

EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT

July THROUGH December of 1983

SUPPLEMENTAL INFORMATION

Facility - Prairie Island Nuclear Generating Plant

Licensee - Northern States Power Company

License Nos. - DPR-42 & DPR-60

1. Regulatory Limits

a. Liquid Effluents:

1. 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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b. Gaseous Effluents:

1. 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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2. 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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2. Maximum Permissible Concentrations

- a. Fission and activation gases in gaseous releases:

10 CFR 20, Appendix B, Table 2, Column 1

- b. Iodine and particulates with half-lives greater than 8 days in gaseous releases:

10 CFR 20, Appendix B, Table 2, Column 1

- c. Liquid Effluents for radionuclides other than dissolved or entrained gases:

10 CFR 20, Appendix B, Table 2, Column 2

- d. Liquid Effluent dissolved and entrained gases:

2.0E-04  $\mu$ ci/ml Total Activity

3.0 Average Energy

Not applicable to Prairie Island Regulatory Limits.

4.0 Measurements and Approximations of Total Radioactivity

a. Fission and activation gases in gaseous releases:	Total	Geli
	Nuclide	Geli
b. Iodines in gaseous releases	Total	Geli
	Nuclide	Geli
c. Particulates in gaseous releases:	Total	Geli
	Nuclide	Geli
d. Liquid Effluents:	Total	Geli
	Nuclide	Geli

BATCH RELEASES

- a. Liquid

Number of Batch Releases

Total Time Period for a Batch Release (hr)

Maximum Time for a Batch Release (hr)

Average Time for a Batch Release (hr)

Minimum Time for a Batch Release (hr)

Ave Mississippi flow during Quarter (CFS)

QTR 3	QTR 4
6.00E01	6.30E01
8.47E01	1.08E02
1.67E00	4.17E00
1.41E00	1.71E00
1.00E00	1.17E00
2.19E04	1.76E04

- b. Gaseous
- |  |  |
|--|--|
| Number of Batch Releases                   |  |
| Total Time Period for a Batch Release (hr) |  |
| Maximum Time for a Batch Release (hr)      |  |
| Average Time for a Batch Release (hr)      |  |
| Minimum Time for a Batch Release (hr)      |  |

QTR 3	QTR 4
5.00E00	4.00E00
4.95E01	1.09E02
3.11E01	8.08E01
9.90E00	2.73E01
4.20E-02	1.08E-01

#### ABNORMAL RELEASES

- a. Liquid
- |                             |  |
|-----------------------------|--|
| Number of Batch Releases    |  |
| Total Activity Release (Ci) |  |
| Total Tritium Release (Ci)  |  |

QTR 3	QTR 4
0.000E00	0.00E00
0.00E00	0.00E00
0.00E00	0.00E00

- b. Gaseous
- |                             |  |
|-----------------------------|--|
| Number of Batch Releases    |  |
| Total Activity Release (Ci) |  |

QTR 3	QTR 4
0.00E00	0.00E00
0.00E00	0.00E00

TABLE 1A  
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT  
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

UNIT	QTR <u>3</u>	QTR <u>4</u>	EST TOTAL ERROR %
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A. Fission and Activation Gases

Total Release	Ci	3.84E01	1.93E01	±2.50E01
Average Release Rate	µCi/sec	4.88E00	2.45E00	
Gamma Dose	mrads	1.39E-02	6.77E-03	
Beta Dose	mrads	5.00E-02	2.46E-02	
% of Gamma T.S. Limit	%	1.39E-01	6.77E-02	
% of Beta T.S. Limit	%	2.50E-01	1.23E-01	

B. Iodines

Total I131	Ci	7.76E-03	7.85E-04	±2.50E01
Average Release Rate	µCi/sec	9.87E-04	9.98E-05	

C. Particulates

Total Release	Ci	8.02E-06	2.26E-05	±2.50E01
Average Release Rate	µCi/sec	1.02E-06	2.87E-06	

D. Tritium

Total Release	Ci	1.78E01	1.45E01	±2.50E01
Average Release Rate	µCi/sec	2.26E00	1.84E00	

Total B & C & D	µCi/sec	2.26E00	1.84E00	±2.50E01
Dose	mrem	5.58E-01	8.01E-02	
% of T.S. Limit	%	3.72E00	5.34E-01	

E. Gross Alpha

Total Release	Ci	0.00E00	0.00E00	±2.50E01
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TABLE 1C

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT  
GASEOUS EFFLUENTS  
GROUND LEVEL RELEASES

CONTINUOUS MODE

BATCH MODE

NUCLIDE	UNIT	QTR <u>3</u>	QTR <u>4</u>	QTR <u>3</u>	QTR <u>4</u>
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## 1. Fission and Activation Gases

Kr85	Ci	5.57E00	2.41E00		
Kr85m	Ci				
Kr87	Ci				
Kr88	Ci				
Xel33	Ci	3.15E01	1.67E01	1.07E-01	1.57E-01
Xel35	Ci	8.27E-01			
Xel35m	Ci				9.50E-03
Xel38	Ci				
Xel31m	Ci	3.90E-01	6.89E-03		
Ar41	Ci				2.69E-03
Xel33m	Ci	4.13E-03			
Total	Ci	3.83E01	1.91E01	1.07E-01	1.69E-01

## 2. Iodines

I131	Ci	7.10E-03	6.72E-04	4.88E-06	7.53E-06
I133	Ci	6.52E-04	1.05E-04	3.31E-07	
I135	Ci				
Total	Ci	7.75E-03	7.77E-04	5.21E-06	7.53E-06

CONTINUOUS MODE

BATCH MODE

NUCLIDE	UNIT	QTR <u>3</u>	QTR <u>4</u>	QTR <u>3</u>	QTR <u>4</u>
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## 3. Particulates

Sr89	Ci		3.56E-08		
Sr90	Ci				
Ca134	Ci				
Ca137	Ci				
Ba-La140	Ci				
Co58	Ci	7.99E-07	2.26E-05		
Co60	Ci	7.22E-06			
Total	Ci	8.02E-06	2.26E-05	0.00E00	0.00E00



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

UNIT	QTR <u>3</u>	QTR <u>4</u>	TOTAL ERROR %
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A. Fission and Activation Products

Total Release W/O H-3, Rad Gas, Alpha	Ci	7.87E-03	1.34E-02	±2.50E01
Average Diluted Concentration	µCi/ml	5.70E-13	9.44E-13	

B. Tritium

Total Release	Ci	1.47E02	9.47E01	±2.50E01
Average Diluted Concentration	µCi/ml	1.06E-08	6.67E-09	

Total A & B	µCi/ml	1.06E-08	6.67E-09	
Total Body Dose	mrem	9.04E-04	1.60E-03	
Critical Organ Dose	mrem	1.37E-03	2.07E-03	
	Organ	LIVER	LIVER	
% Total Body T.S. Limit	%	3.01E-02	5.33E-02	
% of Critical Organ T.S. Limit	%	1.37E-02	2.07E-02	

C. Dissolved and Entrained Gases

Total Release	Ci	9.69E-03	4.38E-03	±2.50E01
Average Diluted Concentration	µCi/ml	7.02E-13	3.08E-13	

D. Gross Alpha

Total Release	Ci	0.00E00	0.00E00	±2.50E01
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E. Volume of Waste  
(Prior to Dilution)

Liters	3.66E07	3.06E07	±2.50E01
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F. Volume of Dilution  
Water

Liters	1.38E13	1.42E13	±2.50E01
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TABLE 2A  
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL RPEORT  
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

CONTINUOUS MODE

BATCH MODE

NUCLIDE	UNIT	QTR <u>3</u>	QTR <u>4</u>	QTR <u>3</u>	QTR <u>4</u>
Sr89	Ci			1.30E-04	
Sr90	Ci				
Cs134	Ci	8.28E-05		4.78E-06	9.71E-05
Cs137	Ci	7.69E-05		1.04E-05	9.22E-05
I131	Ci	4.18E-04	1.20E-03	3.01E-04	3.97E-05
Co58	Ci	8.33E-06	3.46E-05	5.92E-04	3.05E-03
Co60	Ci	2.47E-05		1.30E-04	7.51E-04
Fe59	Ci				
Zn65	Ci				
Mn54	Ci				1.61E-05
Cr51	Ci				
Zr-Nb95	Ci				
Mo99	Ci				
Ba-La140	Ci				
From Addendum	Ci	2.14E-04	0.00E00	5.87E-03	8.20E-03
Total	Ci	8.25E-04	1.23E-03	7.04E-03	1.22E-02

CONTINUOUS MODE

BATCH MODE

NUCLIDE	UNIT	QTR <u>3</u>	QTR <u>4</u>	QTR <u>3</u>	QTR <u>4</u>
Xe133	Ci	7.59E-05	3.52E-03	8.30E-03	7.64E-04
Xe133m	Ci			3.04E-05	
Xe131m	Ci			1.28E-03	
Xe135	Ci		8.48E-05	1.67E-06	1.66E-05
Kr85m	Ci				
Kr85	Ci				
Kr88	Ci				
Total	Ci	7.59E-05	3.60E-03	9.61E-03	7.81E-04

TABLE 2A  
EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT  
SOLID RADIOACTIVE WASTE SEMI-ANNUAL REPORT

July '83 THROUGH December '83

	<u>Volume (FT<sup>3</sup>)</u>	<u>Curie Quantity</u>	<u>Radionuclides</u>	<u>Percent Abundance</u>	<u>Container Type</u>	<u>Quantity</u>
CEMENTED WASTE	502.5	10.93	CO60	70	DOT 7A	67
			CO58	22	Type A	
			CS137	1	55-Gal	
			CS134	1	Drum	
			MN54	1		
COMPACTED TRASH	1005	1.67	CO60	65	DOT 7A	134
			CO58	20	Type A	
			CS134	4	55-Gal	
			CS137	7	Drum	
			MN54	4		
DEWATERED RESIN	572	159.24	CO60	70	Type B	5
			CO58	2	USA/6601/B	
			CS134	4	HIC-121 Ft <sup>3</sup> (2)	
			CS137	23	Type B	
			MN54	1	USA/6754/B	
NON-COMPACTED TRASH .	391.2	0.112			HIC-80 Ft <sup>3</sup> (2)	4
					HN-100	
					Series 2	
					Metal liner 170 Ft <sup>3</sup> (1)	
			CO60	70	Metal Box	
			CO58	22	(STC)	
			CS137	1	97.8 Ft <sup>3</sup>	
			CS134	1		
			MN54	1		

SHIPMENTS 9 5-RICHLAND 4-BARNWELL

Total Volume 2470.7 FT<sup>3</sup>

Total Curie Content 171.95 Curies



TABLE 2A ADDENDUM

## EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT

## LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

NUCLIDE	UNIT	CONTINUOUS RELEASES		BATCH RELEASES	
		QTR 3	QTR 4	QTR 3	QTR 4
As110m	Ci			6.22E-04	3.41E-04
Fe55	Ci			2.88E-03	
I133	Ci	1.34E-04		5.75E-06	
Na24	Ci	7.97E-05			
Sb124	Ci			2.33E-03	5.34E-03
Sb125	Ci				2.45E-03
Sc47	Ci			1.28E-05	7.95E-06
Tc99m	Ci				5.80E-05
Zr97	Ci			1.70E-05	6.30E-06
SUB TOTAL	Ci	2.14E-04	0.00E00	5.87E-03	8.20E-03