

ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8903090408 DOC.DATE: ~~88/12/31~~ NOTARIZED: NO DOCKET #
 FACIL:50-305 Kewaunee Nuclear Power Plant, Wisconsin Public Servic 05000305
 AUTH.NAME AUTHOR AFFILIATION
 STEINHARDT,C.R. Wisconsin Public Service Corp.
 RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: "Semiannual Effluent Release Rept,Jul-Dec 1988." *See Rpt.* W/890301
 ltr.

DISTRIBUTION CODE: IE48D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 40
 TITLE: 50.36a(a)(2) Semiannual Effluent Release Reports

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL
	PD3-3 LA	1 0	PD3-3 PD	5 5
	GIITTER,J	1 1		
INTERNAL:	ACRS	1 1	AEOD/DSP/TPAB	1 1
	ARM TECH ADV	1 1	NRR/DEST/PSB 8D	1 1
	NRR/DREP/RPB 10	2 2	NUDOCS-ABSTRACT	1 1
	<u>REG FILE</u> 01	1 1	RGN3 DRSS/RPB	2 2
	RGN3 FILE 02	1 1		
EXTERNAL:	BNL TICHLER,J03	1 1	EG&G SIMPSON,F	2 2
	LPDR	1 1	NRC PDR	1 1

NOTE TO ALL "RIDS" RECIPIENTS:

PLEASE HELP US TO REDUCE WASTE! CONTACT THE DOCUMENT CONTROL DESK,
 ROOM P1-37 (EXT. 20079) TO ELIMINATE YOUR NAME FROM DISTRIBUTION
 LISTS FOR DOCUMENTS YOU DON'T NEED!

TOTAL NUMBER OF COPIES REQUIRED: LTTR 23 ENCL 22

Er-1
cc

R
I
D
S
/
A
D
D
S

R
I
D
S
/
A
D
D
S



WISCONSIN PUBLIC SERVICE CORPORATION

600 North Adams • P.O. Box 19002 • Green Bay, WI 54307-9002

March 1, 1989

10 CFR 50.36a(a)(2)

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

Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
Semiannual Effluent Release Report July-December 1988

Enclosed please find a copy of the Kewaunee Nuclear Power Plant Semiannual Effluent Release Report for July through December 1988. This report is submitted to meet the requirements of Technical Specification 6.9.3.b.

Sincerely,

Mark L. March
C. R. Steinhardt *for*
Manager - Nuclear Power

PMF/jms

Enc.

cc - Mr. Robert Nelson, US NRC
US NRC, Region III

TE48
11

KEWAUNEE NUCLEAR POWER PLANT

SEMI-ANNUAL
EFFLUENT RELEASE REPORT
JULY - DECEMBER 1988

WISCONSIN PUBLIC SERVICE CORPORATION

WISCONSIN POWER & LIGHT COMPANY

MADISON GAS & ELECTRIC COMPANY

8903090408 881231
FDR ADOCK 05000305
R FDC

10-19-88

DOCKET 50-305

KEWAUNEE NUCLEAR POWER PLANT

SEMIANNUAL

EFFLUENT RELEASE REPORT

JULY - DECEMBER 1988

WISCONSIN PUBLIC SERVICE CORPORATION
GREEN BAY, WISCONSIN
FEBRUARY 1989

TABLE OF CONTENTS

<u>SECTION</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
1.0	INTRODUCTION	1
1.1	Technical Specification Limits	1
2.0	GASEOUS EFFLUENTS	2
2.1	Lower Limits of Detection (LLD) for Gaseous Effluents	2
2.2	Gaseous Batch Release Statistics	2
2.3	Gaseous Effluent Data	2
	Table 2.1 Gaseous Effluents-Summation of all Releases	3
	Table 2.2 Gaseous Effluents-Elevated Release	4
	Table 2.3A Gaseous Release Total	5
	Table 2.3B Gaseous Release Continuous	9
	Table 2.3C Gaseous Release Batch	13
	Table 2.4 Dose From Gaseous Effluents	17
3.0	LIQUID EFFLUENTS	18
3.1	Lower Limits of Detection (LLD) for Liquid Effluents	18
3.2	Liquid Batch Release Statistics	19
3.3	Liquid Effluent Data	19
	Table 3.1 Liquid Effluents - Summation of all Releases	20
	Table 3.2A Liquid Effluents - Batch Releases 3rd Qtr	21
	Table 3.2B Liquid Effluents - Batch Releases 4th Qtr	23
	Table 3.3A Liquid Effluents - Continuous Releases - 3rd Qtr	25
	Table 3.3B Liquid Effluents - Continuous Releases - 4th Qtr	26
	Table 3.4 Dose From Liquid Effluents	27

TABLE OF CONTENTS

<u>SECTION</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
4.0	UNPLANNED RELEASES	29
5.0	METEOROLOGICAL DATA	29
6.0	SOLID WASTE DISPOSAL	30
	Table 6.1 Solid Waste and Irradiated Fuel Shipments	31
7.0	PROGRAM REVISIONS	35

1.0 INTRODUCTION

This report is being submitted in accordance with the requirements of Kewaunee Technical Specifications, Section 6.9.3.b. It includes data from all effluent releases made from July through December 1988. The report contains summaries of the gaseous and liquid releases made to the environment including the quantity, characterization, time duration and calculated radiation dose at the site boundary resulting from these releases. The report also includes a summation of solid waste disposal, revisions to the Process Control Program and the Offsite Dose Calculation Manual, and addresses the cumulative meteorological data.

1.1 Technical Specification Limits

Specifications are set to insure that offsite doses are maintained as low as reasonably achievable while still allowing for practical and dependable operation of the Kewaunee Plant.

The Kewaunee Offsite Dose Calculation Manual (ODCM) is used in conjunction with Section 7 of the Technical Specifications. The ODCM describes the methodology and parameters used in:

1. The calculation of radioactive liquid and gaseous effluent monitoring instrumentation alarm/trip setpoints.
2. The calculation of radioactive liquid and gaseous concentrations, dose rates and cumulative quarterly and annual doses. The ODCM methodology is acceptable for use in demonstrating compliance with 10 CFR 20.106; 10 CFR 50, Appendix I; and 40 CFR 190.

2.0 GASEOUS EFFLUENTS

2.1 Lower Limits of Detection (LLD) for Gaseous Effluents

Gaseous radioactive effluents are released in both the continuous mode and the batch mode. The auxiliary building stack is sampled continuously for particulates, halogens and Strontium by an "off-line" sample train. This stack is also grab-sampled daily for gaseous gamma emitters. Batch releases are sampled prior to release for principal gaseous and particulate gamma emitters, halogens and tritium.

The LLD's for gaseous radioanalyses, as listed in Table 8.4 of the Kewaunee Technical Specifications, are:

<u>Analysis</u>	<u>LLD (uCi/ml)</u>
Gaseous Gamma Emitters	1.00 E-04
Iodine 131	3.00 E-12
Particulate Gamma Emitters	1.00 E-11
Particulate Gross Alpha	1.00 E-11
Strontium 89, 90	1.00 E-11
Noble Gases, Gross Beta or Gamma	1.00 E-06

2.2 Gaseous Batch Release Statistics

The following is a summation of all gaseous batch releases made during the second half of 1988.

Number of batch releases 8

Total time for all batch releases (Sec) . . 2.26 E+5

Maximum time for one batch release (Sec) . . 3.80 E+4

Average time for a batch release (Sec) . . . 2.83 E+4

Minimum time for a batch release (Sec) . . . 7.20 E+2

2.3 Gaseous Effluent Data

The following Table 2.1 presents a quarterly summation of the total activity released and average release rates of 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, but is presented as monthly summations. Table 2.4 presents the dose limits for gaseous effluents for the 3rd and 4th quarters, and the calculated doses this year from gaseous effluents.

TABLE 2.1
Semiannual Effluent Report 1988
Gaseous Effluents-Summation of all Releases

	<u>3rd Quarter</u>	<u>4th Quarter</u>
<u>Fission and Activation Gases</u>		
Total Activity Released (Ci)	$\leq 1.19 \text{ E}+1$	$\leq 6.21 \text{ E}+0$
Average Release Rate (uCi/Sec)	$\leq 1.49 \text{ E}+0$	$\leq 7.81 \text{ E}-1$
<u>Iodines</u>		
Total Activity Released (Ci)	$2.63 \text{ E}-4$	$9.47 \text{ E}-6$
Average Release Rate (uCi/Sec)	$3.31 \text{ E}-5$	$1.19 \text{ E}-6$
<u>Particulates</u>		
Total Activity Released (Ci)	$\leq 1.35 \text{ E}-3$	$\leq 7.03 \text{ E}-4$
Average Release Rate (uCi/Sec)	$\leq 1.70 \text{ E}-4$	$\leq 8.84 \text{ E}-5$
Gross Alpha Released (Ci)	$\leq 4.58 \text{ E}-4$	$\leq 2.28 \text{ E}-4$
<u>Tritium</u>		
Total Activity Released (Ci)	$\leq 7.34 \text{ E}-1$	$\leq 1.10 \text{ E}+0$
Average Release Rate (uCi/Sec)	$\leq 9.23 \text{ E}-2$	$\leq 1.38 \text{ E}-1$

TABLE 2.2
Semiannual Effluent Report 1988
Gaseous Effluents-Elevated Release

<u>Nuclides Released (Ci)</u>	<u>Continuous Mode</u>		<u>Batch Mode</u>	
	<u>3rd Qtr</u>	<u>4th Qtr</u>	<u>3rd Qtr</u>	<u>4th Qtr</u>
<u>Fission Gases</u>				
Kr-85	-	-	-	1.88 E-1
Kr-85m	1.80 E-3	-	-	-
Xe-131m	-	-	-	1.05 E-3
Xe-133	5.77 E+0	2.46 E-1	-	4.67 E-4
Xe-133m	1.04 E-2	-	-	-
Xe-135	3.30 E-2	-	-	-
Unidentified	<6.04 E+0	<5.77 E+0	<5.54 E-3	<5.97 E-3
Total for Period	<u><1.19 E+1</u>	<u><6.02 E+0</u>	<u><5.54 E-3</u>	<u><1.95 E-1</u>
<u>Particulates</u>				
Fe-55	-	-	-	-
Co-58	2.71 E-7	2.36 E-7	-	-
Co-60	9.77 E-7	1.99 E-6	-	-
Sr-89	4.93 E-6	-	-	-
Sr-90	-	-	-	-
Cs-137	-	1.53 E-7	-	-
Unidentified	<3.72 E-6	<6.88 E-6	1.34 E-3	6.94 E-4
Total for Period	<u><9.90 E-6</u>	<u><9.26 E-6</u>	1.34 E-3	6.94 E-4
<u>Iodines</u>				
I-131	2.37 E-4	9.46 E-6	-	5.25 E-9
I-132	1.30 E-6	-	-	-
I-133	2.51 E-5	-	-	-
Total for Period	2.63 E-4	9.46 E-6	-	5.25 E-9

TABLE 2.3A
Semiannual Effluent Report 1988
3rd Quarter Gaseous Release
Total of all Releases

Noble Gases (Curies)

<u>Isotope</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>Total</u>
Kr-85	-	-	-	-
Kr-85m	-	1.80 E-3	-	1.80 E-3
Xe-131m	-	-	-	-
Xe-133	-	3.10 E+0	2.67 E+0	5.77 E+0
Xe-133m	-	1.04 E-2	-	1.04 E-2
Xe-135	-	3.30 E-2	-	3.30 E-2
Unidentified	<2.07 E+0	<2.94 E+0	<1.03 E+0	<6.05 E+0
Total	<u><2.07 E+0</u>	<u><6.09 E+0</u>	<u><3.70 E+0</u>	<u><1.19 E+1</u>

Particulates (Curies)

<u>Isotope</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>Total</u>
Fe-55	-	-	-	-
Co-58	2.71 E-7	-	-	2.71 E-7
Co-60	-	4.22 E-7	5.55 E-7	9.77 E-7
Sr-89	-	-	4.93 E-6	4.93 E-6
Sr-90	-	-	-	-
Cs-137	-	-	-	-
Unidentified	<5.48 E-4	<5.34 E-4	2.58 E-4	<1.34 E-3
Total	<u><5.49 E-4</u>	<u><5.35 E-4</u>	<u>2.63 E-4</u>	<u><1.35 E-3</u>

Halogens (Curies)

<u>Isotope</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>Total</u>
I-131	-	7.07 E-5	1.66 E-4	2.37 E-4
I-132	-	1.30 E-6	-	1.30 E-6
I-133	-	2.24 E-5	2.66 E-6	2.51 E-5
Total	-	9.44 E-5	1.69 E-4	2.63 E-4

TABLE 2.3A (con't)
Semiannual Effluent Report 1988
3rd Quarter Gaseous Release
Total of all Releases

Summary

	<u>July</u>	<u>August</u>	<u>September</u>	<u>Total</u>
Total Noble Gases (Ci)	$\leq 2.07 \text{ E}+0$	$\leq 6.09 \text{ E}+0$	$\leq 3.70 \text{ E}+0$	$\leq 1.19 \text{ E}+1$
Total Halogens (Ci)	-	$9.44 \text{ E}-5$	$1.69 \text{ E}-4$	$2.63 \text{ E}-4$
Total Particulate Gross Beta-Gamma (Ci)	$\leq 5.49 \text{ E}-4$	$\leq 5.35 \text{ E}-4$	$2.63 \text{ E}-4$	$\leq 1.35 \text{ E}-3$
Total Particulate Gross Beta-Gamma Half-Lives >8 Days (Ci)	$2.71 \text{ E}-7$	$4.22 \text{ E}-7$	$5.49 \text{ E}-6$	$6.18 \text{ E}-6$
Total Tritium (Ci)	$\leq 2.96 \text{ E}-1$	$\leq 2.11 \text{ E}-1$	$\leq 2.27 \text{ E}-1$	$\leq 7.34 \text{ E}-1$
Total Particulate Gross Alpha (Ci)	$\leq 1.96 \text{ E}-4$	$\leq 1.85 \text{ E}-4$	$\leq 7.71 \text{ E}-5$	$\leq 4.58 \text{ E}-4$
Maximum Noble Gas Release Rate (uCi/Sec)	$\leq 1.89 \text{ E}+0$	$\leq 2.10 \text{ E}+1$	$\leq 4.08 \text{ E}+0$	-

TABLE 2.3A (con't)
Semiannual Effluent Report 1988
4th Quarter Gaseous Release
Total of all Releases

Noble Gases (Curies)

<u>Isotope</u>	<u>October</u>	<u>November</u>	<u>December</u>	<u>Total</u>
Kr-85	-	1.88 E-1	-	1.88 E-1
Kr-85m	-	-	-	-
Xe-131m	-	1.05 E-3	-	1.05 E-3
Xe-133	2.00 E-1	4.65 E-2	-	2.46 E-1
Xe-133m	-	-	-	-
Xe-135	-	-	-	-
Unidentified	<2.03 E+0	<1.88 E+0	<1.86 E+0	<5.77 E+0
Total	<u><2.23 E+0</u>	<u><2.12 E+0</u>	<u><1.86 E+0</u>	<u><6.21 E+0</u>

Particulates (Curies)

<u>Isotope</u>	<u>October</u>	<u>November</u>	<u>December</u>	<u>Total</u>
Fe-55	-	-	-	-
Co-58	-	-	2.36 E-7	2.36 E-7
Co-60	-	-	1.99 E-6	1.99 E-6
Sr-89	-	-	-	-
Sr-90	-	-	-	-
Cs-137	-	-	1.53 E-7	1.53 E-7
Unidentified	<2.42 E-4	<2.61 E-4	1.98 E-4	<7.01 E-4
Total	<u><2.42 E-4</u>	<u><2.61 E-4</u>	2.00 E-4	<u><7.03 E-4</u>

Halogens (Curies)

<u>Isotope</u>	<u>October</u>	<u>November</u>	<u>December</u>	<u>Total</u>
I-131	8.14 E-6	6.44 E-7	6.83 E-7	9.47 E-6
I-132	-	-	-	-
I-133	-	-	-	-
Total	8.14 E-6	6.44 E-7	6.83 E-7	9.47 E-6

TABLE 2.3A (con't)
Semiannual Effluent Report 1988
4th Quarter Gaseous Release
Total of all Releases

Summary

	<u>October</u>	<u>November</u>	<u>December</u>	<u>Total</u>
Total Noble Gases (Ci)	$\leq 2.23 \text{ E}+0$	$\leq 2.12 \text{ E}+0$	$\leq 1.86 \text{ E}+0$	$\leq 6.21 \text{ E}+0$
Total Halogens (Ci)	$8.14 \text{ E}-6$	$6.44 \text{ E}-7$	$6.83 \text{ E}-7$	$9.47 \text{ E}-6$
Total Particulate Gross Beta-Gamma (Ci)	$\leq 2.42 \text{ E}-4$	$\leq 2.61 \text{ E}-4$	$2.00 \text{ E}-4$	$\leq 7.03 \text{ E}-4$
Total Particulate Gross Beta-Gamma Half-Lives >8 Days (Ci)	-	-	$2.38 \text{ E}-6$	$2.38 \text{ E}-6$
Total Tritium (Ci)	$\leq 2.15 \text{ E}-1$	$\leq 2.23 \text{ E}-1$	$\leq 6.61 \text{ E}-1$	$\leq 1.10 \text{ E}+0$
Total Particulate Gross Alpha (Ci)	$\leq 7.50 \text{ E}-5$	$\leq 8.61 \text{ E}-5$	$\leq 6.64 \text{ E}-5$	$\leq 2.28 \text{ E}-4$
Maximum Noble Gas Release Rate (uCi/Sec)	$\leq 1.23 \text{ E}+0$	$\leq 1.14 \text{ E}+2$	$\leq 1.20 \text{ E}+0$	-

TABLE 2.3B
Semiannual Effluent Report 1988
3rd Quarter Gaseous Release
Continuous Mode Only

Noble Gases (Curies)

<u>Isotope</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>Total</u>
Kr-85	-	-	-	-
Kr-85m	-	1.80 E-3	-	1.80 E-3
Xe-131m	-	-	-	-
Xe-133	-	3.10 E+0	2.67 E+0	5.77 E+0
Xe-133m	-	1.04 E-2	-	1.04 E-2
Xe-135	-	3.30 E-2	-	3.30 E-2
Unidentified	<2.07 E+0	<2.94 E+0	<1.03 E+0	<6.04 E+0
Total	<u><2.07 E+0</u>	<u><6.09 E+0</u>	<u><3.70 E+0</u>	<u><1.19 E+1</u>

Particulates (Curies)

<u>Isotope</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>Total</u>
Fe-55	-	-	-	-
Co-58	2.71 E-7	-	-	2.71 E-7
Co-60	-	4.22 E-7	5.55 E-7	9.77 E-7
Sr-89	-	-	4.93 E-6	4.93 E-6
Sr-90	-	-	-	-
Cs-137	-	-	-	-
Unidentified	<1.35 E-6	<2.37 E-6	-	<3.72 E-6
Total	<u><1.62 E-6</u>	<u><2.79 E-6</u>	5.49 E-6	<u><9.90 E-6</u>

Halogens (Curies)

<u>Isotope</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>Total</u>
I-131	-	7.07 E-5	1.66 E-4	2.37 E-4
I-132	-	1.30 E-6	-	1.30 E-6
I-133	-	2.24 E-5	2.66 E-6	2.51 E-5
Total	-	9.44 E-5	1.69 E-4	2.63 E-4

TABLE 2.3B (con't)
Semiannual Effluent Report 1988
3rd Quarter Gaseous Release
Continuous Mode Only

Summary

	<u>July</u>	<u>August</u>	<u>September</u>	<u>Total</u>
Total Noble Gases (Ci)	$\leq 2.07 \text{ E}+0$	$\leq 6.09 \text{ E}+0$	$\leq 3.70 \text{ E}+0$	$\leq 1.19 \text{ E}+1$
Total Halogens (Ci)	-	$9.44 \text{ E}-5$	$1.69 \text{ E}-4$	$2.63 \text{ E}-4$
Total Particulate Gross Beta-Gamma (Ci)	$\leq 1.62 \text{ E}-6$	$\leq 2.79 \text{ E}-6$	$5.49 \text{ E}-6$	$\leq 9.90 \text{ E}-6$
Total Particulate Gross Beta-Gamma Half-Lives >8 Days (Ci)	$2.71 \text{ E}-7$	$4.22 \text{ E}-7$	$5.49 \text{ E}-6$	$6.18 \text{ E}-6$
Total Tritium (Ci)	$\leq 2.91 \text{ E}-1$	$\leq 2.06 \text{ E}-1$	$\leq 2.23 \text{ E}-1$	$\leq 7.20 \text{ E}-1$
Total Particulate Gross Alpha (Ci)	$\leq 1.09 \text{ E}-6$	$\leq 1.14 \text{ E}-6$	$\leq 1.82 \text{ E}-6$	$\leq 4.05 \text{ E}-6$
Maximum Noble Gas Release Rate (uCi/Sec)	$\leq 1.72 \text{ E}+0$	$2.08 \text{ E}+1$	$3.81 \text{ E}+0$	-

TABLE 2.3B (con't)
Semiannual Effluent Report 1988
4th Quarter Gaseous Release
Continuous Mode Only

Noble Gases (Curies)

<u>Isotope</u>	<u>October</u>	<u>November</u>	<u>December</u>	<u>Total</u>
Kr-85	-	-	-	-
Kr-85m	-	-	-	-
Xe-131m	-	-	-	-
Xe-133	2.00 E-1	4.60 E-2	-	2.46 E-1
Xe-133m	-	-	-	-
Xe-135	-	-	-	-
Unidentified	<2.03 E+0	<1.88 E+0	<1.86 E+0	<5.77 E+0
Total	<u><2.23 E+0</u>	<u><1.93 E+0</u>	<u><1.86 E+0</u>	<u><6.02 E+0</u>

Particulates (Curies)

<u>Isotope</u>	<u>October</u>	<u>November</u>	<u>December</u>	<u>Total</u>
Fe-55	-	-	-	-
Co-58	-	-	2.36 E-7	2.36 E-7
Co-60	-	-	1.99 E-6	1.99 E-6
Sr-89	-	-	-	-
Sr-90	-	-	-	-
Cs-137	-	-	1.53 E-7	1.53 E-7
Unidentified	<4.83 E-6	<2.05 E-6	-	<6.88 E-6
Total	<u><4.83 E-6</u>	<u><2.05 E-6</u>	2.38 E-6	<u><9.26 E-6</u>

Halogens (Curies)

<u>Isotope</u>	<u>October</u>	<u>November</u>	<u>December</u>	<u>Total</u>
I-131	8.14 E-6	6.39 E-7	6.83 E-7	9.46 E-6
I-132	-	-	-	-
I-133	-	-	-	-
Total	8.14 E-6	6.39 E-7	6.83 E-7	9.46 E-6

TABLE 2.3B (con't)
Semiannual Effluent Report 1988
4th Quarter Gaseous Release
Continuous Mode Only

Summary

	<u>October</u>	<u>November</u>	<u>December</u>	<u>Total</u>
Total Noble Gases (Ci)	<u><2.23 E+0</u>	<u><1.93 E+0</u>	<u><1.86 E+0</u>	<u><6.02 E+0</u>
Total Halogens (Ci)	8.14 E-6	6.39 E-7	6.83 E-7	9.46 E-6
Total Particulate Gross Beta-Gamma (Ci)	<u><4.83 E-6</u>	<u><2.05 E-6</u>	2.38 E-6	<u><9.26 E-6</u>
Total Particulate Gross Beta-Gamma Half-Lives >8 Days (Ci)	-	-	2.38 E-6	2.38 E-6
Total Tritium (Ci)	<u><2.11 E-1</u>	<u><2.13 E-1</u>	<u><6.56 E-1</u>	<u><1.08 E+0</u>
Total Particulate Gross Alpha (Ci)	<u><2.33 E-6</u>	<u><1.14 E-6</u>	<u><1.22 E-6</u>	<u><4.69 E-6</u>
Maximum Noble Gas Release Rate (uCi/Sec)	<u><1.08 E+0</u>	<u><9.95 E-1</u>	<u><1.03 E+0</u>	-

TABLE 2.3C
Semiannual Effluent Report 1988
3rd Quarter Gaseous Release
Batch Mode Only

Noble Gases (Curies)

<u>Isotope</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>Total</u>
Kr-85	-	-	-	-
Kr-85m	-	-	-	-
Xe-131m	-	-	-	-
Xe-133	-	-	-	-
Xe-133m	-	-	-	-
Xe-135	-	-	-	-
Unidentified	<1.96 E-3	<1.71 E-3	<1.87 E-3	<5.54 E-3
Total	<u><1.96 E-3</u>	<u><1.71 E-3</u>	<u><1.87 E-3</u>	<u><5.54 E-3</u>

Particulates (Curies)

<u>Isotope</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>Total</u>
Fe-55	-	-	-	-
Co-58	-	-	-	-
Co-60	-	-	-	-
Sr-89	-	-	-	-
Sr-90	-	-	-	-
Cs-137	-	-	-	-
Unidentified	5.47 E-4	5.32 E-4	2.58 E-4	1.34 E-3
Total	5.47 E-4	5.32 E-4	2.58 E-4	1.34 E-3

Halogens (Curies)

<u>Isotope</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>Total</u>
I-131	-	-	-	-
I-132	-	-	-	-
I-133	-	-	-	-
Total	-	-	-	-

TABLE 2.3C (con't)
Semiannual Effluent Report 1988
3rd Quarter Gaseous Release
Batch Mode Only

Summary

	<u>July</u>	<u>August</u>	<u>September</u>	<u>Total</u>
Total Noble Gases (Ci)	<u><1.96 E-3</u>	<u><1.71 E-3</u>	<u><1.87 E-3</u>	<u><5.54 E-3</u>
Total Halogens (Ci)	-	-	-	-
Total Particulate Gross Beta-Gamma (Ci)	5.47 E-4	5.32 E-4	2.58 E-4	1.34 E-3
Total Particulate Gross Beta-Gamma Half-Lives >8 Days (Ci)	-	-	-	-
Total Tritium (Ci)	<u><4.75 E-3</u>	<u><4.75 E-3</u>	<u><4.37 E-3</u>	<u><1.39 E-2</u>
Total Particulate Gross Alpha (Ci)	1.95 E-4	1.84 E-4	7.53 E-5	4.54 E-4
Maximum Noble Gas Release Rate (uCi/Sec)	<u><1.74 E-1</u>	<u><1.55 E-1</u>	<u><2.67 E-1</u>	-

TABLE 2.3C (con't)
Semiannual Effluent Report 1988
4th Quarter Gaseous Release
Batch Mode Only

Noble Gases (Curies)

<u>Isotope</u>	<u>October</u>	<u>November</u>	<u>December</u>	<u>Total</u>
Kr-85	-	1.88 E-1	-	1.88 E-1
Kr-85m	-	-	-	-
Xe-131m	-	1.05 E-3	-	1.05 E-3
Xe-133	-	4.67 E-4	-	4.67 E-4
Xe-133m	-	-	-	-
Xe-135	-	-	-	-
Unidentified	<1.62 E-3	<2.48 E-3	<1.87 E-3	<5.97 E-3
Total	<u><1.62 E-3</u>	<u><1.92 E-1</u>	<u><1.87 E-3</u>	<u><1.95 E-1</u>

Particulates (Curies)

<u>Isotope</u>	<u>October</u>	<u>November</u>	<u>December</u>	<u>Total</u>
Fe-55	-	-	-	-
Co-58	-	-	-	-
Co-60	-	-	-	-
Sr-89	-	-	-	-
Sr-90	-	-	-	-
Cs-137	-	-	-	-
Unidentified	2.37 E-4	2.59 E-4	1.98 E-4	6.94 E-4
Total	2.37 E-4	2.59 E-4	1.98 E-4	6.94 E-4

Halogens (Curies)

<u>Isotope</u>	<u>October</u>	<u>November</u>	<u>December</u>	<u>Total</u>
I-131	-	5.25 E-9	-	5.25 E-9
I-132	-	-	-	-
I-133	-	-	-	-
Total	-	5.25 E-9	-	5.25 E-9

TABLE 2.3C (con't)
Semiannual Effluent Report 1988
4th Quarter Gaseous Release
Batch Mode Only

Summary

	<u>October</u>	<u>November</u>	<u>December</u>	<u>Total</u>
Total Noble Gases (Ci)	$\leq 1.62 \text{ E-3}$	$\leq 1.92 \text{ E-1}$	$\leq 1.87 \text{ E-3}$	$\leq 1.95 \text{ E-1}$
Total Halogens (Ci)	-	5.25 E-9	-	5.25 E-9
Total Particulate Gross Beta-Gamma (Ci)	2.37 E-4	2.59 E-4	1.98 E-4	6.94 E-4
Total Particulate Gross Beta-Gamma Half-Lives >8 Days (Ci)	-	-	-	-
Total Tritium (Ci)	$\leq 3.58 \text{ E-3}$	$\leq 9.83 \text{ E-3}$	$\leq 4.75 \text{ E-3}$	$\leq 1.82 \text{ E-2}$
Total Particulate Gross Alpha (Ci)	7.27 E-5	8.50 E-5	6.52 E-5	2.23 E-4
Maximum Noble Gas Release Rate (uCi/Sec)	$\leq 1.47 \text{ E-1}$	1.13 E+2	$\leq 1.68 \text{ E-1}$	-

TABLE 2.4
Semiannual Effluent Report 1988
Dose From Gaseous Effluents

The offsite dose limits from radioactive materials in gaseous effluents are specified in Section 7 of the Kewaunee Technical Specifications and can be summarized as follows:

	Whole Body Gamma	Skin Beta	Organ
Quarterly	5 mRad	10 mRad	7.5 mRem
Annual	10 mRad	20 mRad	15.0 mRem

The total release of gaseous effluents during the second six months of 1988 was well within Technical Specification limits. The following offsite doses were calculated using equations 2.7, 2.8 and 2.11 from the Kewaunee ODCM. Calculated offsite doses versus quarterly Technical Specification limits are shown below:

	<u>3rd Qtr</u>	<u>4th Qtr</u>
1. Gamma-Whole Body		
Specification (mRads)	5.00 E+0	5.00 E+0
Actual Dose (mRads)	2.40 E-4	1.03 E-5
% of Specification	4.80 E-3	2.06 E-4
2. Beta-Skin		
Specification (mRads)	1.00 E+1	1.00 E+1
Actual Dose (mRads)	7.02 E-4	7.15 E-5
% of Specification	7.02 E-3	7.15 E-4
3. Ingestion Pathways-Organ		
Specification (mRem)	7.50 E+0	7.50 E+0
Actual Dose (mRem)	4.18 E-2	1.70 E-3
% of Specification	5.57 E-1	2.26 E-2

In addition, the cumulative annual offsite doses through the end of December versus the annual Technical Specification limits were:

	<u>Annual</u>
1. Gamma-Whole Body	
Specification (mRads)	1.00 E+1
Actual Dose (mRads)	3.49 E-4
% of Specification	3.49 E-3
2. Beta-Skin	
Specification (mRads)	2.00 E+1
Actual Dose (mRads)	8.54 E-4
% of Specification	4.27 E-3
3. Ingestion Pathways-Organ	
Specification (mRem)	1.50 E+1
Actual Dose (mRem)	6.20 E-2
% of Specification	4.13 E-1

3.0 LIQUID EFFLUENTS

3.1 Lower Limits of Detection (LLD) for Liquid Effluents

Liquid radioactive effluents are released as both batch releases and continuous releases. Each batch is sampled prior to release and analyzed for gamma emitters and tritium. A fraction of each sample is retained for a monthly proportional composite for Gross Alpha, Strontium 89, Strontium 90 and Iron 55.

The LLD's for liquid batch release radioanalyses, as listed in Table 8.3 of the Kewaunee Technical Specifications, are:

<u>Analysis</u>	<u>LLD (uCi/ml)</u>
Principal Gamma Emitters	1.00 E-06
Iodine 131	1.00 E-06
Tritium	1.00 E-05
Gross Alpha	5.00 E-07
Strontium 89, 90	5.00 E-08
Iron 55	1.00 E-06

Continuous liquid releases are grab sampled weekly and analyzed for principal gamma emitters. A fraction of each weekly sample is retained for a monthly proportional composite which is then analyzed for Tritium, Gross Alpha, Strontium 89, Strontium 90 and Iron 55.

The LLD's for liquid continuous release radioanalyses, as listed in Table 8.3 of the Kewaunee Technical Specifications, are:

<u>Analysis</u>	<u>LLD (uCi/ml)</u>
Principal Gamma Emitters	5.00 E-07
Iodine 131	1.00 E-06
Tritium	1.00 E-05
Gross Alpha	5.00 E-07
Strontium 89, 90	5.00 E-08
Iron 55	1.00 E-06

3.2 Liquid Batch Release Statistics

The following is a summation of all liquid batch releases made during the second half of 1988.

Number of batch releases and gallonage:

Laundry	84	77,439.8 Gal.
Boron Recycle	20	128,078.9 Gal.
Miscellaneous Sources	10	89,725.6 Gal.

Total time for all batch releases 12,813 Min.

Maximum time for one batch release 966 Min.

Minimum time for one batch release 17 Min.

Average time for a batch release 112.4 Min.

3.3 Liquid Effluent Data

The following Table 3.1 presents a quarterly summation of the total activity released and average concentration for all liquid effluents. It also presents the gross alpha activity released, volume of waste released and volume of dilution water used. Tables 3.2 and 3.3 are monthly summations of the same information in Table 3.1. Table 3.2 contains the quantity of the individual isotopes released to the unrestricted area for batch releases. Table 3.3 presents a monthly summation of gross radioactivity, tritium, gross alpha and isotopic activity for the secondary blowdown and leakage releases. It also presents the monthly total volume for these releases and dilution volumes. Table 3.4 presents the doses from liquid effluents for the 3rd and 4th quarter and the calculated doses this year from liquid effluents.

TABLE 3.1
Semiannual Effluent Report 1988
Liquid Effluents - Summation of all Releases

	<u>3rd Qtr</u>	<u>4th Qtr</u>	<u>Total</u>
<u>Fission and Activation Products</u>			
Total Release (Excluding H3 and Dissolved Gases) (Ci)	7.38 E-2	5.16 E-2	1.25 E-1
Average Concentration (uCi/ml)	7.73 E-9	7.64 E-9	
<u>Tritium</u>			
Total Release (Ci)	1.21 E+2	8.60 E+1	2.07 E+2
Average Concentration (uCi/ml)	1.33 E-5	1.37 E-5	
Percent of Tech Spec Limit (3.0 E-3 uCi/ml) (%)	4.43 E-1	4.57 E-1	
<u>Dissolved Gases</u>			
Total Release (Ci)	3.60 E-3	-0-	3.60 E-3
Average Concentration (uCi/ml)	3.95 E-10	-0-	
Percent of Tech Spec Limit (2.0 E-4 uCi/ml) (%)	1.98 E-4	-0-	
<u>Gross Alpha Activity</u>			
Total Release (Ci)	<u><2.94 E-4</u>	<u><3.13 E-4</u>	<u><6.07 E-4</u>
<u>Volume of Waste Released</u> (Batch Releases)			
(Liters)	6.06 E+5	5.13 E+5	1.12 E+6
<u>Volume of Dilution Water</u> (Batch Releases)			
(Liters)	9.12 E+9	6.28 E+9	1.54 E+10

TABLE 3.2A
Semiannual Effluent Report 1988
Liquid Effluents - Batch Releases

<u>Liquid Releases</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>3rd Qtr Total</u>
<u>Gross Radioactivity</u>				
Total Release (Excluding Tritium and Dissolved Gases) (Ci)	2.41 E-2	3.32 E-3	4.29 E-2	7.03 E-2
Average Concentration (uCi/ml)	8.40 E-9	1.95 E-9	9.43 E-9	
<u>Tritium</u>				
Total Release (Ci)	1.39 E+1	4.46 E+1	6.22 E+1	1.21 E+2
Average Concentration (uCi/ml)	4.84 E-6	2.62 E-5	1.37 E-5	
<u>Dissolved Noble Gases</u>				
Total Release (Ci)	-0-	7.35 E-6	3.59 E-3	3.60 E-3
Average Concentration (uCi/ml)	-0-	4.32 E-12	7.89 E-10	
<u>Gross Alpha Activity</u>				
Total Release (Ci)	<1.60 E-6	<1.60 E-6	<2.71 E-6	<5.91 E-6
Average Concentration (uCi/ml)	<5.57 E-13	<9.41 E-13	<5.96 E-13	
<u>Volume of Waste Released</u>				
(Liters)	1.75 E+5	1.60 E+5	2.71 E+5	6.06 E+5
<u>Volume of Dilution Water</u>				
(Liters)	2.87 E+9	1.70 E+9	4.55 E+9	9.12 E+9

TABLE 3.2A (con't)
Semiannual Effluent Report 1988
Liquid Effluents - Batch Releases

<u>Isotopes Released</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>3rd Qtr Total</u>
(Curies)				
Sr-89	-0-	-0-	6.77 E-5	6.77 E-5
Sr-90	-0-	-0-	3.79 E-6	3.79 E-6
Fe-55	8.30 E-3	1.04 E-3	1.49 E-2	2.42 E-2
Fe-59	1.32 E-4	-0-	2.48 E-4	3.80 E-4
Co-57	-0-	-0-	3.31 E-5	3.31 E-5
Co-58	5.67 E-3	1.10 E-3	8.81 E-3	1.56 E-2
Co-60	5.46 E-3	8.63 E-4	3.31 E-3	9.63 E-3
Mn-54	2.50 E-4	3.65 E-5	9.47 E-4	1.23 E-3
Cs-134	7.68 E-5	-0-	2.97 E-3	3.05 E-3
Cs-136	-0-	-0-	1.92 E-4	1.92 E-4
Cs-137	6.67 E-4	9.75 E-5	2.27 E-3	3.03 E-3
Ag-110m	2.28 E-3	6.09 E-5	3.89 E-3	6.23 E-3
I-131	-0-	-0-	1.33 E-3	1.33 E-3
I-133	-0-	-0-	1.23 E-4	1.23 E-4
Sb-124	2.44 E-4	3.51 E-5	-0-	2.79 E-4
Sb-125	9.60 E-4	7.47 E-5	7.78 E-5	1.11 E-3
Sn-113	8.39 E-5	-0-	1.29 E-4	2.13 E-4
Xe-133	-0-	7.35 E-6	3.59 E-3	3.60 E-3
La-140	-0-	-0-	2.63 E-5	2.63 E-5

TABLE 3.2B
Semiannual Effluent Report 1988
Liquid Effluents - Batch Releases

<u>Liquid Releases</u>	<u>October</u>	<u>November</u>	<u>December</u>	<u>4th Qtr Total</u>
<u>Gross Radioactivity</u>				
Total Release (Excluding Tritium and Dissolved Gases) (Ci)	2.73 E-2	4.40 E-3	1.61 E-2	4.78 E-2
Average Concentration (uCi/ml)	7.94 E-9	3.03 E-9	1.16 E-8	
<u>Tritium</u>				
Total Release (Ci)	2.46 E+1	3.59 E+1	2.55 E+1	8.60 E+1
Average Concentration (uCi/ml)	7.15 E-6	2.48 E-5	1.83 E-5	
<u>Dissolved Noble Gases</u>				
Total Release (Ci)	-0-	-0-	-0-	-0-
Average Concentration (uCi/ml)	-0-	-0-	-0-	
<u>Gross Alpha Activity</u>				
Total Release (Ci)	<1.66 E-6	<1.71 E-6	<1.76 E-6	<5.13 E-6
Average Concentration (uCi/ml)	<4.83 E-13	<1.18 E-12	<1.27 E-12	
<u>Volume of Waste Released</u>				
(Liters)	1.66 E+5	1.71 E+5	1.76 E+5	5.13 E+5
<u>Volume of Dilution Water</u>				
(Liters)	3.44 E+9	1.45 E+9	1.39 E+9	6.28 E+9

TABLE 3.2B (con't)
Semiannual Effluent Report 1988
Liquid Effluents - Batch Releases

<u>Isotopes Released</u>	<u>October</u>	<u>November</u>	<u>December</u>	<u>4th Qtr Total</u>
(Curies)				
Sr-89	-0-	-0-	-0-	-0-
Sr-90	-0-	-0-	-0-	-0-
Fe-55	1.06 E-2	1.02 E-3	7.21 E-3	1.88 E-2
Co-57	4.83 E-5	-0-	-0-	4.83 E-5
Co-58	7.91 E-3	1.47 E-3	1.55 E-3	1.09 E-2
Co-60	5.20 E-3	1.28 E-3	1.91 E-3	8.39 E-3
Mn-54	2.10 E-4	9.02 E-5	1.58 E-4	4.58 E-4
Cs-134	2.35 E-4	1.74 E-4	2.70 E-3	3.11 E-3
Cs-137	1.69 E-4	1.31 E-4	2.27 E-3	2.57 E-3
Ag-110m	2.84 E-3	2.39 E-4	3.20 E-4	3.40 E-3
I-133	1.02 E-4	-0-	-0-	1.02 E-4

TABLE 3.3A
Semiannual Effluent Report 1988
Liquid Effluents - Continuous Releases

<u>Liquid Releases</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>3rd Qtr Total</u>
<u>Gross Radioactivity</u>				
Total Release (Excluding Tritium and Dissolved Gases) (Ci)	1.52 E-3	2.52 E-4	1.73 E-3	3.50 E-3
Average Concentration (uCi/ml)	2.25 E-11	3.86 E-12	2.65 E-11	
<u>Tritium</u>				
Total Release (Ci)	-0-	-0-	-0-	-0-
<u>Gross Alpha Activity</u>				
Total Release (Ci)	<u><9.72 E-5</u>	<u><9.72 E-5</u>	<u><9.36 E-5</u>	<u><2.88 E-4</u>
<u>Volume of Continuous Release</u>				
(Liters)	9.08 E+6	9.73 E+6	9.38 E+6	2.82 E+7
<u>Volume of Dilution Flow</u>				
(Liters)	6.75 E+10	6.53 E+10	6.53 E+10	1.98 E+11
<u>Isotopes Released</u>				
(Curies)				
Sr-89	-0-	-0-	1.03 E-3	1.03 E-3
Sr-90	-0-	-0-	1.02 E-5	1.02 E-5
Fe-55	1.52 E-3	-0-	6.14 E-4	2.13 E-3
Co-58	-0-	-0-	2.22 E-5	2.22 E-5
Co-60	-0-	-0-	5.23 E-5	5.23 E-5
I-131	-0-	1.55 E-5	-0-	1.55 E-5
Xe-133	-0-	2.36 E-4	-0-	2.36 E-4

TABLE 3.3B
Semiannual Effluent Report 1988
Liquid Effluents - Continuous Releases

<u>Liquid Releases</u>	<u>October</u>	<u>November</u>	<u>December</u>	<u>4th Qtr Total</u>
<u>Gross Radioactivity</u>				
Total Release (Excluding Tritium and Dissolved Gases) (Ci)	3.79 E-3	-0-	-0-	3.79 E-3
Average Concentration (uCi/ml)	6.10 E-11	-0-	-0-	
<u>Tritium</u>				
Total Release (Ci)	-0-	-0-	-0-	-0-
<u>Gross Alpha Activity</u>				
Total Release (Ci)	<u><8.78 E-5</u>	<u><9.70 E-5</u>	<u><1.23 E-4</u>	<u><3.08 E-4</u>
<u>Volume of Continuous Release</u>				
(Liters)	8.79 E+6	9.71 E+6	1.23 E+7	3.08 E+7
<u>Volume of Dilution Flow</u>				
(Liters)	6.21 E+10	3.27 E+10	3.37 E+10	1.29 E+11
<u>Isotopes Released</u>				
(Curies)				
Sr-89	-0-	-0-	-0-	-0-
Sr-90	-0-	-0-	-0-	-0-
Fe-55	3.77 E-3	-0-	-0-	3.77 E-3
Co-60	2.09 E-5	-0-	-0-	2.09 E-5

TABLE 3.4
Semiannual Effluent Report 1988
Dose From Liquid Effluents

The dose to a member of the public from total liquid radioactive release for each quarter was well below the Technical Specification limits of 1.5 mRems to the body and less than or equal to 5 mRems to any organ.

Instantaneous release concentrations are limited by the individual radionuclide concentrations established in 10 CFR 20, Appendix B, for unrestricted areas. During the report period, none of the isotopes released exceeded the concentrations specified in Appendix B. The following offsite doses were calculated using equation 1.5 from the Kewaunee ODCM.

3rd Quarter Dose

	<u>Total Body</u>	<u>Bone</u>	<u>Liver</u>	<u>Thyroid</u>	<u>Kidney</u>	<u>Lung</u>	<u>GI LLI</u>
Dose Total (mRem)	3.189E-2	2.295E-2	4.240E-2	1.722E-3	1.445E-2	5.187E-3	2.490E-3
Quarterly Dose Limit (mRem)	1.5	5.0	5.0	5.0	5.0	5.0	5.0
Percent of Quarterly Limit (%)	2.13	0.46	0.85	0.03	0.29	0.10	0.05

4th Quarter Dose

	<u>Total Body</u>	<u>Bone</u>	<u>Liver</u>	<u>Thyroid</u>	<u>Kidney</u>	<u>Lung</u>	<u>GI LLI</u>
Dose Total (mRem)	5.761E-2	4.060E-2	7.603E-2	5.511E-4	2.536E-2	8.787E-3	2.931E-3
Quarterly Dose Limit (mRem)	1.5	5.0	5.0	5.0	5.0	5.0	5.0
Percent of Quarterly Limit (%)	3.84	0.81	1.52	0.01	0.51	0.18	0.06

TABLE 3.4 (con't)
Semiannual Effluent Report 1988
Dose From Liquid Effluents

Calculated Doses This Year

	<u>Total Body</u>	<u>Bone</u>	<u>Liver</u>	<u>Thyroid</u>	<u>Kidney</u>	<u>Lung</u>	<u>GI LLI</u>
Dose Total (mRem)	1.094E-1	8.408E-2	1.475E-1	3.162E-3	4.963E-2	1.833E-2	6.839E-2
Yearly Dose Limit (mRem)	3	10	10	10	10	10	10
Percent of Yearly Limit (%)	3.65	0.84	1.48	0.03	0.50	0.18	0.68

4.0 UNPLANNED RELEASES

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

5.0 METEOROLOGICAL DATA

Meteorological data for the second six months of 1988 is retained on file at the Kewaunee Nuclear Power Plant. The data on file includes a continuous strip chart recording and a 15-minute interval listing of wind speed, wind direction and atmospheric stability. This is more conservative than the requirements of Technical Specification 6.9.3.b (1)(b).

6.0 SOLID WASTE DISPOSAL

Table 6.1 is a summation of solid wastes shipped for the second half of 1988. Presented are the types of wastes, major nuclide composition, disposition of the wastes and shipping containers used. The volume of the containers employed is 158 ft³ and 38 ft³ - High Integrity Container (HIC); 7.5 ft³ - DOT 17H drums; and 98 ft³ - LSA boxes. No irradiated fuel shipments were made during the report period.

A composite sample from the 1988 dewatered resin shipments was analyzed by a contractor for transuranic nuclides. The results showed an average transuranic concentration of 2.08 E-3 nanocuries/gram, well within the disposal site limit of 10 nanocuries/gram.

Table 6.1 contains the radionuclide content (curies) and percent abundance for each rad waste type. The following radionuclides are included in Table 6.1 as a reporting requirement of 10 CFR 20.311, 10 CFR 61, and Barnwell burial site criteria on radioactive shipment manifests:

- C-14
- Nb-94
- TRU
- Cm-242
- Ni-63
- Ni-59
- Sr-90
- Tc-99 LLD value 3.0 E-5 uCi/g
- I-129 LLD value 1.7 E-5 uCi/g
- H-3 LLD value 3.2 E-5 uCi/g

Isotopes denoted by an asterisk (*) in Table 6.1 are correlated values.

TABLE 6.1
Semiannual Effluent Report 1988
Solid Waste and Irradiated Fuel Shipments

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

1. Type of Waste	Unit	July - December 1988
a. Dewatered resin	Cu.M	1.08 E+1
Container: HIC	Ci	3.38 E+2
b. Dry compressible contaminated waste	Cu.M	4.85 E+1
Container: DOT 17H Drums	Ci	7.66 E-1
c. Non-compressible contaminated scrap	Cu.M	5.55 E+0
Container: LSA Boxes	Ci	4.04 E-2
d. Contaminated filter elements	Cu.M	2.69 E+0
Container: HIC	Ci	9.38 E+1
e. Contaminated sludge solidified in concrete	Cu.M	3.40 E+0
Container: DOT 17H drums in overpack HIC	Ci	1.57 E-1

2. Estimate of Major Nuclide by Composition
(By Type of Waste)

	%	Ci
a. Cr-51	3.57 E-4	1.20 E-3
Mn-54	7.58 E-1	2.56 E+0
Co-57	1.36 E-1	4.59 E-1
Co-58	1.12 E+0	3.79 E+0
Co-60	3.94 E+1	1.33 E+2
Zr-95	6.85 E-3	2.31 E-2
Nb-95	1.46 E-2	4.94 E-2
Ag-110m	2.07 E+0	6.97 E+0
Cs-137	4.56 E-1	1.54 E+0
Sb-124	3.78 E-2	1.28 E-1
Sb-125	1.01 E+1	3.41 E+1
Sn-113	4.65 E-2	1.57 E-1
Fe-55	2.49 E+1	8.42 E+1
* C-14	7.89 E-1	2.66 E+0
* Ni-59	2.29 E-1	7.71 E-1
* Nb-94	8.46 E-5	2.85 E-4
* TRU	1.36 E-5	4.58 E-5
Pu-241	4.89 E-4	1.65 E-3
* Cm-242	3.37 E-6	1.14 E-5
* Ni-63	1.99 E+1	6.71 E+1
* Sr-90	7.13 E-3	2.40 E-2

TABLE 6.1 (con't)
Semiannual Effluent Report 1988
Solid Waste and Irradiated Fuel Shipments

	%	Ci
b. Mn-54	4.06 E+0	3.10 E-2
Co-57	1.38 E-1	1.05 E-3
Co-58	3.99 E+0	3.05 E-2
Co-60	5.40 E+1	4.13 E-1
Zr-95	1.17 E+0	8.94 E-3
Nb-95	1.28 E+0	9.76 E-3
Ag-110m	6.87 E-1	5.26 E-3
Sn-113	2.06 E-1	1.58 E-3
Sb-125	1.79 E+0	1.37 E-2
Cs-137	4.12 E-1	3.16 E-3
* C-14	3.45 E-1	2.64 E-3
* Ni-63	2.57 E+1	1.97 E-1
* Ni-59	2.96 E-1	2.26 E-3
* Sr-90	2.47 E-3	1.89 E-5
* TRU	2.04 E-3	1.56 E-5
Pu-241	1.96 E-2	1.50 E-4
* Cm-242	1.79 E-3	1.37 E-5
Fe-55	5.96 E+0	4.56 E-2
c. Mn-54	4.07 E+0	1.64 E-3
Co-57	1.38 E-1	5.57 E-5
Co-58	4.00 E+0	1.61 E-3
Co-60	5.41 E+1	2.19 E-2
Zr-95	1.17 E+0	4.73 E-4
Nb-95	2.48 E+0	1.00 E-3
Ag-110m	6.89 E-1	2.78 E-4
Sn-113	2.07 E-1	8.35 E-5
Sb-125	1.79 E+0	7.24 E-4
Cs-137	4.14 E-1	1.67 E-4
* C-14	5.41 E-1	2.19 E-4
* Ni-63	2.88 E+1	1.16 E-2
* Ni-59	3.32 E-1	1.34 E-4
* Sr-90	2.15 E-3	8.68 E-7
* TRU	9.91 E-3	4.00 E-6
Pu-241	9.32 E-2	3.76 E-5
* Cm-242	8.75 E-3	3.53 E-6
Fe-55	1.12 E+0	4.51 E-4

TABLE 6.1 (con't)
Semiannual Effluent Report 1988
Solid Waste and Irradiated Fuel Shipments

	%	Ci
d. Cr-51	4.41 E-4	4.14 E-4
Mn-54	7.60 E-1	7.13 E-1
Co-57	1.37 E-1	1.28 E-1
Co-58	1.17 E+0	1.10 E+0
Co-60	3.92 E+1	3.68 E+1
Zr-95	7.18 E-3	6.74 E-3
Nb-95	1.43 E-2	1.34 E-2
Ag-110m	2.08 E+0	1.95 E+0
Cs-137	4.53 E-1	4.25 E-1
Sb-124	3.97 E-2	3.72 E-2
Sb-125	1.01 E+1	9.44 E+0
Sn-113	4.75 E-2	4.46 E-2
Fe-55	2.52 E+1	2.36 E+1
* C-14	8.04 E-1	7.54 E-1
* Ni-59	2.28 E-1	2.14 E-1
* Nb-94	7.61 E-5	7.14 E-5
* TRU	1.38 E-5	1.29 E-5
Pu-241	5.47 E-4	5.14 E-4
* Cm-242	4.71 E-6	4.42 E-6
* Ni-63	1.99 E+1	1.86 E+1
* Sr-90	7.18 E-3	6.74 E-3
e. Mn-54	9.37 E-1	1.47 E-3
Co-57	1.33 E-2	2.08 E-5
Co-58	6.19 E-3	9.71 E-6
Co-60	5.85 E+1	9.18 E-2
Ag-110m	3.65 E-1	5.73 E-4
Cs-137	8.71 E-1	1.37 E-3
Sb-125	1.30 E+0	2.04 E-3
Sn-113	1.57 E-1	2.47 E-4
Fe-55	1.34 E+1	2.11 E-2
* C-14	1.29 E-1	2.02 E-4
* Ni-59	2.76 E-1	4.33 E-4
* Nb-94	2.44 E-2	3.82 E-5
* TRU	9.58 E-5	1.50 E-7
Pu-241	2.96 E-3	4.65 E-6
* Cm-242	1.13 E-5	1.78 E-8
* Ni-63	2.40 E+1	3.77 E-2
* Sr-90	6.01 E-3	9.44 E-6

TABLE 6.1 (con't)
Semiannual Effluent Report 1988
Solid Waste and Irradiated Fuel Shipments

3. Solid Waste Disposition

a. Date of Shipment	Mode of Transportation	Destination
07/20/88	CNSI Conventional Van	Barnwell, SC
09/08/88	CNSI 14-190H Cask	Barnwell, SC
09/15/88	CNSI 14-190H Cask	Barnwell, SC
10/08/88	CNSI 14-190H Cask	Barnwell, SC
10/17/88	CNSI Conventional Van	Barnwell, SC

b. Irradiated Fuel Shipments

No irradiated fuel shipments were made from the Kewaunee Nuclear Power Plant during the second six months of 1988.

7.0 PROGRAM REVISIONS

In accordance with Technical Specifications 6.9.3.b (1)(e), 6.17.2.a, 6.18.2.a and 6.19.1.a, the revisions to the Process Control Program, Offsite Dose Calculation Manual and radioactive waste systems are listed below.

7.1 Process Control Program

The Kewaunee Nuclear Power Plant Process Control Program has not been revised during this report period.

7.2 Offsite Dose Calculation Manual

The Offsite Dose Calculation Manual (ODCM) has not been revised during this report period.

7.3 Major Changes to the Radioactive Liquid, Gaseous and Solid Waste Treatment Systems

Major changes to the radioactive liquid, gaseous or solid waste systems are submitted in the annual Updated Final Safety Analysis Report consistent with Technical Specification 6.19.