

EFFLUENT SEMI-ANNUAL REPORT

JAN-1985 THROUGH JUN-1985

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

Noble Gases	$\leq$ 10 mrad/Qtr Gamma $\leq$ 20 mrad/Qtr Beta $\leq$ 20 mrad/Year Gamma $\leq$ 40 mrad/Year Beta
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I-131, H-3, LLP	$\leq$ 15 mrem/Qtr $\leq$ 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  $\mu$ ci/ml Total ActivityC. 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	QTR
1.1 Number of Batch Releases	7.00E01	4.40E01
1.2 Total Time Period for a Batch Release (hr.)	1.14E02	6.83E01
1.3 Maximum Time for a Batch Release (hr)	2.91E00	2.82E00
1.4 Average Time for a Batch Release (hr)	1.63E00	1.55E00
1.5 Minimum Time for a Batch Release (hr)	1.17E00	1.17E00
1.6 Ave Mississippi flow during Quarter (CFS)	1.86x10 <sup>4</sup>	3.97E04

2.0. BATCH RELEASES (Gaseous)

- 2.1 Number of Batch Releases
- 2.2 Total Time Period for a Batch Release (hr)
- 2.3 Maximum Time for a Batch Release (hr)
- 2.4 Average Time for a Batch Release (hr)
- 2.5 Minimum Time for a Batch Release (hr)

QTR 1	QTR 2
8.00E00	1.00E00
1.45E02	4.64E-01
3.68E01	4.64E-01
1.81E01	4.64E-01
8.43E-02	4.64E-01

3.0 ABNORMAL RELEASES (Liquid)

- 3.1 Number of Batch Releases
- 3.2 Total Activity Release (Ci)
- 3.3 Total Tritium Release (Ci)

QTR 1	QTR 2
0.00E00	0.00E00
0.00E00	0.00E00
0.00E00	0.00E00

4.0. ABNORMAL RELEASES (Gaseous)

- 4.1 Number of Batch Releases
- 4.2 Total Activity Release (Ci)

QTR 1	QTR 2
1.00E00	0.00E00
2.50E-02	0.00E00

TABLE 1A

EFFLUENT SEMIANNUAL REPORT

GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

UNIT	QTR <u>1</u>	QTR <u>2</u>	EST TOTAL ERROR %
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5.0 FISSION AND ACTIVATION GASES

5.1 Total Release (Ci)	1.25E01	4.67E00	2.50E01
5.2 Average Release Rate ( $\mu$ Ci/sec)	1.59E00	5.94E-01	
5.3 Gamma Dose (mrad)	7.85E-03	1.37E-03	
5.4 Beta Dose (mrad)	2.25E-02	6.32E-03	
5.5 % of Gamma T.S. Limit (%)	7.85E-02	1.37E-02	
5.6 % of Beta T.S. Limit (%)	1.13E-01	3.16E-02	

6.0 IODINES

6.1 Total I-131 (Ci)	3.43E-03	1.80E-06	2.50E01
6.2 Average Release Rate ( $\mu$ Ci/sec)	4.36E-04	2.29E-07	

7.0 PARTICULATES

7.1 Total Release (Ci)	1.08E-05	0.00E00	2.50E01
7.2 Average Release Rate ( $\mu$ Ci/sec)	1.37E-06	0.00E00	

8.0 TRITIUM

8.1 Total Release (Ci)	1.17E01	1.47E01	2.50E01
8.2 Average Release Rate ( $\mu$ Ci/sec)	1.49E00	1.87E00	

9.0 TOTAL IODINE PARTICULATES AND TRITIUM ( $\mu$ Ci/sec)

	1.49E00	1.87E00	2.50E01
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10.0 DOSE (mrem)

	2.24E-01	2.67E-02	
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11.0 % OF T.S. LIMIT (%)

	1.49E00	1.78E-01	
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12.0 GROSS ALPHA

12.1 Total Release (Ci)	0.00E00	9.82E-07	2.50E01
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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		1.12E00		
Kr85m	Ci			8.04E-04	
Kr87	Ci			2.96E-04	
Kr88	Ci			1.32E-03	
Xe133	Ci	9.91E00	3.55E00	2.54E00	
Xe135	Ci			1.15E-02	
Xe135m	Ci			1.60E-04	
Xe138	Ci				
Xe131m	Ci				
Ar41	Ci			4.49E-03	
Xe133m	Ci				
Total	Ci	9.91E00	4.67E00	2.56E00	0.00E00

14.0 IODINES (Ci)

I131	Ci	3.43E-03	1.80E-06		
I133	Ci	5.24E-05			
I135	Ci				
Total	Ci	3.48E-03	1.80E-06	0.00E00	0.00E00

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				
Cs134	Ci			1.28E-06	
Cs137	Ci			1.38E-06	
Ba-La140	Ci				
Co58	Ci			4.80E-06	
Co60	Ci			1.27E-06	
*		5.00E-07		1.57E-06	
Total	Ci	5.00E-07	0.00E00	1.03E-05	0.00E00

\* Particulate activity (Ci) from attachment #1

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

UNIT	QTR_1	QTR_2	TOTAL ERROR %
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16.0 VOLUME OF WASTE

(Prior to Dilution)

Liters	6.43E07	5.39E07	2.50E01
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17.0 VOLUME OF DILUTION

Water (liters)

Liters	1.03E11	8.14E10	2.50E01
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18.0 FISSION AND ACTIVATION PRODUCTS

18.1 Total Release W/O H-3, (Ci)  
     Rad Gas, Alpha  
 18.2 Average Diluted ( $\mu$ Ci/ml)  
     Concentration

6.20E-03	2.19E-03	2.50E01
6.02E-11	2.69E-11	

19.0 TRITIUM

19.1 Total Release (Ci)  
 19.2 Average Diluted ( $\mu$ Ci/ml)  
     Concentration

1.48E02	1.79E02	2.50E01
1.44E-06	2.20E-06	

20.0 DISSOLVED AND ENTRAINED GASES

20.1 Total Release (Ci)  
 20.2 Average Diluted ( $\mu$ Ci/ml)  
     Concentration

4.46E-03	1.84E-03	2.50E01
4.33E-11	2.26E-11	

21.0 GROSS ALPHA

21.1 Total Release (Ci)

0.00E00	0.00E00	2.50E01
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22.0 TOTAL TRITIUM, FISSION AND  
ACTIVATION PRODUCTS ( $\mu$ Ci/ml)

1.44E-06	2.20E-06	2.50E01
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TABLE 2A  
EFFLUENT SEMIANNUAL REPORT  
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

		UNIT	QTR <u>1</u>	QTR <u>2</u>	TOTAL ERROR %
23.0	<u>TOTAL BODY DOSE</u>	(mrem)	1.21E-03	4.34E-04	
24.0	<u>CRITICAL ORGAN DOSE</u>	(mrem)	1.62E-03	4.50E-04	
		(organ)	Liver	Liver	
25.0	<u>% TOTAL BODY T.S. LIMIT</u>	(%)	4.03E-02	1.45E-02	
26.0	<u>% OF CRITICAL ORGAN T.S. Limit</u>	(%)	1.62E-02	4.50E-03	

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

CONTINUOUS MODE				BATCH MODE	
NUCLIDE	UNIT	QTR_1	QTR_2	QTR_1	QTR_2

27.0 INDIVIDUAL LIQUID EFFLUENT

Sr89	Ci				
Sr90	Ci				
Cs134	Ci			2.84E-05	6.10E-07
Cs137	Ci	1.90E-04		2.50E-05	
I131	Ci				
Co58	Ci	8.62E-04	1.59E-04	1.72E-03	1.65E-04
Co60	Ci	4.48E-04		3.51E-04	3.29E-04
Fe59	Ci				
Zn65	Ci				
Mn54	Ci			8.34E-05	6.76E-06
Cr51	Ci				
Zr-Nb95	Ci			4.07E-05	
Mo99	Ci				
Ba-La140	Ci				
*	Ci	3.75E-04	0.00E00	2.07E-03	1.53E-03
Total	Ci	1.88E-03	1.59E-04	4.32E-03	2.03E-03

\*Individual Liquid Effluent Activity from Attachment #1

CONTINUOUS MODE

BATCH MODE

NUCLIDE	UNIT	QTR_1	QTR_2	QTR_1	QTR_2
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28.0 DISSOLVED AND ENTRAINED GASES

Xe133	Ci	1.71E-04		3.30E-03	1.84E-03
Xe133m	Ci				
Xe131m	Ci				
Xe135	Ci			2.99E-05	3.18E-06
Kr85m	Ci				
Kr85	Ci			9.64E-04	
Kr88	Ci				
Total	Ci	1.71E-04	0.00E00	4.29E-03	1.84E-03



ATTACHMENT 1  
 ADDITIONAL NUCLIDES  
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GASEOUS EFFLUENTS

NUCLIDE	UNIT	CONTINUOUS MODE		BATCH MODE	
		QTR 1	QTR 2	QTR 1	QTR 2
Ga-72	Ci			8.06E-07	
Mn-54	Ci			7.61E-07	
Se-75	Ci	5.00E-07			
Fe-55	Ci				
Subtotal	Ci	5.00E-07	0.00E00	1.57E-06	0.00E00

LIQUID EFFLUENTS

NUCLIDE	UNIT	CONTINUOUS MODE		BATCH MODE	
		QTR 1	QTR 2	QTR 1	QTR 2
Ag-110m	Ci			9.03E-05	8.62E-04
Cs-136	Ci				5.17E-05
Ga-72	Ci			8.83E-05	
Nb-97	Ci			7.10E-07	
Sb-124	Ci			1.43E-03	1.20E-04
Sb-125	Ci	3.75E-04		4.61E-04	1.90E-04
Sc-47	Ci			1.50E-06	
Sr-92	Ci				2.66E-04
Zr-97	Ci				3.66E-05
Fe-55	Ci				
Subtotal	Ci	3.75E-04	0.00E00	2.07E-03	1.53E-03

PRAIRIE ISLAND NUCLEAR GENERATING PLANT  
NORTHERN STATES POWER

Period: 1-1-85/7-1-85  
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.	<u>Resins</u>	<u>Ft3</u>	<u>818</u>	<u>170/3 @ 76</u>
		<u>Ci</u>	<u>388.254</u>	<u>1 @ 80</u>
B.	<u>Dry Compacted</u>	<u>Ft3</u>	<u>2577</u>	<u>7.5</u>
		<u>Ci</u>	<u>2.106</u>	
C.	<u>Non Compacted</u>	<u>Ft3</u>	<u>1862</u>	<u>98</u>
		<u>Ci</u>	<u>.1</u>	
D.	<u>Wst. Concentrates</u>	<u>Ft3</u>	<u>493</u>	<u>7.5</u>
		<u>Ci</u>	<u>8.796</u>	

PRAIRIE ISLAND NUCLEAR GENERATING PLANT  
NORTHERN STATES POWER

Period: 1-1-85/7-1-85  
License No. DPR-42

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:

<u>TYPE</u> (From Page 1)	<u>Nuclide</u>	<u>Percent</u>
<u>A</u>	Co60	60
	* Ni63	26.2
	Cs137	5.1
	Co58	4.1
	Cs134	3.0
<u>B</u>	* Fe55	23.8
	* Ni63	16.0
	Co58	18.1
	Co60	13.7
	Cs137	12.3
	Cs134	9.5
	NB95	1.7
	Mn54	1.6
	Zr95	1.1

\* = Inferred - Not Measured on Site

PRAIRIE ISLAND NUCLEAR GENERATING PLANT  
NORTHERN STATES POWER

Period: 1-1-85/7-1-85  
License No. DPR-42

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>
<u>C</u>	* Fe55	41.2
	* Ni63	22.9
	Co60	11.4
	Co58	8.2
	Zr95	3.4
	NB95	5.4
	Mn54	1.7
	Ag110	1.2
	Cr51	1.2
<u>D</u>	* Fe55	25.0
	Co60	19.2
	* Ni63	16.9
	Cs137	14.9
	Cs134	12.4
	Co58	6.1
	Ag110	3.2
	Mn54	2.2

\* = Inferred - Not Measured on Site

PRAIRIE ISLAND NUCLEAR GENERATING PLANT  
NORTHERN STATES POWER

Period 1-1-85/7-1-85  
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>
<u>9</u>	<u>Truck</u>	<u>Richland</u>
<u>3</u>	<u>Truck</u>	<u>Barnwell</u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>

B. Irradiated Fuel Shipments:

<u>Number of Shipments</u>	<u>Mode</u>	<u>Destination</u>
<u>None</u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>

PRAIRIE ISLAND NUCLEAR GENERATING PLANT  
 NORTHERN STATES POWER

Period: 1-1-85/7-1-85  
 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:

No.	Volume (Ft3)	Activity (Ci)	Type of Waste	Container Code	Solidify Code
85-01	1078	0.069	C	L	--
85-12	630	0.448	B	L	--
85-12	98	0.002	C	L	--
85-14	76	126.563	A	B	--
85-13	76	128.545	A	B	--
85-15	420	0.701	B	L	--
85-15	210	0.701	D	L	C
85-15	98	0.001	C	L	--
85-17	270	0.098	B	L	--
85-17	196	0.020	C	L	--
85-17	178	0.905	D	L	C
85-17	80	0.315	A	L	--
85-20	170	0.793	A	A	--
85-21	196	0.006	C	L	--
85-21	893	0.632	B	L	--
85-22	105	7.190	D	L	C
85-23	170	9.750	A	A	--
85-24	170	0.188	A	L	--
85-24	196	0.002	C	L	--
85-24	364	0.227	B	L	--
85-19	76	122.100	A	B	--

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