ARKANSAS NUCLEAR ONE

UNIT 1 AND UNIT 2
OPERATING LICENSE NO. DPR-51 AND NPF-6

SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

JULY 1, 1992 THROUGH DECEMBER 31, 1992

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1. INTRODUCTION

Arkansas Nuclear One is a two unit plant consisting of a B&W (Unit 1) and CE (Unit 2) design. Both liquid and gaseous effluents are released in accordance with the respective units Technical Specifications. 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 required by those references:

1. Routine radioactive effluent release reports covering the operation of the unit during the previous 6 months of operation.

2. Description of unplanned releases to unrestricted areas.

3. Description of changes to ODCM.

4. Description of changes to PCP.

5. Summary of the hourly meteorological data collected of the previous calendar year. (This data is included in the first report of each year.)

6. Summary of radiation doses due to radiological effluents during the previous calendar year. (This data is included in the first report of each year.)

7. Radiation dose to members of the public due to their activities inside the site boundary. (This data is included in the first report of each year.)

8. 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.)

This report covers the period of July 1, 1992 through December 31, 1992.

2. REGULATORY LIMITS

Unit One and Unit Two Technical Specifications contain the limits to which Arkansas Nuclear One must adhere. Because of the ALARA philosophy at ANO, an attempt is made to reduce the amount of radiation released to the environment to as low as reasonable achievable. The following are the limits required by the Unit Tech. Specs.

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 mrads gamma
Less than or equal to 10 mrads beta

Yearly

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

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

Quarterly

Less than or equal to 7.5 mrems to any organ

Yearly

Less than or equal to 15 mrems to any organ

B. Liquid Effluents

1. The concentration of radioactive material released to the discharge canal shall be limited to the concentration specified in 10 CFR Part 20, Appendix B, Table II, Column 2 for radionuclides other than dissolve 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

The following data is a summary of the number and times of releases for both Unit 1 and Unit 2. These releases occurred between July 1, 1992 and December 31, 1992.

	Unit 1	Unit 2	
Number of releases:	133	181	
Total time for all releases:	19258	50952	(minutes)
Maximum time for a release:	1635	1290	(minutes)
Average time for a release:	145	280	(minutes)
Minimum time for a release:	14	5	(minutes)

As required by Regulatory Guide 1.21 Rev. 1, a summary of data for liquid releases is provided below. The summary of liquid releases from the radwaste effluent system is as follows:

SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER
ALL LIQUID EFFLUENTS
Starting : 1-Jul-1992 Ending : 31-Dec-1992

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
A. FISSION & ACTIVATION PRODUCTS				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	8.723E-01	2.609E-01	0
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	4.379E-08	3.255E-08	
3. PERCENT OF APPLICABLE LIMIT	%	1.459E+01	1.085E+01	
B. TRITIUM				
1. TOTAL RELEASE	CURIES	3.158E+02	1.047E+01	0
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	1.585E-05	1.306E-06	
3. PERCENT OF APPLICABLE LIMIT	%	5.285E-01	4.355E-02	
C. DISSOLVED AND ENTRAINED GASES				
1. TOTAL RELEASE	CURIES	2.634E-03	3.565E-03	0
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	1.322E-10	4.447E-10	
3. PERCENT OF APPLICABLE LIMIT	%	6.613E-05	2.223E-04	
D. GROSS ALPHA RADIOACTIVITY				
1. TOTAL RELEASE	CURIES	5.035E-04	3.308E-03	0
E. WASTE VOL RELEASED(PRE-DILUTION)	LITERS	8.884E+06	3.960E+06	0
F. VOLUME OF DILUTION WATER USED	LITERS	9.689E+10	8.706E+09	0

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 1992

		CONTINUOUS RELEASES		BATCH RELEASES	
NUCLIDE	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
ALL NUCLIDES					
I-132	CURIES	0.00E+00	0.00E+00	2.75E-06	0.00E+00
NA-24	CURIES	0.00E+00	0.00E+00	2.74E-05	0.00E+00
FE-59	CURIES	0.00E+00	0.00E+00	3.94E-05	0.00E+00
AR-41	CURIES	0.00E+00	0.00E+00	7.36E-05	0.00E+00
RU-103	CURIES	0.00E+00	0.00E+00	8.14E-05	0.00E+00
SB-124	CURIES	0.00E+00	0.00E+00	1.06E-04	0.00E+00
ZN-65	CURIES	0.00E+00	0.00E+00	1.88E-04	0.00E+00
SN-113	CURIES	0.00E+00	0.00E+00	2.79E-04	0.00E+00
RU-106	CURIES	0.00E+00	0.00E+00	4.81E-04	0.00E+00
BE-7	CURIES	0.00E+00	0.00E+00	5.76E-04	0.00E+00
KR-88	CURIES	0.00E+00	0.00E+00	7.26E-04	0.00E+00
XE-131M	CURIES	0.00E+00	0.00E+00	1.31E-03	0.00E+00
SR-92	CURIES	0.00E+00	0.00E+00	4.75E-05	1.96E-05
LA-140	CURIES	0.00E+00	0.00E+00	1.61E-05	3.41E-05
I-133	CURIES	0.00E+00	0.00E+00	3.30E-04	5.72E-05
CR-51	CURIES	0.00E+00	0.00E+00	2.15E-03	2.41E-04
SR-89	CURIES	0.00E+00	0.00E+00	0.00E+00	2.44E-04
SR-90	CURIES	0.00E+00	0.00E+00	1.39E-04	4.02E-04
ZR-95	CURIES	0.00E+00	0.00E+00	4.64E-03	1.38E-03
SB-125	CURIES	0.00E+00	0.00E+00	7.50E-03	1.60E-03
CO-57	CURIES	0.00E+00	0.00E+00	4.50E-03	1.62E-03
AG-110M	CURIES	0.00E+00	0.00E+00	9.19E-03	1.87E-03
I-131	CURIES	0.00E+00	0.00E+00	2.00E-03	1.96E-03
NB-95	CURIES	0.00E+00	0.00E+00	1.07E-02	2.43E-03
G-ALPHA	CURIES	0.00E+00	0.00E+00	5.03E-04	3.30E-03
XE-133	CURIES	0.00E+00	0.00E+00	5.19E-04	3.56E-03

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 1992

		CONTINUOUS RELEASES		BATCH RELEASES	
NUCLIDE	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
ALL NUCLIDES CONTINUED					
MN-54	CURIES	0.00E+00	0.00E+00	8.69E-03	5.68E-03
FE-55	CURIES	0.00E+00	0.00E+00	3.56E-02	8.43E-03
CS-134	CURIES	0.00E+00	0.00E+00	2.62E-02	1.51E-02
CS-137	CURIES	0.00E+00	0.00E+00	4.83E-02	3.79E-02
CO-60	CURIES	0.00E+00	0.00E+00	1.30E-01	5.[illegible]-02
CO-58	CURIES	0.00E+00	0.00E+00	5.79E-01	1.3[illegible]-01
H-3	CURIES	0.00E+00	0.00E+00	3.15E+02	1.04E+01
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	3.16E+02	1.07E+01

SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER
ALL LIQUID EFFLUENTS
Starting : 1-Jul-1992 Ending : 31-Dec-1992

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
A. FISSION & ACTIVATION PRODUCTS				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	7.663E-01	3.986E-01	0
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	2.146E-08	1.044E-08	
3. PERCENT OF APPLICABLE LIMIT	%	7.155E+00	3.481E+00	
B. TRITIUM				
1. TOTAL RELEASE	CURIES	3.087E+01	9.997E+01	0
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	8.647E-07	2.619E-06	
3. PERCENT OF APPLICABLE LIMIT	%	2.882E-02	8.730E-02	
C. DISSOLVED AND ENTRAINED GASES				
1. TOTAL RELEASE	CURIES	1.910E+01	2.535E-02	0
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	5.351E-07	6.641E-10	
3. PERCENT OF APPLICABLE LIMIT	%	2.675E-01	3.321E-04	
D. GROSS ALPHA RADIOACTIVITY				
1. TOTAL RELEASE	CURIES	4.944E-04	3.876E-03	0
E. WASTE VOL RELEASED(PRE-DILUTION)	LITERS	7.330E+06	1.022E+07	0
F. VOLUME OF DILUTION WATER USED	LITERS	9.689E+10	8.706E+10	0

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 1992

		CONTINUOUS RELEASES		BATCH RELEASES	
NUCLIDE	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
ALL NUCLIDES					
NP-239	CURIES	0.00E+00	0.00E+00	3.21E-06	0.00E+00
RU-103	CURIES	0.00E+00	0.00E+00	8.64E-05	0.00E+00
SR-92	CURIES	0.00E+00	0.00E+00	2.20E-04	0.00E+00
KR-88	CURIES	0.00E+00	0.00E+00	4.40E-04	0.00E+00
BA-140	CURIES	0.00E+00	0.00E+00	4.59E-04	0.00E+00
CS-136	CURIES	0.00E+00	0.00E+00	6.08E-04	0.00E+00
TC-99M	CURIES	0.00E+00	0.00E+00	7.41E-04	0.00E+00
MO-99	CURIES	0.00E+00	0.00E+00	9.67E-04	0.00E+00
TE-132	CURIES	0.00E+00	0.00E+00	1.44E-03	0.00E+00
KR-85M	CURIES	0.00E+00	0.00E+00	1.58E-03	0.00E+00
SB-122	CURIES	0.00E+00	0.00E+00	2.80E-03	0.00E+00
KR-85	CURIES	0.00E+00	0.00E+00	6.30E-03	0.00E+00
XE-133M	CURIES	0.00E+00	0.00E+00	1.22E-01	0.00E+00
XE-131M	CURIES	0.00E+00	0.00E+00	1.83E-01	0.00E+00
SN-113	CURIES	0.00E+00	0.00E+00	0.00E+00	4.51E-06
AR-41	CURIES	0.00E+00	0.00E+00	7.48E-05	8.68E-05
LA-140	CURIES	0.00E+00	0.00E+00	1.51E-03	1.20E-04
XE-135	CURIES	0.00E+00	0.00E+00	3.06E-03	1.28E-04
SB-126	CURIES	0.00E+00	0.00E+00	5.70E-04	1.43E-04
I-134	CURIES	0.00E+00	0.00E+00	0.00E+00	1.61E-04
I-133	CURIES	0.00E+00	0.00E+00	5.59E-04	2.16E-04
I-135	CURIES	0.00E+00	0.00E+00	0.00E+00	2.34E-04
CO-57	CURIES	0.00E+00	0.00E+00	1.69E-03	2.55E-04
I-132	CURIES	0.00E+00	0.00E+00	2.92E-03	3.90E-04
FE-59	CURIES	0.00E+00	0.00E+00	9.38E-04	4.05E-04
ZR-95	CURIES	0.00E+00	0.00E+00	1.38E-03	4.30E-04

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 1992

		CONTINUOUS RELEASES		BATCH RELEASES	
NUCLIDE	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
ALL NUCLIDES CONTINUED					
AG-110M	CURIES	0.00E+00	0.00E+00	1.76E-03	9.97E-04
NB-95	CURIES	0.00E+00	0.00E+00	2.27E-03	1.01E-03
G-ALPHA	CURIES	0.00E+00	0.00E+00	4.94E-04	3.87E-03
I-131	CURIES	0.00E+00	0.00E+00	3.60E-02	4.33E-03
CO-60	CURIES	0.00E+00	0.00E+00	9.24E-02	4.49E-03
CR-51	CURIES	0.00E+00	0.00E+00	9.26E-03	6.42E-03
CS-134	CURIES	0.00E+00	0.00E+00	2.91E-02	2.19E-02
SB-124	CURIES	0.00E+00	0.00E+00	2.80E-02	2.32E-02
XE-133	CURIES	0.00E+00	0.00E+00	1.87E+01	2.51E-02
CS-137	CURIES	0.00E+00	0.00E+00	3.34E-02	2.95E-02
RB-88	CURIES	0.00E+00	0.00E+00	1.27E-03	3.58E-02
FE-55	CURIES	0.00E+00	0.00E+00	2.56E-03	3.61E-02
MN-54	CURIES	0.00E+00	0.00E+00	4.04E-02	4.94E-02
SB-125	CURIES	0.00E+00	0.00E+00	4.70E-02	5.51E-02
CO-58	CURIES	0.00E+00	0.00E+00	4.25E-01	1.27E-01
H-3	CURIES	0.00E+00	0.00E+00	3.08E+01	9.99E+01
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	5.07E+01	1.00E+02

4. **SUMMARY OF GASEOUS EFFLUENT DATA**

As required by Regulatory Guide 1.21 Rev. 1, a summary of data for gaseous releases is provided below. The summary of gaseous releases from the radwaste effluent system during July 1, 1992 and December 31, 1992 is as follows:

	Unit 1	Unit 2	
Number of releases:	77	84	
Total time for all releases:	498704	467487	(minutes)
Maximum time for a release:	10429	10748	(minutes)
Average time for a release:	6477	5565	(minutes)
Minimum time for a release:	10	0.167	(minutes)

The Unit 1 gaseous releases consisted of:

18 Emergency Feedwater (EFW) Pump releases - These releases were a result of the surveillances to the EFW pump. Four of these 18 releases were the result of Unit 2 surveillances of the EFW pump. These releases are attributed to Unit 1 because Unit 1 steam was used for the surveillance.

4 Waste Gas Decay Tank releases.

55 weekly vent releases.

The Unit 2 gaseous releases consisted of:

10 Emergency Feedwater (EFW) Pump releases - These releases are a result of the surveillances to the EFW pump.

1 Reactor Building Purge

1 Main Steam release

5 Steam Generator releases

3 Volume Control Tank (VCT) releases

1 Unplanned Main Steam relief valve release

63 Weekly vent releases

SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER
ALL AIRBORNE EFFLUENTS
Starting : 1-Jul-1992 Ending : 31-Dec-1992

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
A. FISSION & ACTIVATION PRODUCTS				
1. TOTAL RELEASE	CURIES	1.640E-01	1.828E-02	0
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	2.064E-02	2.300E-03	
3. PERCENT OF APPLICABLE LIMIT	%	2.889E-04	3.221E-05	
B. RADIOIODINES				
1. TOTAL IODINE-131	CURIES	5.739E-06	4.736E-06	0
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	7.220E-07	5.958E-07	
3. PERCENT OF APPLICABLE LIMIT	%	2.021E-06	1.668E-06	
C. PARTICULATES				
1. PARTICULATES(HALF-LIVES>8 DAYS)	CURIES	1.674E-08	7.156E-09	0
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	2.106E-09	9.003E-10	
3. PERCENT OF APPLICABLE LIMIT	%	5.897E-09	2.520E-09	
4. GROSS ALPHA RADIOACTIVITY	CURIES	0.000E+00	0.000E+00	
D. TRITIUM				
1. TOTAL RELEASE	CURIES	4.006E+00	2.308E+00	0
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	5.039E-01	2.903E-01	
3. PERCENT OF APPLICABLE LIMIT	%	7.055E-04	4.065E-04	

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 1992

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
FISSION GASES					
XE-135	CURIES	0.00E+00	0.00E+00	3.64E-05	0.00E+00
XE-133	CURIES	0.00E+00	0.00E+00	3.50E-04	0.00E+00
KR-85	CURIES	0.00E+00	0.00E+00	1.63E-01	1.82E-02
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	1.64E-01	1.82E-02
IODINES					
I-131	CURIES	0.00E+00	0.00E+00	5.73E-06	4.73E-06
I-133	CURIES	0.00E+00	0.00E+00	0.00E+00	8.57E-06
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	5.73E-06	1.33E-05
PARTICULATES					
CS-137	CURIES	0.00E+00	0.00E+00	1.67E-08	0.00E+00
CO-58	CURIES	0.00E+00	0.00E+00	0.00E+00	7.15E-09
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	1.67E-08	7.15E-09
OTHER					
H-3	CURIES	0.00E+00	0.00E+00	4.00E+00	2.30E+00
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	4.00E+00	2.30E+00

SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER
ALL AIRBORNE EFFLUENTS
Starting : 1-Jul-1992 Ending : 31-Dec-1992

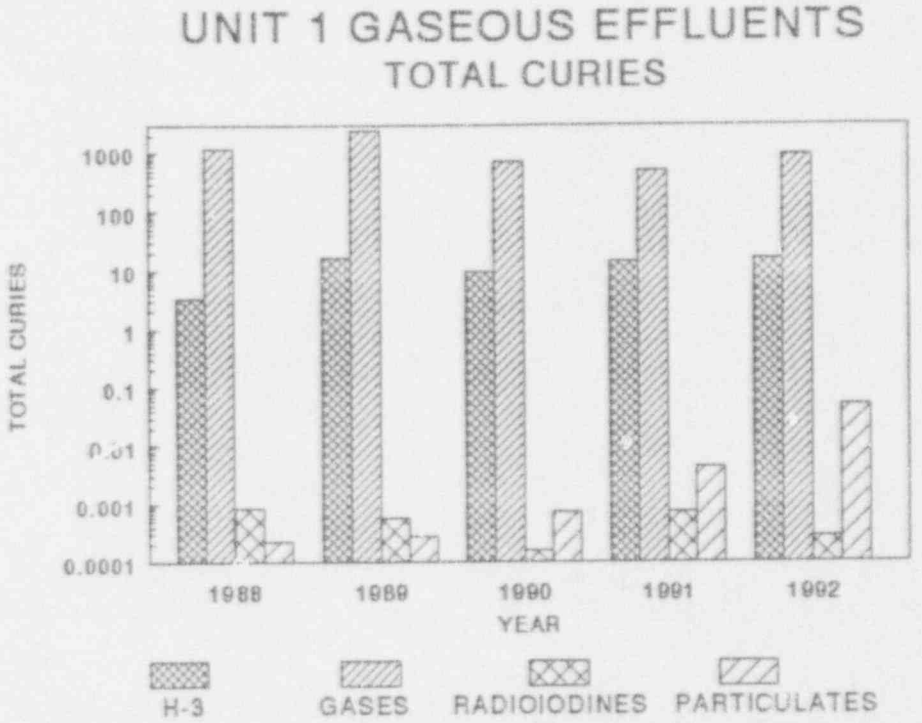
TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
A. FISSION & ACTIVATION PRODUCTS				
1. TOTAL RELEASE	CURIES	1.251E+03	3.188E-01	0
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.574E+02	4.011E-02	
3. PERCENT OF APPLICABLE LIMIT	%	2.204E+00	5.616E-04	
B. RADIOIODINES				
1. TOTAL IODINE-131	CURIES	5.830E-04	2.622E-05	0
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	7.334E-05	3.299E-06	
3. PERCENT OF APPLICABLE LIMIT	%	2.053E-04	9.237E-06	
C. PARTICULATES				
1. PARTICULATES(HALF-LIVES>8 DAYS)	CURIES	3.727E-07	8.196E-05	0
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	4.689E-08	1.031E-05	
3. PERCENT OF APPLICABLE LIMIT	%	1.313E-07	2.887E-05	
4. GROSS ALPHA RADIOACTIVITY	CURIES	3.246E-07	0.000E+00	
D. TRITIUM				
1. TOTAL RELEASE	CURIES	6.552E+00	4.276E-01	0
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	8.243E-01	5.380E-02	
3. PERCENT OF APPLICABLE LIMIT	%	1.154E-03	7.532E-05	

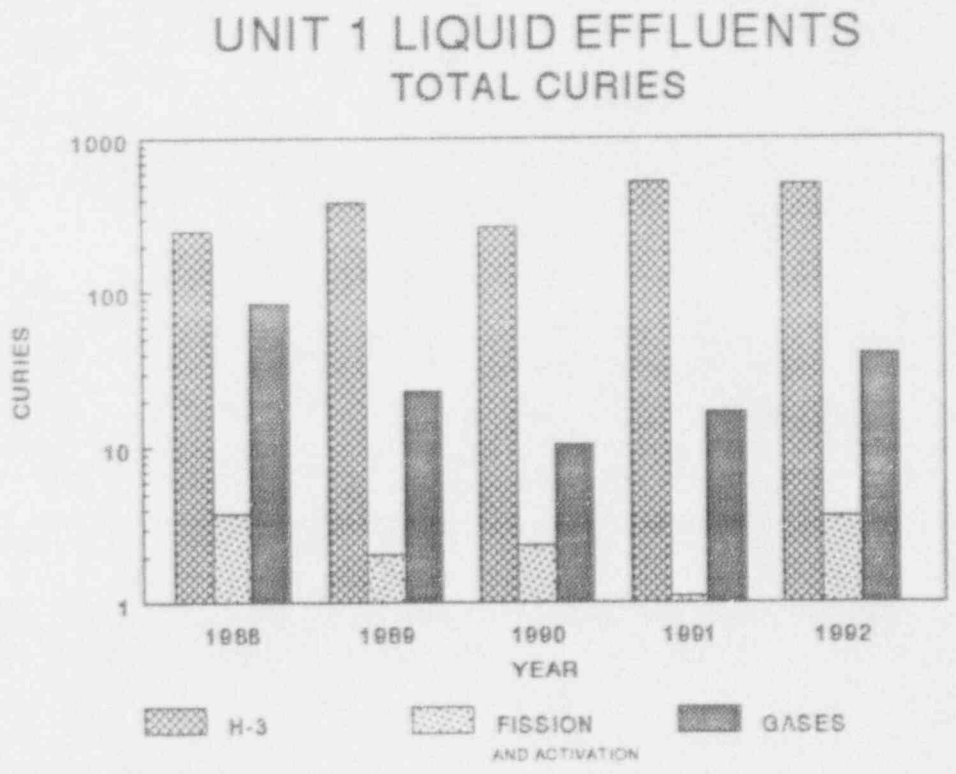
REPORT CATEGORY : SEMIANNUAL AIRBORNE GROUND LEVEL CONTINUOUS AND
: BATCH RELEASES. TOTALS FOR EACH NUCLIDE RELEASED.
TYPE OF ACTIVITY : FISSION GASES, IODINES, AND PARTICULATES
REPORTING PERIOD : QUARTER # 3 AND QUARTER # 4 YEAR 1992

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
FISSION GASES					
KR-85M	CURIES	0.00E+00	0.00E+00	2.81E-02	0.00E+00
XE-133M	CURIES	0.00E+00	0.00E+00	1.29E+00	0.00E+00
XE-135	CURIES	0.00E+00	0.00E+00	3.41E+01	0.00E+00
XE-131M	CURIES	0.00E+00	0.00E+00	1.53E+00	3.67E-02
KR-85	CURIES	0.00E+00	0.00E+00	2.58E+00	9.90E-02
XE-133	CURIES	0.00E+00	0.00E+00	1.21E+03	1.83E-01
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	1.25E+03	3.18E-01
IODINES					
I-133	CURIES	0.00E+00	0.00E+00	9.62E-05	0.00E+00
I-131	CURIES	0.00E+00	0.00E+00	5.83E-04	2.62E-05
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	6.79E-04	2.62E-05
PARTICULATES					
RB-88	CURIES	0.00E+00	0.00E+00	9.17E-04	0.00E+00
CS-137	CURIES	0.00E+00	0.00E+00	0.00E+00	2.91E-08
NB-97	CURIES	0.00E+00	0.00E+00	0.00E+00	1.27E-07
CO-60	CURIES	0.00E+00	0.00E+00	0.00E+00	1.22E-06
ZR-95	CURIES	0.00E+00	0.00E+00	0.00E+00	2.23E-06
NB-95	CURIES	0.00E+00	0.00E+00	0.00E+00	3.36E-06
CR-51	CURIES	0.00E+00	0.00E+00	0.00E+00	1.17E-05
CO-58	CURIES	0.00E+00	0.00E+00	2.60E-07	6.32E-05
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	9.17E-04	8.19E-05
OTHER					
SR-90	CURIES	0.00E+00	0.00E+00	1.07E-07	0.00E+00
G-ALPHA	CURIES	0.00E+00	0.00E+00	3.24E-07	0.00E+00
SR-89	CURIES	0.00E+00	0.00E+00	4.44E-09	1.46E-07
H-3	CURIES	0.00E+00	0.00E+00	6.55E+00	4.27E-01
TOTAL FOR PERIOD	CURIES	0.00E+00	0.00E+00	6.55E+00	4.27E-01

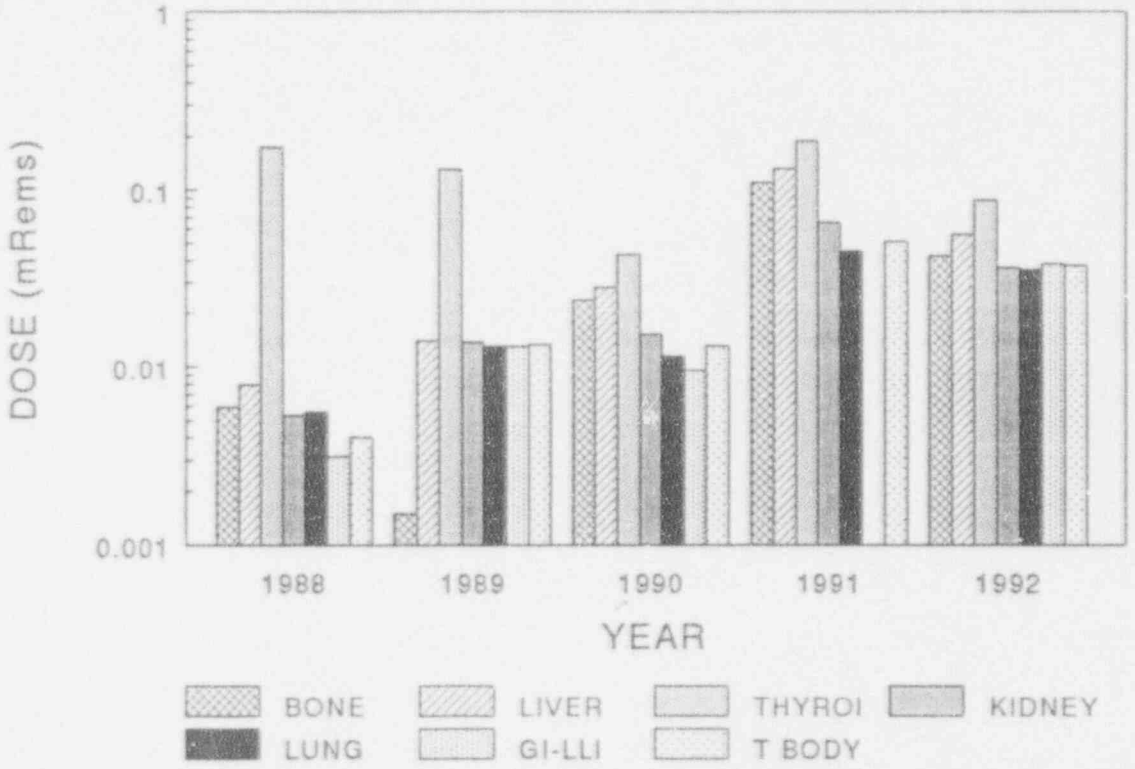
5. HISTORICAL EFFLUENT DATA

The following graphs show the historical release data for both units on a yearly basis. These graphs compare data from 1988 through 1992.

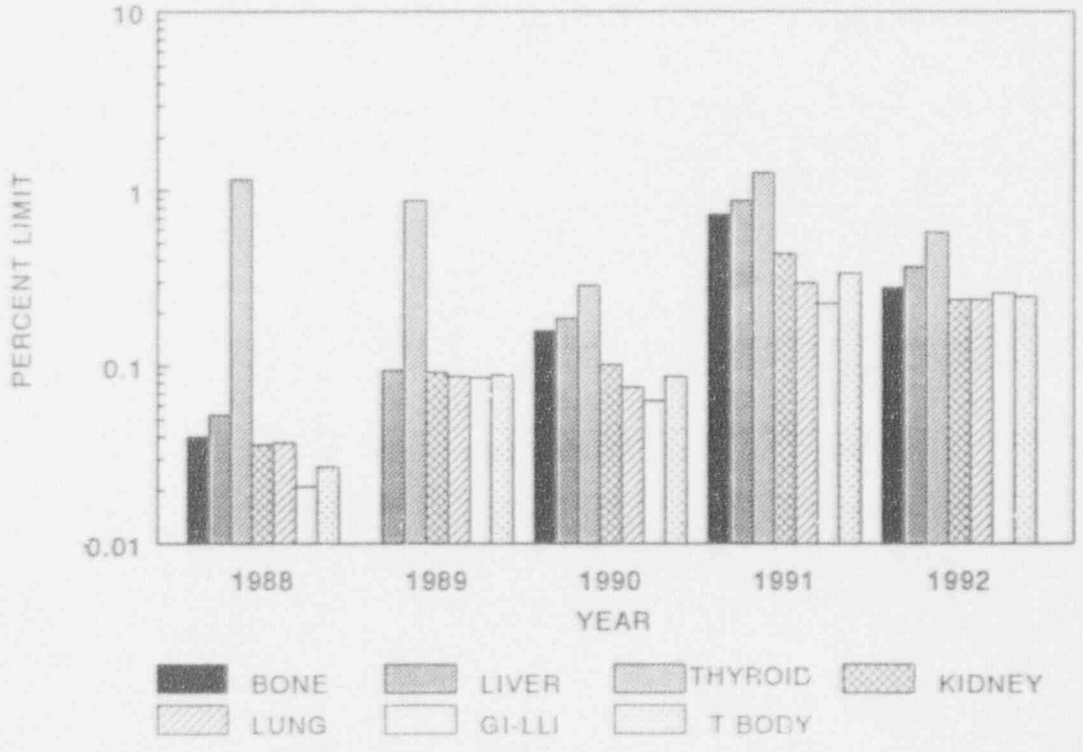




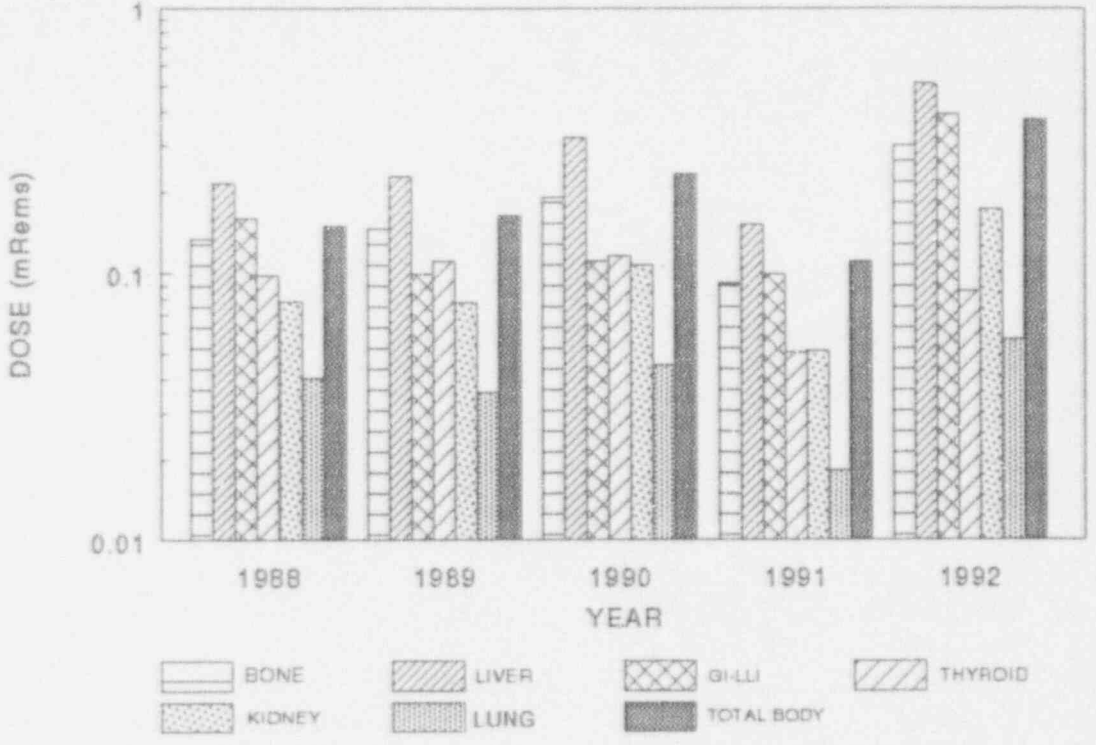
UNIT ONE GASEOUS EFFLUENTS
CRITICAL ORGAN DOSE



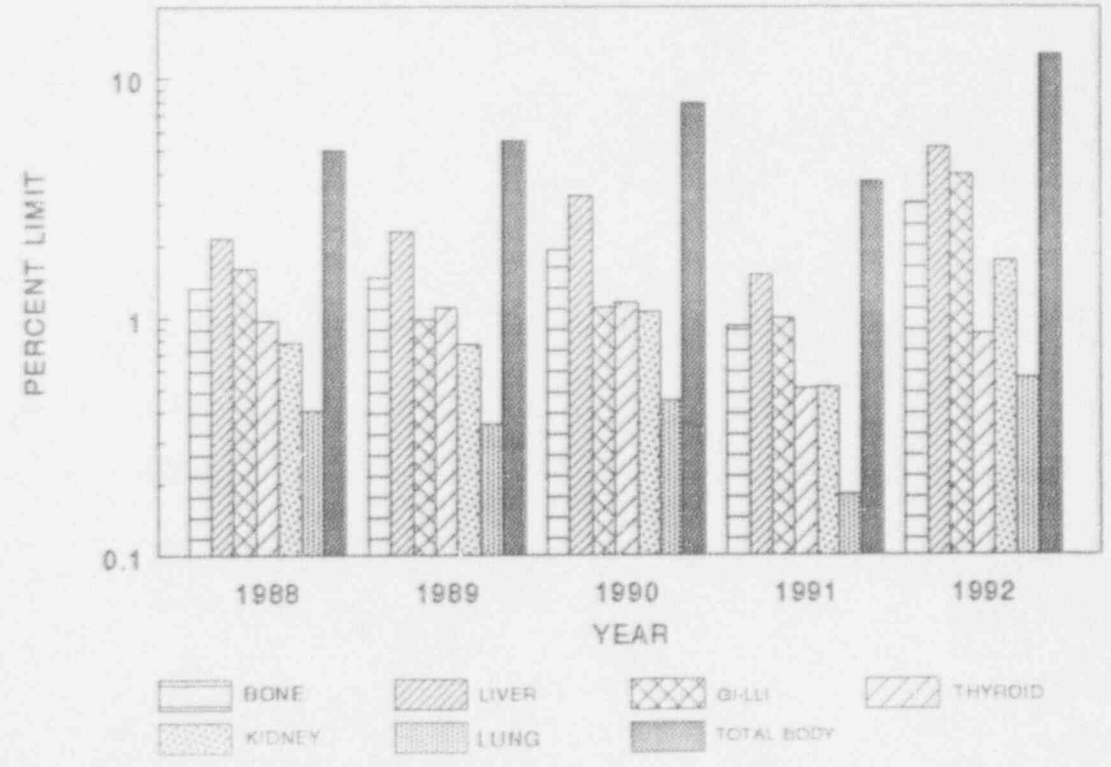
UNIT 1 GASEOUS EFFLUENTS
PERCENT LIMIT



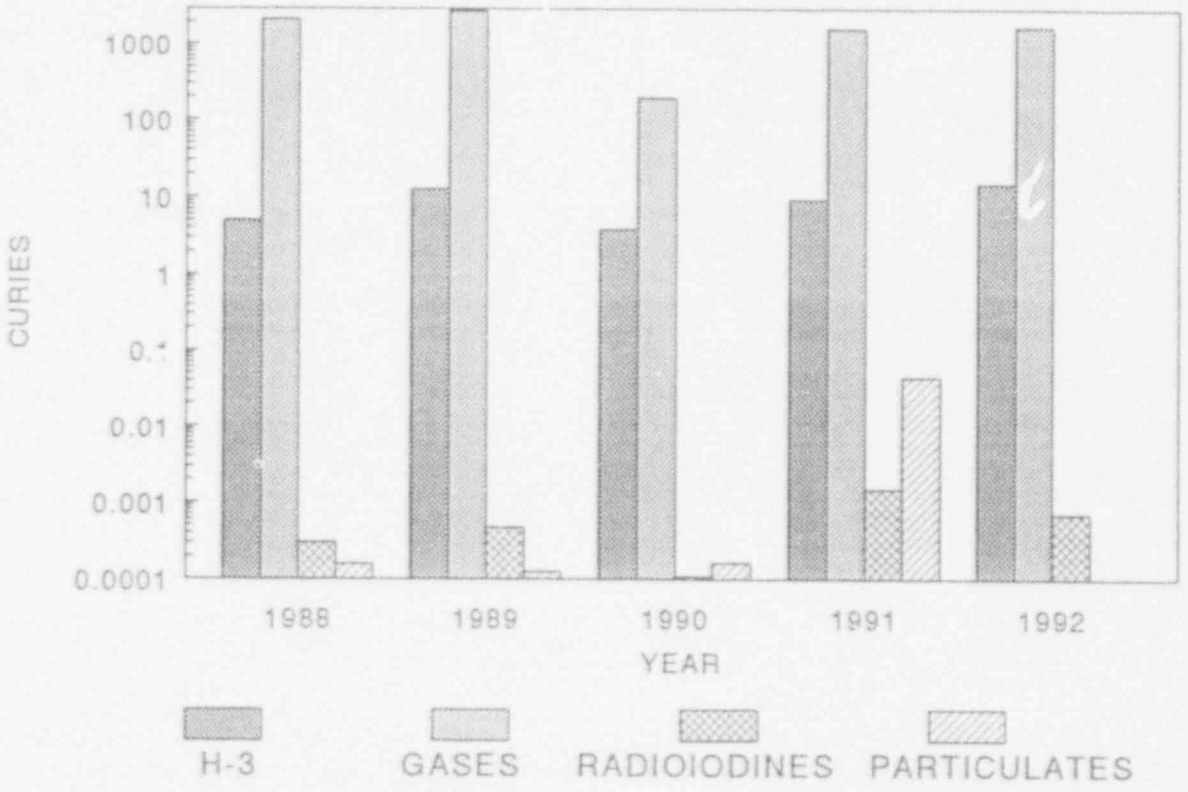
UNIT 1 LIQUID EFFLUENTS
DOSE



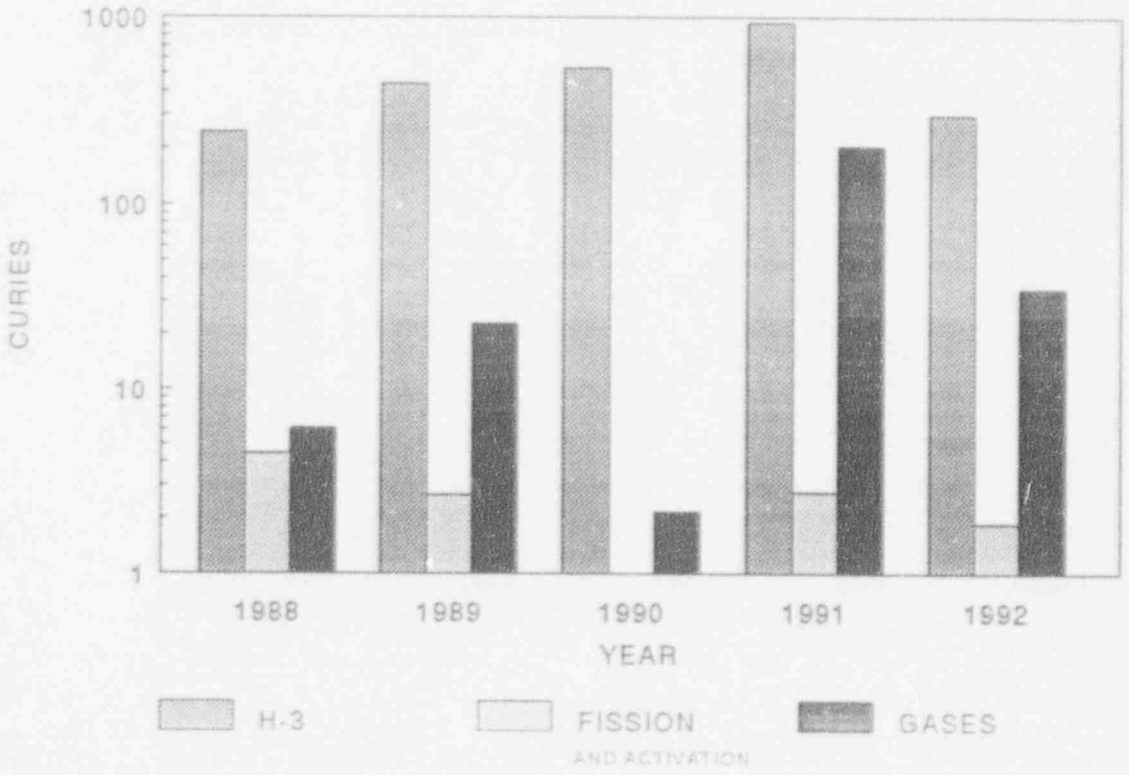
UNIT 1 LIQUID EFFLUENTS
PERCENT LIMIT



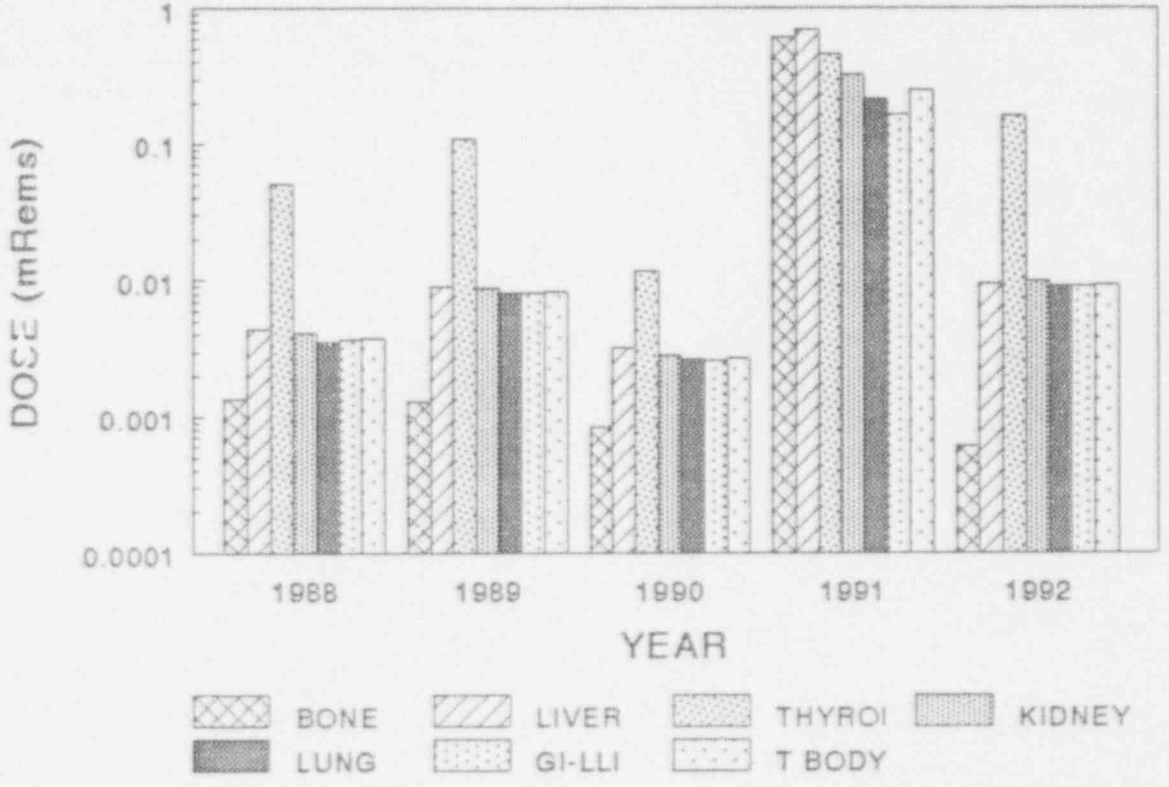
UNIT TWO GASEOUS EFFLUENTS
TOTAL CURIES



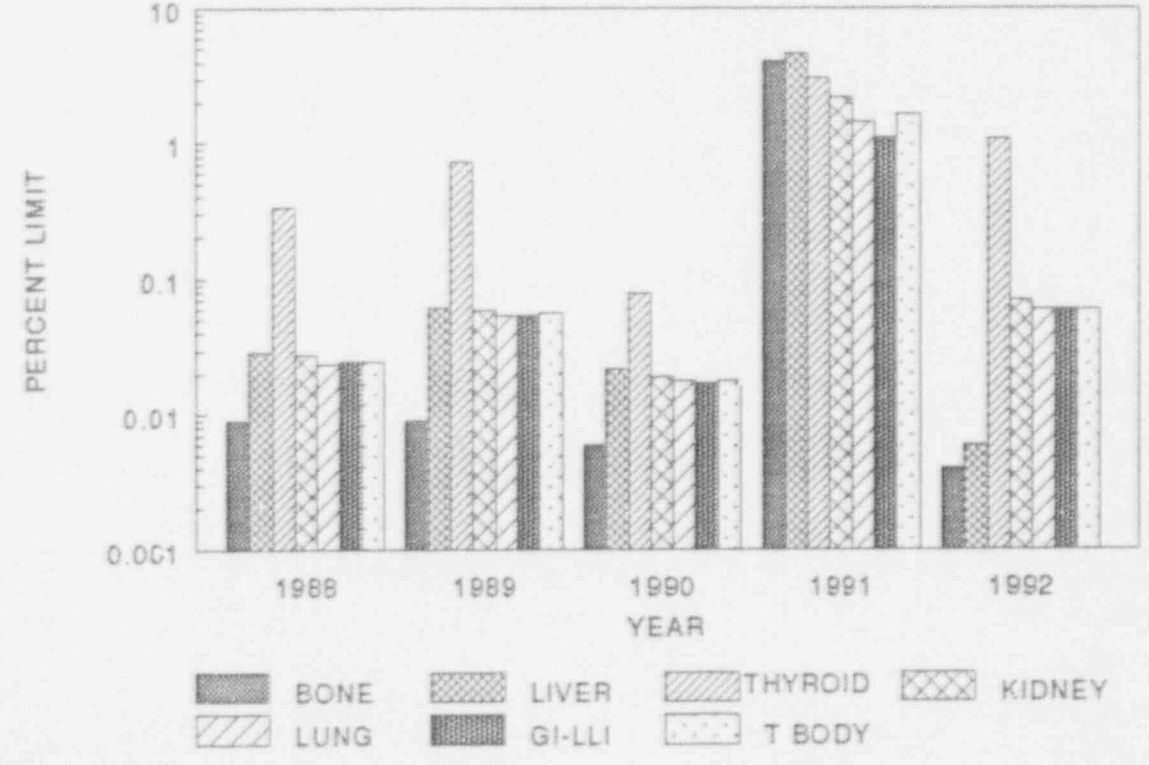
UNIT TWO LIQUID EFFLUENTS
TOTAL CURIES



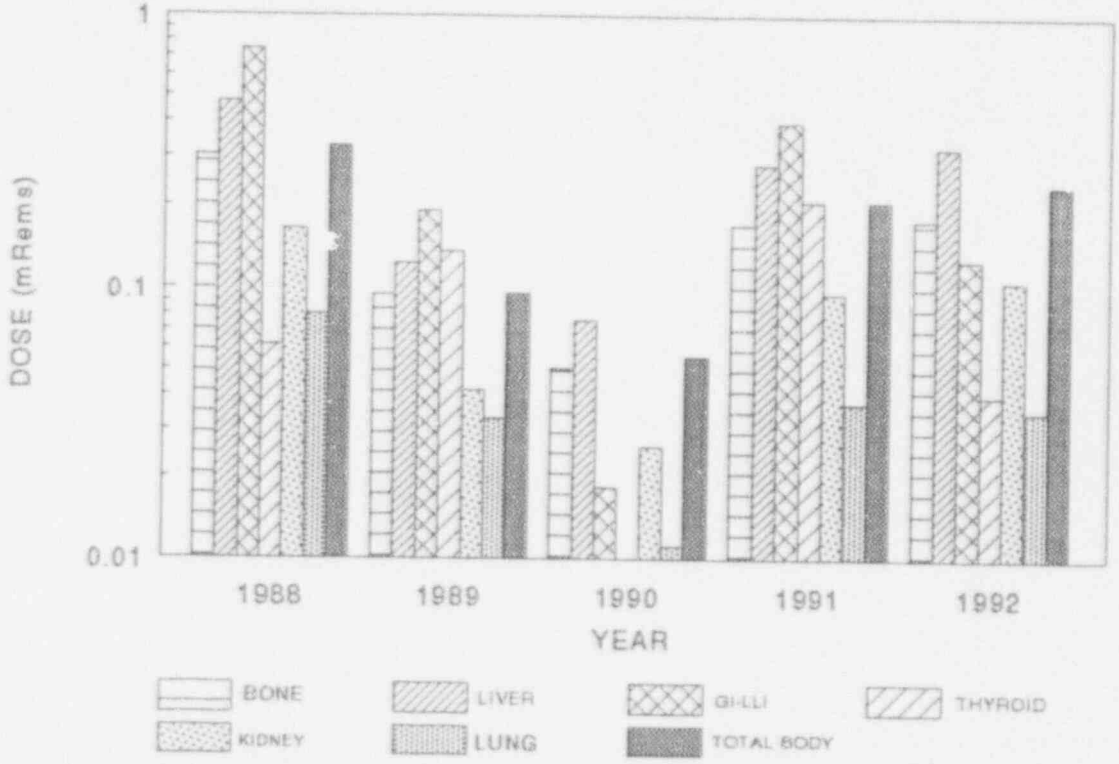
UNIT TWO GASEOUS EFFLUENTS
CRITICAL ORGAN DOSE



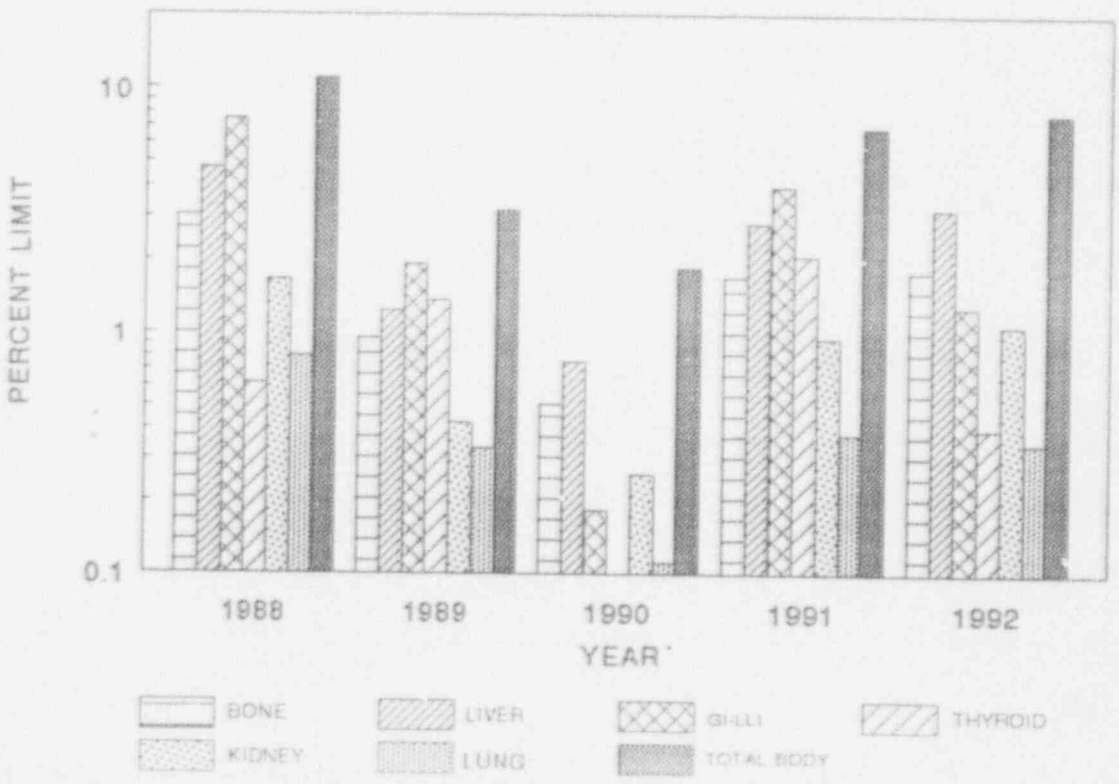
UNIT TWO GASEOUS EFFLUENTS
PERCENT LIMIT



UNIT TWO LIQUID EFFLUENTS
DOSE



UNIT TWO LIQUID EFFLUENTS
PERCENT LIMIT



6. SOLID WASTE SUMMARY

*** REGULATORY GUIDE 1.21 REPORT ***

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1992)

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

ARKANSAS NUCLEAR ONE

ROUTE 3 BOX 137G

RUSSELLVILLE, AR 72801

JULY 1, 1992 THROUGH DECEMBER 31, 1992

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	3.26E+01 1.36E+03	2.31E+00
b. Dry compressible waste, contaminated equip, etc.	m^3 Ci	9.25E+01 4.34E+01	3.35E+00
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)

a. CS 137	41.2 %	5.52E+02
CS 134	35.6 %	4.80E+02
CO 58	14.3 %	1.91E+02
FE 55	2.1 %	2.84E+01
NI 63	2.0 %	2.65E+01
CO 60	1.6 %	2.08E+01
SB 125	1.4 %	1.83E+01
NB 95	0.8 %	1.14E+01
ZR 95	0.5 %	6.95E+00
CR 51	0.4 %	5.28E+00

b. CS 137	65.3 %	2.83E+01
NI 63	10.2 %	4.41E+00
FE 55	9.2 %	3.97E+00
CS 134	8.0 %	3.46E+00
CO 60	4.6 %	2.00E+00
CO 58	1.5 %	6.64E-01
MN 54	0.6 %	2.46E-01
C 14	0.4 %	1.64E-01
TC 99	0.1 %	5.44E-02
SR 90	0.1 %	3.40E-02

c.	%	. E

d.	%	. E

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
19	Unshielded Van/Truck	Oak Ridge, TN
8	Cask Shipment (Type A)	Hanford, WA
1	Cask Shipment (Type B)	Hanford, WA

B. IRRADIATED FUEL SHIPMENTS (Dispositon)

Number of Shipments	Mode of Transportation	Destination

*** REGULATORY GUIDE 1.21 REPORT ***

EFFLUENT AND WASTE DISPOSAL ANNUAL SUMMARY REPORT (1992)

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

ARKANSAS NUCLEAR ONE

ROUTE 3 BOX 137G

RUSSELLVILLE, AR 72801

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not irradiated fuel)

1. Type of waste	Unit	12-month Period	Est. Total Error, %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m^3 Ci	5.13E+01 2.56E+03	1.45E+00
b. Dry compressible waste, contaminated equip, etc.	m^3 Ci	1.24E+02 4.58E+01	3.20E+00
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. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
33	Unshielded Van/Truck	Oak Ridge, TN
10	Cask Shipment (Type A)	Hanford, WA
4	Cask Shipment (Type B)	Hanford, WA

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination

7. UNPLANNED RELEASES

A. For the purpose of this report, an unplanned release is any release of radioactive material that is released to the environment due to causes not controlled by plant personnel.

During the third and fourth quarters of 1992, there was one unplanned release, 2GR92-176. This release resulted from a defective isolation valve and a post-maintenance test. The following is the dose contribution of this release.

Release start time: October 28, 1992 at 1915
Release stop time: October 28, 1992 at 1915
Release volume : 108632 cubic feet
Release duration : 0.167 minutes
Gamma Air Dose = 0.00E+00 mRad
Beta Air Dose = 0.00E+00 mRad
ITP Dose = 1.37E-08 mRem Which is 9.13e-8 percent of the yearly limit (15 mRem/year.)

1. Description of occurrence.

During October 1992, work was performed on 2CV-0305 (Atmospheric Dump Valve). Upon completion of this work, the post maintenance testing consisted of stroking the valve. Normally this valve is isolated upstream prior to stroking. Because the upstream valve was defective full isolation was not accomplished and upon stroking the dump valve a steam release occurred.

2. Identify cause for exceeding the limit.

No limits were exceeded during this release.

3. Explain Corrective actions taken to mitigate occurrence.

No actions were taken to mitigate this occurrence. The release was due to the stroking of a valve which lasted approximately 10 seconds. Upon completion of the stroke test no further testing was required.

4. Define action taken to prevent recurrence.

The defective valve was repaired which will allow isolation to the dump valve.

5. Summary of consequences of occurrence.

At the time of the release, Unit 2 had a primary to secondary leak of <0.01 gpm. Because of this condition, the Unit 2 steam was contaminated. Upon opening of the dump valve, steam was released to the atmosphere. Analysis of the main steam after release resulted in only tritium being released to atmosphere. Tritium is a typical isotope released during routine operations. This release of radioactive material is very low in comparison to the typical amount of tritium release throughout the year. No abnormal consequences would be expected to occur due to this release.

8. RADIATION INSTRUMENTATION

As required by Unit 1 and Unit 2 Technical Specifications, any radioactive effluent instrumentation inoperable for more than 30 days shall be explained in the next Semiannual Radioactive Effluent Release Report. During the third and fourth quarters of 1992, no instrumentation was inoperable longer than 30 days.

9. CHANGES TO PCP

As required by Unit 1 and Unit 2 Technical Specifications, a description of the changes to the made during the reporting period are to be included in the Semiannual Radioactive Effluent Release Report. During the third and fourth quarters of 1992, there were no changes to the PCP.

10. CHANGES TO RADIOACTIVE WASTE SYSTEMS

During 1992, there were no major changes to the radioactive waste systems.

11. CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL

During September 1992, sample station number 47 was deleted from the milk sample stations. This was due to the owners of the animal declining to continue participation in the environmental sample project. It has been determined that these changes to the sampling station will not reduce the accuracy or reliability of the dose calculations or setpoint determinations. In accordance with Technical Specification 3.12.1, ANO is required to obtain milk from at least four stations. Currently ANO has 4 sampling stations and one alternate that meet the criteria of the Tech. Spec.

During November 1992, an alternate food product was added to sample station number 108.

12. METEOROLOGICAL DATA SUMMARY

In accordance with ANO-1 and 2 Technical Specifications 6.12.26(e) and 6.9.3.4.1, respectively, in lieu of including a summary of the meteorological data in this report, the 1992 data is retained at ANO. This data is available for NRC review.

13. SUMMARY OF RADIATION DOSES

The following is a summary of the radiation doses due to radiological effluents during 1992 calculated in accordance with the ODCM.

Entergy Operations Inc.
Arkansas Nuclear One Unit 1
1992 : Cummulative Dose Report

Liquid Radwaste Effluents (mRem)

Dose Limits : Total Body: 1.5/Qtr 3/Yr, other Organs 5/Qtr 10/Yr

Organ	Qtr 1	%	Qtr 2	%	Qtr 3	%	Qtr 4	%	Year	%
TBody	0.1133	7.55	0.1909	12.73	0.0466	3.10	0.0261	1.74	0.3768	12.56
Bone	0.0935	1.87	0.1475	2.95	0.0375	0.75	0.0236	0.47	0.3020	3.02
Liver	0.1569	3.14	0.2607	5.21	0.0630	1.26	0.0360	0.72	0.5165	5.17
Thyroid	0.0765	1.53	0.0072	0.14	0.0375	0.03	0.0009	0.02	0.0860	0.86
Kidney	0.0526	1.05	0.0885	1.77	0.0211	0.42	0.0120	0.24	0.1742	1.74
Lung	0.0175	0.35	0.0277	0.55	0.0074	0.15	0.0040	0.08	0.0565	0.56
GI-LLI	0.0561	1.12	0.1879	3.76	0.1226	2.45	0.0264	0.53	0.3930	3.93

Gaseous Radwaste Effluents

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

Organ	Qtr 1	%	Qtr 2	%	Qtr 3	%	Qtr 4	%	Year	%
TBody	0.0226	0.30	0.0111	0.15	0.0025	0.03	0.0014	0.02	0.0376	0.25
Bone	0.0254	0.34	0.0168	0.22	0.0000	0.00	0.0000	0.00	0.0422	0.28
Liver	0.0280	0.37	0.0241	0.32	0.0025	0.03	0.0014	0.02	0.0560	0.37
Thyroid	0.0683	0.91	0.0130	0.17	0.0037	0.05	0.0025	0.03	0.0875	0.58
Kidney	0.0191	0.26	0.0133	0.18	0.0025	0.03	0.0014	0.02	0.0364	0.24
Lung	0.0215	0.29	0.0101	0.13	0.0025	0.03	0.0014	0.02	0.0354	0.24
GI-LLI	0.0261	0.35	0.0084	0.11	0.0025	0.03	0.0014	0.02	0.0383	0.26

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	0.0284	0.38	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.0284	0.19
Beta	0.0853	1.14	0.0006	0.01	0.0000	0.00	0.0000	0.00	0.0859	0.57

Entergy Operations Inc.
Arkansas Nuclear One Unit 2
1992 : Cummulative Dose Report

Liquid Radwaste Effluents (mRem)

Dose Limits : Total Body: 1.5/Qtr 3/Yr, other Organs 5/Qtr 10/Yr

Organ	Qtr 1	%	Qtr 2	%	Qtr 3	%	Qtr 4	%	Year	%
TBody	0.0437	2.92	0.1224	8.16	0.0388	2.59	0.0328	2.19	0.2377	7.92
Bone	0.0321	0.64	0.0914	1.83	0.0285	0.57	0.0251	0.50	0.1772	1.77
Liver	0.0584	1.17	0.1652	3.30	0.0522	1.04	0.0459	0.92	0.3217	3.22
Thyroid	0.0142	0.28	0.0066	0.13	0.0285	0.31	0.0039	0.08	0.0402	0.40
Kidney	0.0196	0.39	0.0546	1.09	0.0174	0.35	0.0152	0.30	0.1067	1.07
Lung	0.0065	0.13	0.0181	0.36	0.0056	0.11	0.0050	0.10	0.0352	0.35
GI-LLI	0.0110	0.22	0.0568	1.14	0.0343	0.69	0.0246	0.49	0.1268	1.27

Gaseous Radwaste Effluents

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

Organ	Qtr 1	%	Qtr 2	%	Qtr 3	%	Qtr 4	%	Year	%
TBody	0.0008	0.01	0.0039	0.05	0.0043	0.06	0.0003	0.00	0.0093	0.06
Bone	0.0001	0.00	0.0000	0.00	0.0005	0.01	0.0001	0.00	0.0006	0.00
Liver	0.0005	0.01	0.0039	0.05	0.0044	0.06	0.0003	0.00	0.0095	0.06
Thyroid	0.0173	0.23	0.0073	0.10	0.1299	1.73	0.0059	0.08	0.1605	1.07
Kidney	0.0009	0.01	0.0039	0.05	0.0047	0.06	0.0003	0.00	0.0098	0.07
Lung	0.0008	0.01	0.0039	0.05	0.0040	0.05	0.0003	0.00	0.0091	0.06
GI-LLI	0.0008	0.01	0.0039	0.05	0.0041	0.05	0.0003	0.00	0.0091	0.06

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	0.0105	0.14	0.0096	0.13	0.0439	0.58	0.0000	0.00	0.0640	0.43
Beta	0.0297	0.40	0.0153	0.20	0.1212	1.62	0.0000	0.00	0.1662	1.11

14. SUMMARY OF DOSE TO MEMBERS OF THE PUBLIC

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

Arkansas Nuclear One

1992 Cummulative Dose Data : Public Activities Inside Site Boundary (mRem)

Unit 1:

Gaseous Rel.

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	Gi-LLi	Skin
H-3,I-131,& Particulates	1.84E-02	2.45E-02	1.64E-02	3.82E-02	1.59E-02	1.55E-02	1.67E-02	
Noble Gases			7.43E-03					1.79E-02

Liquid Rel.

Fish	3.02E-01	5.16E-01	3.77E-01	8.60E-02	1.74E-01	5.65E-02	3.93E-01	
Sediment			1.38E-02					1.62E-02
Unit 1 Total	3.20E-01	5.41E-01	4.14E-01	1.24E-01	1.90E-01	7.20E-02	4.10E-01	3.41E-02

Unit 2:

Gaseous Rel.

H-3,I-131,& Particulates	2.62E-04	4.15E-03	4.06E-03	7.01E-02	4.28E-03	3.98E-03	3.98E-03	
Noble Gases			1.66E-02					3.85E-02

Liquid Rel.

Fish	1.77E-01	3.22E-01	2.38E-01	4.02E-02	1.07E-01	3.52E-02	1.27E-01	
Sediment			6.59E-03					7.73E-03
Unit 2 Total	1.77E-01	3.26E-01	2.65E-01	1.10E-01	1.11E-01	3.92E-02	1.31E-01	4.62E-02

Site Total	4.98E-01	8.67E-01	6.79E-01	2.35E-01	3.01E-01	1.11E-01	5.41E-01	8.03E-02
Limit	2.50E+01	2.50E+01	2.50E+01	7.50E+01	2.50E+01	2.50E+01	2.50E+01	2.50E+01
% Limit	1.99%	3.47%	2.72%	0.31%	1.20%	0.44%	2.16%	0.32%

15. ODCM REVISION 3

The following are the revisions made to the ODCM during the reporting period.

ODCM Rev. 3

Remove Old Page	Replace With New Page
1	1
37	37
44	44

OFFSITE DOSE CALCULATION MANUAL

FOR ARKANSAS NUCLEAR ONE

REVISION 03

FIGURE 4-1

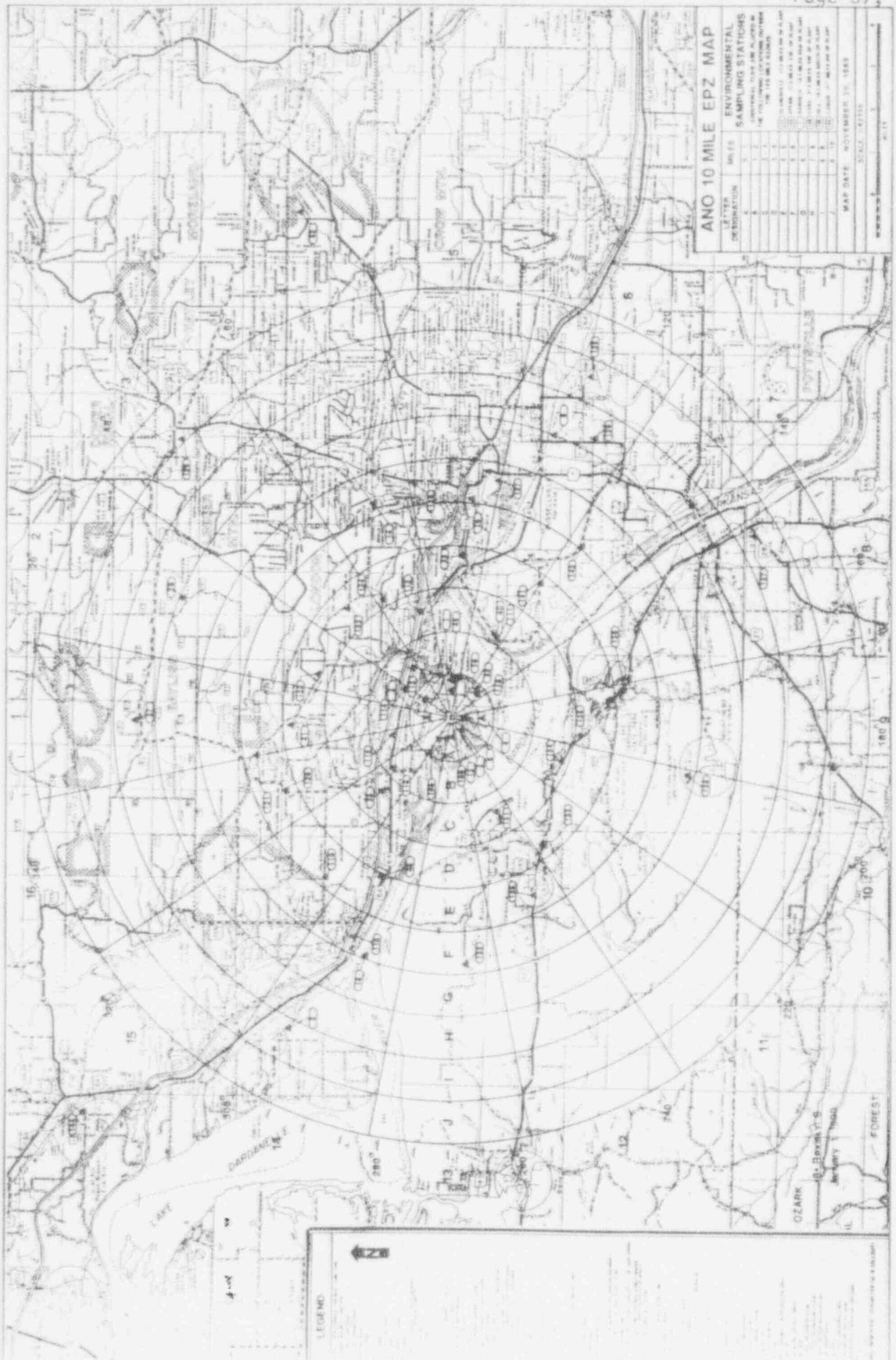

ANO 10 MILE EPZ MAP
ENVIRONMENTAL SAMPLING STATIONS
LEGEND
LAKE DARDANELLE
OZARK
FOREST

TABLE 4-1
Environmental Sampling Stations - Radiological

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.

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: 108
Approximate Direction and Distance from Plant: 301° - 0.9 miles
Sample Types: 1) Direct radiation
2) Food Products (Alternate)
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.