

August 24, 2001  
JAFP-01-0203

United States Nuclear  
Regulatory Commission  
Region 1  
475 Allendale Road  
King of Prussia, PA 19406

ATTENTION: Mr. Hubert Miller  
Regional Administrator

SUBJECT: JAMES A. FITZPATRICK NUCLEAR POWER PLANT  
DOCKET NO. 50-333, LICENSE NO. DPR-59

Gentlemen:

Attached is the Semi-Annual Radioactive Effluent Release Report for the period of January 1, 2001 through June 30, 2001. This report is submitted in accordance with the requirements of Amendment 93, Appendix B, Section 7.3.C of the James A. FitzPatrick Nuclear Power Plant Technical Specifications.

The format used for the effluent data is outlined in Appendix B of Regulatory Guide 1.21, Revision 1. Distribution is in accordance with Regulatory Guide 10.1, Revision 4.

If you have any questions concerning the attached report, please contact Al Jarvis, Chemistry Manager, at the James A. FitzPatrick Nuclear Power Plant.

Very truly yours,

T.A. SULLIVAN  
VICE PRESIDENT - OPERATIONS

TAS/AJ/WH/jbh  
Attachments

Xc:	Document Control Desk (USNRC)	NRC Resident Inspector	
	D. Sherman (ANI Library)	A. Zaremba	RMS (JAF)
	J. Knubel (ENOC/WPO)	T. Kurtz (NMPC)	
	C. Faison (ENOC/WPO)	J. Furfaro (ENOC/WPO)	
	J. Kelly (ENOC/WPO)	P. Merges (NYSDEC)	

**ENTERGY NUCLEAR OPERATIONS, INC.**  
**JAMES A. FITZPATRICK NUCLEAR POWER PLANT**  
**EFFLUENT AND WASTE DISPOSAL**  
**SEMI-ANNUAL REPORT**  
**JANUARY 1, 2001 - JUNE 30, 2001**

**DOCKET NO.: 50-333**

**LICENSE NO.: DPR-59**

ENTERGY NUCLEAR OPERATIONS, INC.  
JAMES A. FITZPATRICK NUCLEAR POWER PLANT  
EFFLUENT AND WASTE DISPOSAL  
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**SUPPLEMENTAL INFORMATION**

FACILITY: JAENPP

LICENSEE: ENTERGY NUCLEAR OPERATIONS, INC.

**1. Technical Specification Limits**

a. Fission and Activation Gases:

- (1) The dose rate at or beyond the site boundary due to radioactive materials released from the plant in gaseous effluent shall be limited as follows:
  - (a) Less than or equal to 500 mrem/year to the whole body and less than or equal to 3000 mrem/year to the skin from noble gases.
- (2) The air dose to areas at or beyond the site boundary from noble gases released from the plant in gaseous effluent shall be limited:
  - (a) During any calendar quarter, to less than or equal to 5 mrad from gamma radiation, and less than or equal to 10 mrad from beta radiation; and,
  - (b) During any calendar year, to less than or equal to 10 mrad from gamma radiation and less than or equal to 20 mrad from beta radiation.

b. Tritium, Iodines and Particulates, Half Lives > 8 days:

- (1) The dose to a member of the public at or beyond the site boundary from Iodine-131, Iodine-133, Tritium, and radionuclides in particulate form with half-lives greater than 8 days released from the plant in gaseous effluent shall be limited:
  - (a) During any calendar quarter to less than or equal to 7.5 mrem to any organ; and,
  - (b) During any calendar year to less than or equal to 15 mrem to any organ.
  - (c) Less than 0.1% of the limits of Specification 3.4.a.1 and 3.4.a.2 as a result of burning contaminated oil.
- (2) The dose rate at or beyond the site boundary due to radioactive materials released from the plant in gaseous effluents shall be limited as follows:
  - (a) Less than or equal to 1500 mrem/year to any organ from Iodine-131, Iodine-133, Tritium and for radioactive materials in particulate form with half-lives greater than 8 days (inhalation pathway only).

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**SUPPLEMENTAL INFORMATION (Continued)**

c. Liquid Effluents:

- (1) The concentration of radioactive materials released to the unrestricted areas shall not exceed the values specified in 10 CFR 20, Appendix B, Table II, Column 2. For dissolved or entrained noble gases the concentration shall be limited to 2.00E-04  $\mu\text{Ci/ml}$ .
- (2) The dose to a member of the public from radioactive materials released from the plant in liquid effluents to unrestricted areas shall be limited as follows:
  - (a) During any calendar quarter, limited to less than or equal to 1.5 mrem to the whole body and to less than or equal to 5 mrem to any organ; and,
  - (b) During any calendar year, limited to less than or equal to 3 mrem to the whole body and to less than or equal to 10 mrem to any organ.

**2. Maximum Permissible Concentrations**

a. Fission and activation gases:	(None specified)	
b. Iodines:	(None specified)	
c. Particulates, half-lives >8 days:	(None specified)	
d. Liquid effluents:	<u>Quarter 1</u>	<u>Quarter 2</u>
(1) Fission and activation products (mixture MPC) ( $\mu\text{Ci/ml}$ )	NONE	NONE
(2) Tritium ( $\mu\text{Ci/ml}$ )	3.00E-03	3.00E-03
(3) Dissolved and entrained gases ( $\mu\text{Ci/ml}$ )	2.00E-04	2.00E-04

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**SUPPLEMENTAL INFORMATION (Continued)**

**3. Average Energy**

(None specified)

**4. Measurements and Approximations of Total Radioactivity**

- a. Fission and Activation Gases: Continuous monitor on each release path calibrated to a marinelli grab sample analyzed by gamma spectroscopy; bubbler grab sample analyzed for Tritium.
- b. Iodines: Gamma spectral analysis of charcoal cartridge and particulate filter on each release path.
- c. Particulates: Gamma spectral analysis of each particulate filter and charcoal cartridge for each release path. A four week per quarter composite of particulate filters for each release path for Strontium-89 and Strontium-90. One week per month particulate filter for each release path for gross alpha.
- d. Liquid Effluents: Gamma spectral analysis of each batch discharged, except composite analysis for Strontium-89, Strontium-90, Iron-55, Tritium, and Alpha.
- e. Solid Waste: Gamma spectral analysis of a representative sample of each waste shipment. Scaling factors established from off-site composite sample analyses to estimate concentration of non-gamma emitters. Low activity trash shipments, curie content estimated by dose rate measurement and application of appropriate scaling factors.
- f. Error Estimation Method: Overall error for sampling and analysis estimated by combining individual errors using error propagation methods. This process is composed of determinate and undeterminate errors.

Determinate - Pump flowrates, volume measurements and analysis collection yields

Undeterminate - Random counting error estimated using accepted statistical calculations

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**SUPPLEMENTAL INFORMATION (Continued)**

**5. Batch Releases**

a. Liquid:	<u>Quarter 1</u>	<u>Quarter 2</u>
(1) Number of batch releases:	NONE	NONE
(2) Total time period for batch release: (min)	NONE	NONE
(3) Maximum time period for batch release: (min)	NONE	NONE
(4) Average time period for batch release: (min)	NONE	NONE
(5) Minimum time period for batch release: (min)	NONE	NONE
b. Gaseous:	NONE	NONE

There were no gaseous batch releases for this report period.

**6. Abnormal Releases**

a. Liquid:	<u>Quarter 3</u>	<u>Quarter 4</u>
(1) Number of releases:	NONE	NONE
(2) Total activity released:	NONE	NONE
b. Gaseous		
(1) Number of releases:	NONE	NONE
(2) Total activity released:	NONE	NONE

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**TABLE 1A  
 GASEOUS EFFLUENTS--SUMMATION OF ALL RELEASES**

	UNIT	QUARTER 1	QUARTER 2	EST TOTAL ERROR %
<b>A. FISSION AND ACTIVATION GASES</b>				
1. Total Release	Ci	7.62E+00	8.79E+00	≤2.50E+01
2. Average release rate for period	μCi/sec	9.70E-01	1.12E+00	
3. Tech. Spec. Limit	%	*	*	
<b>B. IODINE-131</b>				
1. Total Iodine-131	Ci	2.59E-05	1.71E-05	≤2.50E+01
2. Average release rate for period	μCi/sec	3.30E-06	2.18E-06	
3. Tech. Spec. Limit	%	*	*	
<b>C. PARTICULATES</b>				
1. Particulates with half-lives >8 days	Ci	1.25E-05	2.05E-05	≤3.60E+01
2. Average release rate for period	μCi/sec	1.59E-06	2.61E-06	
3. Tech. Spec. Limit	%	*	*	
4. Gross alpha radioactivity	Ci	5.67E-07	3.91E-07	≤2.50E+01
<b>D. TRITIUM</b>				
1. Total Release	Ci	6.71E+00	6.97E+00	≤2.50E+01
2. Average release rate for period	μCi/sec	8.53E-01	8.87E-01	
3. Tech. Spec. Limit	%	*	*	
<b>*E. PERCENT OF TECHNICAL SPECIFICATION LIMITS</b>				
<b>FISSION AND ACTIVATION GASES</b>				
1. Quarterly gamma air dose limit	%	4.28E-03	5.15E-03	
2. Quarterly beta air dose limit	%	2.53E-04	3.49E-04	
3. Yearly gamma air dose limit	%	2.14E-03	2.58E-03	
4. Yearly beta air dose limit	%	1.27E-04	1.75E-04	
5. Whole body dose rate limit	%	4.43E-03	5.63E-04	
6. Skin dose rate limit	%	9.54E-04	1.21E-04	
<b>HALOGENS, TRITIUM AND PARTICULATES WITH HALF-LIVES &gt;8 DAYS</b>				
7. Quarterly dose limit (organ)	%	6.20E-03	1.23E-02	
8. Yearly dose limit (organ)	%	3.10E-03	6.15E-03	
9. Organ dose rate limit	%	1.32E-05	1.27E-05	

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**TABLE 1B**  
**GASEOUS EFFLUENTS--ELEVATED RELEASE**

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE	
		QUARTER 1	QUARTER 2
<b>1. Fission Gases</b>			
Argon-41	Ci	3.63E+00	6.83E+00
Krypton-85m	Ci	1.01E+00	8.30E-01
Krypton-87	Ci	5.01E-01	5.23E-02
Krypton-88	Ci	5.81E-01	1.68E-01
Xenon-133	Ci	2.44E-02	4.54E-01
Xenon-135	Ci	4.58E-01	4.80E-02
Xenon-135m	Ci	3.70E-01	3.89E-02
Xenon-138	Ci	1.05E+00	1.10E-01
TOTAL	Ci	7.62E+00	8.53E+00
<b>2. Iodines</b>			
Iodine-131	Ci	1.61E-05	6.20E-06
Iodine-133	Ci	4.91E-06	2.07E-06
TOTAL	Ci	2.10E-05	8.27E-06
<b>3. Particulates</b>			
Manganese-54	Ci	2.70E-07	7.07E-08
Cobalt-60	Ci	2.08E-07	5.46E-08
Strontium-89	Ci	6.15E-07	1.26E-06
Strontium-90	Ci	9.80E-08	2.19E-09
TOTAL	Ci	1.19E-06	1.39E-06
<b>4. Tritium</b>			
Hydrogen-3	Ci	6.27E-01	6.92E-01

Note: There were no batch releases for this report period.



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**TABLE 1C  
 GASEOUS EFFLUENTS--GROUND LEVEL RELEASES**

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE	
		QUARTER 1	QUARTER 2
<b>1. Fission Gases</b>			
Xe-135	Ci	-----	2.60E-01
TOTAL	Ci	-----	2.60E-01
<b>2. Iodines</b>			
Iodine-131	Ci	9.86E-06	1.09E-05
Iodine-133	Ci	1.85E-05	5.38E-06
TOTAL	Ci	2.84E-05	1.63E-05
<b>3. Particulates</b>			
Manganese-54	Ci	-----	2.41E-06
Cobalt-60	Ci	-----	1.01E-06
Zinc-65	Ci	-----	2.13E-06
Strontium-89	Ci	1.13E-05	8.96E-06
Strontium-90	Ci	-----	4.61E-06
TOTAL	Ci	1.13E-05	1.91E-05
<b>4. Tritium</b>			
Hydrogen-3	Ci	6.08E+00	6.28E+00

Note: There were no batch releases for this report period.

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**TABLE 2A**  
**LIQUID EFFLUENTS--SUMMATION OF ALL RELEASES**

	UNIT	QUARTER 1	QUARTER 2	EST TOTAL -ERROR-%
<b>A. FISSION AND ACTIVATION PRODUCTS</b>				
1. Total Release (not including tritium, gases and alpha)	Ci	NONE	NONE	≤2.50E+01
2. Average diluted concentration during period	μCi/ml	NONE	NONE	
3. Applicable limit	%	-----	-----	
<b>B. TRITIUM</b>				
1. Total Release	Ci	NONE	NONE	≤2.50E+01
2. Average diluted concentration during period	μCi/ml	NONE	NONE	
3. Applicable limit	%	-----	-----	
<b>C. DISSOLVED AND ENTRAINED GASES</b>				
1. Total Release	Ci	NONE	NONE	≤2.50E+01
2. Average diluted concentration during period	%	NONE	NONE	
3. Applicable Limit	%	-----	-----	
<b>D. GROSS ALPHA RADIOACTIVITY</b>				
1. Total Release	Ci	NONE	NONE	≤4.20E+01
<b>E. VOLUME OF WASTE RELEASED (PRIOR TO DILUTION)</b>				
	liters	NONE	NONE	
<b>F. VOLUME OF DILUTION WATER USED DURING PERIOD</b>				
	liters	NONE	NONE	
<b>*G. PERCENT OF TECHNICAL SPECIFICATION LIMITS</b>				
1. Quarterly Whole Body Dose	%	-----	-----	
2. Quarterly Organ Dose	%	-----	-----	
3. Annual Whole Body Dose	%	-----	-----	
4. Annual Organ Dose	%	-----	-----	

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**TABLE 2B**  
**LIQUID EFFLUENTS**

NUCLIDES RELEASED	UNIT	BATCH MODE	
		QUARTER 1	QUARTER 2
<b>1. Fission and Activation Products</b>			
NONE	Ci	-----	-----
<b>2. Tritium</b>			
NONE	Ci	-----	-----
<b>3. Dissolved and Entrained Gases</b>			
NONE	Ci	-----	-----

Note: There were no continuous mode discharges during this report period.

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**TABLE 3A**  
**SOLID WASTE AND IRRADIATED FUEL SHIPMENTS**

A.	SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (NOT IRRADIATED FUEL)	6-month Period				Est. Total Error %
		Type of Waste	Unit	Class A	Class B	
1.	a. Spent resins, filter sludge, evaporator bottoms, etc.	m <sup>3</sup> Ci	2.37E-01 4.53E+00	0.00E+00 0.00E+00	0.00E+00 0.00E+00	1.00E+01 1.00E+01
	b. Dry compressible waste, contaminated equipment, etc.	m <sup>3</sup> Ci	1.04E+01 7.26E+00	0.00E+00 0.00E+00	0.00E+00 0.00E+00	1.00E+01 1.00E+01
	c. Irradiated components, control rods, etc.	m <sup>3</sup> Ci	0.00E+00 0.00E+00	0.00E+00 0.00E+00	0.00E+00 0.00E+00	1.00E+01 1.00E+01
	d. Other: Dry compressible waste, contaminated equipment, spent resins for volume reduction.	m <sup>3</sup> Ci	2.10E+02 3.81E-01	0.00E+00 0.00E+00	0.00E+00 0.00E+00	1.00E+01 1.00E+01

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

a. Spent resins, filter sludge, evaporator bottoms, etc.

Isotope	Percent	Curies	Isotope	Percent	Curies
Iron-55	8.28E+01	3.75E+00	E Nickel-63	1.60E-01	7.25E-03 E
Cobalt-60	7.75E+00	3.51E-01 M	Cesium-137	1.10E-02	4.92E-04 M
Manganese-54	7.73E+00	3.50E-01 M	Carbon-14	1.43E-03	6.48E-05 E
Zinc-65	1.50E+00	6.80E-02 M	Tritium	1.23E-03	5.56E-05 E

b. Dry compressible waste, contaminated equipment, etc.

Isotope	Percent	Curies	Isotope	Percent	Curies
Iron-55	6.88E+01	4.99E+00	E Carbon-14	2.25E+00	1.83E-01 E
Cobalt-60	1.45E+01	1.05E+00	E Cesium-137	1.43E+00	1.04E-01 E
Manganese-54	8.42E+00	6.11E-01 E	Nickel-63	9.00E-01	6.50E-02 E
Zinc-65	3.46E+00	2.51E-01 E	Strontium-90	8.00E-03	5.77E-04 E

c. Irradiated components, control rods, etc.

NONE

d. Other: Dry compressible waste, contaminated equipment, spent resins for volume reduction.

Isotope	Percent	Curies	Isotope	Percent	Curies
Iron-55	6.69E+01	2.55E-01 E	Carbon-14	2.25E+00	8.57E-03 E
Cobalt-60	1.48E+01	5.67E-02 E	Cesium-137	1.59E+00	6.07E-03 E
Manganese-54	9.26E+00	3.53E-02 E	Nickel-63	8.68E-01	3.31E-03 E
Zinc-65	4.24E+00	1.62E-02 E	Cesium-134	4.48E-02	1.71E-04 E

(E- Estimated M- Measured)

Percentage of nuclides and total activities are based on a combination of direct measurements and scaling for non-gamma emitting nuclides.

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**TABLE 3A (continued)**  
**SOLID WASTE AND IRRADIATED FUEL SHIPMENTS**

3.	Solid Waste Disposition		
	<u>No. of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
	2	Truck	Chem-Nuclear Systems, Inc. Barnwell, SC
	5	Truck	*GTS Duratek/S.E.G. Oak Ridge, TN

- - Volume Reduction Facility

B. IRRADIATED FUEL SHIPMENTS (Disposition)

	<u>No. of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
	NONE	-----	-----

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**TABLE 3B  
 SOLID WASTE AND IRRADIATED FUEL SHIPMENTS**

A. NRC CLASS A

<u>SOURCE OF WASTE</u>	<u>PROCESSING EMPLOYED</u>	<u>CONTAINER VOLUME</u>	<u>TYPE OF CONTAINER</u>	<u>NUMBER OF CONTAINERS</u>
Spent Resins, Filter Sludges, evaporator Bottoms, etc.	Air Drying Non-compacted	170.8 ft <sup>3</sup>	HIC	1
Dry compressible Waste (DAW), Contaminated Equipment, etc.	Non-compacted	206.1 ft <sup>3</sup>	STC	1
Dry compressible Waste (DAW), Contaminated Equipment, etc.	Non-compacted	1280 ft <sup>3</sup>	STC	4
Dry compressible Waste (DAW), Contaminated Equipment, etc.	Non-compacted	96.0 ft <sup>3</sup>	STC	11
Dry compressible Waste (DAW), Contaminated Equipment, etc.	Non-compacted	175.0 ft <sup>3</sup>	STC	7

B. NRC CLASS B

<u>SOURCE OF WASTE</u>	<u>PROCESSING EMPLOYED</u>	<u>CONTAINER VOLUME</u>	<u>TYPE OF CONTAINER</u>	<u>NUMBER OF CONTAINERS</u>
NONE				

C. NRC CLASS C

<u>SOURCE OF WASTE</u>	<u>PROCESSING EMPLOYED</u>	<u>CONTAINER VOLUME</u>	<u>TYPE OF CONTAINER</u>	<u>NUMBER OF CONTAINERS</u>
NONE				

Solidification Agent: NONE

HIC- High Integrity Container  
 STC- Strong Tight Container

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**ATTACHMENT NO. 1**

**CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL (ODCM)**

In accordance with Section 7.3.C.3 of Amendment 93 to the James A. FitzPatrick Nuclear Power Plant Technical Specifications, changes made to the Offsite Dose Calculation Manual (ODCM) during the reporting period shall be included in the Semi-Annual Radioactive Effluent Release Report.

There were no changes to the Offsite Dose Calculation Manual (ODCM).

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**ATTACHMENT NO. 2**

**SUMMARY OF CHANGES TO THE PROCESS CONTROL PROGRAM**

In accordance with Section 7.3.C.3 of Amendment 93 to the James A. FitzPatrick Nuclear Power Plant Technical Specifications, changes made to the Process Control Program (PCP) during the reporting period shall be included in the Semi-Annual Radioactive Effluent Release Report.

There were no changes to the Process Control Program Procedure or implementing procedures.



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**ATTACHMENT NO. 3**

**SUMMARY OF CHANGES TO THE ENVIRONMENTAL MONITORING AND  
DOSE CALCULATION LOCATIONS**

In accordance with Section 7.3.C.3 of Amendment 93 to the James A. FitzPatrick Nuclear Power Plant Technical Specifications, a listing of new locations for dose calculation and/or environmental monitoring identified by the land use census shall be included in the Semi-Annual Radioactive Effluent Release Report.

CHANGES IN ENVIRONMENTAL MONITORING LOCATIONS

During the report period, no changes in the Environmental Monitoring Locations sampled to implement the requirements of Technical Specifications were made. Sample location selections are based on the annual land use census.

NEW LOCATIONS FOR DOSE CALCULATIONS

During the report period, no changes in Dose Calculation Receptor Locations were required based on the results of the land use census.

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**ATTACHMENT NO. 4**

**DEVIATIONS FROM THE REQUIRED  
ENVIRONMENTAL SAMPLING SCHEDULE**

In accordance with Section 7.3.C.7 of Amendment 93 to the James A. FitzPatrick Nuclear Power Plant Technical Specifications, the cause for unavailability of any environmental samples required during the report period shall be included in the Semi-Annual Radioactive Effluent Release Report.

EXCEPTIONS TO THE ENVIRONMENTAL SAMPLING PROGRAM

1. The air sampling pumps at the R-1 and R-2 Environmental Sampling Stations were inoperable for approximately 4.5 hours during the sample period of 02/06/01 through 02/13/01. The inoperability of the sampling pumps was caused by a power outage, which was weather related. No corrective action was implemented.
2. The air sampling pump at the R-1 Environmental Sampling Station was inoperable for approximately 9 hours during the period of 05/22/01 through 05/29/01. The inoperability of the sampling pump was caused by an electrical power outage initiated by NMPC for line maintenance to replace a broken pole in the vicinity. No corrective action was implemented.
3. The air sampling pumps at the R-1 and R-2 Environmental Sampling Stations were inoperable for approximately 3 hours on 06/01/01. The inoperability of the sampling pumps was caused by an electrical power outage initiated by NMPC for line maintenance on the distribution system in the vicinity. No corrective action was implemented.
4. Environment Thermoluminescent Dosimeter (TLD) at Technical Specification location no. 53 was found to be missing during the second quarter 2001 change-out. TLD no. 53 is located in close proximity to the Fulton High School. Vandalism is the suspected cause for the missing dosimeter. The missing TLD was replaced at the beginning of the third quarter. There is no previous history of missing TLDs from this location. No corrective action was implemented.

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**ATTACHMENT NO. 5**

**SEMI-ANNUAL SUMMARY OF HOURLY METEOROLOGICAL DATA**

The James A. FitzPatrick Nuclear Power Plant Radiological Environmental Technical Specification 7.3.c.2 states in part: "The Radioactive Effluent Release Report to be submitted within 60 days after January 1 of each year may include an annual summary of meteorological data collected over the previous year. If the meteorological data is not included, the licensee shall retain it on file and provide it to the U.S. Nuclear Regulatory Commission upon request." In accordance with the aforementioned technical specification, meteorological data is not included in this report. It is retained on file and is available upon request.

ENTERGY NUCLEAR OPERATIONS, INC.  
JAMES A. FITZPATRICK NUCLEAR POWER PLANT  
EFFLUENT AND WASTE DISPOSAL  
SEMI-ANNUAL REPORT JANUARY 2001-JUNE 2001

**ATTACHMENT NO. 6**

**MAJOR MODIFICATIONS TO RADIOACTIVE LIQUID, GASEOUS AND SOLID WASTE  
TREATMENT SYSTEMS**

In accordance with Section 6.18 of Amendment 93 to the James A. FitzPatrick Nuclear Power Plant Technical Specifications, Major Modifications to Radioactive Waste Systems (liquid, gaseous and solid) shall be reported in the Semi-Annual Radioactive Effluent Release Report for the period in which the modification is completed and made operational.

There were no major modifications to liquid, gaseous or solid radioactive waste treatment systems.