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KEWAUNEE NUCLEAR POWER PLANT

SEMI-ANNUAL
EFFLUENT RELEASE REPORT

JULY - DECEMBER 1983

WISCONSIN PUBLIC SERVICE CORPORATION

WISCONSIN POWER & LIGHT COMPANY

MADISON GAS & ELECTRIC COMPANY

Docket 50-305

KEWAUNEE NUCLEAR POWER PLANT

SEMIANNUAL

EFFLUENT RELEASE REPORT

JULY - DECEMBER 1983

Wisconsin Public Service Corporation
Green Bay, Wisconsin
February 1984

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1.0 INTRODUCTION

This report is being submitted in accordance with the requirements of Kewaunee Technical Specifications, Section 6.9.3.b. The data reported covers the releases made from July through December 1983. The report contains a summary of the gaseous and liquid releases made to the environment including the quantity, characterization, time duration and percent of technical specification limits of the releases. A summation of solid waste disposal is also included.

1.1 Technical Specification Limits and Objectives

Specifications and objectives are set to insure that as low as practical releases are made to unrestricted areas and still allow for practical and dependable operation of the Kewaunee Plant. The annual objectives for release of gaseous wastes are: noble gases and particulates with half lives less than eight days should not exceed 1.7 E+03 uCi/sec; and halogens and other particulates with half lives greater than eight days should not exceed 9.2 E-04 uCi/sec. Technical Specifications limit gaseous releases to 4.45 E+03 uCi/sec for gross gaseous activity (based on Xe-135): and 6.12 E-02 uCi/sec for halogens and particulates (half lives greater than eight days) when averaged over any calendar quarter. The noble gas activity limit is based on Xe-135 as the most restrictive isotope.

The following are the Kewaunee Plant objectives for the release of liquid effluents to unrestricted areas.

a. The annual total quantity of radioactive materials in liquid waste, excluding tritium and dissolved gases, should not exceed 5 curies.

b. The annual average concentration of radioactive material in liquid waste, prior to dilution in Lake Michigan, excluding tritium and dissolved gases, should not exceed 2.0 E-8 uCi/ml.

c. The annual average concentration of tritium in liquid waste, prior to dilution in Lake Michigan should not exceed 5.0 E-6 uCi/ml.

Technical specification limits for the release of liquid effluents are:

a. The instantaneous gross radioactivity release concentration in liquid effluents shall not exceed the values specified in 10 CFR Part 20 Appendix B, for unrestricted areas.

b. The release rate of radioactive liquid effluents, excluding tritium and dissolved gases, shall not exceed 10 curies during any calendar quarter.

c. The annual average concentration of tritium prior to dilution in a natural body of water shall not exceed 3.0 E-3 uCi/cc.

1.2 Batch Release Data

Gaseous

The following is a summation of the total gaseous batch releases made during the second half of 1983.

Number of batch releases 10

Total time for all batch releases (SEC). . .2.64 E+05

Maximum time for one batch release (SEC) . .3.79 E+04

Average time for a batch release (SEC) . . .2.64 E+04

Minimum time for a batch release (SEC) . . .1.80 E+03

Liquid

The following is a summary of the batch liquid radioactive discharges made in the second half of 1983.

Number of Releases and Gallonage

Laundry	158	139,033 gal.
Boron Recycle	97	485,589 gal.
Miscellaneous Sources	14	132,534 gal.
Total time for all releases		32795 min.
Maximum time for one release		560 min.
Minimum time for one release		19 min.
Average time for a release		121.9 min.

1.3 Abnormal Releases

No abnormal releases were made from the Kewaunee Plant during the report period.

1.4 Lower Limits of Detection (LLD)

All routine releases of radioactive liquid wastes are made in the batch mode. Each batch is quantitatively analyzed for gamma emitters and tritium and an allowable release rate specified to maintain the concentration of radionuclides prior to dilution in Lake Michigan less than the limits stated in Section 1.1. A fraction of each sample is retained for a monthly proportional composite analysis for alpha emitters, Strontium 89, and Strontium 90. The lower limits of detection (LLD) for the various radio-analyses are:

Analysis	LLD (uCi/ml)
Gross beta-gamma	1.2 E-7
Dissolved Noble Gases	7 E-8 to 6 E-7
I-131, Ba-La-140	2 E-7 to 7 E-7
Gamma emitters	7E-8 to 1 E-6
Tritium	1.5 E-6
Gross Alpha	2.3 E-8
Sr-89, 90	1 E-8

Gaseous radioactive effluents are released in both the continuous mode (Auxiliary Building Stack) and the batch mode (Containment Vent, Annulus or Gas Decay Tanks). The Auxiliary Building Stack is sampled continuously for particulates, halogens and strontium by "off-line" sample trains. The stack is also grab-sampled daily for gaseous gamma emitters. The LLDs for these radio analyses are:

Analysis	LLD (uCi/cc)
Gross Gamma (Gas)	2 E-7
Gamma Emitters (Gas)	4.5 E-8 to 3.3E-7 (Kr-85,1.72 E-5)
Iodines	1.8 E-13
Gross beta-gamma (Particulate)	5 E-15
Gamma Emitters (Particulate)	9.9 E-13
Sr-89, 90 (Particulate)	8 E-14
Gross alpha (Particulate)	3 E-15

The batch releases are sampled for particulates, halogens, tritium and fission gases prior to release to determine allowable release rates. The actual amounts released are quantified by samplers downstream of any filters in the release path. The LLDs for these releases are dependent on the duration of the release and, in the case of particulates and iodines, are typically a factor of 6 to 10 higher than those given above for the continuous release mode. The gas LLDs are the same as those given above.

2.0 GASEOUS EFFLUENTS

The release rates for gaseous activity, excluding halogens and particulates with half-lives greater than eight days, were well below applicable Technical Specification limits and annual objectives for the second six months of 1983. The average release rates versus Technical Specifications are shown below.

	3rd QTR	4th QTR
Specification (uCi/sec)	4.45 E+3	4.45 E+3
Average (uCi/sec)	2.16 E+0	2.16 E+0
% of specification	4.85 E-2	4.85 E-2

The average annual release rate was 7.13 E+0 uCi/sec which is 0.419% of Kewaunee's annual release rate objective.

The release rates for halogens and particulates with half-lives greater than eight days were also below Technical Specification limits and Kewaunee annual objectives. Those average quarterly release rates are:

	3rd QTR	4th QTR
Specification (uCi/sec)	6.12 E-2	6.12 E-2
Average (uCi/sec)	1.96 E-6	2.32 E-5
% of specification	3.20 E-3	3.79 E-2

The average release rate for the period was 7.87 E-6 uCi/sec which is 0.855% of Kewaunee's annual release rate objective.

Table 2.1 presents a quarterly summation of the total release, average release rates, and percent of Technical Specifications for four categories of gaseous effluents. Table 2.2 lists the quarterly sums of individual gaseous radionuclides released by continuous and batch modes. Table 2.3 is essentially the same data presented in a monthly summation as required by Technical Specifications.

Table 2.1
Semiannual Effluent Report 1983
Gaseous Effluents - Summation of All Releases

	3rd Quarter	4th Quarter
Fission and Activiation Gases		
Total Release (Ci)	<1.72 E+1	<1.72 E+1
Ave. Release Rate (uCi/sec)	2.16 E+0	2.16 E+0
% of Tech Spec (based on Xe-135)	4.85 E-2	4.85 E-2
Iodine - 131		
Total Release (Ci)	1.19 E-6	6.22 E-7
Ave. Release Rate (uCi/sec)	1.50 E-7	7.82 E-8
% of Tech Spec	2.45 E-4	1.28 E-4
Particulate (half-lives ≥ 8d)		
Total Release (Ci)	<1.44 E-5	<1.80 E-4
Ave. Release Rate (uCi/sec)	1.81 E-6	2.26 E-5
% of Tech Spec	2.96 E-3	3.69 E-2
Gross Alpha Released (Ci)	<7.20 E-5	<2.08 E-4
Tritium		
Total Release (Ci)	3.48 E-2	8.74 E-2
Ave. Release Rate (uCi/sec)	4.38 E-3	1.10 E-2
There is no applicable Tech Spec limiting tritium release rates		

Table 2.2
Semiannual Effluent Report 1983
Gaseous Effluents - Elevated Release

Nuclides Released (Ci)	Continuous Mode 3rd Qtr	Continuous Mode 4th Qtr	Batch Mode 3rd Qtr	Batch Mode 4th Qtr
Fission Gases				
Ar-41	-	-	4.56 E-3	-
Kr-85	6.10 E-3	-	-	2.96 E-2
Kr-85m	-	2.60 E-2	-	-
Kr-87	-	3.48 E-6	-	-
Kr-88	4.10 E-6	4.19 E-5	-	-
Xe-131m	-	-	-	1.60 E-3
Xe-133	5.86 E+0	1.34 E+1	4.03 E-1	2.37 E-2
Xe-133m	-	-	4.05 E-3	-
Xe-135	6.51 E-4	4.27 E-1	1.98 E-3	-
Xe-135m	3.70 E-6	3.10 E-4	-	-
Xe-138	-	1.35 E-4	-	-
Unidentified	<1.09 E+1	<3.27 E+0	6.40 E-3	4.60 E-3
Total for Period	<1.68 E+1	<1.71 E+1	4.20 E-1	5.95 E-2
Iodines				
I-131	1.19 E-6	6.21 E-7	-	1.16 E-9
I-133	-	4.07 E-6	-	-
Total for Period	1.19 E-6	4.69 E-6	-	1.16 E-9
Particulates				
Sr-85	-	-	-	6.07 E-9
Sr-89	<1.11 E-6	<5.03 E-7	-	-
Sr-90	<1.11 E-6	<5.03 E-7	-	-
Cd-109	-	-	1.22 E-5	1.79 E-4
Rn-222	6.00 E-6	-	4.68 E-4	1.04 E-3
Unidentified	<8.55 E-6	<8.87 E-6	3.83 E-5	4.20 E-5
Total for Period	<1.68 E-5	<9.88 E-6	5.18 E-4	1.26 E-3

Semiannual Effluent Report for 1983
3rd Quarter Gaseous Release
Total
Table 2.3A

Noble Gases (Curies)

Isotope	July	August	September	Total
Ar-41	4.56 E-3	-	-	4.56 E-3
Kr-85	2.80 E-3	3.30 E-3	-	6.10 E-3
Kr-88	-	-	4.10 E-6	4.10 E-6
Xe-133	5.57 E+0	6.39 E-1	5.09 E-2	6.26 E+0
Xe-133m	4.05 E-3	-	-	4.05 E-3
Xe-135	2.13 E-3	3.68 E-4	1.33 E-4	2.63 E-3
Xe-135m	-	-	3.70 E-6	3.70 E-6
Unident.	<2.52 E+0	<4.58 E+0	<3.82 E+0	<1.09 E+1
TOTAL	<8.10 E+0	<5.22 E+0	<3.87 E+0	<1.72 E+1

Particulates (Curies)

Isotope	July	August	September	Total
Sr-89	<3.60 E-7	<2.16 E-7	<5.31 E-7	<1.11 E-6
Sr-90	<3.60 E-7	<2.16 E-7	<5.31 E-7	<1.11 E-6
Cd-109	1.22 E-5	-	-	1.22 E-5
Rn-222	3.95 E-5	4.18 E-6	4.30 E-4	4.74 E-4
Unident.	<3.97 E-5	<3.74 E-6	<3.44 E-6	<4.68 E-5
TOTAL	<9.21 E-5	<8.35 E-6	<4.35 E-4	<5.35 E-4

Semiannual Effluent Report for 1983
3rd quarter Gaseous Release
Total
Table 2.3A (con't)

Halogens (Curies)

Isotope	July	August	September	Total
I-131	1.19 E-6	-	-	1.19 E-6
Total	1.19 E-6	-	-	1.19 E-6

Summary

	July	August	September	Total
Total Noble Gases (Ci)	<8.10 E+0	<5.22 E+0	<3.87 E+0	<1.72 E+1
Total Halogens Ci	1.19 E-6	-	-	1.19 E-6
Total Particulate Gross Beta-Gamma	<9.21 E-5	<8.35 E-6	<4.35 E-4	<5.35 E-4
Total Particulate Gross Beta-Gamma Half-Lives >8 Days	<1.29 E-5	<4.32 E-7	<1.06 E-6	<1.44 E-5
Total Tritium Ci	1.74 E-2	5.43 E-3	1.20 E-2	3.48 E-2
Total Particulate Gross Alpha Ci	<2.12 E-5	<1.19 E-6	<4.96 E-5	<7.20 E-5
Maximum Noble Gas Release Rate uCi/sec	7.43 E+1	9.92 E+0	4.63 E+0	

Semiannual Effluent Report for 1983
4th Quarter Gaseous Release
Total
Table 2.3A (con't)

Noble Gases (Curies)

Isotope	October	November	December	Total
Kr-85	-	2.96 E-2	-	2.96 E-2
Kr-85m	2.18 E-5	6.80 E-6	2.60 E-2	2.60 E-2
Kr-87	3.48 E-6	-	-	3.48 E-6
Kr-88	4.19 E-5	-	-	4.19 E-5
Xe-131m	-	1.60 E-3	-	1.60 E-3
Xe-133	4.18 E+0	3.55 E+0	5.69 E+0	1.34 E+1
Xe-135	1.53 E-2	1.61 E-1	2.51 E-1	4.27 E-1
Xe-135m	2.56 E-4	5.39 E-5	-	3.10 E-4
Xe-138	1.30 E-4	4.80 E-6	-	1.35 E-4
Unident.	<9.18 E-1	<1.04 E+0	<1.31 E+0	<3.27 E+0
TOTAL	<5.11 E+0	<4.79 E+0	<7.28 E+0	<1.72 E+1

Particulates (Curies)

Isotope	October	November	December	Total
Cd-109	9.72 E-5	1.51 E-5	6.66 E-5	1.79 E-4
Sr-85	-	6.07 E-9	-	6.07 E-9
Sr-89	<2.25 E-7	<1.49 E-7	<1.29 E-7	<5.03 E-7
Sr-90	<2.25 E-7	<1.49 E-7	<1.29 E-7	<5.03 E-7
Rn-222	5.18 E-4	2.56 E-4	2.66 E-4	1.04 E-3
Unident.	<4.64 E-5	<2.23 E-6	<1.78 E-6	<5.08 E-5
TOTAL	<6.62 E-4	<2.74 E-4	<3.35 E-4	<1.27 E-3

Semiannual Effluent Report for 1983
4th Quarter Gaseous Release
Total
Table 2.3A (con't)

Halogens (Curies)

Isotope	October	November	December	Total
I-131	4.90 E-8	2.34 E-7	3.39 E-7	6.22 E-7
I-133	-	1.33 E-7	3.94 E-6	4.07 E-6
TOTAL	4.90 E-8	3.67 E-7	4.28 E-6	4.69 E-6

Summary

	October	November	December	Total
Total Noble Gases (Ci)	<5.11 E+0	<4.79 E+0	<7.28 E+0	<1.72 E+1
Total Halogens CI	4.90 E-8	3.67 E-7	4.28 E-6	4.69 E-6
Total Particulate Gross Beta-Gamma	<6.62 E-4	<2.74 E-4	<3.35 E-4	<1.27 E-3
Total Particulate Gross Beta-Gamma Half-Lives >8 Days	<9.77 E-5	<1.54 E-5	<6.69 E-5	<1.80 E-4
Total Tritium Ci	1.07 E-2	2.60 E-2	5.07 E-2	8.74 E-2
Total Particulate Gross Alpha Ci	<1.11 E-4	<4.29 E-5	<5.45 E-5	<2.08 E-4
Maximum Noble Gas Release Rate uCi/sec	6.64 E+0	3.20 E+1	3.56 E+1	

Semiannual Effluent Report for 1983
3rd Quarter Gaseous Release
Continuous
Table 2.3B

Noble Gases (Curies)

Isotope	July	August	September	Total
Kr-85	2.80 E-3	3.30 E-3	-	6.10 E-3
Kr-88	-	-	4.10 E-6	4.10 E-6
Xe-133	5.20 E+0	6.07 E-1	5.09 E-2	5.86 E+0
Xe-135	1.50 E-4	3.68 E-4	1.33 E-4	6.51 E-4
Xe-135m	-	-	3.70 E-6	3.70 E-6
Unident.	<2.52 E+0	<4.58 E+0	<3.82 E+0	<1.09 E+1
Total	<7.72 E+0	<5.19 E+0	<3.87 E+0	<1.68 E+1

Particulates (Curies)

Isotope	July	August	September	Total
Sr-89	<3.60 E-7	<2.16 E-7	<5.31 E-7	<1.11 E-6
Sr-90	<3.60 E-7	<2.16 E-7	<5.31 E-7	<1.11 E-6
Rn-222	1.81 E-6	4.18 E-6	-	6.00 E-6
Unident.	<1.39 E-6	<3.71 E-6	<3.44 E-6	<8.55 E-6
TOTAL	<3.92 E-6	<8.32 E-6	<4.50 E-6	<1.68 E-5

Semiannual Effluent Report for 1983
3rd Quarter Gaseous Release
Continuous
Table 2.3B (con't)

Halogens (Curies)

Isotope	July	August	September	Total
I-131	1.19 E-6	-	-	1.19 E-6
TOTAL	1.19 E-6	-	-	1.19 E-6

Summary

	July	August	September	Total
Total Noble Gases (Ci)	<7.72 E+0	<5.19 E+0	<3.87 E+0	<1.68 E+1
Total Halogens CI	1.19 E-6	-	-	1.19 E-6
Total Particulate Gross Beta-Gamma	<3.92 E-6	<8.32 E-6	<4.50 E-6	<1.68 E-5
Total Particulate Gross Beta-Gamma Half-Lives >8 Days	<7.20 E-7	<4.32 E-7	<1.06 E-6	<2.21 E-6
Total Tritium Ci	1.20 E-2	2.00 E-3	2.00 E-3	1.60 E-2
Total Particulate Gross Alpha Ci	<1.14 E-6	<1.19 E-6	<1.23 E-6	<3.56 E-6
Maximum Noble Gas Release Rate uCi/sec	1.26 E+1	7.01 E+0	4.20 E+0	

Semiannual Effluent Report for 1983
4th Quarter Gaseous Release
Continuous
Table 2.3B (con't)

Noble Gases (Curies)

Isotope	October	November	December	Total
Kr-85m	2.18 E-5	6.80 E-6	2.60 E-2	2.60 E-2
Kr-87	3.48 E-6	-	-	3.48 E-6
Kr-88	4.19 E-5	-	-	4.19 E-5
Xe-133	4.18 E+0	3.54 E+0	5.69 E+0	1.34 E+1
Xe-135	1.53 E-2	1.61 E-1	2.51 E-1	4.27 E-1
Xe-135m	2.56 E-4	5.39 E-5	-	3.10 E-4
Xe-138	1.30 E-4	4.80 E-6	-	1.35 E-4
Unident.	<9.15 E-1	<1.04 E+0	<1.31 E+0	<3.27 E+0
TOTAL	<5.11 E+0	<4.74 E+0	<7.28 E+0	<1.71 E+1

Particulates (Curies)

Isotope	October	November	December	Total
SR-89	<2.25 E-7	<1.49 E-7	<1.29 E-7	<5.03 E-7
SR-90	<2.25 E-7	<1.49 E-7	<1.29 E-7	<5.03 E-7
Unident.	<4.87 E-6	<2.23 E-6	<1.78 E-6	<8.87 E-6
TOTAL	<5.32 E-6	<2.53 E-6	<2.04 E-6	<9.88 E-6

Semiannual Effluent Report for 1983
4th Quarter Gaseous Release
Continuous
Table 2.3B (con't)

Halogens (Curies)

Isotope	October	November	December	Total
I-131	4.90 E-8	2.33 E-7	3.39 E-7	6.21 E-7
I-133	-	1.33 E-7	3.94 E-6	4.07 E-6
Total	4.90 E-8	3.66 E-7	4.28 E-6	4.69 E-6

Summary

	October	November	December	Total
Total Noble Gases (Ci)	<5.11 E+0	<4.74 E+0	<7.28 E+0	<1.71 E+1
Total Halogens Ci	4.90 E-8	3.66 E-7	4.28 E-6	4.69 E-6
Total Particulate Gross Beta-Gamma	<5.32 E-6	<2.53 E-6	<2.04 E-6	<9.88 E-6
Total Particulate Gross Beta-Gamma Half-Lives >8 Days	<4.50 E-7	<2.98 E-7	<2.58 E-7	<1.01 E-6
Total Tritium Ci	8.00 E-3	1.80 E-2	2.20 E-2	4.80 E-2
Total Particulate Gross Alpha Ci	<1.11 E-6	<8.45 E-7	<6.92 E-7	<2.65 E-6
Maximum Noble Gas Release Rate uCi/sec	5.23 E+0	5.47 E+0	3.54 E+1	

Semiannual Effluent Report for 1983
3rd Quarter Gaseous Release
Batch
Table 2.3C

Noble Gases (Curies)

Isotope	July	August	September	Total
Ar-41	4.56 E-3	-	-	4.56 E-3
Xe-133	3.71 E-1	3.20 E-2	-	4.03 E-1
Xe-133m	4.05 E-3	-	-	4.05 E-3
Xe-135	1.98 E-3	-	-	1.98 E-3
Unident.	2.71 E-3	-	3.67 E-3	6.40 E-3
TOTAL	3.84 E-1	3.20 E-2	3.67 E-3	4.20 E-1

Particulates (Curies)

Isotope	July	August	September	Total
Cd-109	1.22 E-5	-	-	1.22 E-5
Rn-222	3.77 E-5	-	4.30 E-4	4.68 E-4
Unident.	3.83 E-5	2.94 E-8	-	3.83 E-5
TOTAL	8.82 E-5	2.94 E-8	4.30 E-4	5.18 E-4

Semiannual Effluent Report for 1983
3rd Quarter Release
Batch
Table 2.3C (con't)

Halogens (Curies)

Isotope	July	August	September	Total
Total	-	-	-	-

Summary

	July	August	September	Total
Total Noble Gases (Ci)	3.84 E-1	3.20 E-2	3.67 E-3	4.20 E-1
Total Halogens Ci	-	-	-	-
Total Particulate Gross Beta-Gamma	8.82 E-5	2.94 E-8	4.30 E-4	5.18 E-4
Total Particulate Gross Beta-Gamma Half-Lives >8 Days	1.22 E-5	-	-	1.22 E-5
Total Tritium Ci	5.40 E-3	3.43 E-3	1.00 E-2	1.88 E-2
Total Particulate Gross Alpha Ci	2.01 E-5	3.61 E-9	4.84 E-5	6.85 E-5
Maximum Noble Gas Release Rate uCi/sec	6.17 E+1	2.91 E+0	4.31 E-1	

Semiannual Effluent Report for 1983
4th Quarter Gaseous Release
Batch
Table 2.3C (con't)

Noble Gases (Curies)

Isotope	October	November	December	Total
Kr-85	-	2.96 E-2	-	2.96 E-2
Xe-131m	-	1.60 E-3	-	1.60 E-3
Xe-133	1.24 E-2	1.13 E-2	-	2.37 E-2
Unident.	-	2.60 E-3	1.97 E-3	4.60 E-3
TOTAL	1.24 E-2	4.51 E-2	1.97 E-3	5.95 E-2

Particulates (Curies)

Isotope	October	November	December	Total
Sr-85	-	6.07 E-9	-	6.07 E-9
Cd-109	9.72 E-5	1.51 E-5	6.66 E-5	1.79 E-4
Rn-222	5.18 E-4	2.56 E-4	2.66 E-4	1.04 E-3
Unident.	4.20 E-5	-	-	4.20 E-5
Total	6.57 E-4	2.71 E-4	3.33 E-4	1.26 E-3

Semiannual Effluent Report for 1983
4th Quarter Gaseous Release
Batch
Table 2.3C (con't)

Halogens (Curies)

Isotope	October	November	December	Total
I-131	-	1.16 E-9	-	1.16 E-9
Total	-	1.16 E-9	-	1.16 E-9

Summary

	October	November	December	Total
Total Noble Gases (Ci)	1.24 E-2	4.51 E-2	1.97 E-3	5.95 E-2
Total Halogens Ci	-	1.16 E-9	-	1.16 E_9
Total Particulate Gross Beta-Gamma	6.57 E-4	2.71 E-4	3.33 E-4	1.26 E-3
Total Particulate Gross Beta-Gamma Half-Lives >8 Days	9.72 E-5	1.51 E-5	6.66 E-5	1.79 E-4
Total Tritium Ci	2.67 E-3	7.95 E-3	2.87 E-2	3.93 E-2
Total Particulate Gross Alpha Ci	1.10 E-4	4.21 E-5	5.38 E-5	2.06 E-4
Maximum Noble Gas Release Rate uCi/sec	1.41 E+0	2.65 E+1	2.28 E-1	

3.0 LIQUID EFFLUENTS

The total liquid radioactive release for each quarter was well below the Technical Specification limits of 10 curies per quarter. The 3rd quarter releases were 8.96% of the yearly objective applied by quarter of 1.25 curies. The 4th quarter releases were 4.05% of the objective.

Instantaneous release concentrations are limited by the individual radionuclide concentrations established in 10CFR20, Appendix B, for unrestricted areas. During the report period, none of the isotopes released exceeded the concentrations specified in Appendix B.

The 3rd and 4th quarter release concentrations for liquids, excluding Tritium and dissolved gases, were 7.62 E-09 uCi/ml and 1.98 E-09 uCi/ml respectively, averaging 1.11 E-08 uCi/ml for the report period. The average concentration of tritium released was below Technical Specification limits but above the annual objective due to the high capacity factor Kewaunee maintains with associated lack of plant trips.

Table 3.1 presents a quarterly summation of the total release, average concentration and percent of applicable Technical Specification limit for three categories of liquid effluents. It also presents the gross alpha release, volume of waste released and volume of dilution water used. Table 3.2 is a monthly summation of the same information in Table 3.1, plus the quantify of the individual isotopes released to unrestricted areas.

Table 3.1
Semiannual Effluent Report 1983
Liquid Effluents - Summation of All Releases

	3rd Qtr	4th Qtr	Total
Fission and Activation Products			
Total Release (excluding H3 and dissolved gases) (Ci)	1.12 E-01	5.06 E-02	1.63 E-01
Average Concentration (uCi/ml)	7.62 E-09	1.98 E-09	
Percent of Tech Spec (10 Ci/Qtr) (%)	1.12 E0	5.06 E-01	
Tritium			
Total Release (Ci)	8.05 E+01	1.32 E+02	2.12 E+02
Average Concentration (uCi/ml)	5.48 E-06	5.16 E-06	
Percent of Tech Spec (3.0 E-3 uCi/ml) (%)	1.83 E-01	1.72 E-01	
Dissolved Gases			
Total Release (Ci)	1.92 E-03	7.30 E-03	9.22 E-03
Average Concentration (uCi/ml)	1.31 E-10	2.85 E-10	
No applicable Tech Spec			
Gross Alpha Activity			
Total Release (Ci)	<6.16 E-05	<1.45 E-04	<2.07 E-04
Volume of Waste Released			
(liters)	9.88 E+05	1.86 E+06	2.85 E+06
Volume of Dilution Water			
(liters)	1.47 E+10	2.56 E+10	4.03 E+10

Table 3.2a
Semiannual Effluent Report
Liquid Effluents

LIQUID RELEASES	UNITS	JUL	AUG	SEPT
1. GROSS RADIOACTIVITY				
A. Total Released	CURIES	3.88 E-2	7.02 E-2	2.93 E-3
B. Ave. Conc. Released	UCI/ML	8.92 E-9	1.36 E-8	5.68 E-10
C. Max. Conc. Released	UCI/ML	4.26 E-8	8.43 E-8	5.53 E-9
2. TRITIUM				
A. Total Released	CURIES	1.83 E+1	3.72 E+1	2.50 E+1
B. Ave. Conc. Released	UCI/ML	4.21 E-6	7.22 E-6	4.85 E-6
3. DISSOLVED NOBLE GASES				
A. Total Released	CURIES	1.02 E-3	6.26 E-4	2.75 E-4
B. Ave. Conc. Released	UCI/ML	2.34 E-10	1.22 E-10	5.33 E-11
4. GROSS ALPHA ACTIVITY				
A. Total Released	CURIES	2.72 E-5	9.10 E-6	2.53 E-5
B. Ave. Conc. Released	UCI/ML	9.30 E-8	2.61 E-8	7.30 E-8
5. VOLUME OF LIQUID WASTE RELEASED	LITERS	2.92 E+5	3.49 E+5	3.47 E+5
6. VOLUME OF DILUTION WATER	LITERS	4.35 E+9	5.15 E+9	5.16 E+9
7. ISOTOPES RELEASED				
Sr 89	CURIES	4.47 E-5	5.33 E-5	5.31 E-5
Sr 90	CURIES	1.74 E-5	2.07 E-5	2.06 E-5
Co 60	CURIES	1.12 E-2	1.66 E-2	1.04 E-3
Co 58	CURIES	9.50 E-3	1.96 E-2	9.40 E-4
Mn 54	CURIES	4.99 E-4	1.36 E-3	-0-
Xe 133	CURIES	1.02 E-3	6.26 E-4	2.75 E-4
Fe 59	CURIES	3.69 E-4	-0-	-0-
Cr 51	CURIES	1.34 E-3	1.14 E-3	-0-
I 133	CURIES	1.62 E-5	-0-	-0-
Ag 110m	CURIES	1.35 E-2	1.57 E-2	5.47 E-4
Na 24	CURIES	8.17 E-4	-0-	-0-
Sb 124	CURIES	3.98 E-5	-0-	-0-
I 131	CURIES	3.08 E-5	-0-	-0-
Cs 137	CURIES	3.99 E-4	1.30 E-2	4.82 E-5
Sn 113	CURIES	-0-	3.50 E-5	-0-
Nb 95	CURIES	-0-	2.10 E-3	-0-
Zr 95	CURIES	-0-	3.13 E-4	-0-
Sb 125	CURIES	-0-	-0-	6.42 E-5
Cs 134	CURIES	-0-	-0-	-0-

TABLE 3.2b
Semiannual Effluent Report
Liquid Effluents

LIQUID RELEASES	UNITS	OCT	NOV	DEC	SEMIANNUAL TOTAL
1. GROSS RADIOACTIVITY					
A. Total Released	CURIES	2.02 E-2	1.57 E-2	1.47 E-2	1.63 E-1
B. Ave. Conc. Released	UCI/ML	3.31 E-9	1.41 E-9	1.75 E-9	
C. Max. Conc. Released	UCI/ML	1.81 E-8	2.56 E-8	2.40 E-8	
2. TRITIUM					
A. Total Released	CURIES	3.86 E+1	5.20 E+1	4.09 E+1	2.12 E+2
B. Ave. Conc. Released	UCI/ML	6.33 E-6	4.68 E-6	4.86 E-6	
3. DISSOLVED NOBLE GASES					
A. Total Released	CURIES	1.41 E-3	1.75 E-3	4.14 E-3	9.22 E-3
B. Ave. Conc. Released	UCI/ML	2.31 E-10	1.58 E-10	4.92 E-10	
4. GROSS ALPHA ACTIVITY					
A. Total Released	CURIES	2.95 E-5	5.07 E-5	6.50 E-5	2.07 E-4
B. Ave. Conc. Released	UCI/ML	8.10 E-8	8.10 E-8	7.50 E-8	
5. VOLUME OF LIQUID WASTE RELEASED	LITERS	3.64 E+5	6.26 E+5	8.67 E+5	2.85 E+6
6. VOLUME OF DILUTION WATER	LITERS	6.10 E+9	1.11 E+10	8.41 E+9	4.03 E+10
7. ISOTOPES RELEASED					
Sr 89	CURIES	2.04 E-6	3.51 E-6	4.86 E-6	1.62 E-4
Sr 90	CURIES	2.77 E-6	4.76 E-6	6.59 E-6	7.28 E-5
Co 60	CURIES	9.63 E-3	4.72 E-3	2.56 E-3	4.58 E-2
Co 58	CURIES	3.06 E-3	4.96 E-4	4.21 E-4	3.40 E-2
Mn 54	CURIES	3.59 E-4	8.42 E-5	5.66 E-5	2.36 E-3
Xe 133	CURIES	1.41 E-3	1.75 E-3	4.14 E-3	9.22 E-3
Fe 59	CURIES	-0-	-0-	-0-	3.69 E-4
Cr 51	CURIES	-0-	-0-	-0-	2.48 E-3
I 133	CURIES	-0-	-0-	-0-	1.62 E-5
Ag 110m	CURIES	3.91 E-3	7.58 E-3	6.40 E-3	4.76 E-2
Na 124	CURIES	-0-	-0-	-0-	8.17 E-4
Sb 124	CURIES	-0-	-0-	-0-	3.98 E-5
I 131	CURIES	-0-	-0-	-0-	3.08 E-5
Cs 137	CURIES	8.98 E-4	8.31 E-4	1.08 E-3	1.63 E-2
Sn 113	CURIES	3.61 E-5	-0-	-0-	7.11 E-5
Nb 95	CURIES	3.36 E-6	-0-	-0-	2.10 E-3
Zr 95	CURIES	-0-	-0-	-0-	3.13 E-4
Sb 125	CURIES	2.27 E-4	8.46 E-5	-0-	3.76 E-4
Cs 134	CURIES	1.85 E-4	1.43 E-4	1.37 E-4	4.65 E-4
Cs 138	CURIES	-0-	2.23 E-10	-0-	2.23 E-10
Ba 140	CURIES	-0-	6.43 E-6	-0-	6.43 E-6

4.0 SOLID WASTE DISPOSAL

Table 4.1 is a summation of solid wastes shipped for the second half of 1983. Presented are the types of waste, major nuclide composition and disposition of wastes. No irradiated fuel shipments were made during the report period.

A composite sample from the 1983 solidified resin shipments was analyzed by a contractor for transuranic nuclides. The results showed an average transuranic concentration of 1.52 E-1 nanocuries/ gram, well within the disposal site limit of 10 nanocuries/gram. The transuranic concentration of 1.52 E-1 includes the isotopic concentration of Pu-241.

Table 4.1
July thru December 1983 Solid Waste and Irradiated Fuel Shipments

A. Solid Waste Shipped Off-Site for Burial or Disposal (Not Irradiated Fuel)

1. Type of Waste	Unit	July - Dec 1983
a. Spent resins solidified in a concrete matrix	Cu.M	8.303 E+0
	Ci	5.912 E+2
b. Dry compressable contaminated waste	Cu.M	9.770 E+0
	Ci	9.720 E+0
c. Non-compressable contaminated scrap	Cu.M	6.091 E+0
	Ci	1.693 E+0
d. Contaminated Filter elements solidified in concrete	Cu.M	7.221 E+0
	Ci	6.546 E+1
e. Contaminated sludge solidified in concrete	Cu.M	1.699 E+0
	Ci	8.520 E+0

2. Estimate of Major Nuclide by Composition (By Type of Waste)	Ci	%
a. Manganese-54	1.684 E+1	2.848 E+0
Cobalt-57	2.903 E+0	4.910 E-1
Cobalt-58	4.419 E+1	7.475 E+0
Cobalt-60	5.045 E+2	8.533 E+1
Niobium-95	3.646 E-2	6.166 E-3
Silver-110m	1.106 E+1	1.871 E+0
Cesium-137	1.171 E+1	1.980 E+0
Tin-113	5.017 E-3	8.485 E-4
b. Maganese-54	6.061 E-2	6.200 E-1
Cobalt-57	1.189 E-3	1.223 E-2
Cobalt-58	1.903 E+0	1.957 E+1
Cobalt-60	7.046 E+0	7.248 E+1
Zirconium-95	1.248 E-3	1.280 E-2
Niobium-95	4.772 E-2	4.910 E-1
Silver-110m	3.555 E-3	3.660 E-2
Cesium-134	9.482 E-3	9.760 E-2
Cesium-137	6.460 E-1	6.646 E+0
Tin-113	1.210 E-3	1.250 E-2
c. Chromium-51	9.000 E-3	5.300 E-1
Maganese-54	1.300 E-2	7.678 E-1
Cobalt-57	1.000 E-3	5.900 E-2
Cobalt-58	6.940 E-1	4.099 E+1
Cobalt-60	5.540 E-1	3.272 E+1

	Zirconium-95	1.050 E-1	6.200 E+0
	Niobium-95	1.430 E-1	8.444 E+0
	Silver-110m	8.000 E-3	4.730 E-1
	Cesium-134	7.000 E-3	4.130 E-1
	Cesium-137	5.600 E-2	3.307 E+0
	Tin-113	2.000 E-3	1.180 E-1
d.	Chromium-51	4.381 E+0	6.693 E+0
	Maganese-54	1.573 E+0	2.402 E+0
	Cobalt-57	1.207 E-1	1.844 E-1
	Cobalt-58	1.686 E+1	2.576 E+1
	Cobalt-60	3.720 E+1	5.683 E+1
	Zirconium-95	1.032 E+0	1.577 E+0
	Niobium-95	1.706 E+0	2.606 E+0
	Silver-110m	1.392 E+0	2.127 E+0
	Cesium-137	6.137 E-1	9.374 E-1
	Antimony-125	6.088 E-3	9.300 E-3
	Antimony-124	1.024 E-1	1.565 E-1
	Tin-113	1.983 E-1	3.029 E-1
	Iron-59	2.716 E-1	4.149 E-1
e.	Chromium-51	2.563 E-3	3.008 E-2
	Maganese-54	1.574 E-1	1.848 E+0
	Cobalt-57	2.268 E-2	2.662 E-1
	Cobalt-58	1.719 E+0	2.018 E+1
	Cobalt-60	3.976 E+0	4.667 E+1
	Zirconium-95	1.909 E+0	2.241 E+1
	Niobium-95	6.345 E-2	7.448 E-1
	Silver-110m	6.049 E-1	7.099 E0
	Cesium-137	2.888 E-2	3.389 E-1
	Tin-113	3.616 E-2	4.244 E-1

3. Solid Waste Disposition

Date of Shipment	Mode of Transportation	Destination
07/15/83	Chem-Nuclear 14-170 Cask	Barnwell South Carolina
07/26/83	Chem-Nuclear 14-170 Cask	Barnwell South Carolina
08/16/83	Chem-Nuclear Shielded Van	Barnwell South Carolina
09/08/83	Chem-Nuclear 14-195H Cask	Barnwell South Carolina
09/14/83	Chem-Nuclear 14-195H Cask	Barnwell South Carolina
10/20/83	Chem-Nuclear	Barnwell

	Shielded Van	South Carolina
11/14/83	Chem-Nuclear 14-195H Cask	Barnwell South Carolina
11/21/83	Chem-Nuclear 14-195H Cask	Barnwell South Carolina
12/21/83	Chem-Nuclear Shielded Van	Barnwell South Carolina

B. Irradiated Fuel Shipments

No irradiated fuel shipments were made from the Kewaunee Nuclear Power Plant during the second six months of 1983.

ERRATA SHEET FOR KEWAUNEE NUCLEAR POWER PLANT

SEMI-ANNUAL EFFLUENT REPORT JANUARY - JUNE 1983

- Page 2, section 1.2 Batch Release Data, change:

  Total time for all batch releases (sec) ... 4.92E+06
  Maximum time for one batch release (sec) ... 2.59E+06
  Average time for a batch release (sec) ... 3.78E+05

- Page 21, third paragraph, third line, change:

  "averaging 4.66E-08 uCi/ml" to "averaging 1.43E-08 uCi/ml"

- Page 22, Table 3.1, Total Release (excluding H3 and dissolved gases) (Ci), change:

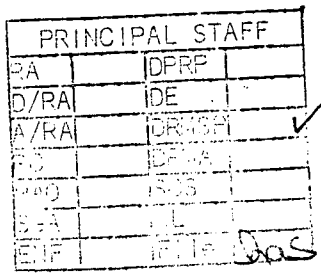
  "Total 1.23E0" to "Total 3.8E-1"

NRC-84-34

WISCONSIN PUBLIC SERVICE CORPORATION

P.O. Box 1200, Green Bay, Wisconsin 54305

DMB



February 29, 1984

Mr. J. G. Keppler, Regional Administrator
Region III
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

Dear Mr. Keppler:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
Semi-Annual Effluent Report - July to December

Please find enclosed a copy of the Kewaunee Semi-Annual Effluent Report for July through December 1983, submitted per Technical Specification 6.9.3.b.

Included at the end of the report is an errata sheet which contains corrections to the Semi-Annual Effluent Report for January through June 1983.

Very truly yours,

C. W. Giesler
Vice President - Nuclear Power

JSG/js

Enc.

IE:25

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