Entergy

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file

February 28, 2002
JAFP-02-0051

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 July 1, 2001 through December 31, 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.

This report includes, as an Addendum, an Assessment of the Radiation Doses to the public due to the radioactive liquid and gaseous effluents released during the 2001 calendar year. 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 Crystal A. Boucher, Chemistry Superintendent, at the James A. FitzPatrick Nuclear Power Plant.

Very truly yours,

T.A. SULLIVAN
VICE PRESIDENT - OPERATIONS

TAS/CAB/jbh

Attachments

Xc:	Document Control Desk (USNRC)	B. O'Grady	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

JULY 1, 2001 - DECEMBER 31, 2001

DOCKET NO.: 50-333

LICENSE NO.: DPR-59

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

SUPPLEMENTAL INFORMATION

FACILITY: JAFNPP 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).

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 μCi/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:	Quarter 3	Quarter 4
(1) Fission and activation products (mixture MPC) (μCi/ml)	None	None
(2) Tritium (μCi/ml)	3.00E-03	3.00E-03
(3) Dissolved and entrained gases (μCi/ml)	2.00E-04	2.00E-04

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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EFFLUENT AND WASTE DISPOSAL
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SUPPLEMENTAL INFORMATION (Continued)

5. **Batch Releases**

a. Liquid:	Quarter 3	Quarter 4
(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:	Quarter 3	Quarter 4
(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

ENTERGY NUCLEAR OPERATIONS, INC.
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EFFLUENT AND WASTE DISPOSAL
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TABLE 1A
GASEOUS EFFLUENTS–SUMMATION OF ALL RELEASES

	UNIT	QUARTER 3	QUARTER 4	EST TOTAL ERROR %
A. FISSION AND ACTIVATION GASES				
1. Total Release	Ci	1.11E+01	6.79E+00	≤2.50E+01
2. Average release rate for period	µCi/sec	1.40E+00	9.07E-01	
3. Tech. Spec. Limit	%	*	*	
B. IODINE-131				
1. Total Iodine-131	Ci	8.02E-06	3.13E-05	≤2.50E+01
2. Average release rate for period	µCi/sec	1.01E-06	3.94E-06	
3. Tech. Spec. Limit	%	*	*	
C. PARTICULATES				
1. Particulates with half-lives >8 days	Ci	1.56E-05	2.21E-05	≤3.60E+01
2. Average release rate for period	µCi/sec	1.96E-06	2.78E-06	
3. Tech. Spec. Limit	%	*	*	
4. Gross alpha radioactivity	Ci	6.04E-07	6.04E-07	≤2.50E+01
D. TRITIUM				
1. Total Release	Ci	8.44E+00	6.18E+00	≤2.50E+01
2. Average release rate for period	µCi/sec	1.06E+00	7.78E-01	
3. Tech. Spec. Limit	%	*	*	
***E. PERCENT OF TECHNICAL SPECIFICATION LIMITS**				
FISSION AND ACTIVATION GASES				
1. Quarterly gamma air dose limit	%	6.33E-03	4.09E-03	
2. Quarterly beta air dose limit	%	2.99E-04	1.92E-04	
3. Yearly gamma air dose limit	%	3.17E-03	2.04E-03	
4. Yearly beta air dose limit	%	1.49E-04	9.61E-05	
5. Whole body dose rate limit	%	4.23E-04	3.04E-04	
6. Skin dose rate limit	%	8.58E-05	6.18E-05	
HALOGENS, TRITIUM AND PARTICULATES WITH HALF-LIVES >8 DAYS				
7. Quarterly dose limit (organ)	%	4.82E-03	8.60E-03	
8. Yearly dose limit (organ)	%	2.41E-03	4.30E-03	
9. Organ dose rate limit	%	1.52E-05	1.43E-05	

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TABLE 1B
GASEOUS EFFLUENTS--ELEVATED RELEASE

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE QUARTER 3	CONTINUOUS MODE QUARTER 4
1. Fission Gases			
Argon-41	Ci	8.66E+00	5.98E+00
Krypton-85m	Ci	1.15E+00	6.36E-01
Krypton-88	Ci	3.39E-01	----------
Xenon-133	Ci	9.06E-01	1.70E-01
TOTAL	Ci	1.11E+01	6.79E+00
2. Iodines			
Iodine-131	Ci	1.56E-06	5.58E-06
TOTAL	Ci	1.56E-06	5.58E-06
3. Particulates			
Strontium-89	Ci	9.96E-07	1.02E-06
Strontium-90	Ci	1.06E-08	4.06E-11
TOTAL	Ci	1.01E-06	1.02E-06
4. Tritium			
Hydrogen-3	Ci	1.78E+00	9.81E-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 3	CONTINUOUS MODE QUARTER 4
1. Fission Gases			
None	Ci	----------	----------
TOTAL	Ci	----------	----------
2. Iodines			
Iodine-131	Ci	8.00E-06	3.12E-05
Iodine-133	Ci	7.71E-06	6.31E-05
TOTAL	Ci	1.57E-05	9.43E-05
3. Particulates			
Strontium-89	Ci	1.11E-05	1.95E-05
Strontium-90	Ci	1.19E-06	1.59E-06
Cesium-137	Ci	2.35E-06	----------
TOTAL	Ci	1.46E-05	2.11E-05
4. Tritium			
Hydrogen-3	Ci	6.66E+00	5.20E+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 3	QUARTER 4	EST TOTAL ERROR %
A. FISSION AND ACTIVATION PRODUCTS				
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. TRITIUM				
1. Total Release	Ci	NONE	NONE	≤2.50E+01
2. Average diluted concentration during period	µCi/ml	NONE	NONE	
3. Applicable limit	%	------	------	
C. DISSOLVED AND ENTRAINED GASES				
1. Total Release	Ci	NONE	NONE	≤2.50E+01
2. Average diluted concentration during period	µCi/ml	NONE	NONE	
3. Applicable Limit	%	------	------	
D. GROSS ALPHA RADIOACTIVITY				
1. Total Release	Ci	NONE	NONE	≤4.20E+01
E. VOLUME OF WASTE RELEASED (PRIOR TO DILUTION)	liters	NONE	NONE	
F. VOLUME OF DILUTION WATER USED DURING PERIOD	liters	NONE	NONE	
***G. PERCENT OF TECHNICAL SPECIFICATION LIMITS**				
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 3	BATCH MODE QUARTER 4
1. Fission and Activation Products			
NONE	Ci	------	------
2. Tritium			
NONE	Ci	------	------
3. Dissolved and Entrained Gases			
NONE	Ci	------	------

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

ENTERGY NUCLEAR OPERATIONS, INC.
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EFFLUENT AND WASTE DISPOSAL
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TABLE 3A
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (NOT IRRADIATED FUEL)

1.	Type of Waste	Unit	6-month Period Class A	Class B	Class C	Est. Total Error %
	a. Spent resins, filter sludge, evaporator bottoms, etc.	m^3	3.41E+00	3.41E+00	0.00E+00	1.00E+01
		Ci	9.27E+01	5.85E+02	0.00E+00	1.00E+01
	b. Dry compressible waste, contaminated equipment, etc.	m^3	0.00E+00	0.00E+00	0.00E+00	1.00E+01
		Ci	0.00E+00	0.00E+00	0.00E+00	1.00E+01
	c. Irradiated components, control rods, etc.	m^3	0.00E+00	0.00E+00	0.00E+00	1.00E+01
		Ci	0.00E+00	0.00E+00	0.00E+00	1.00E+01
	d. Other: Dry compressible waste, contaminated equipment, spent resins for volume reduction.	m^3	2.18E+02	0.00E+00	0.00E+00	1.00E+01
		Ci	9.65E -02	0.00E+00	0.00E+00	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	5.24E+01	3.55E +02	E	Nickel-63	1.08E+00	7.33 E+00	E
Manganese-54	2.05E+01	1.39E +02	M	Chromium-51	9.57E -01	6.49 E+00	M
Cobalt-60	1.50E+01	1.02E +02	M	Iron-59	8.18E -01	5.55 E+00	M
Zinc-65	6.44E+00	4.37E +01	M	Cesium-137	3.47E -01	2.35 E+00	M
Cobalt-58	2.15E+00	1.46E +01	E	Carbon-14	3.36E -01	2.28E+00	E

b. Dry compressible waste, contaminated equipment, etc.

NONE

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	6.79E+01	6.55E -02	E	Carbon-14	2.34E+00	2.26E-03	E
Cobalt-60	1.39E+01	1.34E -02	E	Cesium-137	1.33E+00	1.29E-03	E
Manganese-54	9.54E+00	9.20E -03	E	Nickel-63	8.32E -01	8.03E-04	E
Zinc-65	4.14E+00	4.00E -03	E	Strontium-90	7.44E -03	7.17E-06	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

No. of Shipments	Mode of Transportation	Destination
2	Truck	Chem-Nuclear Systems, Inc. Barnwell, SC
4	Truck	*Duratek, Inc. Oak Ridge, TN

* Volume Reduction Facility

B. IRRADIATED FUEL SHIPMENTS (Disposition)

No. of Shipments	Mode of Transportation	Destination
NONE	-------	------

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TABLE 3B
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. NRC CLASS A

SOURCE OF WASTE	PROCESSING EMPLOYED	CONTAINER VOLUME	TYPE OF CONTAINER	NUMBER OF CONTAINERS
Spent Resins, Filter Sludges, evaporator Bottoms, etc	Dewatered	128.0 ft^3	HIC	1
Dry compressible Waste (DAW), Contaminated Equipment, etc. For volume reduction	Non-compacted	1280 ft^3	STC	6

B. NRC CLASS B

SOURCE OF WASTE	PROCESSING EMPLOYED	CONTAINER VOLUME	TYPE OF CONTAINER	NUMBER OF CONTAINERS
Spent Resins, Filter Sludges, evaporator Bottoms, etc	Dewatered	128.0 ft^3	HIC	1

C. NRC CLASS C

SOURCE OF WASTE	PROCESSING EMPLOYED	CONTAINER VOLUME	TYPE OF CONTAINER	NUMBER OF CONTAINERS
NONE				

Solidification Agent: NONE

HIC- High Integrity Container
STC- Strong Tight Container

ENTERGY NUCLEAR OPERATIONS, INC.
JAMES A. FITZPATRICK NUCLEAR POWER PLANT
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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.

Revision 16 of the ODCM was approved by the Plant Operating Review Committee on November 06, 2001 at Meeting No. 01-047 and became effective on November 16, 2001. This revision does not reduce the accuracy or reliability of any dose calculations or setpoint determinations. Listed below is a brief summary of the changes incorporated in this revision. Attached to this report is a revised copy of the ODCM.

DVP-01.02, Revision 7
REVISION SUMMARY SHEET
CHANGE AND REASON FOR CHANGE

-Changed references from NYPA, Power Authority, New York Power Authority, etc. to Entergy throughout document.

-Specified current revision number in Section 1.2 of REC and Section 1.3 of ODCM.

-Added definition of Independent Spent Fuel Storage Installation (ISFSI) Controlled Area in Section 1.3 of REC

-Limiting Conditions for Operation, Sections 4.1.1.b and 4.1.1.c.2, added reference to 10CFR72.104(a), which specifies the limits for dose to the public for ISFSI.

-Surveillance Requirements, Section 4.1, added reference to 10CFR72.104(a), which specifies the limits for dose to the public for ISFSI.

-Sections 5.0 and 5.1, added reference to 10CFR72.104(a) to the existing 40 CFR 190 dose evaluation

-Add a reference to Annual Reporting Requirement to the Commission for ISFSI Effluent and Doses. Required by 10CFR72.44(d)(2).

-Section 5.4 Dose From Direct Radiation , added reference to 10CFR72.104(a) for ISFSI. Added the ISFSI as an identified and enumerated source of offsite dose contribution to the public.

DVP-01.02, Revision 7
REVISION SUMMARY SHEET
CHANGE AND REASON FOR CHANGE (CONTINUED)

-Section H.1.3, added a reference to ISFSI as an area for the location of Environmental TLDs.

-Page H-2, Index for Section H updated to reflect changes made to this section

-Add Sample Location Map H-4, illustrating location of Environmental TLD locations for ISFSI monitoring. New revised Table H-1 with listing of ISFSI TLD locations.

-Added Terms Edible and Non-Edible to the applicable pages of Table H-1 to clarify the type of broadleaf vegetation sampled.

-Added new control milk sampling location to Table H-1 and map Figure H-1 (previous control location no longer in business).

-Added new garden (food product) sampling location No. 274 to Table H-1 and map Figure H-1. New location identified in 2001 Land Use Census. Garden (food product) sampling locations no. 5, 8, and control no. 2 removed from Table H-1 and map Figure H-1, as gardens were not maintained by owner and have not been enumerated in land use census for the previous three years (1999-2001)

-Added references Nos. 15, 16, 17, 18 and 19, which are base documents for ISFSI requirements/ information included in this revision:

- JAF-CALC-SFS-03346
- JAF-CALC-SFS-04025
- ISFSI 10CFR72.212 Evaluation Report
- Certificate of Compliance No. 1014
- AP-03.04

-Changed the map reference numbers on Table H-1 to match the sample location designations used in the annual Radiological Environmental Operating Report.

-Added Section H.1.4 that qualifies the current Environmental Monitoring Program as acceptable for environmental monitoring of the ISFSI.

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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.

Revisions to the Process Control Program Procedure were approved by the Plant Operating Review Committee on July 3, 2001 at Meeting No. 01-027 and became effective July 13, 2001. These revisions do not reduce the overall conformance of the solidified waste product to existing criteria for solid wastes. Listed below is a brief summary of the changes incorporated in this revision.

1) Revised Section 4.0 and Step 6.1.4 to Process Control Program AP-06.01 to support ITS. This includes the relocation of CST 6.16 to the UFSAR Chapters 11 and 17 and CTS RETS 4.0 to the PCP.

2) Deleted performance reference for CNSI-FO-OP-022-41802. This procedure is no longer required and has been withdrawn.

ENTERGY NUCLEAR OPERATIONS, INC.
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· EFFLUENT AND WASTE DISPOSAL
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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

The existing milk sampling program control location (ODCM location No. 66) was deleted from the sampling program in August 2001. The last sample collected from this location was on August 20, 2001. The sampling location was retired because the owner ceased milk production and sold the milking herd. The retired control location was replaced by the new control location, which was first sampled on August 06, 2001. The ODCM was revised to reflect the change in control location for the site milk sampling program. The new sampling location is designated as ODCM milk sampling location number 77.

Collection Site	ODCM No.	Location*
Old Milk Control	66	13.9 miles @ 234 SW
New Milk Control	77	13.9 miles @ 192 SSW

*Based on Nine Mile Point Unit 2 Reactor Centerline

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.

ENTERGY NUCLEAR OPERATIONS, INC.
JAMES A. FITZPATRICK NUCLEAR POWER PLANT
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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 pump at the R-1 Offsite Environmental Station was inoperable for approximately 3 hours on November 13, 2001 (13:00 hrs. to 16:00 hrs.). The inoperability of the sampling pump was caused by an electrical power outage initiated by Niagara Mohawk Power Corp. for line maintenance to relocate a utility pole power supply. No corrective action was implemented (DER No. 01-4603).

2. The air sampling pumps at the R-1 and R-2 Offsite Environmental Sampling Stations were inoperable for approximately 8 hours on November 17, 2001 (01:30 hrs. to 05:00 hrs.). The inoperability of the sampling pumps was caused by a power outage, which was the result of a car accident involving a power pole. No corrective action was implemented.

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

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 any liquid, gaseous, or solid radioactive waste treatment systems.

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

ADDENDUM 1

ASSESSMENT OF RADIATION DOSES TO THE PUBLIC JANUARY - DECEMBER 2001

1. INTRODUCTION

The James A. FitzPatrick Nuclear Power Plant Radiological Effluent Technical Specifications (RETS) require an assessment of the radiation doses to the public due to radioactive liquid and gaseous effluents. This assessment of doses to the public is based on accepted methodologies found in the Offsite Dose Calculation Manual (ODCM).

2. DOSE LIMITS

A. DOSE FROM LIQUID EFFLUENTS (RETS 2.3)

Applicability

Applies to doses from radioactive material in liquid effluents.

Objective

To ensure that the dose limitations of 10 CFR 50, Appendix I, are met.

Specifications

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:

1. 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.

2. 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.

B. GASEOUS DOSE RATES (RETS 3.2)

Applicability

Applies to the radiation dose from radioactive material in gaseous effluents.

ADDENDUM 1 (continued)

Objective

To ensure that the dose rates at or beyond the site boundary from gaseous effluents do not exceed the annual dose limits of 10 CFR 20, for unrestricted areas.

Specifications

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:

1. 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; and,

2. 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).

C. AIR DOSE, NOBLE GASES (RETS 3.3)

Applicability

Applies to the air dose due to noble gases in gaseous effluents.

Objective

To ensure that the noble gas dose limitations of 10 CFR 50, Appendix I, are met.

Specifications

The air dose to areas at or beyond the site boundary from noble gases released from the plant in gaseous effluents shall be limited:

1. 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,

2. 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.

ADDENDUM 1 (continued)

D. DOSE DUE TO IODINE-131, IODINE-133, TRITIUM AND RADIONUCLIDES IN PARTICULATE FORM (RETS 3.4)

Applicability

Applies to the cumulative dose from Iodine-131, Iodine-133, Tritium, and radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents.

Objective

To ensure that the dose limitations of 10 CFR 50, Appendix I, are met.

Specifications

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 effluents shall be limited:

1. During any calendar quarter to less than or equal to 7.5 mrem to any organ; and,

2. During any calendar year to less than or equal to 15 mrem to any organ.

E. TOTAL DOSE FROM URANIUM FUEL CYCLE (RETS 5.1)

Applicability

Applies to radiation dose from releases of radioactivity and radiation from uranium fuel cycle sources.

Objective

To ensure that the requirements of 40 CFR 190 are met.

ADDENDUM 1 (continued)

Specifications

The dose or dose commitment to any member of the public, due to releases of radioactivity and radiation, from uranium fuel cycle sources shall be limited as follows:

1. Less than or equal to 25 mrem/year to the whole body; and,

2. Less than or equal to 25 mrem/year to any organ except the thyroid which shall be limited to less than or equal to 75 mrem/year.

3. DOSE ASSESSMENT

A. METHODOLOGY

The assessment of radiation doses to the public due to radioactive liquid and gaseous effluents is performed in accordance with the ODCM. The ODCM is based on methodologies and models suggested by the "Guidance Manual For Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants" (NUREG-0133) and "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the purpose of Evaluating Compliance with 10CFR50, Appendix I" (Regulatory Guide 1.109).

B. ASSUMPTIONS

Dose calculations are performed using formulas and constants defined in the ODCM. Specific radioactive release activities used in the dose calculations are listed in the Semi-Annual Radioactive Effluent Release Reports (1.21 Reports) for the period of January 1, 2001 to December 31, 2001. Historical meteorological data was used to generate tables of average dispersion factors. Locations of interest were identified from the 2001 land use census. Dispersion factors and locations of interest used in performing the dose calculations are listed in Table 2.

C. ASSESSMENT RESULTS SUMMARY

The calculated doses to the public due to radioactive effluents are listed in Table 1. The calculated doses are small fractions of their respective dose limits.

ADDENDUM 1 (continued)

4. 40 CFR 190 DOSE ASSESSMENT

A. METHODOLOGY

Evaluation to demonstrate compliance with the 40 CFR 190 dose limits must be performed when the doses calculated for 10 CFR 50 compliance exceed twice their respective limits. When additional dose assessment is required to demonstrate compliance with 40 CFR 190 it is performed in accordance with the ODCM.

B. RESULTS SUMMARY

The cumulative dose contribution from liquid and gaseous effluents for this report period were calculated and are listed in Table 1. The cumulative dose contribution from direct radiation from the reactor unit and from radwaste storage tanks is measured by environmental thermoluminescent dosimeters for the report period. This data is contained in the Annual Environmental Operating Report. The calculated doses from liquid and gaseous effluents are less than twice their respective 10 CFR 50 limits, therefore, additional calculations are not necessary to demonstrate compliance with 40 CFR 190 dose limits (RETS 5.1.b).

ADDENDUM 1 (continued)
TABLE 1
ANNUAL DOSE ASSESSMENT 2001

A. LIQUIDS

QUARTER	1	2	3	4	ANNUAL
Organ (mrem)	NONE	NONE	NONE	NONE	NONE
% of Limit	------	------	------	------	------
Whole Body (mrem)	NONE	NONE	NONE	NONE	NONE
% of Limit	------	------	------	------	------

B. NOBLE GASES

QUARTER	1	2	3	4	ANNUAL
Total Body (mrem/yr)	2.21E-02	2.81E-03	2.12E-03	1.52E-03	2.21E-02
% of Limit	4.43E-03	5.63E-04	4.23E-04	3.04E-04	4.43E-03
Skin (mrem/yr)	2.86E-02	3.64E-03	2.57E-03	1.86E-03	2.86E-02
% of Limit	9.54E-04	1.21E-04	8.58E-05	6.18E-05	9.54E-04
Gamma (mrad)	2.14E-04	2.58E-04	3.17E-04	2.04E-04	9.93E-04
% of Limit	4.28E-03	5.15E-03	6.33E-03	4.09E-03	9.93E-03
Beta (mrad)	2.53E-05	3.49E-05	2.99E-05	1.92E-05	1.09E-04
% of Limit	2.53E-04	3.49E-04	2.99E-04	1.92E-04	5.47E-04

ADDENDUM 1 (continued)

TABLE 1
ANNUAL DOSE ASSESSMENT 2001

C. IODINES AND PARTICULATES

QUARTER	1	2	3	4	ANNUAL
	(a)	(b)	(a)	(a)	(a)
Organ (mrem)	4.65E-04	9.22E-04	3.62E-04	6.45E-04	1.89E-03
% of Limit	6.20E-03	1.23E-02	4.82E-03	8.60E-03	1.26E-02
Organ Dose Rate (mrem/yr)	1.97E-04	1.91E-04	2.28E-04	2.15E-04	2.28E-04
% of Limit	1.32E-05	1.27E-05	1.52E-05	1.43E-05	1.52E-05

(a) Dose to the Child Thyroid primarily by the vegetation pathway.
(b) Dose to the Child Bone primarily by the vegetation pathway.

ADDENDUM 1 (continued)

TABLE 2
METEOROLOGICAL DATA AND LOCATIONS OF INTEREST

RECEPTOR	GEOGRAPHIC LOCATION		ATMOSPHERIC DISPERSION FACTOR	
A. IODINE & PARTICULATES	DISTANCE/ DIRECTION	RELEASE POINT	X/Q (sec/m^3)	D/Q ($1/m^2$)
1. Garden	0.93 mi @ 82EE	ST	2.86E-08*	1.72E-09
Grazing Season	0.93 mi @ 82EE	RX	1.94E-07*	4.76E-09
Cary	0.93 mi @ 82EE	TB	1.76E-07*	4.57E-09
Location No. 78	0.93 mi @ 82EE	RF	1.94E-07*	4.76E-09
	0.93 mi @ 82EE	RW	3.08E-07*	5.45E-09
2. Meat	1.24 mi @ 126ESE	ST	1.70E-08*	6.51E-10
Grazing Season	1.24 mi @ 126ESE	RX	5.17E-08*	1.24E-09
Parkhurst	1.24 mi @ 126ESE	TB	4.97E-08*	1.21E-09
Location No. 26	1.24 mi @ 126ESE	RF	5.17E-08*	1.24E-09
	1.24 mi @ 126ESE	RW	8.74E-08*	1.39E-09
3. Cow	2.2 mi @ 138ESE	ST	1.65E-08*	3.11E-10
Grazing Season	2.2 mi @ 138ESE	RX	3.04E-08*	5.07E-10
France	2.2 mi @ 138ESE	TB	2.98E-08*	4.97E-10
Location No. 10	2.2 mi @ 138ESE	RF	3.04E-08*	5.07E-10
	2.2 mi @ 138ESE	RW	4.66E-08*	5.39E-10
4. Goat	2.5 mi @ 146ESE	ST	1.67E-08*	2.65E-10
Grazing Season	2.5 mi @ 146ESE	RX	2.76E-08*	4.14E-10
Nickolas	2.5 mi @ 146ESE	TB	2.71E-08*	4.07E-10
Location No. 61	2.5 mi @ 146ESE	RF	2.76E-08*	4.14E-10
	2.5 mi @ 146ESE	RW	4.15E-08*	4.36E-10
5. Resident Annual Average				
a. Inhalation	1.55 mi @ 90EE**	ST	2.99E-08	-
	0.93 mi @ 82EE	RX	1.98E-07	-
	0.93 ml @ 82EE	TB	1.81E-07	-
	0.93 mi @ 82EE	RF	1.98E-07	-
	0.93 mi @ 82EE	RW	2.93E-07	-

*Tritium Dose Calculation Only
**Highest Sector Average X/Q in a populated area.

ADDENDUM 1 (continued)

TABLE 2
METEOROLOGICAL DATA AND LOCATIONS OF INTEREST

RECEPTOR	GEOGRAPHIC LOCATION		ATMOSPHERIC DISPERSION FACTOR	
A. IODINE & PARTICULATES	DISTANCE/ DIRECTION	RELEASE POINT	X/Q (sec/m3)	D/Q (1/m2)
5 b. Deposition	0.70 mi @ 118□ESE	ST	-	1.61E-09
	0.70 mi @ 118EESE	RX	-	5.65E-09
	0.70 mi @ 118EESE	TB	-	5.42E-09
	0.70 mi @ 118EESE	RF	-	5.65E-09
	0.70 mi @ 118EESE	RW	-	6.42E-09
B. NOBLE GASES				
1. Air Dose	1.55 mi @ 90EE	ST	2.99E-08	-
Annual Average	0.6 mi @ 90EE	ST(fc)	1.16E-07	-
	0.6 mi @ 90EE	RX	3.58E-07	-
	0.6 mi @ 90EE	TB	3.19E-07	-
	0.6 mi @ 90EE	RF	3.58E-07	-
	0.6 mi @ 90EE	RW	5.39E-07	-
2. Total Body	0.6 mi @ 90EE	ST(fc)	1.16E-07	-
Annual Average	0.6 mi @ 90EE	RX	3.58E-07	-
	0.6 mi @ 90EE	TB	3.19E-07	-
	0.6 mi @ 90EE	RF	3.58E-07	-
	0.6 mi @ 90EE	RW	5.39E-07	-
3. Skin	1.55 mi @ 90EE	ST	2.99E-08	-
Annual Average	0.6 mi @ 90EE	ST(fc)	1.16E-07	-
	0.6 mi @ 90EE	RX	3.58E-07	-
	0.6 mi @ 90EE	TB	3.19E-07	-
	0.6 mi @ 90EE	RF	3.58E-07	-
	0.6 mi @ 90EE	RW	5.39E-07	-

ST = Main Stack
RX = Reactor Building
TB = Turbine Building Vent
RF = Refuel Floor Vent
RW = Radwaste Vent
fc = Finite Cloud