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U. S. Nuclear Regulatory Commission
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Subject: Arkansas Nuclear One - Units 1 and 2
Docket Nos. 50-313 and 50-368
License Nos. DPR-51 and NPF-6
Semiannual Radioactive Effluent Release Report For The Third And Fourth
Quarters Of 1995

Gentlemen:

Arkansas Nuclear One, Units 1 and 2 (ANO-1 & 2) Technical Specifications 6.12.2.6 and 6.9.3, respectively, require the submittal of a Semiannual Radioactive Effluent Release Report. The purpose of this letter is to complete this reporting requirement for the third and fourth quarters of 1995 at ANO. This submittal also includes the additional information required by Technical Specifications 6.12.2.6 and 6.9.3 which is to be provided in the first report filed each year. Liquid and gaseous release data show that the dose from both ANO-1 and ANO-2 is generally a factor of 100 below the technical specification limits. This data reveals that the radioactive effluents have an overall minimal dose contribution to the surrounding environment.

Should you have any questions regarding this submittal, please contact me.

Very truly yours,

Dwight C. Mims
Dwight C. Mims
Director, Nuclear Safety

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ARKANSAS NUCLEAR ONE
UNIT 1 AND UNIT 2
OPERATING LICENSE NO. DPR-51 AND NPF-6
SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
JULY 1 THROUGH DECEMBER 31, 1995

TABLE OF CONTENTS

1. Introduction
2. Regulatory Limits
3. Summary of Liquid Effluent Data
4. Summary of Gaseous Effluent Data
5. Summary of Radiation Doses
6. Summary of Dose to Members of the Public
7. Historical Effluent Data
8. Solid Waste Summary
9. Unplanned Releases
10. Radiation Instrumentation
11. Changes to the Process Control Program
12. Changes to the Offsite Dose Calculation Manual
13. LLD Levels
14. Radiological Environmental Monitoring Program
 - A. Changes in Sample Locations
 - B. Identification of New Sample Locations
15. Summary of the Hourly Meteorological Data
16. Description of Major Changes to Radioactive Waste Systems

1. INTRODUCTION

Arkansas Nuclear One (ANO) is a two unit plant consisting of a Babcock & Wilcox (Unit 1) and a Combustion Engineering (Unit 2) Nuclear Steam Supply System. Both liquid and gaseous effluents are released in accordance with the technical specifications for each unit. This report is a summary of the effluent data in accordance with Unit 1 Technical Specification 6.12.2.6 and Unit Two Technical Specification 6.9.3. This report provides the following information:

- A. Routine radioactive effluent release reports covering the operation of the units during the reporting period.
- B. Description of unplanned releases to unrestricted areas.
- C. Description of changes to Offsite Dose Calculation Manual (ODCM).
- D. Description of changes to Process Control Program (PCP).
- E. Summary of radiation doses due to radiological effluents during the previous calendar year. This data is included in the first report of each year.
- F. Radiation dose to members of the public due to activities inside the site boundary. This data is included in the first report of each year.
- G. Description of licensee initiated major changes to the radioactive waste systems during the previous calendar year. This data is included in the first report of each year.
- H. Items to be reported in the Semiannual Report per other miscellaneous technical specifications.

This report covers the period from July 1 through December 31, 1995.

2. REGULATORY LIMITS

Unit One and Unit Two Technical Specifications contain the limits to which ANO must adhere. Because of the "as low as reasonably achievable" (ALARA) philosophy at ANO, an attempt is made to reduce the amount of radiation released to the environment. Liquid and gaseous release data show that the dose from both ANO-1 and ANO-2 is generally a factor of 100 below the technical specification limits. This data reveals that the radioactive effluents have an overall minimal dose contribution to the surrounding environment. The following are the limits required by the technical specifications.

- A. Gaseous Effluents

1. Dose rate due to radioactive materials released in gaseous effluent to unrestricted areas 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, tritium, and for all radionuclides in particulate form with half lives greater than 8 days

- Less than or equal to 1500 mrem/yr

2. Dose - Noble Gases

Quarterly

Less than or equal to 5 mrad gamma
Less than or equal to 10 mrad beta

Yearly

Less than or equal to 10 mrad gamma
Less than or equal to 20 mrad beta

3. Dose - Iodine-131, Tritium, and Radionuclides in Particulate Form

Quarterly

Less than or equal to 7.5 mrem to any organ

Yearly

Less than or equal to 15 mrem to any organ

B. Liquid Effluents

1. Concentration

The concentration of radioactive material released to the discharge canal shall be limited to the concentration specified in 10CFR20, Appendix B, Table II, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the total concentration released shall be limited to 2E-4 microcuries/ml.

2. Dose

Quarterly

Less than or equal to 1.5 mrem total body
Less than or equal to 5 mrem critical organ

Yearly

Less than or equal to 3 mrem total body
Less than or equal to 10 mrem critical organ

3. **SUMMARY OF LIQUID EFFLUENT DATA**

As required by Regulatory Guide 1.21, Rev. 1, a summary of data for liquid releases is provided in the Semiannual Report. This summary covers releases from July 1 to December 31, 1995. The summary of liquid effluents for both Unit 1 and Unit 2 is as follows:

	<u>Unit 1</u>	<u>Unit 2</u>
Number of releases:	520	256
Total time for all releases (minutes):	86464	190556
Maximum time for a release (minutes):	370	12263
Average time for a release (minutes):	166	744
Minimum time for a release (minutes):	29	56

The Unit 1 liquid releases consisted of:

517 Normal Releases
3 Non-routine Releases
0 Unplanned Releases

The Unit 2 liquid releases consisted of:

243	Normal Releases
13	Non-routine Releases
0	Unplanned Releases

**SEMIANNUAL SUMMATION FOR ALL RELEASES BY QUARTER
 (ALL LIQUID EFFLUENTS)
 July 1 through December 31, 1995**

Unit 1

Type of Effluent	Units	Quarter 3	Quarter 4	Est. Total Error %
<u>A. Fission and Activation Products</u>				
1. Total Release (Not Including Tritium, Gases, Alpha)	Curies	1.957E-01	2.941E-01	0
2. Average Diluted Concentration During Period	μCi/ml	5.094E-10	9.709E-10	
3. Percent of Applicable Limit	%	1.698E-01	3.236E-01	
<u>B. Tritium</u>				
1. Total Release	Curies	1.318E+02	6.667E+01	0
2. Average Diluted Concentration During Period	μCi/ml	3.430E-07	2.201E-07	
3. Percent of Applicable Limit	%	1.143E-02	7.335E-03	
<u>C. Dissolved and Entrained Gases</u>				
1. Total Release	Curies	3.799E-01	7.969E-03	0
2. Average Diluted Concentration	μCi/ml	9.890E-10	2.631E-11	
3. Percent of Applicable Limit	%	4.945E-04	1.315E-05	
<u>D. Gross Alpha Radioactivity</u>				
1. Total Release	Curies	2.072E-02	3.993E-03	0
<u>E. Waste Vol Released (Pre-Dilution)</u>				
	Liters	3.066E+07	3.016E+07	0
<u>F. Volume of Dilution Water Used</u>				
	Liters	3.840E+11	3.029E+11	0

UNIT 1

REPORT CATEGORY : SEMIANNUAL LIQUID CONTINUOUS AND BATCH RELEASES
: TOTALS FOR EACH NUCLIDE RELEASED
TYPE OF ACTIVITY : ALL RADIONUCLIDES
REPORTING PERIOD : QUARTER # 3 AND QUARTER # 4 YEAR 1995

NUCLIDE	UNIT	CONTINUOUS RELEASES		BATCH RELEASES	
		QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
CS-138	CURIES	0.00E+00	0.00E+00	2.16E-04	0.00E+00
XE-131M	CURIES	0.00E+00	0.00E+00	4.27E-03	0.00E+00
SR-92	CURIES	0.00E+00	0.00E+00	0.00E+00	4.72E-06
I-133	CURIES	0.00E+00	0.00E+00	4.46E-06	6.35E-06
ZR-95	CURIES	0.00E+00	0.00E+00	0.00E+00	1.73E-05
NB-95	CURIES	0.00E+00	0.00E+00	3.78E-06	2.36E-05
XE-133M	CURIES	0.00E+00	0.00E+00	5.56E-04	3.10E-05
XE-135	CURIES	0.00E+00	0.00E+00	1.32E-04	3.72E-05
SE-75	CURIES	0.00E+00	0.00E+00	0.00E+00	4.63E-05
AG-110M	CURIES	0.00E+00	0.00E+00	2.34E-05	1.06E-04
SB-124	CURIES	0.00E+00	0.00E+00	4.11E-03	2.73E-04
I-131	CURIES	0.00E+00	0.00E+00	1.40E-03	6.27E-04
CR-51	CURIES	0.00E+00	0.00E+00	4.98E-03	8.37E-04
NA-24	CURIES	0.00E+00	0.00E+00	3.18E-03	1.47E-03
CS-134	CURIES	0.00E+00	0.00E+00	2.10E-03	2.31E-03
CO-57	CURIES	0.00E+00	0.00E+00	3.06E-04	3.29E-03
G-ALPHA	CURIES	0.00E+00	0.00E+00	2.07E-02	3.99E-03
CS-137	CURIES	0.00E+00	0.00E+00	5.33E-03	6.42E-03
XE-133	CURIES	0.00E+00	0.00E+00	3.75E-01	7.90E-03
MN-54	CURIES	0.00E+00	0.00E+00	1.05E-02	1.31E-02
SB-125	CURIES	0.00E+00	0.00E+00	1.16E-01	2.81E-02
CO-60	CURIES	0.00E+00	0.00E+00	5.70E-03	4.24E-02
CO-58	CURIES	0.00E+00	0.00E+00	4.15E-02	1.95E-01
H-3	CURIES	0.00E+00	0.00E+00	1.32E+02	6.67E+01
Total for Period	CURIES	0.00E+00	0.00E+00	1.32E+02	6.70E+01

**SEMIANNUAL SUMMATION FOR ALL RELEASES BY QUARTER
 (ALL LIQUID EFFLUENTS)
 July 1 through December 31, 1995**

Unit 2

Type of Effluent	Units	Quarter 3	Quarter 4	Est. Total Error %
<u>A. Fission and Activation Products</u>				
1. Total Release (Not Including Tritium, Gases, Alpha)	Curies	6.414E-02	3.560E-01	0
2. Average Diluted Concentration During Period	μCi/ml	1.670E-10	1.175E-09	
3. Percent of Applicable Limit	%	5.566E-02	3.917E-01	
<u>B. Tritium</u>				
1. Total Release	Curies	1.617E+02	1.752E+01	0
2. Average Diluted Concentration During Period	μCi/ml	4.350E-07	5.783E-08	
3. Percent of Applicable Limit	%	1.450E-02	1.928E-03	
<u>C. Dissolved and Entrained Gases</u>				
1. Total Release	Curies	3.863E+01	2.482E-01	0
2. Average Diluted Concentration	μCi/ml	1.006E-07	8.195E-10	
3. Percent of Applicable Limit	%	5.028E-02	4.097E-04	
<u>D. Gross Alpha Radioactivity</u>				
1. Total Release	Curies	4.216E-03	1.973E-05	0
<u>E. Waste Vol Released (Pre-Dilution)</u>	Liters	2.364E+07	1.955E+07	0
<u>F. Volume of Dilution Water Used</u>	Liters	3.840E+11	3.029E+11	0

UNIT 2

REPORT CATEGORY : SEMIANNUAL LIQUID CONTINUOUS AND BATCH RELEASES

: TOTALS FOR EACH NUCLIDE RELEASED

TYPE OF ACTIVITY : ALL RADIONUCLIDES

REPORTING PERIOD : QUARTER # 3 AND QUARTER # 4 YEAR 1995

NUCLIDE	UNIT	CONTINUOUS RELEASES		BATCH RELEASES	
		QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
Y-88	CURIES	0.00E+00	0.00E+00	7.09E-06	0.00E+00
Y-91M	CURIES	0.00E+00	0.00E+00	1.56E-05	0.00E+00
FE-59	CURIES	0.00E+00	0.00E+00	1.59E-05	0.00E+00
NB-94	CURIES	0.00E+00	0.00E+00	1.74E-05	0.00E+00
NB-97	CURIES	0.00E+00	0.00E+00	4.11E-05	0.00E+00
XE-135M	CURIES	0.00E+00	0.00E+00	4.62E-05	0.00E+00
SE-75	CURIES	0.00E+00	0.00E+00	5.89E-05	0.00E+00
I-134	CURIES	0.00E+00	0.00E+00	7.89E-05	0.00E+00
AR-41	CURIES	0.00E+00	0.00E+00	1.29E-04	0.00E+00
BA-140	CURIES	0.00E+00	0.00E+00	1.32E-04	0.00E+00
KR-87	CURIES	0.00E+00	0.00E+00	1.49E-04	0.00E+00
MO-99	CURIES	0.00E+00	0.00E+00	2.36E-04	0.00E+00
TC-99M	CURIES	0.00E+00	0.00E+00	2.88E-04	0.00E+00
I-135	CURIES	0.00E+00	0.00E+00	4.05E-04	0.00E+00
KR-88	CURIES	0.00E+00	0.00E+00	4.28E-04	0.00E+00
CS-136	CURIES	0.00E+00	0.00E+00	4.63E-04	0.00E+00
CE-144	CURIES	0.00E+00	0.00E+00	1.41E-03	0.00E+00
KR-85M	CURIES	0.00E+00	0.00E+00	1.97E-03	0.00E+00
RB-88	CURIES	0.00E+00	0.00E+00	3.03E-03	0.00E+00
XE-135	CURIES	0.00E+00	0.00E+00	8.64E-02	0.00E+00
KR-85	CURIES	0.00E+00	0.00E+00	1.11E-01	0.00E+00
LA-140	CURIES	0.00E+00	0.00E+00	1.69E-04	1.86E-05
G-ALPHA	CURIES	0.00E+00	0.00E+00	4.22E-03	1.97E-05
NB-95	CURIES	0.00E+00	0.00E+00	3.11E-04	4.73E-05
I-133	CURIES	0.00E+00	0.00E+00	7.03E-04	6.70E-05
CO-57	CURIES	0.00E+00	0.00E+00	0.00E+00	8.63E-05
NA-24	CURIES	0.00E+00	0.00E+00	1.43E-04	9.43E-05
SB-122	CURIES	0.00E+00	0.00E+00	8.45E-05	9.83E-05
ZR-95	CURIES	0.00E+00	0.00E+00	2.03E-04	1.28E-04
SN-117M	CURIES	0.00E+00	0.00E+00	0.00E+00	1.99E-04
SB-126	CURIES	0.00E+00	0.00E+00	0.00E+00	2.60E-04
TE-132	CURIES	0.00E+00	0.00E+00	1.60E-04	3.11E-04
MN-54	CURIES	0.00E+00	0.00E+00	9.05E-04	7.92E-04

I-132	CURIES	0.00E+00	0.00E+00	1.98E-04	8.48E-04
XE-133M	CURIES	0.00E+00	0.00E+00	4.21E-01	9.15E-04
I-131	CURIES	0.00E+00	0.00E+00	3.73E-03	1.02E-03
AG-110M	CURIES	0.00E+00	0.00E+00	5.06E-04	1.11E-03
CO-60	CURIES	0.00E+00	0.00E+00	1.29E-03	1.16E-03
CS-138	CURIES	0.00E+00	0.00E+00	8.79E-05	1.75E-03
CS-134	CURIES	0.00E+00	0.00E+00	6.08E-03	2.49E-03
CS-137	CURIES	0.00E+00	0.00E+00	1.37E-02	4.82E-03
XE-131M	CURIES	0.00E+00	0.00E+00	1.85E-01	7.49E-03
CO-58	CURIES	0.00E+00	0.00E+00	1.23E-02	1.09E-02
CR-51	CURIES	0.00E+00	0.00E+00	4.19E-03	1.23E-02
SB-124	CURIES	0.00E+00	0.00E+00	6.27E-04	6.17E-02
XE-133	CURIES	0.00E+00	0.00E+00	3.78E+01	2.40E-01
SB-125	CURIES	0.00E+00	0.00E+00	1.26E-02	2.56E-01
H-3	CURIES	0.00E+00	0.00E+00	1.67E+02	1.75E+01
Total for Period	CURIES	0.00E+00	0.00E+00	2.06E+02	1.81E+01

4. SUMMARY OF GASEOUS EFFLUENT DATA

As required by Regulatory Guide 1.21, Rev. 1, a summary of data for gaseous releases is provided in the Semiannual Report. This summary covers releases from July 1 to December 31, 1995. The summary of gaseous effluents for both Unit 1 and Unit 2 is as follows:

	<u>Unit 1</u>	<u>Unit 2</u>
Number of releases:	54	113
Total time for all releases (minutes):	400687	690965
Maximum time for a release (minutes):	10897	10585
Average time for a release (minutes):	7825	6061
Minimum time for a release (minutes):	0.55	6

The Unit 1 gaseous releases consisted of:

- 46 Routine vent releases
- 8 Non-routine releases:
 - 7 Steam-driven emergency feedwater (EFW) pump
 - 1 Steam safeties

The Unit 2 gaseous releases consisted of:

- 80 Routine vent releases
- 33 Non-routine releases:
 - 11 Steam-driven emergency feedwater (EFW) pump
 - 1 Containment purge
 - 7 Containment ventilation
 - 2 Volume control tank gas space purge
 - 4 Atmospheric dump valve
 - 1 Auxiliary Steam
 - 7 Eastern Technologies Incorporated (vendor contracted to provide outage laundry processing)

**SEMIANNUAL SUMMATION FOR ALL RELEASES BY QUARTER
 (ALL AIRBORNE EFFLUENTS)
 July 1 through December 31, 1995**

Unit 1

Type of Effluent	Units	Quarter 3	Quarter 4	Est. Total Error %
<u>A. Fission and Activation Products</u>				
1. Total Release	Curies	6.594E+01	5.836E+01	0
2. Average Release Rate for Period	μCi/Sec	8.296E+00	7.343E+00	
3. Percent of Applicable Limit	%	1.161E-01	1.028E-01	
<u>B. Radioiodines</u>				
1. Total Iodine-131	Curies	6.561E-05	7.912E-06	0
2. Average Release Rate for Period	μCi/Sec	8.255E-06	9.954E-07	
3. Percent of Applicable Limit	%	2.311E-05	2.787E-06	
<u>C. Particulates</u>				
1. Particulates (Half-Lives > 8 Days)	Curies	0.000E+00	0.000E+00	0
2. Average Release Rate for Period	μCi/Sec	0.000E+00	0.000E+00	
3. Percent of Applicable Limit	%	0.000E+00	0.000E+00	
4. Gross Alpha Radioactivity	Curies	0.000E+00	0.000E+00	
<u>D. Tritium</u>				
1. Total Release	Curies	2.245E+00	3.320E+00	0
2. Average Release Rate for Period	μCi/Sec	2.825E-01	4.176E-01	
3. Percent of Applicable Limit	%	3.955E-04	5.847E-04	

UNIT 1

REPORT CATEGORY : SEMIANNUAL AIRBORNE GROUND LEVEL
 : CONTINUOUS AND BATCH RELEASES
 : TOTALS FOR EACH NUCLIDE RELEASED
TYPE OF ACTIVITY : FISSION GASES, IODINES, AND PARTICULATES
REPORTING PERIOD : QUARTER # 3 AND QUARTER # 4 YEAR 1995

NUCLIDE	UNIT	CONTINUOUS RELEASES		BATCH RELEASES	
		QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4

Fission Gases

AR-41	CURIES	0.00E+00	0.00E+00	4.00E-07	0.00E+00
XE-135	CURIES	0.00E+00	0.00E+00	3.19E+00	1.22E+01
XE-133	CURIES	0.00E+00	0.00E+00	6.27E+01	4.61E+01
Total for Period	CURIES	0.00E+00	0.00E+00	6.59E+01	5.84E+01

Iodines

I-133	CURIES	0.00E+00	0.00E+00	3.43E-06	0.00E+00
I-131	CURIES	0.00E+00	0.00E+00	6.56E-05	7.91E-06
Total for Period	CURIES	0.00E+00	0.00E+00	6.90E-05	7.91E-06

Particulates

Total for Period	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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Other

H-3	CURIES	0.00E+00	0.00E+00	2.25E+00	3.32E+00
Total for Period	CURIES	0.00E+00	0.00E+00	2.25E+00	3.32E+00

**SEMIANNUAL SUMMATION FOR ALL RELEASES BY QUARTER
 (ALL AIRBORNE EFFLUENTS)
 July 1 through December 31, 1995**

Unit 2

Type of Effluent	Units	Quarter 3	Quarter 4	Est. Total Error %
<u>A. Fission and Activation Products</u>				
1. Total Release	Curies	1.669E+03	1.816E+01	0
2. Average Release Rate for Period	μCi/Sec	2.100E+02	2.285E+00	
3. Percent of Applicable Limit	%	2.939E+00	3.199E-02	
<u>B. Radioiodines</u>				
1. Total Iodine-131	Curies	6.244E-05	7.023E-05	0
2. Average Release Rate for Period	μCi/Sec	7.855E-06	8.835E-06	
3. Percent of Applicable Limit	%	2.199E-05	2.474E-05	
<u>C. Particulates</u>				
1. Particulates (Half-Lives > 8 Days)	Curies	0.000E+00	4.010E-03	0
2. Average Release Rate for Period	μCi/Sec	0.000E+00	5.044E-04	
3. Percent of Applicable Limit	%	0.000E+00	1.412E-03	
4. Gross Alpha Radioactivity	Curies	0.000E+00	9.122E-07	
<u>D. Tritium</u>				
1. Total Release	Curies	2.828E+00	6.724E+00	0
2. Average Release Rate for Period	μCi/Sec	3.558E-01	8.459E-01	
3. Percent of Applicable Limit	%	4.981E-04	1.184E-03	

UNIT 2

REPORT CATEGORY : SEMIANNUAL AIRBORNE GROUND LEVEL
 : CONTINUOUS AND BATCH RELEASES
 : TOTALS FOR EACH NUCLIDE RELEASED
 TYPE OF ACTIVITY : FISSION GASES, IODINES, AND PARTICULATES
 REPORTING PERIOD : QUARTER # 3 AND QUARTER # 4 YEAR 1995

NUCLIDE	UNIT	CONTINUOUS RELEASES		BATCH RELEASES	
		QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4

Fission Gases

XE-133M	CURIES	0.00E+00	0.00E+00	3.15E+00	0.00E+00
KR-85M	CURIES	0.00E+00	0.00E+00	4.29E+01	0.00E+00
XE-135	CURIES	0.00E+00	0.00E+00	1.33E+02	9.10E-04
XE-135M	CURIES	0.00E+00	0.00E+00	0.00E+00	1.23E-03
AR-41	CURIES	0.00E+00	0.00E+00	0.00E+00	1.75E-03
XE-131M	CURIES	0.00E+00	0.00E+00	2.17E+00	4.66E-03
KR-85	CURIES	0.00E+00	0.00E+00	0.00E+00	2.75E-02
XE-133	CURIES	0.00E+00	0.00E+00	1.49E+03	1.81E+01
Total for Period	CURIES	0.00E+00	0.00E+00	1.67E+03	1.82E+01

Iodines

I-133	CURIES	0.00E+00	0.00E+00	4.50E-06	0.00E+00
I-132	CURIES	0.00E+00	0.00E+00	5.39E-06	0.00E+00
I-131	CURIES	0.00E+00	0.00E+00	6.24E-05	7.02E-05
Total for Period	CURIES	0.00E+00	0.00E+00	7.23E-05	7.02E-05

Particulates

RB-88	CURIES	0.00E+00	0.00E+00	1.28E-04	0.00E+00
CS-137	CURIES	0.00E+00	0.00E+00	0.00E+00	1.98E-03
CS-134	CURIES	0.00E+00	0.00E+00	0.00E+00	2.03E-03
Total for Period	CURIES	0.00E+00	0.00E+00	1.28E-04	4.01E-03

Other

SR-89	CURIES	0.00E+00	0.00E+00	0.00E+00	7.18E-08
G-ALPHA	CURIES	0.00E+00	0.00E+00	0.00E+00	9.12E-07
H-3	CURIES	0.00E+00	0.00E+00	2.83E+00	6.72E+00
Total for Period	CURIES	0.00E+00	0.00E+00	2.83E+00	6.72E+00

5. SUMMARY OF RADIATION DOSES

The following is a summary of the annual radiation doses due to radiological effluents during 1995 calculated in accordance with the Offsite Dose Calculation Manual.

UNIT 1

Liquid Radwaste Effluents

Dose Limits (mRem): Total Body = 1.5/Qtr 3/Yr, Other Organs = 5/Qtr 10/Yr

<u>Organ</u>	<u>Qtr 1</u>	<u>%</u>	<u>Qtr 2</u>	<u>%</u>	<u>Qtr 3</u>	<u>%</u>	<u>Qtr 4</u>	<u>%</u>	<u>Year</u>	<u>%</u>
TBody	0.0101	0.67	0.0059	0.39	0.0039	0.26	0.0056	0.37	0.0255	0.85
Bone	0.0080	0.16	0.0051	0.10	0.0031	0.06	0.0044	0.09	0.0205	0.21
Liver	0.0136	0.27	0.0080	0.16	0.0055	0.11	0.0076	0.15	0.0347	0.35
Thyroid	0.0261	0.52	0.0024	0.05	0.0031	0.02	0.0005	0.01	0.0299	0.30
Kidney	0.0047	0.09	0.0026	0.05	0.0020	0.04	0.0026	0.05	0.0120	0.12
Lung	0.0017	0.03	0.0012	0.02	0.0008	0.02	0.0010	0.02	0.0047	0.05
GI-LLI	0.0170	0.34	0.0024	0.05	0.0018	0.04	0.0056	0.11	0.0267	0.27

Gaseous Radwaste Effluents

Iodine, H-3, and Particulate (ITP) - Dose Limits (mRem) = 7.5/Qtr 15/Yr

<u>Organ</u>	<u>Qtr 1</u>	<u>%</u>	<u>Qtr 2</u>	<u>%</u>	<u>Qtr 3</u>	<u>%</u>	<u>Qtr 4</u>	<u>%</u>	<u>Year</u>	<u>%</u>
TBody	0.0015	0.02	0.0013	0.02	0.0014	0.02	0.0020	0.03	0.0062	0.04
Bone	0.0005	0.01	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0006	0.00
Liver	0.0014	0.02	0.0013	0.02	0.0014	0.02	0.0020	0.03	0.0062	0.04
Thyroid	0.0274	0.36	0.0044	0.06	0.0155	0.21	0.0037	0.05	0.0511	0.34
Kidney	0.0015	0.02	0.0013	0.02	0.0015	0.02	0.0021	0.03	0.0063	0.04
Lung	0.0014	0.02	0.0013	0.02	0.0014	0.02	0.0020	0.03	0.0060	0.04
GI-LLI	0.0014	0.02	0.0013	0.02	0.0014	0.02	0.0020	0.03	0.0061	0.04

Noble Gas Air Dose Limits (mRad) = Gamma 5/Qtr 10/Yr, Beta 10/Qtr 20/Yr

Type	Qtr 1	%	Qtr 2	%	Qtr 3	%	Qtr 4	%	Year	%
Gamma	0.0010	0.02	0.0001	0.00	0.0025	0.05	0.0035	0.07	0.0072	0.07
Beta	0.0042	0.04	0.0005	0.01	0.0065	0.07	0.0070	0.07	0.0182	0.09

UNIT 2

Liquid Radwaste Effluents

Dose Limits (mRem): Total Body = 1.5/Qtr 3/Yr, Other Organs = 5 /Qtr 10/Yr

Organ	Qtr 1	%	Qtr 2	%	Qtr 3	%	Qtr 4	%	Year	%
TBody	0.0041	0.27	0.0005	0.03	0.0097	0.65	0.0044	0.30	0.0187	0.62
Bone	0.0031	0.06	0.0003	0.01	0.0081	0.16	0.0037	0.07	0.0153	0.15
Liver	0.0055	0.11	0.0006	0.01	0.0135	0.27	0.0061	0.12	0.0257	0.26
Thyroid	0.0079	0.16	0.0001	0.00	0.0081	0.04	0.0005	0.01	0.0103	0.10
Kidney	0.0023	0.05	0.0003	0.01	0.0047	0.09	0.0021	0.04	0.0093	0.09
Lung	0.0010	0.02	0.0002	0.00	0.0017	0.03	0.0007	0.01	0.0035	0.04
GI-LLI	0.0044	0.09	0.0002	0.00	0.0035	0.07	0.0010	0.02	0.0092	0.09

Gaseous Radwaste Effluents

Iodine, H-3, and Particulate - Dose Limits (mRem) = 7.5/Qtr 15/Y

Organ	Qtr 1	%	Qtr 2	%	Qtr 3	%	Qtr 4	%	Year	%
TBody	0.0061	0.08	0.0013	0.02	0.0018	0.02	0.0452	0.60	0.0544	0.36
Bone	0.0012	0.02	0.0000	0.00	0.0000	0.00	0.1073	1.43	0.1085	0.72
Liver	0.0065	0.09	0.0013	0.02	0.0018	0.02	0.1319	1.76	0.1415	0.94
Thyroid	0.1661	2.22	0.0014	0.02	0.0152	0.20	0.0410	0.55	0.2238	1.49
Kidney	0.0066	0.09	0.0013	0.02	0.0018	0.02	0.0596	0.79	0.0693	0.46
Lung	0.0058	0.08	0.0013	0.02	0.0017	0.02	0.0380	0.51	0.0467	0.31
GI-LLI	0.0058	0.08	0.0013	0.02	0.0017	0.02	0.0265	0.35	0.0353	0.24

Noble Gas Air dose Limits (mRad) = Gamma 5/Qtr 10/Yr, Beta 10/Qtr 20/Yr

Type	Qtr 1	%	Qtr 2	%	Qtr 3	%	Qtr 4	%	Year	%
Gamma	0.0644	1.29	0.0185	0.37	0.0741	1.48	0.0006	0.01	0.1576	1.58
Beta	0.1824	1.82	0.0430	0.43	0.1759	1.76	0.0017	0.02	0.4030	2.02

6. SUMMARY OF DOSE TO MEMBERS OF THE PUBLIC

The following is a summary of the annual radiation dose to members of the public due to activities inside the site boundary.

UNIT 1

	<u>BONE</u>	<u>LIVER</u>	<u>TBODY</u>	<u>THYROID</u>	<u>KIDNEY</u>	<u>GI-LLI</u>	<u>LUNG</u>	<u>SKIN</u>
<u>Gaseous Effluent</u>								
Iodine/Tritium	2.58E-04	2.70E-03	2.72E-03	2.23E-02	2.74E-03	2.64E-03	2.65E-03	
Particulate								
Noble Gas			1.91E-03					4.69E-03
<u>Liquid Effluent</u>								
Fish	2.05E-02	3.47E-02	2.55E-02	2.99E-02	1.20E-02	4.73E-03	2.67E-02	
Sediment			1.55E-03					1.83E-03
Unit 1 Total	2.08E-02	3.74E-02	3.01E-02	5.22E-02	1.47E-02	7.37E-03	2.94E-02	6.51E-03

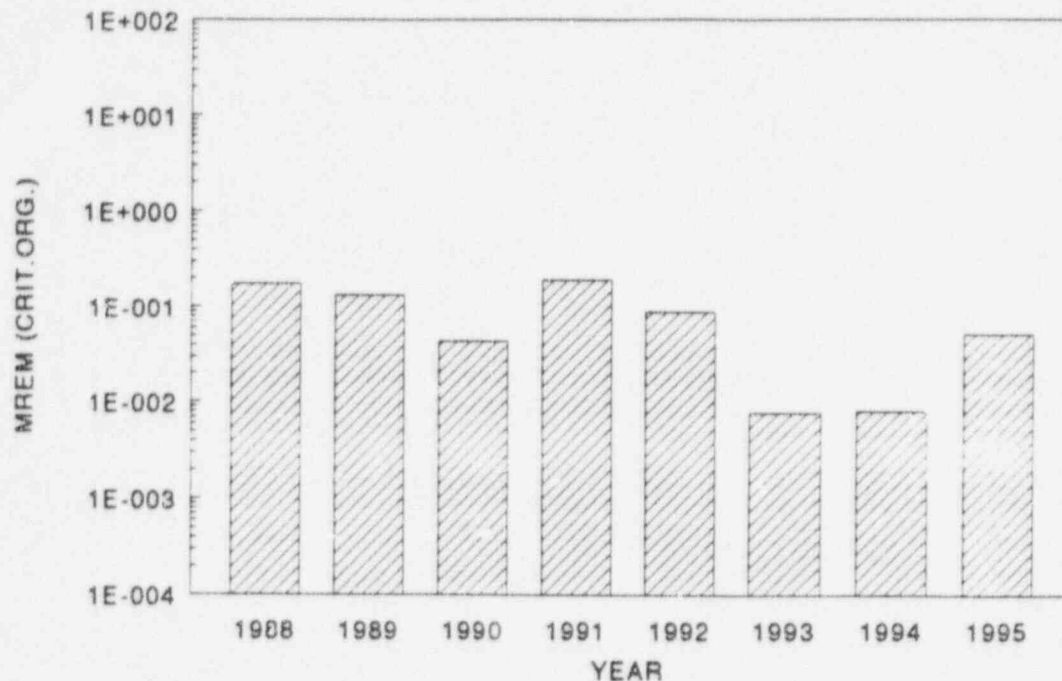
UNIT 2

<u>Gaseous Effluent</u>								
Iodine/Tritium	4.74E-02	6.18E-02	2.38E-02	9.78E-02	3.03E-02	2.04E-02	1.54E-02	
Particulate								
Noble Gas			4.16E-02					9.72E-02
<u>Liquid Effluent</u>								
Fish	1.53E-02	2.57E-02	1.87E-02	1.03E-02	9.28E-03	3.52E-03	9.16E-03	
Sediment			2.78E-04					3.25E-04
Unit 2 Total	6.27E-02	8.75E-02	8.40E-02	1.08E-01	3.96E-02	2.40E-02	2.46E-02	9.76E-02
Site Total	8.35E-02	1.25E-01	1.14E-01	1.60E-01	5.43E-02	3.13E-02	5.40E-02	1.04E-01
Limit (40CFR190)	25	25	75	25	25	25	25	25
% Limit	3.34E-01	5.00E-01	1.52E-01	6.41E-01	2.17E-01	1.25E-01	2.16E-01	4.16E-01

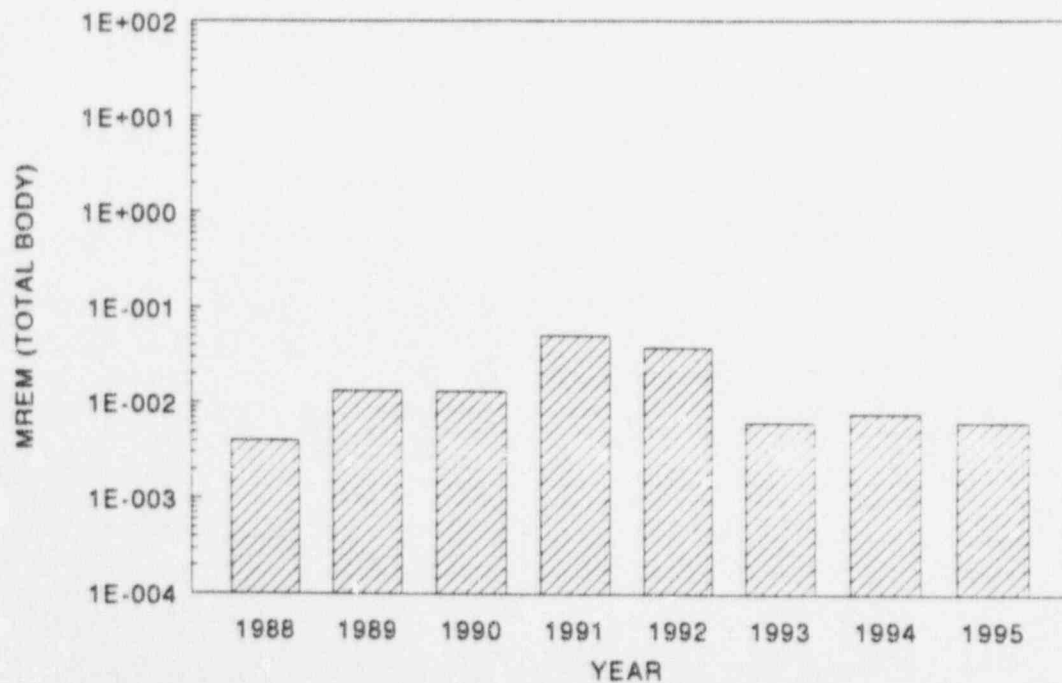
7. HISTORICAL EFFLUENT DATA

The following graphs show the historical release data for both units on a yearly basis. These graphs compare data from 1988 through 1995.

UNIT 1 GASEOUS EFFLUENTS Critical Organ Dose

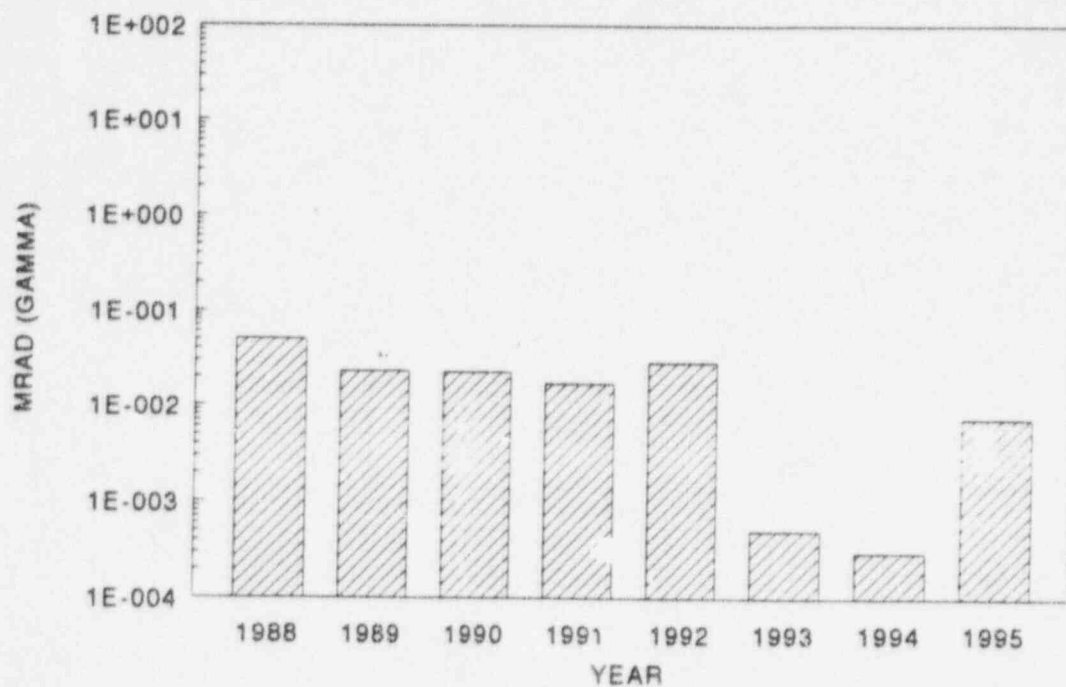


UNIT 1 GASEOUS EFFLUENTS Total Body Dose



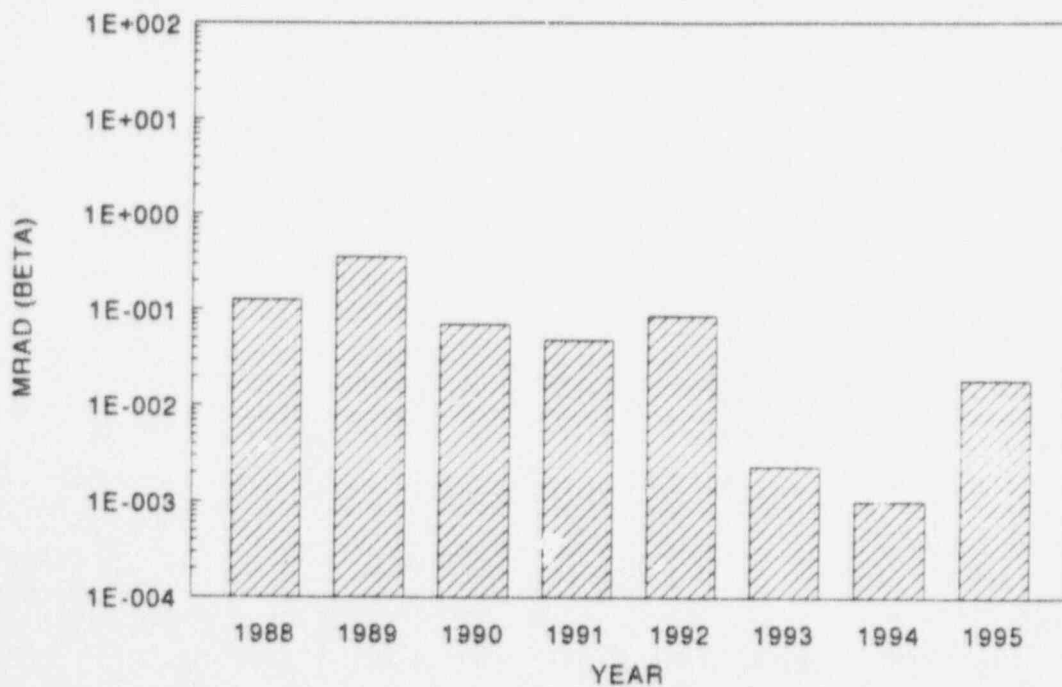
UNIT 1 GASEOUS EFFLUENTS

Gamma Dose

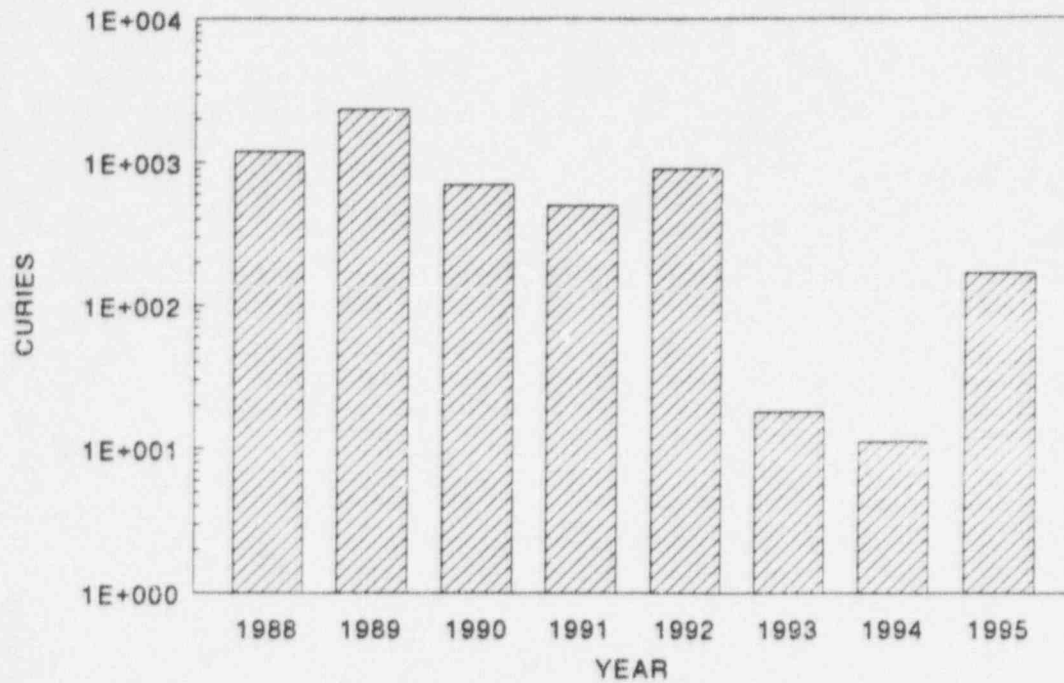


UNIT 1 GASEOUS EFFLUENTS

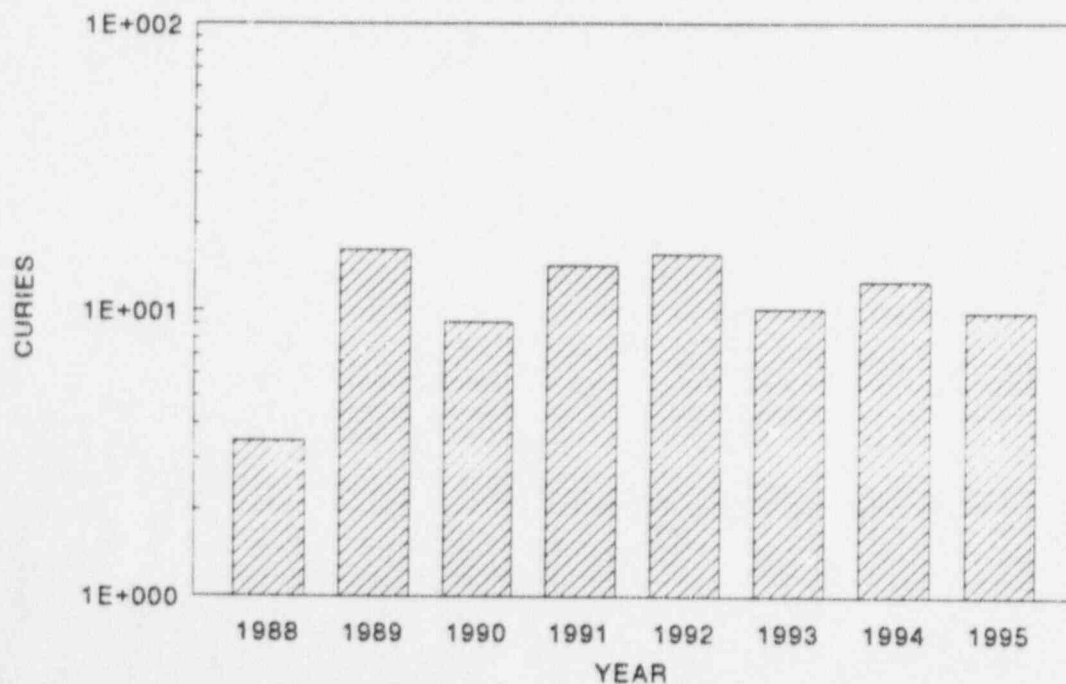
Beta Dose



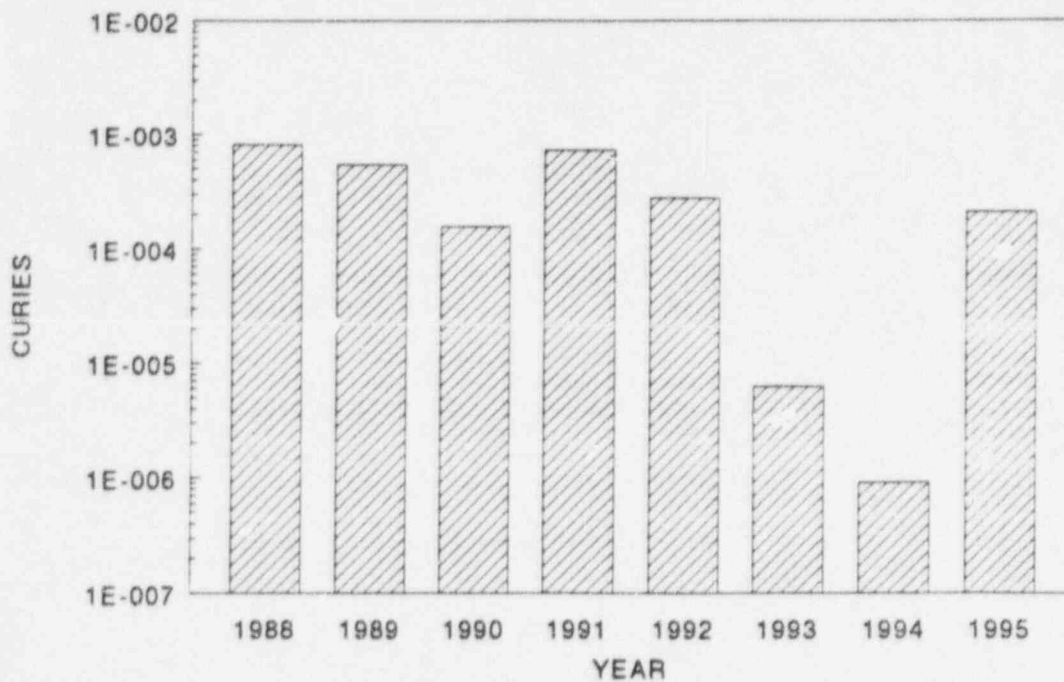
UNIT 1 GASEOUS EFFLUENTS Fission and Activation Products



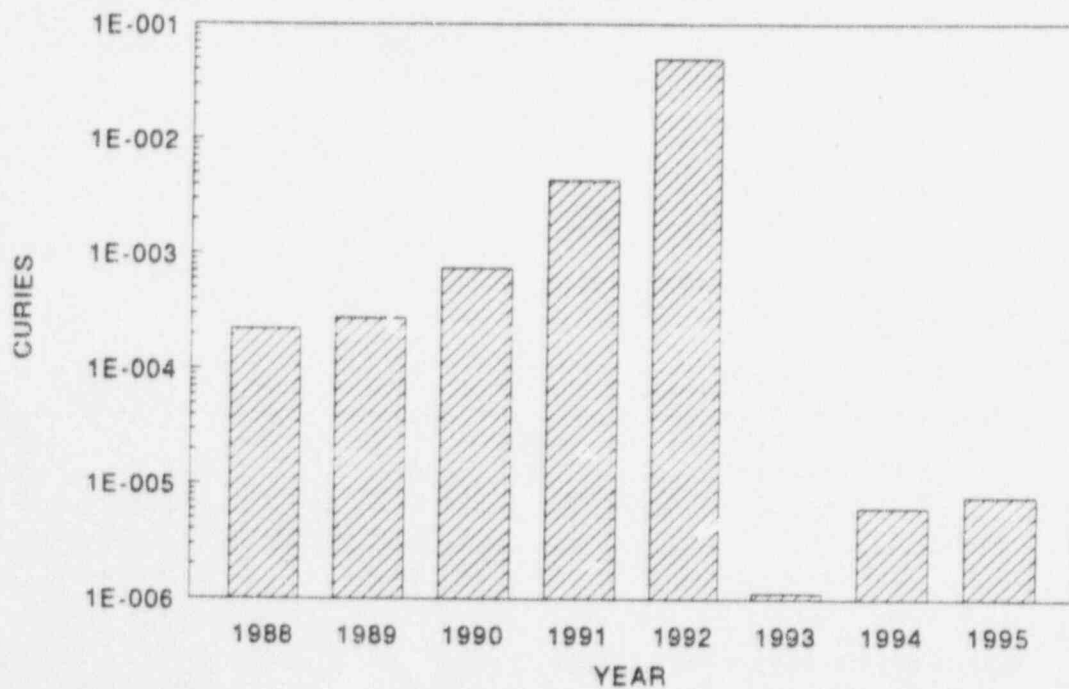
UNIT 1 GASEOUS EFFLUENTS Tritium



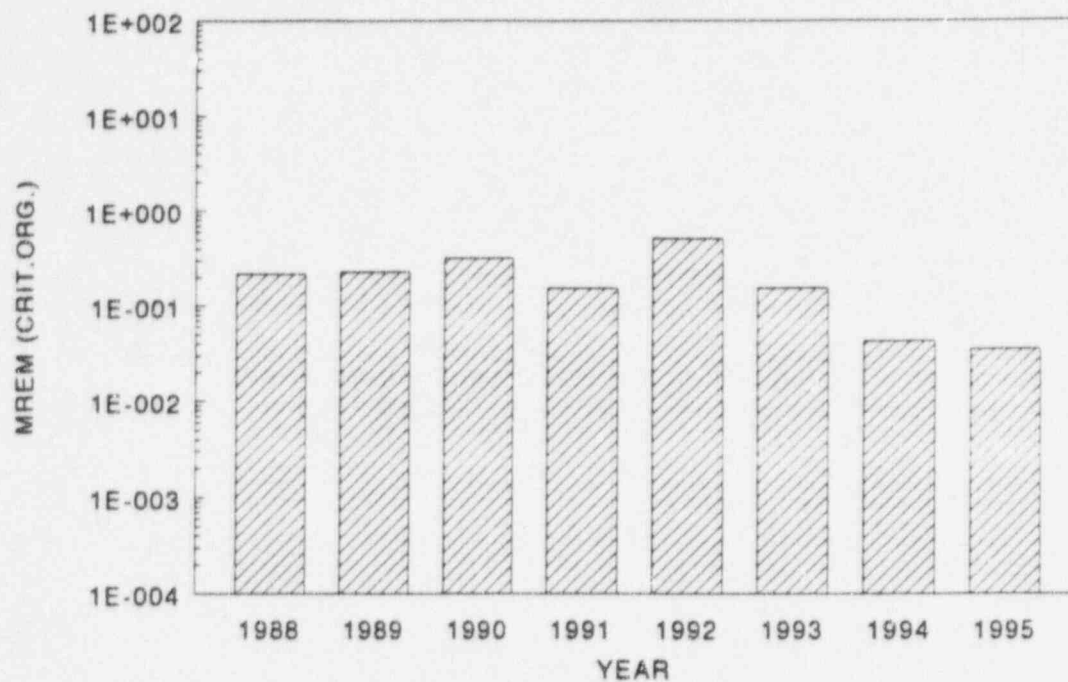
UNIT 1 GASEOUS EFFLUENTS Radiiodines



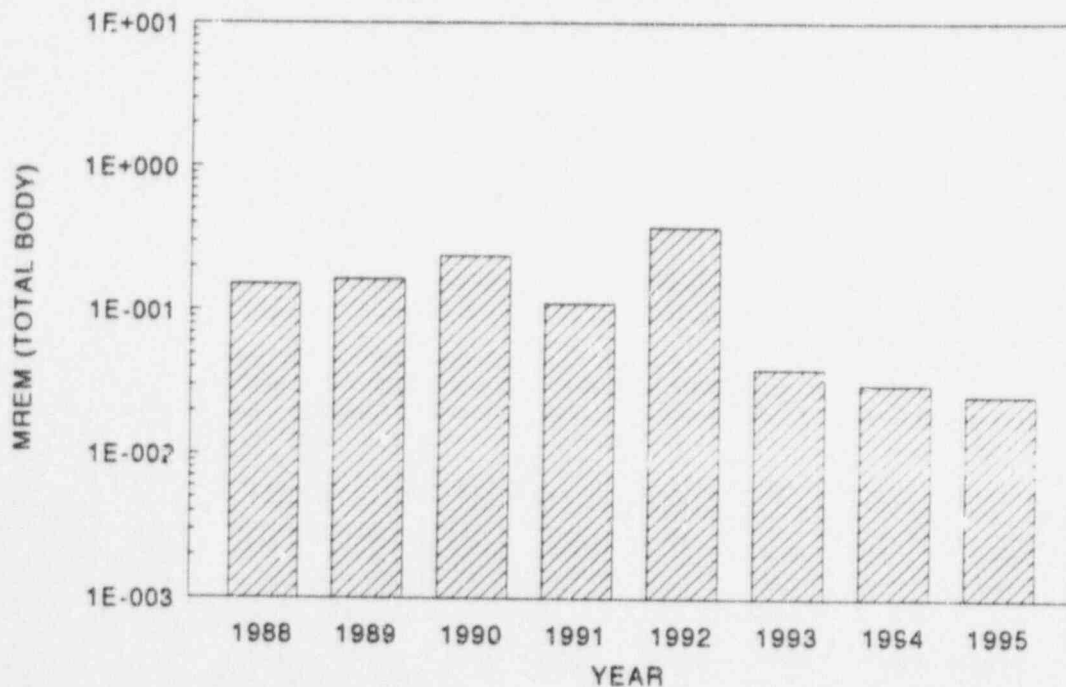
UNIT 1 GASEOUS EFFLUENTS Particulates



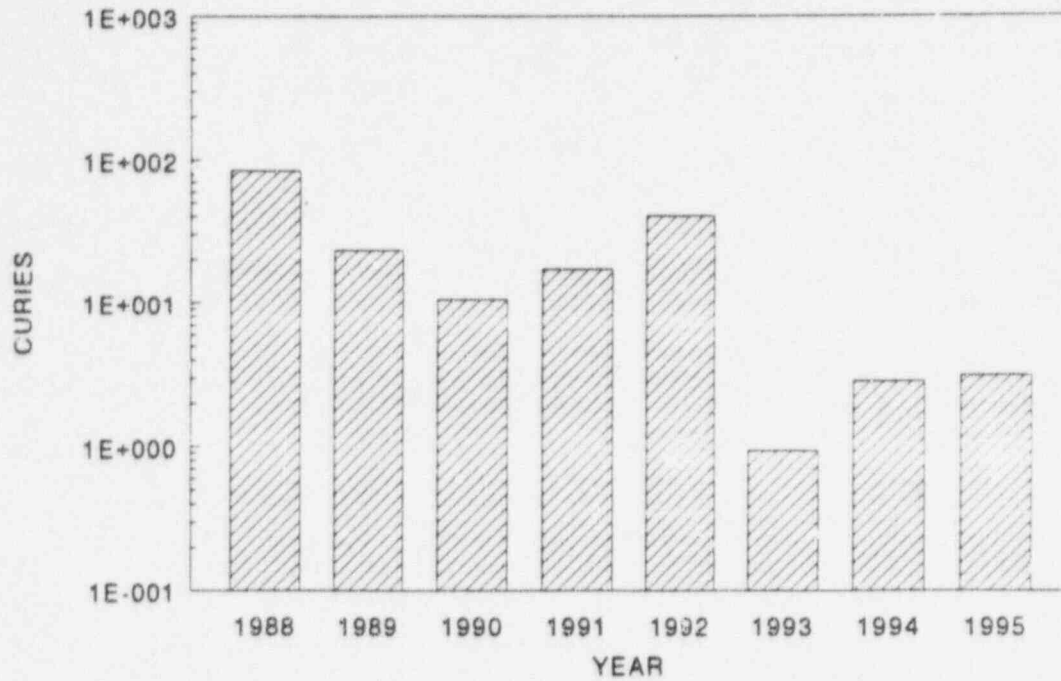
UNIT 1 LIQUID EFFLUENTS Critical Organ Dose



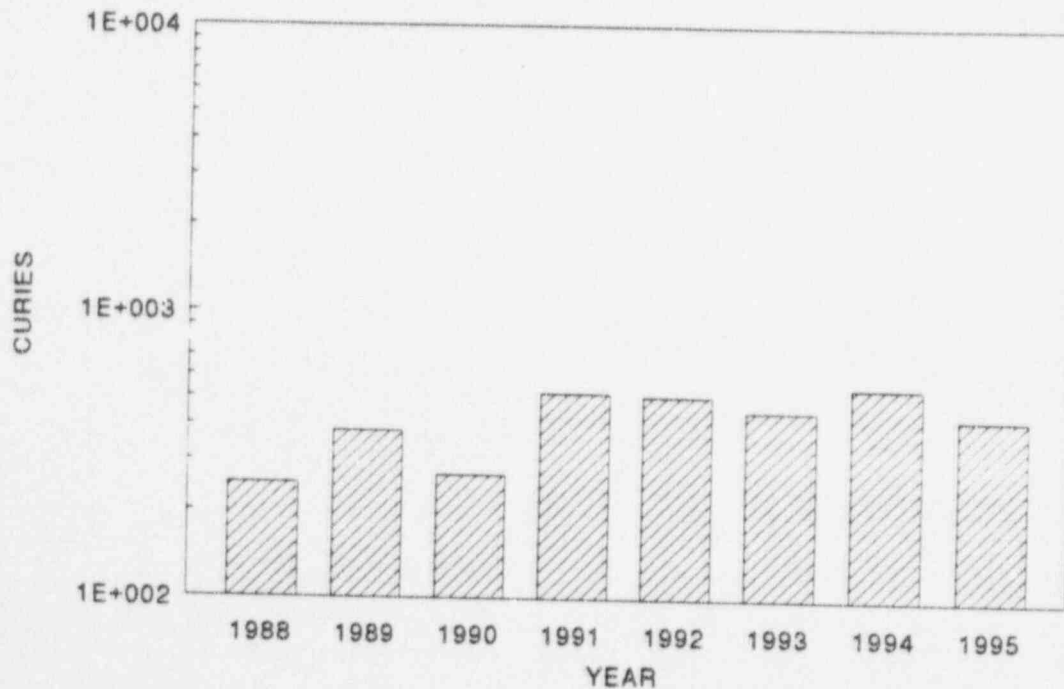
UNIT 1 LIQUID EFFLUENTS Total Body Dose



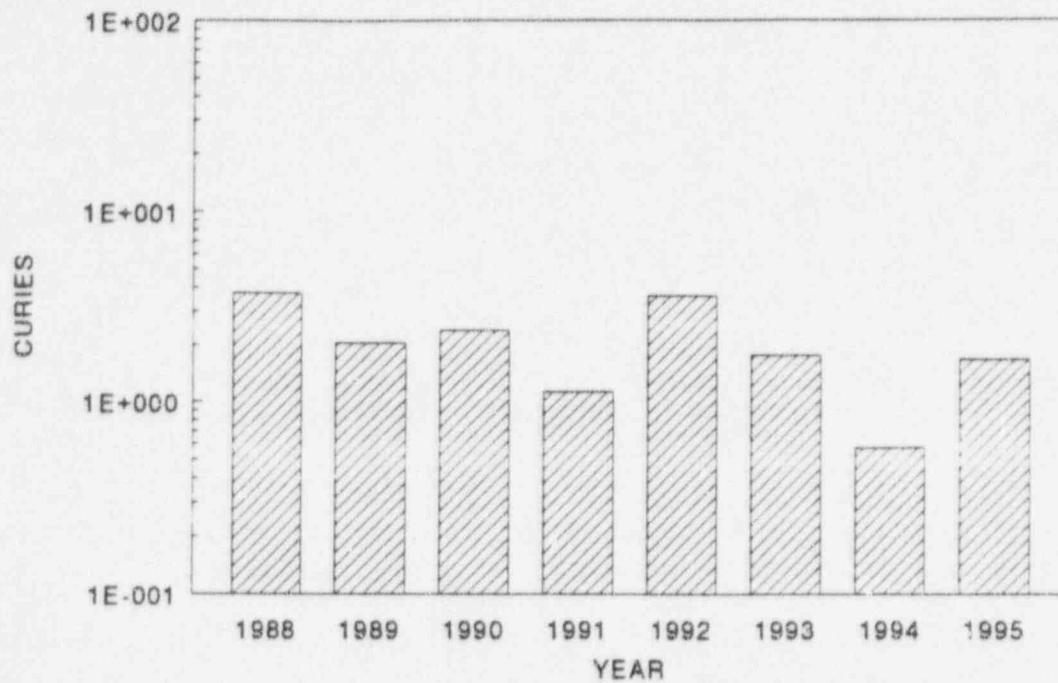
UNIT 1 LIQUID EFFLUENTS Dissolved and Entrained Gases



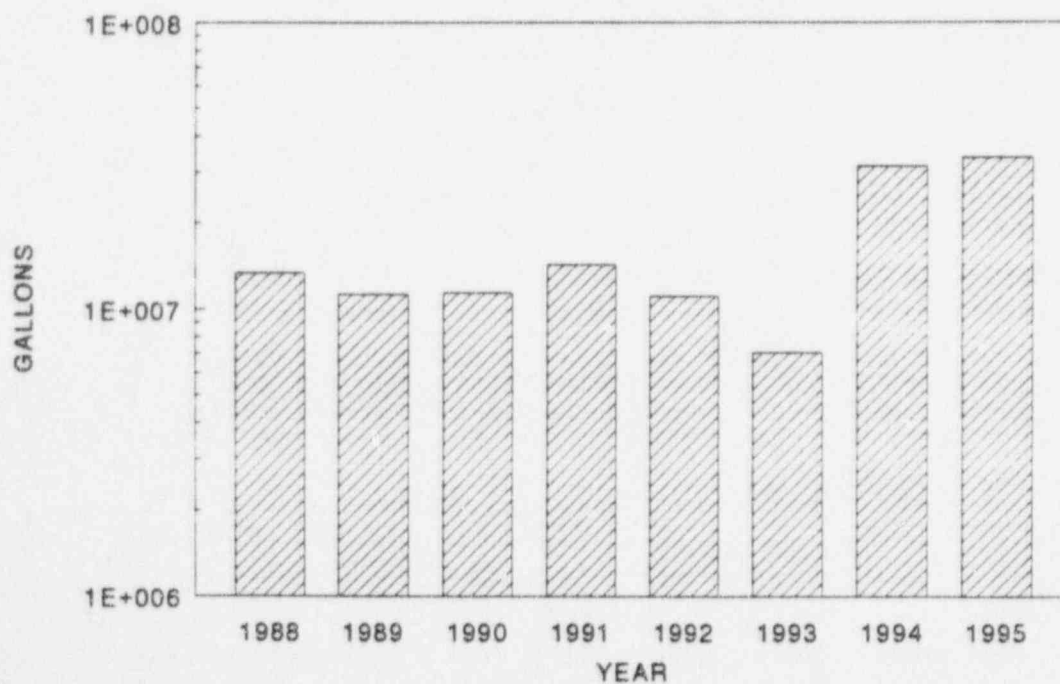
UNIT 1 LIQUID EFFLUENTS Tritium



UNIT 1 LIQUID EFFLUENTS Fission and Activation Products

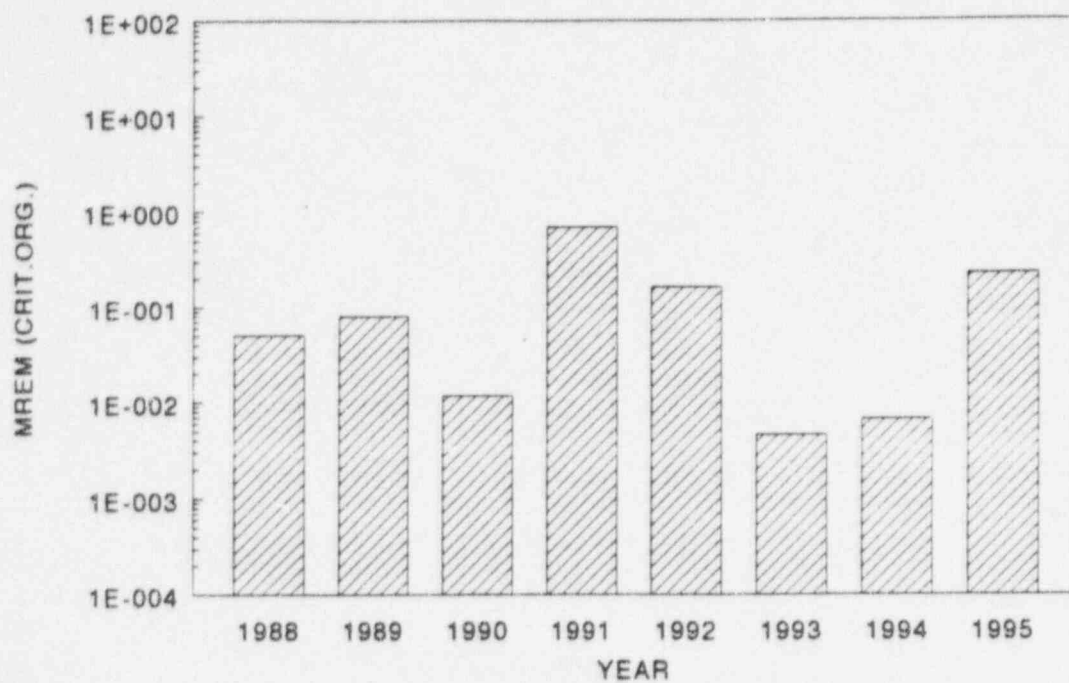


UNIT 1 LIQUID EFFLUENTS Total Volume Released



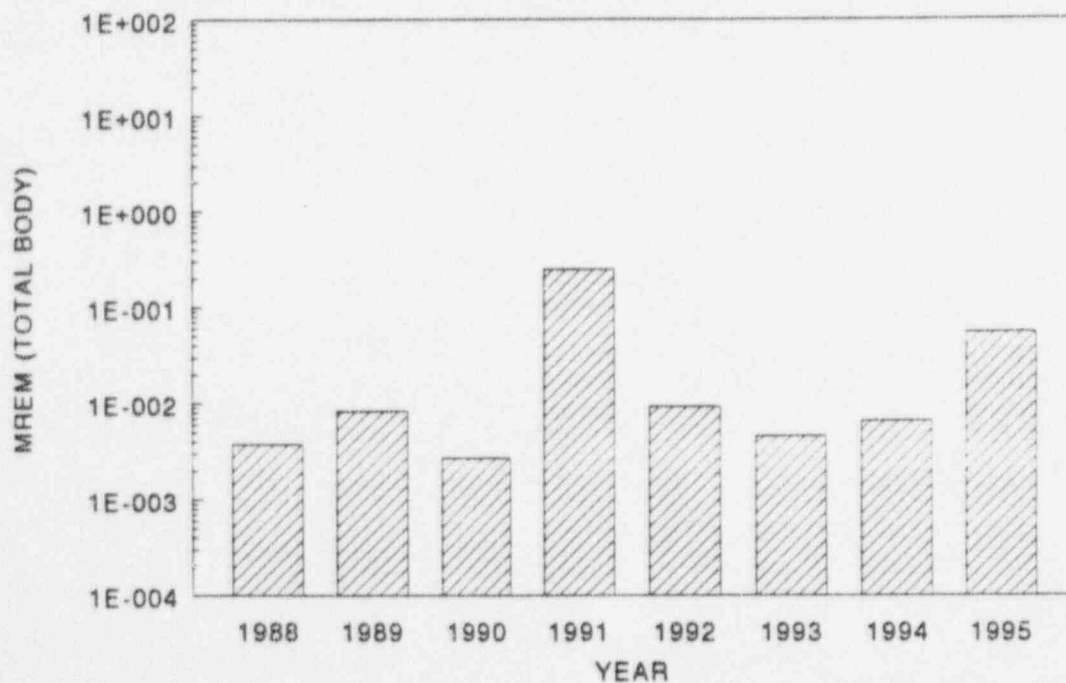
UNIT 2 GASEOUS EFFLUENTS

Critical Organ Dose



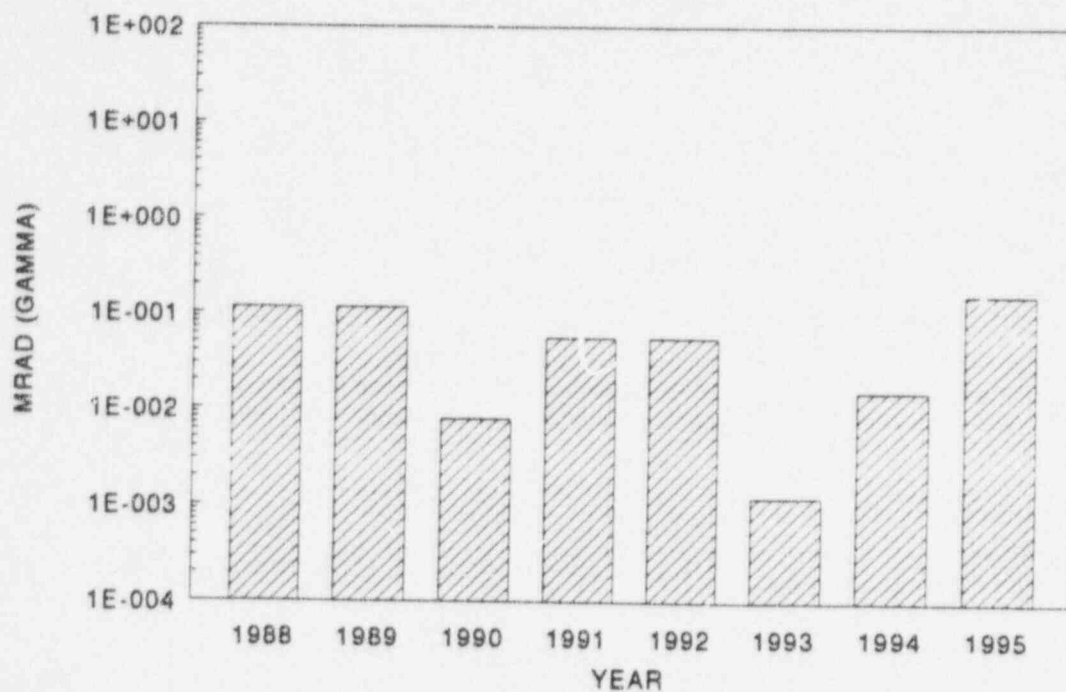
UNIT 2 GASEOUS EFFLUENTS

Total Body Dose



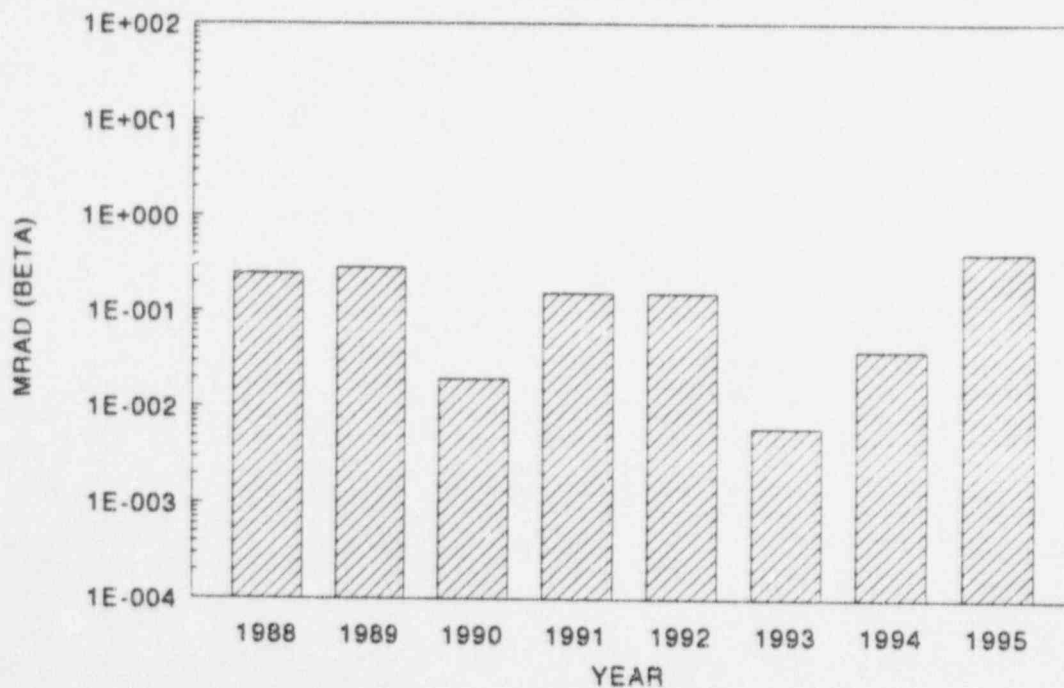
UNIT 2 GASEOUS EFFLUENTS

Gamma Dose



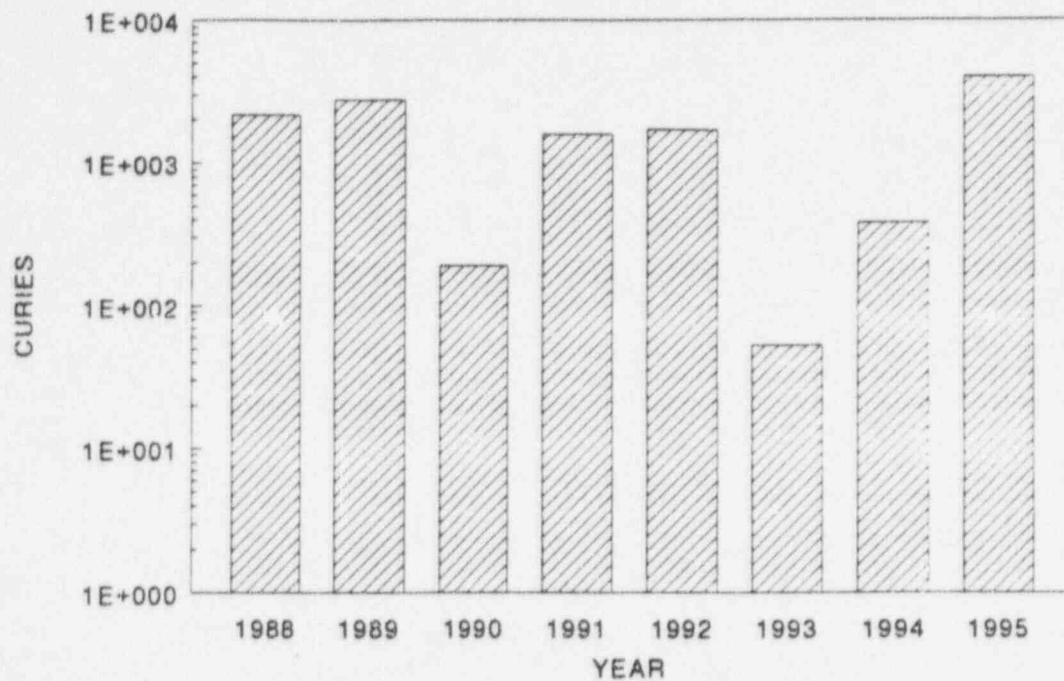
UNIT 2 GASEOUS EFFLUENTS

Beta Dose



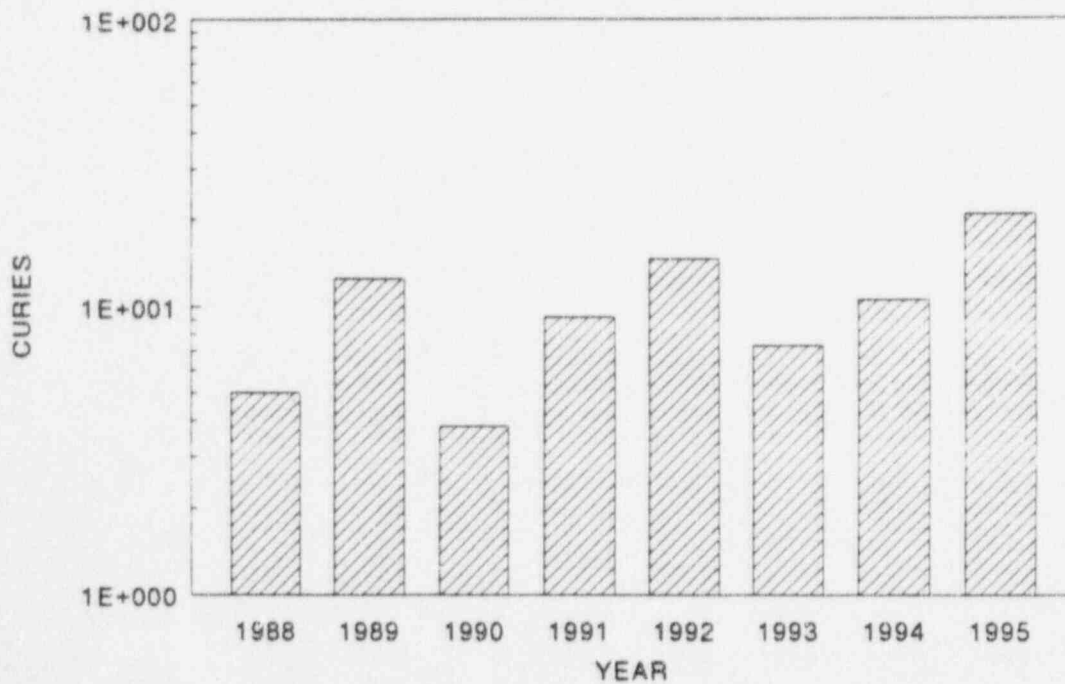
UNIT 2 GASEOUS EFFLUENTS

Fission and Activation Products

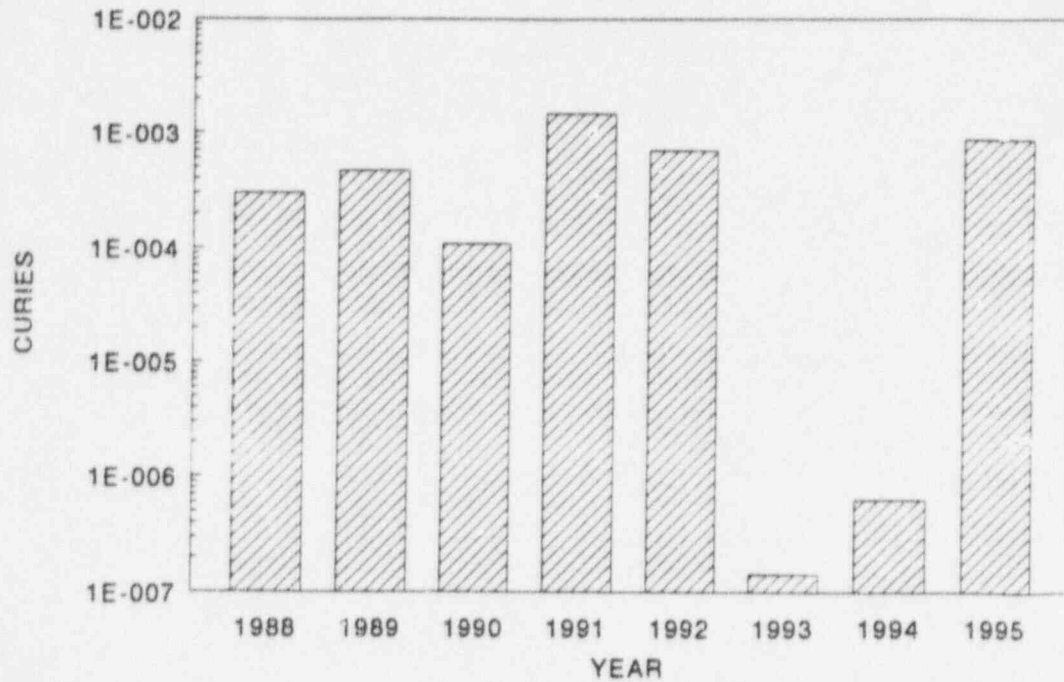


UNIT 2 GASEOUS EFFLUENTS

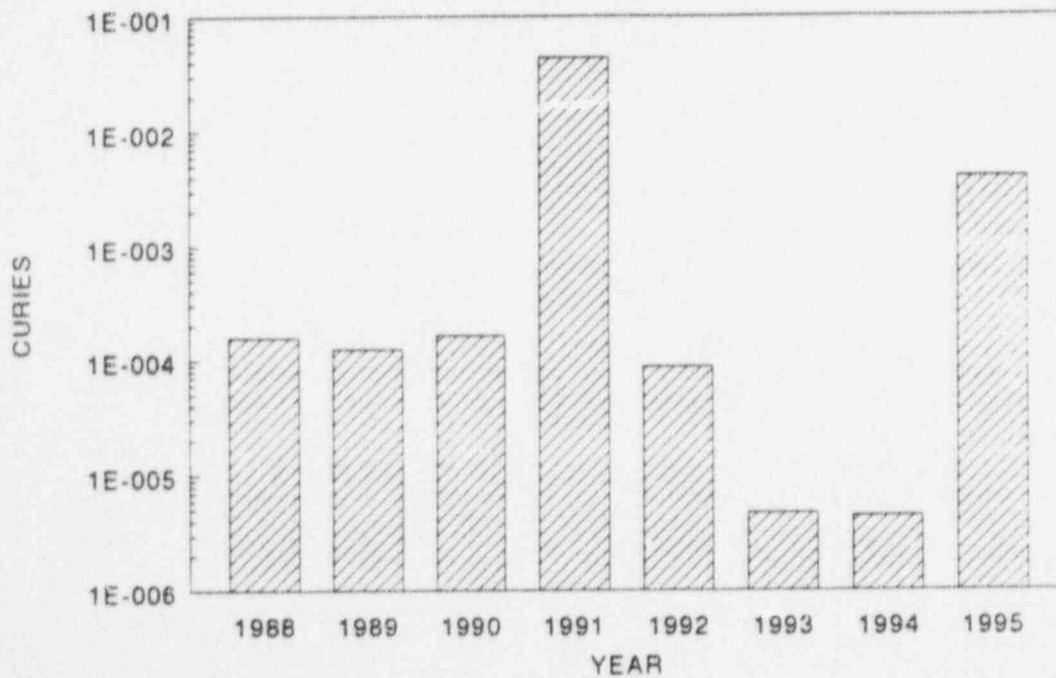
Tritium



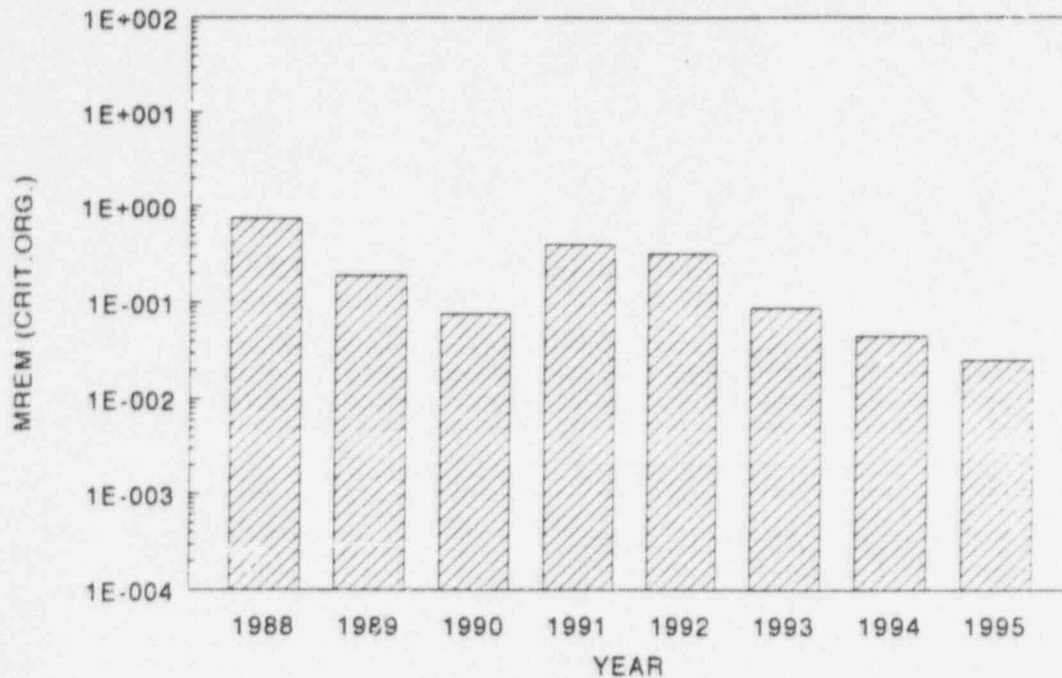
UNIT 2 GASEOUS EFFLUENTS Radioiodines



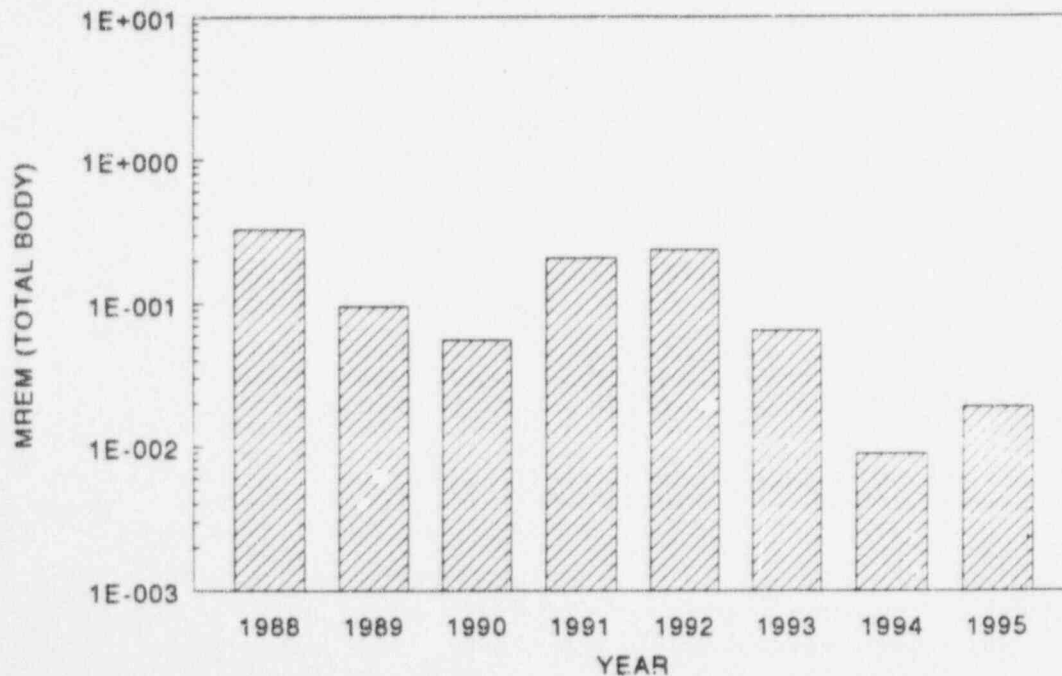
UNIT 2 GASEOUS EFFLUENTS Particulates



UNIT 2 LIQUID EFFLUENTS Critical Organ Dose

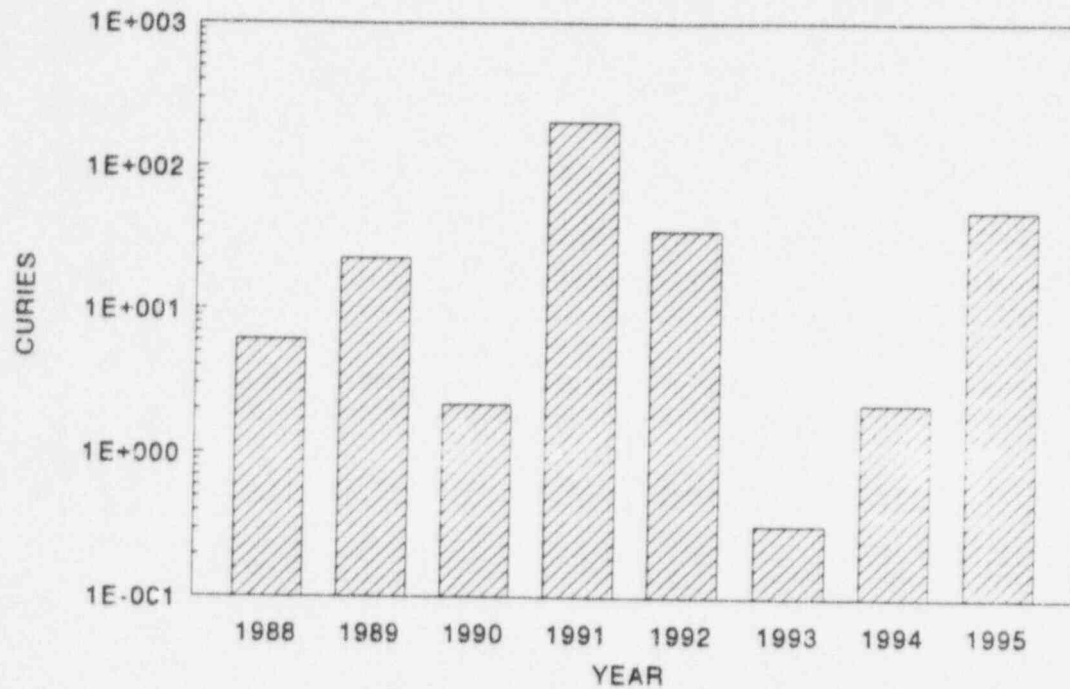


UNIT 2 LIQUID EFFLUENTS Total Body Dose



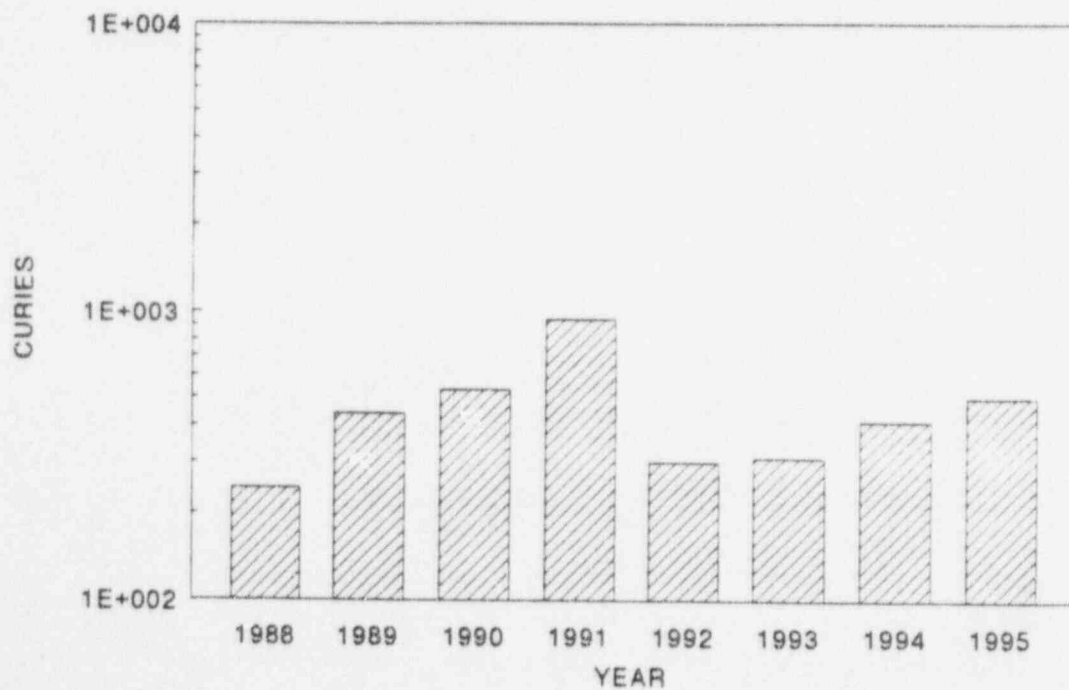
UNIT 2 LIQUID EFFLUENTS

Dissolved and Entrained Gases

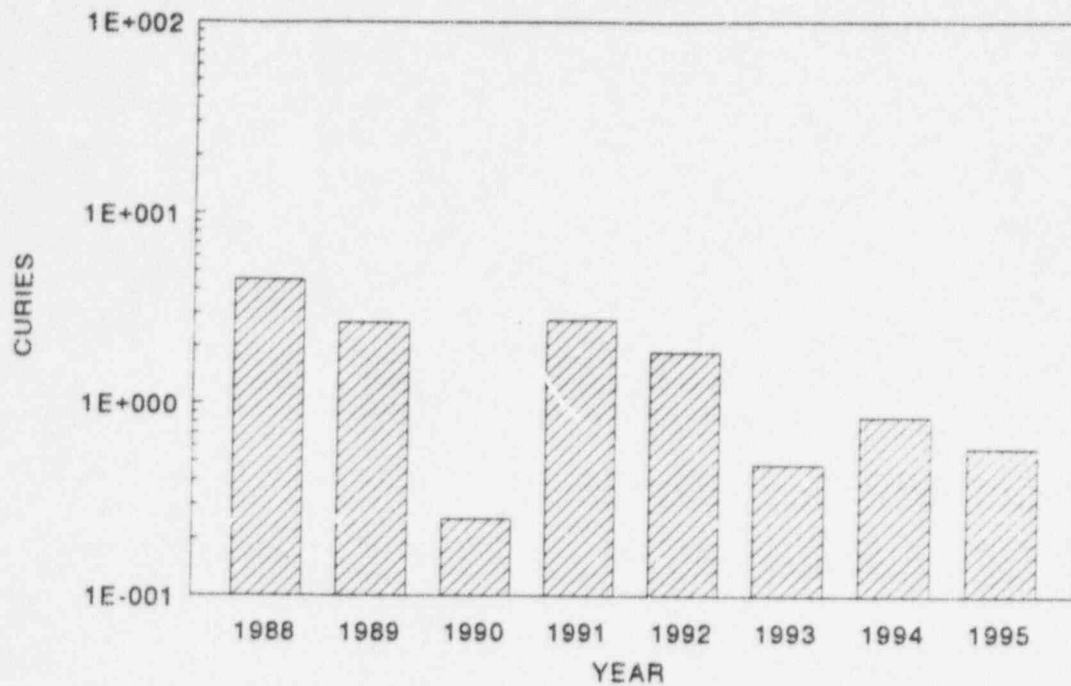


UNIT 2 LIQUID EFFLUENTS

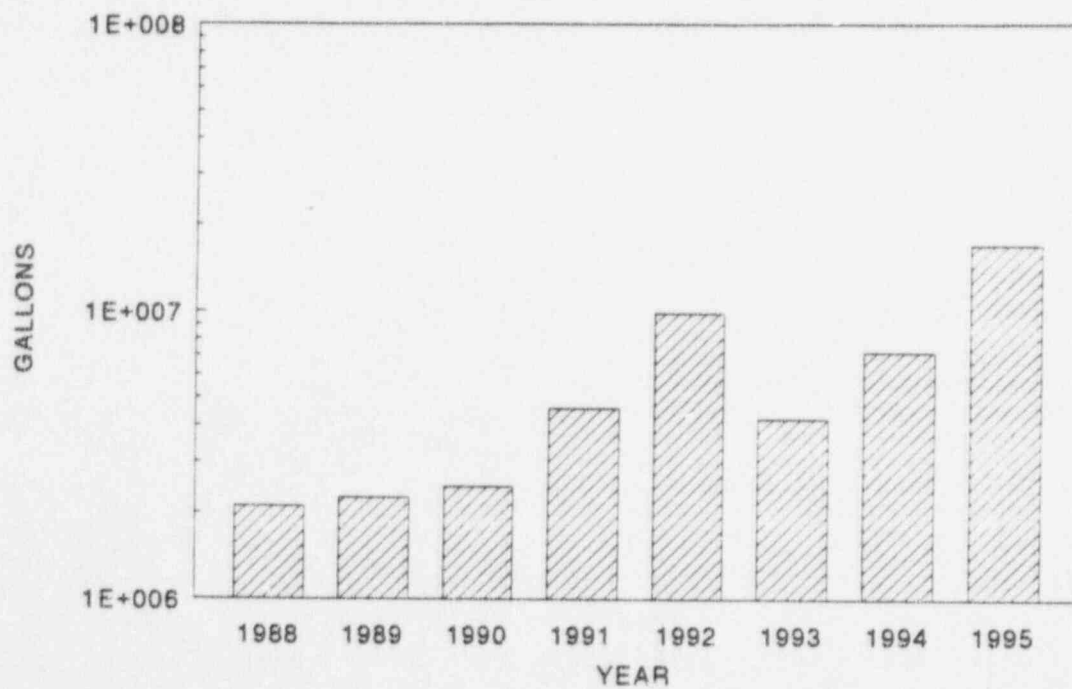
Tritium



UNIT 2 LIQUID EFFLUENTS Fission and Activation Products



UNIT 2 LIQUID EFFLUENTS Total Volume Released



8. **SOLID WASTE SUMMARY**

The following is a summary of the solid wastes shipped offsite during the last six months of 1995.

REGULATORY GUIDE 1.21 REPORT
WASTE DISPOSAL ANNUAL SUMMARY REPORT
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
JULY THROUGH DECEMBER 1995

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 Ci	0.00E+00 0.00E+00	0.00E+00
b. Dry compressible waste, contaminated equip, etc.	m ³ Ci	5.50E+01 8.44E+00	9.73E-01
c. Irradiated components, control rods, etc.	m ³ Ci	0.00E+00 0.00E+00	0.00E+00
d. Other (describe)	m ³ Ci	0.00E+00 0.00E+00	0.00E+00

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

	%	Curies
a. CS-137	0.0	0.00E+00
CS-134	0.0	0.00E+00
NI-63	0.0	0.00E+00
FE-55	0.0	0.00E+00
CO-60	0.0	0.00E+00
CO-58	0.0	0.00E+00
AG-110M	0.0	0.00E+00
C-14	0.0	0.00E+00
b. CO-58	28.7	2.42E+00
CS-137	21.8	1.83E+00
FE-55	13.2	1.11E+00
NI-63	9.1	7.68E-01
SB-125	7.9	6.66E-01
AG-110M	7.2	6.07E-01
CO-60	6.4	5.35E-01
CS-134	4.0	3.35E-01
TE-125M	0.9	7.54E-02
MN-54	0.7	6.24E-02
c. N/A		
d. N/A		

3. Solid Waste Disposition

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
5	Unshielded Van/Truck	Oak Ridge, TN
2	Unshielded Van/Truck	Barnwell, SC

B. Irradiated Fuel Shipments (Disposition)

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
N/A	N/A	N/A

9. **UNPLANNED RELEASES**

No unplanned releases occurred during the third and fourth quarters of 1995.

10. **RADIATION INSTRUMENTATION**

As required by Unit 1 and Unit 2 Technical Specifications, any radioactive effluent instrumentation inoperable for more than 30 days shall be reported in the next Semiannual Radioactive Effluent Release Report. During the third and fourth quarters of 1995, no instrumentation was inoperable longer than 30 days.

11. **CHANGES TO THE PROCESS CONTROL PROGRAM**

As required by Unit 1 and Unit 2 Technical Specifications, a description of changes made to the Process Control Program (PCP) during the reporting period shall be included in the next Semiannual Radioactive Effluent Release Report. No changes were made to the PCP during the third and fourth quarters of 1995.

12. **CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL**

In accordance with Unit 1 and Unit 2 Technical Specifications, changes to the Offsite Dose Calculation Manual (ODCM) shall be documented in the next Semiannual Radioactive Effluent Release Report. During the third and fourth quarters of 1995, no changes were made to the ODCM.

13. **LLD LEVELS**

In accordance with Unit 1 and Unit 2 Technical Specifications, lower limits of detection (LLDs) higher than required shall be documented in the Semiannual Radioactive Effluent Release Report. During the reporting period, there were no LLDs higher than required.

14. RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

In accordance with Unit 1 and Unit 2 Technical Specifications, unavailability of milk or fresh leafy vegetable samples or an increase in an environmental sample location's calculated dose commitment must be identified in the Semiannual Radioactive Effluent Release Report. During the reporting period, the following changes occurred:

- A. There was one environmental sampling location change during the reporting period. The following is a description and reason for the change:
 - 1. Sample Station Number 42 - Milk products for this sample point were deleted. This sample was moved to sample station number 50. The dairy at sample station number 42 is no longer in business. Draft ODCM changes reflective of this change are attached.
- B. During the reporting period, there were no environmental sampling locations identified which would yield a calculated dose commitment greater than the values currently being calculated.

15. SUMMARY OF HOURLY METEOROLOGICAL DATA

In accordance with ANO-1 and ANO-2 Technical Specification 6.12.2.6(e) and 6.9.3.4.1, respectively, a summary of the hourly meteorological data collected over the previous calendar year is to be included in the first Semiannual Radioactive Effluent Release Report of the year. In lieu of including a summary of the meteorological data in this report, the 1995 data is retained at ANO. This data is available for NRC review.

16. DESCRIPTION OF MAJOR CHANGES TO RADWASTE SYSTEMS

During 1995, no major changes were made to the liquid or gaseous radwaste systems for either unit.

**DRAFT OFFSITE DOSE CALCULATION
MANUAL CHANGES**

DRAFT

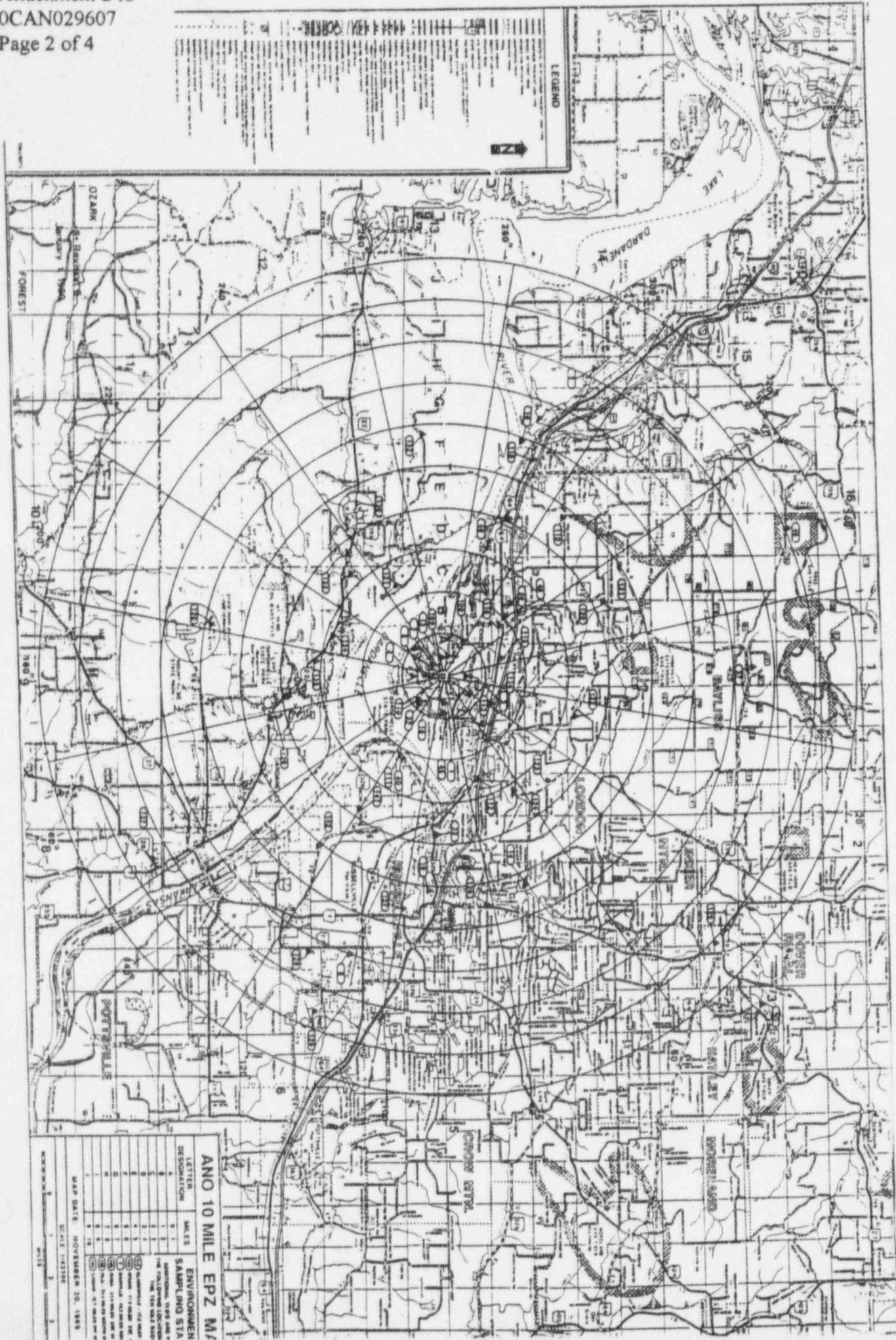


TABLE 4-1
Environmental Sampling Stations - Radiological

Sample Station Number: 46

Approximate Direction and Distance from Plant: 295° - 4.1 miles

Sample Types: 1) Food products

Sample Station Location:

From west junction of Highway 64 and Highway 333 in London, AR, go west on Highway 64 approximately 2.4 miles. Turn right onto Scottie Lane and go approximately 0.1 miles. The sample location is on the right at Dewey Gregory's residence.

Sample Station Number: 48

Approximate Direction and Distance from Plant: 316° - 2.2 miles

Sample Types: 1) Food Products

Sample Station Location:

R.J. Cochran residence, No. 26 Hwy 64 London West, directly North (across from) London Volunteer Fire Dept.

Sample Station Number: 49

Approximate Direction and Distance from Plant: 338° - 9.0 miles

Sample Types: 1) Milk

Sample Station Location:

IF traveling from London,
THEN take Hwy. 333 N. to Augsburg community. Turn left (west) at the Augsburg Church. Travel west on County Road 81 for 3.2 miles. Rylee Dairy on right (north) side of County Road 81.

Sample Station Number: 50

Approximate Direction and Distance from Plant: 47° - 10.8 miles

Sample Types: 1) Milk

Sample Station Location:

Take State Highway 7 north to Dover. Turn right (east) on State Highway 27. Go approximately 1.6 miles. Dairy is located on left (north) side of State Highway 27.

Sample Station Number: 108

Approximate Direction and Distance from Plant: 301° - 0.9 miles

Sample Types: 1) Direct radiation

2) Food Products

Sample Station Location:

IF traveling from Highway 333,
THEN turn south onto Flatwood Road and go approximately 0.4 miles. The sample station is on the right.

IF traveling north on Flatwood Road,
THEN go approximately 0.4 miles from sample station 109. The sample station is on the left.

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TABLE 4-1
Environmental Sampling Stations - Radiological

Sample Station Number: 38
Approximate Direction and Distance from Plant: 314° - 2.4 miles
Sample Types: Food products (alternate)
Sample Station Location:

From west junction of Highway 64 and Highway 333 in London, AR, go approximately 0.4 miles west on Highway 64. Turn right at Hornet Estate and go approximately 0.1 miles. Turn left and go approximately 0.1 miles. The sample station is on the left at Ronnie Jones' residence.

Sample Station Number: 40
Approximate Direction and Distance from Plant: 119° - 2.2 miles
Sample Types: 1) Foods products
Sample Station Location:

From junction on Highway 64 and Highway 326 (Marina Road), go approximately 2.0 miles on Marina Road. The sample station is on the left at Horace Hollis' residence just prior to curve.

Sample Station Number: 45
Approximate Direction and Distance from Plant: 90° - 0.9 miles
Sample Types: 1) Broad leaf vegetation
Sample Station Location:

The sample station is located near mouth of intake canal.

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