

EFFLUENT SEMI-ANNUAL REPORT

Jan. 1988 THROUGH June 1988

SUPPLEMENTAL INFORMATION

Facility - Prairie Island Nuclear Generating Plant

Licensee - Northern States Power Company License Nos. - DPR-42 & DPR-60

A. Regulatory Limits

1. Liquid Effluents:

- a. The dose or dose commitment to an individual from radioactive materials in liquid effluents released from the site shall be limited:

for the Quarter	3.0 mrem Total Body 10.0 mrem Any Organ
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for the Year	6.0 mrem Total Body 20.0 mrem Any Organ
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2. Gaseous Effluents:

- a. The dose rate due to radioactive materials released in gaseous effluents from the site shall be limited to:

Noble Gases	< 500 mrem/Year Total Body < 3000 mrem/Year Skin
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I-131, H-3, LLP	< 1500 mrem/Year Any Organ
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- b. The dose due to radioactive gaseous effluents shall be limited to:

Noble Gases	< 10 mrad/Qtr Gamma < 20 mrad/Qtr Beta < 20 mrad/Year Gamma < 40 mrad/Year Beta
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I-131, H-3, LLP	< 15 mrem/Qtr < 30 mrem/Year
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B. Maximum Permissible Concentrations

1. Fission and activation gases in gaseous releases:
 10 CFR 20, Appendix B, Table 2, Column 1
2. Iodine and particulates with half-lives greater than 8 days in gaseous releases:
 10 CFR 20, Appendix B, Table 2, Column 1
3. Liquid Effluents for radionuclides other than dissolved or entrained gases:
 10 CFR 20, Appendix B, Table 2, Column 2
4. Liquid Effluent dissolved and entrained gases:
 2.0E-04 μ ci/ml Total Activity

C. Average Energy

Not applicable to Prairie Island Regulatory Limits.

D. Measurements and Approximations of Total Radioactivity

1. Fission and activation gases in gaseous releases:	Total Nuclide	Geli Geli
2. Iodines in gaseous releases	Total Nuclide	Geli Geli
3. Particulates in gaseous releases:	Total Nuclide	Geli Geli
4. Liquid Effluents:	Total Nuclide	Geli Geli

1.0 BATCH RELEASES (Liquid)

	QTR 1	QTR 2
1.1 Number of Batch Releases	5.50E+01	2.80E+01
1.2 Total Time Period for a Batch Release (hr.)	8.60E+01	4.58E+01
1.3 Maximum Time for a Batch Release (hr)	1.90E+00	2.30E+00
1.4 Average Time for a Batch Release (hr)	1.56E+00	1.64E+00
1.5 Minimum Time for a Batch Release (hr)	1.00E+00	1.30E+00
1.6 Ave Mississippi flow during Quarter (CFS)	1.01E+04	1.32E+04

2.0. BATCH RELEASES (Gaseous)

	QTR 1	QTR 2
2.1 Number of Batch Releases	1.60E+01	1.00E+00
2.2 Total Time Period for a Batch Release (hr)	1.27E+02	2.90E+00
2.3 Maximum Time for a Batch Release (hr)	3.27E+01	2.90E+00
2.4 Average Time for a Batch Release (hr)	7.92E+00	2.90E+00
2.5 Minimum Time for a Batch Release (hr)	3.00E-02	2.90E+00

3.0 ABNORMAL RELEASES (Liquid)

	QTR 1	QTR 2
3.1 Number of Batch Releases	0.00E+00	0.00E+00
3.2 Total Activity Release (Ci)	0.00E+00	0.00E+00
3.3 Total Tritium Release (Ci)	0.00E+00	0.00E+00

4.0. ABNORMAL RELEASES (Gaseous)

	QTR 1	QTR 2
4.1 Number of Batch Releases	0.00E+00	0.00E+00
4.2 Total Activity Release (Ci)	0.00E+00	0.00E+00

TABLE 1A
E. UENT SEMIANNUAL REPORT
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

UNIT	QTR 1	QTR 2	EST TOTAL ERROR %
<u>5.0 FISSION AND ACTIVATION GASES</u>			
5.1 Total Release (Ci)	6.60E-02	3.75E-02	2.50E+01
5.2 Average Release Rate (μ Ci/sec)	8.40E-03	4.77E-03	
5.3 Gamma Dose (mrad)	2.86E-05	4.21E-06	
5.4 Beta Dose (mrad)	4.86E-04	3.01E-04	
5.5 % of Gamma T.S. Limit (%)	2.86E-04	4.21E-05	
5.6 % of Beta T.S. Limit (%)	2.43E-03	1.51E-03	
<u>6.0 IODINES</u>			
6.1 Total I-131 (Ci)	0.00E+00	6.49E-07	2.50E+01
6.2 Average Release Rate (μ Ci/sec)	0.00E+00	8.26E-08	
<u>7.0 PARTICULATES</u>			
7.1 Total Release (Ci)	9.25E-07	2.78E-07	2.50E+01
7.2 Average Release Rate (μ Ci/sec)	1.18E-07	3.54E-08	
<u>8.0 TRITIUM</u>			
8.1 Total Release (Ci)	7.20E+00	9.48E+00	2.50E+01
8.2 Average Release Rate (μ Ci/sec)	9.16E-01	1.21E+00	
<u>9.0 TOTAL IODINE PARTICULATES AND TRITIUM</u>			
(μ Ci/sec)	9.16E-01	1.21E+00	2.50E+01
<u>10.0 DOSE</u> (mrem)			
	1.31E-02	1.71E-02	
<u>11.0 % OF T.S. LIMIT</u> (%)			
	8.73E-02	1.14E-01	
<u>12.0 GROSS ALPHA</u>			
12.1 Total Release (Ci)	5.02E-07	3.44E-07	2.50E+01

TABLE 1C

EFFLUENT SEMIANNUAL REPORT
GASEOUS EFFLUENTS
GROUND LEVEL RELEASES

CONTINUOUS MODE

BATCH MODE

NUCLIDE	UNIT	QTR <u>1</u>	QTR <u>2</u>	QTR <u>1</u>	QTR <u>2</u>
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13.0 INDIVIDUAL FISSION AND ACTIVATION GASES

Kr85	Ci			5.14E-02	3.64E-02
Kr85m	Ci				
Kr87	Ci				
Kr88	Ci				
Xe133	Ci			1.41E-02	1.08E-03
Xe135	Ci			5.12E-04	
Xe135m	Ci				
Xe138	Ci				
Xe131m	Ci				
Ar41	Ci				
Xe133m	Ci				
Total	Ci	0.00E+00	0.00E+00	6.60E-02	3.75E-02

14.0 IODINES (Ci)

I131	Ci		6.49E-07		
I133	Ci		2.00E-05		
I135	Ci				
Total	Ci	0.00E+00	2.06E-05	0.00E+00	0.00E+00

CONTINUOUS MODE

BATCH MODE

NUCLIDE	UNIT	QTR <u>1</u>	QTR <u>2</u>	QTR <u>1</u>	QTR <u>2</u>
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15.0 PARTICULATES (Ci)

Sr89	Ci				
Sr90	Ci	3.07E-08			
Cs134	Ci				
Cs137	Ci		2.78E-07	2.08E-07	
Ba-La140	Ci				
Co58	Ci				
Co60	Ci	6.86E-07			
Total	Ci	7.17E-07	2.78E-07	2.08E-07	0.00E+00

TABLE 2A

EFFLUENT SEMIANNUAL REPORT

LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

UNIT	QTR_1	QTR_2	TOTAL ERROR %	
16.0 <u>VOLUME OF WASTE</u>				
(Prior to Dilution)	Liters	7.58E+07	3.36E+07	2.50E+01
17.0 <u>VOLUME OF DILUTION</u>				
Water (liters)	Liters	1.08E+11	7.97E+10	2.50E+01
18.0 <u>FISSION AND ACTIVATION PRODUCTS</u>				
18.1 Total Release W/O H-3, (Ci) Rad Gas, Alpha	1.20E-02	5.13E-03	2.50E+01	
18.2 Average Diluted (μ Ci/ml) Concentration	1.11E-10	3.93E-11		
19.0 <u>TRITIUM</u>				
19.1 Total Release (Ci)	1.60E+02	6.14E+01	2.50E+01	
19.2 Average Diluted (μ Ci/ml) Concentration	1.48E-6	7.70E-07		
20.0 <u>DISSOLVED AND ENTRAINED GASES</u>				
20.1 Total Release (Ci)	1.75E-03	1.94E-03	2.50E-01	
20.2 Average Diluted (μ Ci/ml) Concentration	1.62E-11	2.44E-11		
21.0 <u>GROSS ALPHA</u>				
21.1 Total Release (Ci)	0.00E+00	0.00E+00	2.50E+01	
22.0 <u>TOTAL TRITIUM, FISSION AND ACTIVATION PRODUCTS</u> (μ Ci/ml)				
	1.48E-06	7.70E-07	2.50E+01	

TABLE 2A
 EFFLUENT SEMIANNUAL REPORT
 LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

UNIT	QTR 1	QTR 2	TOTAL ERROR %
23.0 <u>TOTAL BODY DOSE</u> (mrem)	4.12E-04	2.86E-04	
24.0 <u>CRITICAL ORGAN DOSE</u> (mrem) (organ)	3.15E-03 GI	2.86E-04 TOTAL BODY	
25.0 <u>% TOTAL BODY T.S. LIMIT</u> (%)	1.37E-02	9.53E-03	
26.0 <u>% OF CRITICAL ORGAN</u> (%) <u>T.S. Limit</u>	3.15E-02	9.53E-03	

TABLE 2A
EFFLUENT SEMIANNUAL RPEORT
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

CONTINUOUS MODE BATCH MODE

NUCLIDE	UNIT	QTR <u>1</u>	QTR <u>2</u>	QTR <u>1</u>	QTR <u>2</u>
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27.0 INDIVIDUAL LIQUID EFFLUENT

Sr89	Ci	1.24E-03	1.66E-04		
Sr90	Ci		1.05E-04	7.02E-06	3.89E-06
Cs134	Ci				
Cs137	Ci			2.22E-06	
I131	Ci				
Co58	Ci			5.22E-03	4.33E-04
Co60	Ci	5.12E-04		1.63E-03	5.92E-04
Fe59	Ci			7.28E-04	3.29E-05
Zn65	Ci			7.63E-06	5.26E-06
Mn54	Ci			3.13E-04	9.33E-06
Cr51	Ci			4.03E-04	2.04E-04
Zr-Nb95	Ci			2.42E-04	7.20E-06
Mo99	Ci				
Ba-La140	Ci				
*	Ci	0.00E+00	0.00E+00	1.64E-03	1.57E-03
Total	Ci	1.75E-03	2.71E-04	1.02E-02	2.86E-03

* From Attachment #1, Additional Nuclides

CONTINUOUS MODE BATCH MODE

NUCLIDE	UNIT	QTR <u>1</u>	QTR <u>2</u>	QTR <u>1</u>	QTR <u>2</u>
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28.0 DISSOLVED AND ENTRAINED GASES

Xe133	Ci			1.73E-03	1.79E-03
Xe133m	Ci				
Xe131m	Ci				
Xe135	Ci			2.36E-05	1.54E-04
Kr85m	Ci				
Kr85	Ci				
Kr88	Ci				
Total	Ci	0.00E+00	0.00E+00	1.75E-03	1.94E-03

ATTACHMENT 1
ADDITIONAL NUCLIDES

LIQUID EFFLUENTS

CONTINUOUS MODE

BATCH MODE

NUCLIDE	UNIT	<u>CONTINUOUS MODE</u>		<u>BATCH MODE</u>	
		QTR 01	QTR 02	QTR 01	QTR 02
AG-110M	CI			3.34E-04	7.67E-04
CO-57	CI			2.13E-06	
CS-138	CI				4.75E-06
NA-24	CI				1.11E-06
NB-97	CI			3.69E-05	1.48E-05
SB-122	CI			6.54E-06	
SB-124	CI			4.94E-04	1.88E-04
SB-125	CI			4.35E-04	5.08E-04
SN-113	CI				6.99E-05
SC-47	CI			3.29E-04	
SR-92	CI				2.27E-06
ZR-97	CI				1.43E-05
SUBTOTAL	CI	0.00E+00	0.00E+00	1.64E-03	1.57E-03

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
 NORTHERN STATES POWER

Period: 1-1-88 to 6-30-88
 License No. DPR-42

SOLID RADIOACTIVE WASTE DISPOSAL SEMI-ANNUAL REPORT

Table I: Solid Waste and Irradiated Fuel Shipments

A. Solid Waste Total Volumes and Measured Curie Quantities:

1. Type of Waste:

		<u>Units</u>	<u>Total</u>	<u>Container Volumes</u>
A.	_____	_____	_____	_____
	_____	_____	_____	_____
B.	_____	_____	_____	_____
	_____	_____	_____	_____
C.	Non Compacted	ft ³	748.8	96
	DAW	Ci	1.458	
D.	_____	_____	_____	_____
	_____	_____	_____	_____
S.	_____	_____	_____	_____
	_____	_____	_____	_____

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
 NORTHERN STATES POWER

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SOLID RADIOACTIVE WASTE DISPOSAL SEMI-ANNUAL REPORT

Table I: Solid Waste and Irradiated Fuel Shipments (Continued)

2. Measured Major Nuclide Composition by Type of Waste
 (Continuation):

<u>TYPE</u> (From Page 1)	<u>Nuclide</u>	<u>Percent</u>
_____	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
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	_____	_____

* = Inferred - Not Measured on Site

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
NORTHERN STATES POWER

Period: 1-1-88 to 6-30-88
License No. DPR-42

SOLID RADIOACTIVE WASTE DISPOSAL SEMI-ANNUAL REPORT

Table I: Solid Waste and Irradiated Fuel Shipments (Continued)

3. Solid Waste Disposition:

<u>Number of Shipments</u>	<u>Mode</u>	<u>Destination</u>
2	Truck	Scientific Ecology Group
1	Truck	Quadrex Recycle Center

B. Irradiated Fuel Shipments:

<u>Number of Shipments</u>	<u>Mode</u>	<u>Destination</u>
0		

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
NORTHERN STATES POWER

Period: 1-1-88 to 6-30-88
License No. DPR-42

SOLID RADIOACTIVE WASTE DISPOSAL SEMI-ANNUAL REPORT

Table I. Solid Waste and Irradiated Fuel Shipments (Continued)

C. Shipping Container and Solidification Method:

<u>No.</u>	<u>Volume</u> <u>(Ft³)</u>	<u>Activity</u> <u>(Ci)</u>	<u>Type of</u> <u>Waste</u>	<u>Container</u> <u>Code</u>	<u>Solidify</u> <u>Code</u>
87-39	240.0	0.541	C	L	N/A
87-40	96.3	0.366	C	L	N/A
87-42	412.5	0.551	C	L	N/A
TOTALS	3	748.8	1.458		

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

SOLIDIFICATION CODES: C = Cement

TYPES OF WASTE: A = Resins
B = Dry Compacted
C = Non-Compacted
D = Wst. Conc.
S = Spent Fuel