

EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT

January THROUGH June 1982

SUPPLEMENTAL INFORMATION

Facility - Prairie Island Nuclear Generating PlantLicensee - Northern States Power Company License Nos. - DPR-42 & DPR-601. Regulatory Limits

Action is required if the rate of release of radioactive materials, when averaged over a three-month period, is such that these quantities, if continued at the same release rate for a year, would exceed twice the design objectives. Design objectives are:

- a. Fission and activation gases (and all other radioactive isotopes except halogen and particulate isotopes with half-lives greater than 8 days) in gaseous releases:

$$\sum_i \frac{Q_i}{MPC_i} \leq 1300 \text{ m}^3/\text{sec}$$

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

$$\sum_i \frac{Q_i}{MPC_i} \leq 67 \text{ m}^3/\text{sec}$$

- c. Liquid Effluents:

1. Annual total quantity of radioactive material in liquid waste, excluding tritium and dissolved gases, of 5 Ci per unit.
2. Annual average concentration of radioactive material in liquid waste, prior to dilution in the Mississippi River, excluding tritium and dissolved gases, of 2×10^{-8} $\mu\text{Ci/ml}$.
3. Annual average concentration of tritium in liquid waste, prior to dilution in the Mississippi River, of 5×10^{-8} $\mu\text{Ci/ml}$.

2. Maximum Permissible Concentrations

- a. Fission and activation gases (and all other radioactive isotopes except halogen and particulate isotopes with half-lives greater than 8 days) in gaseous releases:

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

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2. Maximum Permissible Concentrations

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:

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

3. Average Energy

Not applicable to Prairie Island Regulatory Limits.

4. Measurements and Approximations of Total Radioactivity

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

BATCH RELEASES

a. Liquid		
Number of Patch Releases	QTR 1	QTR 2
Total Time Period for a Batch Release (hr)	1.80E01	8.4E01
Maximum Time for a Batch Release (hr)	2.53E01	1.23E02
Average Time for a Batch Release (hr)	2.00E00	2.42E00
Minimum Time for a Batch Release (hr)	1.41E00	1.47E00
Ave Mississippi flow during Quarter (CFS)	1.17E00	1.17E00
	1.15E04	4.51E04
b. Gaseous		
Number of Batch Releases	QTR 1	QTR 2
Total Time Period for Batch Releases (hr)	0.00E00	3.00E00
Maximum Time for a Batch Release (hr)	0.00E00	3.88E01
Average Time for a Batch Release (hr)	0.00E00	2.59E01
Minimum Time for a Batch Release (hr)	0.00E00	1.29E01
	0.00E00	4.67E00

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ABNORMAL RELEASES

a. Liquid
Number of Releases
Total Activity Released (Ci)
Total Tritium Released (Ci)

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

b. Gaseous
Number of Releases
Total Activity Releases (Ci)

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

TABLE 1A

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

	UNIT	QTR 1	QTR 2	EST TOTAL ERROR %
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A. Fission and Activation Gases

Total Release	Ci	8.07E01	1.36E02	± 25%
Average Release Rate	µCi/sec	1.03E01	1.73E01	

B. Short Lived Particulate ($t_{1/2} < 8$ days)

Total Release	Ci	0.00E00	0.00E00	± 25%
Average Release Rate	µCi/sec	0.00E00	0.00E00	

C. Tritium

Total Release	Ci	9.03E00	1.56E01	± 25%
Average Release Rate	µCi/sec	1.15E00	1.98E00	

Total A & B & C	µCi/sec	1.14E01	1.93E01	± 25%
% of Design Objective	%	4.16E00	7.04E00	

D. Iodines

Total I131	Ci	4.26E-05	1.58E-04	± 25%
Average Release Rate	µCi/sec	5.42E-06	2.01E-05	

E. Long Lived Particulatates ($t_{1/2} > 8$ days)

Total Release	Ci	0.00E00	0.00E00	±
Average Release Rate	µCi/sec	0.00E00	0.00E00	

Total D & E	µCi/sec	5.42E-06	2.01E-05	± 25%
% of Design Objective	%	7.10E-02	2.63E-01	

F. Gross Alpha

Total Release	Ci	0.00E00	0.00E00	± 25%
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TABLE 1B
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
GASEOUS EFFLUENTS

CONTINUOUS MODE

BATCH MODE

NUCLIDE	UNIT	QTR 1	QTR 2	QTR 1	QTR 2
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1. Fission and Activation Gases

Kr85	Ci				3.09E-02
Kr85m	Ci		1.84E00		
Kr87	Ci		7.83E-01		
Kr88	Ci		1.09E00		
Xel133	Ci	8.03E01	1.27E02		2.58E-01
Xel135	Ci	3.89E-01	4.70E00		9.59E-03
Xel135m	Ci		2.18E-01		
Xel138	Ci		8.70E-02		
Xel131m	Ci				
Ar41	Ci				8.39E-02
Xel133m	Ci		6.96E-01		
Total	Ci	8.07E01	1.36E02	0.00E00	3.82E-01

2. Iodines

I131	Ci	4.26E-05	1.58E-04		
I133	Ci		2.20E-04		
I135	Ci				
Total	Ci	4.26E-05	3.78E-04	0.00E00	0.00E00

CONTINUOUS MODE

BATCH MODE

NUCLIDE	UNIT	QTR 1	QTR 2	QTR 1	QTR 2
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3. Particulates

Sr89	Ci				
Sr90	Ci				
Cs134	Ci				
Cs137	Ci				
Ba-La140	Ci				
Co58	Ci				
Co60	Ci				
Cd109	Ci				
Sb124	Ci				
Na24	Ci				
Co57	Ci				
Ce144	Ci				
Zr-Nb95	Ci				
Rb88	Ci				

TABLE 1B
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
GASEOUS EFFLUENTS

3. Particulates

Sr85	Ci				
Mn54	Ci				
Cs138	Ci				
Y88	Ci				
TOTAL	Ci	0.00E00	0.00E00	0.00E00	0.00E00

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

UNIT	QTR 1	QTR 2	TOTAL ERROR %
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A. Fission and Activation Products

Total Release W/O H-3, Rad Gas, Alpha	Ci	4.57E-05	1.42E-04	± 25%
Average Diluted Concentration	µCi/ml	1.78E-13	1.54E-13	
% of T. S. Annual Curie Design Objective	%	4.57E-04	1.42E-03	

B. Tritium

Total Release	Ci	9.24E01	1.98E02	± 25%
Average Diluted Concentration	µCi/ml	3.60E-07	2.14E-07	
% of T. S. Annual Design Objective Conc	%	7.20E00	4.28E00	

C. Dissolved and Entrained Gases

Total Release	Ci	6.31E-03	6.54E-02	± 25%
Average Diluted Concentration	µCi/ml	2.46E-11	7.07E-11	

D. Gross Alpha

Total Release	Ci	0.00E00	8.75E-08	± 25%
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E. Volume of Waste (Prior to Dilution)

liters	4.77E07	8.37E07	± 25%
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F. Volume of Dilution Water

liters	2.57E11	9.25E11	± 25%
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TABLE 2A
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

NUCLIDE	UNIT	Continuous Mode		Batch Mode	
		QTR <u>1</u>	QTR <u>2</u>	QTR <u>1</u>	QTR <u>2</u>
Sr89	Ci				
Sr90	Ci				
Cs134	Ci				
Cs137	Ci				
I131	Ci				
Co58	Ci		1.77E-05		
Co60	Ci				8.28E-06
Fe59	Ci				
Zn65	Ci				
Mn54	Ci				
Cr51	Ci				
Zr-Nb95	Ci				
Mn99	Ci				
Ba-134	Ci				
Ag110m	Ci				
Na24	Ci				
W187	Ci				
Sb124	Ci				
Sr85	Ci				
Cs136	Ci				
Zr-Nb97	Ci				
Cd109	Ci				
Rb88	Ci				
Total	Ci	0.00E00	1.77E-05	0.00E00	8.28E-06

NUCLIDE	UNIT	Continuous Mode		Batch Mode	
		QTR <u>1</u>	QTR <u>2</u>	QTR <u>1</u>	QTR <u>2</u>
Xe133	Ci			6.28E-03	6.44E-02
Xe133m	Ci				4.99E-04
Xe131m	Ci				4.43E-04
Xe135	Ci			1.81E-05	9.58E-05
Kr85m	Ci				
Kr85	Ci				
Kr88	Ci				
Xe135m	Ci			1.58E-05	
Total	Ci	0.00E00	0.00E00	6.31E-03	6.54E-02

TABLE 3
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
January through June 1982
Solid Waste and Irradiated Fuel Shipments

A. Solid waste shipped offsite for burial or disposal (not irradiated fuel)

1. Type of Waste	Unit	6 Month Period	Est. Total Error %
a. Spent Resins	ft ³ Ci	320 320.8	± 15%
b. Dry compressible waste, contaminated equipment, evaporator, bottoms, etc.	ft ³ Ci	2533.3 9.1	± 15%
c. Irradiated components, control rods, etc.	ft ³ Ci	None	
d. Other (describe)	ft ³ Ci	None	

2. Estimate of major nuclide composition (by type of waste).

a.	Co58	2.1%	± 10%
	Co60	79 %	± 10%
	Cs137	14.2 %	± 10%
	Cs134	3.7%	± 10%
	Mn54	1.0%	± 10%
b.	Co58	0.6%	± 10%
	Co60	86.8%	± 10%
	Cs137	8.8%	± 10%
	Cs134	2.3%	± 10%
	Mn54	1.5%	± 10%
c.			
d.			

3. Solid Waste Disposition

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
5	Truck	U.S. Ecology, Richland, WA
2	Truck	Chem Nuclear, Barnwell, SC

B. Irradiated Fuel Shipments (disposition)

NONE



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August 27, 1982

Regional Administrator, Region III
U S Nuclear Regulatory Commission
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Glen Ellyn, IL 60137

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
Docket No. 50-282 License No. DPR-42
50-306 DPR-60

Effluent and Waste Disposal Semiannual Report
for January 1, 1982 through June 30, 1982

In accordance with the Prairie Island Technical Specifications, Appendix A to Operating License DPR-22, we are submitting one copy of the Effluent and Waste Disposal Semiannual Report covering the first half of 1982.

David Musolf
Manager of Nuclear Support Services

DMM/bd

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Certified By Per W. Meinke

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