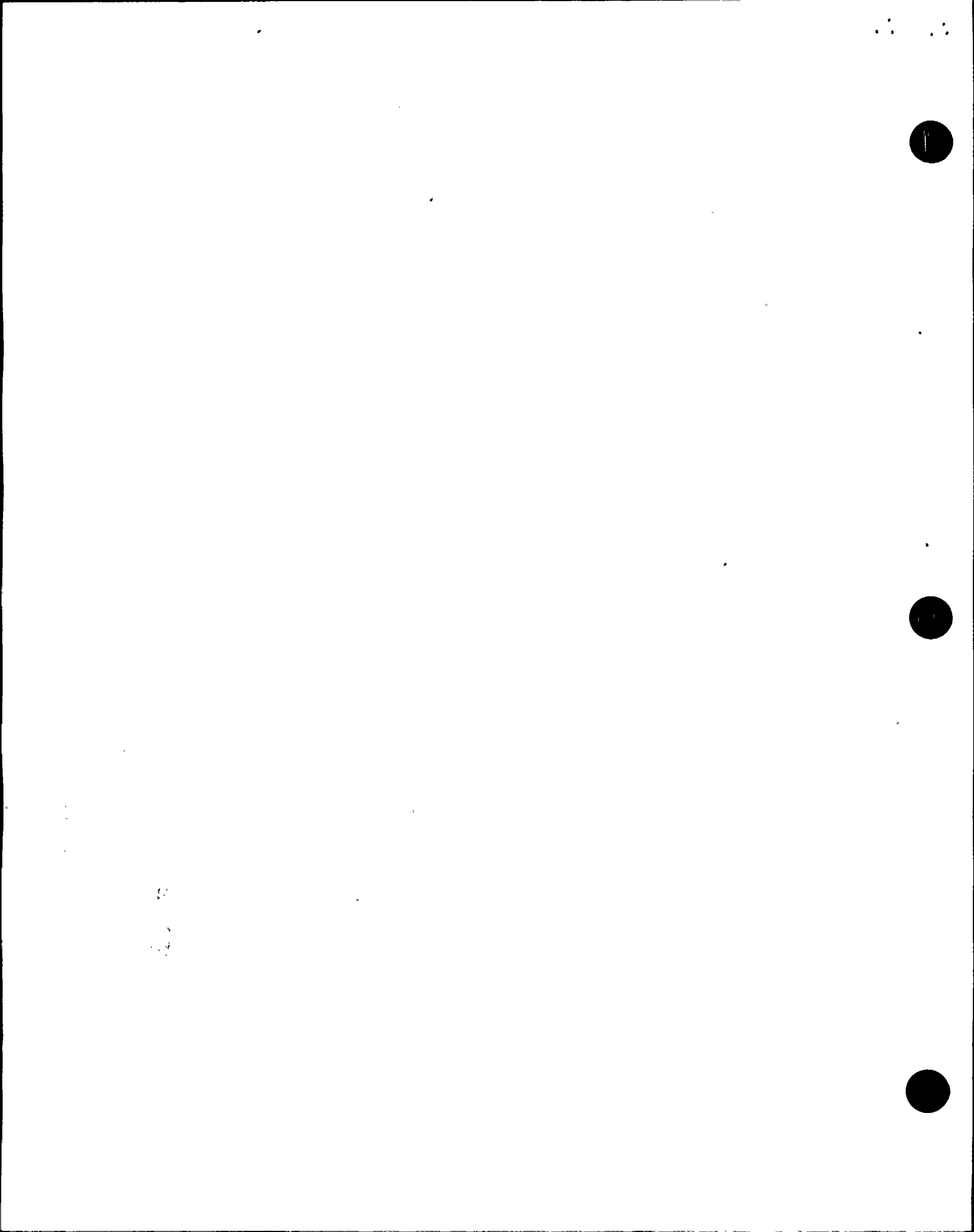
During any calendar year, to less than or equal to 3 mrem to the total body and less than or equal to 10 mrem to any organ.

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.

Less than or equal to 1500 mrem/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.

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.

2.0 MAXIMUM PERMISSIBLE CONCENTRATIONS

Water: As per 10CFR20, Appendix B, Table II, Column 2, 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 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.

When alpha, tritium and named nuclides are shown as -----curies on the following tables, 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, from the waste disposal system, were isotopically analyzed for gamma emitting isotopes on a multichannel analyzer.

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 radioactivity. Tritium was determined by use of liquid scintillation techniques and gross alpha radioactivity was determined by use of a solid state scintillation system. The quarterly composite was analyzed for Sr-89, Sr-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, Sr-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.

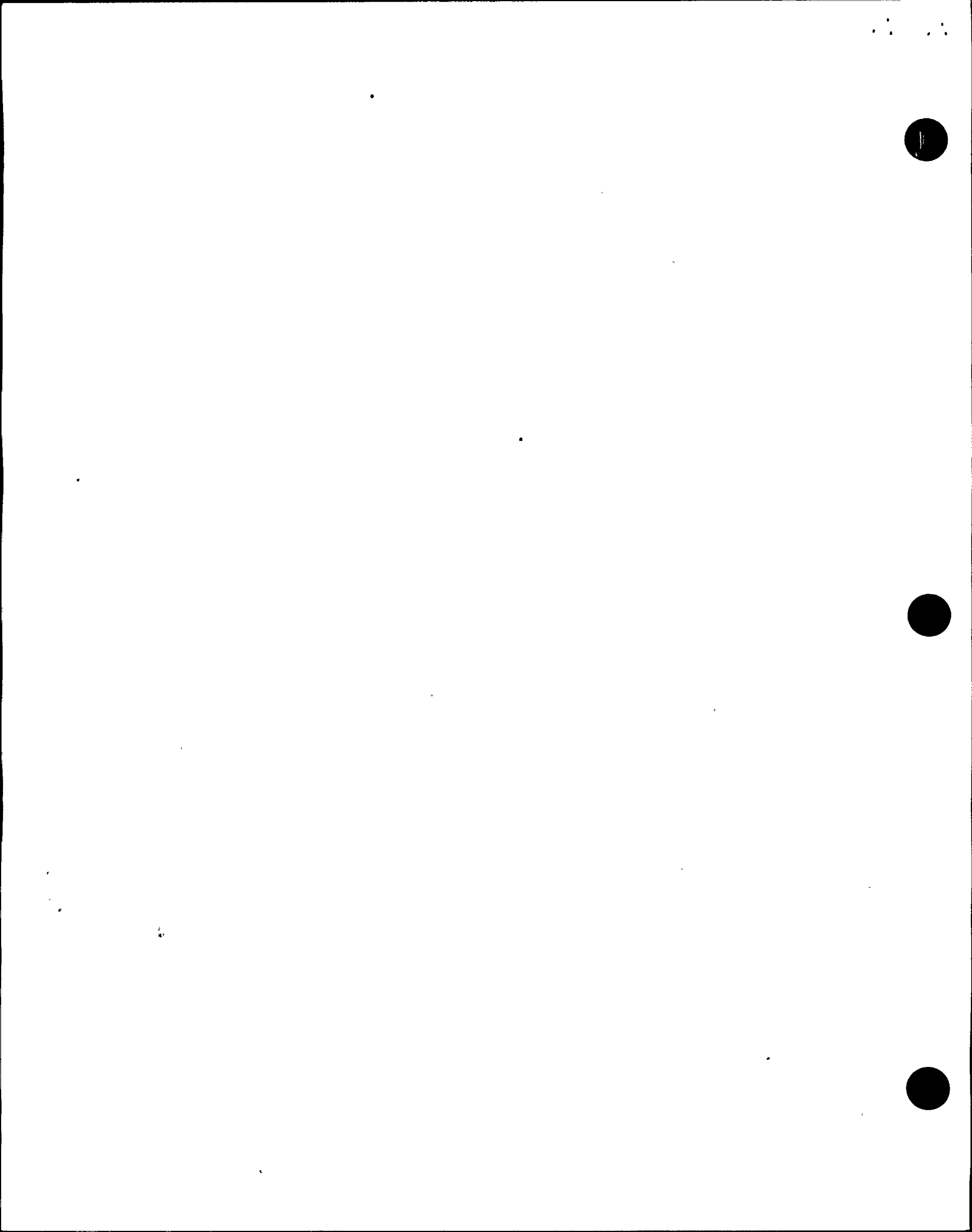
Portions of the gas waste treatment system are shared by both units and generally all gas releases from the shared system are allocated on a 50/50 basis to each unit.

Meteorological data for the period January 1991 through December 1991, 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	± 2.7	± 14
Gaseous	± 2.5	± 4

5.0 BATCH RELEASES

5.1 Liquid

	<u>Unit 3</u>	<u>Unit 4</u>
a) Number of releases,	1.94E+02	1.94E+02
b) Total time period of batch releases, minutes	1.71E+04	1.71E+04
c) Maximum time period for a batch release, minutes	1.80E+02	1.80E+02
d) Average time period for a batch release, minutes	8.97E+01	8.97E+01
e) Minimum time period for a batch release, minutes	2.10E+01	2.10E+01
f) Average stream flow during period of release of effluent into a flowing stream, LPM	2.99E+06	2.99E+06

5.2 Gaseous

	<u>Unit 3</u>	<u>Unit 4</u>
a) Number of batch releases	8.50E+00	9.50E+00
b) Total time period of batch releases, minutes	1.23E+03	1.47E+03
c) Maximum time period for a batch release, minutes	6.40E+02	6.40E+02
d) Average time period for a batch release, minutes	1.45E+02	1.55E+02
e) Minimum time period for a batch release, minutes	3.00E+01	3.00E+01

100
100
100
100
100

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 event.		

7.0 REACTOR COOLANT ACTIVITY

7.1 Unit 3

Reactor coolant activity limits of 100/E-bar and 1.0 microCurie per gram Dose Equivalent I-131 were not exceeded.

7.2 Unit 4

Reactor coolant activity limits of 100/E-bar and 1.0 microCurie per gram 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 4 and Unit 4, Table 4. These dose calculations were made using historical meteorological data.

VISITOR DOSE SUMMATION
JANUARY 1991 THROUGH DECEMBER 1991
UNITS 3 AND 4

Age Group: Adult
Location: Red Barn

<u>Inhalation</u>	<u>Dose(mrem)</u>
Bone	6.82 E-08
Liver	6.90 E-07
Thyroid	2.98 E-05
Kidney	7.48 E-07
Lung	7.77 E-07
GI-LLI	6.21 E-07
Total Body	6.50 E-07

NOBLE GAS EXPOSURE

Gamma Air Dose	1.70 E-05 mrad
Beta Air Dose	4.79 E-05 mrad

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 of this report.

11.0 PROCESS CONTROL PROGRAM REVISIONS

Changes to the Process Control Program are summarized in Attachment 1.



TURKEY POINT PLANT
SEMIANNUAL REPORT

JULY 1991 THROUGH DECEMBER 1991

UNIT 3 TABLE 1

LIQUID EFFLUENTS SUMMARY

A. FISSION AND ACTIVATION PRODUCTS

	Units	Quarter 3	Quarter 4
1. Total Release(not including tritium, gases, alpha)	Ci	1.35 E-01	1.25 E-01
2. Average diluted concentration during period	μ Ci/ml	9.31 E-09	3.34 E-09

B. TRITIUM

1. Total Release	Ci	4.21 E+01	4.95 E+01
2. Average diluted concentration during period	μ Ci/ml	2.90 E-06	1.32 E-06

C. DISSOLVED AND ENTRAINED GASES

1. Total Release	Ci	5.60 E-04	1.04 E-02
2. Average diluted concentration during period	μ Ci/ml	3.86 E-11	2.78 E-10

D. GROSS ALPHA RADIOACTIVITY

1. Total Release *	Ci	<6.20E-08	<4.07E-08
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E. LIQUID VOLUMES

1. Batch waste released, prior to dilution	liters	2.39 E+06	1.82 E+06
2. Continuous waste released, prior to dilution	liters	-----	-----
3. Dilution water used during period	liters	1.45 E+10	3.74 E+10

*MDA Values in units of μ Ci/ml.

TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1991 THROUGH DECEMBER 1991

UNIT 3 TABLE 2

LIQUID EFFLUENTS SUMMARY

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Cr-51	Ci	-----	-----	-----	1.03 E-05
Mn-54	Ci	-----	-----	2.39 E-02	8.70 E-03
Fe-55	Ci	-----	-----	9.32 E-02	8.26 E-02
Co-57	Ci	-----	-----	4.00 E-07	1.03 E-05
Co-58	Ci	-----	-----	1.45 E-03	2.69 E-03
Fe-59	Ci	-----	-----	2.86 E-06	-----
Co-60	Ci	-----	-----	5.95 E-03	1.87 E-02
Sr-89	Ci	-----	-----	1.02 E-04	-----
Sr-90	Ci	-----	-----	1.10 E-04	1.08 E-04
Nb-95	Ci	-----	-----	-----	1.57 E-05
Tc-99	Ci	-----	-----	-----	2.02 E-06
Ag-110	Ci	-----	-----	5.15 E-04	6.10 E-04
Sn-113	Ci	-----	-----	5.25 E-06	-----
Sb-124	Ci	-----	-----	1.14 E-04	-----
Sb-125	Ci	-----	-----	3.56 E-03	2.02 E-03
I-131	Ci	-----	-----	-----	2.30 E-04
I-133	Ci	-----	-----	-----	3.29 E-04
Cs-134	Ci	-----	-----	1.31 E-03	1.98 E-03
I-135	Ci	-----	-----	-----	1.97 E-05
Cs-137	Ci	-----	-----	4.84 E-03	7.00 E-03
W-187	Ci	-----	-----	2.85 E-05	1.08 E-05
Total for period	Ci	-----	-----	1.35 E-01	1.25 E-01

SEMIANNUAL REPORT

JULY 1991 THROUGH DECEMBER 1991

UNIT 3 TABLE 2 (continued)

LIQUID EFFLUENTS SUMMARY

LIQUID DISSOLVED GAS

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Kr-85	Ci	-----	-----	2.26 E-03	-----
Xe-131	Ci	-----	-----	-----	-----
Xe-131m	Ci	-----	-----	-----	-----
Xe-133	Ci	-----	-----	-----	1.04 E-02
Xe-133m	Ci	-----	-----	-----	-----
Xe-135	Ci	-----	-----	-----	5.40 E-06
Xe-135m	Ci	-----	-----	-----	-----
Total for Period	Ci	-----	-----	2.26 E-03	1.04 E-02

LIQUID EFFLUENTS-DOSE SUMMATION

JANUARY 1991 THROUGH DECEMBER 1991

UNIT 3

Age group: Teenager
Location: Cooling Canal

Shoreline Deposition	Dose (mrem)	% of Annual Limit
Total Body	2.76 E-03	9.20 E-02

SEMIANNUAL REPORT

JULY 1991 THROUGH DECEMBER 1991

UNIT 3 TABLE 3

GASEOUS EFFLUENTS SUMMARY

A. FISSION AND ACTIVATION PRODUCTS

	Units	Quarter 3	Quarter 4
1. Total Release	Ci	-----	8.87 E+00
2. Average Release Rate for Period	$\mu\text{Ci}/\text{sec}$	-----	1.12 E+00

B. IODINES

1. Total Iodine-131	Ci	-----	5.85 E-04
2. Average Release Rate for Period	$\mu\text{Ci}/\text{sec}$	-----	7.36 E-05

C. PARTICULATES

1. Particulates T _{1/2} > 8 days	Ci	1.15 E-06	2.55 E-06
2. Average Release Rate for Period	$\mu\text{Ci}/\text{sec}$	1.45 E-07	3.21 E-07
3. Gross Alpha Radioactivity *	Ci	<2.60E-15	<2.03E-15

D. TRITIUM

1. Total Release	Ci	-----	-----
2. Average Release Rate for Period	$\mu\text{Ci}/\text{sec}$	-----	-----

*MDA values in units of $\mu\text{Ci}/\text{ml}$

SEMIANNUAL REPORT

JULY 1991 THROUGH DECEMBER 1991

UNIT 3 TABLE 4

GASEOUS EFFLUENTS SUMMARYA. FISSION GASES

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Kr-85m	Ci	-----	-----	-----	1.94 E-04
Kr-87	Ci	-----	-----	-----	-----
Xe-131m	Ci	-----	-----	-----	2.91 E-02
Xe-133	Ci	-----	5.20 E+00	-----	3.42 E+00
Xe-133m	Ci	-----	-----	-----	2.63 E-02
Xe-135	Ci	-----	1.86 E-01	-----	8.55 E-03
Xe-135m	Ci	-----	-----	-----	-----
Total for period	Ci	-----	5.39 E+00	-----	3.48 E+00

B. IODINES

Nuclides Released	Units	Continuous Mode	
		Quarter 3	Quarter 4
I-131	Ci	-----	5.85 E-04
I-133	Ci	-----	2.95 E-05
Total for period	Ci	-----	6.15 E-04

C. PARTICULATES

Nuclides Released	Units	Continuous Mode	
		Quarter 3	Quarter 4
Co-60	Ci	-----	2.04 E-06
Cs-137	Ci	1.15 E-06	5.05 E-07
Total for period	Ci	1.15 E-06	2.55 E-06

TURKEY POINT PLANT
SEMIANNUAL REPORT

JANUARY 1991 THROUGH DECEMBER 1991

UNIT 3 TABLE 5

DOSES DUE TO IODINE, TRITIUM, AND PARTICULATES

Pathway	Bone	Liver	Thyroid	Kidney	Lung	GI-LLI	Skin	Total Body
Cow milk- Infant	2.96 E-05	3.62 E-05	1.00 E-02	8.51 E-06	1.63 E-06	2.38 E-06	-----	1.97 E-05
Fruit&Veg Fresh	1.23 E-06	3.07 E-06	3.84 E-04	3.56 E-06	1.46 E-06	2.14 E-06	-----	2.43 E-06
Ground Plane	3.11 E-06	3.11 E-06	3.11 E-06	3.11 E-06	3.11 E-06	3.11 E-06	3.65 E-06	3.11 E-06
Inhalation Adult	5.67 E-08	6.06 E-07	2.48 E-05	6.54 E-07	6.78 E-07	5.48 E-07	-----	5.72 E-07
Totals (mrem)	3.40 E-05	4.30 E-05	1.04 E-02	1.58 E-05	6.88 E-06	8.17 E-06	3.65 E-06	2.58 E-05
‡Annual Limit	2.26 E-04	2.87 E-04	6.95 E-02	1.06 E-04	4.59 E-05	5.45 E-05	2.43 E-05	1.72 E-04

Dose due to Noble Gases

Gamma Air Dose 6.34 E-05 mrad % of Annual Limit 6.34 E-04 %/yr
 Beta Air Dose 1.79 E-04 mrad % of Annual Limit 8.93 E-04 %/yr

SEMIANNUAL REPORT
 JULY 1991 THROUGH DECEMBER 1991

UNIT 4 TABLE 1

LIQUID EFFLUENTS SUMMARY

A. FISSION AND ACTIVATION PRODUCTS

	Units	Quarter 3	Quarter 4
1. Total Release(not including tritium, gases, alpha)	Ci	1.35 E-01	1.25 E-01
2. Average diluted concentration during period	μ Ci/ml	9.31 E-09	3.34 E-09

B. TRITIUM

1. Total Release	Ci	4.21 E+01	4.95 E+01
2. Average diluted concentration during period	μ Ci/ml	2.90 E-06	1.32 E-06

C. DISSOLVED AND ENTRAINED GASES

1. Total Release	Ci	5.60 E-04	1.04 E-02
2. Average diluted concentration during period	μ Ci/ml	3.86 E-11	2.78 E-10

D. GROSS ALPHA RADIOACTIVITY

1. Total Release *	Ci	<6.20E-08	<4.07E-08
--------------------	----	-----------	-----------

E. LIQUID VOLUMES

1. Batch waste released, prior to dilution	liters	2.39 E+06	1.82 E+06
2. Continuous waste released, prior to dilution	liters	-----	-----
3. Dilution water used during period	liters	1.45 E+10	3.74 E+10

*MDA Values in units of μ Ci/ml.

SEMIANNUAL REPORT

JULY 1991 THROUGH DECEMBER 1991

UNIT 4 TABLE 2

LIQUID EFFLUENTS SUMMARY

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Cr-51	Ci	-----	-----	-----	1.03 E-05
Mn-54	Ci	-----	-----	2.39 E-02	8.70 E-03
Fe-55	Ci	-----	-----	9.32 E-02	8.26 E-02
Co-57	Ci	-----	-----	4.00 E-07	1.03 E-05
Co-58	Ci	-----	-----	1.45 E-03	2.69 E-03
Fe-59	Ci	-----	-----	2.86 E-06	-----
Co-60	Ci	-----	-----	5.95 E-03	1.87 E-02
Sr-89	Ci	-----	-----	1.02 E-04	-----
Sr-90	Ci	-----	-----	1.10 E-04	1.08 E-04
Nb-95	Ci	-----	-----	-----	1.57 E-05
Tc-99	Ci	-----	-----	-----	2.02 E-06
Ag-110	Ci	-----	-----	5.15 E-04	6.10 E-04
Sn-113	Ci	-----	-----	5.25 E-06	-----
Sb-124	Ci	-----	-----	1.14 E-04	-----
Sb-125	Ci	-----	-----	3.56 E-03	2.02 E-03
I-131	Ci	-----	-----	-----	2.30 E-04
I-133	Ci	-----	-----	-----	3.29 E-04
Cs-134	Ci	-----	-----	1.31 E-03	1.98 E-03
I-135	Ci	-----	-----	-----	1.97 E-05
Cs-137	Ci	-----	-----	4.84 E-03	7.00 E-03
W-187	Ci	-----	-----	2.85 E-05	1.08 E-05
Total for period	Ci	-----	-----	1.35 E-01	1.25 E-01

SEMIANNUAL REPORT

JULY 1991 THROUGH DECEMBER 1991

UNIT 4 TABLE 2 (continued)

LIQUID EFFLUENTS SUMMARY

LIQUID DISSOLVED GAS

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Kr-85	Ci	-----	-----	2.26 E-03	-----
Xe-131	Ci	-----	-----	-----	-----
Xe-131m	Ci	-----	-----	-----	-----
Xe-133	Ci	-----	-----	-----	1.04 E-02
Xe-133m	Ci	-----	-----	-----	-----
Xe-135	Ci	-----	-----	-----	5.40 E-06
Xe-135m	Ci	-----	-----	-----	-----
Total for Period	Ci	-----	-----	2.26 E-03	1.04 E-02

LIQUID EFFLUENTS-DOSE SUMMATION

JANUARY 1991 THROUGH DECEMBER 1991

UNIT 4

Age group: Teenager
Location: Cooling Canal

Shoreline Deposition	Dose (mrem)	% of Annual Limit
Total Body	1.80 E-3	6.00 E-02

SEMIANNUAL REPORT

JULY 1991 THROUGH DECEMBER 1991

UNIT 4 TABLE 3

GASEOUS EFFLUENTS SUMMARYA. FISSION AND ACTIVATION PRODUCTS

	Units	Quarter 3	Quarter 4
1. Total Release	Ci	-----	9.46 E+00
2. Average Release Rate for Period	$\mu\text{Ci}/\text{sec}$	-----	1.19 E+00

B. IODINES

1. Total Iodine-131	Ci	-----	5.85 E-04
2. Average Release Rate for Period	$\mu\text{Ci}/\text{sec}$	-----	7.36 E-05

C. PARTICULATES

1. Particulates T _{1/2} > 8 days	Ci	1.15 E-06	2.55 E-06
2. Average Release Rate for Period	$\mu\text{Ci}/\text{sec}$	1.45 E-07	3.21 E-07
3. Gross Alpha Radioactivity *	Ci	<2.60E-15	<2.03E-15

D. TRITIUM

1. Total Release	Ci	-----	1.99 E-02
2. Average Release Rate for Period	$\mu\text{Ci}/\text{sec}$	-----	2.50 E-03

*MDA values in units of $\mu\text{Ci}/\text{ml}$

SEMIANNUAL REPORT

JULY 1991 THROUGH DECEMBER 1991

UNIT 4 TABLE 4

GASEOUS EFFLUENTS SUMMARYA. FISSION GASES

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Kr-85m	Ci	-----	-----	-----	1.94 E-04
Kr-87	Ci	-----	-----	-----	-----
Xe-131m	Ci	-----	-----	-----	2.91 E-02
Xe-133	Ci	-----	5.20 E+00	-----	4.01 E+00
Xe-133m	Ci	-----	-----	-----	2.63 E-02
Xe-135	Ci	-----	1.86 E-01	-----	8.55 E-03
Xe-135m	Ci	-----	-----	-----	-----
Total for period	Ci	-----	5.39 E+00	-----	4.07 E+00

B. IODINES

Nuclides Released	Units	Continuous Mode	
		Quarter 3	Quarter 4
I-131	Ci	-----	5.85 E-04
I-133	Ci	-----	2.95 E-05
Total for period	Ci	-----	6.15 E-04

C. PARTICULATES

Nuclides Released	Units	Continuous Mode	
		Quarter 3	Quarter 4
Co-60	Ci	-----	2.04 E-06
Cs-137	Ci	1.15 E-06	5.05 E-07
Total for period	Ci	1.15 E-06	2.55 E-06

TURKEY POINT PLANT
SEMIANNUAL REPORT

JANUARY 1991 THROUGH DECEMBER 1991

UNIT 4 TABLE 5

DOSES DUE TO IODINE, TRITIUM, AND PARTICULATES

Pathway	Bone	Liver	Thyroid	Kidney	Lung	GI-LLI	Skin	Total Body
Cow milk- Infant	2.95 E-05	3.60 E-05	1.00 E-02	8.43 E-06	1.49 E-06	2.23 E-06	-----	1.95 E-05
Fruit&Veg Fresh	1.23 E-06	2.89 E-06	3.83 E-04	3.39 E-06	1.28 E-06	1.96 E-06	-----	2.25 E-06
Ground Plane	3.11 E-06	3.11 E-06	3.11 E-06	3.11 E-06	3.11 E-06	3.11 E-06	3.65 E-06	3.11 E-06
Inhalation Adult	5.66 E-08	5.41 E-07	2.47 E-05	5.89 E-07	6.13 E-07	4.83 E-07	-----	5.08 E-07
Totals (mrem)	3.39 E-05	4.26 E-05	1.04 E-02	1.55 E-05	6.50 E-06	7.79 E-06	3.65 E-06	2.54 E-05
‡Annual Limit	2.26 E-04	2.84 E-04	6.94 E-02	1.03 E-04	4.33 E-05	5.19 E-05	2.43 E-05	1.69 E-04

Dose due to Noble Gases

Gamma Air Dose 6.69 E-05 mrad % of Annual Limit 6.69 E-04 %/yr
 Beta Air Dose 1.89 E-04 mrad % of Annual Limit 9.44 E-04 %/yr



FLORIDA POWER AND LIGHT COMPANY
 TURKEY POINT PLANT
 SEMIANNUAL REPORT
 JULY 1991 THROUGH DECEMBER 1991
 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	UNITS	6 MONTH PERIOD		%ERR
a. Spent resin, filters	m ³	5.52	E0	
sludge, evaporator bottoms	Ci	1.27	E0	20
b. Dry Compressible waste (Note 1)	m ³ Ci	8.29 1.17	E1 E0	20
c. Irradiated components Control rods, etc.	m ³ Ci	0.00 0.00	E0 E0	
d. Other non-compressible Waste (Note 2)	m ³ Ci	9.98 4.62	E0 E-3	20

2. ESTIMATE OF MAJOR NUCLIDE COMPOSITION BY TYPE OF WASTE

	UNITS	VALUE
a. Cs-137	%	44
Co-60	%	18
Cs-134	%	11
Fe-55	%	9
Ni-63	%	7
Co-58	%	7
Sb-125	%	2
Mn-54	%	2
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b. Fe-55	%	37
Co-60	%	31
Ni-63	%	15
Cs-137	%	9
Co-58	%	2
Cs-134	%	2
Cr-51	%	2
Ag-110m	%	1
Sb-125	%	1
<hr/>		
c.		



FLORIDA POWER AND LIGHT COMPANY
 TURKEY POINT PLANT
 SEMIANNUAL REPORT
 JULY 1991 THROUGH DECEMBER 1991
 UNITS 3 AND 4 TABLE 6

	UNITS	VALUE
d. Fe-55	%	52
H-3	%	39
C-14	%	3
Cs-137	%	2
Co-60	%	2
Sb-125	%	1
Cs-134	%	1

3. SOLID WASTE DISPOSITION

NUMBER OF SHIPMENTS	MODE OF TRANSPORT	DESTINATION
11 (Note 3)	Sole use truck	Oak Ridge, TN
1	Sole use truck	Barnwell, SC
2 (Note 4)	Sole use truck	Kingston, TN

B. IRRADIATED FUEL SHIPMENTS

None

FLORIDA POWER & LIGHT COMPANY
 TURKEY POINT PLANT
 SEMIANNUAL REPORT
 JULY 1991 THROUGH DECEMBER 1991
 UNITS 3 & 4 TABLE 6
 SOLID WASTE SUPPLEMENT

Waste Classification	Total Volume Ft ³	(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	195.1	1.27	Ni-63 Sr-90 Cs-137	Dewatered Resin	1a.	>Type A, LSA Cask	N/A
Class A	2926.9	1.17	None	Compactable and Non-Compactable Trash	1b.	Strong Tight	N/A
Class A	352.5	0.0046	None	Waste Oil	1d.	Strong Tight	N/A

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1991 THROUGH DECEMBER 1991
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 797.4 m³
- Note 2: Other noncompressible waste indicates volume shipped to a waste processing facility for disposal via incineration.
- 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: Material transported to Kingston, Tennessee was consigned to a licensed processing facility for incineration.
- 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 frequently 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.



FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1991 THROUGH DECEMBER 1991
UNITS 3 AND 4 TABLE 6

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.

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT PLANT
SEMIANNUAL REPORT
JULY 1991 THROUGH DECEMBER 1991
UNITS 3 AND 4 ATTACHMENT 1

SUMMARY OF CHANGES TO THE PROCESS CONTROL PROGRAM

During this reporting period, Turkey Point Operating Procedure 11550.48, Process Control Program for Dewatering Radioactive Waste Liners, was cancelled and replaced with Procedure O-HPS-042.8, Dewatering Controls for Radioactive Waste Liners.

This change is only to revise the Process Control Program to Turkey Point's upgraded procedure format. No change was made to the technical content of the procedure.

These changes are administrative only. They have no impact on the degree of assurance that the waste form produced under the Process Control Program will conform to the requirements of 10CFR61 and the disposal site licenses.

NuPac Services, Inc. Procedure PT-51, Solidification Process Control Procedure, Revision 8, March 30, 1988, was approved for use at Turkey Point Nuclear Plant during this reporting period. This procedure was subsequently cancelled following completion of a waste solidification campaign.

This vendor process control program, together with the supporting Topical Report, provides assurance that the waste form produced conforms to the requirements of 10CFR61 and the disposal site licenses.

Copies of the above procedures are attached.

RKR/eb/114