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August 28, 1989
NRC-89-0138

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

References: (1) Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

(2) Appendix A, Facility Operating License No. NPF-43, Technical Specification 6.9.1.8

Subject: Semi-Annual Radiological Effluent Release Report

The Semi-Annual Effluent Release Report for Fermi 2 is attached. This report is being transmitted in compliance with Reference 2 and Regulatory Guide 1.21, Revision 1. The attached report covers the period from January 1 through June 30, 1989.

During this reporting period there were no instances of unmonitored or unplanned radioactive releases from the site.

Please direct any questions or requests for additional information to Joseph Pendergast at (313) 586-1682.

Sincerely,

B Ralph Sylvia

cc: A. B. Davis
R. C. Knop
W. G. Rogers
J. F. Stang
Region III

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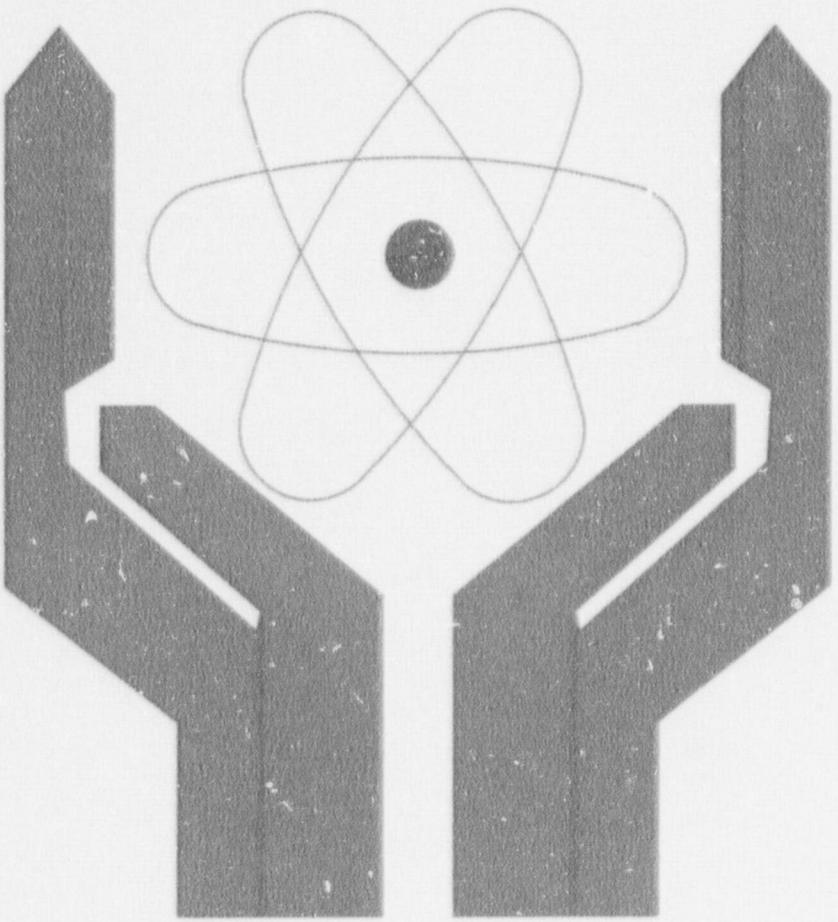
FERMI 2

SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

January 1, 1989 through June 30, 1989



Prepared by: Radiological Effluents Group

TABLE OF CONTENTS

PAGE		
1	1.	Introduction
2	2.	Regulatory Limits
3	3.	Maximum Permissible Concentration
4	4.	Average Energy
4	5	Measurements and Approximations of Total Activity
7	6	Abnormal Releases
8	7.	Batch Releases
9	8.	Liquid Effluent Summary
11	9.	Gaseous Effluent Summary
14	10.	Solid Waste and Irradiated Fuel Shipments
15	11.	Radiation Instrumentation
16	12.	Changes to the Process Control Program (PCP)
16	13.	Changes to the Offsite Dose Calculation Manual (ODCM)

1. INTRODUCTION

The Detroit Edison Fermi 2 Nuclear Power Plant is designed and operated to strictly control and monitor the release of radioactive effluents to the environment in accordance with Nuclear Regulatory Commission (NRC) and Detroit Edison Company requirements. This Semiannual Radioactive Effluent Release Report is submitted in accordance with Fermi-2 Technical Specification 6.9.1.8 and NRC Regulatory Guide 1.21. This report provides the following information required by those references:

1. Summation of the quantities of radioactive material (in the form of gases and liquids) released from the plant

2. Summation of quantities of radioactive material contained in solid waste packaged and shipped for off-site disposal

3. Changes to the Process Control Program (PCP)

4. Changes to the Offsite Dose Calculation Manual (ODCM)

This report covers the period of January 1 through June 30, 1989.

During the first half of 1989, the total gaseous and liquid radioactive effluent releases were maintained As Low As Reasonably Achievable (ALARA). A summary of the dose due to radioactive effluents in comparison to NRC limits is shown below:

NRC DOSE LIMITS (10CFR50 APPENDIX I)	FERMI-2 ESTIMATED DOSE
GASEOUS EFFLUENTS	
Noble Gases (Unrestricted Area)	
≤10 gamma mrad/year to air	To be summarized in next report*
≤20 beta mrad/year to air	To be summarized in next report*
Dose to an individual from I-131, 133, Tritium and Particulates	
≤15 mrem/year to any organ	To be summarized in next report*
LIQUID EFFLUENTS	
≤3 mrem/year to the total body	To be summarized in next report*
≤10 mrem/year to any organ	To be summarized in next report*

* Fermi 2 Technical Specification 6.9.1.8 states that the report to be submitted within 60 days after January 1 shall include an assessment of radiation doses for the previous calendar year.

2. REGULATORY LIMITS

The Nuclear Regulatory Commission limits on liquid and gaseous effluents are incorporated in the Fermi 2 Technical Specifications. These limits prescribe the maximum quantities and rates of release for radioactive effluents resulting from normal operation of Fermi-2. The limits are defined in several ways to limit the overall impact on persons living near the plant. The limits are described below:

A. Gaseous Effluents

1. Dose rate due to radioactive materials released in gaseous effluents from the site to areas at and beyond the site boundary shall be limited to the following:

   a. Noble gases

      Less than or equal to 500 mrem/year to the total body
      Less than or equal to 3000 mrem/year to the skin

   b. Iodine 131, 133, tritium, and for all radionuclides in particulate form with half lives greater than 8 days.
      Less than or equal to 1500 mrem/year to any organ.

2. Air dose due to noble gases released in gaseous effluents from the reactor to areas at and beyond the site boundary shall be limited to the following:

   a. Less than or equal to 5 mrads for gamma radiation
      Less than or equal to 10 mrads for beta radiation
      -During any calendar quarter

   b. Less than or equal to 10 mrads for gamma radiation
      Less than or equal to 20 mrads for beta radiation
      -During any calendar year

3. Dose to a member of the public from Iodine-131, 133, tritium, and all radionuclides in particulate form with half lives greater than 8 days in gaseous effluents released from the reactor to areas at and beyond the site boundary shall be limited to the following:

   a. Less than or equal to 7.5 mrems to any organ
      -During any calendar quarter

   b. Less than or equal to 15 mrems to any organ
      -During any calendar year

B. Liquid Effluents

1. The concentration of radioactive material released in liquid effluents to unrestricted areas shall be limited to the concentrations specified in Title 10 of the Code of Federal Regulations Part 20 (Standards for Protection Against Radiation), Appendix B, Table II, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases

the concentraton shall be limited to 2x10-4 (.0002) microcuries/ml total activity.

2. The dose or dose commitment to a member of the public from radioactive materials in liquid effluents released from the reactor to unrestricted areas shall be limited to:

   a. Less than or equal to 1.5 mrem to the total body
      Less than or equal to 5 mrem to any organ
      -During any calender quarter

   b. Less than or equal to 3 mrem to the total body
      Less than or equal to 10 mrem to any organ
      -During any calender year

3. MAXIMUM PERMISSIBLE CONCENTRATION (MPC)

As required by NRC Regulatory Guide 1.21, the MPC's used to calculate permissible release rates and concentrations are described below:

A. Gases

The dose rate due to gaseous effluents is calculated in accordance with the Fermi 2 Offsite Dose Calculation Manual (ODCM). The maximum permissible dose rates for gaseous releases are defined in Fermi 2 Technical Specifications:

Technical Specification 3.11.2.1.a (Dose rate at the site boundary from gaseous effluents in the the form of noble gases):

-Less than or equal to 500 mrem/year to the total body
-Less than or equal to 3000 mrem/year to the skin

Technical Specification 3.11.2.1.b (Iodine-131, 133, tritium and particulates with half-lives greater than 8 days):

-Less than or equal to 1500 mrem/year to any organ

B. Liquids

Allowable liquid release rates are calculated in accordance with the Fermi-2 Offsite Dose Calculation Manual (ODCM). The maximum permissible concentration (MPC) for liquids used for these calculations are taken from 10CFR20, Appendix B, Table II, Column 2. The most restrictive MPC is used in all cases. For dissolved and entrained gases the MPC of 2E-4 microcuries/ml is applied. This MPC is based on the Xe-135 MPC in air (submersion dose) converted to an equivalent concentration in water as discussed in the International Commission on Radiological Protection (ICRP) Publication 2.

4. AVERAGE ENERGY

The Fermi 2 Technical Specifications limit the site boundary dose rates for fission and activation gases to less than or equal to 500 mrem/yr to the total body and less than or equal to 3000 mrem/yr to the skin. Therefore, the average beta and gamma energies (E) for gaseous effluents required to be reported by Regulatory Guide 1.21 are not applicable to Fermi 2 and need not be reported.

5. MEASUREMENTS AND APPROXIMATIONS OF TOTAL ACTIVITY

As required by NRC Regulatory Guide 1.21, this section describes the methods used to measure the total radioactivity in effluent releases and to estimate the overall errors associated with these measurements. The effluent monitoring systems are described in Chapter 11.4 of the Fermi-2 Updated Final Safety Analysis Report (UFSAR).

A. Gaseous Effluents

1. Fission and Activation Gases

Samples are obtained from each of the seven plant radiation monitors which continuously monitor the six ventilation exhaust points. The fission and activation gases are quantified by gamma spectroscopy analysis of periodic samples. The following are typical fission and activation gases that are quantified for dose calculations:

Krypton (Kr)-87	Krypton (Kr)-88	Xenon (Xe)-133
Xenon (Xe)-133m	Xenon (Xe)-135	Xenon (Xe)-138

The values reported in Section 9 are the sums of all fission and activation gases quantified at all monitored release points.

Considering the inherent variability in radiation measurement and the uncertainties in sample volume, flow rate, and pressure measurements, Detroit Edison estimates that the total uncertainty of its fission and activation gas measurements is 7 percent low and 50 percent high.

2. Radioiodines

Samples are obtained from each of the seven plant radiation monitors, which continuously monitor the six ventilation exhaust points. The radioiodines are entrained on charcoal and then quantified by gamma spectroscopy analysis. For each sample the duration of sampling and continuous flow rate through the charcoal are used in determining the concentration of radioiodines. From the flow rate of the ventilation system a rate of release can be determined. The radioiodines usually quantified for dose calculations are the following:

Iodine (I)-131	Iodine (I)-132
Iodine (I)-133	Iodine (I)-135

The values reported in Section 9 are the sums of all radioiodines quantified at all continuously monitored release points.

Considering the inherent variability in radiation measurments and the uncertainties in sample volume, flow rate, and pressure measurements, Detroit Edison estimates that the total uncertainty of these measurements is 23 percent low and 55 percent high.

3. Particulates

Samples are obtained from each of the seven plant effluent radiation monitors, which continuously monitor the six ventilation exhaust points. The particulates are collected on a filter and then quantified by gamma spectroscopy analysis. For each sample the duration of sampling and continuous flow rate through the filter are used in determining the concentration of particulates. From the flow rate of the ventilation system a rate of release can be determined. The particulates usually quantified for dose calculations are the following:

Manganese (Mn)-54	Iron (Fe)-59	Cobalt (Co)-58
Cobalt (Co)-60	Zinc (Zn)-65	Molybdenum (Mo)-99
Cerium (Ce)-141	Cesium (Cs)-134	Cesium (Cs)-137
Cerium (Ce)-144		

(Also other quantified radionuclides with half lives greater than 8 days)

A composite of the filters from each ventilation release point are analyzed monthly for gross alpha radioactivity using gas proprotional counting methods. Quarterly the filters are radiochemically separated and analyzed for Strontium (Sr) 89/90 using various analytical methods. If found these radionuclides are reported as total particulate activity.

The values reported in Section 9 are the sums of all particulates quantified at all monitored release points.

Considering the inherent variability in radiation measurments and the uncertainties in sample volume, flow rate, and pressure measurements, Detroit Edison estimates that the total uncertainty of these measurements is 23 percent low and 55 percent high.

4. Tritium

Samples are obtained for each of the seven plant effluent radiation monitors which continuously monitor the six ventilation exhaust points. The sample is passed through a bottle containing water and the tritium is "washed" out to the collecting water. Portions of the collecting water are analyzed for tritium using liquid scintillation counting techniques. For each sample, the duration of sample and sample flow rate is used to determine the concentration. From the flow rate of the ventilation system a release rate can be determined.

The values reported in Section 9 are the sums of all tritium quantified at all monitored release points.

Considering the inherent variability in radiation measurement and the uncertainties in sample volume, flow rate, and pressure measurements, Detroit Edison estimates that the total uncertainty of these measurements is 12 percent low and 51 percent high.

B. Liquid Effluents

The liquid radwaste processing system and the liquid effluent monitoring system are described in the Fermi-2 UFSAR.

1. Fission and activation products

Before the contents of each holding tank is discharged to the environment, a representative sample of the tanks contents is taken and retained. The sample allows for the determination of radioactive material concentrations and establishes the rate at which the radioactive material can be discharged to the environment. Radioactive activation and fission products that are typically found include the following:

Manganese (Mn)-54	Iron (Fe)-59	Cerium (Ce)-144
Cobalt (Co)-58	Cobalt (Co)-60	
Zinc (Zn)-65	Molybdenum (Mo)-99	

At the end of the calendar quarter a composite sample is made of all discharge samples taken during the quarter. This composite sample consists of portions of each discharge sample which are proportional to the volumes discharged. The composite sample is analyzed for Iron (Fe)-55 and Strontium (Sr)-89/90. Radiochemical separations and various analytical methods are used to quantify the amounts of Sr-89/90 and Fe-55.

The values reported in Section 8 are the sums of all fission and activation products found in all batch releases.

Considering the inherent variability in radiation measurement and the uncertainties in sample flow rate and volume measurements, Detroit Edison estimates that the total uncertainty in liquid fission and activation product measurements is less than 14 percent.

2. Tritium

Before the contents of each holding tank is discharged to the environment, a representative sample of the tank contents is taken and retained. At the end of the calendar month a composite sample is made of all discharge samples taken during the month. This composite sample consists of portions of each discharge sample which are proportional to the volumes discharged. The composite sample is analyzed for tritium by liquid scintillation counting.

The values reported in Section 8 sums all tritium quantified from all batch releases.

Considering the inherent variability in radiation measurement and the uncertainties in flow rate and volume measurement, Detroit Edison estimates the total uncertainty in Tritium measurements is less than 14 percent.

3. Dissolved and Entrained Gases

Prior to releasing liquid radioactive waste to the environment a sample is taken from the radwaste holding tank. This sample is representative of the tanks contents. The sample is examined using gamma spectroscopy to determine the dissolved and entrained noble gases. The following radiogases are typical of those which may be found:

Krypton (Kr)-85m	Xenon (Xe)-131
Krypton (Kr)-85	Xenon (Xe)-133
Krypton (Kr)-88	Xenon (Xe)-137
Krypton (Kr)-89	Xenon (Xe)-138

The values reported in Section 8 are the sums of all radiogases found for all batch releases.

Considering the inherent variability in radiation measurement and the uncertainties in flow rate and volume measurements, Detroit Edison estimates that the total uncertainty in dissolved and entrained gases measurements is less than 15 percent.

4. Gross Alpha

Before the contents of each holding tank is discharged to the environment, a representative sample of the tank contents is taken and retained. At the end of the calendar month a composite sample is made of all discharge samples taken during the month. This composite sample consists of portions of each discharge sample which are proportional to the volumes discharged. The composite sample is analyzed for gross alpha radioactivity by gas proportional counting.

The values reported in Section 8 are the sums of the gross alpha radioactivity from all batch releases.

Considering the inherent variability in radiation measurement and the uncertainty in flow rate and volume measurements, Detroit Edison estimates that the total uncertainty in liquid gross alpha activity measurements is less than 23 percent.

6 ABNORMAL RELEASES

For the purpose of this report, an abnormal release is any release of radioactive material not performed in accordance the Fermi 2 license and implementing procedures. No abnormal releases occurred during the reporting period.

I. BATCH RELEASES

As required by Regulatory Guide 1.21, a summary of data for batch releases is provided below. The following batch liquid releases from radwaste holding tanks to the Circulating Water Decant Line occurred between January 1, 1989 and June 30, 1989:

Number of releases:	3
Total time for all releases:	1339 minutes
Maximum time for a release:	502 minutes
Average time for a release:	446 minutes
Minimum time for a release:	381 minutes

The only batch gaseous releases from Fermi 2 are the venting or purging of the primary containment (drywell) atmosphere. Since these releases pass through the reactor building ventilation or standby gas treament system and are monitored by the final effluent monitors for these pathways, separate data on the individual releases are not reported.

8. LIQUID EFFLUENT SUMMARY

REPORT CATEGORY : SEMIANNUAL SUMMMATION OF ALL RELEASES BY QUARTER
TYPE OF ACTIVITY : ALL LIQUID EFFLUENTS
REPORTING PERIOD : QUARTER 1 AND QUARTER 2

TYPE OF EFFLUENT	UNIT	QUARTER 1	QUARTER 2
A. FISSION AND ACTIVATION PRODUCTS			
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	1.44E-02	1.73E-02
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ml	1.62E-09	1.75E-09
B. TRITIUM			
1. TOTAL RELEASE	CURIES	1.19E-01	7.95E-02
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ml	1.34E-08	8.06E-09
C. DISSOLVED AND ENTRAINED GASES			
1. TOTAL RELEASE	CURIES	5.90E-05	2.61E-05
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ml	6.62E-12	2.65E-12
D. GROSS ALPHA RADIOACTIVITY			
1. TOTAL RELEASE	CURIES	0.00E+00	0.00E+00
E. WASTE VOL RELEASED (PRE-DILUTION)	LITERS	1.29E+05	6.26E+04
F. TOTAL VOLUME DILUTION DISCHARGED	LITERS	8.92E+09	9.86E+09

8. LIQUID EFFLUENT SUMMARY (continued)

REPORT CATEGORY : SEMIANNUAL LIQUID BATCH RELEASES
TYPE OF ACTIVITY : TOTALS FOR EACH NUCLIDE RELEASED
: ALL RADIONUCLIDES
REPORTING PERIOD : QUARTER 1 AND QUARTER 2

		BATCH RELEASES	
NUCLIDE	UNIT	QUARTER 1	QUARTER 2
ALL NUCLIDES			
H-3	CURIES	1.19E-01	7.95E-02
Na-24	CURIES	4.43E-03	2.40E-03
Cr-51	CURIES	6.93E-03	1.18E-02
Mn-54	CURIES	1.52E-04	6.82E-05
Co-58	CURIES	4.05E-04	2.44E-04
Co-60	CURIES	1.81E-04	1.05E-04
Zn-65	CURIES	2.47E-04	4.76E-04
Mo-99	CURIES	6.06E-04	4.74E-04
Tc-99m	CURIES	1.02E-03	1.14E-03
I-131	CURIES	2.00E-05	1.60E-05
I-133	CURIES	1.12E-04	1.18E-04
Xe-133	CURIES	5.90E-05	*<4.6E-08
Xe-135	CURIES	*<1.4E-08	2.61E-05
Sr-89	CURIES	3.08E-05	5.63E-06
Fe-55	CURIES	*<1.0E-06	1.38E-04
Ba-131	CURIES	5.09E-05	2.55E-05
Re-188	CURIES	1.85E-04	9.77E-05
As-76	CURIES	3.96E-05	1.93E-04
Fe-59	CURIES	*<5.2E-08	*<5.2E-08
Cs-134	CURIES	*<1.3E-08	*<1.3E-08
Cs-137	CURIES	*<1.6E-08	*<1.6E-08
Ce-141	CURIES	*<2.4E-08	*<2.4E-08
Ce-144	CURIES	*<9.8E-08	*<9.8E-08
Total for Period	CURIES	1.34E-01	9.68E-02

* Less than Lower Limit of Detection (LLD), i.e., the maximum sensitivity of measurement, in units of microcuries per milliliter (uCi/ml).

9. GASEOUS EFFLUENT SUMMARY

REPORT CATEGORY : SEMIANNUAL SUMMMATION OF ALL RELEASES BY QUARTER
TYPE OF ACTIVITY : ALL AIRBORNE EFFLUENTS
REPORTING PERIOD : QUARTER 1 AND QUARTER 2

TYPE OF EFFLUENT	UNIT	QUARTER 1	QUARTER 2
A. FISSION AND ACTIVATION GASES			
1. TOTAL RELEASE	CURIES	4.03E+01	5.70E+01
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	5.19E+00	7.25E+00
B. RADIOIODINES			
1. TOTAL IODINE - 131	CURIES	3.49E-04	7.15E-04
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	4.49E-05	9.09E-05
C. PARTICULATES			
1. PARTICULATES (HALF-LIVES>8 DAYS)	CURIES	3.84E-03	3.42E-03
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	4.94E-04	4.35E-04
3. GROSS ALPHA RADIOACTIVITY	CURIES	1.69E-07	2.97E-07
D. TRITIUM			
1. TOTAL RELEASE	CURIES	0.00E+00	0.00E+00
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	0.00E+00	0.00E+00

9. GASEOUS EFFLUENT SUMMARY (continued)

REPORT CATEGORY : SEMIANNUAL AIRBORNE CONTINUOUS RELEASES
TYPE OF ACTIVITY : FISSION GASES, IODINES, AND PARTICULATES
REPORTING PERIOD : QUARTER 1 AND QUARTER 2

		GROUND RELEASES	
NUCLIDE	UNIT	QUARTER 1	QUARTER 2
PARTICULATES			
Cr-51	CURIES	2.97E-03	2.93E-03
Mn-54	CURIES	6.51E-05	1.62E-05
Co-58	CURIES	1.97E-04	6.12E-05
Mo-99	CURIES	*<1.1E-13	4.90E-05
Ba-140	CURIES	8.30E-05	1.68E-04
La-140	CURIES	7.01E-05	1.16E-04
Tc-99m	CURIES	3.19E-02	1.76E-02
Ba-139	CURIES	1.60E-01	1.87E-01
Y-91m	CURIES	1.41E-03	1.67E-03
Sr-91	CURIES	1.24E-03	2.42E-03
Zn-65	CURIES	1.81E-04	8.91E-05
Co-60	CURIES	3.88E-05	2.15E-05
Na-24	CURIES	9.72E-03	4.23E-03
Ba-131	CURIES	2.15E-04	1.74E-05
Ba-135m	CURIES	5.60E-04	*<4.7E-14
As-75	CURIES	3.07E-04	2.27E-04
Rb-89	CURIES	1.17E-01	2.91E-01
Cs-138	CURIES	5.66E-02	8.88E-02
Mn-56	CURIES	1.97E-03	4.34E-04
Ag-110m	CURIES	4.80E-05	*<7.5E-14
Re-188	CURIES	5.70E-04	1.42E-04
Se-75	CURIES	4.90E-06	8.57E-07
Zn-69m	CURIES	3.92E-05	5.67E-05
Cu-64	CURIES	3.42E-02	2.33E-02
Tc-101	CURIES	1.15E-03	*<2.1E-13
Sr-89	CURIES	3.35E-05	1.12E-04
Sr-90	CURIES	5.76E-06	7.21E-06
Fe-59	CURIES	*<5.3E-14	*<5.3E-14
Cs-134	CURIES	*<1.7E-14	*<1.7E-14
Cs-137	CURIES	*<1.5E-14	*<1.5E-14
Ce-141	CURIES	*<1.8E-14	*<1.8E-14
Ce-144	CURIES	*<1.0E-13	*<1.0E-13
Total for Period	CURIES	4.21E-01	6.19E-01

* Less than Lower Limit of Detection (LLD), i.e., the maximum sensitivity of measurement in units of microcuries per milliliter (uCi/ml).

9. GASEOUS EFFLUENT SUMMARY (continued)

REPORT CATEGORY : SEMIANNUAL AIRBORNE CONTINUOUS RELEASES
TYPE OF ACTIVITY : FISSION GASES, IODINES, AND PARTICULATES
REPORTING PERIOD : QUARTER 1 AND QUARTER 2

		GROUND RELEASES	
NUCLIDE	UNIT	QUARTER 1	QUARTER 2
FISSION GASES			
Ar-41	CURIES	9.28E+00	1.31E+01
Kr-85m	CURIES	1.47E+00	2.08E+00
Xe-129m	CURIES	8.11E+00	1.15E+01
Xe-135	CURIES	8.60E-01	1.21E+00
Xe-135m	CURIES	1.39E+00	1.96E+00
Xe-137	CURIES	1.49E+01	2.11E+01
Xe-138	CURIES	4.31E+00	6.09E+00
Kr-87	CURIES	*<2.8E-08	*<2.8E-08
Kr-88	CURIES	*<5.1E-08	*<5.1E-08
Xe-133	CURIES	*<2.9E-08	*<2.9E-08
Xe-133m	CURIES	*<1.3E-07	*<1.3E-07
TOTAL FOR PERIOD	CURIES	4.03E+01	5.70E+01
IODINES			
I-131	CURIES	3.49E-04	7.15E-04
I-132	CURIES	3.73E-04	1.54E-03
I-133	CURIES	1.95E-03	5.17E-03
I-134	CURIES	3.87E-04	*<1.1E-13
I-135	CURIES	9.23E-04	2.58E-03
Total for Period	CURIES	3.99E-03	1.00E-02

* Less than the Lower Limit of Detection (LLD), i.e., the maximum sensitivity of measurement in units of microcuries per milliliter (uCi/ml).

10. SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. Solid Waste Shipped Offsite for burial or disposal (not irradiated fuel)

1. Type of Waste	Unit	6 month period	Est. Total Error %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m^3	1.27E+02	±25
	Curies	3.95E+02	±25
b. Dry compressible waste, contaminated equipment, etc.	m^3	2.82E+01	±25
	Curies	4.69E-01	±25
c. Irradiated components, control rods, etc.		0	
d. Other		0	

2. Estimate of major nuclide composition (by type of waste)

a. Spent resins, filter sludges, evaporator bottoms, etc.

Nuclide	Percent of Total Activity	Curies
Cr-51	36.2	1.43E+02
Mn-54	9.4	3.70E+01
Fe-55	27.3	1.08E+02
Co-58	8.3	3.27E+01
Co-60	7.3	2.90E+01
Fe-59	0.5	1.91E+00
Zn-65	9.5	3.74E+01
H-3	<0.1	9.59E-03
C-14	0.3	1.09E+00
Zr-95	0.2	6.86E-01
Ba-131	<0.1	1.12E-01
Ni-63	0.2	7.40E-01
Ag-110m	0.6	2.19E+00
Nb-95	0.4	1.59E+00
Tc-99	<0.1	3.34E-04
I-129	<0.1	4.00E-04

b. Dry compressible waste, contaminated equipment, etc.

Cr-51	8.7	4.09E-02
Mn-54	14.6	6.84E-02
Fe-55	38.8	1.82E-01
Co-58	6.6	3.09E-02
Co-60	10.2	4.79E-02
Zn-65	6.4	3.01E-02
Ni-63	3.0	1.41E-02
C-14	11.6	5.46E-02
Fe-59	<0.1	1.93E-04
Cs-137	<0.1	9.24E-07

Note: Activities of all principal radionuclides were determined by measurement.

3. Solid Waste Disposition (All waste was Class A and was shipped in LSA containers)

Type of shipment/ solidifcation process	Number of shipments	Mode of Transport.	Destination
Dewatered resin	16	truck	Barnwell, SC
Dry active waste	1	truck	Channahon, IL

4. Irradiated Fuel Shipments:

None

11. RADIATION INSTRUMENTATION

Fermi 2 Technical Specifications 3.3.7.11, Radioactive Liquid Effluent Monitoring Instrumentation, and 3.3.7.12, Radioactive Gaseous Effluent Monitoring Instrumentation, require that those monitors which exceed the time specified for out of service be reported in the next Semiannual Effluent Release Report. During this reporting period, January through June of 1989, the time specified in the action statements for these monitors was not exceeded.

12. CHANGES TO THE PROCESS CONTROL PROGRAM (PCP)

As required by the Fermi 2 license the operator (Detroit Edison) is required to establish a program that will reasonably assure the complete processing of radioactive wastes. This program assures processed wastes are completely solidified and are free of standing water. Changes to the PCP Manual are provided to document changes to pre-established conditions and to ensure that controls are in place to assure that the radioactive waste is solidified.

During this reporting period, January through June of 1989, there were no changes to the PCP.

13. CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL (ODCM)

During this reporting period, January through June of 1989, there were no changes to the ODCM.