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L-2008-061
10 CFR 50.36a(a)(2)

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555-00001

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

Attached is the Radioactive Effluent Release Report for the period of January 1, 2007, through December 31, 2007, for Turkey Point Units 3 and 4, as required by Technical Specification 6.9.1.4 and 10 CFR 50.36a (a)(2).

Should there be any questions or comments regarding this information, please contact Paul Infanger at (305) 246-6632.

Very truly yours,

William Jefferson, Jr.
Vice President
Turkey Point Nuclear Plant

SM

Attachment

cc: Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

IE48
NRR

Florida Power and Light
Turkey Point Plant
Units 3 and 4

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

January 2007 through December 2007

Submitted by:

NUCLEAR CHEMISTRY DEPARTMENT
FLORIDA POWER AND LIGHT COMPANY

P. E. Skinner, Chemistry Manager

Michael Kiley, Plant General Manager

Table of Contents

1.0 REGULATORY LIMITS

1.1 Liquid Effluent

(a) The concentration of radioactive material released in liquid effluents to unrestricted areas shall not exceed ten times the concentration specified in 10CFR20 Appendix B, Table 2, Column 2 for radionuclides other than dissolved or entrained gases. For dissolved or entrained noble gases, the concentration shall not exceed 2.0E-04 micro-curies per milliliter total activity.

(b) The dose or dose commitment per reactor to a member of the public from any radioactive materials in liquid effluents 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 less than or equal to 5 mrem to any organ.
- During any calendar year, to less than or equal to 3.0 mrem to the total body and less than or equal to 10 mrem to any organ.

1.2 Gaseous Effluent

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

- Less than or equal to 500 mrem per year to the total body and less than or equal to 3000 mrem per year to the skin due to noble gases.
- Less than or equal to 1500 mrem per 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 to:

- 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 all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluent 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 EFFLUENT CONCENTRATION

Water : In accordance with 10CFR20, Appendix B, Table 2, Column 2, and 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 of this report.

3.0 AVERAGE ENERGY

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

4.0 MEASUREMENTS AND APPROXIMATIONS OF TOTAL ACTIVITY

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 Offsite Dose Calculation Manual (ODCM) analysis techniques to achieve the required Lower Limit 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 determine if 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, Ni-63, and Fe-55 by chemical separation.

All radioactivity concentrations determined from sample 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 samples from the waste disposal system were analyzed on a pre-release basis by gamma spectral 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 respectively.

There were no continuous liquid effluent releases above the lower limit of detection for either Unit 3 or Unit 4 during this reporting period and therefore these have been omitted from Table 2 of this report.

4.2 Gaseous Effluents

Airborne releases to the atmosphere occurred from the following sources:

- Gas Decay Tanks
- Containment Purges
- Releases incidental to operation of the plant.

The techniques employed in determining the radioactivity in airborne releases are:

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

All gaseous 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 monitors and the Plant Vent process monitor data using the current calibration curve for that process monitor. This method was not used this reporting period.

Both units share portions of the gaseous waste treatment system and generally all gaseous releases from the shared system are allocated on a 50/50 basis to each unit.

Meteorological data for the period January 2007 through December 2007, in the form of Joint Frequency Distribution Tables, are maintained on site.

4.3 Estimation 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 ± 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, reported to us by the independent lab, were used as the basis for deriving the following analytical error terms:

NUCLIDE TYPE	AVERAGE ERROR	MAXIMUM ERROR
Liquid	± 5.2%	± 13.0%
Gaseous	± 3.7%	± 8.0%

5.0 BATCH RELEASES

5.1 LIQUID	Unit 3	Unit 4
a) Number of releases	6.70E+01	6.70E+01
b) Total time period of batch releases, minutes	6.62E+03	6.62E+03
c) Maximum time period for a batch release, minutes	1.65E+02	1.65E+02
d) Average time period for a batch release, minutes	9.78E+01	9.78E+01
e) Minimum time for a batch release, minutes	2.80E+01	2.80E+01
f) Average stream flow during period of release of effluent into a flowing stream, liters-per-minute	4.84E+06	4.84E+06

5.1 GASEOUS	Unit 3	Unit 4
a) Number of releases	1.70E+01	1.30E+01
b) Total time period of batch releases, minutes	1.18E+03	8.72E+02
c) Maximum time period for a batch release, minutes	2.40E+02	2.40E+02
d) Average time period for a batch release, minutes	1.14E+02	5.40E+01
e) Minimum time for a batch release, minutes	2.70E+01	2.70E+01

6.0 UNPLANNED RELEASES

6.1 Liquid

There were no unplanned liquid releases this period for either Unit 3 or Unit 4.

6.2 Gaseous

There were no unplanned gaseous releases this period for either Unit 3 or Unit 4.

7.0 REACTOR COOLANT ACTIVITY

7.1 Unit 3

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

7.2 Unit 4

Reactor coolant activity limits of 100/E-Bar and 1.0 uCi/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 at the child development center/fitness center for ten hours a day, five days each week for fifty weeks of the year, receiving exposure from both Unit 3 and Unit 4 at Turkey Point. The child development center/fitness center is located approximately 1.75 miles WNW of the plant. Specific activities used in these calculations are the sum of the activities listed in Unit 3 Table 3 and Unit 4 Table 3. The following dose calculations were made using historical meteorological data:

	Adult Inhalation	Child Inhalation
Bone (mrem)	6.70E-10	1.21E-09
Liver (mrem)	5.24E-05	3.68E-05
Thyroid (mrem)	5.27E-05	3.72E-05
Kidney (mrem)	5.24E-05	2.43E-05
Lung (mrem)	5.24E-05	3.68E-05
GI-LLI (mrem)	5.24E-05	3.68E-05
Total Body (mrem)	5.24E-05	3.68E-05

Gamma Air Dose (mrad)	2.51E-05
Beta Air Dose (mrad)	5.35E-05

9.0 OFFSITE DOSE CALCULATION MANUAL (ODCM) REVISIONS

The ODCM was reviewed, and the revision was implemented in June 2007. A summary of the changes is listed on Attachment A along with the pages of the ODCM that were revised.

10.0 SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

No irradiated fuel shipments or irradiated component shipments were made from the site. Common solid waste from Turkey Point Units 3 and 4 was shipped jointly. A summation of these shipments is given in Table 6 of this report.

11.0 PROCESS CONTROL PROGRAM REVISIONS

There were no revisions to the Process Control Program during this reporting period.

12.0 INOPERABLE EFFLUENT MONITORING INSTRUMENTATION

There was no inoperable effluent monitoring instrumentation requiring reportability during this period.

13.0 NEI's INDUSTRY INITIATIVE ON GROUND WATER SAMPLING

In 2007 as part of the Industry Initiative on Groundwater Sampling, a minimum of 10 wells on site and adjacent to the site were sampled for tritium. The tritium results were from 360 to 4350 Pico curie per liter. All results were less than the limits of the Offsite Dose Calculation Manual, Table 5.1-2, Reporting Levels for Radioactivity Concentrations in Environmental Samples. The results are reported in the Annual Radiological Environmental Operating Report.

During this period there was a spill of approximately 10 gallons of radioactive water from the 3A Containment Spray Pump full flow test onto the ground outside the Auxiliary Building. This is inside the owner controlled area.

A sample of the water from the spill was obtained and analyzed for gamma emitting nuclides and tritium. The spill was estimated at 10gals and an investigation was performed to determine if the Limits of Section 5.0 of the ODCM (REMP) were exceeded. The water did not enter the storm drains or the canal system; and since the water did not reach Unrestricted Areas the limits of the REMP were not exceeded. No reporting was required; however, the NRC resident inspector was notified.

TURKEY POINT UNITS 3 AND 4
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
JANUARY 2007 THROUGH DECEMBER 2007

LIQUID EFFLUENTS SUMMARY

UNIT 3
TABLE 1

A. FISSION AND ACTIVATION PRODUCTS

	UNITS	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Est. Error (%)
1. Total Release (not including tritium,gases, alpha)	Ci	5.79E-03	6.32E-03	1.16E-02	5.74E-03	3.44
2. Average diluted concentration during the period	uCi/ml	8.80E-10	1.22E-09	8.18E-10	9.51E-10	
3. Percent of applicable limit	%	5.02E-02	5.13E-02	4.14E-02	5.21E-02	

B. TRITIUM

	UNITS	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Est. Error (%)
1. Total Release	Ci	9.10E+01	1.27E+02	2.01E+02	8.52E+01	2.50
2. Average diluted concentration during the period	uCi/ml	1.38E-05	2.45E-05	1.41E-05	1.41E-05	
3. Percent of applicable limit	%	1.38E+00	2.45E+00	1.41E+00	1.41E+00	

C. DISSOLVED AND ENTRAINED GASES

	UNITS	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Est. Error (%)
1. Total Release	Ci	0.00E+00	0.00E+00	8.58E-04	2.07E-03	3.44
2. Average diluted concentration during the period	uCi/ml	0.00E+00	0.00E+00	6.03E-11	3.43E-10	
3. Percent of applicable limit	%	0.00E+00	0.00E+00	3.02E-05	1.71E-04	

D. GROSS ALPHA RADIOACTIVITY

	UNITS	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Est. Error (%)
1. Total Release	Ci	- -	- -	- -	- -	

E. LIQUID VOLUMES

	UNITS	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Est. Error (%)
1. Batch waste released, prior to dilution	LITERS	3.07E+05	2.31E+05	6.67E+05	2.74E+05	10.00
2. Continuous waste released, prior to dilution	LITERS	- -	- -	- -	- -	
3. Dilution water used during period	LITERS	6.58E+09	5.19E+09	1.42E+10	6.04E+09	

LIQUID EFFLUENTS SUMMARY

UNIT 3
TABLE 2

NUCLIDES RELEASED	UNITS	BATCH MODE			
		Qtr 1	Qtr 2	Qtr 3	Qtr 4
Fe-55	Ci	2.10E-03	2.43E-03	1.94E-03	4.91E-04
Ni-63	Ci	1.01E-03	1.84E-03	2.29E-03	6.91E-04
Sr-89	Ci	--	--	--	--
Sr-90	Ci	--	--	--	--
Na-24	Ci	--	--	--	--
Cr-51	Ci	1.54E-04	--	4.74E-05	7.80E-05
Mn-54	Ci	2.48E-05	2.16E-05	1.43E-04	4.27E-05
Co-57	Ci	6.06E-06	2.50E-06	1.62E-05	4.87E-06
Co-58	Ci	1.70E-03	1.39E-03	6.39E-03	3.98E-03
Fe-59	Ci	5.39E-06	8.85E-05	1.85E-05	--
Co-60	Ci	3.20E-04	4.00E-04	6.48E-04	2.84E-04
Zn-65	Ci	--	--	--	--
Nb-95	Ci	1.81E-05	2.73E-06	2.49E-06	1.61E-06
Zr-95	Ci	2.91E-06	--	--	--
Mo-99	Ci	1.35E-05	--	--	--
Ru-106	Ci	--	--	--	--
Ag-110	Ci	5.33E-05	2.97E-05	1.44E-06	8.73E-06
Sn-113	Ci	1.40E-06	--	--	--
Sn-117m	Ci	--	--	6.90E-06	3.29E-05
Sb-124	Ci	--	--	--	6.60E-06
Sb-125	Ci	3.02E-04	1.08E-04	1.20E-04	1.24E-04
I-131	Ci	--	--	--	--
I-133	Ci	--	--	--	--
I-134	Ci	--	--	--	--
Cs-134	Ci	3.34E-06	--	--	--
I-135	Ci	--	--	--	--
Cs-137	Ci	8.18E-05	2.38E-06	--	--
La-140	Ci	--	--	--	--
Ce-141	Ci	--	--	--	--
Ce-144	Ci	--	--	--	--
W-187	Ci	--	--	--	--
Np-239	Ci	--	--	--	--
Te-129	Ci	--	--	--	--
TOTAL FOR PERIOD	Ci	5.79E-03	6.32E-03	1.16E-02	5.74E-03

LIQUID EFFLUENTS - DISSOLVED GAS SUMMARY

NUCLIDES RELEASED	UNITS	BATCH MODE			
		Qtr 1	Qtr 2	Qtr 3	Qtr 4
Ar-41	Ci	--	--	--	--
Kr-85m	Ci	--	--	--	--
Kr-85	Ci	--	--	8.58E-04	1.88E-03
Xe-131	Ci	--	--	--	--
Xe-133	Ci	--	--	--	1.91E-04
Xe-133m	Ci	--	--	--	--
Xe-135	Ci	--	--	--	--
Xe-138	Ci	--	--	--	--
TOTAL FOR PERIOD	Ci	0.00E+00	0.00E+00	8.58E-04	2.07E-03

LIQUID EFFLUENTS - DOSE SUMMATION

Age group : Teenager
Location : Cooling Canal

Shoreline Deposition	Dose (mrem)	% of Annual Limit
TOTAL BODY	8.40E-05	2.80E-03

TURKEY POINT UNITS 3 AND 4
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
JANUARY 2007 THROUGH DECEMBER 2007

GASEOUS EFFLUENTS SUMMARY

UNIT 3
TABLE 3

A. FISSION AND ACTIVATION PRODUCTS

	UNITS	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Est. Error (%)
1. Total Release	Ci	1.14E-03	5.23E-02	2.18E-01	5.87E+00	2.79
2. Average release rate for the period	uCi/sec	1.47E-04	6.66E-03	2.75E-02	7.55E-01	
3. Percent of Technical Specification LImit	%	4.87E-15	5.06E-12	2.02E-11	4.34E-11	

B. IODINES

	UNITS	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Est. Error (%)
1. Total Release	Ci	- -	- -	2.57E-05	- -	3.44
2. Average release rate for the period	uCi/sec	- -	- -	3.24E-06	- -	
3. Percent of Technical Specification LImit	%	- -	- -	4.43E-03	- -	

C. PARTICULATES

	UNITS	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Est. Error (%)
1. Particulates with half-life >8 days	Ci	- -	- -	3.91E-05	- -	2.50
2. Average release rate for the period	uCi/sec	- -	- -	4.91E-06	- -	
3. Percent of Technical Specification LImit	%	- -	- -	6.32E-07	- -	
4. Gross Alpha Radioactivity	Ci	- -	- -	- -	- -	

D. TRITIUM

	UNITS	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Est. Error (%)
1. Total Release	Ci	2.96E-01	2.50E+00	7.19E+00	4.85E-01	2.50
2. Average release rate for the period	uCi/sec	3.81E-02	3.18E-01	9.05E-01	6.24E-02	
3. Percent of Technical Specification LImit	%	2.97E-05	1.88E-05	5.40E-05	3.64E-06	

TURKEY POINT UNITS 3 AND 4
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GASEOUS EFFLUENTS SUMMARY

UNIT 3
TABLE 4

A . FISSION GASES

NUCLIDES RELEASED	UNITS	BATCH MODE			
		Qtr 1	Qtr 2	Qtr 3	Qtr 4
Ar-41	Ci	- -	3.85E-02	1.54E-01	- -
Kr-85	Ci	- -	- -	- -	- -
Kr-85m	Ci	- -	- -	- -	- -
Xe-131m	Ci	1.73E-05	2.04E-05	- -	7.93E-05
Xe-133	Ci	1.12E-03	1.38E-02	6.36E-02	4.72E-03
Xe-133m	Ci	- -	- -	5.56E-04	1.29E-05
Xe-135	Ci	- -	- -	1.45E-04	2.51E-05
Xe-135m	Ci	- -	- -	- -	- -
TOTAL FOR PERIOD	Ci	1.14E-03	5.23E-02	2.18E-01	4.84E-03

NUCLIDES RELEASED	UNITS	CONTINUOUS MODE			
		Qtr 1	Qtr 2	Qtr 3	Qtr 4
Ar-41	Ci	- -	- -	- -	- -
Kr-85	Ci	- -	- -	- -	- -
Kr-85m	Ci	- -	- -	- -	- -
Kr-87	Ci	- -	- -	- -	- -
Kr-88	Ci	- -	- -	- -	- -
Xe-131m	Ci	- -	- -	- -	- -
Xe-133	Ci	- -	- -	- -	5.95E+00
Xe-133m	Ci	- -	- -	- -	2.36E+00
Xe-135	Ci	- -	- -	- -	- -
Xe-135m	Ci	- -	- -	- -	1.95E-01
Xe-138	Ci	- -	- -	- -	- -
TOTAL FOR PERIOD	Ci	- -	- -	- -	8.50E+00

B. IODINES

NUCLIDES RELEASED	UNITS	CONTINUOUS MODE			
		Qtr 1	Qtr 2	Qtr 3	Qtr 4
Br-82	Ci	- -	- -	2.08E-05	- -
I-131	Ci	- -	- -	4.94E-06	- -
I-133	Ci	- -	- -	- -	- -
TOTAL FOR PERIOD	Ci	- -	- -	2.57E-05	- -

C. PARTICULATES

NUCLIDES RELEASED	UNITS	CONTINUOUS MODE			
		Qtr 1	Qtr 2	Qtr 3	Qtr 4
Co-58	Ci	- -	- -	- -	- -
Co-60	Ci	- -	- -	- -	- -
Mn-54	Ci	- -	- -	- -	- -
Cr-51	Ci	- -	- -	- -	- -
TOTAL FOR PERIOD	Ci	- -	- -	- -	- -

DOSES DUE TO IODINE,TRITIUM, AND PARTICULATES

UNIT 3
TABLE 5

PATHWAY	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
Cow milk - Infant (mrem)	2.03E-07	7.89E-05	1.57E-04	3.46E-05	7.87E-05	7.87E-05	--	7.88E-05
Fruit & Veg Fresh (mrem)	9.73E-09	8.21E-06	1.14E-05	5.42E-06	8.20E-06	8.20E-06	--	8.21E-06
Ground Plane (mrem)	1.35E-09	1.35E-09	1.35E-09	1.35E-09	1.35E-09	1.35E-09	1.64E-09	1.35E-09
Inhalation - Adult (mrem)	3.94E-10	3.55E-05	3.57E-05	3.55E-05	3.55E-05	3.55E-05	--	3.55E-05
TOTAL (mrem)	2.15E-07	1.23E-04	2.04E-04	7.55E-05	1.22E-04	1.22E-04	1.64E-09	1.23E-04
% of Annual Limit	1.43E-06	8.18E-04	1.36E-03	5.03E-04	8.16E-04	8.16E-04	1.09E-08	8.17E-04

DOSE DUE TO NOBLE GASES

	mrad	% of Annual Limit
Gamma Air Dose	9.69E-05	9.69E-04
Beta Air Dose	1.94E-04	9.68E-04

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LIQUID EFFLUENTS SUMMARY

UNIT 4
TABLE 1

A. FISSION AND ACTIVATION PRODUCTS

	UNITS	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Est. Error (%)
1. Total Release (not including tritium,gases, alpha)	Ci	5.79E-03	6.32E-03	1.16E-02	5.74E-03	3.44
2. Average diluted concentration during the period	uCi/ml	8.80E-10	1.22E-09	8.18E-10	9.51E-10	
3. Percent of applicable limit	%	5.02E-02	5.13E-02	4.14E-02	5.21E-02	

B. TRITIUM

	UNITS	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Est. Error (%)
1. Total Release	Ci	9.10E+01	1.27E+02	2.01E+02	8.52E+01	2.50
2. Average diluted concentration during the period	uCi/ml	1.38E-05	2.45E-05	1.41E-05	1.41E-05	
3. Percent of applicable limit	%	1.38E+00	2.45E+00	1.41E+00	1.41E+00	

C. DISSOLVED AND ENTRAINED GASES

	UNITS	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Est. Error (%)
1. Total Release	Ci	- -	- -	8.58E-04	2.07E-03	3.44
2. Average diluted concentration during the period	uCi/ml	- -	- -	6.03E-11	3.43E-10	
3. Percent of applicable limit	%	- -	- -	3.02E-05	1.71E-04	

D. GROSS ALPHA RADIOACTIVITY

	UNITS	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Est. Error (%)
1. Total Release	Ci	- -	- -	- -	- -	

E. LIQUID VOLUMES

		Qtr 1	Qtr 2	Qtr 3	Qtr 4	Est. Error (%)
1. Batch waste released, prior to dilution	LITERS	3.07E+05	2.31E+05	6.67E+05	2.74E+05	10.00
2. Continuous waste released, prior to dilution	LITERS	- -	- -	- -	- -	
3. Dilution water used during period	LITERS	6.58E+09	5.19E+09	1.42E+10	6.04E+09	

TURKEY POINT UNITS 3 AND 4
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LIQUID EFFLUENTS SUMMARY

UNIT 4
TABLE 2

NUCLIDES RELEASED	UNITS	BATCH MODE			
		Qtr 1	Qtr 2	Qtr 3	Qtr 4
Fe-55	Ci	2.10E-03	2.43E-03	1.94E-03	4.91E-04
Ni-63	Ci	1.01E-03	1.84E-03	2.29E-03	6.91E-04
Sr-89	Ci	- -	- -	- -	- -
Sr-90	Ci	- -	- -	- -	- -
Na-24	Ci	- -	- -	- -	- -
Cr-51	Ci	1.54E-04	- -	4.74E-05	7.80E-05
Mn-54	Ci	2.48E-05	2.16E-05	1.43E-04	4.27E-05
Co-57	Ci	6.06E-06	2.50E-06	1.62E-05	4.87E-06
Co-58	Ci	1.70E-03	1.39E-03	6.39E-03	3.98E-03
Fe-59	Ci	5.39E-06	8.85E-05	1.85E-05	- -
Co-60	Ci	3.20E-04	4.00E-04	6.48E-04	2.84E-04
Zn-65	Ci	- -	- -	- -	- -
Nb-95	Ci	1.81E-05	2.73E-06	2.49E-06	1.61E-06
Zr-95	Ci	2.91E-06	- -	- -	- -
Mo-99	Ci	1.35E-05	- -	- -	- -
Ru-106	Ci	- -	- -	- -	- -
Ag-110	Ci	5.33E-05	2.97E-05	1.44E-06	8.73E-06
Sn-113	Ci	1.40E-06	- -	- -	- -
Sn-117m	Ci	- -	- -	6.90E-06	3.29E-05
Sb-124	Ci	- -	- -	- -	6.60E-06
Sb-125	Ci	3.02E-04	1.08E-04	1.20E-04	1.24E-04
I-131	Ci	- -	- -	- -	- -
I-133	Ci	- -	- -	- -	- -
I-134	Ci	- -	- -	- -	- -
Cs-134	Ci	3.34E-06	- -	- -	- -
I-135	Ci	- -	- -	- -	- -
Cs-137	Ci	8.18E-05	2.38E-06	- -	- -
La-140	Ci	- -	- -	- -	- -
Ce-141	Ci	- -	- -	- -	- -
Ce-144	Ci	- -	- -	- -	- -
W-187	Ci	- -	- -	- -	- -
Np-239	Ci	- -	- -	- -	- -
Te-129	Ci	- -	- -	- -	- -
TOTAL FOR PERIOD	Ci	5.79E-03	6.32E-03	1.16E-02	5.74E-03

LIQUID EFFLUENTS - DISSOLVED GAS SUMMARY

NUCLIDES RELEASED	UNITS	BATCH MODE			
		Qtr 1	Qtr 2	Qtr 3	Qtr 4
Ar-41	Ci	- -	- -	- -	- -
Kr-85m	Ci	- -	- -	- -	- -
Kr-85	Ci	- -	- -	8.58E-04	1.88E-03
Xe-131	Ci	- -	- -	- -	- -
Xe-133	Ci	- -	- -	- -	1.91E-04
Xe-133m	Ci	- -	- -	- -	- -
Xe-135	Ci	- -	- -	- -	- -
Xe-138	Ci	- -	- -	- -	- -
TOTAL FOR PERIOD	Ci	- -	- -	8.58E-04	2.07E-03

LIQUID EFFLUENTS - DOSE SUMMATION

Age group : Teenager
Location : Cooling Canal

Shoreline Deposition	Dose (mrem)	% of Annual Limit
TOTAL BODY	8.40E-05	2.80E-03

TURKEY POINT UNITS 3 AND 4
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
JANUARY 2007 THROUGH DECEMBER 2007

GASEOUS EFFLUENTS SUMMARY

UNIT 4
TABLE 3

A. FISSION AND ACTIVATION PRODUCTS

	UNITS	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Est. Error (%)
1. Total Release	Ci	8.63E-03	4.42E-04	7.28E-02	6.00E+00	2.79
2. Average release rate for the period	uCi/sec	1.11E-03	5.62E-05	9.16E-03	7.72E-01	
3. Percent of Technical Specification LImit	%	9.78E-13	1.85E-15	4.92E-12	3.02E-11	

B. IODINES

	UNITS	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Est. Error (%)
1. Total Release	Ci	- -	- -	2.57E-05	- -	3.44
2. Average release rate for the period	uCi/sec	- -	- -	3.24E-06	- -	
3. Percent of Technical Specification LImit	%	- -	- -	4.43E-03	- -	

C. PARTICULATES

	UNITS	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Est. Error (%)
1. Particulates with half-life >8 days	Ci	- -	- -	3.91E-05	- -	2.50
2. Average release rate for the period	uCi/sec	- -	- -	4.91E-06	- -	
3. Percent of Technical Specification LImit	%	- -	- -	6.32E-07	- -	
4. Gross Alpha Radioactivity	Ci	- -	- -	- -	- -	

D. TRITIUM

	UNITS	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Est. Error (%)
1. Total Release	Ci	3.16E-01	2.50E+00	3.16E+00	1.72E+00	2.50
2. Average release rate for the period	uCi/sec	4.07E-02	3.18E-01	3.97E-01	2.21E-01	
3. Percent of Technical Specification LImit	%	2.38E-06	1.88E-05	2.37E-05	1.29E-05	

TURKEY POINT UNITS 3 AND 4
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
JANUARY 2007 THROUGH DECEMBER 2007

GASEOUS EFFLUENTS SUMMARY

UNIT 4
TABLE 4

A . FISSION GASES

NUCLIDES RELEASED	UNITS	BATCH MODE			
		Qtr 1	Qtr 2	Qtr 3	Qtr 4
Ar-41	Ci	7.49E-03	--	3.66E-02	--
Kr-85	Ci	--	--	--	--
Kr-85m	Ci	--	--	--	--
Xe-131m	Ci	1.73E-05	2.04E-05	2.42E-04	7.93E-05
Xe-133	Ci	1.12E-03	4.21E-04	3.52E-02	4.72E-03
Xe-133m	Ci	--	--	5.37E-04	1.29E-05
Xe-135	Ci	--	--	1.45E-04	2.51E-05
Xe-135m	Ci	--	--	--	--
TOTAL FOR PERIOD	Ci	8.63E-03	4.42E-04	7.28E-02	4.84E-03

NUCLIDES RELEASED	UNITS	CONTINUOUS MODE			
		Qtr 1	Qtr 2	Qtr 3	Qtr 4
Ar-41	Ci	--	--	--	--
Kr-85	Ci	--	--	--	--
Kr-85m	Ci	--	--	--	--
Kr-87	Ci	--	--	--	--
Kr-88	Ci	--	--	--	--
Xe-131m	Ci	--	--	--	--
Xe-133	Ci	--	--	--	5.80E+00
Xe-133m	Ci	--	--	--	--
Xe-135	Ci	--	--	--	1.95E-01
Xe-135m	Ci	--	--	--	--
Xe-138	Ci	--	--	--	--
TOTAL FOR PERIOD	Ci	--	--	--	6.00E+00

B. IODINES

NUCLIDES RELEASED	UNITS	CONTINUOUS MODE			
		Qtr 1	Qtr 2	Qtr 3	Qtr 4
Br-82	Ci	--	--	2.08E-05	--
I-131	Ci	--	--	4.94E-06	--
I-133	Ci	--	--	--	--
TOTAL FOR PERIOD	Ci	--	--	2.57E-05	--

C. PARTICULATES

NUCLIDES RELEASED	UNITS	CONTINUOUS MODE			
		Qtr 1	Qtr 2	Qtr 3	Qtr 4
Co-58	Ci	--	--	--	--
Co-60	Ci	--	--	--	--
Mn-54	Ci	--	--	--	--
Cr-51	Ci	--	--	--	--
TOTAL FOR PERIOD	Ci	--	--	--	--

TURKEY POINT UNITS 3 AND 4
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
JANUARY 2007 THROUGH DECEMBER 2007

DOSES DUE TO IODINE,TRITIUM, AND PARTICULATES

UNIT 4
TABLE 5

PATHWAY	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
Cow milk - Infant (mrem)	2.03E-07	5.80E-05	1.36E-04	2.54E-05	5.78E-05	5.78E-05	--	5.79E-05
Fruit & Veg Fresh (mrem)	9.73E-09	6.03E-06	9.26E-06	3.98E-06	6.02E-06	6.02E-06	--	6.03E-06
Ground Plane (mrem)	1.35E-09	1.35E-09	1.35E-09	1.35E-09	1.35E-09	1.35E-09	1.64E-09	1.35E-09
Inhalation - Adult (mrem)	3.94E-10	2.61E-05	2.63E-05	2.61E-05	2.61E-05	2.61E-05	--	2.61E-05
TOTAL (mrem)	2.15E-07	9.01E-05	1.71E-04	5.55E-05	8.99E-05	8.99E-05	1.64E-09	9.00E-05
% of Annual Limit	1.43E-06	6.01E-04	1.14E-03	3.70E-04	5.99E-04	5.99E-04	1.09E-08	6.00E-04

DOSES DUE TO NOBLE GASES

	mrad	% of Annual Limit
Gamma Air Dose	5.16E-05	5.16E-04
Beta Air Dose	1.23E-04	6.16E-04

TURKEY POINT UNITS 3 AND 4
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
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DOSES DUE TO IODINE,TRITIUM, AND PARTICULATES

Summation Table 5

PATHWAY	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
Cow milk - Infant	4.06E-07	1.37E-04	2.92E-04	6.00E-05	1.36E-04	1.36E-04	--	1.37E-04
Fruit & Veg Fresh	1.95E-08	1.42E-05	2.07E-05	9.40E-06	1.42E-05	1.42E-05	--	1.42E-05
Ground Plane	2.70E-09	2.70E-09	2.70E-09	2.70E-09	2.70E-09	2.70E-09	3.28E-09	2.70E-09
Inhalation - Adult	7.88E-10	6.16E-05	6.20E-05	6.16E-05	6.16E-05	6.16E-05	--	6.16E-05
TOTAL (mrem)	4.29E-07	2.13E-04	3.75E-04	1.31E-04	2.12E-04	2.12E-04	3.28E-09	2.13E-04
% of Annual Limit	2.86E-06	1.42E-03	2.50E-03	8.73E-04	1.42E-03	1.42E-03	2.19E-08	1.42E-03

DOSES DUE TO NOBLE GASES

	mrad	% of Annual Limit
Gamma Air Dose	1.49E-04	1.49E-03
Beta Air Dose	3.17E-04	1.58E-03

TABLE 6

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL

1.	TYPE OF WASTE	UNITS	12 MONTH PERIOD	% ERROR
a.	Spent resin, filters, sludge, evaporator bottoms, etc.	m^3 Ci	7.65 E +00 4.37 E +02	2.00 E+00
b.	Dry compressible waste (Note 1)	m^3 Ci	6.32 E+02 4.82 E+00	2.00 E+00
c.	Irradiated components, control rods, etc.	m^3 Ci	0.00 E+00 0.00 E+00	2.00 E+00
d.	Other: non-compressed	m^3 Ci	2.83 E+01 2.66 E-02	2.00 E+00

2. ESTIMATE OF MAJOR NUCLIDE COMPOSITION (by type of waste)

a.	NUCLIDE	UNITS	VALUE
	Fe-55	%	12.42
	Co-60	%	70.67
	Cs-137	%	1.29

b.	NUCLIDE	UNITS	VALUE
	Fe-55	%	77.85
	Co-60	%	5.22
	Ni-63	%	15.33

TABLE 6

c.

NUCLIDE	UNITS	VALUE
	None shipped	

d.

NUCLIDE	UNITS	VALUE
Co-60	%	5.37
Ni-63	%	16.23
Fe-55	%	77.93

3. SOLID WASTE DISPOSITION (Note 2)

Number of Shipments	Mode of Transportation	Destination
11	Sole use truck	Energy Solutions (Oak Ridge, Tn)
1	Sole use truck	Clive Disposal Facility (Bulk) Clive, Utah
3	Sole use truck	Studsvik (Erwin, Tn)
1	Sole use truck	Studsvik/RACE LLC (Memphis, Tn)

B. IRRADIATED FUEL SHIPMENTS (Disposition)

None.

TABLE 6

SOLID WASTE SHIPMENTS

Waste Classification	Total Volume Cubic Feet	(Note 3) Total Curies	(Note 4) Principal Radionuclides	(Note 5) Type of Waste	R.G. 1.21 Category	(Note 6) Type of Container
Class A	2.3 E+04	4.84 E+00	None	Compressible Waste	1.b	General Design
Class B	2.77 E+02	4.37 E+02	None	Primary Resin	1.b.	Type B

No solidification or absorbing agents were used or needed in the shipment of these waste types

TABLE 6

NOTE 1: Dry compressible waste volume indicates volume shipped to a burial site following reduction by a waste processing facility.

NOTE 2: Material transported to 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 or Clive Utah in accordance with the appropriate burial license activity limits. The material shipped directly to Barnwell was processed by CNSI / Duratek Inc. and buried.

NOTE 3: 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.

The composition of radionuclides in the waste is determined by periodic off-site analysis for difficult to measure isotopes. Off-site analyses are used to establish scaling factors or other estimates for difficult to measure isotopes and principle Gamma emitters.

NOTE 4: 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 61.55.

NOTE 5: 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 6: Type of container refers to the transport package.

Attachment A

ODCM Revision

Summary of Changes to the ODCM following the annual review:

1. Insert 1, page 1-4, change to Control 1.4, explains the addition of new section to the Annual Radioactive Effluent Release Report. This details information about the NEI Industry Initiative on Groundwater and what is to be reported in the Annual Radioactive Effluent Release Report (ARERR).
2. Insert 2, page 1-5, Information to be included in the Annual Radiological Environmental Operating Report (AREOR).
3. Insert 3, page 1-7, Definition of the Industry Initiative. (CR2006-17093, CA#1,2 and CR2006-17607 CA#11)
4. Insert 4, page 1-9, Definition of Sampling Evolution.
5. Insert 5, page 1-16, Adds a Reference Section to the ODCM
6. Typographic error correction page 2-14. Corrects the Figure referenced.
7. Insert 6, page 3-3. Adds a paragraph to Subsection C of Section 3, Radioactive Gaseous Effluents. This paragraph summarizes the change to Iodine and Particulate sampling of the SJAE pathway due to PTN-ENG-SENS-06-048, The Calculation Developing the Iodine and Particulate Activity Compensation Factors for the Steam Jet Air Ejector Vent Monitors. (CR2006-20742 CA#5)
8. Page 3-5, Typographical correction, missing subscript on equation.
9. Change numbering to actions on pages 3-11 and 3-12, to account for changes in Insert 7.
10. Insert 7, page 3-13, Clarifies actions and implements PTN-ENG-SENS-06-048, The Calculation Developing the Iodine and Particulate Activity Compensation Factors for the Steam Jet Air Ejector Vent Monitors. Adds Sampling Evolution to the actions as necessary to perform planned samples and not violate the continuous sampling expectation. This is in accordance with industry practice. (CR2006-20742 CA#5)
11. On page 3-14, Eliminate Iodine and Particulate sampling in accordance with PTN-ENG-SENS-06-048, The Calculation Developing the Iodine and Particulate Activity Compensation Factors for the Steam Jet Air Ejector Vent Monitors. (CR2006-20742 CA#5)
12. Delete page 3-21, this table was added to the ODCM in previous revisions as a convenient location for a table describing the set points of effluent monitors, however non-effluent monitors were listed and this caused some confusion. The information is below the level of detail of the ODCM and is already included in plant procedures.
13. Page 3-28 adds notation to Table 3.2-1, Radioactive Gaseous Waste Sampling and Analysis Program to implement PTN-ENG-SENS-06-048, The Calculation Developing the Iodine and Particulate Activity Compensation Factors for the Steam Jet Air Ejector Vent Monitors. (CR2006-20742 CA#5)
14. Insert 8, page 3-31, the notes referenced in item number 11.
15. Insert 9, page 5-9, Change in wording to follow NUREG-1301. (CR2005-17141, CA#2)
16. Insert 10, page 5A-3, addition of a sample point into the Waterborne, Surface Water table.
17. Inserts a new Appendix to Section 5, Radiological Environmental Monitoring Program (REMP). This Appendix implements the actions necessary for PTN to meet the requirements of the NEI Industry Initiative on Groundwater Sampling. (CR2006-17093, CA#1,2 and CR2006-17607 CA#11) Also includes recommendations from review by ANI.

OFFSITE DOSE CALCULATION MANUAL

FOR

GASEOUS AND LIQUID EFFLUENTS

FROM THE

TURKEY POINT PLANT UNITS 3 AND 4

REVISION 14

CHANGE DATED 6/4/07

Florida Power and Light Company

TURKEY POINT UNIT 3 & 4 OFFSITE DOSE CALCULATION MANUAL

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5-8	11/22/02	3B-13	11/22/02	3B-53	11/22/02
5-9	06/04/07	3B-14	11/22/02	3B-54	11/22/02
5-10	11/22/02	3B-15	11/22/02	3B-55	11/22/02
5-11	11/22/02	3B-16	11/22/02	3B-56	11/22/02
5-12	11/22/02	3B-17	11/22/02		

LIST OF EFFECTIVE PAGES

Offsite Dose Calculation Manual

PAGE	DATE
3B-57	11/22/02
3C-1	11/22/02
3C-2	11/22/02
3C-3	11/22/02
5A-1	11/22/02
5A-2	11/22/02
5A-3	06/04/07
5A-4	11/22/02
5B-1	06/04/07
5B-2	06/04/07

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5.0 Radiological Environmental Monitoring Program

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5.0 Radiological Environmental Monitoring Program

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INTRODUCTION

PURPOSE

This manual describes methods which are acceptable for calculating radioactivity concentrations in the environment and potential offsite doses associated with liquid and gaseous effluents from the Turkey Point Nuclear Units. These calculations are performed to satisfy Technical Specifications and to ensure that the radioactive dose or dose commitment to any member of the public is not exceeded.

The radioactivity concentration calculations and dose estimates in this manual are used to demonstrate compliance with the Technical Specifications required by 10 CFR 50.36. The methods used are acceptable for demonstrating operational compliance with 10 CFR 20.1302, 10CFR50 Appendix I, and 40CFR190. Only the doses attributable to Turkey Point Units 3 and 4 are determined in demonstrating compliance with 40CFR190 since there are no other nuclear facilities within 50 miles of the plant. Monthly calculations are performed to verify that potential offsite releases do not exceed Technical Specifications and to provide guidance for the management of radioactive effluents. The dose receptor is described such that the exposure of any member of the public is not likely to be substantially underestimated.

Quarterly and annual calculations of committed dose are also performed to verify compliance with regulatory limits of offsite dose. For these calculations, the dose receptor is chosen on the basis of applicable exposure pathways identified in a land use survey and the maximum ground level atmospheric dispersion factor (χ/Q) at a residence, or on the basis of more conservative conditions such that the dose to any resident near the plant is not likely to be underestimated.

The radioactive effluent controls set forth in this ODCM are designed to allow operational flexibility but still maintain releases and doses "as low as is reasonably achievable"; that is, within the objectives of Appendix I, 10 CFR Part 50 and comply with the limits in 10 CFR 20.1302.

The methods specified in the OFFSITE DOSE CALCULATION MANUAL (ODCM) for calculating doses due to planned or actual releases are consistent with the guidance and methods provided in:

Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," Revision 1. October 1977.

Regulatory Guide 1.111, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water Cooled Reactors," Revision 1, July 1977.

INTRODUCTION, (continued)

Regulatory Guide 1.113, "Estimating Aquatic Dispersion of Effluents from Accidental and Routine Reactor Releases for the Purpose of Implementing Appendix I," April 1977.

The required detection capabilities for radioactive materials in liquid and gaseous waste samples are tabulated in terms of the lower limits of detection (LDD's). Detailed discussion of the LLD and other detection limits, can be found in Currie, L. A., "Lower Limit of Detection: Definition and Elaboration of a Proposed Position for Radiological Effluent and Environmental Measurements," NUREG/CR-4077 (September 1984), in HASL Procedures Manual, HASL300 and in Hartwell, J. K., "Detection Limits for Radioanalytical Counting Techniques," Atlantic Richfield Hanford Company Report ARH-SA-215 (June 1975).

1.0 ADMINISTRATIVE CONTROLS

CONTROL 1.3 : Annual Radioactive Effluent Release Report *, (continued)

c. An assessment of radiation doses to the likely most exposed MEMBER OF THE PUBLIC from reactor releases from the previous calendar year and other nearby uranium fuel cycle sources, including doses from primary effluent pathways and direct radiation, for the previous calendar year to show conformance with 40 CFR Part 190, "Environmental Radiation Protection Standards for Nuclear Power Operation." Acceptable methods for calculating the dose contribution from liquid and gaseous effluents are given in Regulatory Guide 1.109, Revision 1, October 1977.

d. A list and description of unplanned releases from the site to UNRESTRICTED AREAS of radioactive materials in gaseous and liquid effluents made during the reporting period.

e. Any changes made during the reporting period to the OFFSITE DOSE CALCULATION MANUAL (ODCM), pursuant to Technical Specification 6.14, as well as any major change to Liquid, Gaseous, or Solid Radwaste Treatment Systems pursuant to Control 1.2. It shall also include a listing of new locations for dose calculations and/or environmental monitoring identified by the Land Use Census pursuant to Control 5.2.

f. An explanation, if applicable, as to why the inoperability of liquid or gaseous effluent monitoring instrumentation was not corrected within the time specified in Control 2.1 or 3.1, respectively; and description of the events leading to liquid holdup tanks or gas storage tanks exceeding the limits of Technical Specification 3.7.9.

g. Beginning with the Report that is due April 1, 2007, the Annual Radioactive Effluent Release Reports shall include the following information for the previous year:

   i. A listing description of all leaks or spills that have been communicated to State and Local Officials in accordance with the INDUSTRY INITIATIVE (Nuclear Policy NP-922).

   ii. Groundwater sample results that have been taken in support of the INDUSTRY INITIATIVE (Nuclear Policy NP-922), unless they are from locations that are described in the Radiological Environmental Monitoring Program (REMP) and will therefore be reported in the Annual Radiological Environmental Operating Report. See Appendix 5B for details.

* A single submittal may be made for a multiple unit station. The submittal should combine those sections that are common to all units at the station; however, for units with separate radwaste systems, the submittal shall specify the releases of radioactive material from each unit.

** In lieu of submission with the Annual Radioactive Effluent Release Report, the licensee has the option of retaining this summary of required meteorological data on site in a file that shall be provided to the NRC upon request.

1.0 ADMINISTRATIVE CONTROLS

CONTROL 1.4 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT *

Routine Annual Radiological Environmental Operating Reports covering the operation of the unit during the previous calendar year shall be submitted prior to May 15 of the following year and shall include :

a. Summaries, interpretations, and an analysis of trends of the results of the radiological environmental surveillance activities for the report period, including a comparison with preoperational studies, with operational controls, as appropriate, and with previous environmental surveillance reports, and an assessment of the observed impacts of the plant operation on the environment. The reports shall also include the results of the Land Use Census required by Control 5.2

b. The results of analysis of all radiological environmental samples and of all environmental radiation measurements taken during the period pursuant to the locations specified in the table and figures in Control 5.1, as well as summarized and tabulated results of these analyses and measurements in the format of the table in the Radiological Assessment Branch Technical Position, Revision 1, November 1979. In the event that some individual results are not available for inclusion with the report, the report shall be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted as soon as possible in a supplementary report.

c. A summary description of the Radiological Environmental Monitoring Program; at least two legible maps ** covering all sampling locations keyed to a table giving distances and directions from the centerline of one reactor; the results of licensee participation in the Interlaboratory Comparison Program and the corrective action taken if the specified program is not being performed as required by Control 5.3; reasons for not conducting the Radiological Environmental Monitoring Program as required by Control 5.1, and discussion of all deviations from the sampling schedule of Table 5.1-1; discussion of environmental sample measurements that exceed the reporting levels of Table 5.1-2 but are not the result of plant effluents, pursuant to ACTION b. of Control 5.1; and discussion of all analyses in which the LLD required by Table 5.1-3 was not achievable.

d. Results from the Turkey Point Groundwater Sampling Program for the samples and locations in Appendix 5B.

* A single submittal may be made for a multiple unit station.

** One map shall cover stations near the SITE BOUNDARY; a second shall include the more distant stations.

1.0 ADMINISTRATIVE CONTROLS

1.5 DEFINITIONS (continued)

DOSE EQUIVALENT I-131

1.5.5 DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microCurie/gram) which alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in Table III of TID-14844, "Calculation of Distance Factors for Power and Test Reactor Sites" or Table E-7 of NRC Regulatory Guide 1.109, Revision 1, October 1977.

FREQUENCY NOTATION

1.5.6 The FREQUENCY NOTATION specified for the performance of Surveillance Requirements shall correspond to the intervals defined in Table 1.5-1

GAS DECAY TANK SYSTEM

1.5.7 A GAS DECAY TANK SYSTEM shall be any system designed and installed to reduce radioactive gaseous effluents by collecting Reactor Coolant System off gases from the Reactor Coolant System and providing for delay or holdup for the purpose of reducing the total radioactivity prior to release to the environment.

INDUSTRY INITIATIVE

1.5.8 Nuclear Energy Institute Initiative on Managing Situations Involving Inadvertent Radiological Releases into Groundwater (The INDUSTRY INITIATIVE has been adopted through Nuclear Policy, NP-922).

INITIAL CALIBRATION

1.5.9 INITIAL CALIBRATION – An INITIAL CALIBRATION is the determination of the detector sensitivity when the detector is exposed in a known geometry to radiation from sources of known energies and activity levels traceable to National Institute of Standards & Technology (NIST). The vendor usually performs this calibration. Furthermore, subsequent CHANNEL CALIBRATIONS should include the use of a TRACEABLE SOURCE positioned in a reproducible geometry with respect to the sensor whose effect on the system was established at the time of the initial calibration. This CHANNEL CALIBRATION will establish the dynamic capabilities of a detector, electronics and power supplies in such a way as to ensure that the detector will perform its basic task of sensing radiation at the predetermined minimum detectable concentration based on the Initial Calibration.

MEMBER(S) OF THE PUBLIC

1.0 ADMINISTRATIVE CONTROLS

1.5.10 MEMBER(S) OF THE PUBLIC shall mean any individual except when that individual is receiving an occupational dose.

1.0 ADMINISTRATIVE CONTROLS

1.5 DEFINITIONS (continued)

OFFSITE DOSE CALCULATION MANUAL

1.5.11 The OFFSITE DOSE CALCULATION MANUAL (ODCM) shall contain the methodology and parameters used in the calculation of offsite doses resulting from radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring Alarm/Trip setpoints, and in the conduct of the Environmental Radiological Monitoring Program. The ODCM shall also contain (1) the Radioactive Effluent Controls and Radiological Environmental Monitoring Programs required by Tech Spec Section 6.8.4 and (2) descriptions of the information that should be included in the Annual Radioactive Effluent Release Report and the Annual Radiological Environmental Operating Report required by Controls 1.3 and 1.4.

OPERABLE - OPERABILITY

1.5.12 A system, subsystem, train, component or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s), and when all necessary attendant instrumentation, controls, electrical power, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its function(s) are also capable of performing their related support function(s).

OPERATIONAL MODE - MODE

1.5.13 An OPERATIONAL MODE (i.e., MODE) shall correspond to any one inclusive combination of core reactivity condition, power level, and average reactor coolant temperature specified in Table 1.5-2

PROCESS CONTROL PROGRAM

1.5.14 The PROCESS CONTROL PROGRAM (PCP) shall contain the current formulas, sampling, analysis, tests, and determinations to be made to ensure that processing and packaging of solid radioactive wastes based on demonstrated processing of actual or simulated wet solid wastes will be accomplished in such a way as to assure compliance with 10 CFR Parts 20, 61, and 71 and Federal and State regulations, burial ground requirements, and other requirements governing the disposal of radioactive waste.

1.0 ADMINISTRATIVE CONTROLS

1.5 DEFINITIONS (continued)

PURGE - PURGING

1.5.15 PURGE or PURGING shall be any controlled process of discharging air or gas from a confinement to maintain temperature, pressure, humidity, concentration or other operating condition, in such a manner that replacement air or gas is required to purify the confinement.

RATED THERMAL POWER

1.5.16 RATED THERMAL POWER shall be a total reactor core heat transfer rate to the reactor coolant of 2300 MWt

REPORTABLE EVENT

1.5.17 A REPORTABLE EVENT shall be any of those conditions specified in Section 50.73 of 10 CFR Part 50.

SAMPLING EVALUATION

1.5.18 A SAMPLING EVOLUTION is the exchange of iodine cartridge or particulate filter or the attachment of a sample rig to obtain a noble gas or tritum sample.

SITE BOUNDARY

1.5.19 The SITE BOUNDARY shall mean that line beyond which the land or property is not owned, leased, or otherwise controlled by the licensee, see figure 1.5 - 1.

SOURCE CHECK

1.5.20 A SOURCE CHECK shall be the qualitative assessment of channel response when the channel sensor is exposed to a source of increased radioactivity.

THERMAL POWER

1.5.21 THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.

TRACEABLE SOURCE

1.5.22 TRACEABLE SOURCE – Radiation sources that are **related** not only to the reference sources that were used for the INITIAL CALIBRATION but also certified by the National Institute of Standards & Technology (NIST). These transfer sources will calibrate the detector by positioning it in a reproducible geometry as prescribed by the INITIAL CALIBRATION.

UNRESTRICTED AREA

1.5.23 An UNRESTRICTED AREA shall mean an area, access to which is neither limited nor controlled by the licensee.

1.0 ADMINISTRATIVE CONTROLS

1.5 DEFINITIONS (continued)

VENTILATION EXHAUST TREATMENT SYSTEM

1.5.24 A VENTILATION EXHAUST TREATMENT SYSTEM shall be any system designed and installed to reduce gaseous radioactive iodine or radioactive material in particulate form in effluents by passing ventilation or vent exhaust gases through charcoal absorbers and/or HEPA filters for the purpose of removing iodine or particulates from the gaseous exhaust stream prior to the release to the environment. Such a system is not considered to have any effect on noble gas effluents. Engineered Safety Features Atmospheric Cleanup Systems are not considered to be VENTILATION EXHAUST TREATMENT SYSTEM components.

VENTING

1.5.25 VENTING shall be the controlled process of discharging air or gas from a confinement to maintain temperature, pressure, humidity, concentration, or other operating condition, in such a manner that replacement air or gas is not provided or required during VENTING. Vent, used in system names, does not imply a VENTING process.

TABLE 1.5-1

FREQUENCY NOTATION

NOTATION	FREQUENCY
S	At least once per 12 hours.
D	At least once per 24 hours.
W	At least once per 7 days.
M	At least once per 31 days.
Q	At least once per 92 days.
SA	At least once per 184 days.
R	At least once per 18 months.
S/U	Prior to each reactor startup.
NA	Not applicable.
P	Completed prior to each batch release.

1.0 ADMINISTRATIVE CONTROLS

1.7 SURVEILLANCE REQUIREMENTS (continued)

1.7.4 Entry into an OPERATIONAL MODE or other specified condition shall not be made unless the Surveillance Requirement(s) associated with a Control has been performed within the stated surveillance interval or as otherwise specified. This provision shall not prevent passage through or to OPERATIONAL MODES as required to comply with ACTION requirements.

1.7.6 Surveillance Requirements shall apply to each unit individually unless otherwise indicated as stated in Control 1.6.5 for individual controls or whenever certain portions of a control contain surveillance parameters different for each unit, which will be identified in parentheses, footnotes or body of the requirement.

1.8 REFERENCES

1. Condition Report (CR) 2005-17141, REMP QA Audit

2. PTN-ENG-SENS-05-049, Temporary Suspension of Continuous Monitoring via the Plant Vent and Unit 3 Spent Fuel Pool SPINGS for the performance of Required Maintenance.

3. PTN-ENG-SENS-06-048, The Calculation Developing the Iodine and Particulate Activity Compensation Factors for the Steam Jet Air Ejector Vent Monitors. This Engineering Evaluation is valid through 31 Dec. 2009.

4. Condition Report (CR) 2006-17093, Nuclear Energy Institute Industry Initiative on Managing Situations Involving Inadvertent Radiological Releases into Groundwater.

5. Condition Report (CR) 2006-17607, Sampling and Monitoring Groundwater at PTN.

6. Nuclear Policy NP-922, Managing Situations Involving Inadvertent Radiological Releases into Groundwater. (Implements the INDUSTRY INITIATIVE).

2.0 RADIOACTIVE LIQUID EFFLUENTS

CONTROL 2.2 : CONCENTRATIONS IN RADIOACTIVE LIQUID EFFLUENTS

The concentration of radioactive material released in liquid effluents to UNRESTRICTED AREAS (see Figure 1.5-1) shall be limited to 10 times the concentrations specified in 10 CFR Part 20, Appendix B, Table 2, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to 2×10^{-4} micro Curie/ml total activity.

APPLICABILITY : At all times.

ACTION : With the concentration of radioactive material released in liquid effluents to UNRESTRICTED AREAS exceeding the above limits, immediately restore the concentration to within the above limits.

SURVEILLANCE REQUIREMENTS

2.2.1 Radioactive liquid wastes shall be sampled and analyzed according to the sampling and analysis program of Table 2.2-1.

2.2.2 The results of the radioactivity analyses shall be used in accordance with the methodology and parameters in the ODCM to assure that the concentrations at the point of release are maintained within the limits of this Control.

3.0 RADIOACTIVE GASEOUS EFFLUENTS

C. GASEOUS RADWASTE SYSTEM

Radioactive and potentially radioactive gases from units 3 and 4 containment buildings, the auxiliary building, unit 4 spent fuel pit, radwaste building and laundry area are released via the monitored plant vent after passing through filter systems. Radioactive waste gases from the primary systems (CVCS hold-up tanks) are stored in gas decay tanks to reduce activity levels by radioactive decay prior to release via the plant vent. The unit 3 spent fuel pit area is ventilated via its' own monitored vent after passing through a filtering system. The filtration systems for the Auxiliary Building, 3 & 4 Spent fuel Pit, the Radwaste Building, and the Laundry consist of a pre-filter and a HEPA filter. The Containment Buildings have roughing filters only.
The steam jet air ejectors from each unit are vented through monitored release pathways. Other steam losses concurrent with primary to secondary leakage are unmonitored and gaseous activity must be accounted for.

Radionuclides other than noble gases in the gaseous effluents are measured by the radioactive gaseous waste sampling and analysis program described in ODCM Table 3.2-1. Noble gas radionuclides are measured by continuous monitors in the four release points. The gaseous effluent streams monitoring points, and effluent discharge points are illustrated schematically in Figure 3-1.

The measured radionuclide concentrations in gaseous effluents from the plant are used for estimating offsite radionuclide concentrations and radiation doses. Sampling and analyses are performed consistent with the requirements of ODCM Table 3.2-1.

The radioactive iodines and particulate radionuclides from continuous releases and batch releases (Containment Purges and Gas Decay Tanks are released via the Plant Vent) are determined by charcoal and filter samples removed weekly from continuous sample trains installed at each release point (plant vent, condenser air ejectors and Unit 3 Spent Fuel Pit vent). Tritium activity is determined on monthly grab samples from the plant vent, condenser air ejector, and Unit 3 Spent Fuel Pit and by a grab sample from each containment purge.

The Condenser Air Ejector Exhaust pathway is not conducive to collection of iodine and particulate in that the pathway is not capable of isokinetic sampling. The exhaust flow rate varies, doesn't have an isokinetic nozzle and when condenser air in leakage is at very low flow rates emits puffs versus a constant flow rate. Therefore the Steam Jet Air Ejector SPING will be sampling a mixture of Condenser off gas and the atmosphere, and not gathering a representative sample. To account for the inability to perform isokinetic sampling, compensation factors were developed to relate the estimated concentration of particulates and iodine to the concentration of noble gas emitted. Calculation dose, from this pathway, from particulates is performed assuming that all curies released are Co-60 and all iodine curies released is I-131. No analysis for alpha or Sr-89 and Sr-90 will be performed. The compensation factors developed using PTN-ENG-SENS-06-048, The Calculation Developing the Iodine and Particulate Activity Compensation Factors for the Steam Jet Air Ejector Vent Monitor,are valid until 31 Dec. 2009.

3.0 RADIOACTIVE GASEOUS EFFLUENTS

OBJECTIVES & SYSTEM DESCRIPTION (continued)

C. GASEOUS RADWASTE SYSTEM, (continued)

The total measured radioactivity discharged via a stack or vent during a specific time period can be determined from the effluent monitors by :

$$Q_j = \frac{N_j \bullet F \bullet 28317}{h}$$

where:

Q_j = total measured gaseous radioactivity release via a stack or vent during counting interval j, (μCi)

N_j = counts accumulated during counting interval j, (counts = N(cpm) x t (min))

F = discharge rate of gaseous effluent stream, (ft^3/min)

28317 = conversion constant, (cm^3/ft^3)

h = effluent noble gas monitor calibration or counting rate response for noble gas gamma radiation, $\frac{cpm}{\mu Ci / cm^3}$

During periods of primary to secondary leakage, the activity released through unmonitored pathways can be estimated using the following methods. Other more accurate methods may be used, when appropriate and with the proper level of management approval.

$$Q_j = C \times F_j \times T_j$$

where:

C = The concentration of the individual isotope released.

F_j = The mass of unmonitored water and steam released through unmonitored pathways.

$$F_j = M_w - (M_b + M_s)$$

M_w = Mass rate of make up water

M_b = Mass rate of blowdown

M_s = Mass rate of steam from monitored sources

T_j = Time interval for the period being quantified

3.0 RADIOACTIVE GASEOUS EFFLUENT

CONTROL 3.1 : Radioactive Gaseous Effluent Monitoring Instrumentation, Operability and Alarm/Trip Setpoints, (continued)

TABLE 3.1-1

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

	INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABILITY	ACTION
1.	GAS DECAY TANK SYSTEM			
a.	Noble Gas Activity Monitor - Providing Alarm and Automatic Termination of Release (Plant Vent Monitor)	1	*	3.1.1
b.	Effluent System Flow Rate Measuring Device	1	*	3.1.2
2.	Condenser Air Ejector Vent System			
a.	Noble Gas Activity Monitor (SPING or PRMS)	1	#	3.1.3
b.	Iodine Sampler	1	##	3.1.6
c.	Particulate Sampler	1	##	3.1.6
d.	Effluent System Flow Rate Measuring Device	1	##	3.1.2
e.	Sampler Flow Rate Measuring Device	1	##	3.1.5

3.0 RADIOACTIVE GASEOUS EFFLUENT

CONTROL 3.1 : Radioactive Gaseous Effluent Monitoring Instrumentation; Operability and Alarm/Trip Setpoints, (continued)

TABLE 3.1-1 (continued)
RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABILITY	ACTION
3. Plant Vent System (Include Unit 4's Spent Fuel Pool)			
a. Noble Gas Activity Monitor (SPING or PRMS)	1	*	3.1.3
b. Iodine Sampler	1	*	3.1.4
c. Particulate Sampler	1	*	3.1.4
d. Effluent System Flow Rate Measuring Device	1	*	3.1.2
e. Sampler Flow Rate Measuring Device	1	*	3.1.5
4. Unit 3 Spent Fuel Pit Building Vent			
a. Noble Gas Activity Monitor	1	*	3.1.3
b. Iodine Sampler	1	*	3.1.4
c. Particulate Sampler	1	*	3.1.4
d. Sampler Flow Rate Measuring Device	1	*	3.1.5

3.0 RADIOACTIVE GASEOUS EFFLUENT

CONTROL 3.1 : Radioactive Gaseous Effluent Monitoring Instrumentation; Operability and Alarm/Trip Setpoints, (continued)

TABLE 3.1-1 (Continued)
TABLE NOTATION

* At all times.
\# Applies during MODE 1, 2, 3 and 4.
\## Applies during MODE 1, 2, 3 and 4 when primary to secondary leakage is detected.

ACTION 3.1.1 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, the contents of the tank(s) may be released to the environment provided that prior to initiating the release:

a. At least two independent samples of the tank's contents are analyzed, **and**

b. At least two technically qualified members of the facility staff independently verify the release rate calculations and discharge valve lineup;

Otherwise, suspend release of radioactive effluents via this pathway.

ACTION 3.1.2 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue provided the flow rate is estimated at least once per 4 hours.

ACTION 3.1.3 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue provided grab samples are taken at least once per 12 hours and these samples are analyzed for radioactivity within 24 hours.

SAMPLING EVOLUTIONS are not an interruption of the continuous sample collection requirement and do not render the channel INOPERABLE. If a SAMPLE EVOLUTION is unable to be completed, THEN perform the actions for an INOPERABLE channel within 4 hours of the start of the SAMPLING EVOLUTION.

ACTION 3.1.4 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via the affected pathway may continue provided continuous sample collection with auxiliary equipment as required by Table 3.2-1 is installed within 4 hours of the channel being declared INOPERABLE, and analyzed at least weekly.

3.0 RADIOACTIVE GASEOUS EFFLUENT

SAMPLING EVOLUTIONS are not an interruption of the continuous sample collection requirement and do not render the channel INOPERABLE. If a SAMPLING EVOLUTION is unable to be completed, THEN perform the actions for an INOPERABLE channel within 4 hours of the start of the SAMPLING EVOLUTION.

ACTION 3.1.5 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via the affected pathway may continue provided auxiliary equipment is installed, AND the sample flow rate is verified at least once per 4 hours.

ACTION 3.1.6 Continuous collection of iodine and particulate in the Condenser Air Ejector is not required. If Primary to Secondary leakage is detected, effluent releases via the affected pathway may continue provided that the iodine and particulate curies released are determined using the methodology of Reference 3.

SAMPLING EVOLUTIONS are not an interruption of the continuous sample collection requirement and do not render the channel INOPERABLE. If a SAMPLING EVOLUTION is unable to be completed, THEN perform the actions for an INOPERABLE channel within 4 hours of the start of the SAMPLING EVOLUTION.

3.0 RADIOACTIVE GASEOUS EFFLUENT

CONTROL 3.1 : Radioactive Gaseous Effluent Monitoring Instrumentation; Operability and Alarm/Trip Setpoints, (continued)

TABLE 3.1-2

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1. GAS DECAY TANK SYSTEM					
a. Noble Gas Activity Monitor Providing Alarm and Automatic Termination of Release (Plant Vent Monitor)	P	P	R (3)	Q (1)	*
b. Effluent System Flow Rate Measuring Device	P (4)	N.A.	R	N.A.	*
2. Condenser Air Ejector Vent System					
a. Noble Gas Activity Monitor (SPING or PRMS)	D	M	R (3)	Q (2)	#
b. Effluent System Flow Rate Measuring Device	D (4)	N.A.	R	N.A.	##
c. Sample Flow Rate Measuring Device	D (4)	N.A.	R	N.A.	##

3.0 RADIOACTIVE GASEOUS EFFLUENT

CONTROL 3.1 : Radioactive Gaseous Effluent Monitoring Instrumentation; Operability and Alarm/Trip Setpoints, (continued)

TABLE 3.1-2 (Continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
3. Plant Vent System (Include Unit 4's Spent Fuel Pool)					
a. Noble Gas Activity Monitor (SPING or PRMS)	D	M	R (3)	Q (2)	*
b. Iodine Sampler	W (5)	N.A.	N.A.	N.A.	*
c. Particulate Sampler	W (5)	N.A.	N.A.	N.A.	*
d. Effluent System Flow Rate Measuring Device	D (4)	N.A.	R	N.A.	*
e. Sampler Flow Rate Measuring Device	D (4)	N.A.	R	N.A.	*
4. Unit 3 Spent Fuel Pit Building Vent					
a. Noble Gas Activity Monitor	D	M	R (3)	Q (2)	*
b. Iodine Sampler	W (5)	N.A.	N.A.	N.A.	*
c. Particulate Sampler	W (5)	N.A.	N.A.	N.A.	*
d. Sampler Flow Rate Measuring Device	D (4)	N.A.	R	N.A.	*

3.0 RADIOACTIVE GASEOUS EFFLUENT

CONTROL 3.1 : Radioactive Gaseous Effluent Monitoring Instrumentation; Operability and Alarm/Trip Setpoints, (continued)

TABLE 3.1-2 (Continued)

TABLE NOTATIONS

* At all times during periods of release.
\# Applies during MODE 1, 2, 3 and 4.
\## Applies during MODE 1, 2, 3 and 4 when primary to secondary leakage is detected.

(1) The ANALOG CHANNEL OPERATIONAL TEST shall also demonstrate that automatic isolation of this pathway and control room alarm annunciation occurs if the instrument indicates measured levels above the Alarm/Trip Setpoint.

(2) The ANALOG CHANNEL OPERATIONAL TEST shall also demonstrate that if the instrument indicates measured levels above the Alarm Setpoint, alarm annunciation occurs in the control room (for PRMS only) and in the computer room (for SPING only).

(3) The initial CHANNEL CALIBRATION shall be performed using one or more of the reference standards certified by the National Institute of Standards and Technology (NIST) or using standards that have been obtained from suppliers that participate in measurement assurance activities with NIST. When practical, these standards shall permit calibrating the system over its intended range of energy and measurement range. For subsequent CHANNEL CALIBRATION, sources that have been related to the initial calibration shall be used.

(4) CHANNEL CHECK shall be made at least once per 24 hours on days on which continuous, periodic, or batch releases are made.

(5) The CHANNEL CHECK shall consist of changing and analyzing the filter on a weekly basis.

3.0 RADIOACTIVE GASEOUS EFFLUENT

CONTROL 3.1 : Radioactive Gaseous Effluent Monitoring Instrumentation; Operability and Alarm/Trip Setpoints, (continued)

METHOD 3.1.1 : GASEOUS EFFLUENT MONITOR SURVEILLANCES

The surveillances of Gross Radioactivity Monitors Providing Alarm and Automatic Termination of Release and Flow Rate Measurement Devices are scheduled by procedure 0-ADM-215, Plant Surveillance Tracking Program.

METHOD 3.1.2 : ESTABLISHING GASEOUS EFFLUENT MONITOR ALARM AND TRIP SETPOINTS

The radioactive gaseous effluent monitoring instrumentation channels alarm setpoints and trip setpoints are set in accordance with Control 3.1 to ensure the limits of Control 3.2 are not exceeded.

Each radioactive noble gas effluent monitor setpoint is derived on the basis of total body dose equivalent rate at or beyond the site boundary.

For the purpose of deriving a setpoint, the distribution of radioactive noble gases in an effluent stream may be determined in one of the following ways :

- Preferably, the radionuclide distribution is obtained by gamma spectrum analysis of identifiable noble gases in effluent gas samples. Results of analysis of one or more samples may be averaged to obtain a representative spectrum.

- Alternately, the total activity concentration of radioactive noble gases may be assumed to be Xe-133. This approach is valid because Xe-133 contributes about 99% of the noble gas activity.

3.0 RADIOACTIVE GASEOUS EFFLUENT

CONTROL 3.1 : Radioactive Gaseous Effluent Monitoring Instrumentation; Operability and Alarm/Trip Setpoints, (continued)

METHOD 3.1.2 : ESTABLISHING GASEOUS EFFLUENT MONITOR ALARM AND TRIP SETPOINTS (continued)

A noble gas effluent monitor alarm and trip setpoint, based on dose rate, is calculated with the equation below, or a method which gives a lower setpoint value in accordance with approved plant procedures.

$$S = 1.06 \left[\frac{h \bullet S_f}{F \bullet \chi / Q}\right] \left[\frac{\sum_i C_i}{\sum_i (C_i \bullet DF_i)}\right] + Bkg \qquad \text{Eqn 3.1-1}$$

where:

S = The alarm setpoint, (cpm)

1.06 = conversion constant (500 mrem/yr·60 sec/min · 35.32 ft^3/m^3· $1m^3/10^6cm^3$)

h = monitor response to activity concentration of effluent, $\frac{cpm}{(\mu Ci/cc)}$

F = flow of gaseous effluent stream, i.e., flow past the monitor, (ft^3/min)

χ/Q = atmospheric dispersion factor at the off-site location of interest, (sec/m^3)

C_i = concentration of radionuclide i in gaseous effluent (μCi/cc).

DF_i = Dose factor for exposure to a semi-infinite cloud of noble gas, See Table 3.1-3. $\frac{mrem}{(yr \cdot \mu Ci/m^3)}$

S_f = A factor to allow for multiple sources from different or common release points. The allowable operating setpoints will be controlled administratively by assigning a fraction of the total allowable release to each of the release sources. For gas releases, this fraction is assigned as follows: 0.6 for the Plant Vent, 0.1 for the 3 Spent Fuel Pit Vent, 0.1 for each SJAE Vent, and 0.1 for unmonitored gas releases.

Bk = Instrument background count rate, cpm

3.0 RADIOACTIVE GASEOUS EFFLUENT

CONTROL 3.1 : Radioactive Gaseous Effluent Monitoring Instrumentation; Operability and Alarm/Trip Setpoints, (continued)

METHOD 3.1.2 : ESTABLISHING GASEOUS EFFLUENT MONITOR ALARM AND TRIP SETPOINTS, (continued)

Each monitoring channel has a unique response, h, which is determined by the instrument calibration.

Atmospheric dispersion depends upon the local atmospheric conditions. For the purpose of calculating a radioactive noble gas effluent monitor setpoint, the atmospheric dispersion factor, χ/Q, will be based on prevailing meteorological conditions or on reference meteorological conditions. The minimum atmospheric dispersion off site derived from reference meteorological conditions at the site boundary is 5.8×10^{-7} sec/m^3 at a location 1950 meters south southeast of the plant.

The applicable dose conversion factors, DF_i, for deriving setpoints are in Table 3.1-3.

The limiting factor for equation 3.1-1 is the total body dose rate limit of 500 mrem/year which is included in the 1.06 conversion factor. The use of the total body dose assumes that the total body dose will be the controlling dose rate and the dominant contributor to this dose will be Xe-133.

Each iodine and particulate effluent monitor setpoint may be calculated using equation 3.1-2, or a method which gives a lower setpoint value. Since the iodine and particulate channels are not required by Control 3.1, the primary method to ensure Control 3.2 is met is the performance of the sampling and analysis program in table 3.2-1 and the noble gas alarm setpoints.

3.0 RADIOACTIVE GASEOUS EFFLUENT

CONTROL 3.1 : Radioactive Gaseous Effluent Monitoring Instrumentation; Operability and Alarm/Trip Setpoints, (continued)

METHOD 3.1.2 : ESTABLISHING GASEOUS EFFLUENT MONITOR ALARM AND TRIP SETPOINTS (continued)

$$S = \frac{DR \bullet h \bullet S_f \bullet 3600 \bullet t \bullet V_R}{TA_{anip} \bullet \chi_d / Q} + BKG \qquad \text{Eqn 3.1-2}$$

where:

DR = the dose rate limit the effluent pathway is limited to; 1500 mrem/year.

Ta_{anip} = a factor relating the airborne concentration time integral of radionuclide i to the dose equivalent to organ, n, of a person in age group, a, exposed via pathway, p (inhalation), as described in Method 3.2, See Appendix 3B. $\frac{\text{mrem/yr}}{(\mu Ci/m^3)}$

3600 = conversion constant, (sec/hr).

h = monitor response to activity deposited on the sample collection media, cpm/uCi.

t = period of time over which the effluent release takes place, (hours).

χ_d/Q = atmospheric dispersion factor adjusted for depletion by deposition at the off-site location of interest (sec/m^3).

S_f = A factor to allow for multiple sources from different or common release points. The allowable operating setpoints will be controlled administratively by assigning a fraction of the total allowable release to each of the release sources. For gas releases, this fraction is assigned as follows: 0.6 for the Plant Vent, 0.1 for the 3 Spent Fuel Pit Vent, 0.1 for each SJAE Vent, and 0.1 for unmonitored gas releases.

V_R = Ratio of sample volume to release volume.

3.0 RADIOACTIVE GASEOUS EFFLUENTS

CONTROL 3.2 : DOSE RATE FROM RADIOACTIVE GASEOUS EFFLUENTS, (continued)

TABLE 3.2-1
RADIOACTIVE GASEOUS WASTE SAMPLING AND ANALYSIS PROGRAM

GASEOUS RELEASE TYPE	SAMPLING FREQUENCY	MINIMUM ANALYSIS FREQUENCY	TYPE OF ACTIVITY ANALYSIS	LOWER LIMIT OF DETECTION (LLD)[1], (μCi/cc)
1. Gas Decay Tank (Batch)	P Each Tank, Grab Sample	P Each Tank	Principal Gamma Emitters [2]	1×10^{-4}
2. Containment Purge or Venting (Batch)	P [6]	P [6]	Principal Gamma Emitters [2]	1×10^{-4}
	Grab Sample	Each PURGE	H-3	1×10^{-6}
3. Condenser Air Ejectors	M [6]	M [6]	Principal Gamma Emitters [2]	1×10^{-4}
	Grab Sample	Gas Sample	H-3	1×10^{-6}
4. Plant Vent (includes Unit 4 Spent Fuel Pit Building Vent)	M [6] Grab Sample	M [6] Gas Sample	Principal Gamma Emitters [2]	1×10^{-4}
	M [4], [5] Grab Sample	M	H-3	1×10^{-6}
5. Unit 3 Spent Fuel Pit Building Vent	M Grab Sample	M Gas Sample	Principal Gamma Emitters [2]	1×10^{-4}
	M [4], [5] Grab Sample	M	H-3	1×10^{-6}
6. All Release Types as listed in 3,4, and 5 (above)	Continuous [3] [9]	W [7] [8] Charcoal Sample	I-131	1×10^{-12}
	Continuous [3] [9]	W [7] [8] Particulate Sample	Principal Gamma Emitters [2]	1×10^{-11}
	Continuous [3] [9]	M [8] Composite Particulate sample	Gross Alpha	1×10^{-11}
	Continuous [3] [9]	Q [8] Composite Particulate sample	Sr-89, Sr-90	1×10^{-11}
	Continuous [3] [9]	Noble Gas Monitor	Noble Gas Gross Beta or Gamma	1×10^{-6}

3.0 RADIOACTIVE GASEOUS EFFLUENTS

CONTROL 3.2 : DOSE RATE FROM RADIOACTIVE GASEOUS EFFLUENTS, (continued)

TABLE 3.2-1 (Continued)

TABLE NOTATIONS (Continued)

(6) Sampling and analysis shall also be performed following shutdown, startup, or a THERMAL POWER change exceeding 15% of RATED THERMAL POWER within a 1 hour period if (1) analysis shows that the DOSE EQUIVALENT I-131 concentration in the primary coolant has increased by more than a factor of 3; and (2) the noble gas activity monitor shows that effluent activity has increased by more than a factor of 3.

(7) Sample collection media on the applicable Unit shall be changed at least once per 7 days and analyses shall be completed within 48 hours after changing, or after removal from sampler. Sample collection media on the applicable Unit shall also be changed at least once per 24 hours for at least 7 days following each shutdown, startup, or THERMAL POWER change exceeding 15% of RATED THERMAL POWER within a 1 hour period and analyses shall be completed within 48 hours of changing if: (1) analysis shows that the DOSE EQUIVALENT I-131 concentration in the primary coolant has increased more than a factor of 3; and (2) the noble gas monitor shows that effluent activity has increased more than a factor of 3. When samples collected for 24 hours are analyzed, the corresponding LLD's may be increased by a factor of 10.

(8) The condenser Air Ejectors pathway is not isokinetic and therefore monitoring of iodine and particulate is not representative. The iodine and particulate curies released are determined using the methodology of Reference 3.

(9) SAMPLING EVOLUTIONS are not an interruption of the continuous sample collection requirement and do not render the channel INOPERABLE. If a SAMPLING EVOLUTION is unable to be completed, THEN perform the actions for an INOPERABLE channel within 4 hours of the start of the SAMPLING EVOLUTION.

5.0 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

CONTROL 5.1 : CONDUCT OF SAMPLING AND ANALYSIS (continued)

TABLE NOTATIONS (continued) - TABLE 5.1-3 (continued)

(3) The LLD is defined (continued)

It should be recognized that the LLD is defined as an a priori (before the fact) limit representing the capability of a measurement system and not as an a posteriori (after the fact) limit for a particular measurement. Analyses shall be performed in such a manner that the stated LLDs will be achieved under routine conditions. Occasionally background fluctuations, unavoidable small sample sizes, the presence of interfering nuclides, or other uncontrollable circumstances may render these LLDs unachievable. In such cases, the contributing factors shall be identified and described in the Annual Radiological Environmental Operating Report pursuant to Control 1.4.

(4) LLD for drinking water. If no drinking water pathway exists, a value of 15pCi/l may be used.

(5) An equilibrium mixture of the parent and daughter isotopes which corresponds to 15 pCi/l of the parent isotope.

METHOD 5.1: RADIOLOGICAL ENVIRONMENTAL SURVEILLANCE - TURKEY POINT PLANT

It is the policy of Florida Power and Light Company (FPL) that the Turkey Point 3 and 4, Radiological Environmental Monitoring Programs, (REMP), are conducted by the State of Florida Department of Health (DOH), pursuant to an Agreement between FPL and DOH. The policy also states that the coordination of the REMP with DOH and compliance with the REMP requirements are the responsibility of the Nuclear Division Health Physics/Chemistry Staff.

The following pages describe the actual sampling and analysis program implemented to satisfy ODCM Table 5.1-1.

5.0 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Turkey Point Supplemental REMP Sampling

Pathway: Waterborne, Surface Water

Sampling and Collection Frequency: Monthly

Name	Sector	Distance *	Description
T75	NW	1.2	Florida City Canal (~ cross-street from satellite school)
T84	WSW	0.5	Cooling canal, discharge, ~ by bridge to parking lot
T97	E	0.2	Cooling Canal, intake, ~ Air Force school area
T08	S	5.5	Southern shore of canal system, west of Grand Canal Bridge

* Approximate Distance from plant in miles

Pathway: Waterborne, Vegetation

Sampling and Collection Frequency: Quarterly

Name	Description
T84	'Seaweed' from any location in the cooling canal

Pathway: Waterborne, Sediment

Sampling and Collection Frequency: A = Annual S = Semiannual
(All Locations are the Cooling Canals)

Name	SCF	Description
T01	A	~ Air Force school area
T02	A	West side of dam @ 'old intake'
T03	A	North end of collector canals, west of 'Grand Canal'
T04	A	In front (east) of LU offices
T05 / T84	S	Cooling canal, discharge, ~ by bridge to parking lot
T06 / T85	S	NW corner of canal system
T07	A	SW corner of canal system
T08	A	South end of main canal, near bridge
T09	A	'Old Discharge Canal' at bend south of earth dam
T10	A	SE corner of canal system

Turkey Point Groundwater Sampling Program to Support the INDUSTRY INITIATIVE on Groundwater Protection

Appendix 5B

6/4/07

The following sampling and analysis program is performed to meet the INDUSTRY INITIATIVE on Groundwater Sampling. The sample points are the minimum recommended and other points may be sampled in addition. The following notes apply:

1. The sample locations apply after January 1, 2007.

2. All sample results taken in support of the INDUSTRY INITIATIVE (NP-922) for the previous calendar year and required to be included in the Annual Radiological Environmental Operating Report (AREOR) to the NRC due May 1st shall be reported to the Radiological Environmental Monitoring Program Specialist, Juno Nuclear Operations Support for inclusion in the AREOR.

3. All sample results taken in support of the INDUSTRY INITATIVE (NP-922) for the previous calendar year and required to be included in the Annual Radiological Effluent Release Report to the NRC shall be provided to the Chemistry Department for inclusion in the Annual Radioactive Effluent Release Report due April 1st.

4. No drinking water pathway exists from groundwater at Turkey Point. Since on-site groundwater at Turkey Point Nuclear Plant does not provide a path to drinking water, the criterion in Section 2.2 of the INDUSTRY INITATIVE (NP-922) is not applicable.

5. All well and water samples taken as required by Appendix 5B will be analyzed for tritum and Principal Gamma Emitters (PGE). PGE's are those as described in Table 2.2-1, Note (3). All well and water sample taken as required by Appendix 5B will, at a minimum, be analyzed to meet the Lower Limit of Detection (LLD) on the Water Column of Table 5.1-3. In addition the LLD for tritum will be as low as practical that can be achieved for the equipment and sampling methods being used.

6. All well and water samples taken as required by Appendix 5B with a confirmed level of tritum activity, or PGE greater than the Lower Limit of Detection (LLD) on the Water Column of Table 5.1-3, determined during the current years sampling will be analyzed at least once per year for Sr-89, Sr-90, Fe-55 and Ni-63.

7. The following wells will be sampled quarterly. Other wells and water samples may be added based on engineering analysis, hydrological assessments or sample results and trends.

Well	Location
G-21	Tallahassee Road extension, west of FPL property. Sample from top and bottom.
G-28	Tallahassee Road extension, west of FPL property. Sample from top and bottom.
L-3	West of Interceptor Canal, on Land-U property. Sample from top and bottom.
L-5	West of Interceptor Canal, on Land-U property. Sample from top and bottom.
STP-1	Northeast of PTN Sewage Plant.
P-94-2	North of Solids Settling Basin, east of PTN intake.
P-94-4	East of Dress-out Building, in the RCA.
PTPED-9	Northeast Corner of Neutralization Basin.
CD-1	Northeast Corner of Neutralization Basin.