

NEW YORK POWER AUTHORITY
JAMES A. FITZPATRICK NUCLEAR POWER PLANT
EFFLUENT AND WASTE DISPOSAL
SEMI-ANNUAL REPORT

JULY 1, 1992 - DECEMBER 31, 1992

DOCKET NO.: 50-333

LICENSE NO.: DPR-59

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SUPPLEMENTAL INFORMATION

FACILITY: JAENPP

LICENSEE: NEW YORK POWER AUTHORITY

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 $2.00\text{E-}04 \mu\text{Ci/ml}$.
- (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 3</u>	<u>Quarter 4</u>
(1) Fission and activation products (mixture MPC) ($\mu\text{Ci/ml}$)	5.51E-05	1.10E-04
(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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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 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 3</u>	<u>Quarter 4</u>
(1) Number of batch releases:	3.70E+01	1.10E+01
(2) Total time period for batch release: (min)	2.90E+03	7.75E+02
(3) Maximum time period for batch release: (min)	1.10E+02	7.90E+01
(4) Average time period for batch release: (min)	7.84E+01	7.05E+01
(5) Minimum time period for batch release: (min)	6.00E+01	5.40E+01

b. Gaseous:

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 3	QUARTER 4	EST TOTAL ERROR %
A. FISSION AND ACTIVATION GASES				
1. Total Release	Ci	3.24E+01	2.95E+01	≤2.50E+01
2. Average release rate for period	μCi/sec	4.07E+00	3.71E+00	
3. Tech. Spec. Limit	%	*	*	
B. IODINE-131				
1. Total Iodine-131	Ci	-----	-----	≤2.50E+01
2. Average release rate for period	μCi/sec	-----	-----	
3. Tech. Spec. Limit	%	*	*	
C. IODINE-133 AND PARTICULATES				
1. Iodine-133 and Particulates with half-lives >8 days	Ci	5.73E-05	1.07E-05	≤2.50E+01
2. Average release rate for period	μCi/sec	7.21E-06	1.35E-06	
3. Tech. Spec. Limit	%	*	*	
4. Gross alpha radioactivity	Ci	1.12E-06	1.05E-06	≤2.50E+01
D. TRITIUM				
1. Total Release	Ci	3.62E-01	2.24E-01	≤2.50E+01
2. Average release rate for period	μCi/sec	4.56E-02	2.81E-02	
3. Tech. Spec. Limit	%	*	*	
*E. PERCENT OF TECHNICAL SPECIFICATION LIMITS				
FISSION AND ACTIVATION GASES				
1. Quarterly gamma air dose limit	%	4.09E-03	1.35E-02	
2. Quarterly beta air dose limit	%	7.72E-03	8.13E-03	
3. Yearly gamma air dose limit	%	2.05E-03	6.76E-03	
4. Yearly beta air dose limit	%	3.86E-03	4.07E-03	
5. Whole body dose rate limit	%	4.11E-04	2.95E-03	
6. Skin dose rate limit	%	3.31E-04	8.22E-04	
HALOGENS, TRITIUM AND PARTICULATES WITH HALF-LIVES >8 DAYS				
7. Quarterly dose limit (organ)	%	2.36E-03	7.28E-04	
8. Yearly dose limit (organ)	%	1.18E-03	3.64E-04	
9. Organ dose rate limit	%	7.96E-04	6.31E-05	

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TABLE 1B
GASEOUS EFFLUENTS--ELEVATED RELEASE

<u>NUCLIDES RELEASED</u>	<u>UNIT</u>	<u>CONTINUOUS MODE</u>	
		<u>QUARTER 3</u>	<u>QUARTER 4</u>
1. <u>Fission Gases</u>			
Krypton-85m	CI	-----	1.50E-01
Krypton-88	CI	1.31E-02	2.80E-02
Xenon-131m	CI	5.65E-01	6.44E-01
Xenon-133	CI	4.44E-02	1.37E-01
Xenon-133m	CI	2.87E-02	3.09E-01
Xenon-135	CI	2.09E-02	-----
TOTAL	CI	6.72E-01	1.27E+00
2. <u>Iodines</u>			
Iodine-131	CI	-----	-----
Iodine-133	CI	-----	-----
TOTAL	CI	-----	-----
3. <u>Particulates</u>			
Ruthenium-103	CI	5.77E-08	-----
Cesium-137	CI	-----	2.20E-07
TOTAL	CI	5.77E-08	2.20E-07
4. <u>Tritium</u>			
Hydrogen-3	CI	2.19E-03	3.31E-03

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

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TABLE 1C
GASEOUS EFFLUENTS--GROUND LEVEL RELEASES

<u>NUCLIDES RELEASED</u>	<u>UNIT</u>	<u>CONTINUOUS MODE</u>	
		<u>QUARTER 3</u>	<u>QUARTER 4</u>
1. <u>Fission Gases</u>			
Krypton-85m	CI	-----	3.91E+00
Krypton-87	CI	1.89E-01	6.81E-01
Krypton-88	CI	-----	1.95E+00
Xenon-131m	CI	2.77E+01	9.59E+00
Xenon-133	CI	-----	3.24E+00
Xenon-133m	CI	6.45E-01	8.69E+00
Xenon-135	CI	3.17E+00	1.66E-01
TOTAL	CI	3.17E+01	2.82E+01
2. <u>Iodines</u>			
Iodine-131	CI	-----	-----
Iodine-133	CI	-----	-----
TOTAL	CI	-----	-----
3. <u>Particulates</u>			
Manganese-54	CI	1.04E-06	-----
Cobalt-60	CI	3.38E-05	1.02E-05
Zinc-65	CI	2.24E-05	-----
Ruthenium-103	CI	-----	2.95E-07
TOTAL	CI	5.72E-05	1.05E-05
4. <u>Tritium</u>			
Hydrogen-3	CI	3.60E-01	2.20E-01

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	1.85E-03	6.46E-04	≤2.50E+01
2. Average diluted concentration during period	μCi/ml	3.17E-11	9.51E-12	
3. Applicable limit	%	5.76E-05	8.65E-06	
B. TRITIUM				
1. Total Release	Ci	1.25E+00	3.12E-01	≤2.50E+01
2. Average diluted concentration during period	μCi/ml	2.14E-08	4.59E-09	
3. Applicable limit	%	7.13E-04	1.53E-04	
C. DISSOLVED AND ENTRAINED GASES				
1. Total Release	Ci	-----	-----	≤2.50E+01
2. Average diluted concentration during period	μCi/ml	-----	-----	
3. Applicable Limit	%	-----	-----	
D. GROSS ALPHA RADIOACTIVITY				
1. Total Release	Ci	1.69E-05	4.86E-06	≤2.50E+01
E. VOLUME OF WASTE RELEASED (PRIOR TO DILUTION)				
	liters	1.64E+06	4.72E+05	
F. VOLUME OF DILUTION WATER USED DURING PERIOD				
	liters	5.83E+10	6.79E+10	
G. PERCENT OF TECHNICAL SPECIFICATION LIMITS				
1. Quarterly Whole Body Dose	%	9.20E-03	1.26E-03	
2. Quarterly Organ Dose	%	5.32E-03	6.84E-04	
3. Annual Whole Body Dose	%	4.60E-03	6.30E-04	
4. Annual Organ Dose	%	2.66E-03	3.42E-04	

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TABLE 2B
LIQUID EFFLUENTS

<u>NUCLIDES RELEASED</u>	<u>UNIT</u>	<u>BATCH MODE</u>	
		<u>QUARTER 3</u>	<u>QUARTER 4</u>
<u>1. Fission and Activation Products</u>			
Chromium-51	CI	-----	6.59E-06
Manganese-54	CI	2.03E-04	8.91E-05
Cobalt-60	CI	7.88E-04	4.48E-04
Zinc-65	CI	7.40E-04	9.82E-05
Niobium-97	CI	5.60E-05	-----
Silver-110m	CI	1.59E-05	-----
Antimony-125	CI	3.75E-06	-----
Cesium-134	CI	7.96E-06	1.41E-06
Cesium-137	CI	3.44E-05	3.05E-06
TOTAL	CI	1.85E-03	6.46E-04
<u>2. Tritium</u>			
Hydrogen-3	CI	1.25E+00	3.12E-01
<u>3. Dissolved and Entrained Gases</u>			
TOTAL	CI	-----	-----

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

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TABLE 3
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

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

	Unit	Class A	6-month Period Class B	Class C	Est Total Error %
1. <u>Type of Waste</u>					
a. Spent resins, filter sludges, evaporator bottoms, etc.	m ³ Ci	2.78E+01 1.73E+02	N/A N/A	N/A N/A	-- 2.50E+01
b. Dry compressible waste, contaminated equipment, etc.	m ³ Ci	5.65E+01 2.10E+00	N/A N/A	N/A N/A	-- 2.50E+01
c. Irradiated components, control rods, etc.	m ³ Ci	N/A N/A	N/A N/A	N/A N/A	
d. Other (describe)	m ³ Ci	N/A N/A	N/A N/A	N/A N/A	

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

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

Isotope	Percent	Curies	Isotope	Percent	Curies
Zinc-65	3.24E+01	5.61E+01	Cesium-137	1.83E+00	3.17E+00
Iron-55	3.15E+01	5.45E+01	Nickel-63	1.18E+00	2.04E+00
Cobalt-60	2.77E+01	4.79E+01	Cesium-134	9.48E-01	1.64E+00
Manganese-54	4.27E+00	7.39E+00	Nickel-59	1.19E-01	2.06E-01

b. Dry compressible waste, contaminated equipment, etc.

Isotope	Percent	Curies	Isotope	Percent	Curies
Zinc-65	6.35E+01	1.33E+00	Cesium-137	2.36E+00	4.95E-02
Iron-55	1.43E+01	2.99E-01	Carbon-14	4.74E-01	9.97E-03
Cobalt-60	1.34E+01	2.82E-01	Nickel-63	1.37E-01	2.87E-03
Manganese-54	5.83E+00	1.23E-01			

c. Irradiated components, control rods, etc.
None

d. Other
None

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 3 (continued)
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

3. Solid Waste Disposition

<u>No. of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
6	Truck	Barnwell, SC
0	N/A	Richland, WA
1	Rail	* Alaron Corp. Wampum, PA
11	Truck	* Scientific Ecology Group Oak Ridge, TN
* Waste Reduction Facility		

B. IRRADIATED FUEL SHIPMENTS (Disposition)

<u>No. of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
None	N/A	N/A

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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.

No changes were made to the ODCM this report period.

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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.

Revision 9 to the Process Control Program (PCP) procedure AP-1.10 was approved for use on November 5, 1992 (PORC Meeting No. 92-148). This revision was made to delete Section 7.4.1.a describing manual calculations for 10CFR61 classification to backup the computer program. This section was added in 1984 when there was only one computer available for these calculations. Backup capability and the availability of numerous computers onsite made this section of the procedure unnecessary. This change did not reduce the conformance to existing criteria for solid waste.

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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

1. No changes in the Environmental Monitoring Locations required by Technical Specifications were made based on the land use census.
2. The Jones farm was deleted from the milk sampling program with the last sample collected on July 20, 1992. The milk herd was sold by the farmer and samples are no longer available. This sample location was not required by Technical Specifications but was sampled as a long term, historical milk location. The farm was designated as location No. 16 in the past radiological Environmental Surveillance reports and was geographically located 5.9 miles from the site at 190°.

NEW LOCATIONS FOR DOSE CALCULATIONS

1. No changes in Dose Calculation Receptor Locations were required based on 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.

EXCEPTION TO THE ENVIRONMENTAL SAMPLING PROGRAM

1) Surface Water Sample, Monthly Composite (RETS, Table 6.1-1)

The Composite sampler used to collect the surface water offsite control sample was found to be inoperative for a period of seven days due to an electrical failure. The period of pump inoperability was from July 10, 1992 (1105 hrs.) to July 17, 1992 (1049 hrs.) The deviation from the normal sample period of 31 days had no significance on the validity of the sample. This sample serves as a control station which is located upstream from the site and is used to measure background. As a corrective action, the sample pump is now checked twice per week by the technician staff to provide for earlier detection of equipment failures.

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ATTACHMENT NO. 5

SEMI-ANNUAL SUMMARY OF HOURLY METEOROLOGICAL DATA

In accordance with Section 7.3.C.2 of Amendment 93 to the James A. FitzPatrick Nuclear Power Plant Technical Specifications, an annual summary of meteorological data may be included and submitted in the Semi-Annual Radioactive Effluent Release Report within 60 days after January 1 of each year.

Meteorological data for the period of January 1, 1992 through December 31, 1992 is not included in this report. It is on file and available upon request.

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ADDENDUM 1

ASSESSMENT OF RADIATION DOSES TO THE PUBLIC JANUARY - DECEMBER 1992

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.

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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.

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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.

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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, 1992 to December 31, 1992. Historical meteorological data was used to generate tables of average dispersion factors. Locations of interest were identified from the 1992 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.

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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 calculated doses 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 5.1.6).

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ADDENDUM 1 (continued)

TABLE 1
ANNUAL DOSE ASSESSMENT 1992

A. LIQUIDS					
<u>QUARTER</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>ANNUAL</u>
	(a)	(b)	(b)	(b)	(b)
Organ (mrem)	1.37E-04	3.33E-04	2.66E-04	3.42E-05	7.22E-04
% of Limit	2.74E-03	6.66E-03	5.32E-03	6.84E-04	7.22E-03
	(c)	(d)	(d)	(c)	(d)
Whole Body (mrem)	8.70E-05	2.14E-04	1.38E-04	1.89E-05	3.98E-04
% of Limit	5.80E-03	1.43E-02	9.20E-03	1.26E-03	1.33E-02

(a) Dose to the Teen GI-LLI primarily by the fish pathway.

(b) Dose to the Teen Liver primarily by the fish pathway.

(c) Dose to the Teen Whole Body primarily by the fish pathway.

(d) Dose to the Adult Whole Body primarily by the fish pathway.

B. NOBLE GASES					
<u>QUARTER</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>ANNUAL</u>
Total Body (mrem/yr)	2.60E-02	1.84E-02	2.06E-03	1.47E-02	2.60E-02
% of Limit	5.20E-03	3.68E-03	4.12E-04	2.94E-03	5.20E-03
Skin (mrem/yr)	4.67E-02	3.31E-02	9.93E-03	2.47E-02	4.67E-02
% of Limit	1.57E-03	7.10E-03	3.31E-04	8.23E-04	1.57E-03
Gamma (mrad)	2.54E-03	6.91E-04	2.05E-04	6.76E-04	4.11E-03
% of Limit	5.08E-02	1.38E-02	4.10E-03	1.35E-02	4.11E-02
Beta (mrad)	2.56E-03	1.22E-03	7.72E-04	8.13E-04	5.37E-03
% of Limit	2.56E-02	1.22E-02	7.72E-03	8.13E-03	2.69E-02

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ADDENDUM 1 (continued)

TABLE 1
ANNUAL DOSE ASSESSMENT 1992

C. IODINES AND PARTICULATES					
<u>QUARTER</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>ANNUAL</u>
	(a)	(b)	(c)	(d)	(a)
Organ (mrem)	2.45E-03	2.78E-04	1.77E-04	5.46E-05	2.83E-03
% of Limit	3.27E-02	3.71E-03	2.36E-03	7.28E-04	1.89E-02
Organ Dose Rate (mrem/yr)	3.99E+00	3.77E-02	1.99E-02	9.47E-04	3.99E+00
% of Limit	2.26E-01	2.51E-03	7.96E-04	6.31E-05	2.26E-01

- (a) Dose to the Infant Thyroid primarily by the goats milk pathway.
 (b) Dose to the Child Liver primarily by the ground plane deposition pathway.
 (c) Dose to the Teen GI-LLI primarily by the ground plane deposition pathway.
 (d) Dose to the Child GI-LLI primarily by the ground plane deposition pathway.
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ADDENDUM 1 (continued)

TABLE 2
METEOROLOGICAL DATA AND LOCATIONS OF INTEREST

RECEPTOR	GEOGRAPHIC LOCATION	ATMOSPHERIC DISPERSION FACTOR		
		RELEASE POINT	X/Q (sec/m ³)	D/Q (l/m ²)
A. IODINE & PARTICULATES				
1. Garden	0.9 mi @ 82°E	ST	-	1.62E-09
Grazing Season	0.9 mi @ 82°E	RX	-	5.18E-09
Cary	0.9 mi @ 82°E	TB	-	4.74E-09
Location No. 78	0.9 mi @ 82°E	RF	-	5.18E-09
	0.9 mi @ 82°E	RW	-	6.10E-09
2. Meat	1.2 mi @ 126°SE	ST	-	8.39E-10
Grazing Season	1.2 mi @ 126°SE	RX	-	1.72E-09
Parkhurst	1.2 mi @ 126°SE	TB	-	1.61E-09
Location No. 26	1.2 mi @ 126°SE	RF	-	1.72E-09
	1.2 mi @ 126°SE	RW	-	2.01E-09
3. Cow	2.2 mi @ 138°SE	ST	-	3.87E-10
Grazing Season	2.2 mi @ 138°SE	RX	-	6.57E-10
France	2.2 mi @ 138°SE	TB	-	6.30E-10
Location No. 10	2.2 mi @ 138°SE	RF	-	6.57E-10
	2.2 mi @ 138°SE	RW	-	7.23E-10
4. Goat	2.5 mi @ 146°SE	ST	-	3.30E-10
Grazing Season	2.5 mi @ 146°SE	RX	-	5.33E-10
Nickolas	2.5 mi @ 146°SE	TB	-	5.13E-10
Location No. 61	2.5 mi @ 146°SE	RF	-	5.33E-10
	2.5 mi @ 146°SE	RW	-	5.80E-10
5. Resident Annual Average				
a. Inhalation	1.9 mi @ 90°E	ST	3.16E-08	-
	0.9 mi @ 82°E	RX	2.81E-07	-
	0.9 mi @ 82°E	TB	2.41E-07	-
	0.9 mi @ 82°E	RF	2.81E-07	-
	0.9 mi @ 82°E	RW	4.38E-07	-

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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 (l/m ²)
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	5 b. Deposition	0.9 mi @ 82°E	ST	-	1.63E-09
		0.7 mi @ 118°ESE	RX	-	5.99E-09
		0.7 mi @ 118°ESE	TB	-	5.45E-09
		0.7 mi @ 118°ESE	RF	-	5.99E-09
		0.7 mi @ 118°ESE	RW	-	7.06E-09
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B. NOBLE GASES					
1.	Air Dose	1.9 mi @ 90°E	ST	3.16E-08	-
	Annual Average	0.6 mi @ 90°E	ST(fc)	1.44E-07	-
		0.6 mi @ 90°E	RX	4.83E-07	-
		0.6 mi @ 90°E	TB	3.96E-07	-
		0.6 mi @ 90°E	RF	4.83E-07	-
		0.6 mi @ 90°E	RW	7.47E-07	-
2.	Total Body	0.6 mi @ 90°E	ST(fc)	1.44E-07	-
	Annual Average	0.6 mi @ 90°E	RX	4.83E-07	-
		0.6 mi @ 90°E	TB	3.96E-07	-
		0.6 mi @ 90°E	RF	4.83E-07	-
		0.6 mi @ 90°E	RW	7.47E-07	-
3.	Skin	1.9 mi @ 90°E	ST	3.16E-08	-
	Annual Average	0.6 mi @ 90°E	ST(fc)	1.44E-07	-
		0.6 mi @ 90°E	RX	4.83E-07	-
		0.6 mi @ 90°E	TB	3.96E-07	-
		0.6 mi @ 90°E	RF	4.83E-07	-
		0.6 mi @ 90°E	RW	7.47E-07	-

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