



# Entergy Operations

Entergy Operations, Inc.

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Indianapolis, IN 46204

IN 301-Reg. 3100

February 28, 1992

OCAN029209

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 & 50-368  
License Nos. DPR-51 & NFP-6  
Semiannual Radiological Effluent  
Release Report for the Third and  
Fourth Quarters of 1991

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 1991 at ANO.

Attachment A provides the routine radioactive effluent and solid waste release reports for the third and fourth quarters of 1991. A description of the unplanned release is located in Attachment B. Attachment C describes changes to the Offsite Dose Calculational Manual and Process Control Program that have occurred during the last half of 1991.

Technical Specifications 6.12.2.6 and 6.9.3 also require additional information be provided in the first report filed each year. This additional information includes:

- In accordance with ANO-1 and 2 Technical Specifications 6.12.2.6 (e) and 6.9.3.4.1, respectively, in lieu of including a summary of the meteorological data in this report, the 1991 data is retained at ANO. This data is available for NRC review.
- A summary of radiation doses due to radiological effluents during 1991 and the dose to members of the public due to activities inside the site boundaries. These summaries are included in Attachments D and E respectively; and
- A description of licensee initiated major changes to the radioactive waste systems is provided in Attachment F.

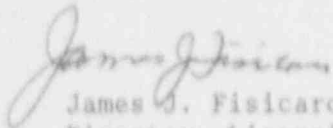
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Should you have any questions regarding this submittal, please contact me.

Very truly yours,



James J. Fisicaro  
Director, Licensing

JJF/RWC/sjf  
Attachments

cc: Mr. Robert Martin  
U. S. Nuclear Regulatory Commission  
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NRC Senior Resident Inspector  
Arkansas Nuclear One - ANO-1 & 2  
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Ms. Sheri Peterson  
NRR Project Manager, Region IV/ANO-2  
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ATTACHMENT A

SUMMARY OF THE QUANTITIES  
OF RADIOACTIVE LIQUID AND GASEOUS  
EFFLUENTS AND SOLID WASTE  
RELEASE FROM ANO

1 ARKANSAS U LEAR ONE 1 UNIT 1

REPORT CATEGORY 1 SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER

TYPE OF ACTIVITY 1 ALL LIQUID EFFLUENTS

REPORTING PERIOD 1 QUARTER # 3 AND QUARTER # 4 OF 1991

	UNIT	QUARTER 3	QUARTER 4	EST. TOTAL
TYPE OF EFFLUENT	HOURS	16553-2760		

#### A. FISSION AND ACTIVATION PRODUCTS

1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	3.50E-01	5.47E-02	0.00E-01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	UCI/ML	9.91E-10	2.64E-10	
3. PERCENT OF APPLICABLE LIMIT	%	3.30E-01	8.79E-02	

#### B. TRITIUM

1. TOTAL RELEASE	CURIES	1.06E-02	1.40E-02	0.00E-01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	UCI/ML	4.34E-07	4.36E-07	
3. PERCENT OF APPLICABLE LIMIT	%	1.61E-02	1.45E-02	

#### C. DISSOLVED AND ENTRAINED GASES

1. TOTAL RELEASE	CURIES	1.07E-00	9.48E-00	0.00E-01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	UCI/ML	4.34E-09	2.95E-08	
3. PERCENT OF APPLICABLE LIMIT	%	2.17E-03	1.48E-02	

#### D. GROSS ALPHA RADIOACTIVITY

1. TOTAL RELEASE	CURIES	6.82E-04	4.43E-04	0.00E-01
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E. WASTE VOL RELEASED (PRE-DILUTION)	GAL	6.44E-06	7.50E-06	0.00E-01
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F. VOLUME OF DILUTION WATER USED	GAL	1.01E-11	3.48E-10	0.00E-01
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		: CONTINUOUS RELEASES :		BATCH RELEASES :	
NUCLIDE	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
		HOURS	HOURS	HOURS	HOURS
		14345-6552	6553-8760	14345-6552	6553-8760

## ALL NUCLIDES

H-3	CURIES	0.00E-01	0.00E-01	1.36E-02	1.40E-02
C-14	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
NA-24	CURIES	0.00E-01	0.00E-01	7.63E-03	1.05E-02
P-32	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CR-51	CURIES	0.00E-01	0.00E-01	2.44E-03	0.00E-01
MN-54	CURIES	0.00E-01	0.00E-01	1.01E-02	6.28E-03
MN-56	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
FE-55	CURIES	0.00E-01	0.00E-01	1.54E-01	2.10E-02
FE-59	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CO-58	CURIES	0.00E-01	0.00E-01	3.62E-02	1.50E-02
CO-60	CURIES	0.00E-01	0.00E-01	7.20E-03	3.77E-03
NI-63	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
NI-65	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CU-64	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
ZN-65	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
ZN-69	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BR-83	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BR-84	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BR-85	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
RE-86	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
RE-88	CURIES	0.00E-01	0.00E-01	2.21E-04	0.00E-01
RE-89	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SR-89	CURIES	0.00E-01	0.00E-01	1.07E-02	0.00E-01
SR-91	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SR-92	CURIES	0.00E-01	0.00E-01	1.26E-04	2.26E-05
Y-90	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
Y-91M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
Y-91	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
Y-92	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
Y-93	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
ZR-93	CURIES	0.00E-01	0.00E-01	1.96E-03	1.10E-04
ZR-97	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
NB-95	CURIES	0.00E-01	0.00E-01	3.10E-03	2.94E-04
MO-99	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TC-99M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TC-101	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
RU-103	CURIES	0.00E-01	0.00E-01	1.24E-05	0.00E-01
RU-105	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
RU-106	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
AG-110M	CURIES	0.00E-01	0.00E-01	2.51E-02	5.05E-04
TE-125M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TE-127M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TE-127	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TE-129M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TE-129	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TE-131M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01

		CONTINUOUS RELEASES		BATCH RELEASES	
NUCLIDE	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
		HOURS	HOURS	HOURS	HOURS
		4345-6552	6553-8760	4345-6552	6553-8760

## ALL NUCLIDES CONTINUED

TE-131	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TE-132	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
I-130	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
I-131	CURIES	0.00E-01	0.00E-01	6.80E-05	7.18E-04
I-132	CURIES	0.00E-01	0.00E-01	0.00E-01	5.51E-05
I-133	CURIES	0.00E-01	0.00E-01	5.40E-05	8.90E-04
I-134	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
I-135	CURIES	0.00E-01	0.00E-01	0.00E-01	3.09E-04
Cl-134	CURIES	0.00E-01	0.00E-01	3.36E-02	5.81E-03
Cl-136	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
Ca-137	CURIES	0.00E-01	0.00E-01	5.46E-02	9.70E-03
CS-138	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BA-139	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BA-140	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BA-141	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BA-142	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
LA-140	CURIES	0.00E-01	0.00E-01	2.14E-03	3.83E-04
LA-142	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CL-141	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CL-143	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CL-144	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
PK-143	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
PK-144	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
ND-147	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
W-187	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
NP-239	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
KR-83M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
KR-85M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
KR-85	CURIES	0.00E-01	0.00E-01	1.35E-01	6.89E-01
KR-87	CURIES	0.00E-01	0.00E-01	4.03E-05	0.00E-01
KR-88	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
KR-89	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
KR-90	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
XE-131M	CURIES	0.00E-01	0.00E-01	3.46E-02	1.77E-01
XE-133M	CURIES	0.00E-01	0.00E-01	6.27E-03	3.90E-02
XE-133	CURIES	0.00E-01	0.00E-01	1.49E-00	8.55E-00
XE-135M	CURIES	0.00E-01	0.00E-01	0.00E-01	2.19E-04
XE-135	CURIES	0.00E-01	0.00E-01	1.48E-04	6.85E-04
XE-137	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
XE-138	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
AR-41	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SR-90	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
G ALPHA	CURIES	0.00E-01	0.00E-01	6.82E-04	4.43E-04
OTHER	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SE-7	CURIES	0.00E-01	0.00E-01	1.68E-04	1.94E-04
K-40	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01

		-----			
		: CONTINUOUS RELEASES :		: BATCH RELEASES :	
		-----			
	: UNIT :	: QUARTER 3 :	: QUARTER 4 :	: QUARTER 3 :	: QUARTER 4 :
	:	: HOURS :	: HOURS :	: HOURS :	: HOURS :
NUCLIDE	:	: 14345-6552 :	: 6553-8760 :	: 14345-6552 :	: 6553-8760 :
		-----			

## ALL NUCLIDES CONTINUED

		-----			
CO-56	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :
CO-57	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 7.26E-05 :	: 0.00E-01 :
SE-75	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :
SR-85	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :
Y-86	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :
NB-94	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :
NB-97	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :	: 4.15E-05 :
MO-99	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :
CO-109	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :
CO-113M	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :
SA-113	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 2.41E-04 :	: 0.00E-01 :
SB-122	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :
SB-124	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :	: 3.48E-05 :
SB-125	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 4.04E-04 :	: 8.96E-03 :
SB-127	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :
SA-133	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :
CE-139	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :
EU-152	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :
HS-205	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :
PI-214	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :
BI-214	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :
KA-226	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :
TH-228	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :
U-235	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :	: 0.00E-01 :
		-----			
TOTAL FOR PERIOD	: CURIES :	: 0.00E-01 :	: 0.00E-01 :	: 1.88E-02 :	: 1.50E-02 :
		-----			



: ARKANSAS POWER AND LIGHT COMPANY PAGE 1 OF 4  
 : ARKANSAS NUCLEAR ONE : UNIT 1  
 : SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER  
 : ALL AIRBORNE EFFLUENTS  
 : QUARTER # 3 AND QUARTER # 4 OF 1991

REPORT CATEGORY  
 TYPE OF ACTIVITY  
 REPORTING PERIOD

	UNIT	QUARTER 3	QUARTER 4	EST. TOTAL
TYPE OF EFFLUENT		HOURS	HOURS	ERROR %
		4345-6552	6553-8760	

#### A. FISSION AND ACTIVATION GASES

1. TOTAL RELEASE	:CURIES	: 7.29E 01	: 1.90E 02	: 0.00E-01:
2. AVERAGE RELEASE RATE FOR PERIOD	:UCI/SEC	: 9.27E 00	: 2.42E 01	:
3. PERCENT OF APPLICABLE LIMIT	: %	: 1.30E-01	: 3.38E-01	:

#### B. RADIOIODINES

1. TOTAL RELEASE	:CURIES	: 5.00E-06	: 2.78E-06	: 0.00E-01:
2. AVERAGE RELEASE RATE FOR PERIOD	:UCI/SEC	: 6.38E-07	: 3.53E-07	:
3. PERCENT OF APPLICABLE LIMIT	: %	: 1.78E-06	: 9.89E-07	:

#### C. PARTICULATES

1. PARTICULATES (HALF-LIFE OF 10 DAYS)	:CURIES	: 4.65E-06	: 3.01E-06	: 0.00E-01:
2. AVERAGE RELEASE RATE FOR PERIOD	:UCI/SEC	: 5.91E-07	: 3.73E-07	:
3. PERCENT OF APPLICABLE LIMIT	: %	: 1.05E-06	: 1.07E-06	:
4. GROSS ALPHA RADIOACTIVITY	:CURIES	: 0.00E-01	: 0.00E-01	:

#### D. TRITIUM

1. TOTAL RELEASE	:CURIES	: 3.89E 00	: 3.06E 00	: 0.00E-01:
2. AVERAGE RELEASE RATE FOR PERIOD	:UCI/SEC	: 4.95E-01	: 3.89E-01	:
3. PERCENT OF APPLICABLE LIMIT	: %	: 6.93E-04	: 5.44E-04	:



		ELEVATED		GROUND	
		BATCH	RELEASES	BATCH	RELEASES
UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4	
	HOURS	HOURS	HOURS	HOURS	
NUCLIDE					
	4345-6552	6553-8760	4345-6552	6553-8760	

## FISSION GASES

KR-83M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
KR-85M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
KR-85	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
KR-87	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
KR-88	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
KR-89	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
KR-90	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
XE-131M	CURIES	0.00E-01	0.00E-01	2.67E-05	0.00E-01
XE-133M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
XE-133	CURIES	0.00E-01	0.00E-01	6.96E-01	1.88E-02
XE-135M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
XE-135	CURIES	0.00E-01	0.00E-01	3.28E-00	2.05E-00
XE-137	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
XE-138	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
AR-41	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
OTHER	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TOTAL FOR PERIOD	CURIES	0.00E-01	0.00E-01	7.29E-01	1.90E-02

## IODINES

I-130	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
I-131	CURIES	0.00E-01	0.00E-01	5.00E-06	2.78E-06
I-132	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
I-133	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
I-134	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
I-135	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
OTHER	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TOTAL FOR PERIOD	CURIES	0.00E-01	0.00E-01	5.00E-06	2.78E-06

## PARTICULATES

H-3	CURIES	0.00E-01	0.00E-01	3.89E-00	3.06E-00
C-14	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
NA-24	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
P-32	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CR-51	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
MN-54	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
MN-56	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
FE-55	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
FE-59	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CO-58	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CO-60	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
NI-63	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
NI-65	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CU-64	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
ZN-65	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01

		ELEVATED		GROUND	
		BATCH	RELEASES	BATCH	RELEASES
		QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
		HOURS	HOURS	HOURS	HOURS
NUCLIDE	UNIT	14345-6552	16553-8760	14345-6552	16553-8760
PARTICULATES CONTINUED					
ZN-69	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BR-83	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BR-84	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BR-85	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
RB-86	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
RE-88	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
RB-89	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SR-89	CURIES	0.00E-01	0.00E-01	3.27E-06	0.00E-01
SR-91	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SR-92	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
Y-90	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
Y-91M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
Y-91	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
Y-92	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
Y-93	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
ZR-95	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
ZR-97	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
NB-99	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
MO-99	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TC-99M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TC-101	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
RU-103	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
RU-105	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
RU-106	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
AG-110M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TE-125M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TE-127M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TE-127	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TE-129M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TE-129	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TE-131M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TE-131	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TE-132	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CS-134	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CS-136	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CS-137	CURIES	0.00E-01	0.00E-01	1.37E-06	2.84E-06
CS-138	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BA-139	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BA-140	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BA-141	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BA-142	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
LA-140	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
LA-142	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CE-141	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CE-143	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CE-144	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01

NUCLIDE	UNIT	ELEVATED		GROUND	
		BATCH	RELEASES	BATCH	RELEASES
		QUARTER 3 HOURS	QUARTER 4 HOURS	QUARTER 3 HOURS	QUARTER 4 HOURS
		4345-6552	6553-8760	4345-6552	6553-8760

## PARTICULATES CONTINUED

PR-143	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
PR-144	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
ND-147	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
W-187	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
NP-239	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SR-90	CURIES	0.00E-01	0.00E-01	8.92E-09	1.63E-07
G ALPHA	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
OTHLS	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BE-7	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
K-40	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CO-56	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CO-57	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
Sc-72	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SR-85	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
Y-86	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
NE-94	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
NO-97	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
MO-99	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CD-107	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CD-113M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SN-113	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SB-121	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SB-124	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SB-125	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SB-127	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BA-133	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CE-139	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
EU-152	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
HG-203	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
PB-214	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BI-214	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
RA-226	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TH-226	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
U-235	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TOTAL FOR PERIOD		CURIES	0.00E-01	0.00E-01	3.59E 00 : 3.06E 00 :

ARKANSAS POWER AND LIGHT COMPANY PAGE 1 OF 4  
 ARKANSAS NUCLEAR ONE UNIT 2  
 SEMIANNUAL SUMMARY OF ALL RELEASES BY QUARTER  
 ALL LIQUID EFFLUENTS  
 QUARTER 3 AND QUARTER 4 OF 1991

REPORT CATEGORY  
 TYPE OF ACTIVITY  
 REPORTING PERIOD

UNIT	QUARTER 3	QUARTER 4	EST. TOTAL
HOURS	HOURS	ERROR %	
14345-6552	16553-8760		

#### A. FISSION AND ACTIVATION PRODUCTS

1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	2.29E-01	1.43E 00	0.00E-01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	UCI/ML	5.97E-10	4.46E-09	
3. PERCENT OF APPLICABLE LIMIT	%	1.99E-01	1.49E 00	

#### B. TRITIUM

1. TOTAL RELEASE	CURIES	2.63E 01	5.54E 02	0.00E-01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	UCI/ML	6.65E-09	1.73E-08	
3. PERCENT OF APPLICABLE LIMIT	%	2.26E-03	5.76E-02	

#### C. DISSOLVED AND ENTRAINED GASES

1. TOTAL RELEASE	CURIES	6.55E 01	1.06E 02	0.00E-01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	UCI/ML	1.79E-07	3.31E-07	
3. PERCENT OF APPLICABLE LIMIT	%	6.93E-02	1.65E-01	

#### D. GROSS ALPHA RADIOACTIVITY

1. TOTAL RELEASE	CURIES	3.16E-04	8.37E-07	0.00E-01
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E. WASTE VOL RELEASED (PRE-DILUTION) :GAL		1.74E 06	3.84E 06	0.00E-01
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F. VOLUME OF DILUTION WATER USED :GAL		1.01E 11	8.48E 10	0.00E-01
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		CONTINUOUS RELEASES		BATCH RELEASES	
NUCLIDE	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
		HOURS	HOURS	HOURS	HOURS
		14345-6552	16553-8760	14345-6552	16553-8760

## ALL NUCLIDES

H-3	CURIES	0.00E-01	0.00E-01	2.63E-01	5.54E-02
C-14	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
NA-24	CURIES	0.00E-01	0.00E-01	2.17E-04	1.53E-03
P-32	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CR-51	CURIES	0.00E-01	0.00E-01	5.58E-04	2.63E-03
MN-54	CURIES	0.00E-01	0.00E-01	2.13E-03	5.13E-03
MN-56	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
FE-55	CURIES	0.00E-01	0.00E-01	2.64E-02	5.84E-02
FE-59	CURIES	0.00E-01	0.00E-01	1.73E-05	3.68E-05
CO-58	CURIES	0.00E-01	0.00E-01	1.42E-02	3.22E-02
CO-60	CURIES	0.00E-01	0.00E-01	3.23E-03	7.36E-03
NI-63	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
NI-65	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CU-64	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
ZN-65	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
ZN-69	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BR-80	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BR-82	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BR-84	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
RU-93	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
RE-88	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
RE-90	CURIES	0.00E-01	0.00E-01	1.05E-01	7.18E-01
SR-89	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SR-91	CURIES	0.00E-01	0.00E-01	2.24E-03	1.84E-03
SR-92	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
Y-90	CURIES	0.00E-01	0.00E-01	1.94E-04	3.54E-04
Y-91M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
Y-91	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
Y-92	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
Y-93	CURIES	0.00E-01	0.00E-01	8.93E-05	0.00E-01
ZR-95	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
ZR-97	CURIES	0.00E-01	0.00E-01	9.35E-04	1.31E-03
NE-95	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
MO-99	CURIES	0.00E-01	0.00E-01	7.35E-04	2.15E-03
TC-99M	CURIES	0.00E-01	0.00E-01	0.00E-01	1.09E-02
TC-101	CURIES	0.00E-01	0.00E-01	7.50E-05	1.39E-02
RU-103	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
RU-105	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
RU-106	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
AG-110M	CURIES	0.00E-01	0.00E-01	4.95E-04	0.00E-01
TE-123M	CURIES	0.00E-01	0.00E-01	1.56E-02	1.26E-02
TC-127M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TE-127	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TE-129B	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TE-129	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TE-131M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01



NUCLIDE	UNIT	CONTINUOUS RELEASES		BATCH RELEASES	
		QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
		HOURS	HOURS	HOURS	HOURS
		14345-6552	16553-8760	14345-6552	16553-8760

## ALL NUCLIDES CONTINUED

TE-131	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TE-132	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
I-130	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
I-131	CURIES	0.00E-01	0.00E-01	3.12E-02	2.16E-01
I-132	CURIES	0.00E-01	0.00E-01	0.00E-01	1.34E-03
I-133	CURIES	0.00E-01	0.00E-01	4.51E-03	2.55E-02
I-134	CURIES	0.00E-01	0.00E-01	0.00E-01	3.04E-04
I-135	CURIES	0.00E-01	0.00E-01	4.05E-04	3.83E-03
CO-134	CURIES	0.00E-01	0.00E-01	1.33E-03	1.26E-01
CS-136	CURIES	0.00E-01	0.00E-01	0.00E-01	2.40E-02
CS-137	CURIES	0.00E-01	0.00E-01	6.30E-03	1.42E-01
CS-138	CURIES	0.00E-01	0.00E-01	0.00E-01	1.33E-03
BA-139	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BA-140	CURIES	0.00E-01	0.00E-01	3.00E-01	8.83E-05
BA-141	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BA-142	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
LA-140	CURIES	0.00E-01	0.00E-01	1.93E-04	1.60E-04
LA-141	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
Cl-143	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
Cl-144	CURIES	0.00E-01	0.00E-01	0.00E-01	8.59E-05
PR-143	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
PR-144	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
ND-147	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
W-187	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
NF-239	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
KR-85M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
KR-85H	CURIES	0.00E-01	0.00E-01	1.46E-02	4.56E-02
KR-86	CURIES	0.00E-01	0.00E-01	7.87E-03	3.49E-02
KR-87	CURIES	0.00E-01	0.00E-01	0.00E-01	7.6E-04
KR-88	CURIES	0.00E-01	0.00E-01	3.94E-03	2.4E-02
KR-89	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
KR-90	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
XE-131M	CURIES	0.00E-01	0.00E-01	4.51E-01	1.03E-00
XL-133M	CURIES	0.00E-01	0.00E-01	5.02E-00	1.45E-00
XE-133	CURIES	0.00E-01	0.00E-01	6.24E-01	1.02E-02
XE-135M	CURIES	0.00E-01	0.00E-01	0.00E-01	4.66E-03
XE-135	CURIES	0.00E-01	0.00E-01	7.03E-01	1.77E-00
XE-137	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
XL-136	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
AR-41	CURIES	0.00E-01	0.00E-01	1.82E-05	1.31E-03
SA-70	CURIES	0.00E-01	0.00E-01	0.00E-01	2.42E-03
U ALPHA	CURIES	0.00E-01	0.00E-01	3.18E-04	6.37E-07
OTHER	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CL-7	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
K-40	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01

		CONTINUOUS RELEASES		BATCH RELEASES	
NUCLIDE	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
		HOURS	HOURS	HOURS	HOURS
		14345-6552	6553-8760	14345-6552	6553-8760

## ALL NUCLIDES CONTINUED

CO-56	CURISS	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CO-57	CURISS	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SL-75	CURISS	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SR-85	CURISS	0.00E-01	0.00E-01	0.00E-01	0.00E-01
Y-86	CURISS	0.00E-01	0.00E-01	2.35E-05	3.16E-04
NR-94	CURISS	0.00E-01	0.00E-01	0.00E-01	0.00E-01
NR-97	CURISS	0.00E-01	0.00E-01	5.67E-05	4.56E-04
MO-90	CURISS	0.00E-01	0.00E-01	1.18E-04	2.79E-05
CL-104	CURISS	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CO-113	CURISS	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SR-111	CURISS	0.00E-01	0.00E-01	1.43E-04	1.17E-04
SB-122	CURISS	0.00E-01	0.00E-01	5.46E-04	6.21E-05
SB-124	CURISS	0.00E-01	0.00E-01	1.40E-04	7.93E-04
SB-125	CURISS	0.00E-01	0.00E-01	1.15E-02	1.55E-02
SB-127	CURISS	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BA-133	CURISS	0.00E-01	0.00E-01	0.00E-01	1.1E-04
CL-134	CURISS	0.00E-01	0.00E-01	0.00E-01	0.00E-01
EU-152	CURISS	0.00E-01	0.00E-01	0.00E-01	0.00E-01
HO-201	CURISS	0.00E-01	0.00E-01	0.00E-01	0.00E-01
PE-214	CURISS	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BI-214	CURISS	0.00E-01	0.00E-01	0.00E-01	0.00E-01
RR-226	CURISS	0.00E-01	0.00E-01	0.00E-01	0.00E-01
IR-226	CURISS	0.00E-01	0.00E-01	0.00E-01	0.00E-01
U-235	CURISS	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TOTAL FOR PERIOD	CURISS	0.00E-01	0.00E-01	9.51E-01	6.80E-02



1 ARKANSAS POWER AND LIGHT COMPANY PAGE 1 OF 4  
 1 ARKANSAS NUCLEAR ONE 1 UNIT 2  
 1 SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER  
 1 ALL AIRBORNE EFFLUENTS  
 1 QUARTER 3 AND QUARTER 4 OF 1991

REPORT CATEGORY  
 TYPE OF ACTIVITY  
 REPORTING PERIOD

	UNIT	QUARTER 3	QUARTER 4	EST. TOTAL
TYPE OF EFFLUENT		HOURS	HOURS	ERROR %
		4345-4542	4553-4760	

#### A. FISSION AND ACTIVATION BASES

1. TOTAL RELEASE	ICURIES	5.936 02	5.51E 02	0.00E+01
2. AVERAGE RELEASE RATE FOR PERIOD	UCI/SEC	7.556 01	7.01E 01	
3. PERCENT OF APPLICABLE LIMIT	%	1.06E 00	9.81E-01	

#### B. RADIOIODINE

1. TOTAL RELEASE	ICURIES	1.97E-04	3.04E-04	0.00E+01
2. AVERAGE RELEASE RATE FOR PERIOD	UCI/SEC	2.31E-06	3.93E-06	
3. PERCENT OF APPLICABLE LIMIT	%	7.04E-04	1.10E-04	

#### C. PARTICULATE

1. PARTICULATE (HALF-LIFE OF 30 DAYS)	ICURIES	3.77E-06	3.81E-06	0.00E+01
2. AVERAGE RELEASE RATE FOR PERIOD	UCI/SEC	4.50E-07	4.98E-06	
3. PERCENT OF APPLICABLE LIMIT	%	1.34E-06	1.39E-06	
4. GROSS ALPHA RADIOACTIVITY	ICURIES	0.00E+01	0.00E+01	

#### D. TRITIUM

1. TOTAL RELEASE	ICURIES	2.89E 00	2.75E 00	0.00E+01
2. AVERAGE RELEASE RATE FOR PERIOD	UCI/SEC	3.68E-01	3.50E-01	
3. PERCENT OF APPLICABLE LIMIT	%	5.15E-04	4.90E-04	

	UNIT	ELEVATED		GROUND	
		BATCH	RELEASES	BATCH	RELEASES
		QUARTER 3 HOURS	QUARTER 4 HOURS	QUARTER 3 HOURS	QUARTER 4 HOURS
NUCLIDE		4345-6552	16553-8760	4345-6552	16553-8760

## FISSION CASES

KR-83M	CURIES	0.00E+01	0.00E+01	0.00E+01	0.00E+01
KA-88M	CURIES	0.00E+01	0.00E+01	0.00E+01	1.79E+01
KA-89	CURIES	0.00E+01	0.00E+01	0.00E+01	5.44E+00
KR-92	CURIES	0.00E+01	0.00E+01	0.00E+01	2.69E+04
KR-93	CURIES	0.00E+01	0.00E+01	0.00E+01	4.39E+04
KR-94	CURIES	0.00E+01	0.00E+01	0.00E+01	0.00E+01
KA-90	CURIES	0.00E+01	0.00E+01	0.00E+01	0.00E+01
XL-101M	CURIES	0.00E+01	0.00E+01	0.00E+01	1.76E+00
XE-123M	CURIES	0.00E+01	0.00E+01	5.70E+06	7.67E+00
XL-131	CURIES	0.00E+01	0.00E+01	5.76E+03	5.23E+02
XL-132M	CURIES	0.00E+01	0.00E+01	0.00E+01	5.03E+04
XL-133	CURIES	0.00E+01	0.00E+01	1.73E+01	1.24E+01
XL-137	CURIES	0.00E+01	0.00E+01	0.00E+01	0.00E+01
XL-138	CURIES	0.00E+01	0.00E+01	0.00E+01	2.98E+04
AR-41	CURIES	0.00E+01	0.00E+01	0.00E+01	2.68E+04
OTHER	CURIES	0.00E+01	0.00E+01	0.00E+01	0.00E+01
TOTAL FCS PERIOD	CURIES	0.00E+01	0.00E+01	5.93E+02	5.51E+02

## IODINES

I-130	CURIES	0.00E+01	0.00E+01	0.00E+01	0.00E+01
I-131	CURIES	0.00E+01	0.00E+01	1.97E+03	3.04E+04
I-132	CURIES	0.00E+01	0.00E+01	0.00E+01	2.24E+06
I-133	CURIES	0.00E+01	0.00E+01	1.13E+06	5.87E+05
I-134	CURIES	0.00E+01	0.00E+01	0.00E+01	0.00E+01
I-135	CURIES	0.00E+01	0.00E+01	0.00E+01	0.00E+01
OTHER	CURIES	0.00E+01	0.00E+01	0.00E+01	0.00E+01
TOTAL FCS PERIOD	CURIES	0.00E+01	0.00E+01	2.09E+05	3.17E+04

## PARTICULATES

H-3	CURIES	0.00E+01	0.00E+01	2.89E+00	2.75E+00
C-14	CURIES	0.00E+01	0.00E+01	0.00E+01	0.00E+01
NA-24	CURIES	0.00E+01	0.00E+01	0.00E+01	0.00E+01
P-32	CURIES	0.00E+01	0.00E+01	0.00E+01	0.00E+01
KR-81	CURIES	0.00E+01	0.00E+01	0.00E+01	0.00E+01
RN-84	CURIES	0.00E+01	0.00E+01	0.00E+01	0.00E+01
RN-86	CURIES	0.00E+01	0.00E+01	0.00E+01	0.00E+01
FE-55	CURIES	0.00E+01	0.00E+01	0.00E+01	0.00E+01
FE-59	CURIES	0.00E+01	0.00E+01	0.00E+01	0.00E+01
CO-58	CURIES	0.00E+01	0.00E+01	0.00E+01	3.77E+05
CO-60	CURIES	0.00E+01	0.00E+01	0.00E+01	3.23E+07
NI-63	CURIES	0.00E+01	0.00E+01	0.00E+01	0.00E+01
NI-64	CURIES	0.00E+01	0.00E+01	0.00E+01	0.00E+01
CU-64	CURIES	0.00E+01	0.00E+01	0.00E+01	0.00E+01
ZN-65	CURIES	0.00E+01	0.00E+01	0.00E+01	0.00E+01

		ELEVATED		GROUND	
		BATCH	RELEASES	BATCH	RELEASES
UNIT		QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
HOURS		HOURS	HOURS	HOURS	HOURS
NUCLIDE		4343-6552	5553-6760	4343-6552	5553-6760
PARTICULATES		CONTINUOUS			
Zn-64	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
BK-63	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
BK-64	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
SK-65	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
RE-66	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
RE-68	CUR188	0.00E+01	0.00E+01	0.00E+01	5.33E+01
RE-69	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
SK-69	CUR188	0.00E+01	0.00E+01	3.00E+06	5.50E+08
SK-91	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
SK-92	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
Y-90	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
Y-91A	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
Y-91	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
Y-92	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
Y-93	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
ZR-95	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
ZR-97	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
NO-99	CUR188	0.00E+01	0.00E+01	0.00E+01	3.10E+07
MO-99	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
TC-99	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
TC-101	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
RU-101	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
RU-103	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
AC-103	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
AC-110	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
TE-123A	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
TE-127A	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
TE-127	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
TE-129A	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
TE-129	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
TE-131A	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
TE-131	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
TE-132	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
CS-134	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
CS-136	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
CS-137	CUR188	0.00E+01	0.00E+01	7.70E+07	7.50E+07
CS-138	CUR188	0.00E+01	0.00E+01	0.00E+01	1.41E+01
BA-139	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
BA-140	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
BA-141	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
BA-142	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
LA-140	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
LA-142	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
CE-141	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
CE-143	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01
CE-144	CUR188	0.00E+01	0.00E+01	0.00E+01	0.00E+01

		ELEVATED		GROUND	
		BATCH	RELEASES	BATCH	RELEASES
	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
		HOURS	HOURS	HOURS	HOURS
NUCLID		4345-4537	4553-8760	4345-4537	4553-8760

## PARTICULATES CONTINUED

PR-143	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
PR-144	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
ND-147	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
W-147	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
NF-239	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SA-90	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
G ALPHA	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
OTHER	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BL-7	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
K-40	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CO-58	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CO-57	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BL-75	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SA-130	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
Y-90	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
NE-94	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
NE-97	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
MO-90	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CD-109	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CD-113M	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SN-113	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SB-114	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SB-124	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SB-125	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SB-127	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SA-133	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CE-134	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
EU-152	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
HG-203	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
PE-214	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
BI-214	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
RA-226	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TH-232	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
U-235	CURIES	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TOTAL FOR PERIOD		CURIES	0.00E-01	0.00E-01	2.89E 00

\*\*\* REGULATORY GUIDE 1.21 REPORT \*\*\*

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1991)

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

ARKANSAS NUCLEAR ONE

ROUTE 3 BOX 137G

RUSSELLVILLE, AR 72801

JULY 1, 1991 THROUGH DECEMBER 1, 1991

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 <sup>3</sup> Ci	1.91E+02 5.74E+02	1.51E+00
b. Dry compressible waste, contaminated equip, etc.	m <sup>3</sup> Ci	1.86E+02 2.14E+01	2.10E+00
c. Irradiated components, control rods, etc.	m <sup>3</sup> Ci	0.00E-00 0.00E-00	0.00E-00
d. Other (describe)	m <sup>3</sup> Ci	0.00E-00 0.00E-00	0.00E-00

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

a. NI 63	24.4 %	1.40E+02
FE 55	21.8 %	1.25E+02
CS 137	19.3 %	1.11E+02
CO 58	12.0 %	6.90E+01
CS 134	7.77 %	4.46E+01
CO 60	7.39 %	4.24E+01
C 14	1.59 %	9.15E+00
NB 95	1.16 %	6.64E+00
MN 54	1.05 %	6.01E+00
CR 51	0.93 %	5.34E+00

b. CS 137	31.2 %	6.67E+00
FE 55	21.2 %	4.53E+00
CO 58	15.6 %	3.34E+00
NI 63	12.0 %	2.57E+00
CS 134	9.22 %	1.97E+00
CO 60	5.95 %	1.27E+00
C 14	3.29 %	7.03E-01
NB 95	0.48 %	1.02E-01
ZR 95	0.35 %	7.55E-02
AG 110M	0.34 %	7.36E-02

c.	%	. E
----	---	-----

d.	%	. E
----	---	-----

### 3. Solid Waste Disposition

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
15	Unshielded Van/Truck	Oak Ridge, TN
11	Unshielded Van/Truck	Hanford, WA
6	Cask Shipment (Type A)	Hanford, WA
1	Cask Shipment (Type A)	Hanford, WA

### B. IRRADIATED FUEL SHIPMENTS (Dispositon)

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
1	Spent Fuel Cask	Studsvik, Sweden



\*\*\* REGULATORY GUIDE 1.21 REPORT \*\*\*

EFFLUENT AND WASTE DISPOSAL ANNUAL SUMMARY REPORT (1991)

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 <sup>3</sup> Ci	1.91E+02 5.74E+02	1.51E+00
b. Dry compressible waste, contaminated equip, etc.	m <sup>3</sup> Ci	2.27E+02 2.92E+01	1.74E+00
c. Irradiated components, control rods, etc.	m <sup>3</sup> Ci	0.00E-00 0.00E-00	0.00E-00
d. Other (describe)	m <sup>3</sup> Ci	0.00E-00 0.00E-00	0.00E-00

2. Solid Waste Disposition

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
24	Unshielded Van/Truck	Oak Ridge, TN
1	Unshielded Van/Truck	Wampum, PA
11	Unshielded Van/Truck	Hanford, WA
6	Cask Shipment (Type A)	Hanford, WA
1	Cask Shipment (Type B)	Hanford, WA

B. IRRADIATED FUEL SHIPMENTS (Disposition)

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
1	Spent Fuel Cask	Studsvik, Sweden



\*\*\*SPECIAL NOTE\*\*\*

The Reg. Guide 1.21 Annual Summary Report reflects a reduction in the reported volume of dry compressible waste for the January 1 - June 30 period. Due to a misinterpretation of data in an offsite processor's burial report, it was necessary to reduce the volume for this period from 41.7 cubic meters to 41.2 cubic meters.

## ATTACHMENT B

### UNPLANNED RELEASES TO UNRESTRICTED AREAS

There were two unplanned releases from ANO during the third and fourth quarters of 1991. A discussion of these releases is provided below.

On November 11, 1991, a control room isolation occurred. Initiation of the isolation was an increase in radiation monitoring reading. Upon further investigation, the source of radiation into the system was caused by the Auxiliary Building ventilation housing being opened for maintenance. Although the exhaust fans were secure, air flow via the condenser off gas system and the 2T12 purge system had not been secured.

Due to the primary to secondary leak on ANO-2, an amount of radiation was released upon opening the vent housing. 171 cubic meters of effluent and 0.007 curies were released. This release produced a quarterly critical organ dose of 0.0650 mrem to members of the public. This represents 0.866% of the quarterly limits.

On December 9, 1991, during the calibration of the PASS SPING, it was found that vent flow from the PASS ventilation system existed. Upon further investigation, it was found that the supply fans to the PASS building were running, the exhaust fans were secured, and the dampers were opened. The supply fans were subsequently secured.

Since the PASS SPING was being calibrated during this release, no monitoring system was in place. Charcoal and particulate samples taken from the SPING prior to calibration were used to determine the radioactive contents of the release along with a gas and tritium sample after the release. Tritium was the only isotope found in the analysis of the samples.

It was determined that 19,770 cubic meters of effluent and 0.00124 curies were released. This release produced a quarterly critical organ dose of 0.0658 mrem to members of the public. This represents 0.877% of the quarterly limits.

ATTACHMENT C

CHANGES TO THE OFFSITE DOSE  
CALCULATIONAL MANUAL AND  
PROCESS CONTROL PROGRAM

There were no changes made to the Offsite Dose Calculational Manual during the third and fourth quarters of 1991.

No changes to the Process Control Program were made during the third and fourth quarters of 1991.

ATTACHMENT D

RADIATION DOSES DUE TO  
RADIOLOGICAL EFFLUENT

-----  
 ARKANSAS POWER AND LIGHT  
 ARKANSAS NUCLEAR ONE  
 LIQUID RADIOACTIVE WASTE DATA FILE  
 CUMULATIVE DOSE DATA  
 -----

		TS	
		LIMIT	%LIMIT
** UNIT 1 ** QUARTER 1 OF 1991 **			
TOTAL DOSE (MREM) FOR BONE	:	1.4066E-02	5.0 0.281%
TOTAL DOSE (MREM) FOR LIVER	:	2.1474E-02	5.0 0.429%
TOTAL DOSE (MREM) FOR TOTAL BODY	:	1.5837E-02	1.5 1.056%
TOTAL DOSE (MREM) FOR THYROID	:	3.4077E-02	5.0 0.682%
TOTAL DOSE (MREM) FOR KIDNEY	:	7.6324E-03	5.0 0.153%
TOTAL DOSE (MREM) FOR LUNG	:	2.7451E-03	5.0 0.549%
TOTAL DOSE (MREM) FOR GI-LLI	:	4.9807E-02	5.0 0.996%

		TS	
		LIMIT	%LIMIT
** UNIT 1 ** QUARTER 2 OF 1991 **			
TOTAL DOSE (MREM) FOR BONE	:	3.4260E-02	5.0 0.685%
TOTAL DOSE (MREM) FOR LIVER	:	5.8551E-02	5.0 1.171%
TOTAL DOSE (MREM) FOR TOTAL BODY	:	4.2494E-02	1.5 2.833%
TOTAL DOSE (MREM) FOR THYROID	:	1.5481E-02	5.0 0.310%
TOTAL DOSE (MREM) FOR KIDNEY	:	1.9527E-02	5.0 0.391%
TOTAL DOSE (MREM) FOR LUNG	:	6.5974E-03	5.0 0.132%
TOTAL DOSE (MREM) FOR GI-LLI	:	1.5687E-02	5.0 0.314%

		TS	
		LIMIT	%LIMIT
** UNIT 1 ** QUARTER 3 OF 1991 **			
TOTAL DOSE (MREM) FOR BONE	:	2.7036E-02	5.0 0.741%
TOTAL DOSE (MREM) FOR LIVER	:	6.0377E-02	5.0 1.208%
TOTAL DOSE (MREM) FOR TOTAL BODY	:	4.3798E-02	1.5 2.920%
TOTAL DOSE (MREM) FOR THYROID	:	2.8508E-04	5.0 0.006%
TOTAL DOSE (MREM) FOR KIDNEY	:	2.0058E-02	5.0 0.401%
TOTAL DOSE (MREM) FOR LUNG	:	7.0814E-03	5.0 0.142%
TOTAL DOSE (MREM) FOR GI-LLI	:	2.9798E-02	5.0 0.596%

		TS	
		LIMIT	%LIMIT
** UNIT 1 ** QUARTER 4 OF 1991 **			
TOTAL DOSE (MREM) FOR BONE	:	6.7668E-03	5.0 0.135%
TOTAL DOSE (MREM) FOR LIVER	:	1.1704E-02	5.0 0.234%
TOTAL DOSE (MREM) FOR TOTAL BODY	:	8.4791E-03	1.5 0.565%
TOTAL DOSE (MREM) FOR THYROID	:	5.8925E-04	5.0 0.012%
TOTAL DOSE (MREM) FOR KIDNEY	:	4.0083E-03	5.0 0.080%
TOTAL DOSE (MREM) FOR LUNG	:	1.8145E-03	5.0 0.036%
TOTAL DOSE (MREM) FOR GI-LLI	:	4.0046E-03	5.0 0.080%

		TS	
		LIMIT	%LIMIT
** UNIT 1 ** TOTALS FOR 1991 **			
TOTAL DOSE (MREM) FOR BONE	:	9.2129E-02	10.0 0.921%
TOTAL DOSE (MREM) FOR LIVER	:	1.5211E-01	10.0 1.521%
TOTAL DOSE (MREM) FOR TOTAL BODY	:	1.1061E-01	3.0 3.687%
TOTAL DOSE (MREM) FOR THYROID	:	5.0432E-02	10.0 0.504%
TOTAL DOSE (MREM) FOR KIDNEY	:	5.1226E-02	10.0 0.512%
TOTAL DOSE (MREM) FOR LUNG	:	1.8238E-02	10.0 0.182%
TOTAL DOSE (MREM) FOR GI-LLI	:	9.9296E-02	10.0 0.993%

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		TS	%LIMIT
		LIMIT	
** UNIT 2 ** QUARTER 1 OF 1991 **			
TOTAL DOSE (MREM) FOR BONE	: 1.8407E-02	5.0	0.368%
TOTAL DOSE (MREM) FOR LIVER	: 2.8441E-02	5.0	0.569%
TOTAL DOSE (MREM) FOR TOTAL BODY	: 2.0412E-02	1.5	1.361%
TOTAL DOSE (MREM) FOR THYROID	: 9.7229E-02	5.0	1.945%
TOTAL DOSE (MREM) FOR KIDNEY	: 1.0444E-02	5.0	0.209%
TOTAL DOSE (MREM) FOR LUNG	: 4.3380E-03	5.0	0.087%
TOTAL DOSE (MREM) FOR GI-LLI	: 7.2258E-02	5.0	1.445%

		TS	%LIMIT
		LIMIT	
** UNIT 2 ** QUARTER 2 OF 1991 **			
TOTAL DOSE (MREM) FOR BONE	: 3.2585E-02	5.0	0.652%
TOTAL DOSE (MREM) FOR LIVER	: 5.1585E-02	5.0	1.032%
TOTAL DOSE (MREM) FOR TOTAL BODY	: 3.7225E-02	1.5	2.482%
TOTAL DOSE (MREM) FOR THYROID	: 6.8570E-03	5.0	0.137%
TOTAL DOSE (MREM) FOR KIDNEY	: 1.7455E-02	5.0	0.349%
TOTAL DOSE (MREM) FOR LUNG	: 1.0095E-02	5.0	0.202%
TOTAL DOSE (MREM) FOR GI-LLI	: 2.9440E-01	5.0	5.888%

		TS	%LIMIT
		LIMIT	
** UNIT 2 ** QUARTER 3 OF 1991 **			
TOTAL DOSE (MREM) FOR BONE	: 3.7062E-03	5.0	0.074%
TOTAL DOSE (MREM) FOR LIVER	: 5.5060E-03	5.0	0.110%
TOTAL DOSE (MREM) FOR TOTAL BODY	: 3.8040E-03	1.5	0.254%
TOTAL DOSE (MREM) FOR THYROID	: 1.2652E-02	5.0	0.253%
TOTAL DOSE (MREM) FOR KIDNEY	: 1.8366E-03	5.0	0.037%
TOTAL DOSE (MREM) FOR LUNG	: 1.0076E-03	5.0	0.020%
TOTAL DOSE (MREM) FOR GI-LLI	: 6.9880E-03	5.0	0.140%

		TS	%LIMIT
		LIMIT	
** UNIT 2 ** QUARTER 4 OF 1991 **			
TOTAL DOSE (MREM) FOR BONE	: 1.1496E-01	5.0	2.300%
TOTAL DOSE (MREM) FOR LIVER	: 1.9415E-01	5.0	3.883%
TOTAL DOSE (MREM) FOR TOTAL BODY	: 1.4606E-01	1.5	9.373%
TOTAL DOSE (MREM) FOR THYROID	: 8.8667E-02	5.0	1.773%
TOTAL DOSE (MREM) FOR KIDNEY	: 6.5434E-02	5.0	1.309%
TOTAL DOSE (MREM) FOR LUNG	: 2.2337E-02	5.0	0.447%
TOTAL DOSE (MREM) FOR GI-LLI	: 2.5086E-02	5.0	0.502%

		TS	%LIMIT
		LIMIT	
** UNIT 2 ** TOTALS FOR 1991 **			
TOTAL DOSE (MREM) FOR BONE	: 1.6966E-01	10.0	1.697%
TOTAL DOSE (MREM) FOR LIVER	: 2.7968E-01	10.0	2.797%
TOTAL DOSE (MREM) FOR TOTAL BODY	: 2.0750E-01	3.0	6.917%
TOTAL DOSE (MREM) FOR THYROID	: 2.0540E-01	10.0	2.054%
TOTAL DOSE (MREM) FOR KIDNEY	: 9.5170E-02	10.0	0.952%
TOTAL DOSE (MREM) FOR LUNG	: 3.7778E-02	10.0	0.378%
TOTAL DOSE (MREM) FOR GI-LLI	: 3.9873E-01	10.0	3.987%



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\*\* UNIT 1 \*\* QUARTER 1 OF 1991 \*\*

DOSE FROM RADIOIODINES, PARTICULATES, AND TRITIUM  
 AT CONTROLLING LOCATION:

		TS LIMIT	%LIMIT
TOTAL DOSE (MREM) FOR BONE	: 6.2978E-04	7.5	0.008%
TOTAL DOSE (MREM) FOR LIVER	: 2.1461E-03	7.5	0.029%
TOTAL DOSE (MREM) FOR TOTAL BODY	: 1.7297E-03	7.5	0.023%
TOTAL DOSE (MREM) FOR THYROID	: 1.6503E-03	7.5	0.022%
TOTAL DOSE (MREM) FOR KIDNEY	: 1.8106E-03	7.5	0.024%
TOTAL DOSE (MREM) FOR LUNG	: 1.7090E-03	7.5	0.023%
TOTAL DOSE (MREM) FOR GI-LLI	: 1.6567E-03	7.5	0.022%
NOBLE GAS AIRDOSE AT SITE BOUNDARY:			
TOTAL GAMMA AIRDOSE (MRAD)	: 1.2676E-03	5.0	0.025%
TOTAL BETA AIRDOSE (MRAD)	: 3.1601E-03	10.0	0.032%

\*\* UNIT 1 \*\* QUARTER 2 OF 1991 \*\*

DOSE FROM RADIOIODINES, PARTICULATES, AND TRITIUM  
 AT CONTROLLING LOCATION:

		TS LIMIT	%LIMIT
TOTAL DOSE (MREM) FOR BONE	: 1.0895E-01	7.5	1.453%
TOTAL DOSE (MREM) FOR LIVER	: 1.2540E-01	7.5	1.672%
TOTAL DOSE (MREM) FOR TOTAL BODY	: 4.4914E-02	7.5	0.599%
TOTAL DOSE (MREM) FOR THYROID	: 1.8179E-01	7.5	2.424%
TOTAL DOSE (MREM) FOR KIDNEY	: 5.9518E-02	7.5	0.794%
TOTAL DOSE (MREM) FOR LUNG	: 3.8857E-02	7.5	0.518%
TOTAL DOSE (MREM) FOR GI-LLI	: 2.8329E-02	7.5	0.378%
NOBLE GAS AIRDOSE AT SITE BOUNDARY:			
TOTAL GAMMA AIRDOSE (MRAD)	: 6.8062E-03	5.0	0.136%
TOTAL BETA AIRDOSE (MRAD)	: 1.9811E-02	10.0	0.198%

\*\* UNIT 1 \*\* QUARTER 3 OF 1991 \*\*

DOSE FROM RADIOIODINES, PARTICULATES, AND TRITIUM  
 AT CONTROLLING LOCATION:

		TS LIMIT	%LIMIT
TOTAL DOSE (MREM) FOR BONE	: 5.4428E-05	7.5	0.001%
TOTAL DOSE (MREM) FOR LIVER	: 2.4558E-03	7.5	0.031%
TOTAL DOSE (MREM) FOR TOTAL BODY	: 2.4317E-03	7.5	0.032%
TOTAL DOSE (MREM) FOR THYROID	: 3.3294E-03	7.5	0.044%
TOTAL DOSE (MREM) FOR KIDNEY	: 2.4370E-03	7.5	0.032%
TOTAL DOSE (MREM) FOR LUNG	: 2.4268E-03	7.5	0.032%
TOTAL DOSE (MREM) FOR GI-LLI	: 2.4254E-03	7.5	0.032%
NOBLE GAS AIRDOSE AT SITE BOUNDARY:			
TOTAL GAMMA AIRDOSE (MRAD)	: 2.6974E-03	5.0	0.054%
TOTAL BETA AIRDOSE (MRAD)	: 7.0779E-03	10.0	0.071%



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\*\* UNIT 1 \*\* QUARTER 4 OF 1991 \*\*

DOSE FROM RADIOIODINES, PARTICULATES, AND TRITIUM  
 AT CONTROLLING LOCATION:

		TS LIMIT	%LIMIT
TOTAL DOSE (MREM) FOR BONE	: 1.9174E-04	7.5	0.003%
TOTAL DOSE (MREM) FOR LIVER	: 1.8952E-03	7.5	0.025%
TOTAL DOSE (MREM) FOR TOTAL BODY	: 1.8672E-03	7.5	0.025%
TOTAL DOSE (MREM) FOR THYROID	: 2.3419E-03	7.5	0.031%
TOTAL DOSE (MREM) FOR KIDNEY	: 1.8536E-03	7.5	0.025%
TOTAL DOSE (MREM) FOR LUNG	: 1.8381E-03	7.5	0.025%
TOTAL DOSE (MREM) FOR GI-LLI	: 1.8325E-03	7.5	0.024%
NOBLE GAS AIRDOSE AT SITE BOUNDARY:			
TOTAL GAMMA AIRDOSE (MRAD)	: 6.2366E-03	5.0	0.125%
TOTAL BETA AIRDOSE (MRAD)	: 1.7959E-02	10.0	0.180%

\*\* UNIT 1 \*\* TOTALS FOR 1991 \*\*

DOSE FROM RADIOIODINES, PARTICULATES, AND TRITIUM  
 AT CONTROLLING LOCATION:

		TS LIMIT	%LIMIT
TOTAL DOSE (MREM) FOR BONE	: 1.0983E-01	15.0	0.732%
TOTAL DOSE (MREM) FOR LIVER	: 1.3190E-01	15.0	0.879%
TOTAL DOSE (MREM) FOR TOTAL BODY	: 5.0943E-02	15.0	0.340%
TOTAL DOSE (MREM) FOR THYROID	: 1.8911E-01	15.0	1.261%
TOTAL DOSE (MREM) FOR KIDNEY	: 6.5619E-02	15.0	0.437%
TOTAL DOSE (MREM) FOR LUNG	: 4.4831E-02	15.0	0.299%
TOTAL DOSE (MREM) FOR GI-LLI	: 3.4244E-04	15.0	0.228%
NOBLE GAS AIRDOSE AT SITE BOUNDARY:			
TOTAL GAMMA AIRDOSE (MRAD)	: 1.7008E-02	10.0	0.170%
TOTAL BETA AIRDOSE (MRAD)	: 4.8008E-02	20.0	0.240%

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\*\* UNIT 2 \*\* QUARTER 1 OF 1991 \*\*

DOSE FROM RADIOIODINES, PARTICULATES, AND TRITIUM  
 AT CONTROLLING LOCATION:

		TS LIMIT	%LIMIT
TOTAL DOSE (MREM) FOR BONE	: 1.7503E-03	7.5	0.023%
TOTAL DOSE (MREM) FOR LIVER	: 3.2082E-03	7.5	0.043%
TOTAL DOSE (MREM) FOR TOTAL BODY	: 2.5179E-03	7.5	0.034%
TOTAL DOSE (MREM) FOR THYROID	: 9.2932E-02	7.5	1.239%
TOTAL DOSE (MREM) FOR KIDNEY	: 2.8410E-03	7.5	0.038%
TOTAL DOSE (MREM) FOR LUNG	: 2.3084E-03	7.5	0.031%
TOTAL DOSE (MREM) FOR GI-LLI	: 2.4014E-03	7.5	0.032%
NOBLE GAS AIRDOSE AT SITE BOUNDARY:			
TOTAL GAMMA AIRDOSE (MRAD)	: 1.1777E-02	5.0	0.236%
TOTAL BETA AIRDOSE (MRAD)	: 3.3679E-02	10.0	0.337%

\*\* UNIT 2 \*\* QUARTER 2 OF 1991 \*\*

DOSE FROM RADIOIODINES, PARTICULATES, AND TRITIUM  
 AT CONTROLLING LOCATION:

		TS LIMIT	%LIMIT
TOTAL DOSE (MREM) FOR BONE	: 6.1033E-01	7.5	8.138%
TOTAL DOSE (MREM) FOR LIVER	: 6.8720E-01	7.5	9.163%
TOTAL DOSE (MREM) FOR TOTAL BODY	: 2.4046E-01	7.5	3.206%
TOTAL DOSE (MREM) FOR THYROID	: 2.9493E-01	7.5	3.932%
TOTAL DOSE (MREM) FOR KIDNEY	: 3.1765E-01	7.5	4.235%
TOTAL DOSE (MREM) FOR LUNG	: 2.0798E-01	7.5	2.773%
TOTAL DOSE (MREM) FOR GI-LLI	: 1.5779E-01	7.5	2.104%
NOBLE GAS AIRDOSE AT SITE BOUNDARY:			
TOTAL GAMMA AIRDOSE (MRAD)	: 3.5573E-03	5.0	0.071%
TOTAL BETA AIRDOSE (MRAD)	: 9.2862E-03	10.0	0.093%

\*\* UNIT 2 \*\* QUARTER 3 OF 1991 \*\*

DOSE FROM RADIOIODINES, PARTICULATES, AND TRITIUM  
 AT CONTROLLING LOCATION:

		TS LIMIT	%LIMIT
TOTAL DOSE (MREM) FOR BONE	: 3.9097E-05	7.5	0.001%
TOTAL DOSE (MREM) FOR LIVER	: 1.8192E-03	7.5	0.024%
TOTAL DOSE (MREM) FOR TOTAL BODY	: 1.7985E-03	7.5	0.024%
TOTAL DOSE (MREM) FOR THYROID	: 5.4906E-03	7.5	0.073%
TOTAL DOSE (MREM) FOR KIDNEY	: 1.8133E-03	7.5	0.024%
TOTAL DOSE (MREM) FOR LUNG	: 1.7914E-03	7.5	0.024%
TOTAL DOSE (MREM) FOR GI-LLI	: 1.7918E-03	7.5	0.024%
NOBLE GAS AIRDOSE AT SITE BOUNDARY:			
TOTAL GAMMA AIRDOSE (MRAD)	: 2.1427E-02	5.0	0.429%
TOTAL BETA AIRDOSE (MRAD)	: 5.8621E-02	10.0	0.586%

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 ARKANSAS POWER AND LIGHT COMPANY  
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\*\* UNIT 2 \*\* QUARTER 4 OF 1991 \*\*

DOSE FROM RADIOIODINES, PARTICULATES, AND TRITIUM

AT CONTROLLING LOCATION:

		TS	%LIMIT
		LIMIT	
TOTAL DOSE (MREM) FOR BONE	: 2.3410E-04	7.5	0.003%
TOTAL DOSE (MREM) FOR LIVER	: 1.9278E-03	7.5	0.026%
TOTAL DOSE (MREM) FOR TOTAL BODY	: 1.8341E-03	7.5	0.024%
TOTAL DOSE (MREM) FOR THYROID	: 6.7312E-02	7.5	0.897%
TOTAL DOSE (MREM) FOR KIDNEY	: 2.0434E-03	7.5	0.027%
TOTAL DOSE (MREM) FOR LUNG	: 1.7187E-03	7.5	0.023%
TOTAL DOSE (MREM) FOR GI-LLI	: 1.7428E-03	7.5	0.023%
NOBLE GAS AIRDOSE AT SITE BOUNDARY:			
TOTAL GAMMA AIRDOSE (MRAD)	: 1.8219E-02	5.0	0.364%
TOTAL BETA AIRDOSE (MRAD)	: 5.2117E-02	10.0	0.521%

\*\* UNIT 2 \*\* TOTALS FOR 1991 \*\*

DOSE FROM RADIOIODINES, PARTICULATES, AND TRITIUM

AT CONTROLLING LOCATION:

		TS	%LIMIT
		LIMIT	
TOTAL DOSE (MREM) FOR BONE	: 6.1235E-01	15.0	4.082%
TOTAL DOSE (MREM) FOR LIVER	: 6.9416E-01	15.0	4.628%
TOTAL DOSE (MREM) FOR TOTAL BODY	: 2.4661E-01	15.0	1.644%
TOTAL DOSE (MREM) FOR THYROID	: 4.6066E-01	15.0	3.071%
TOTAL DOSE (MREM) FOR KIDNEY	: 3.2434E-01	15.0	2.162%
TOTAL DOSE (MREM) FOR LUNG	: 2.1380E-01	15.0	1.425%
TOTAL DOSE (MREM) FOR GI-LLI	: 1.6372E-01	15.0	1.092%
NOBLE GAS AIRDOSE AT SITE BOUNDARY:			
TOTAL GAMMA AIRDOSE (MRAD)	: 5.4981E-02	10.0	0.550%
TOTAL BETA AIRDOSE (MRAD)	: 1.5370E-01	20.0	0.769%

ATTACHMENT E

RADIATION DOSE TO MEMBERS OF  
THE PUBLIC DUE TO THEIR  
ACTIVITIES INSIDE OF THE  
SITE BOUNDARY

## Arkansas Nuclear One

1991 Cumulative Dose Data : Public Activities Inside Site Boundary (mRem)

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI	Skin
Unit 1:								
Gaseous Rel.								
H-3, I-131, &								
Particulates	4.80E-02	5.76E-02	2.23E-02	8.27E-02	2.87E-02	1.96E-02	1.50E-02	
Noble Gases			6.29E-03					1.50E-02
Liquid Rel.								
Fish	9.21E-02	1.52E-01	1.11E-01	5.04E-02	5.12E-02	1.82E-02	9.93E-02	
Sediment			1.81E-03					2.11E-03
Unit 1 Total	1.40E-01	2.10E-01	1.41E-01	1.33E-01	7.99E-02	3.78E-02	1.14E-01	1.72E-02
Unit 2:								
Gaseous Rel.								
H-3, I-131, &								
Particulates	2.68E-01	3.03E-01	1.08E-01	2.01E-01	1.42E-01	9.34E-02	7.16E-02	
Noble Gases			2.03E-02					4.83E-02
Liquid Rel.								
Fish	1.70E-01	2.80E-01	2.08E-01	2.05E-01	9.52E-02	3.78E-02	3.99E-01	
Sediment			3.10E-03					3.62E-03
Unit 2 Total	4.37E-01	5.83E-01	3.39E-01	4.07E-01	2.37E-01	1.31E-01	4.70E-01	5.20E-02
Site Total	5.77E-01	7.93E-01	4.80E-01	5.40E-01	3.17E-01	1.69E-01	5.85E-01	6.91E-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	2.31%	3.17%	1.92%	0.72%	1.27%	0.68%	2.34%	0.28%

ATTACHMENT F

CHANGES TO THE RADIOACTIVE  
WASTE SYSTEMS

There were no licensee initiated major modifications made to the ANO-1 or 2 liquid, gaseous, or solid radwaste systems during the calendar year of 1991.