RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TURKEY POINT UNITS 3 & 4

DOCKET NOS. 50-250, 251

DADE COUNTY, FLORIDA

1-1-84 TO 6-30-84

PREPARED AUGUST 1984

DATA SUBMITTED BY: FLA. DHRS

DATA REVIEWED AND REPORT PREPARED BY: [signature] 08-22-84

REPORT REVIEWED BY: [signature] 8/27/84

I. INTRODUCTION

This report is submitted pursuant to Section 6.9 of the Turkey Point Plant Units 3 & 4 Technical Specifications and provides information and results for environmental samples specified by Table 4.12-1.

Radiological environmental surveillance for the Turkey Point Plant is conducted in accordance with Section 4.12 of the plant's Technical Specifications. A summary of the samples collected and analyses performed during the period January 1, 1984 through June 30, 1984 is provided in Table 1.

1. THE MONITORING PROGRAM

Period Covered: This report covers the period from January 1, 1984 through June 30, 1984.

Analytical Responsibility: Radiological environmental monitoring for the Turkey Point Plant is conducted by the State of Florida, Department of Health and Rehabilitative Services (DHRS). Samples are collected and analyzed by DHRS personnel.

Number of Samples: During the period, a total of 696 samples were collected from 46 different locations to be analyzed for radioactivity. Table 1 summarizes the highest, lowest and mean results for all sample locations, and where applicable the highest, lowest and mean results for the sample locations which yielded the highest mean levels. The values in Table 1 are based upon only those analyses which yielded detectable measurements.

Split-Sample: During the period January 1, 1984 - June 30, 1984, in addition to the samples identified in Table 1, fourteen (14) samples were submitted for comparative analysis by the DOE in accordance with the DHRS/DOE split-sampling program.

3. MISSING DATA

A description and explanation for missing data is contained in Table 1.

4. DISCUSSION AND INTERPRETATION OF DATA

Air Monitoring: Continuous air sampling was conducted at 8 different locations surrounding the Turkey Point Plant. Samples were collected and analyzed by Florida DHRS for gross radioactivity and radioiodines (I-131) on a weekly basis. All samples from this reporting period were within the normal range for background measurements. Table 1 provides a summary of these results.

Direct Radiation Monitoring: Continuous monitoring of ambient radiation exposure rate was provided routinely at eleven different sample locations surrounding the Turkey Point Plant. Samples were collected and analyzed by Florida DHRS on a monthly basis. Results are based upon the average readings of two dosimeters at each location. All results from this reporting period were within the normal range for background measurements. Table 1 provides a summary of these results.

Other Samples: In addition to the samples described above, several other environmental samples are routinely collected from areas around the Turkey Point Nuclear Plant. These samples include precipitation, surface water, drinking water, sediment, fish, crustacea, food crops, vegetation, milk, soil and other terrestrial biota. Table 1 provides a summary of the results of these samples from January 1, 1984 through June 30, 1984.

As in the past, tritium was the predominant radionuclide to be detected in water samples from around the Turkey Point Plant, with the highest levels found in water samples taken from within the plant's closed cooling system. The highest tritium concentration measured during this surveillance period was only about 0.19% of the concentration which would be permitted continously in unrestricted area waters (10CFR20, Appendix B, Table II.) The highest concentration of tritium observed in water samples outside of the closed cooling system was only about 0.01% of the unrestricted area concentration. Trend analyses indicate that there is no evidence of a continued buildup of tritium around the Turkey Point Plant.

In addition to waterborne tritium, trace concentrations of fission and activation products continue to be detected in some of the samples taken from within the closed cooling system. These results are consistent with past measurements and data indicate no discernable increase in radioactivity in these samples.

The results of radiological measurements for other media and other locations surrounding the Turkey Point Plant do not yield evidence of buildup in the environment when compared to past measurements, including samples collected during the preoperational surveillance program, and elsewhere within the State of Florida.

5. SUMMARY AND CONCLUSIONS

- Continuous air sampling measurements are all within the normal range for background values.

- Continuous ambient radiation exposure rate measurements are all within the normal range for background values.

- Tritium concentrations in water samples collected around the Turkey Point Plant are consistent with past measurements. The highest observed tritium concentrations are found within the plant's closed cooling system. All measurements are well below the concentration permitted by 10CFR20 for unrestricted area waters.

- Radioactivity measured in sediment and biota samples taken from within the closed cooling system (inside the owner controlled area) is consistent with past measurements, with no discernable increase noted.

- Measurements for other media and samples are consistent with past measurements including those taken during the preoperational surveillance program.

The concentration of all radionuclides reported in Table 1 is much less than that permitted for release to unrestricted areas as specified in 10 CFR 20, Appendix B, Table II. The Radiological Environmental Monitoring Program establishes that radioactivity released as a result of operation of the Turkey Point Plant Units 3 & 4 is not contributing significantly to the radiation exposure to any member of the public.

TABLE 1
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

NAME OF FACILITY TURKEY POINT PLANT UNITS 3 & 4 DOCKET NO. 50-250, 251

LOCATION OF FACILITY DADE COUNTY FLORIDA REPORTING PERIOD JANUARY 1, 1984 - JUNE 30, 1984

Medium or Pathway Sampled	Unit	Analysis for	Number of Sites	Number of Samples	Number of Analyses	All Indicator Locations Mean[1]	All Indicator Locations Range[1]	Location with Highest Mean: Sample Location Distance & Direction	Location with Highest Mean: Mean[1]	Location with Highest Mean: Range[1]	Control[2] Location: Mean[1]	Control[2] Location: Range[1]	No. of Nonroutine Reported Measurements
1.1 AIR													
1. Particulates	pCi/m^3	Gross B	8	208	208	.015 (208/208)	.005-.033	T51: Homestead Bayfront Park (2 miles - NNW)	.016 (26/26)	.007-.033	.015 (26/26)	.006-.023	
2. Radioiodine	pCi/m^3	^{131}I	8.	208	208	ND	NA	NA	NA	NA	ND	NA	
1.2 DIRECT RADIATION													
1. TLD	uRem/hr	Exposure Rate	11	132	65[4]	4.9 (65/65)	2.7-6.6	T64: Natoma Substation (22 miles - N)	6.2 (5/5)	5.4-6.6	6.2 (5/5)	5.4-6.6	
1.3 PRECIPITATION													
1. Rainwater	pCi/l	Gross B-DS	4	23[4]	22[4]	11.0 (11/22)	3.5-28.1	T72: Boy Scout Camp (Onsite - WSW)	14.1 (4/6)	6.7-23.1	8.3 (2/6)	8.1-8.4	
	"	Gross B-UDS			22[4]	3.2 (1/22)	NA	T64:Natoma Substation (22 miles - N)	3.2 (1/6)	NA	3.2 (1/6)	NA	
	"	Tritium			23	ND	NA	NA	NA	NA	ND	NA	
	"	γ emitting[3] isotopes			21[4]	ND	NA	NA	NA	NA	ND	NA	

DS - Dissolved Solids UDS - Undissolved Solids ND - Not Detectable NA - Not Applicable

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2.1 SURFACE WATERS												
1. Estuarine			10	20								
(Surface Water)	pCi/l	Tritium		20	240 (2/20)	230-240	T95:Long Arsenieker Key (4 miles - SSE)	240 (1/2)	NA	NA	NA	
	"	^{89}Sr		20	ND	NA	NA	NA	NA	NA	NA	
	"	^{90}Sr		20	ND	NA	NA	NA	NA	NA	NA	
	"	γ emitting[3] isotopes		20	ND	NA	NA	NA	NA	NA	NA	
2. Closed Cooling Canal			2	12								
(Surface Water)	pCi/l	Tritium		12	4700 (12/12)	3300-5700	T84:Closed Cooling Canal (Onsite- SW)	4900 (6/6)	4100-5700	NA	NA	
	"	^{89}Sr		12	ND	NA	NA	NA	NA	NA	NA	
	"	^{90}Sr		12	ND	NA	NA	NA	NA	NA	NA	
	"	γ emitting[3] isotopes		12	ND	NA	NA	NA	NA	NA	NA	

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3. Fresh Water Drainage Canals			2	12									
(Surface Water)	pCi/l	Tritium			12	420 (2/12)	330-500	T75 - Florida City Canal (2 miles - WNW)	420 (2/6)	330-500	NA NA	NA NA	
	"	Gross B-DS			12	138 (12/12)	3.1-340	T75: Florida City Canal (2 miles - WNW)	270 (6/6)	220-340	NA	NA	
	"	Gross B-UDS			12	ND	NA	NA	NA	NA	NA	NA	
2.2 WELLS													
1. Potable Well Water			3	6									
(Drinking Water)	pCi/l	Tritium			6	ND	NA	NA	NA	NA	NA	NA	
	"	Gross B-DS			6	7.5 (6/6)	5.1-12.3	T57: Dolan's Farm (4 miles - NW)	11.0 (2/2)	9.7-12.3	NA	NA	
	"	Gross B-UDS			6	ND	NA	NA	NA	NA	NA	NA	
2. Ground Water Wells			6	12									
(Ground Water)	pCi/l	Tritium			12	260 (4/12)	210-310	T91: Groundwater well G-10A (2 miles - SW)	310 (1/2)	NA	NA	NA	
	"	^{89}Sr			12	ND	NA	NA	NA	NA	NA	NA	
	"	^{90}Sr			12	ND	NA	NA	NA	NA	NA	NA	
	"	γ emitting[3] isotopes			12	ND	NA	NA	NA	NA	NA	NA	

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3.0 BOTTOM SEDIMENTS												
1. Closed Cooling Canal			2	4								
(Sediment)	pCi/kg	^{89}Sr		4	ND	NA	NA	NA	NA	NA	NA	
	"	^{90}Sr		4	ND	NA	NA	NA	NA	NA	NA	
		γ emitting[3] isotopes		4								
	"	1. ^{58}Co			154 (4/4)	45-430	T84: Closed Cooling Canal (Onsite-SW)	240 (2/2)	60-430	NA	NA	
	"	2. ^{60}Co			740 (4/4)	320-1440	T84: Closed Cooling Canal (Onsite-SW)	1140 (2/2)	840-1440	NA	NA	
	"	3. ^{137}Cs			36 (2/4)	35-36	T85: Closed Cooling Canal (Onsite-SW)	36 (1/2)	NA	NA	NA	
	"	4. ^{54}Mn			30 (1/4)	NA	T84: Closed Cooling Canal (Onsite-SW)	.30 (1/2)	NA	NA	NA	
	"	5. ^{95}Nb			80 (1/4)	NA	T84: Closed Cooling Canal (Onsite-SW)	80 (1/2)	NA	NA	NA	
	"	6. ^{113}Sn			13 (1/4)	NA	T84: Closed Cooling Canal (Onsite-SW)	13 (1/2)	NA	NA	NA	
2. Estuarine			7	7								
(Sediment)	pCi/kg	^{89}Sr		7	ND	NA	NA	NA	NA	NA	NA	
	"	^{90}Sr		7	ND	NA	NA	NA	NA	NA	NA	
	"	γ emitting[3] isotopes		7	ND	NA	NA	NA	NA	NA	NA	

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4.0 AQUATIC BIOTA													
1. Crustacea			6	6									
(Blue Crab)	pCi/kg	^{89}Sr			6	ND	NA	NA	NA	NA	NA	NA	
	"	^{90}Sr			6	ND	NA	NA	NA	NA	NA	NA	
	"	γ emitting[3] isotopes			6	ND	NA	NA	NA	NA	NA	NA	
2. Fish,Carnivore			7	8									
(Mixed Species)	pCi/kg	^{89}Sr			6	ND	NA	NA	NA	NA	NA	NA	
	"	^{90}Sr			6	ND	NA	NA	NA	NA	NA	NA	
		γ emitting[3] isotopes			8								
	"	1. ^{137}Cs				200 (2/8)	160-240	T84 - Closed Cooling Canal (Onsite - SW)	200 (2/2)	160-240	NA	NA	
	"	2. Others				ND	NA	NA	NA	NA	NA	NA	

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3. Fish, Herbivore			6	6								
(Mullet)	pCi/kg	^{89}Sr		6	ND	NA	NA	NA	NA	NA	NA	
	"	^{90}Sr		6	ND	NA	NA	NA	NA	NA	NA	
	"	γemitting[3] isotopes		6	ND	NA	NA	NA	NA	NA	NA	
4. Turtle Grass			6	6								
(Turtle Grass)	pCi/kg	^{89}Sr		6	ND	NA	NA	NA	NA	NA	NA	
	"	^{90}Sr		6	ND	NA	NA	NA	NA	NA	NA	
	"	γemitting[3] isotopes		6	ND	NA	NA	NA	NA	NA	NA	
5. Sponges			6	6								
(Sponge)	pCi/kg	γemitting[3] isotopes		6	ND	NA	NA	NA	NA	NA	NA	

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5.0 TERRESTRIAL												
1. Small Animal			1	1								
(Racoon)	pCi/kg	^{89}Sr		1	ND	NA	NA	NA	NA	NA	NA	
	"	^{90}Sr		1	ND	NA	NA	NA	NA	NA	NA	
	"	γ emitting[3] isotopes		1	ND	NA	NA	NA	NA	NA	NA	
2. Food Crops			3	3								
(Malanga, Corn	pCi/kg	^{89}Sr		3	ND	NA	NA	NA	NA	NA	NA	
Potatoes)	"	^{90}Sr		3	2.3 (2/3)	1.0-3.6	T52: Florida City Substation (7 miles W)	3.6 (1/1)	NA	NA	NA	
	"	γ emitting[3] isotopes		3	ND	NA	NA	NA	NA	NA	NA	

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3. Milk			1	1									
(Goat Milk)	pCi/l	γemitting[3] isotopes			1								
	"	1. ^{131}I				ND	NA	NA	NA	NA	NA	NA	
	"	2. ^{137}Cs				ND	NA	NA	NA	NA	NA	NA	
	"	3.Others				ND	NA	NA	NA	NA	NA	NA	
4. Vegetation			7	7									
(Mangrove leaves)	pCi/kg	^{89}Sr			7	ND	NA	NA	NA	NA	ND	NA	
	"	^{90}Sr			7	3.6 (1/7)	NA	T58: Entrance Road (Onsite - NW)	3.6 (1/1)	NA	ND	NA	
	"	γemitting[3] isotopes			7	ND	NA	NA	NA	NA	ND	NA	

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5. Soil			7	7								
(Soil)	pCi/kg	^{89}Sr		7	ND	NA	NA	NA	NA	ND	NA	
	"	^{90}Sr		7	ND	NA	NA	NA	NA	ND	NA	
		γ emitting[3] isotopes		7								
	"	1. ^{137}Cs			178 (7/7)	64-260	T55: Silver Palm Drive (7 miles - NNW)	260 (1/1)	NA	64 (1/1)	NA	
	"	2.Others			ND	NA	NA	NA	NA	ND	NA	

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TABLE 1

NOTES

1) Mean and Range values based upon data with detectable results only.

(/) Indicates the number of analyses with detectable results compared to the numer of analyses performed.

2) Control location - T64, Florida Power & Light Company - Natoma Substation (22 Miles - N).

3) Excluding Potassium - 40 (^{40}K), Radon - 226 (^{226}Ra), Thorium - 232 (^{232}Th) and Beryllium-7 (^{7}Be) which are naturally occurring radioisotopes commonly found in many environmental specimens.

4) Missing Data

DATE	LOCATION	SAMPLE TYPE	REASON MISSING
02-14-84	T52	Precipitation	Insufficient Precipitation for sample at this location
02-14-84	T57	Precipitation	Sample was collected however sample volume was too small for gamma scan and gross beta analyses
05-15-84	T64	Direct Radiation	The TLD's were collected, but data was lost due to personnel error. TLD's were accidently zeroed
06-15-84	T52	Precipitation	The gamma scan analysis could not be performed due to laboratory spillage accident

* Key to sample locations is provided in Turkey Point Units 3 & 4 Technical Specifications.