MONTICELLO NUCLEAR GENERATING PLANT
NORTHERN STATES POWER COMPANY

Period: Jan - Jun 1987
License No. DPR-22

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT

Supplemental Information

1. Regulatory Limits - Quarterly levels requiring reporting to Nuclear Regulatory Commission

   A. Noble Gases:

      5 mrad/quarter gamma radiation
      10 mrad/quarter beta radiation

   B. Long Lived Iodines, Particulates, and Tritium:

      7.5 mrem/quarter to any organ

   C. Liquid Effluents:

      1.5 mrem/quarter dose to the total body
      5.0 mrem/quarter dose to any organ

2. Maximum Permissible Concentrations:

   A. Noble Gases:
      10 CFR Part 20, Appendix B, Table II, Column 1

   B. Long Lived Iodines, Particulates, and Tritium:
      10 CFR Part 20, Appendix B, Table II, Column 1

   C. Liquid Effluents:
      10 CFR Part 20, Appendix B, Table II, Column 2
      2 E-04 uci/ml for dissolved and entrained gases

3. Average Energy:

   (Not Applicable)

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Supplemental Information (continued)

4. Measurements and Approximations of Total Radioactivity:

A. Noble Gases:
Continuous gross activity monitors in Reactor Building Vent and plant stack exhaust streams. Weekly isotopic analysis of steam jet air ejector stream. Monthly analysis of storage tank contents.

B. Iodines in Gaseous Effluent:
Continuous monitoring with charcoal cartridges in Reactor Building vent and plant stack exhaust streams with weekly analysis.

C. Particulates in Gaseous Effluent:
Continuous monitoring with particulate filters in Reactor Building vent and plant stack exhaust streams with weekly analysis.

D. Tritium in Gaseous Effluent:
Continuous monitoring with silica gel cartridges in Reactor Building vent and plant stack exhaust streams with biweekly analysis.

E. Liquid Effluents:
Tank sample analyzed prior to each planned release and continuous monitoring of gross activity during planned release.

5. Batch Releases:

A. Liquid:

1. Number of Batch Releases	0	
2. Total Time Period For Batch Releases	0.0	Min
3. Maximum Time Period for a Batch Release	0.0	Min
4. Average Time Period for a Batch Release	0.0	Min
5. Minimum Time Period for a Batch Release	0.0	Min
6. Average River Flow During Releases	0.0	Cf/sec

B. Gaseous:

1. Number of Batch Releases	0	
2. Total Time Period for Batch Releases	NA	Min
3. Maximum Time Period for a Batch Release	NA	Min
4. Average Time Period for a Batch Release	NA	Min
5. Minimum Time Period for a Batch Release	NA	Min

6. Abnormal Releases:

A. Liquid:

1. Number of Releases	0	
2. Total Activity Released	0.0	Ci

B. Gaseous:

1. Number of Releases	0	
2. Total Activity Released	0.0	Ci

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Table 1A Gaseous Effluents - Summation of all Releases

	Units	1st Qtr	2nd Qtr	Pcnt Est Error
A. Noble Gases:				
1. Total Release:				
A. Elevated Release	Ci	7.08E+02	9.26E+02	
B. Building Vent Release	Ci	3.51E+02	1.79E+02	
C. Total	Ci	1.06E+03	1.11E+03	5.00E+01
2. Average Release Rate:				
A. Elevated Release	uCi/sec	9.11E+01	1.18E+02	
B. Building Vent Release	uCi/sec	4.52E+01	2.27E+01	
C. Total	uCi/sec	1.36E+02	1.41E+02	5.00E+01
3. Percent Tech Spec Qtrly Reporting Level				
Gamma Radiation		8.54E+00	4.02E+00	
Beta Radiation		5.44E+00	2.50E+00	
B. Iodines:				
1. Total I-131:				
A. Elevated Release	Ci	1.24E-02	1.91E-02	
B. Building Vent Release	Ci	8.89E-03	2.05E-02	
C. Total	Ci	2.13E-02	3.95E-02	5.00E+01
2. Average I-131 Release Rate:				
A. Elevated Release	uCi/sec	1.60E-03	2.42E-03	
B. Building Vent Release	uCi/sec	1.14E-03	2.60E-03	
C. Total	uCi/sec	2.74E-03	5.03E-03	5.00E+01
C. Long Lived Particulates and Gross Alpha Releases:				
1. Total Particulates:				
A. Elevated Release	Ci	1.04E-03	7.65E-04	
B. Building Vent Release	Ci	3.04E-03	1.93E-03	
C. Total	Ci	4.08E-03	2.69E-03	5.00E+01
2. Average Release Rate:				
A. Elevated Release	uCi/sec	1.34E-04	9.73E-05	
B. Building Vent Release	uCi/sec	3.91E-04	2.45E-04	
C. Total	uCi/sec	5.25E-04	3.43E-04	5.00E+01

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Table 1A Gaseous Effluents - Summation of All Releases (Continued)

	Units	1st Qtr	2nd Qtr	Pcnt Est Error
3. Gross Alpha Radioactivity:				
A. Elevated Release	Ci	2.29E-06	4.97E-07	
B. Building Vent Release	Ci	1.37E-05	1.41E-05	
C. Total	Ci	1.60E-05	1.46E-05	1.00E+02
D. Tritium:				
1. Total Release:				
A. Elevated Release	Ci	5.67E+00	1.09E+01	
B. Building Vent Release	Ci	2.81E+01	4.06E+01	
C. Total	CI	3.38E+01	5.15E+01	5.00E+01
2. Average Release Rate:				
A. Elevated Release	uCi/sec	7.29E-01	1.39E+00	
B. Building Vent Release	uCi/sec	3.62E+00	5.16E+00	
C. Total	uCi/sec	4.35E+00	6.55E+00	5.00E+01
E. Percent Tech Spec Qtrly Reporting Level for Long Lived Iodines, Patriculates, and Tritium		3.07E+00	9.04E+00	

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Table 1B Gaseous Effluents - Elevated Release

Nuclides Released	Units	Continuous Mode 1st Qtr	Continuous Mode 2nd Qtr	Batch Mode 1st Qtr	Batch Mode 2nd Qtr
1. Noble Gases:					
Xe133	Ci	4.45E+02	4.83E+02	0.0	0.0
Xe135	Ci	4.47E+00	7.38E+00	0.0	0.0
Kr85M	Ci	9.41E-01	1.52E+00	0.0	0.0
Kr88	Ci	3.07E+00	4.82E+00	0.0	0.0
Kr87	Ci	3.68E+00	6.39E+00	0.0	0.0
Xe138	Ci	5.75E+01	1.02E+02	0.0	0.0
Kr90	Ci	2.00E+00	3.54E+00	0.0	0.0
Xe139	Ci	5.98E+00	1.06E+01	0.0	0.0
Kr89	Ci	6.05E+01	1.06E+02	0.0	0.0
Xe137	Ci	7.92E+01	1.39E+02	0.0	0.0
Xe135M	Ci	4.87E+00	8.47E+00	0.0	0.0
Kr83M	Ci	7.62E-01	1.29E+00	0.0	0.0
Xe133M	Ci	3.66E+00	2.82E+00	0.0	0.0
Xe131M	Ci	1.83E+00	2.27E+00	0.0	0.0
Kr85	Ci	3.47E+01	4.64E+01	0.0	0.0
Total for Period	Ci	7.08E+02	9.26E+02	0.0	0.0
2. Iodines:					
I-131	Ci	1.24E-02	1.91E-02	0.0	0.0
I-133	Ci	2.78E-02	7.42E-02	0.0	0.0
I-135	Ci	2.07E-02	5.01E-02	0.0	0.0
Total	Ci	6.09E-02	1.43E-01	0.0	0.0

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Table 1B Gaseous Effluents - Elevated Release (Continued)

Nuclides Released	Units	Continuous Mode 1st Qtr	Continuous Mode 2nd Qtr	Batch Mode 1st Qtr	Batch Mode 2nd Qtr
3. Particulates:					
Ce144	Ci	7.97E-06	1.38E-06	0.0	0.0
Ce141	Ci	3.12E-07	3.85E-06	0.0	0.0
Ba140	Ci	7.16E-04	7.49E-04	0.0	0.0
Cs137	Ci	6.43E-06	4.44E-06	0.0	0.0
Sr90	Ci	1.47E-06	0.0	0.0	0.0
Sr89	Ci	3.02E-04	0.0	0.0	0.0
Co60	Ci	2.03E-06	3.62E-06	0.0	0.0
Mn54	Ci	4.31E-07	7.14E-07	0.0	0.0
Cr51	Ci	3.06E-06	1.93E-06	0.0	0.0
Total	Ci	1.04E-03	7.65E-04	0.0	0.0

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Table 1C Gaseous Effluents - Building Vent Releases (Continued)

Nuclides Released	Units	Continuous Mode 1st Qtr	Continuous Mode 2nd Qtr	Batch Mode 1st Qtr	Batch Mode 2nd Qtr
3. Particulates:					
Ce141	Ci	1.71E-05	7.40E-06	0.0	0.0
Ba140	Ci	1.40E-03	1.58E-03	0.0	0.0
Cs137	Ci	2.83E-04	1.60E-04	0.0	0.0
Cs136	Ci	2.65E-05	0.0	0.0	0.0
Cs134	Ci	5.55E-05	4.36E-06	0.0	0.0
Sr90	Ci	8.44E-06	0.0	0.0	0.0
Sr89	Ci	1.71E-04	0.0	0.0	0.0
Zn65	Ci	7.66E-05	5.53E-06	0.0	0.0
Co60	Ci	3.16E-04	8.27E-05	0.0	0.0
Co58	Ci	6.89E-05	1.35E-05	0.0	0.0
Co57	Ci	3.41E-06	0.0	0.0	0.0
Mn54	Ci	4.66E-05	0.0	0.0	0.0
Cr51	Ci	5.69E-04	7.97E-05	0.0	0.0
Total	Ci	3.04E-03	1.93E-03	0.0	0.0

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Table 1C Gaseous Effluents - Building Vent Release

Nuclides Released	Units	Continuous Mode 1st Qtr	Continuous Mode 2nd Qtr	Batch Mode 1st Qtr	Batch Mode 2nd Qtr
1. Noble Gases:					
Xe133	Ci	1.53E+00	6.45E-01	0.0	0.0
Xe135	Ci	6.94E+00	3.36E+00	0.0	0.0
Kr85M	Ci	1.48E+00	6.89E-01	0.0	0.0
Kr88	Ci	4.79E+00	2.19E+00	0.0	0.0
Kr87	Ci	5.73E+00	2.90E+00	0.0	0.0
Xe138	Ci	9.04E+01	4.66E+01	0.0	0.0
Kr90	Ci	3.14E+00	1.61E+00	0.0	0.0
Xe139	Ci	9.36E+00	4.79E+00	0.0	0.0
Kr89	Ci	9.47E+01	4.83E+01	0.0	0.0
Xe137	Ci	1.24E+02	6.33E+01	0.0	0.0
Xe135M	Ci	7.63E+00	3.85E+00	0.0	0.0
Kr83M	Ci	1.19E+00	5.84E-01	0.0	0.0
Xe133M	Ci	4.96E-02	2.16E-02	0.0	0.0
Xe131M	Ci	3.50E-03	1.45E-03	0.0	0.0
Kr85	Ci	4.11E-02	1.64E-02	0.0	0.0
Total for Period	Ci	3.51E+02	1.79E+02	0.0	0.0
2. Iodines:					
I-131	Ci	8.89E-03	2.05E-02	0.0	0.0
I-133	Ci	5.38E-02	8.82E-02	0.0	0.0
I-135	Ci	3.20E-01	7.99E-02	0.0	0.0
Total	Ci	3.82E-01	1.89E-01	0.0	0.0

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Table 2A Liquid Effluents - Summation of All Releases

	Units	1st Qtr	2nd Qtr	Pcnt Est Error
A. Fission and Activation Products:				
1. Total Release (Except H-3, Gases, and Alpha)	Ci	0.0	0.0	0.0
2. Avg Diluted Concentration	uCi/ml	0.0	0.0	
B. Tritium:				
1. Total Release	Ci	0.0	0.0	0.0
2. Avg Diluted Concentration	uCi/ml	0.0	0.0	
C. Dissolved and Entrained Gases:				
1. Total Release	Ci	0.0	0.0	0.0
2. Avg Diluted Concentration	uCi/ml	0.0	0.0	
D. Percent Qtrly Tech Spec Reporting Level				
Whole Body Dose		0.0	0.0	
Organ Dose		0.0	0.0	
E. Gross Alpha Radioactivity:				
1. Total Release	Ci	0.0	0.0	0.0
F. Volume of Waste Released	Liters	0.0	0.0	0.0
G. Volume of Dilution Water Used	Liters	0.0	0.0	0.0

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Table 2B Liquid Effluents

Nuclides Released	Units	Continuous Mode 1st Qtr	Continuous Mode 2nd Qtr	Batch Mode 1st Qtr	Batch Mode 2nd Qtr
None Released This Period					

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EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT

Table 3 Solid Waste and Irradiated Fuel Shipments

A. Solid Waste Shipped Offsite For Burial or Disposal:

1. Type of Waste:

	Units	Total	Pcnt Est Error
A. Spent Resins, Filter Sludges, Evaporator Bottoms, Etc.	Cu Meter	5.10E+01	
	Ci	5.07E+02	5.00E+01
B. Dry Compressible Waste, Contaminated Equip, Etc.	Cu Meter	3.81E+01	
	Ci	1.71E+00	5.00E+01
C. Irradiated Components, Control Rods, Etc.	Cu Meter	0.0	
	Ci	0.0	0.0

D. Other (described below):

None

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Table 3 Solid Waste and Irradiated Fuel Shipments (Continued)

2. Measured Major Nuclide Composition by Type of Waste:

TYPE	Nuclide	Percent
A	Ba140	4.45E-01
	Cs137	1.07E+01
	Cs134	1.73E+00
	Sr90	3.52E-03
	Sr89	1.78E+00
	Zn65	6.40E+00
	Co60	1.60E+01
	Co58	1.54E+00
	Mn54	3.12E+00
	Cr51	2.37E+01
	I 131	5.74E-01
	Fe55	3.13E+01
B	Cs137	3.75E+00
	Sr90	2.83E-01
	Sr89	3.62E+00
	Zn65	6.54E-01
	Co60	3.21E+01
	Mn54	8.21E+00
	Cr51	1.26E+00
	Fe55	2.92E+01

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Table 3 Solid Waste and Irradiated Fuel Shipments (Continued)

3. Solid Waste Disposition:

Number of Shipments	Mode	Destination
1	Truck	US Ecology, Richland, WA
9	Rail	US Ecology, Richland, WA

B. Irradiated Fuel Shipments:

Number of Shipments	Mode	Destination
6	Rail	General Electric, Morris, IL

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Table 3 Solid Waste and Irradiated Fuel Shipments (Continued)

C. Shipping Container and Solidification Method:

No.	Volume (M3)	Activity (Ci)	Type of Waste	Container Code	Solidification Code
(87-02)	5.66E+00	6.47E+01	A	A	C
(87-05)	5.66E+00	9.38E+01	A	A	C
(87-08)	5.66E+00	1.06E+02	A	A	C
(87-11)	5.66E+00	1.04E+01	A	A	C
(87-12)	3.81E+01	1.71E+00	B	L	
(87-14)	5.66E+00	1.72E+01	A	A	C
(87-17)	5.66E+00	5.42E+01	A	A	C
(87-22)	5.66E+00	4.21E+01	A	A	C
(87-26)	5.66E+00	4.46E+01	A	A	C
(87-28)	5.66E+00	7.47E+01	A	A	C

CONTAINER CODES:
L - LSA
A - Type A
B - Type B
Q - Large Quantity

SOLIFICATION CODES:
C - Cement
U - Urea Formaldehyde

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Notes:

1. Release of individual noble gas isotopes from the plant stack was determined using an isotopic analysis at the steam jet air ejector. Xe133, Xe135, Kr85M, Kr88, Kr87, and Xe138 were measured and used to characterize the mode of gas release from the fuel. Other significant noble gases were determined using known ratios, the measured total offgas holdup system delay time, and the known fraction of the offgas stream released via the gland exhauster.

2. An isotopic analysis for noble gases is normally not possible at the building vents. Individual isotopes are generally below their lower limit of detection (LLD). Therefore, for reactor building vent releases, the noble gas isotopic mixture is assumed to be the same as the mixture determined at the steam jet air ejector.

3. Information specified in Regulatory Guide 1.21 which is not applicable to the Monticello plant is indicated by 'NA'.

4. Nuclides not detected in plant effluents (those below the LLD of the analysis) are not included in the quantities reported released. LLD values are recorded and must be less than the minimum LLD values stated in the Monticello Technical Specifications.