

EFFLUENT SEMIANNUAL REPORT

06-JUL-92 THROUGH 03-JAN-93

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
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- 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 : 17-JUN-91
2. Process Control Program Manual latest Revision number: 4  
Revision date : 23-APR-91

## 1.0 BATCH RELEASES (LIQUID)

- 1.1 NUMBER OF BATCH RELEASES
- 1.2 TOTAL TIME PERIOD (HRS)
- 1.3 MAXIMUM TIME PERIOD (HRS)
- 1.4 AVERAGE TIME PERIOD (HRS)
- 1.5 MINIMUM TIME PERIOD (HRS)
- 1.6 AVERAGE MISSISSIPPI RIVER FLOW (CFS)

QTR: 03	QTR: 04
5.00E+01	1.03E+02
2.24E+02	1.91E+02
7.53E+00	4.62E+00
4.48E+00	1.86E+00
2.83E+00	1.20E+00
1.95E+04	5.76E+04

## 2.0 BATCH RELEASES (GASEOUS)

- 2.1 NUMBER OF BATCH RELEASES
- 2.2 TOTAL TIME PERIOD (HRS)
- 2.3 MAXIMUM TIME PERIOD (HRS)
- 2.4 AVERAGE TIME PERIOD (HRS)
- 2.5 MINIMUM TIME PERIOD (HRS)

QTR: 03	QTR: 04
6.00E+00	1.30E+01
1.42E+01	2.98E+01
8.00E+00	8.10E+00
1.33E+00	2.29E+00
2.50E-01	2.50E-01

## 3.0 ABNORMAL RELEASES (LIQUID)

- 3.1 NUMBER OF RELEASES
- 3.2 TOTAL ACTIVITY RELEASED (CI)
- 3.3 TOTAL TRITIUM RELEASED (CI)

QTR: 03	QTR: 04
0.00E+00	1.00E+00
0.00E+00	3.70E-03
0.00E+00	2.96E-02

## 4.0 ABNORMAL RELEASES (GASEOUS)

- 4.1 NUMBER OF RELEASES
- 4.2 TOTAL ACTIVITY RELEASED (CI)

QTR: 03	QTR: 04
0.00E+00	0.00E+00
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)	1.73E+01	3.52E+00
5.2 AVERAGE RELEASE RATE (UCI/SEC)	2.20E+00	4.48E-01
5.3 GAMMA DOSE (MRAD)	7.46E-03	2.05E-03
5.4 BETA DOSE (MRAD)	2.39E-02	1.16E-02
5.5 PERCENT OF GAMMA TECH SPEC (%)	7.46E-02	2.05E-02
5.6 PERCENT OF BETA TECH SPEC (%)	1.20E-01	5.80E-02
6.0 IODINES		
6.1 TOTAL I-131 (CI)	1.48E-05	1.72E-04
6.2 AVERAGE RELEASE RATE (UCI/SEC)	1.88E-06	2.19E-05
7.0 PARTICULATES		
7.1 TOTAL RELEASE (CI)	3.71E-06	3.80E-05
7.2 AVERAGE RELEASE RATE (UCI/SEC)	4.72E-07	4.83E-06
8.0 TRITIUM		
8.1 TOTAL RELEASE (CI)	1.59E+01	9.80E+00
8.2 AVERAGE RELEASE RATE (UCI/SEC)	2.02E+00	1.25E+00
9.0 TOTAL IODINE, PARTICULATE AND TRITIUM (UCI/SEC)	2.02E+00	1.25E+00
10.0 DOSE (MREM)	3.39E-02	4.31E-02
11.0 PERCENT OF TECH SPEC (%)	2.26E-01	2.87E-01
12.0 GROSS ALPHA (CI)	0.00E+00	5.39E-08

TABLE 1C  
GASEOUS EFFLUENTS - GROUND LEVEL RELEASES

## 13.0 FISSION AND ACTIVATION GASES

NUCLIDE	UNITS	CONTINUOUS MODE		BATCH MODE	
		QTR: 03	QTR: 04	QTR: 03	QTR: 04
KR-85	CI			2.74E-01	7.90E-01
XE-131M	CI				2.41E-02
XE-133	CI	1.61E+01	1.85E+00	6.58E-01	8.10E-01
XE-133M	CI	1.67E-01			5.66E-04
XE-135	CI	1.58E-01	4.15E-02	1.43E-04	2.06E-05
XE-135M	CI			5.72E-04	
TOTAL	CI	1.64E+01	1.90E+00	9.33E-01	1.62E+00

## 14.0 IODINES

NUCLIDE	UNITS	CONTINUOUS MODE		BATCH MODE	
		QTR: 03	QTR: 04	QTR: 03	QTR: 04
I-131	CI	1.07E-05	1.65E-04	4.08E-06	7.11E-06
I-132	CI			5.73E-10	
I-133	CI			2.97E-06	1.02E-07
I-134	CI			5.29E-10	
I-135	CI			4.87E-07	
TOTAL	CI	1.07E-05	1.65E-04	7.54E-06	7.21E-06

TABLE 1C  
GASEOUS EFFLUENTS - GROUND LEVEL RELEASES

## 15.0 PARTICULATES

NUCLIDE	UNITS	CONTINUOUS MODE		BATCH MODE	
		QTR: 03	QTR: 04	QTR: 03	QTR: 04
AG-110M	CI		7.01E-07		
CO-58	CI		3.36E-06		5.61E-06
CO-60	CI				1.67E-06
CS-134	CI			1.88E-06	8.83E-06
CS-136	CI			2.35E-07	
CS-137	CI			1.56E-06	7.68E-06
MN-54	CI			3.80E-08	
NA-24	CI			2.81E-10	
NB-97	CI				1.51E-07
NB-95	CI				5.47E-06
SR-89	CI			5.10E-08	
TE-132	CI				3.61E-07
ZR-95	CI				3.36E-06
SR-90	CI		8.02E-07		
TOTAL	CI	0.00E+00	4.86E-06	3.71E-06	3.31E-05

TABLE 2A  
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

	QTR: 03	QTR: 04
16.0 VOLUME OF WASTE PRIOR TO DILUTION (LITERS)	2.77E+07	3.09E+08
17.0 VOLUME OF DILUTION WATER (LITERS)	2.66E+11	9.35E+10
18.0 FISSION AND ACTIVATION PRODUCTS		
18.1 TOTAL RELEASE W/O H-3, RADGAS, ALPHA (CI)	1.11E-01	2.23E-01
18.2 AVERAGE DILUTED CONCENTRATION (UCI/ML)	4.17E-10	2.39E-09
19.0 TRITIUM		
19.1 TOTAL RELEASE (CI)	2.10E+02	3.93E+01
19.2 AVERAGE DILUTED CONCENTRATION (UCI/ML)	7.90E-07	4.19E-07
20.0 DISSOLVED AND ENTRAINED GASES		
20.1 TOTAL RELEASE (CI)	2.39E-02	2.20E-02
20.2 AVERAGE DILUTED CONCENTRATION (UCI/ML)	8.99E-11	2.35E-10
21.0 GROSS ALPHA (CI)	0.00E+00	0.00E+00
22.0 TOTAL TRITIUM, FISSION AND ACTIVATION PRODUCTS (UCI/ML)	7.90E-07	4.21E-07
23.0 TOTAL BODY DOSE (MREM)	8.12E-04	3.82E-03
24.0 CRITICAL ORGAN		
24.1 DOSE (MREM)	8.12E-04	3.82E-03
24.2 ORGAN	TTL BODY	TTL BODY
25.0 PERCENT OF TOTAL BODY TECH SPEC LIMIT (%)	2.71E-02	1.27E-01
26.0 PERCENT OF CRITICAL ORGAN TECH SPEC LIMIT (%)	2.71E-02	1.27E-01

TABLE 2A  
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

## 27.0 INDIVIDUAL LIQUID EFFLUENT

NUCLIDE	UNITS	CONTINUOUS MODE		BATCH MODE	
		QTR: 03	QTR: 04	QTR: 03	QTR: 04
AG-108M	CI				2.66E-06
AG-110M	CI		1.15E-04	2.17E-02	1.34E-02
BE-7	CI			4.26E-04	5.75E-05
CO-57	CI			5.29E-05	1.59E-05
CO-58	CI		5.93E-05	1.83E-02	5.43E-02
CO-60	CI			7.21E-03	9.82E-03
CR-51	CI			1.95E-03	1.39E-02
CS-134	CI		3.40E-05		3.06E-04
CS-137	CI		2.78E-05	5.84E-05	4.21E-04
CU-64	CI				8.17E-04
FE-55	CI			5.19E-02	4.99E-02
FE-59	CI			1.34E-03	6.04E-03
I-131	CI		5.56E-06	8.19E-05	3.03E-03
I-133	CI				6.91E-06
LA-140	CI			1.00E-04	3.44E-04
MN-54	CI			7.29E-04	1.61E-03
MO-99	CI			1.58E-05	1.37E-05
NA-24	CI				8.06E-07
NB-95	CI				3.29E-04
NB-97	CI			7.93E-06	5.25E-06
RH-105	CI			2.20E-05	
RU-103	CI				3.17E-06
SB-122	CI			2.08E-05	3.60E-03
SB-124	CI			1.09E-03	3.59E-02

Subject: Northern States Power, Prairie Island Liquid Effluent Release  
Abnormal Release during 4th Quarter 1992.

On Dec 6, 1992 two liquid waste tanks were placed on recirculation for release. One of the tanks were sampled and processed for release prior to the second tank. The release authorization papers and operations procedures became mixed up and the tank that was not yet sampled and authorized was released. The mistake was realized later in the day when the sample and release authorization papers were being prepared for the second tank to be released. Follow-up samples were taken and compared to projected and actual observed radiation monitor readings. The two tanks were very similar in concentration and it was determined that the original pre-release dose calculations were reasonably accurate. The tank was released at a rate that was 0.22% of the maximum release rate limit based on MPCs as per the ODCM.

Operations and Effluent Release procedures have been altered to prevent re-occurrence. This event has been investigated and the corrective actions determined adequate. Further information concerning this event can be found in Prairie Island LER for Unit #1 92-16.