

August 30, 1996

OCAN089607

U. S. Nuclear Regulatory Commission
Document Control Desk
Mail Station P1-137
Washington, DC 20555

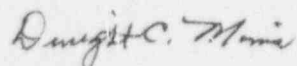
Subject: Arkansas Nuclear One - Units 1 and 2
Docket Nos. 50-313 and 50-368
License Nos. DPR-51 and NPF-6
Semi-Annual Radioactive Effluent Release Report for the First and Second
Quarters of 1996

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 Semi-Annual Radioactive Effluent Release Report. The purpose of this letter is to complete this reporting requirement for the first and second quarters of 1996 at ANO. 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
Director, Nuclear Safety

DCM/eas

Attachments

9609090154 960830
PDR ADOCK 05000313
R PDR

IF 48 %

cc: Mr. Leonard J. Callan
Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

NRC Senior Resident Inspector
Arkansas Nuclear One
P.O. Box 310
London, AR 72847

Mr. George Kalman
NRR Project Manager Region IV/ANO-1 & 2
U. S. Nuclear Regulatory Commission
NRR Mail Stop 13-H-3
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

Mr. Bernie Bevill
Arkansas Department of Health
Division of Radiation Control
and Emergency Management
4815 West Markham Street
Little Rock, AR 72205

ARKANSAS NUCLEAR ONE
UNIT 1 AND UNIT 2
OPERATING LICENSE NO. DPR-51 AND NPF-6
SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
JANUARY 1 THROUGH JUNE 30, 1996

TABLE OF CONTENTS

	Page
1. Introduction	3
2. Regulatory Limits	3
3. Summary of Liquid Effluent Data	5
4. Summary of Gaseous Effluent Data	11
5. Summary of Radiation Doses	16
6. Summary of Dose to Members of the Public	16
7. Historical Effluent Data	16
8. Solid Waste Summary	16
9. Unplanned Releases	18
10. Radiation Instrumentation	19
11. Changes to the Process Control Program	21
12. Changes to the Offsite Dose Calculation Manual	21
13. LLD Levels	21
14. Radiological Environmental Monitoring Program	22
A. Changes in Sample Locations	22
B. Identification of New Sample Locations	22
15. Summary of the Hourly Meteorological Data	22
16. Description of Major Changes to Radioactive Waste Systems	22

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 provided in the report covering the third and fourth quarters of each year.
- F. Radiation dose to members of the public due to activities inside the site boundary. This data is provided in the report covering the third and fourth quarters of each year.
- G. Description of licensee initiated major changes to the radioactive waste systems during the previous calendar year. This data is provided in the report covering the third and fourth quarters of each year.
- H. Items to be reported in the Semi-Annual Report per other miscellaneous technical specifications.

This report covers the period from January 1 through June 30, 1996.

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, Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants, a summary of data for liquid releases is provided in the Semi-Annual Report. This summary covers releases from January 1 through June 30, 1996. 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:	535	181
Total time for all releases (minutes):	89673	297266
Maximum time for a release (minutes):	458	14210
Average time for a release (minutes):	168	1642
Minimum time for a release (minutes):	14	94

The Unit 1 liquid releases consisted of:

532 Normal Releases

132 Neutralization Tank
54 Treated Waste Monitor Tanks
1 Laundry Drain Tanks
345 Turbine Building Sump

3 Non-routine Releases

3 Condenser Reject to Flume

0 Unplanned Releases

The Unit 2 liquid releases consisted of:

181 Normal Releases

9 Boric Acid Condensate Tanks
145 Regenerative Waste Tanks
27 Turbine Building Sump

0 Non-routine Releases

0 Unplanned Releases

**SEMI-ANNUAL SUMMATION FOR ALL RELEASES BY QUARTER
 (ALL LIQUID EFFLUENTS)
 January 1 through June 30, 1996**

Unit 1

Type of Effluent	Units	Quarter 1	Quarter 2	Est. Total Error %
<u>A. Fission and Activation Products</u>				
1. Total Release (Not Including Tritium, Gases, Alpha)	Curies	9.907E-02	9.652E-02	0
2. Average Diluted Concentration During Period	μCi/ml	3.487E-10	2.710E-10	
3. Percent of Applicable Limit	%	1.162E-01	9.033E-02	
<u>B. Tritium</u>				
1. Total Release	Curies	1.885E+02	2.584E+02	0
2. Average Diluted Concentration During Period	μCi/ml	6.634E-07	7.255E-07	
3. Percent of Applicable Limit	%	2.211E-02	2.418E-02	
<u>C. Dissolved and Entrained Gases</u>				
1. Total Release	Curies	8.525E-01	3.231E+00	0
2. Average Diluted Concentration During Period	μCi/ml	3.000E-09	9.071E-09	
3. Percent of Applicable Limit	%	1.500E-03	4.536E-03	
<u>D. Gross Alpha Radioactivity</u>				
1. Total Release	Curies	7.250E-05	2.850E-03	0
<u>E. Waste Vol Released (Pre-Dilution)</u>				
	Liters	3.095E+07	3.105E+07	0
<u>F. Volume of Dilution Water Used</u>				
	Liters	2.841E+11	3.561E+11	0

UNIT 1

**REPORT CATEGORY : SEMI-ANNUAL LIQUID CONTINUOUS AND BATCH
 RELEASES**
: TOTALS FOR EACH NUCLIDE RELEASED
TYPE OF ACTIVITY : ALL RADIONUCLIDES
REPORTING PERIOD : QUARTER # 1 AND QUARTER # 2 YEAR 1996

NUCLIDE	UNIT	CONTINUOUS RELEASES		BATCH RELEASES	
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
SR-92	CURIES	0.00E+00	0.00E+00	1.05E-05	0.00E+00
NB-97	CURIES	0.00E+00	0.00E+00	3.24E-05	0.00E+00
CE-144	CURIES	0.00E+00	0.00E+00	1.17E-04	0.00E+00
Y-91M	CURIES	0.00E+00	0.00E+00	1.57E-04	0.00E+00
Y-91	CURIES	0.00E+00	0.00E+00	7.53E-04	0.00E+00
NB-94	CURIES	0.00E+00	0.00E+00	0.00E+00	7.47E-06
I-133	CURIES	0.00E+00	0.00E+00	2.75E-05	9.45E-06
ZR-95	CURIES	0.00E+00	0.00E+00	0.00E+00	2.66E-05
KR-85M	CURIES	0.00E+00	0.00E+00	0.00E+00	3.06E-05
NB-95	CURIES	0.00E+00	0.00E+00	6.97E-05	6.15E-05
AG-110M	CURIES	0.00E+00	0.00E+00	2.89E-05	6.89E-05
MN-54	CURIES	0.00E+00	0.00E+00	1.79E-04	1.13E-04
SN-117M	CURIES	0.00E+00	0.00E+00	0.00E+00	1.28E-04
SB-124	CURIES	0.00E+00	0.00E+00	2.12E-04	3.15E-04
XE-135	CURIES	0.00E+00	0.00E+00	5.57E-04	4.23E-04
CO-57	CURIES	0.00E+00	0.00E+00	8.90E-04	4.48E-04
I-131	CURIES	0.00E+00	0.00E+00	4.91E-04	1.55E-03
CR-51	CURIES	0.00E+00	0.00E+00	5.97E-04	2.45E-03
G-ALPHA	CURIES	0.00E+00	0.00E+00	7.25E-05	2.85E-03
NA-24	CURIES	0.00E+00	0.00E+00	2.04E-03	2.99E-03
CS-134	CURIES	0.00E+00	0.00E+00	1.35E-03	4.25E-03
CO-58	CURIES	0.00E+00	0.00E+00	2.53E-02	6.65E-03
CS-137	CURIES	0.00E+00	0.00E+00	8.71E-03	1.20E-02
XE-133M	CURIES	0.00E+00	0.00E+00	2.12E-03	1.27E-02
CO-60	CURIES	0.00E+00	0.00E+00	2.36E-02	1.37E-02
KR-85	CURIES	0.00E+00	0.00E+00	0.00E+00	2.06E-02
SB-125	CURIES	0.00E+00	0.00E+00	3.45E-02	5.17E-02
XE-131M	CURIES	0.00E+00	0.00E+00	1.57E-02	6.19E-02
XE-133	CURIES	0.00E+00	0.00E+00	8.34E-01	3.14E+00
H-3	CURIES	0.00E+00	0.00E+00	1.88E+02	2.58E+02
Total for Period	CURIES	0.00E+00	0.00E+00	1.89E+02	2.62E+02

**SEMI-ANNUAL SUMMATION FOR ALL RELEASES BY QUARTER
 (ALL LIQUID EFFLUENTS)
 January 1 through June 30, 1996**

Unit 2

Type of Effluent	Units	Quarter 1	Quarter 2	Est. Total Error %
<u>A. Fission and Activation Products</u>				
1. Total Release (Not Including Tritium, Gases, Alpha)	Curies	1.595E-02	4.851E-02	0
2. Average Diluted Concentration During Period	μCi/ml	5.614E-11	1.362E-10	
3. Percent of Applicable Limit	%	1.871E-02	4.540E-02	
<u>B. Tritium</u>				
1. Total Release	Curies	1.402E+01	3.037E+01	0
2. Average Diluted Concentration During Period	μCi/ml	4.935E-08	8.527E-08	
3. Percent of Applicable Limit	%	1.645E-03	2.842E-03	
<u>C. Dissolved and Entrained Gases</u>				
1. Total Release	Curies	2.968E-03	2.632E-04	0
2. Average Diluted Concentration During Period	μCi/ml	1.044E-11	7.391E-13	
3. Percent of Applicable Limit	%	5.222E-06	3.695E-07	
<u>D. Gross Alpha Radioactivity</u>				
1. Total Release	Curies	3.446E-03	1.790E-02	0
<u>E. Waste Vol Released (Pre-Dilution)</u>				
	Liters	1.535E+07	1.623E+07	0
<u>F. Volume of Dilution Water Used</u>				
	Liters	2.841E+11	3.561E+11	0

UNIT 2

REPORT CATEGORY : SEMI-ANNUAL LIQUID CONTINUOUS AND BATCH RELEASES
: TOTALS FOR EACH NUCLIDE RELEASED
TYPE OF ACTIVITY : ALL RADIONUCLIDES
REPORTING PERIOD : QUARTER # 1 AND QUARTER # 2 YEAR 1996

NUCLIDE	UNIT	CONTINUOUS RELEASES		BATCH RELEASES	
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
MN-54	CURIES	0.00E+00	0.00E+00	7.29E-06	0.00E+00
NA-24	CURIES	0.00E+00	0.00E+00	3.06E-04	0.00E+00
CO-57	CURIES	0.00E+00	0.00E+00	0.00E+00	3.23E-06
ZR-97	CURIES	0.00E+00	0.00E+00	0.00E+00	1.90E-05
CE-143	CURIES	0.00E+00	0.00E+00	0.00E+00	2.18E-05
FE-55	CURIES	0.00E+00	0.00E+00	0.00E+00	1.27E-04
I-131	CURIES	0.00E+00	0.00E+00	1.79E-04	2.02E-04
XE-133	CURIES	0.00E+00	0.00E+00	2.97E-03	2.63E-04
CO-60	CURIES	0.00E+00	0.00E+00	1.82E-04	3.07E-04
CS-134	CURIES	0.00E+00	0.00E+00	6.04E-04	3.26E-04
AG-110M	CURIES	0.00E+00	0.00E+00	3.65E-04	5.85E-04
CS-137	CURIES	0.00E+00	0.00E+00	1.01E-03	7.11E-04
SR-89	CURIES	0.00E+00	0.00E+00	2.82E-05	1.15E-03
CR-51	CURIES	0.00E+00	0.00E+00	6.29E-04	1.57E-03
CO-58	CURIES	0.00E+00	0.00E+00	1.94E-03	2.00E-03
SB-124	CURIES	0.00E+00	0.00E+00	9.51E-04	3.03E-03
G-ALPHA	CURIES	0.00E+00	0.00E+00	3.45E-03	1.79E-02
SB-125	CURIES	0.00E+00	0.00E+00	9.75E-03	3.85E-02
H-3	CURIES	0.00E+00	0.00E+00	1.40E+01	3.04E+01
Total for Period	CURIES	0.00E+00	0.00E+00	1.40E+01	3.04E+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 Semi-Annual Report. This summary covers releases from January 1 through June 30, 1996. 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:	60	83
Total time for all releases (minutes):	326173	526101
Maximum time for a release (minutes):	10615	10321
Average time for a release (minutes):	5436	6339
Minimum time for a release (minutes):	18	2

The Unit 1 gaseous releases consisted of:

- 46 Routine vent releases
 - 18 Fuel Handling Area
 - 27 Radwaste Area
 - 1 Hydrogen Purge Emergency Penetration Room
- 3 Routine tank releases
 - 3 T18, Waste Gas Decay Tank
- 9 Non-routine releases:
 - 8 Steam-driven emergency feedwater (EFW) pump
 - 1 Steam safeties
- 2 Unplanned releases
 - 2 Steam safeties/atmospheric dump valves

The Unit 2 gaseous releases consisted of:

73 Routine vent releases

- 15 Auxiliary Building Extension
- 13 Fuel Handling Area
- 2 Hydrogen Purge Emergency Penetration Room
- 12 Low Level Radwaste Building
- 4 Post Accident Sampling System
- 27 Radwaste Area

10 Non-routine releases:

- 10 Steam driven emergency feedwater (EFW) pump

**SEMI-ANNUAL SUMMATION FOR ALL RELEASES BY QUARTER
 (ALL AIRBORNE EFFLUENTS)
 January 1 through June 30, 1996**

Unit 1

Type of Effluent	Units	Quarter 1	Quarter 2	Est. Total Error %
<u>A. Fission and Activation Products</u>				
1. Total Release	Curies	4.200E+01	3.955E+01	0
2. Average Release Rate for Period	μCi/Sec	5.342E+00	5.030E+00	
3. Percent of Applicable Limit	%	7.479E-02	7.042E-02	
<u>B. Radioiodines</u>				
1. Total Iodine-131	Curies	4.653E-06	2.613E-05	0
2. Average Release Rate for Period	μCi/Sec	5.918E-07	3.323E-06	
3. Percent of Applicable Limit	%	1.657E-06	9.304E-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	1.793E-07	
<u>D. Tritium</u>				
1. Total Release	Curies	5.984E+00	1.502E+00	0
2. Average Release Rate for Period	μCi/Sec	7.611E-01	1.911E-01	
3. Percent of Applicable Limit	%	1.066E-03	2.675E-04	

UNIT 1

REPORT CATEGORY : SEMI-ANNUAL AIRBORNE GROUND LEVEL
 : CONTINUOUS AND BATCH RELEASES
 : TOTALS FOR EACH NUCLIDE RELEASED
TYPE OF ACTIVITY : FISSION GASES, IODINES, AND PARTICULATES
REPORTING PERIOD : QUARTER # 1 AND QUARTER # 2 YEAR 1996

NUCLIDE	UNIT	CONTINUOUS RELEASES		BATCH RELEASES	
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2

Fission Gases

XE-131M	CURIES	0.00E+00	0.00E+00	2.56E-02	3.58E-04
KR-85	CURIES	0.00E+00	0.00E+00	9.66E-02	1.63E-02
XE-135	CURIES	0.00E+00	0.00E+00	9.03E-06	3.93E+00
XE-133	CURIES	0.00E+00	0.00E+00	4.19E+01	3.56E+01
Total for Period	CURIES	0.00E+00	0.00E+00	4.20E+01	3.95E+01

Iodines

I-133	CURIES	0.00E+00	0.00E+00	5.21E-07	1.37E-06
I-131	CURIES	0.00E+00	0.00E+00	4.56E-06	2.61E-05
Total for Period	CURIES	0.00E+00	0.00E+00	5.17E-06	2.75E-05

Particulates

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

Other

G-ALPHA	CURIES	0.00E+00	0.00E+00	0.00E+00	1.79E-07
H-3	CURIES	0.00E+00	0.00E+00	5.98E+00	1.50E+00
Total for Period	CURIES	0.00E+00	0.00E+00	5.98E+00	1.50E+00

**SEMI-ANNUAL SUMMATION FOR ALL RELEASES BY QUARTER
(ALL AIRBORNE EFFLUENTS)
January 1 through June 30, 1996**

Unit 2

Type of Effluent	Units	Quarter 1	Quarter 2	Est. Total Error %
<u>A. Fission and Activation Products</u>				
1. Total Release	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	
<u>B. Radioiodines</u>				
1. Total Iodine-131	Curies	4.396E-07	1.316E-07	0
2. Average Release Rate for Period	μCi/Sec	5.591E-08	1.674E-08	
3. Percent of Applicable Limit	%	1.565E-07	4.688E-08	
<u>C. Particulates</u>				
1. Particulates (Half-Lives > 8 Days)	Curies	1.105E-06	0.000E+00	0
2. Average Release Rate for Period	μCi/Sec	1.405E-07	0.000E+00	
3. Percent of Applicable Limit	%	3.935E-07	0.000E+00	
4. Gross Alpha Radioactivity	Curies	4.728E-07	5.398E-07	
<u>D. Tritium</u>				
1. Total Release	Curies	4.228E+00	2.021E+00	0
2. Average Release Rate for Period	μCi/Sec	5.378E-01	2.571E-01	
3. Percent of Applicable Limit	%	7.529E-04	3.599E-04	

UNIT 2

REPORT CATEGORY : SEMI-ANNUAL AIRBORNE GROUND LEVEL
 : CONTINUOUS AND BATCH RELEASES
 : TOTALS FOR EACH NUCLIDE RELEASED
TYPE OF ACTIVITY : FISSION GASES, IODINES, AND PARTICULATES
REPORTING PERIOD : QUARTER # 1 AND QUARTER # 2 YEAR 1996

NUCLIDE	UNIT	CONTINUOUS RELEASES		BATCH RELEASES	
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2

Fission Gases

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

Iodines

I-131	CURIES	0.00E+00	0.00E+00	4.40E-07	1.32E-07
Total for Period	CURIES	0.00E+00	0.00E+00	4.40E-07	1.32E-07

Particulates

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

Other

SR-89	CURIES	0.00E+00	0.00E+00	1.10E-06	0.00E+00
G-ALPHA	CURIES	0.00E+00	0.00E+00	4.73E-07	5.40E-07
H-3	CURIES	0.00E+00	0.00E+00	4.23E+00	2.02E+00
Total for Period	CURIES	0.00E+00	0.00E+00	4.23E+00	2.02E+00

5. **SUMMARY OF RADIATION DOSES**

Annual data is provided in the report covering the third and fourth quarters of each year.

6. **SUMMARY OF DOSE TO MEMBERS OF THE PUBLIC**

Annual data is provided in the report covering the third and fourth quarters of each year.

7. **HISTORICAL EFFLUENT DATA**

Annual data is provided in the report covering the third and fourth quarters of each year.

8. **SOLID WASTE SUMMARY**

As required by Regulatory Guide 1.21, Rev. 1, Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants, a summary of data for solid wastes shipped offsite is provided in the Semi-Annual Report. This summary covers shipments from January 1, 1996 through June 30, 1996. The summary for solid waste shipments is as follows:

REGULATORY GUIDE 1.21 REPORT
WASTE DISPOSAL ANNUAL SUMMARY REPORT
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
JANUARY 1 THROUGH JUNE 30, 1996

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 sludge, evaporator bottoms, etc.	m ³ Ci	0.00E+00 0.00E+00	0.00E+00
b. Dry compressible waste, contaminated equipment, etc.	m ³ Ci	3.04E+00 4.34E-01	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)

a.	CS-137	0.00	0.00E+00
	CS-134	0.00	0.00E+00
	NI-63	0.00	0.00E+00
	FE-55	0.00	0.00E+00
	CO-60	0.00	0.00E+00
	CO-58	0.00	0.00E+00
	AG-110M	0.00	0.00E+00
	C-14	0.00	0.00E+00
b.	FE-55	24.0	1.04E-01
	CS-137	17.3	7.52E-02
	CO-60	15.7	6.84E-02
	CO-58	14.3	6.19E-02
	NI-63	9.9	4.32E-02
	CS-134	5.9	2.57E-02
	SB-125	4.7	2.05E-02
	AG-110M	2.6	1.12E-02
	MN-54	1.6	7.13E-03
	CR-51	1.5	6.48E-03
c.	N/A	N/A	N/A
d.	N/A	N/A	N/A

3. Solid Waste Disposition

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
1	Unshielded Van/Truck	Oak Ridge, TN

B. Irradiated Fuel Shipments (Disposition)

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

9. UNPLANNED RELEASES

An unplanned release is defined as any release of radioactive material to the environment that does not meet the following criteria:

- A. Sample analysis prior to release, and
- B. Release calculations performed prior to release.

During the first and second quarters of 1996, there were two unplanned releases (1GR96-0076 and 1GR96-0077). The following is a summary of the unplanned releases:

1GR96-0076 - Release of Main Steam via Main Steam Safety Valves

Release start time : May 19, 1996 at 0312
Release stop time : May 19, 1996 at 0330
Release volume : 6.7953E+6 cubic feet
Release duration : 18 minutes
Gamma Air Dose : 0.000E+0 mRad - Percent of yearly limit < 0.01
Beta Air Dose : 0.000E+0 mRad - Percent of yearly limit < 0.01
ITP Dose : 2.970E-5 mRem - Percent of yearly limit < 0.01

1GR96-0077 - Release of Main Steam via Atmospheric Dump Valves

Release start time : May 19, 1996 at 0348
Release stop time : May 19, 1996 at 0549
Release volume : 9.3737E+6 cubic feet
Release duration : 60 minutes
Gamma Air Dose : 0.000E+0 mRad - Percent of yearly limit < 0.01
Beta Air Dose : 0.000E+0 mRad - Percent of yearly limit < 0.01
ITP Dose : 4.096E-5 mRem - Percent of yearly limit < 0.01

A. Description of Event and Equipment Involved

On May 19, 1996, ANO-1 experienced a reactor trip on high reactor coolant system pressure. The pressure increase was caused by reduced main feed water (MFW) flow originating from a component failure affecting controls of one of the operating MFW pumps. After the reactor trip, the other MFW pump tripped on high discharge pressure. Emergency feed water automatically actuated. As expected, several main steam safety valves (MSSVs) opened following the reactor trip. One MSSV failed to re-seat. This led to the manual start of one high pressure injection pump because of reduced pressurizer level and manual actuation of main steam isolation of the affected Once Through Steam Generator.

B. Cause(s) for the Unplanned Release

The MSSV failed to re-seat because inadequate engagement between the valve release nut and a cotter pin used to lock it in place allowed the nut to rotate and engage the manual lift top lever. This incident resulted in the release of steam from the main steam system to the atmosphere via the main steam safety valves and the atmospheric dump valves (ADV's).

C. Actions Taken to Prevent Recurrence

The open MSSV was gagged shut. A modification was made to the MSSVs (other than the one gagged) to minimize the possibility of future inadequate pin engagement. The MSSV that is gagged shut will be modified similar to the other MSSVs during the next refueling outage which is scheduled for September 1996.

D. Consequences of the Unplanned Release

The Unit 1 secondary system is designed to release steam to the atmosphere whenever the turbine trips. However, due to a small primary to secondary leak (< 0.01 gpm), the contents of this release contained radioactivity. Sample results revealed that the steam contained H-3 in levels above minimum detectable concentrations. The dose due to this release is low in comparison to the yearly limits specified in the Unit 1 Technical Specifications. No abnormal consequences would be expected to occur due to this release. See data above for dose contribution from this release.

10. RADIATION INSTRUMENTATION

As required by Unit 1 and Unit 2 Technical Specifications (TS), any radioactive effluent instrumentation inoperable for more than 30 days shall be reported in the next Semi-Annual Radioactive Effluent Release Report. During the first and second quarters of 1996, one flow meter was found to be inoperable for longer than 30 days:

A. 2FT-4423

ANO-2 Operations personnel discovered that the 18-month channel calibration test had not been performed as required by TS for the flow monitor in the regenerative waste system (RWS). At the time the TS became effective on January 1, 1985, the RWS was not being used to process radioactive liquids, and its operating procedure did not have provisions for radioactive releases. When the system operating procedure was changed in 1990 to allow release of radioactive liquids, the flow monitor became a radioactive liquid effluent monitoring instrument subject to TS 3.3.3.10 and associated surveillance requirements. The procedure change did not adequately consider impact upon the surveillance program. The root cause of this condition has been attributed to inadequate change management. Enhancements to the procedure change administration process implemented subsequent to this condition's origin have been judged to be adequate to minimize the probability of a similar future occurrence. The flow monitor was declared inoperable until a calibration procedure was prepared and

the calibration successfully completed. This condition did not cause release of radioactive liquids in excess of any limit.

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 Semi-Annual Radioactive Effluent Release Report. No changes were made to the PCP during the first and second quarters of 1996.

12. CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL

In accordance with Unit 1 and Unit 2 TS, changes to the Offsite Dose Calculation Manual (ODCM) shall be documented in the next Semi-Annual Radioactive Effluent Release Report. During the first and second quarters of 1996, one change was made to the ODCM:

Revision 6

This revision deleted milk sample station number 42 due to the fact that the dairy had gone out of business. Milk sample station number 50 was added as a replacement to Figure 4-1 and Table 4-1.

The associated station environmental sampling procedure was changed and approved on December 20, 1995, as allowed by technical specifications. The changes were submitted as "draft" in the 1995 3rd & 4th quarter Semi-Annual Report since the new milk sample location was already in use, but the associated ODCM change had not yet been approved. The ODCM was revised on June 13, 1996. These changes do not reduce the accuracy or reliability of dose calculations or setpoint determinations. The affected pages are included in Attachment 2.

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 Semi-Annual Radioactive Effluent Release Report. During the reporting period, there were no LLDs higher than required.

14. RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

A. Changes in Sample Locations

In accordance with Unit 1 and Unit 2 TS, 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 Semi-Annual Radioactive Effluent Release Report. During the reporting period, there were no environmental sampling location changes and there were no environmental sampling locations identified which would yield a calculated dose commitment greater than the values currently being calculated.

B. Identification of New Sample Locations

No sample locations were added during the reporting period.

15. SUMMARY OF HOURLY METEOROLOGICAL DATA

Annual data is provided in the report covering the third and fourth quarters of each year.

16. DESCRIPTION OF MAJOR CHANGES TO RADIOACTIVE WASTE SYSTEMS

Annual data is provided in the report covering the third and fourth quarters of each year.

**OFFSITE DOSE CALCULATION
MANUAL CHANGES**

OFFSITE DOSE CALCULATION MANUAL
FOR ARKANSAS NUCLEAR ONE
REVISION 06

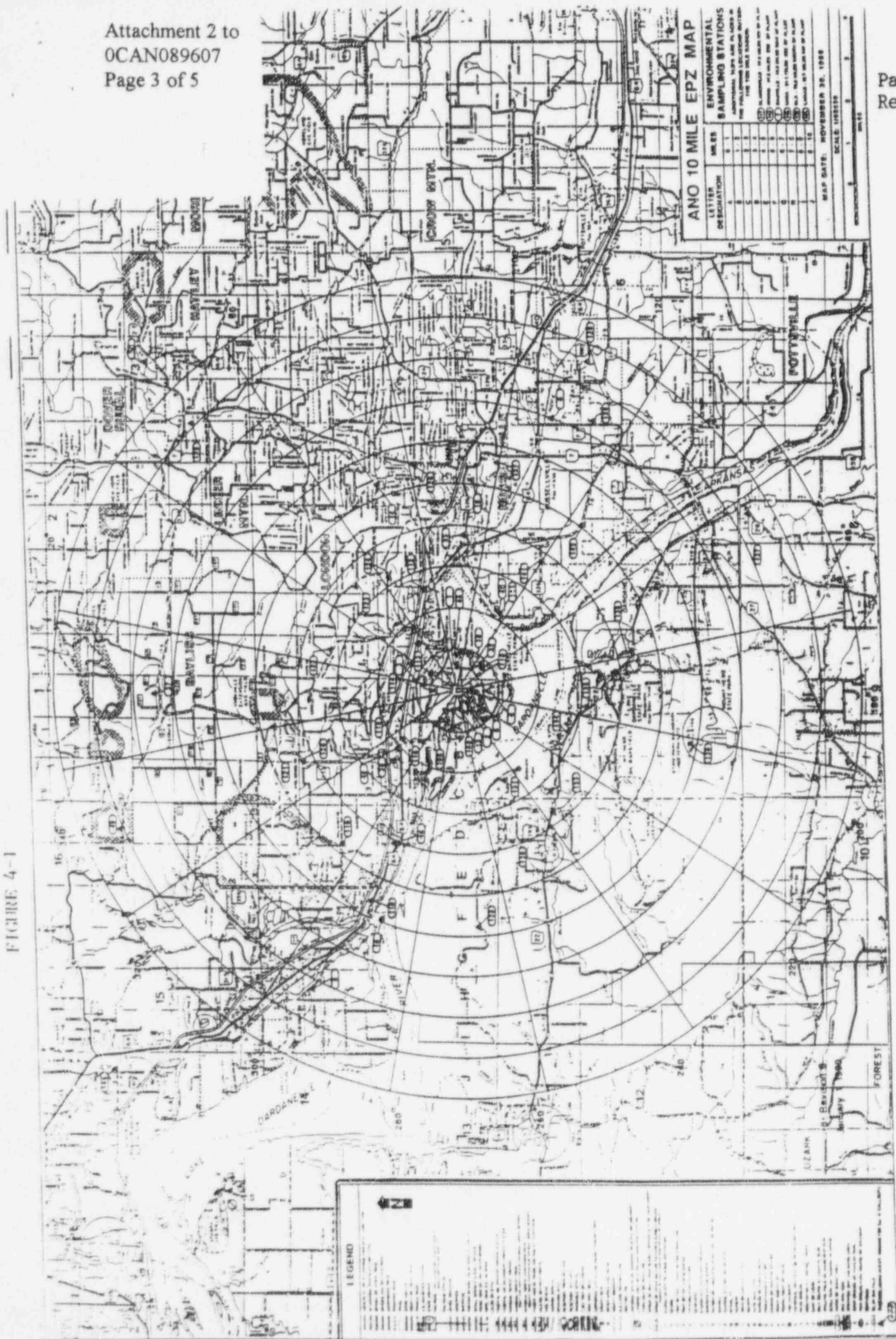


TABLE 4-1
Environmental Sampling Stations - Radiological

<p><u>Sample Station Number:</u> 38</p> <p><u>Approximate Direction and Distance from Plant:</u> 314° - 2.4 miles</p> <p><u>Sample Types:</u> Food products (alternate)</p> <p><u>Sample Station Location:</u></p> <p>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.</p>
<p><u>Sample Station Number:</u> 40</p> <p><u>Approximate Direction and Distance from Plant:</u> 119° - 2.2 miles</p> <p><u>Sample Types:</u> 1) Foods products</p> <p><u>Sample Station Location:</u></p> <p>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.</p>
<p><u>Sample Station Number:</u> 45</p> <p><u>Approximate Direction and Distance from Plant:</u> 90° - 0.9 miles</p> <p><u>Sample Types:</u> 1) Broad leaf vegetation</p> <p><u>Sample Station Location:</u></p> <p>The sample station is located near mouth of intake canal.</p>

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.