

AMENDMENT

to the
MONTICELLO

Effluent and Waste Disposal Semiannual Report
(for the 2nd Half year of 1989)

*This report provides the previously omitted 4th quarter
analyses results of Sr-89 and Sr-90*

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NORTHERN STATES POWER COMPANY
MONTICELLO NUCLEAR GENERATING PLANT
License No. DPR-22

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
Period : Jul - Dec 1989

Supplemental Information

1. Regulatory Limits - Quarterly levels requiring reporting to
Nuclear Regulatory Commission

A. Noble Gases :

5 mrad/quarter gamma radiation
10 mrad/quarter beta radiation

B. Long Lived Iodines, Particulates, and Tritium :

7.5 mrem/quarter dose to any organ

C. Liquid Effluents :

1.5 mrem/quarter dose to the total body
5.0 mrem/quarter dose to any organ

2. Maximum Permissible Concentrations

A. Noble Gases :

10 CFR Part 20, Appendix B, Table II, Column 1

B. Long Lived Iodines, Particulates, and Tritium :

10 CFR Part 20, Appendix B, Table II, Column 1

C. Liquid Effluents :

10 CFR Part 20, Appendix B, Table II, Column 2
2.0 E-4 uci/ml for dissolved and entrained gases

3. Average Energy

(Not Applicable)

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Period : Jul -- Dec 1989

Supplemental Information (continued)

4. Measurements and Approximations of Total Radioactivity

A. Noble Gases :

Continuous gross activity monitors in Reactor Building Vent and Plant Stack exhaust streams. Weekly isotopic analysis of exhaust streams.

B. Iodines in Gaseous Effluent :

Continuous monitoring with charcoal cartridges in Reactor Building Vent and Plant Stack exhaust streams with weekly analysis.

C. Particulates in Gaseous Effluent :

Continuous monitoring with particulate filters in Reactor Building Vent and Plant Stack exhaust streams with weekly analysis.

D. Tritium in Gaseous Effluent :

Continuous monitoring with silica gel cartridges in Reactor Building Vent and Plant Stack exhaust streams with weekly analysis.

E. Liquid Effluents :

Tank sample analyzed prior to each planned release and continuous monitoring of gross activity during planned release.

5. Batch Releases

A. Liquid :

1. Number of Batch Releases	0	
2. Total Time Period for Batch Releases	NA	min
3. Maximum Time Period for a Batch Release	NA	min
4. Average Time Period for a Batch Release	NA	min
5. Minimum Time Period for a Batch Release	NA	min
6. Average River Flow During Release	NA	cf/sec

B. Gaseous :

1. Number of Batch Releases	3	
2. Total Time Period for Batch Releases	2821.0	min
3. Maximum Time Period for a Batch Release	2160.0	min
4. Average Time Period for a Batch Release	940.3	min
5. Minimum Time Period for a Batch Release	136.0	min

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Supplemental Information (continued)

6. Abnormal Releases

A. Liquid :

1. Number of Releases	0	
2. Total Activity Released	NA	Ci

B. Gaseous :

1. Number of Releases	0	
2. Total Activity Released	0.0	Ci

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Table 1A Gaseous Effluents - Summation of all Releases

	Units	3rd Qtr	4th Qtr	Est. Total Error, %
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A. Fission & Activation gases

1. Total Release	Ci	6.85E+02	5.74E+02	5.00E+01
2. Average Release Rate	uci/sec	8.61E+01	7.23E+01	
3. Percent Tech Spec Qtrly Reporting Level				
Gamma Radiation	%	4.09E+00	7.92E-01	
Beta Radiation	%	2.45E+00	4.25E-01	

B. Iodines

1. Total I-131 Release	Ci	2.54E-02	2.95E-03	5.00E+01
2. Average I-131 Release Rate	uci/sec	3.20E-03	3.71E-04	

C. Particulates

1. Total Particulates	Ci	1.03E-02	1.16E-03	5.00E+01
2. Average Release Rate	uci/sec	1.29E-03	1.46E-04	
3. Gross Alpha Radioactivity	Ci	2.89E-05	1.54E-05	

Tritium

1. Total Release	Ci	2.67E+01	1.21E+01	5.00E+01
2. Average Release Rate	uci/sec	3.36E+00	1.52E+00	

E. Percent Qtrly Tech Spec Reporting Levels

1. Iodines, Particulates, and Tritium	%	4.74E+00	5.26E-01	
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EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
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Table 1B Gaseous Effluents - Elevated Releases

Nuclides Released	Unit	Continuous Mode		Batch Mode	
		3rd Qtr	4th Qtr	3rd Qtr	4th Qtr
1. Fission Gases					
KR-85	Ci	1.46E+01	1.50E+01	0.00E+00	0.00E+00
KR-85M	Ci	8.92E-01	1.48E+00	0.00E+00	0.00E+00
KR-87	Ci	4.33E+00	9.17E+00	0.00E+00	0.00E+00
KR-88	Ci	3.05E+00	4.28E+00	0.00E+00	0.00E+00
KR-89	Ci	8.34E+01	1.32E-02	0.00E+00	0.00E+00
KR-90	Ci	2.83E+00	4.49E-04	0.00E+00	0.00E+00
XE-131M	Ci	8.48E-01	6.37E-02	0.00E+00	0.00E+00
XE-133	Ci	2.11E+02	3.78E+01	0.00E+00	0.00E+00
XE-133M	Ci	1.55E+00	8.96E-01	0.00E+00	0.00E+00
XE-135	Ci	4.65E+00	3.58E+01	0.00E+00	0.00E+00
XE-135M	Ci	6.43E+00	4.13E+01	0.00E+00	0.00E+00
XE-137	Ci	1.09E+02	1.76E+02	0.00E+00	0.00E+00
XE-138	Ci	8.68E+01	1.18E+02	0.00E+00	0.00E+00
XE-139	Ci	8.41E+00	1.33E-03	0.00E+00	0.00E+00
Total for Period	Ci	5.38E+02	4.40E+02	0.00E+00	0.00E+00
2. Iodines					
I-131	Ci	6.09E-03	1.49E-03	0.00E+00	0.00E+00
I-133	Ci	1.10E-02	5.85E-03	0.00E+00	0.00E+00
I-135	Ci	8.09E-03	6.77E-03	0.00E+00	0.00E+00
Total for Period	Ci	2.52E-02	1.41E-02	0.00E+00	0.00E+00
3. Particulates					
CR-51	Ci	0.00E+00	7.96E-07	0.00E+00	0.00E+00
MN-54	Ci	5.47E-06	8.70E-06	0.00E+00	0.00E+00
CO-58	Ci	1.39E-06	5.72E-07	0.00E+00	0.00E+00
FE-59	Ci	0.00E+00	1.10E-06	0.00E+00	0.00E+00
CO-60	Ci	3.78E-05	2.58E-05	0.00E+00	0.00E+00
ZN-65	Ci	2.74E-06	1.87E-06	0.00E+00	0.00E+00
CS-134	Ci	1.08E-06	4.03E-07	0.00E+00	0.00E+00
CS-137	Ci	3.02E-05	1.27E-05	0.00E+00	0.00E+00
BA-140	Ci	2.70E-04	3.94E-04	0.00E+00	0.00E+00
CE-141	Ci	9.30E-07	1.81E-07	0.00E+00	0.00E+00
CE-144	Ci	0.00E+00	3.56E-07	0.00E+00	0.00E+00
SR-89	Ci	3.41E-04	2.27E-04	0.00E+00	0.00E+00
SR-90	Ci	3.30E-06	1.38E-06	0.00E+00	0.00E+00
Total for Period	Ci	6.94E-04	6.75E-04	0.00E+00	0.00E+00

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Table 1C Gaseous Effluents - Building Vent Releases

Nuclides Released	Unit	Continuous Mode		Batch Mode	
		3rd Qtr	4th Qtr	3rd Qtr	4th Qtr
1. Fission Gases					
KR-85	Ci	5.58E-03	4.52E+01	0.00E+00	0.00E+00
KR-85M	Ci	4.23E-01	3.61E-03	0.00E+00	0.00E+00
KR-87	Ci	2.07E+00	1.79E-02	0.00E+00	0.00E+00
KR-88	Ci	1.44E+00	1.22E-02	0.00E+00	0.00E+00
KR-89	Ci	3.94E+01	3.34E-01	0.00E+00	0.00E+00
KR-90	Ci	1.33E+00	1.13E-02	0.00E+00	0.00E+00
XE-131M	Ci	5.64E-04	1.65E-01	0.00E+00	0.00E+00
XE-133	Ci	2.53E-01	1.49E+01	3.85E-01	0.00E+00
XE-133M	Ci	1.01E-02	8.71E-05	0.00E+00	0.00E+00
XE-135	Ci	2.00E+00	2.84E+01	2.38E-01	6.31E-04
XE-135M	Ci	3.04E+00	4.42E+01	0.00E+00	0.00E+00
XE-137	Ci	5.15E+01	4.39E-01	0.00E+00	0.00E+00
XE-138	Ci	4.08E+01	3.46E-01	0.00E+00	0.00E+00
XE-139	Ci	3.97E+00	3.37E-02	0.00E+00	0.00E+00
Total for Period	Ci	1.46E+02	1.34E+02	6.23E-01	6.31E-04
2. Iodines					
I-131	Ci	1.93E-02	1.45E-03	1.30E-05	0.00E+00
I-133	Ci	2.90E-02	1.26E-02	0.00E+00	0.00E+00
I-135	Ci	3.27E-02	1.44E-02	0.00E+00	0.00E+00
Total for Period	Ci	8.10E-02	2.85E-02	1.30E-05	0.00E+00
3. Particulates					
CR-51	Ci	9.52E-04	0.00E+00	0.00E+00	0.00E+00
MN-54	Ci	7.04E-05	1.99E-05	0.00E+00	0.00E+00
CO-58	Ci	8.75E-05	0.00E+00	0.00E+00	0.00E+00
CO-60	Ci	1.63E-03	2.42E-04	0.00E+00	0.00E+00
ZN-65	Ci	6.42E-03	1.47E-05	0.00E+00	0.00E+00
RU-103	Ci	2.61E-05	0.00E+00	0.00E+00	0.00E+00
CS-134	Ci	0.00E+00	2.96E-06	0.00E+00	0.00E+00
CS-137	Ci	5.48E-05	7.54E-05	0.00E+00	0.00E+00
BA-140	Ci	2.87E-04	9.17E-05	0.00E+00	0.00E+00
CE-141	Ci	2.06E-06	3.94E-06	0.00E+00	0.00E+00
SR-89	Ci	3.79E-05	3.56E-05	0.00E+00	0.00E+00
SR-90	Ci	1.50E-06	0.00E+00	0.00E+00	0.00E+00
Total for Period	Ci	9.57E-03	4.86E-04	0.00E+00	0.00E+00

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Table 2A Liquid Effluents - Summation of all Releases

	Units	3rd Qtr	4th Qtr	Est. Total Error, %
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A. Fission & Activation products

1. Total Release (not including tritium, gases, alpha)	Ci	0.00E+00	0.00E+00	0.00E+00
2. Avg Diluted Concentration	uci/ml	0.00E+00	0.00E+00	

B. Tritium

1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00
2. Avg Diluted Concentration	uci/ml	0.00E+00	0.00E+00	

C. Dissolved and Entrained Gases

1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00
2. Avg Diluted Concentration	uci/ml	0.00E+00	0.00E+00	

D. Percent Qtrly Tech Spec Reporting Level

1. Whole Body Dose	%	0.00E+00	0.00E+00	
2. Organ Dose	%	0.00E+00	0.00E+00	

Gross Alpha Radioactivity

1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00
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F. Volume of Waste Released	Liters	0.00E+00	0.00E+00	0.00E+00
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F. Volume of Dilution Water Used	Liters	0.00E+00	0.00E+00	0.00E+00
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Table 2B Liquid Effluents

Nuclides Released	Unit	Continuous Mode		Batch Mode	
		3rd Qtr	4th Qtr	3rd Qtr	4th Qtr

None Released This Period

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Table 3 Solid Waste and Irradiated Fuel Shipments

A. Solid Waste Shipped Offsite for Burial or Disposal (not irradiated fuel)

1. Type of Waste	Units	6-month Period	Est. Total Error, %
A. Spent resins, filter sludges, evaporator bottoms, etc.	Cu. Meter	2.57E+01	5.00E+01
	Ci	3.52E+02	
B. Dry compressible waste, contaminated equipment, etc.	Cu. Meter	1.68E+02	5.00E+01
	Ci	6.17E+00	
C. Irradiated components, control rods, etc.	Cu. Meter	0.00E+00	5.00E+01
	Ci	0.00E+00	
D. Other (describe)	Cu. Meter	0.00E+00	5.00E+01
	Ci	0.00E+00	

2. Estimate of major nuclide composition (by type of waste)	Nuclide	Percent
A	Mn-54	5.14E+00
	Fe-55	2.55E+01
	Co-58	1.14E+00
	Fe-59	2.91E-01
	Co-60	5.54E+01
	Zn-65	5.75E+00
	Sr-89	4.03E-01
	Sr-90	1.67E-01
	Zr-95	2.45E-02
	Ru-103	1.23E-01
	I-131	8.35E-02
	Cs-134	9.12E-01
	Cs-137	3.67E+00
	Ba-140	8.87E-02
	Ce-141	1.34E-01
B	Cr-51	2.56E+00
	Mn-54	1.12E+01
	Fe-55	3.07E+01
	Co-58	5.68E-01
	Fe-59	7.70E-01
	Co-60	3.19E+01
	Zn-65	3.15E+00
	Sr-89	1.03E+00
	Sr-90	3.49E-01
	Cs-134	1.44E+00
	Cs-137	4.75E+00
	Ba-140	4.44E-01
	La-140	4.38E-01

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Table 3 Solid Waste and Irradiated Fuel Shipments

3. Solid waste disposal

Number of Shipments	Mode of Transportation	Destination
3	Truck	Chem-Nuc Inc., Barnwell, SC.
3	Railway	Chem-Nuc Inc., Barnwell, SC.
7	Truck	US Ecology, Richland, WA.

B. Irradiated Fuel Shipments

1. Disposition

Number of Shipments	Mode of Transportation	Destination
None This Period		

C. Shipping Container and Solidification Method

No.	Volume M3	Activity Ci	Type of Waste	Container Code	Solidification Code
89-24	5.83E+00	2.29E+01	A	A	D
89-26	3.41E+00	1.33E+02	A	A	D
89-34	3.81E+01	1.14E+00	B	L	N
89-40	3.55E+00	7.32E+01	A	A	C
89-47	3.55E+00	2.23E+01	A	A	C
89-57	1.70E+01	5.85E-01	B	L	N
89-61	1.70E+01	7.79E-01	B	L	N
89-52	3.55E+00	8.71E+00	A	A	C
89-74	1.70E+01	5.60E-01	B	L	N
89-91	3.79E+01	1.84E+00	B	L	N
89-92	5.83E+00	9.11E+01	A	A	D
89-99	2.40E+01	6.24E-01	B	L	N
89-88	1.70E+01	6.50E-01	B	L	N

Container Codes :

L - LSA
A - Type A
B - Type B
Q - Large Quantity

Solidification Codes :

C - Cement
U - Urea Formaldehyde
D - Dewatering
N - Not Applicable

PROCESS CONTROL PROGRAM

PCP 3.0

ABSORPTION OF LIQUID WASTES

Prepared by: SSC Date 8/17/87

Reviewed by: L. Beckman Date 11/29/89

User Review by: BAB Date 8/17/89

QA Review: Revision 7 Date 5/2/88

Q.A. Revision Review Required: Yes No

ALARA Review: Revision 7 Date 5/17/88

ALARA Revision Review Required: Yes No

Operations Committee Final Review: Meeting Number: 1697 Date 11/30/89

Op. Com. Revision Review Required: Yes No

Approved by: [Signature] Date 12/4/89

3.0 ABSORPTION OF LIQUID WASTES

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3.0 ABSORPTION OF LIQUID WASTES

3.1 Purpose

To establish the process parameters which provide reasonable assurance of complete absorption of liquid wastes.

3.2 Applicability

This section of the PCP is applicable to the manual absorption of liquid wastes with approved absorbent material. Waste liquids which may be absorbed include:

- A. Oils
- B. Chemical Waste
- C. Laundry Waste

3.3 Description of Operation

The absorbent of liquid waste is a manual process in which the waste and absorbent are repetitively layered, absorbent-waste-absorbent-waste, in an approved container. Approved absorbent materials are listed in the current revisions of the site license or site criteria. The specific absorbent material will be assigned to the project by the Radioactive Material Shipping Coordinator (RMSC) after checking the site requirements.

The drums are then capped and stored awaiting shipment to the approved burial site.

3.4 Operation

A representative sample of each type of waste is to be sampled and analyzed for isotopic content. After sampling, the waste is to be layered with absorbent into an approved shipping container starting with absorbent. The drum is then inspected, capped and stored.

3.5 Verification of Absorption

Each container is to contain twice the amount of absorbent required for absorption, as determined prior to the full-scale absorption.

If absorption fails to take place, the process shall be suspended until the cause is determined and remedies are defined.

3.6 Sample Absorption of Liquid Wastes

3.6.1 Sampling Requirements

Each type of waste to be absorbed is to be sampled.

3.6.2 Prerequisites

Before drawing a sample of waste, the waste must be adequately mixed to achieve a representative sample.

3.6.3 Sample Preparation

Obtain a specimen of each waste in the required volume. The volume required will normally be 1000 ml.

3.6.3.1 Transfer 250 ml of samples to 2-liter containers for each type of waste. Record the sample number.

Note: Label container and sample with same number.

3.6.3.2 Add approximately 500 ml of absorbent material to each container and mix for a minimum of 30 seconds.

3.6.3.3 Record results.

3.6.3.4 Add approximately 50 ml absorbent material to each container, and record results.

3.6.3.5 Continue to add about 50 ml of absorbent material and record results until some uncoated absorbent remains.

Note: Acceptable ratio is approximately 3 to 1.

3.6.4 Sample Acceptance Criteria

3.6.4.1 Visual inspection after mixing will confirm that there is some uncoated absorbent material.

3.6.4.2 If no uncoated absorbent remains refer to 3.6.3.5.

Process Control Program Revision Summary

1. Description of Change:

Section 3.0, Absorption of Liquid Wastes, was revised to incorporate a clarification on the method used to absorb liquid waste. Words were added to make it clear that waste and absorbent are repetitively layered, absorbent-waste-absorbent.

The revision was prompted by comments contained in an NRC review of Revision 4 of the PCP.

2. The change does not reduce the overall conformance of the solidified waste product to existing criteria.
3. The change was reviewed and found acceptable by the Operations Committee in meeting #1697, November 30, 1989.