Northern States Power Company

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February 26, 1992

Prairie Island Technical
Specification TS6.7A 5&6

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Prairie Island Nuclear Generating Plant
Docket No. 50-282 License No. DPR-42
Docket No. 50-306 License No. DPR-60

Effluent and Waste Disposal Semiannual Report
for July 1, 1991 through December 31, 1991

In accordance with the Prairie Island Technical Specifications, Appendix A to Operating License DPR-42 and DPR-60, we are submitting one copy of the Effluent and Waste Disposal Semiannual Report, covering the last half year of 1991.

Analysis for isotopes Sr-89, Sr-90 and Fe-55 for the fourth quarter were not completed in time to be included with this report, therefore, the third quarter values are used as an estimate for the fourth quarter values. The analyses results are not expected to significantly change the computed off-site doses, and will be included with the next semiannual report.

Enclosed with this report is an amended Effluent and Waste Disposal Semiannual Report for the first half of 1991 which includes the previously omitted second quarter analyses results of Sr-89, Sr-90 and Fe-55.

The Offsite Dose Calculation Manual (ODCM) and Process Control Program (PCP) Manual are not attached since they remained unchanged during the reporting period.

Fred L Fey

F.L. Fey, Jr., Manager
Nuclear Radiological Services

Attachment

IE48

TRANSMITTAL MANIFEST

NORTHERN STATES POWER COMPANY

NUCLEAR GENERATION DEPARTMENT

PRAIRIE ISLAND NUCLEAR GENERATING PLANT

Effluent and Waste Disposal Semiannual Report
for July 1, 1991 through December 31, 1991

MANIFEST DATE: FEBRUARY 27, 1992

USNRC	4
Regional Admin III	
NRR Project Manager	
DCD	
Resident Inspector	
K M Beadell	1
D A Schuelke	1
P H Kamman	1
PI Site General Mgr.	1
Monticello Plant Mgr.	1
ERAD Dept.	1
Attn: Records Clerk	
Communications Department	1
NRS File	1
NSS File	1
MDH	1
Attn: Comm. of Health	
ANI Library	1
Fluor Daniels	3
J Gelston	
T Synder	
Corporate Library	
Shaw Pittman Potts & Trowbridge	1
J Silberg	
Westinghouse Electric	2
G Goldberg	
D Sommers	
Safety Audit Committee	10
K J Albrecht	
A B Cutter	
F W Hartley	
D M Musolf	
G H Neils	
T M Parker	
M B Sellman	
C R Steinhardt	
J A Thie	
Secretary	
Manifest File	

EFFLUENT SEMIANNUAL REPORT

01-JUL-91 THROUGH 05-JAN-92

SUPPLEMENTAL INFORMATION

Facility: Prairie Island Nuclear Generating Plant

Licensee: Northern States Power Company

License Numbers: 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 to:

for the quarter	3.0 mrem to the total body 10.0 mrem to any organ
for the year	6.0 mrem to the total body 20.0 mrem to any organ

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
I-131, H-3, LLP	≤1500 mrem/year to any organ

b. The dose due to radioactive gaseous effluents shall be limited to:

noble gases	≤10 mrad/quarter gamma ≤20 mrad/quarter beta ≤20 mrad/year gamma ≤40 mrad/year beta
I-131, H-3, LLP	≤15 mrem/quarter to any organ ≤30 mrem/year to any organ

B. Maximum Permissible Concentration

1. Fission and activation gases in gaseous releases:

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

2. Iodine and particulates with halflives 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 uCi/ml Total Activity

C. Average Energy

Not applicable to Prairie Island regulatory limits.

D. Measurements and approximations of total activity

1.	Fission and activation gases in gaseous releases:	Total Nuclide	GeLi GeLi	±25%
2.	Iodines in gaseous releases:	Total Nuclide	GeLi GeLi	±25%
3.	Particulates in gaseous releases:	Total Nuclide	GeLi GeLi	±25%
4.	Liquid effluents	Total Nuclide	GeLi GeLi	±25%

E. Manual Revisions

1. Offsite Dose Calculations Manual latest Revision number: 12

   Revision date : 30-JUN-91

2. Process Control Program Manual latest Revision number: 4

   Revision date : 23-APR-91

1.0 BATCH RELEASES (LIQUID)

	QTR: 03	QTR: 04
1.1 NUMBER OF BATCH RELEASES	2.90E+01	2.80E+01
1.2 TOTAL TIME PERIOD (HRS)	4.82E+01	4.21E+01
1.3 MAXIMUM TIME PERIOD (HRS)	2.75E+00	1.83E+00
1.4 AVERAGE TIME PERIOD (HRS)	1.66E+00	1.50E+00
1.5 MINIMUM TIME PERIOD (HRS)	9.50E-01	1.27E+00
1.6 AVERAGE MISSISSIPPI RIVER FLOW (CFS)	2.70E+04	1.98E+04

2.0 BATCH RELEASES (GASEOUS)

	QTR: 03	QTR: 04
2.1 NUMBER OF BATCH RELEASES	5.00E+00	0.00E+00
2.2 TOTAL TIME PERIOD (HRS)	4.30E+00	0.00E+00
2.3 MAXIMUM TIME PERIOD (HRS)	3.80E+00	0.00E+00
2.4 AVERAGE TIME PERIOD (HRS)	8.60E-01	0.00E+00
2.5 MINIMUM TIME PERIOD (HRS)	2.00E-02	0.00E+00

3.0 ABNCRMAL RELEASES (LIQUID)

	QTR: 03	QTR: 04
3.1 NUMBER OF RELEASES	0.00E+00	0.00E+00
3.2 TOTAL ACTIVITY RELEASED (CI)	0.00E+00	0.00E+00
3.3 TOTAL TRITIUM RELEASED (CI)	0.00E+00	0.00E+00

4.0 ABNORMAL RELEASES (GASEOUS)

	QTR: 03	QTR: 04
4.1 NUMBER OF RELEASES	0.00E+00	0.00E+00
4.2 TOTAL ACTIVITY RELEASED (CI)	0.00E+00	0.00E+00

TABLE 1A
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

	QTR: 03	QTR: 04
5.0 FISSION AND ACTIVATION GASES		
5.1 TOTAL RELEASE (CI)	2.19E-01	0.00E+00
5.2 AVERAGE RELEASE RATE (UCI/SEC)	2.78E-02	0.00E+00
5.3 GAMMA DOSE (MRAD)	1.70E-05	0.00E+00
5.4 BETA DOSE (MRAD)	1.78E-03	0.00E+00
5.5 PERCENT OF GAMMA TECH SPEC (%)	1.70E-04	0.00E+00
5.6 PERCENT OF BETA TECH SPEC (%)	8.90E-03	0.00E+00
6.0 IODINES		
6.1 TOTAL I-131 (CI)	4.59E-06	0.00E+00
6.2 AVERAGE RELEASE RATE (UCI/SEC)	5.84E-07	0.00E+00
7.0 PARTICULATES		
7.1 TOTAL RELEASE (CI)	3.90E-07	0.00E+00
7.2 AVERAGE RELEASE RATE (UCI/SEC)	4.96E-08	0.00E+00
8.0 TRITIUM		
8.1 TOTAL RELEASE (CI)	1.83E+01	1.35E+01
8.2 AVERAGE RELEASE RATE (UCI/SEC)	2.33E+00	1.59E+00
9.0 TOTAL IODINE, PARTICULATE AND TRITIUM (UCI/SEC)	2.33E+00	1.59E+00
10.0 DOSE (MREM)	3.34E-02	2.43E-02
11.0 PERCENT OF TECH SPEC (%)	2.23E-01	1.62E-01
12.0 GROSS ALPHA (CI)	0.00E+00	0.00E+00

TABLE 1C
GASEOUS EFFLUENTS - GROUND LEVEL RELEASES

13.0 FISSION AND ACTIVATION GASES

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNITS	QTR: 03	QTR: 04	QTR: 03	QTR: 04
KR-85	CI			2.18E-01	
XE-133	CI			9.27E-04	
TOTAL	CI	0.00E+00	0.00E+00	2.19E-01	0.00E+00

14.0 IODINES

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNITS	QTR: 03	QTR: 04	QTR: 03	QTR: 04
I-131	CI	4.59E-06			
TOTAL	CI	4.59E-06	0.00E+00	0.00E+00	0.00E+00

15.0 PARTICULATES

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNITS	QTR: 03	QTR: 04	QTR: 03	QTR: 04
CS-134	CI			1.58E-07	
CS-137	CI			2.32E-07	
TOTAL	CI	0.00E+00	0.00E+00	3.90E-07	0.00E+00

TABLE 2A
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

	QTR: 03	QTR: 04
16.0 VOLUME OF WASTE PRIOR TO DILUTION (LITERS)	3.25E+07	4.23E+07
17.0 VOLUME OF DILUTION WATER (LITERS)	2.65E+11	1.90E+11
18.0 **FISSION AND ACTIVATION PRODUCTS**		
18.1 TOTAL RELEASE W/O H-3, RADGAS, ALPHA (CI)	4.13E-02	3.12E-02
18.2 AVERAGE DILUTED CONCENTRATION (UCi/ML)	1.56E-10	1.64E-10
19.0 **TRITIUM**		
19.1 TOTAL RELEASE (CI)	1.62E+02	1.56E+02
19.2 AVERAGE DILUTED CONCENTRATION (UCI/ML)	6.11E-07	8.21E-07
20.0 **DISSOLVED AND ENTRAINED GASES**		
20.1 TOTAL RELEASE (CI)	2.15E-03	9.23E-04
20.2 AVERAGE DILUTED CONCENTRATION (UCI/ML)	8.11E-12	4.86E-12
21.0 GROSS ALPHA (CI)	0.00E+00	0.00E+00
22.0 TOTAL TRITIUM, FISSION AND ACTIVATION PRODUCTS (UCI/ML)	6.11E-07	8.21E-07
23.0 TOTAL BODY DOSE (MREM)	5.45E-04	5.18E-04
24.0 **CRITICAL ORGAN**		
24.1 DOSE (MREM)	5.45E-04	5.18E-04
24.2 ORGAN	TTL BODY	TTL BODY
25.0 PERCENT OF TOTAL BODY TECH SPEC LIMIT (%)	1.82E-02	1.73E-02
26.0 PERCENT OF CRITICAL ORGAN TECH SPEC LIMIT (%)	1.82E-02	1.73E-02

TABLE 2A
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

27.0 INDIVIDUAL LIQUID EFFLUENT

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNITS	QTR: 03	QTR: 04	QTR: 03	QTR: 04
AG-108M	CI			3.60E-06	
AG-110M	CI			2.42E-02	1.57E-02
BE-7	CI			1.95E-04	1.10E-03
CO-57	CI				5.90E-06
CO-58	CI			9.50E-04	1.12E-03
CO-60	CI			7.38E-04	3.13E-03
CR-51	CI			2.05E-03	2.12E-04
CS-134	CI			8.98E-06	8.54E-06
CS-137	CI			3.46E-05	2.70E-05
FE-55	CI	3.17E-03		8.09E-03	6.34E-03
FE-59	CI			1.71E-04	2.68E-04
I-131	CI				4.54E-06
LA-140	CI				6.67E-06
MN-54	CI			5.41E-06	1.55E-04
NB-97	CI			4.61E-06	
SC-47	CI			1.45E-05	3.89E-05
SB-124	CI			4.75E-04	2.80E-04
SB-125	CI			8.52E-04	2.20E-03
SN-113	CI			3.23E-04	4.22E-04
SR-92	CI			5.44E-06	
W-187	CI				9.09E-06
ZR-95	CI				6.25E-05
TOTAL	CI	3.17E-03	0.00E+00	3.81E-02	3.12E-02

TABLE 2A
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

28.0 DISSOLVED AND ENTRAINED GASES

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNITS	QTR: 03	QTR: 04	QTR: 03	QTR: 04
KR-85	CI			2.31E-04	
XE-133	CI			1.91E-03	9.03E-04
XE-135	CI			8.56E-06	1.99E-05
TOTAL	CI	0.00E+00	0.00E+00	2.15E-03	9.23E-04

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
NORTHERN STATES POWER

Period: 7-1-91 to 12-31-9
License No. DPR-42

SOLID RADIOACTIVE WASTE DISPOSAL SEMI-ANNUAL REPORT

Table I: Solid Waste and Irradiated Fuel Shipments

1. Solid Waste Total Volumes and Total Curie Quantities:

Type of Waste	Units	Totals	Container Disposal Volumes (List)
A. Resins	ft^3	1052.3	183.3
	Ci	180.088	135.8
B. Dry-Compacted	ft^3	2572.5	7.5
	Ci	8.197	
C. Non-Compacted	ft^3	270.6	96
	Ci	.472	
D. Filter Media	ft^3		
	Ci		
S. Spent Fuel	ft^3		
	Ci		

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PRAIRIE ISLAND NUCLEAR GENERATING PLANT
NORTHERN STATES POWER

Period: 7-1-91 to 12-31-91
License No. DPR-42

SOLID RADIOACTIVE WASTE DISPOSAL SEMI-ANNUAL REPORT

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

2. Principal Radionuclide Composition by Type of Waste:

TYPE (From Page 1)		Nuclide	Percent Abundance
A		CO-60	40.6
	*	NI-63	28.5
		CO-58	18.6
		CS-137	5.5
	*	FE-55	3.5
		CS-134	1.7
B		CO-60	43.4
	*	NI-63	28.7
	*	FE-55	19.1
	*	C-14	6.2
		SB-125	1.0

* = Inferred - Not Measured on Site

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PRAIRIE ISLAND NUCLEAR GENERATING PLANT
NORTHERN STATES POWER

Period: 7-1-91 to 12-31-9
License No. DPR-42

SOLID RADIOACTIVE WASTE DISPOSAL SEMI-ANNUAL REPORT

Table 1: Solid Waste and Irradiated Fuel Shipments (Continued)

2. Principal Radionuclide Composition by Type of Waste (Continuation):

TYPE (From Page 1)	Nuclide	Percent Abundance
C	* H-3	35.8
	CS-137	22.6
	* C-14	21.3
	CS-134	16.6
	CO-60	1.6
	* NI-63	1.0
	* FE-55	0.7

* = Inferred - Not Measured on Site

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PRAIRIE ISLAND NUCLEAR GENERATING PLANT
NORTHERN STATES POWER

Period: 7-1-91 to 12-31-9
License No. DPR-42

SOLID RADIOACTIVE WASTE DISPOSAL SEMI-ANNUAL REPORT

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

3. Solid Waste Disposition:

Number of Shipments	Mode	Destination
10	Truck	Richland, WA
2	Truck	Oak Ridge, TN
1	Truck	Barnwell, SC

4. Irradiated Fuel Shipments:

Number of Shipments	Mode	Destination

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
NORTHERN STATES POWER

Period: 7-1-91 to 12-31-9
License No. DPR-42

SOLID RADIOACTIVE WASTE DISPOSAL SEMI-ANNUAL REPORT

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

5. Shipping Container and Solidification Method:

No.	Disposal Volume (Ft3)	Activity (Ci)	Type of Waste	Container Code	Solidif. Code
91-09	153.8	0.363	C	L	N/A
91-10	116.8	0.108	C	L	N/A
91-20	510.0	1.439	B	L	N/A
91-21	510.0	2.567	B	L	N/A
91-23	183.3	3.160	A	L	N/A
91-25	183.3	1.741	A	L	N/A
91-22	510.0	2.305	B	L	N/A
91-27	183.3	1.379	A	L	N/A
91-28	183.3	0.966	A	L	N/A
91-24	510.0	0.970	B	L	N/A
91-26	532.5	0.916	B	L	N/A
91-29	183.3	3.528	A	L	N/A
91-30	135.8	169.314	A	L	N/A

TOTALS 13 3895.4 188.756

CONTAINER CODES: (Shipment Type)
L = LSA
A = Type A
B = Type B
Q = Highway Route Controlled Quantity

SOLIDIFICATION CODES: C = Cement

TYPES OF WASTE:
A = Resins
B = Dry Compacted
C = Non-Compacted
D = Filter Media
S = Spent Fuel

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PRAIRIE ISLAND NUCLEAR GENERATING PLANT
NORTHERN STATES POWER

Period: 7-1-91 to 12-31-91
License No. DPR-42

SOLID RADIOACTIVE WASTE DISPOSAL SEMI-ANNUAL REPORT

Table II: Process Control Program Changes

Title: Process Control Program for Solidification/Dewatering of Radioactive Waste From Liquid Systems.

Current Revision Number: 4 Effective Date: 5-23-91

NOTE: If the effective date of the PCP is within the period covered by this report, then a description and justification of the changes to the PCP is required (T.S. 6.7.A.4). Attach the sidelined pages to this report.

Changes/Justification:

EFFLUENT SEMIANNUAL REPORT

30-DEC-90 THROUGH 30-JUN-91

SUPPLEMENTAL INFORMATION

Facility: Prairie Island Nuclear Generating Plant

Licensee: Northern States Power Company

License Numbers: 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 to:

for the quarter	3.0 mrem to the total body 10.0 mrem to any organ
for the year	6.0 mrem to the total body 20.0 mrem to any organ

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
I-131, H-3, LLP	≤1500 mrem/year to any organ

b. The dose due to radioactive gaseous effluents shall be limited to:

noble gases	≤10 mrad/quarter gamma ≤20 mrad/quarter beta ≤20 mrad/year gamma ≤40 mrad/year beta
I-131, H-3, LLP	≤15 mrem/quarter to any organ ≤30 mrem/year to any organ

B. Maximum Permissible Concentration

1. Fission and activation gases in gaseous releases:

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

2. Iodine and particulates with halflives 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 uCi/ml Total Activity

C. Average Energy

Not applicable to Prairie Island regulatory limits.

D. Measurements and approximations of total activity

1.	Fission and activation gases in gaseous releases:	Total Nuclide	GeLi GeLi	±25%
2.	Iodines in gaseous releases:	Total Nuclide	GeLi GeLi	±25%
3.	Particulates in gaseous releases:	Total Nuclide	GeLi GeLi	±25%
4.	Liquid effluents	Total Nuclide	GeLi GeLi	±25%

E. Manual Revisions

1. Offsite Dose Calculations Manual latest Revision number: 12

   Revision date : 30-JUN-91

2. Process Control Program Manual latest Revision number: 4

   Revision date : 23-APR-91

1.0 BATCH RELEASES (LIQUID)	QTR: 01	QTR: 02
1.1 NUMBER OF BATCH RELEASES	3.00E+01	6.90E+01
1.2 TOTAL TIME PERIOD (HRS)	4.42E+01	1.19E+02
1.3 MAXIMUM TIME PERIOD (HRS)	2.00E+00	3.58E+00
1.4 AVERAGE TIME PERIOD (HRS)	1.47E+00	1.72E+00
1.5 MINIMUM TIME PERIOD (HRS)	4.20E-01	1.17E+00
1.6 AVERAGE MISSISSIPPI RIVER FLOW (CFS)	9.21E+03	4.14E+04

2.0 BATCH RELEASES (GASEOUS)	QTR: 01	QTR: 02
2.1 NUMBER OF BATCH RELEASES	3.00E+00	1.80E+01
2.2 TOTAL TIME PERIOD (HRS)	1.40E+00	1.37E+02
2.3 MAXIMUM TIME PERIOD (HRS)	1.20E+00	1.99E+01
2.4 AVERAGE TIME PERIOD (HRS)	4.67E-01	7.60E+00
2.5 MINIMUM TIME PERIOD (HRS)	6.00E-02	1.00E-01

3.0 ABNORMAL RELEASES (LIQUID)	QTR: 01	QTR: 02
3.1 NUMBER OF RELEASES	0.00E+00	0.00E+00
3.2 TOTAL ACTIVITY RELEASED (CI)	0.00E+00	0.00E+00
3.3 TOTAL TRITIUM RELEASED (CI)	0.00E+00	0.00E+00

4.0 ABNORMAL RELEASES (GASEOUS)	QTR: 01	QTR: 02
4.1 NUMBER OF RELEASES	0.00E+00	0.00E+00
4.2 TOTAL ACTIVITY RELEASED (CI)	0.00E+00	0.00E+00

TABLE 1A
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

	QTR: 01	QTR: 02
5.0 **FISSION AND ACTIVATION GASES**		
5.1 TOTAL RELEASE (CI)	2.13E-01	5.56E+01
5.2 AVERAGE RELEASE RATE (UCI/SEC)	2.71E-02	7.07E+00
5.3 GAMMA DOSE (MRAD)	8.05E-05	2.24E-02
5.4 BETA DOSE (MRAD)	2.39E-04	7.34E-02
5.5 PERCENT OF GAMMA TECH SPEC (%)	8.05E-04	2.24E-01
5.6 PERCENT OF BETA TECH SPEC (%)	1.20E-03	3.67E-01
6.0 **IODINES**		
6.1 TOTAL I-131 (CI)	0.00E+00	1.14E-04
6.2 AVERAGE RELEASE RATE (UCI/SEC)	0.00E+00	1.45E-05
7.0 **PARTICULATES**		
7.1 TOTAL RELEASE (CI)	0.00E+00	3.68E-04
7.2 AVERAGE RELEASE RATE (UCI/SEC)	0.00E+00	4.68E-05
8.0 **TRITIUM**		
8.1 TOTAL RELEASE (CI)	1.46E+01	2.40E+01
8.2 AVERAGE RELEASE RATE (UCI/SEC)	1.86E+00	3.05E+00
9.0 TOTAL IODINE, PARTICULATE AND TRITIUM (UCI/SEC)	1.86E+00	3.05E+00
10.0 DOSE (MREM)	2.70E-02	1.25E-01
11.0 PERCENT OF TECH SPEC (%)	1.80E-01	8.33E-01
12.0 GROSS ALPHA (CI)	0.00E+00	4.43E-08

TABLE 1C
GASEOUS EFFLUENTS - GROUND LEVEL RELEASES

13.0 FISSION AND ACTIVATION GASES

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNITS	QTR: 01	QTR: 02	QTR: 01	QTR: 02
AR-41	CI				6.54E-03
KR-85	CI		1.18E+00		8.05E-01
XE-131M	CI				8.71E-03
XE-133	CI	2.13E-01	5.16E+01		9.43E-01
XE-133M	CI		5.69E-01		
XE-135	CI		4.45E-01		3.42E-03
TOTAL	CI	2.13E-01	5.38E+01	0.00E+00	1.77E+00

14.0 IODINES

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNITS	QTR: 01	QTR: 02	QTR: 01	QTR: 02
I-131	CI		1.14E-04		
I-133	CI		1.32E-05		9.07E-09
TOTAL	CI	0.00E+00	1.27E-04	0.00E+00	9.07E-09

15.0 PARTICULATES

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNITS	QTR: 01	QTR: 02	QTR: 01	QTR: 02
CS-137	CI				7.95E-05
CS-134	CI				6.67E-05
CO-58	CI		2.39E-07		2.14E-05
CO-60	CI				1.88E-04
MN-54	CI				1.18E-05
NB-95	CI		1.15E-06		
TOTAL	CI	0.00E+00	1.39E-06	0.00E+00	3.67E-04

TABLE 2A
LIQUID FFFLUENTS - SUMMATION OF ALL RELEASES

	QTR: 01	QTR: 02
16.0 VOLUME OF WASTE PRIOR TO DILUTION (LITERS)	2.04E+07	3.66E+07
17.0 VOLUME OF DILUTION WATER (LITERS)	1.46E+11	6.94E+10
18.0 **FISSION AND ACTIVATION PRODUCTS**		
18.1 TOTAL RELEASE W/O H-3, RADGAS, ALPHA (CI)	3.29E-02	7.94E-02
18.2 AVERAGE DILUTED CONCENTRATION (UCI/ML)	2.25E-10	1.14E-09
19.0 **TRITIUM**		
19.1 TOTAL RELEASE (CI)	1.64E+02	7.64E+01
19.2 AVERAGE DILUTED CONCENTRATION (UCI/ML)	1.12E-06	1.10E-06
20.0 **DISSOLVED AND ENTRAINED GASES**		
20.1 TOTAL RELEASE (CI)	5.99E-03	1.07E-03
20.2 AVERAGE DILUTED CONCENTRATION (UCI/ML)	4.10E-11	1.54E-11
21.0 GROSS ALPHA (CI)	0.00E+00	0.00E+00
22.0 TOTAL TRITIUM, FISSION AND ACTIVATION PRODUCTS (UCI/ML)	1.12E-06	1.10E-06
23.0 TOTAL BODY DOSE (MREM)	5.98E-04	1.21E-03
24.0 **CRITICAL ORGAN**		
24.1 DOSE (MREM)	5.98E-04	1.21E-03
24.2 ORGAN	TTL BODY	TTL BODY
25.0 PERCENT OF TOTAL BODY TECH SPEC LIMIT (%)	1.99E-02	4.04E-02
26.0 PERCENT OF CRITICAL ORGAN TECH SPEC LIMIT (%)	1.99E-02	4.04E-02

TABLE 2A
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

27.0 INDIVIDUAL LIQUID EFFLUENT

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNITS	QTR: 01	QTR: 02	QTR: 01	QTR: 02
AG-110M	CI			1.06E-02	3.39E-02
BE-7	CI			5.38E-05	
CO-57	CI				7.12E-06
CO-58	CI		6.02E-06	4.99E-04	1.36E-02
CO-60	CI	4.57E-06		2.15E-03	2.42E-03
CR-51	CI			5.35E-04	4.64E-03
CS-134	CI		6.37E-05	1.22E-05	1.27E-05
CS-137	CI		1.25E-04	3.90E-05	3.66E-05
FE-55	CI	2.69E-04		1.71E-02	1.54E-02
FE-59	CI			2.06E-04	8.56E-04
I-131	CI				1.50E-04
LA-140	CI				3.95E-05
MN-54	CI			3.84E-05	2.21E-04
NB-95	CI			8.48E-05	
RH-105	CI			1.21E-05	
SB-122	CI				2.64E-04
SB-124	CI			2.16E-04	4.06E-03
SB-125	CI			7.40E-04	2.47E-03
SB-126	CI				5.96E-06
SC-47	CI			4.41E-06	2.20E-04
SE-75	CI				1.34E-05
SN-113	CI			3.04E-04	5.29E-04
SR-92	CI			2.86E-06	3.22E-04

CONTINUED

TABLE 2A
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

27.0 INDIVIDUAL LIQUID EFFLUENT (CONTINUED)

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNITS	QTR: 01	QTR: 02	QTR: 01	QTR: 02
W-187	CI			1.45E-05	
ZN-65	CI			6.26E-06	
ZR-95	CI			4.10E-05	
ZR-97	CI				1.33E-06
TOTAL	CI	2.74E-04	1.95E-04	3.26E-02	7.94E-02

28.0 DISSOLVED AND ENTRAINED GASES

		CONTINUOUS MODE		BATCH MODE	
NUCLIDE	UNITS	QTR: 01	QTR: 02	QTR: 01	QTR: 02
XE-131M	CI				3.18E-05
XE-133	CI		2.64E-05	5.96E-03	7.62E-04
XE-133M	CI			2.72E-05	4.61E-06
XE-137	CI				2.40E-04
TOTAL	CI	0.00E+00	2.64E-05	5.99E-03	1.04E-03

NORTHERN STATES POWER COMPANY

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
OFF-SITE RADIATION DOSE ASSESSMENT FOR

January 1- December 31, 1991

An assessment of radiation dose due to release from the Prairie Island Nuclear Generating Plant during 1991 was performed in accordance with the Technical Specifications. Computed doses were well below the 40 CFR Part 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 Effluent and Waste Disposal Semiannual Reports prepared for NRC review during the year of 1991.

Off-site Doses from Gaseous Release

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 Release

Computed doses due to liquid releases are reported in Table 1. Receptor information is reported in Table 2. Both whole body dose and organ dose are a small percentage of Appendix I Guidelines.

Doses to Individuals Due to Activities Inside the Site Boundary

Occasionally sportsmen enter the Prairie Island site for recreational activities. These individuals are not expected to spend more than a few hours per year within the site boundary. Commercial and recreational river traffic exists through this area.

For purposes of estimating the dose due to recreational and river water transportation activities within the site boundary, it is assumed that the limiting dose within the site boundary would be received by an individual who spends a total of seven days per year on the river just off shore from the main plant buildings (ESE at 0.2 miles). Whole body and inhalation organ doses were calculated for this location and occupancy time. These doses were reported in Table 1.

Doses to Most Exposed Member of the General Public from Reactor Releases and Other Uranium Fuel Cycle Sources

There are no other uranium fuel facilities in the vicinity of the Prairie Island site. The only other artificial source of exposure to the general public in addition to the plant effluent releases is from direct radiation of the reactors. This direct radiation from pressurized water reactors has been shown to be negligible. An array of TLD monitoring stations around the perimeter of the site boundary has consistently indicated that plant operation in the past years has no effect on ambient gamma radiation.

Therefore, the 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 the sum of the liquid and gaseous whole body and organ doses reported in Table 1 for the site boundary and critical receptor, respectively. These doses are well below 40 CFR Part 190 standards of 25 mrem to the whole body, 75 mrem to the thyroid, and 25 mrem to any other organ.

TABLE 1

OFF-SITE RADIATION DOSE ASSESSMENT - PRAIRIE ISLAND

PERIOD: JANUARY 1 through DECEMBER 31, 1991

		10 CFR Part 50 Appendix I Guidelines per 2-units site per year
Gaseous Releases		
Maximum Site Boundary Gamma Air Dose (mrad)	0.0212	20
Maximum Site Boundary Beta Air Dose (mrad)	0.0661	40
Maximum Off-site Dose to Any Organ (mrem)* Total	0.194	30
Offshore Location (mrem)		
Whole Body	2.09E-04	10
Organ	2.12E-04	30
Liquid Releases		
Maximum Off-site Dose Whole Body (mrem)	2.89E-03	6
Maximum Off-site Dose Organ, Total	2.89E-03	20

* Long-lived Particulates, I-131, and H-3

TABLE 2

OFF-SITE RADIATION DOSE ASSESSMENT - PRAIRIE ISLAND
SUPPLEMENTAL INFORMATION

PERIOD: JANUARY 1 through DECEMBER 31, 1991

Gaseous Releases

Maximum Site Boundary Dose Location (from Building vents)	
Sector	WNW
Distance (miles)	0.4
Offshore Location Within Site Boundary	
Sector	ESE
Distance (miles)	0.2
Maximum Off-site Dose Location	
Sector	SSE
Distance (miles)	0.6
Pathways	Plume, Ground, Inhalation, Vegetables
Age Group	Child
Organ	Skin

Liquid Releases

Maximum Off-site Dose Location Downstream	
Pathways	Fish
Organ	Whole Body