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Monticello Nuclear Generating Plant
2807 West County Road 75
Monticello, MN 55362-9637
Operated by Nuclear Management Company LLC

February 26, 2001

Technical Specification 6.7.A.4

US Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263 License No. DPR-22

Effluent and Waste Disposal
Semi-Annual Report for July Through December, 2000

In accordance with Monticello Technical Specification Section 6.7.A.4, we are submitting the following information as attachments:

Attachment A: Effluent and Waste Disposal Semi-Annual Report for July 1 – December 31, 2000

Attachment B: Off-Site Radiation Dose Assessment for January 1- December 31, 2000

There were no changes to the Offsite Dose Calculation Manual (ODCM), the Process Control Program (PCP) Manual or the Radiation Environmental Monitoring Program during the reporting period. There were no changes in land use resulting in significant increases in calculated doses. Also, there were no milk and vegetable sampling deviations during this reporting period.

This letter contains no new NRC commitments, nor does it modify any prior commitments. Please contact Sam Shirey at (763) 295-1449 if you require further information.

Byron D. Day

Byron D. Day
Plant Manager
Monticello Nuclear Generating Plant

c: Regional Administrator - III, NRC
NRR Project Manager, NRC
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Attachment A

Effluent and Waste Disposal Semi-Annual Report
for
July 1 – December 31, 2000

(The attached Report contains 10 pages.)

NORTHERN STATES POWER COMPANY
MONTICELLO NUCLEAR GENERATING PLANT
License No. DPR-22

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
Period : Jul - Dec 2000

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 dose 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
      2.0 E-4 uci/ml for dissolved and entrained gases

3. Average Energy

      (Not Applicable)

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
Period : Jul - Dec 2000

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 exhaust streams.

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 :

Weekly grab samples from Reactor Building Vent and Plant Stack exhaust streams.

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 Release	0.0	cf/sec

B. Gaseous :

1. Number of Batch Releases	2	
2. Total Time Period for Batch Releases	1397.0	min
3. Maximum Time Period for a Batch Release	982.0	min
4. Average Time Period for a Batch Release	698.5	min
5. Minimum Time Period for a Batch Release	415.0	min

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
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Supplemental Information (continued)

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

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
Period : Jul - Dec 2000

Table 1A Gaseous Effluents - Summation of all Releases

	Units	3rd Qtr	4th Qtr	Est. Total Error, %
A. Fission & Activation gases				
1. Total Release	Ci	4.72E+01	4.98E+01	2.00E+01
2. Average Release Rate	uci/sec	5.94E+00	6.26E+00	
3. Percent Tech Spec Qtrly Reporting Level				
Gamma Radiation	%	2.30E-02	5.37E-02	
Beta Radiation	%	9.21E-03	2.95E-02	
B. Iodines				
1. Total I-131 Release	Ci	8.20E-04	5.72E-04	1.00E+01
2. Average I-131 Release Rate	uci/sec	1.03E-04	7.19E-05	
C. Particulates				
1. Total Particulates	Ci	2.85E-04	1.29E-04	3.00E+01
2. Average Release Rate	uci/sec	3.59E-05	1.63E-05	
3. Gross Alpha Radioactivity	Ci	8.32E-07	5.30E-07	
D. Tritium				
1. Total Release	Ci	2.58E+00	2.83E+00	1.00E+01
2. Average Release Rate	uci/sec	3.24E-01	3.56E-01	
E. Percent Qtrly Tech Spec Reporting Levels				
1. Iodines, Particulates, and Tritium	%	8.39E-02	6.73E-02	

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
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Table 1B Gaseous Effluents - Elevated Releases

Nuclides Released	Unit	Continuous Mode		Batch Mode	
		3rd Qtr	4th Qtr	3rd Qtr	4th Qtr
1. Fission Gases					
KR-87	Ci	5.75E-01	3.05E-01	0.00E+00	0.00E+00
KR-88	Ci	1.09E-01	0.00E+00	0.00E+00	0.00E+00
XE-133	Ci	1.38E+01	9.24E+00	0.00E+00	0.00E+00
XE-133M	Ci	1.24E-01	0.00E+00	0.00E+00	0.00E+00
XE-135	Ci	1.92E+00	1.96E+00	0.00E+00	0.00E+00
XE-135M	Ci	4.32E+00	5.43E+00	0.00E+00	0.00E+00
XE-137	Ci	1.47E+01	1.56E+01	0.00E+00	0.00E+00
XE-138	Ci	9.80E+00	9.00E+00	0.00E+00	0.00E+00
Total for Period	Ci	4.54E+01	4.16E+01	0.00E+00	0.00E+00
2. Iodines					
I-131	Ci	6.00E-04	3.09E-04	0.00E+00	0.00E+00
I-133	Ci	5.51E-03	2.54E-03	0.00E+00	0.00E+00
I-135	Ci	8.42E-03	4.43E-03	0.00E+00	0.00E+00
Total for Period	Ci	1.45E-02	7.28E-03	0.00E+00	0.00E+00
3. Particulates					
CO-60	Ci	2.28E-06	6.00E-07	0.00E+00	0.00E+00
CS-137	Ci	1.25E-06	1.16E-07	0.00E+00	0.00E+00
BA-140	Ci	3.02E-05	3.10E-05	0.00E+00	0.00E+00
SR-89	Ci	6.20E-06	1.25E-05	0.00E+00	0.00E+00
SR-90	Ci	9.10E-08	9.75E-08	0.00E+00	0.00E+00
Total for Period	Ci	4.00E-05	4.44E-05	0.00E+00	0.00E+00

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
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Table 1C Gaseous Effluents - Building Vent Releases

Nuclides Released	Unit	Continuous Mode 3rd Qtr	Continuous Mode 4th Qtr	Batch Mode 3rd Qtr	Batch Mode 4th Qtr
1. Fission Gases					
XE-135	Ci	1.81E+00	8.21E+00	9.82E-04	0.00E+00
AR-41	Ci	0.00E+00	0.00E+00	6.59E-03	0.00E+00
Total for Period	Ci	1.81E+00	8.21E+00	7.57E-03	0.00E+00
2. Iodines					
I-131	Ci	2.20E-04	2.63E-04	0.00E+00	0.00E+00
I-133	Ci	1.61E-03	1.92E-03	0.00E+00	0.00E+00
Total for Period	Ci	1.83E-03	2.19E-03	0.00E+00	0.00E+00
3. Particulates					
CR-51	Ci	1.04E-05	0.00E+00	0.00E+00	0.00E+00
CO-60	Ci	1.18E-04	4.86E-05	0.00E+00	0.00E+00
CS-137	Ci	1.16E-04	3.49E-05	0.00E+00	0.00E+00
SR-89	Ci	7.20E-07	1.56E-06	0.00E+00	0.00E+00
SR-90	Ci	6.80E-08	1.53E-09	0.00E+00	0.00E+00
Total for Period	Ci	2.45E-04	8.50E-05	0.00E+00	0.00E+00

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
Period : Jul - Dec 2000

Table 2A Liquid Effluents - Summation of all Releases

	Units	3rd Qtr	4th Qtr	Est. Total Error, %
A. Fission & Activation products				
1. Total Release (not including tritium, gases, alpha)	Ci	0.00E+00	0.00E+00	0.00E+00
2. Avg Diluted Concentration	uci/ml	0.00E+00	0.00E+00	
B. Tritium				
1. Total Release	Ci	2.74E-04	0.00E+00	3.00E+01
2. Avg Diluted Concentration	uci/ml	1.44E-09	0.00E+00	
C. Dissolved and Entrained Gases				
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00
2. Avg Diluted Concentration	uci/ml	0.00E+00	0.00E+00	
D. Percent Qtrly Tech Spec Reporting Level				
1. Whole Body Dose	%	1.77E-10	0.00E+00	
2. Organ Dose	%	5.32E-11	0.00E+00	
E. Gross Alpha Radioactivity				
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00
F. Volume of Waste Released	Liters	7.88E+04	0.00E+00	3.00E+01
F. Volume of Dilution Water Used	Liters	2.02E+08	0.00E+00	3.00E+01

Table 2B Liquid Effluents

Nuclides Released	Unit	Continuous Mode		Batch Mode	
		3rd Qtr	4th Qtr	3rd Qtr	4th Qtr

None Released This Period

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
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Table 3 Solid Waste and Irradiated Fuel Shipments
A. Solid Waste Shipped Offsite for Burial or Disposal (not irradiated fuel)

1. Type of Waste	Units	6-month Period	Est. Total Error, %
a. Spent resins, filter sludges, evaporator bottoms, etc.	Cu. Meter Ci	0.00E+00 0.00E+00	0.00E+00
b. Dry compressible waste, contaminated equipment, etc.	Cu. Meter Ci (est)	1.88E+01 2.24E-01	3.50E+01
c. Irradiated components, control rods, etc.	Cu. Meter Ci	0.00E+00 0.00E+00	0.00E+00
d. Other (describe)	Cu. Meter Ci	0.00E+00 0.00E+00	0.00E+00

2. Estimate of major nuclide composition (by type of waste)				
Nuclide	Type A percent	Type B percent	Type C percent	Type D percent
H-3		1.05E-01		
C-14		1.24E-01		
Cr-51		3.77E-01		
Mn-54		4.17E+00		
Fe-55		6.36E+01		
Co-58		5.95E-03		
Fe-59		7.08E-02		
Ni-59		2.84E-04		
Co-60		2.03E+01		
Ni-63		4.63E-01		
Zn-65		6.80E+00		
Sr-90		1.45E-02		
I-131		9.94E-02		
Cs-137		1.16E+00		
Ba-140		7.80E-02		
Eu-154		2.57E+00		
Pu-238		2.87E-03		
Pu-239		1.94E-03		
Am-241		6.74E-03		
Pu-241		1.19E-01		
Cm-242		2.00E-03		
Cm-243		1.94E-03		
Eu-152		2.27E+00		

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
Period : Jul - Dec 2000

Table 3 Solid Waste and Irradiated Fuel Shipments

3. Solid waste disposal

Number of Shipments	Mode of Transportation	Destination
34	Truck	Envirocare, Clive, UT.

B. Irradiated Fuel Shipments

1. Disposition

Number of Shipments	Mode of Transportation	Destination

None This Period

C. Shipping Container and Solidification Method

No.	Volume M3	Activity Ci	Type of Waste	Container Code	Solidification Code
9838B	2.18E-01	2.96E-04	B	L	N
0026G	4.53E-01	2.30E-03	B	L	N
0026H	9.06E-02	7.00E-04	B	L	N
0026I	2.72E-01	7.00E-04	B	L	N
0026J	2.95E-01	4.00E-04	B	L	N
0026K	2.23E+00	1.01E-01	B	L	N
0026L	1.59E-01	3.20E-02	B	L	N
9917G	6.25E-02	5.00E-04	B	L	N
9917H	4.81E-02	4.00E-04	B	L	N
9906E	1.71E-02	9.00E-05	B	L	N
9906F	1.13E-01	5.00E-04	B	L	N
9908G	3.19E-02	2.16E-04	B	L	N
9908H	4.65E-02	9.44E-04	B	L	N
9908I	5.31E-02	1.70E-03	B	L	N
9908J	7.30E-02	3.00E-03	B	L	N
9908K	3.83E-02	2.42E-04	B	L	N
9908L	3.64E-01	6.28E-03	B	L	N
0026M	2.04E-01	2.59E-04	B	L	N
0026N	8.61E-01	1.21E-03	B	L	N
0026O	1.59E-01	1.89E-04	B	L	N
9906G	3.85E-02	2.36E-04	B	L	N
9908M	2.27E-01	1.16E-04	B	L	N
9906H	1.13E-01	4.93E-04	B	L	N
0036H	6.71E-03	1.42E-02	B	L	N
0026P	3.62E-01	9.23E-04	B	L	N
0036I	4.93E-02	2.98E-03	B	L	N
9906I	6.54E+00	2.89E-02	B	L	N
9908N	1.79E-02	3.30E-05	B	L	N

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
Period : Jul - Dec 2000

C. Shipping Container and Solidification Method (Cont.)

No.	Volume M3	Activity Ci	Type of Waste	Container Code	Solidification Code
9917I	1.40E-02	5.38E-05	B	L	N
0036J	7.82E-01	1.15E-02	B	L	N
9917J	8.27E-01	2.99E-03	B	L	N
9917K	2.61E+00	4.62E-03	B	L	N
9917L	5.08E-01	1.29E-03	B	L	N
9908O	8.71E-01	2.60E-03	B	L	N

Container Codes :
- L - LSA
- A - Type A
- B - Type B
- Q - Large Quantity

Solidification Codes :
- C - Cement
- U - Urea Formaldehyde
- D - Dewatering
- N - Not Applicalble

Attachment B

Off-Site Radiation Dose Assessment
for January 1, - December 31, 2000

(The attached Report contains 6 pages.)

NORTHERN STATES POWER COMPANY
MONTICELLO NUCLEAR GENERATING PLANT

Off-Site Radiation Dose Assessment
for January 1, - December 31, 2000

An assessment of radiation dose due to releases from the Monticello Nuclear Generating Plant during 2000 was performed in accordance with the Technical Specifications (T.S.). Computed doses were well below the 40 CFR 190 Standards and 10 CFR Part 50, Appendix I Guidelines.

Off-site dose calculation formulas and meteorological data from the Off-site Dose Calculation Manual were used in making this assessment. Source terms were obtained from the two Semi-Annual Effluent Release Reports for 2000.

Off-Site Doses from Gaseous Releases (T.S. 6.7.A.4)

Computed doses due to gaseous releases are reported in Table 1. Critical receptor location and pathways for organ doses are reported in Table 2. Doses, both whole body and organ, are a small percentage of Appendix I Guidelines.

Off-Site Doses From Liquid Releases (T.S. 6.7.A.4)

Doses from liquid releases are listed in Table 1. Doses are based on release of Turbine Building Normal Drain Sump water releases in the second and third quarters with tritium activity present.

Doses to Individuals Due to Their Activities Inside the Site Boundary (T.S. 6.7.A.4)

There are several groups of concern, contract tree trimmers clearing transmission lines, sportsmen entering the Monticello site for recreational activities and XCEL Energy Company transmission and distribution crews working in the substation. Use of a very conservative assumption of 40 hours/week spent inside the site boundary by these groups would conservatively represent the most exposed individual. The annual whole body, skin and organ dose was computed using plant stack and reactor building vent X/Q values for the abandoned Environmental Protection Agency Field Station location (a bounding location due to predominant wind direction and nearness to the release points) as input to the GASPAR code. This computed dose was reduced by the factor of 40/168 to account for limited occupancy. Dose to the whole body, skin and organ (thyroid) is less than that for the critical receptor location which is reported in Table 1.

Doses to the Likely Most Exposed Member of the General Public from Reactor Releases and Other Nearby Uranium Fuel Cycle Sources (T.S. 6.7.A.4)

There are no other uranium fuel facilities in the vicinity of the Monticello site. The only artificial source of exposure to the general public in addition to the plant effluent releases is from direct radiation of the reactor and the steam turbines.

Environmental TLDs were used to provide data on direct and skyshine radiation dose and the GASPAR code was used to provide data on dose from airborne pathways. The net dose from the TLDs was added to the GASPAR dose data for locations of off site residences. This data indicates that the annual whole body and organ dose to each of these locations is less than 15 millirem. (see pages 5 and 6 for details)

Therefore, the likely most exposed member of the general public will not receive an annual radiation dose from reactor effluent releases and all other fuel cycle activities in excess of 40 CFR 190 standards of 25 millirem to the whole body, 75 millirem to the thyroid, and 25 millirem to any other organ.

Changes in Land Use and Non Obtainable Milk or Vegetable Samples
(T.S. 4.16.B.2 & T.S. 4.16.A.5)

There were no changes in land use resulting in significant increases in calculated doses.
There were no milk or vegetable samples that could not be obtained during this reporting period.

Table 1

Off-Site Radiation Dose Assessment - Monticello

PERIOD: January 1, through December 31, 2000

GASEOUS RELEASES	PLANT	10 CFR 50 APPENDIX I CRITERIA
Maximum Site Boundary Gamma Air Dose (mrad/year)	0.004	10
Maximum Site Boundary Beta Air Dose (mrad/year)	0.005	20
Maximum Off-Site Dose to Any Organ (mrem/year)	0.014	15
Maximum Dose to the Likely Most Exposed Member of the General Public (mrem/year) Whole Body Skin Organ (Thyroid)	 0.007 0.008 0.014	 5 15 15
LIQUID RELEASES		
Maximum Off-Site Dose (mrem) Whole Body Organ	 2.81E-12 2.81E-12	 3 10

Table 2

Off-Site Radiation Dose Assessment - Monticello
Supplemental Information

PERIOD: January 1, through December 31, 2000

Maximum Site Boundary Dose Location (from Reactor Building Vents)		
Sector	SSE	
Distance (miles)	0.40	
EPA Field Station		
Sector	SE	
Distance from Plant Stack (miles)	0.26	
Distance from Reactor Building Vents	0.36	
Critical Receptor Location		
Sector	SSW	
Distance from Reactor Building Vents (miles)	0.60	
Pathways	Plume, Ground, Inhalation, Vegetable	
Age Group	CHILD	
Organ	THYROID	
St. Paul Drinking Water Intake Location		
Pathways	Drinking Water	Drinking Water, Fish
Age Group	Infant	Adult
Organ	Whole Body	GI Tract
Dilution Factor (drinking water)	7:1	7:1

Bases for Radiation Dose Statements

40 CFR 190 Limits for Annual Dose Equivalent

Whole Body – 25 mrem Thyroid – 75 mrem Any Other Organ – 25 mrem

Critical Receptor Locations

Maximum Organ Dose – 0.6 miles SSW
Maximum Site Boundary TLD – 0.4 miles W

Maximally Exposed Individuals

A. Maximum Offsite Dose from Airborne Effluents (Calculated by GASPAR program)

Whole Body:	0.007 mrem
Thyroid:	0.014 mrem
Any Other Organ:	0.008 mrem

B. Dose from Shine

TLD	Location	Mean Reading (mrem/91 days)	Standard Deviation
Controls	4 quadrants @ 90° separation	14.7	1.42 (4 sites all >10 mile distance)
M-09A	0.6 miles SSW	14.4	0.30 (in direction of Critical Receptor)
M-12A	0.4 miles W	16.9	0.39 (maximum site boundary TLD)

The difference (D) between the indicator and control TLDs, the standard deviation of D, and the limits for D at the 90% confidence level are as follows:

TLD	D	Std Dev	90% Conf	Limits at 90% Confidence
M-09A	-0.28	0.39	0.64	$-0.92 < D < 0.37$
M-12A	2.25	0.41	0.67	$1.58 < D < 2.92$

M-09A – Because zero is in the interval, there may be no difference between the indicator and control TLDs. At the 90% confidence level, the difference is no greater than 0.37 mrem per 91 days, or approximately 1.5 mrem/year.

M-12A – At the 90% confidence level, the difference is no greater than 2.92 mrem per 91 days, or approximately 11.7 mrem/year.

C. Maximum Total Dose

Annual Dose from effluents to any individual, regardless of location, will be no more than:

Whole Body:	0.007 mrem
Thyroid:	0.014 mrem
Other Organs:	0.008 mrem

Annual Direct Dose will be no more than: 11.7 mrem

Therefore, the maximum dose quantities for comparison to 49 CFR 190 limits are (mrem/year):

	Dose	Limit
Whole Body:	11.71	25
Thyroid:	11.71	75
Any Other Organ:	11.71	25