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SUBJECT: "Semiannual Radioactive Effluent Release & Solid Waste Disposal Repts." W/890301 ltr.

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Duke Power Company
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HAL B. Tucker
Vice President
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(704)373-4531



DUKE POWER

March 1, 1989

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


Re: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287
Semi-Annual Radioactive Effluent Release Report

Dear Sir:

Pursuant to Oconee Nuclear Station Technical Specification 6.6.1.4 and 10 CFR 50.36a (a)(2), please find attached the 1988 Semi-Annual Radioactive Effluent Release Report for July 1 - December 31, 1988.

Attachment 1 contains the Semi-Annual Radioactive Effluent Release and Solid Waste Disposal Reports. Attachment 2 provides details of unplanned (or abnormal) offsite releases. The meteorological data, concurrent with the release of gaseous effluents, is included as Attachment 3. Pursuant to Technical Specification 3.5.5, please find attached a description of all Radioactive Gas and Liquid Monitors that were inoperable for greater than 30 days (Attachment 4). Please note that one revision was made to the Offside Dose Calculation Manual, during this reporting period.

Very truly yours,


Hal B. Tucker

RRE18/td

Attachments

cc: Malcom L. Ernst, Acting Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, GA 30323

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11

U. S. Nuclear Regulatory Commission
March 1, 1989
Page Two

cc: Ms. Helen Pastis
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Mr. P. H. Skinner
NRC Resident Inspector
Oconee Nuclear Station

U. S. Nuclear Regulatory Commission
March 1, 1989
Page Three

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Duke Power Company
Oconee Nuclear Station

Attachment 1

Radioactive Effluent Release and
Solid Waste Disposal Reports

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PDR ADOCK 05000269
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I. REGULATORY LIMITS - STATION

A. NOBLE GASES - AIR DOSE

1. CALENDAR QUARTER - GAMMA DOSE = 15 MRAD
2. CALENDAR QUARTER - BETA DOSE = 30 MRAD
3. CALENDAR YEAR - GAMMA DOSE = 30 MRAD
4. CALENDAR YEAR - BETA DOSE = 60 MRAD

B. LIQUID EFFLUENTS - DOSE

1. CALENDAR QUARTER - TOTAL BODY DOSE = 4.5 MREM
2. CALENDAR QUARTER - ORGAN DOSE = 15 MREM
3. CALENDAR YEAR - TOTAL BODY DOSE = 9 MREM
4. CALENDAR YEAR - ORGAN DOSE = 30 MREM

C. IODINE - 131 AND 133, TRITIUM, PARTICULATES W/T 1/2 > 8 DAYS - ORGAN DOSE

1. CALENDAR QUARTER = 22.5 MREM
2. CALENDAR YEAR = 45 MREM

II. MAXIMUM PERMISSIBLE CONCENTRATIONS

A. GASEOUS EFFLUENTS - INFORMATION FOUND IN OFFSITE DOSE CALCULATION MANUAL

B. LIQUID EFFLUENTS - INFORMATION FOUND IN 10CFR20, APPENDIX B, TABLE II, COLUMN 2

III. AVERAGE ENERGY - NOT APPLICABLE

IV. MEASUREMENTS AND APPROXIMATIONS OF TOTAL RADIOACTIVITY
INFORMATION FOUND IN OFFSITE DOSE CALCULATION MANUAL

V. BATCH RELEASES

A. LIQUID EFFLUENT

1. $1.47E+03$ = TOTAL NUMBER OF BATCH RELEASES
2. $5.29E+05$ = TOTAL TIME(MIN.) FOR BATCH RELEASES.
3. $4.46E+04$ = MAXIMUM TIME(MIN.) FOR A BATCH RELEASE.
4. $3.59E+02$ = AVERAGE TIME(MIN.) FOR A BATCH RELEASE.
5. $4.00E+00$ = MINIMUM TIME(MIN.) FOR A BATCH RELEASE.
6. $4.89E+06$ = AVERAGE DILUTION WATER FLOW DURING RELEASES(GPM).

B. GASEOUS EFFLUENT

1. $2.45E+02$ = TOTAL NUMBER OF BATCH RELEASES.
2. $7.73E+05$ = TOTAL TIME(MIN.) FOR BATCH RELEASES.
3. $4.46E+04$ = MAXIMUM TIME(MIN.) FOR A BATCH RELEASE.
4. $3.15E+03$ = AVERAGE TIME(MIN.) FOR A BATCH RELEASE.
5. $1.50E+01$ = MINIMUM TIME(MIN.) FOR A BATCH RELEASE.

ABNORMAL RELEASES

LIQUID

1. NUMBER OF RELEASES 2
2. TOTAL ACTIVITY RELEASED(CURIES) 2.08×10^{-5} CI

B. GASEOUS

1. NUMBER OF RELEASES 0
2. TOTAL ACTIVITY RELEASED(CURIES) 0

OCONEE NUCLEAR STATION

The estimated percentage of error for both Liquid and Gaseous effluent release data at Oconee Nuclear Station has been determined to be $\pm 23\%$. This number was derived by summing the following individual estimates of errors:

- 1) Flow rate determining devices = $\pm 5\%$
- 2) Counting error = $\pm 15\%$
- 3) Sample preparation error = $\pm 3\%$

OCONEE NUCLEAR STATION
 RADIOACTIVE EFFLUENT RELEASES
 DATE : 02/23/89

I. LIQUID RELEASES

	UNITS	1ST QTR	2ND QTR	3RD QTR	4TH QTR	YEAR : 1988 TOTAL
1. GROSS RADIOACTIVITY						
A. TOTAL RELEASE	CURIES	7.85E-01	7.85E-01	9.07E-01	6.21E-01	3.10E+00
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	6.08E-09	2.46E-09	6.65E-09	6.22E-09	4.53E-09
C. MAXIMUM CONCENTRATION RELEASED	UCI/ML	1.60E-07	1.29E-07	1.47E-07	1.79E-07	1.79E-07
2. TRITIUM						
A. TOTAL RELEASE	CURIES	2.40E+02	1.88E+02	1.63E+02	1.19E+02	7.10E+02
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	1.86E-06	5.90E-07	1.20E-06	1.19E-06	1.04E-06
3. DISSOLVED NOBLE GASES						
A. TOTAL RELEASE	CURIES	1.93E+00	2.02E+00	2.25E+00	5.63E-01	6.76E+00
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	1.49E-08	6.32E-09	1.65E-08	5.64E-09	9.88E-09
4. GROSS ALPHA ACTIVITY						
A. TOTAL RELEASE	CURIES	0.00E+00	0.00E+00	0.00E+00	8.01E-04	8.01E-04
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	0.00E+00	0.00E+00	0.00E+00	8.02E-12	1.17E-12
5. VOLUME OF LIQUID WASTE TO DISCHARGE CANAL	LITERS	1.26E+09	1.04E+09	3.33E+07	2.31E+07	2.36E+09
6. VOLUME OF DILUTION WATER	LITERS	1.29E+11	3.19E+11	1.36E+11	9.99E+10	6.84E+11
7. RADIONUCLIDES RELEASED	CURIES					
NA-24		1.95E-04	1.22E-03	7.17E-04	0.00E+00	2.13E-03
CR-51		2.70E-02	2.91E-02	1.67E-01	1.63E-02	2.39E-01
MN-54		6.39E-04	1.16E-03	2.27E-03	4.31E-03	8.38E-03
FE-55		1.75E-02	5.56E-03	2.44E-02	3.67E-02	8.42E-02
FE-59		2.75E-04	1.07E-04	2.66E-03	0.00E+00	3.04E-03
CO-57		3.72E-04	1.76E-04	4.35E-05	5.67E-04	1.16E-03
CO-58		3.21E-01	5.91E-02	1.22E-01	1.24E-01	6.27E-01
CO-60		1.55E-02	1.43E-02	2.98E-02	6.14E-02	1.21E-01
RB-88		2.41E-04	0.00E+00	0.00E+00	0.00E+00	2.41E-04
SR-89		0.00E+00	2.66E-04	2.85E-04	5.72E-05	6.08E-04
SR-90		1.62E-05	9.45E-05	4.46E-05	4.00E-06	1.59E-04
SR-92		8.72E-04	8.26E-03	0.00E+00	6.50E-05	9.19E-03
ZR-95		1.58E-02	2.75E-03	6.58E-03	5.17E-03	3.03E-02
NB-95		1.60E-02	1.22E-02	1.15E-02	9.19E-03	4.90E-02
NB-97		3.76E-03	4.45E-02	3.73E-03	1.67E-03	5.37E-02
MO-99		0.00E+00	2.40E-04	1.94E-03	0.00E+00	2.18E-03
TC-99M		4.55E-04	4.39E-04	5.23E-03	0.00E+00	6.13E-03
RU-103		1.75E-02	1.54E-03	6.94E-03	1.01E-03	2.70E-02
RU-106		1.00E-02	0.00E+00	0.00E+00	1.39E-03	1.14E-02
AG-110M		1.74E-02	5.04E-02	3.57E-02	2.20E-01	3.24E-01
I-131		4.21E-02	4.46E-02	3.26E-02	7.72E-03	1.27E-01
I-132		1.18E-03	3.37E-04	2.38E-04	0.00E+00	1.76E-03
I-133		2.88E-02	2.59E-04	1.65E-04	2.97E-04	2.95E-02
SB-122		2.65E-03	3.28E-04	3.83E-05	0.00E+00	3.01E-03
SB-124		1.32E-02	5.46E-02	4.16E-02	3.22E-03	1.13E-01
SB-125		1.61E-01	3.84E-01	3.70E-01	7.82E-02	9.94E-01
CS-134		1.34E-02	6.99E-03	1.12E-02	8.80E-03	4.04E-02
CS-136		5.98E-06	1.79E-05	9.57E-05	1.39E-03	1.51E-03
CS-137		3.41E-02	2.29E-02	1.99E-02	1.13E-02	8.81E-02
CS-138		3.95E-04	1.41E-03	0.00E+00	0.00E+00	1.81E-03
BA-139		0.00E+00	2.78E-02	0.00E+00	2.05E-02	4.83E-02
BA-140		4.57E-04	1.09E-04	0.00E+00	0.00E+00	5.66E-04
LA-140		3.70E-03	4.37E-03	7.18E-03	1.21E-03	1.65E-02
CE-141		5.33E-03	3.11E-04	8.12E-04	0.00E+00	6.45E-03
CE-144		9.93E-03	2.97E-03	1.05E-03	6.54E-03	2.05E-02
W-187		0.00E+00	1.99E-04	0.00E+00	0.00E+00	1.99E-04
NP-239		3.02E-03	5.78E-04	4.27E-04	0.00E+00	4.03E-03
SB-126		2.73E-04	1.04E-03	4.50E-04	0.00E+00	1.77E-03
AR-41		2.67E-05	0.00E+00	4.36E-05	0.00E+00	7.02E-05
KR-85		4.40E-04	3.25E-03	3.01E-02	0.00E+00	3.38E-02
KR-85M		0.00E+00	0.00E+00	0.00E+00	6.43E-05	6.43E-05
XE-131M		9.52E-03	3.28E-02	2.63E-02	3.67E-04	6.89E-02
XE-133		1.89E+00	1.96E+00	2.17E+00	5.50E-01	6.57E+00
XE-133M		1.38E-02	1.42E-02	1.57E-02	4.49E-03	4.82E-02
XE-135		1.69E-02	2.89E-03	6.83E-03	8.71E-03	3.53E-02

SKIN	MAXIMUM DOSE-	5.23D-03 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	SHORE
	CO 58	9.09 %				
	CO 60	24.93 %				
	SB 125	27.04 %				
	CS 134	6.80 %				
	CS 137	26.08 %				
BONE	MAXIMUM DOSE-	3.99D-01 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	FISH
	CS 134	21.71 %				
	CS 137	77.29 %				
LIVER	MAXIMUM DOSE-	5.17D-01 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	CS 134	32.11 %				
	CS 137	61.97 %				
T. BODY	MAXIMUM DOSE-	3.75D-01 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	H 3	9.73 %				
	CS 134	35.71 %				
	CS 137	53.70 %				
THYROID	MAXIMUM DOSE-	4.45D-01 MREM	CRITICAL AGE-	INFANT	CRITICAL PATHWAY-	DRINKING
	H 3	10.58 %				
	I 131	80.26 %				
	I 133	9.15 %				
KIDNEY	MAXIMUM DOSE-	1.96D-01 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	H 3	18.64 %				
	CS 134	27.10 %				
	CS 137	53.37 %				
LUNG	MAXIMUM DOSE-	1.01D-01 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	48.20 %				
	CS 134	15.74 %				
	CS 137	34.56 %				
GI-LLI	MAXIMUM DOSE-	4.83D-01 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	H 3	7.55 %				
	NB 95	83.18 %				

02/23/89

SKIN	MAXIMUM DOSE-	7.33D-03 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	SHORE
	CO 60	32.81 %				
	AG 110M	6.26 %				
	SB 125	42.54 %				
	CS 137	10.42 %				
BONE	MAXIMUM DOSE-	2.49D-01 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	FISH
	CS 134	27.91 %				
	CS 137	69.36 %				
LIVER	MAXIMUM DOSE-	3.36D-01 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	CS 134	39.57 %				
	CS 137	53.32 %				
T. BODY	MAXIMUM DOSE-	2.47D-01 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	H 3	9.63 %				
	CS 134	43.48 %				
	CS 137	45.66 %				
THYROID	MAXIMUM DOSE-	2.95D-01 MREM	CRITICAL AGE-	INFANT	CRITICAL PATHWAY-	DRINKING
	H 3	10.39 %				
	I 131	89.53 %				
KIDNEY	MAXIMUM DOSE-	1.27D-01 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	H 3	13.22 %				
	CS 134	33.43 %				
	CS 137	48.38 %				
LUNG	MAXIMUM DOSE-	6.69D-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	DRINKING
	H 3	47.29 %				
	CS 134	19.01 %				
	CS 137	29.14 %				
GI-LLI	MAXIMUM DOSE-	3.39D-01 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	H 3	7.00 %				
	NB 95	81.53 %				

SKIN MAXIMUM DOSE- 1.27D-02 MREM CRITICAL AGE- TEEN CRITICAL PATHWAY- SHORE

CO 60 53.17 %
AG 110M 30.33 %
SB 125 7.07 %

BONE MAXIMUM DOSE- 2.14D-01 MREM CRITICAL AGE- CHILD CRITICAL PATHWAY- FISH

CS 134 34.79 %
CS 137 62.41 %

LIVER MAXIMUM DOSE- 3.13D-01 MREM CRITICAL AGE- TEEN CRITICAL PATHWAY- FISH

H 3 5.32 %
CS 134 45.42 %
CS 137 44.19 %

T. BODY MAXIMUM DOSE- 2.32D-01 MREM CRITICAL AGE- ADULT CRITICAL PATHWAY- FISH

H 3 10.15 %
CS 134 49.38 %
CS 137 37.43 %

THYROID MAXIMUM DOSE- 1.17D-01 MREM CRITICAL AGE- INFANT CRITICAL PATHWAY- DRINKING

H 3 26.11 %
I 131 73.42 %

KIDNEY MAXIMUM DOSE- 1.22D-01 MREM CRITICAL AGE- TEEN CRITICAL PATHWAY- FISH

H 3 13.65 %
CS 134 37.19 %
CS 137 38.86 %

LUNG MAXIMUM DOSE- 6.39D-02 MREM CRITICAL AGE- TEEN CRITICAL PATHWAY- FISH

H 3 26.10 %
CO 60 8.97 %
AG 110M 5.16 %
CS 134 27.39 %
CS 137 29.35 %

GI-LLI MAXIMUM DOSE- 3.86D-01 MREM CRITICAL AGE- ADULT CRITICAL PATHWAY- FISH

H 3 6.11 %
NB 95 77.99 %
AG 110M 6.90 %

OCONEE NUCLEAR STATION
RADIOACTIVE EFFLUENT RELEASES
DATE : 02/23/89

II. AIRBORNE RELEASES

	UNITS	1ST QTR	2ND QTR	3RD QTR	4TH QTR	TOTAL	YEAR : 1988
1. TOTAL NOBLE GASES	CURIES	4.35E+03	9.88E+03	9.94E+03	1.69E+03	2.59E+04	
2. TOTAL HALOGENS	CURIES	1.24E-02	2.72E-02	6.20E-02	6.84E-03	1.08E-01	
3. TOTAL PARTICULATE GROSS BETA-GAMMA	CURIES	4.90E-02	1.56E-02	9.44E-03	5.69E-03	7.98E-02	
4. TOTAL TRITIUM	CURIES	1.48E+01	6.44E+00	1.44E+01	1.03E+01	4.60E+01	
5. TOTAL PARTICULATE GROSS ALPHA ACTIVITY	CURIES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
6. MAXIMUM NOBLE GAS RELEASE RATE	UCI/SEC	1.60E+03	1.60E+03	1.60E+03	1.60E+03	1.60E+03	
7. RADIONUCLIDES RELEASED	CURIES						
PARTICULATES							
NA-24		0.00E+00	9.02E-09	9.58E-08	0.00E+00	1.05E-07	
CR-51		0.00E+00	0.00E+00	4.05E-05	2.32E-06	4.28E-05	
MN-54		0.00E+00	6.05E-07	7.39E-06	0.00E+00	8.00E-06	
CO-57		3.08E-08	1.57E-07	6.57E-08	3.32E-08	2.87E-07	
CO-58		2.13E-06	3.92E-05	6.93E-05	8.15E-06	1.19E-04	
CO-60		4.41E-06	7.47E-05	1.14E-04	1.25E-05	2.06E-04	
BB-88		3.07E-02	1.30E-02	8.14E-03	4.82E-03	5.67E-02	
BB-89		0.00E+00	1.35E-05	0.00E+00	0.00E+00	1.35E-05	
SR-89		1.50E-02	9.81E-07	1.55E-07	2.02E-07	1.50E-02	
SR-90		0.00E+00	3.03E-07	0.00E+00	0.00E+00	3.03E-07	
SR-92		0.00E+00	1.17E-06	5.67E-08	1.04E-07	1.33E-06	
ZR-95		0.00E+00	9.26E-07	0.00E+00	0.00E+00	9.26E-07	
NB-95		0.00E+00	1.37E-06	1.12E-06	0.00E+00	2.49E-06	
NB-97		2.59E-07	3.65E-06	0.00E+00	0.00E+00	3.91E-06	
TC-99M		0.00E+00	4.65E-07	6.63E-07	1.33E-06	2.45E-06	
RU-103		1.01E-05	2.32E-05	0.00E+00	0.00E+00	3.33E-05	
RU-106		0.00E+00	3.48E-05	0.00E+00	0.00E+00	3.48E-05	
AG-110M		0.00E+00	8.28E-06	2.05E-07	0.00E+00	8.48E-06	
SB-122		3.51E-07	0.00E+00	0.00E+00	0.00E+00	3.51E-07	
SB-125		6.35E-07	3.28E-06	5.69E-07	1.89E-07	4.67E-06	
CS-134		9.00E-05	2.54E-04	1.67E-04	7.90E-05	5.90E-04	
CS-136		6.48E-07	5.62E-06	5.53E-07	0.00E+00	6.82E-06	
CS-137		3.32E-04	5.80E-04	6.66E-04	5.24E-04	2.10E-03	
CS-138		2.83E-03	1.54E-03	2.17E-04	2.29E-04	4.82E-03	
LA-140		0.00E+00	1.33E-08	0.00E+00	0.00E+00	1.33E-08	
CE-141		0.00E+00	2.02E-07	0.00E+00	0.00E+00	2.02E-07	
CE-143		8.24E-06	8.27E-06	1.15E-05	9.81E-06	3.78E-05	
CE-144		0.00E+00	3.52E-06	3.32E-06	0.00E+00	6.84E-06	
HALOGENS							
I-131		8.24E-03	1.73E-02	5.40E-02	3.33E-03	8.29E-02	
I-132		2.18E-04	7.80E-04	3.75E-04	8.96E-05	1.46E-03	
I-133		3.08E-03	6.90E-03	6.35E-03	2.78E-03	1.91E-02	
I-134		1.39E-04	2.38E-05	2.31E-05	3.26E-07	1.87E-04	
I-135		7.32E-04	2.16E-03	1.17E-03	6.40E-04	4.70E-03	
GASES							
AR-41		0.00E+00	3.64E+00	8.61E-01	6.18E-01	5.12E+00	
KR-85		9.15E+02	4.77E+02	1.37E+02	1.60E+02	1.69E+03	
KR-85M		4.16E-01	6.25E+00	2.02E+00	9.64E-01	9.65E+00	
KR-87		0.00E+00	1.02E+00	3.02E-01	2.05E-01	1.53E+00	
KR-88		1.27E+00	4.75E+00	1.81E+00	9.66E-01	8.79E+00	
XE-131M		5.21E+01	1.75E+02	9.90E+01	4.56E+01	3.72E+02	
XE-133		3.34E+03	9.04E+03	9.55E+03	1.46E+03	2.34E+04	
XE-133M		1.57E+01	6.25E+01	9.79E+01	1.05E+01	1.87E+02	
XE-135		1.94E+01	1.01E+02	5.32E+01	3.39E+01	1.87E+02	
XE-135M		0.00E+00	1.20E+00	5.56E-02	0.00E+00	1.26E+00	

O'CONNOR GROUND AND ELEVATED COMBINED SUMMARY
SPECIAL LOCATION
AT 4.00 MILES S

001-091 88

02/23/89

NOBLE GAS EXPOSURE:

BETA AIR DOSE = $7.07\text{E-}02$ MILLIRADS
GAMMA AIR DOSE = $1.65\text{E-}02$ MILLIRADS

TOTAL BODY DOSE = $9.66\text{E-}03$ MILLIREM
KR 85 1.38%
XE133 92.68%

TOTAL SKIN DOSE = $4.31\text{E-}02$ MILLIREM
37.39%
58.53%

O'CONNOR GROUND AND ELEVATED COMBINED SUMMARY 001-091 88
SPECIAL LOCATION
AT 4.50 MILES WNW

02/23/89

IODINE, PARTICULATE, AND TRITIUM EXPOSURE SUMMARY:

MAXIMUM ORGAN - THYROID
CRITICAL AGE - INFANT
CRITICAL PATHWAY - COW MILK @ 99.84%

MAXIMUM ORGAN DOSE = 1.16E-01 MILLIREM
I 131 99.57%

OCCONEE GROUND AND ELEVATED COMBINED SUMMARY 092-182 88 02/23/89
SPECIAL LOCATION
AT 4.00 MILES S

NOBLE GAS EXPOSURE:

BETA AIR DOSE = 1.43E-01 MILLIRADS
GAMMA AIR DOSE = 4.64E-02 MILLIRADS

TOTAL BODY DOSE = 2.73E-02 MILLIREM
KR 85 0.25%
XE133 88.59%
XE135 6.10%

TOTAL SKIN DOSE = 8.53E-02 MILLIREM
9.85%
80.07%
5.18%

O'CONNOR GROUND AND ELEVATED COMBINED SUMMARY 092-182 88
SPECIAL LOCATION
AT 3.50 MILES NNE

02/23/89

IODINE, PARTICULATE, AND TRITIUM EXPOSURE SUMMARY:

MAXIMUM ORGAN - THYROID
CRITICAL AGE - INFANT
CRITICAL PATHWAY - GOATMILK @ 99.51%

MAXIMUM ORGAN DOSE = 2.41E-01 MILLIREM
I 131 99.44%

OCCONEE GROUND AND ELEVATED COMBINED SUMMARY 183-274 88 02/23/89
SPECIAL LOCATION
AT 4.00 MILES S

NOBLE GAS EXPOSURE:

BETA AIR DOSE = 1.39E-01 MILLIRADS
GAMMA AIR DOSE = 4.66E-02 MILLIRADS

TOTAL BODY DOSE = 2.73E-02 MILLIREM
XE133 94.23%

TOTAL SKIN DOSE = 8.01E-02 MILLIREM
90.36%

O'CONNOR GROUND AND ELEVATED COMBINED SUMMARY 183-274 88
SPECIAL LOCATION
AT 4.50 MILES WNW

02/23/89

IODINE, PARTICULATE, AND TRITIUM EXPOSURE SUMMARY:

MAXIMUM ORGAN - THYROID
CRITICAL AGE - INFANT
CRITICAL PATHWAY - COW MILK @ 99.88%

MAXIMUM ORGAN DOSE = 7.60E-01 MILLIREM
I 131 99.86%

OCCONEE GROUND AND ELEVATED COMBINED SUMMARY 275-366 88 02/23/89
SPECIAL LOCATION
AT 1.50 MILES S

NOBLE GAS EXPOSURE:

BETA AIR DOSE = 3.24E-02 MILLIRADS
GAMMA AIR DOSE = 1.05E-02 MILLIRADS

TOTAL BODY DOSE = 6.22E-03 MILLIREM
KR 85 0.28%
XE133 86.23%
XE135 6.53%

TOTAL SKIN DOSE = 1.95E-02 MILLIREM
10.86%
77.61%
5.51%

O'CONNOR GROUND AND ELEVATED COMBINED SUMMARY 275-366 88
SPECIAL LOCATION
AT 4.50 MILES WNW

02/23/89

IODINE, PARTICULATE, AND TRITIUM EXPOSURE SUMMARY:

MAXIMUM ORGAN - THYROID
CRITICAL AGE - INFANT
CRITICAL PATHWAY - COW MILK @ 99.72%

MAXIMUM ORGAN DOSE = $4.74E-02$ MILLIREM
I 131 98.99%

O'CONNOR GROUND AND ELEVATED COMBINED SUMMARY
SPECIAL LOCATION
AT 4.00 MILES S

001-366 88

02/23/89

NOBLE GAS EXPOSURE:

BETA AIR DOSE = 3.80E-01 MILLIRADS
GAMMA AIR DOSE = 1.17E-01 MILLIRADS

TOTAL BODY DOSE = 6.88E-02 MILLIREM
KR 85 0.36%
XE133 91.38%

TOTAL SKIN DOSE = 2.24E-01 MILLIREM
13.30%
79.04%

OCCONEE GROUND AND ELEVATED COMBINED SUMMARY 001-366 88
SPECIAL LOCATION
AT 4.50 MILES WNW

02/23/89

IODINE, PARTICULATE, AND TRITIUM EXPOSURE SUMMARY:

MAXIMUM ORGAN - THYROID
CRITICAL AGE - INFANT
CRITICAL PATHWAY - COW MILK @ 99.86%

MAXIMUM ORGAN DOSE = 1.16E+00 MILLIREM
I 131 99.74%

1988 FUEL CYCLE CALCULATIONS

1988 OCONEE FUEL CYCLE SUMMARY

DAYS 001-366 02/23/89 AT 15:49

MAXIMUM TOTAL BODY S 4.00 MILES 8.61E-01 AGE : ADULT

MAXIMUM ORGAN WNW 4.50 MILES 2.11E+00 AGE : INFANT ORGAN : THYROID

OCONEE NUCLEAR STATION
SOLID RADIOACTIVE WASTE SHIPPED TO A DISPOSAL FACILITY
REPORT PERIOD 7/1/88 THROUGH 12/31/88

TYPES OF WASTE SHIPPED		NUMBER OF SHIPMENTS	NUMBER OF CONTAINERS	WASTE CLASS	CONT. TYPE	BURIAL VOLUME		TOTAL ACT. Ci	EST. TOTAL ERROR %
						(ft ³)	(m ³)		
1	WASTE FROM LIQUID SYSTEMS								
	(A) Dewatered Secondary Resins	5	15	AU	STC	3091.5	87.54	0.38	10
	(B) Dewatered Bead Resins	3	3	1B, 2C	B	360.9	10.22	2660.90	10
	(C) Evaporator Concentrates	11	656	AU	STC	4920.0	139.32	0.54	10
	(D) Dewatered Mechanical Filters	7	24	6AU, 8AS 10B	STC	1177.9	33.35	114.30	15
	(E) Dewatered Demineralizers	3	9	1AS, 8B	STC	344.7	9.76	94.06	10
	(F) Solidified Oils, Acids, Sludges	0	0	N/A	N/A	0	0	0	N/A
2	DRY SOLID WASTE								
	(A) Dry Active Waste (compacted)	0	0	N/A	N/A	0	0	0	N/A
	(B) Dry Active Waste (non-compac)	4	16	AU	STC	745.3	21.10	2.95	15
	(C) Dry Active Waste (brokered)	---	---	7AU, 4AS 4B, 1C	STC, B	5775.2	163.54	15.94	15
	(D) Irradiated Components	0	0	N/A	N/A	0	0	0	N/A
TOTALS		33*	723*	--	--	16415.5	464.83	2889.07	--

* does not include brokered totals

OCONEE - SUMMARY OF MAJOR RADIONUCLIDE COMPOSITION

<u>Types of Wastes</u>	<u>Radionuclide</u>	<u>% Abundance*</u>
Wastes from Liquid Systems		
A. Dewatered Secondary Resins	Co-58	12.6
	Co-60	0.9
	Ni-63	1.3
	Cs-134	22.3
	Cs-137	39.2
	Fe-55	2.9
	I-131	18.2
	Mn-54	0.5
	Ag-110M	0.3
	Xe-133	1.0
	Xe-131M	0.1
	C-14	0.3
	Nb-95	0.2
	Zr-95	0.1
	Cr-51	0.1
B. Dewatered Primary Resins	Co-57	0.1
	Co-58	14.6
	Co-60	1.8
	Ni-63	2.6
	Sr-90	0.3
	Cs-134	35.7
	Cs-136	0.2
	Cs-137	39.5
	Fe-55	3.2
	I-131	0.5
	Mn-54	0.7
	Ag-110M	0.1
	Sb-125	0.1
	Pu-241	0.1
	Sb-122	0.4
C. Evaporator Concentrates	Co-60	11.1
	Ni-63	15.7
	Cs-134	2.4
	Cs-137	32.5
	Fe-55	35.0
	C-14	3.3
D. Dewatered Mechanical Filters	Co-58	16.2
	Co-60	22.2
	Ni-63	17.8
	Cs-134	2.9
	Cs-137	8.4
	Fe-55	22.1
	I-131	0.2
	Mn-54	4.7
	Ag-110M	3.8
	Sb-125	0.9
	C-14	0.8

E. Dewatered Demineralizers

Co-57	0.1
Co-58	19.9
Co-60	2.6
Ni-63	6.3
Cs-134	29.9
Cs-136	0.1
Cs-137	29.4
Fe-55	3.7
I-131	0.4
Mn-54	0.8
Ag-110M	3.1
Sb-125	0.9
Nb-95	0.6
Te-125M	0.1
Cr-51	1.7
Zr-95	0.2
Ru-103	0.1

F. Solidified Acids, Oils, Sludges

(none shipped this period)

2. Solid Dry Waste

A. Dry Active Waste (compacted)

Co-58	4.6
Co-60	14.3
Ni-63	9.8
Cs-134	9.4
Cs-137	29.9
Fe-55	25.5
Mn-54	1.9
Ag-110M	2.4
C-14	0.8
H-3	0.3
Pu-241	1.1

B. Dry Active Waste (non-compacted)

Co-58	4.6
Co-60	14.3
Ni-63	9.7
Cs-134	9.4
Cs-137	29.9
Fe-55	25.5
Mn-54	1.9
Ag-110M	2.4
C-14	0.8
H-3	0.3
Pu-241	1.1

C. Irradiated Components

(none shipped this period)

*Average % abundance for all shipments

Duke Power Company
Oconee Nuclear Station

Attachment 2

Summary of Unplanned Radioactive
Releases to Unrestricted Areas

Date: November 14, 1988

Event Description

Approximately 150 gallons of steam generator cleaning solution was released from the discharge tank to the yard drain when the discharge tank release valve was left open while resuming system operation.

Cause

This release was caused by a Defective Procedure. The operating procedure used by the B&W technicians operating the portable evaporator did not instruct them to ensure that the discharge tank release valve was shut or to notify Radwaste personnel prior to resuming operation.

Corrective Action to Prevent Recurrence

The discharge tank release valve was shut which terminated the release. Radwaste and vendor personnel were counselled and trained concerning procedures.

Consequences

Approximately 150 gallons of slightly radioactive water was released to the yard drains. The estimated dose contribution from this release to an individual was 2.0×10^{-3} mrem.

Date: December 9, 1988

Event Description

Approximately 100 gallons leaked from a condensate heat exchanger line due to an eroded gasket.

Cause

The release was caused by a leaking gasket on the flange of a condensate line at the Condensate Heat Exchanger.

Corrective Action

The evaporator was shut down, the line isolated and the flange gasket replaced.

Consequences

Approximately 100 gallons of slightly radioactive water was released to the ground. The estimated dose contribution from the release to an individual was 1.8×10^{-4} mrem.

Duke Power Company
Oconee Nuclear Station

Attachment 3

Meteorological Data

OCONEE NUCLEAR STATION
1988 METEOROLOGY JOINT FREQUENCY DISTRIBUTIONS (THIRD QUARTER)

8:33 MONDAY, FEBRUARY 13, 1989 1

PASQUILL STABILITY A

SECTOR	WIND SPEED CLASS							TOTAL
	0.45- 1.49	1.50- 2.49	2.50- 3.49	3.50- 4.49	4.50- 5.49	5.50- 6.49	6.50- 7.49	
	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	
-N-	1	2	3
-NNE-	.	2	1	1	.	.	.	4
-NE-	.	.	2	.	1	.	.	3
-ENE-	.	.	.	2	5	2	1	10
-E-	.	.	.	2	1	.	1	4
-ESE-	.	.	2	2
-SE-	.	.	.	1	.	.	.	1
-S-	.	1	2	3
-SSW-	.	14	12	6	5	2	.	39
-SW-	1	28	26	8	5	4	.	72
-WSW-	2	14	4	1	.	.	.	21
-W-	.	4	2	6
-WNW-	1	4	5
-NW-	1	1	2
-NNW-	.	2	2
TOTAL	6	72	51	21	17	8	2	177

OCONEE NUCLEAR STATION
1988 METEOROLOGY JOINT FREQUENCY DISTRIBUTIONS (THIRD QUARTER)

8:33 MONDAY, FEBRUARY 13, 1989 2

PASQUILL STABILITY B

SECTOR	WIND SPEED CLASS								TOTAL
	0.45- 1.49	1.50- 2.49	2.50- 3.49	3.50- 4.49	4.50- 5.49	5.50- 6.49	6.50- 7.49	7.50- 8.49	
	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	
-N-	1	4	5
-NNE-	1	3	1	5
-NE-	.	1	3	1	.	1	.	.	6
-ENE-	.	2	.	6	5	4	1	1	19
-E-	.	.	3	4	3	.	.	.	10
-ESE-	.	.	3	3
-SE-	.	1	1
-SSE-	.	2	1	.	.	1	.	.	4
-S-	.	.	3	1	4
-SSW-	1	7	8	4	1	2	1	.	24
-SW-	.	10	8	1	6	1	.	.	26
-WSW-	1	5	1	1	8
-W-	2	1	3
-WNW-	2	2
-NW-	1	3	1	5
-NNW-	2	3	5
TOTAL	11	42	32	18	15	9	2	1	130

P. ALL STABILITY C

SECTOR	WIND SPEED CLASS										TOTAL
	0.45- 1.49	1.50- 2.49	2.50- 3.49	3.50- 4.49	4.50- 5.49	5.50- 6.49	6.50- 7.49	7.50- 8.49	8.50- 9.49		
	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.		
-N-	4	2	6	
-NNE-	3	4	2	4	.	1	.	.	.	14	
-NE-	.	6	2	4	1	13	
-ENE-	.	2	2	5	3	2	1	.	1	16	
-E-	.	2	4	2	1	9	
-ESE-	1	.	.	2	3	
-SE-	.	1	3	.	1	5	
-SSE-	.	1	1	
-S-	.	2	2	
-SSW-	1	8	.	5	1	15	
-SW-	3	4	4	2	4	1	1	.	.	19	
-WSW-	2	3	.	.	.	1	.	1	1	8	
-W-	4	1	.	5	
-WNW-	4	.	.	1	5	
-NW-	.	3	3	
-NNW-	4	2	6	
TOTAL	26	40	17	25	11	5	2	2	2	130	

OCONEE NUCLEAR STATION
1988 METEOROLOGY JOINT FREQUENCY DISTRIBUTIONS (THIRD QUARTER)

8:33 MONDAY, FEBRUARY 13, 1989

4

PASQUILL STABILITY D

SECTOR	WIND SPEED CLASS										TOTAL
	0.45- 1.49	1.50- 2.49	2.50- 3.49	3.50- 4.49	4.50- 5.49	5.50- 6.49	6.50- 7.49	7.50- 8.49	8.50- 9.49		
	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.		
-N-	14	32	12	4	1	63	
-NNE-	11	24	11	7	8	61	
-NE-	4	23	57	58	28	6	1	.	.	177	
-ENE-	1	14	38	39	29	9	1	.	.	131	
-E-	3	7	24	9	10	3	.	.	.	56	
-ESE-	2	9	8	6	.	2	.	.	.	27	
-SE-	2	1	5	2	1	11	
-SSE-	4	1	4	3	12	
-S-	3	3	4	3	13	
-SSW-	4	6	7	7	6	6	3	4	.	43	
-SW-	4	11	11	21	11	5	.	2	.	65	
-WSW-	13	6	9	7	8	4	.	2	.	49	
-W-	15	7	5	1	1	.	1	.	1	31	
-WNW-	13	9	5	1	28	
-NW-	15	14	2	5	.	1	.	.	.	37	
-NNW-	15	26	9	2	.	1	.	.	.	53	
TOTAL	123	193	211	175	103	37	6	8	1	857	

O'CONNOR NUCLEAR STATION
1988 METEOROLOGY JOINT FREQUENCY DISTRIBUTIONS (THIRD QUARTER)

8:33 MONDAY, FEBRUARY 13, 1989

6

PASQUILL STABILITY F

	WIND SPEED CLASS					TOTAL
	0.45- 1.49	1.50- 2.49	2.50- 3.49	3.50- 4.49	4.50- 5.49	
	NØ.	NØ.	NØ.	NØ.	NØ.	
SECTOR						
-NE-	.	1	.	.	.	1
-ENE-	1	1
-ESE-	.	.	1	1	.	2
-SE-	.	.	1	.	.	1
-SSE-	.	1	.	.	.	1
-S-	2	2
-SW-	.	.	1	1	1	3
-W-	1	1
-WNW-	.	1	.	.	.	1
-NW-	.	2	1	.	.	3
-NNW-	1	4	1	.	.	6
TOTAL	5	9	5	2	1	22

OCONEE NUCLEAR STATION
1988 METEOROLOGY JOINT FREQUENCY DISTRIBUTIONS (THIRD QUARTER)

8:33 MONDAY, FEBRUARY 13, 1989 7

ALL STABILITY CLASSES

SECTOR	WIND SPEED CLASS										TOTAL
	0.45- 1.49	1.50- 2.49	2.50- 3.49	3.50- 4.49	4.50- 5.49	5.50- 6.49	6.50- 7.49	7.50- 8.49	8.50- 9.49		
	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.		
-N-	36	118	40	8	3	205	
-NNE-	29	77	29	18	9	1	.	.	.	163	
-NE-	10	57	87	67	31	7	1	.	.	260	
-ENE-	7	31	56	69	44	18	4	1	1	231	
-E-	5	15	37	22	16	3	1	.	.	99	
-ESE-	7	13	22	12	.	2	.	.	.	56	
-SE-	2	7	11	7	2	1	.	.	.	30	
-SSE-	6	6	9	5	1	1	.	.	.	28	
-S-	8	8	18	9	3	46	
-SSW-	10	42	39	30	16	10	4	4	.	155	
-SW-	15	75	66	40	28	11	1	2	.	238	
-WSW-	36	42	17	13	9	6	.	3	1	127	
-W-	48	21	10	3	1	.	1	1	1	86	
-WNW-	50	25	6	3	1	85	
-NW-	33	43	8	5	.	1	1	.	.	91	
-NNW-	38	79	23	2	.	1	.	.	.	143	
TOTAL	340	659	478	313	164	62	13	11	3	2043	

OCONEE NUCLEAR STATION
1988 METEOROLOGY JOINT FREQUENCY DISTRIBUTIONS (FOURTH QUARTER)

8:33 MONDAY, FEBRUARY 13, 1989 8

ALL STABILITY CLASSES

SECTOR	WIND SPEED CLASS										TOTAL
	0.45- 1.49	1.50- 2.49	2.50- 3.49	3.50- 4.49	4.50- 5.49	5.50- 6.49	6.50- 7.49	7.50- 8.49	8.50- 9.49	>9.50 M/S	
	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	
-N-	42	79	30	8	3	3	.	.	.	1	166
-NNE-	23	60	45	7	4	5	144
-NE-	11	21	28	61	27	5	153
-ENE-	8	33	26	41	25	8	4	.	.	.	145
-E-	7	20	24	31	18	5	2	1	.	2	110
-ESE-	9	14	15	7	1	2	48
-SE-	9	18	14	11	2	54
-SSE-	5	17	21	16	5	1	.	.	.	3	68
-S-	7	18	35	15	4	1	80
-SSW-	19	38	55	50	35	13	1	3	.	.	214
-SW-	19	40	55	35	38	28	35	13	16	7	286
-WSW-	27	50	15	22	23	19	15	10	5	11	197
-W-	33	15	11	11	15	12	5	6	3	6	117
-WNW-	46	23	14	7	15	17	10	4	5	7	148
-NW-	54	34	9	11	9	7	4	2	2	1	133
-NNW-	44	45	18	6	2	5	120
-CALM-	2	2
TOTAL	365	525	415	339	224	129	76	39	31	42	2185

OCONEE NUCLEAR STATION
1988 METEOROLOGY JOINT FREQUENCY DISTRIBUTIONS (FOURTH QUARTER)

8:33 MONDAY, FEBRUARY 13, 1989 1

PASQUILL STABILITY A

	WIND SPEED CLASS										TOTAL
	0.45- 1.49	1.50- 2.49	2.50- 3.49	3.50- 4.49	4.50- 5.49	5.50- 6.49	6.50- 7.49	7.50- 8.49	8.50- 9.49		
	Nº.	Nº.	Nº.	Nº.	Nº.	Nº.	Nº.	Nº.	Nº.		
SECTOR											
-NE-	.	.	.	1	1	
-ENE-	.	.	.	1	1	
-E-	.	.	.	2	2	4	
-S-	.	1	1	2	
-SSW-	.	2	11	4	3	20	
-SW-	2	3	8	4	1	1	1	3	3	26	
-WSW-	1	1	1	.	1	.	1	.	.	5	
TOTAL	3	7	21	12	7	1	2	3	3	59	

OCONEE NUCLEAR STATION
1988 METEOROLOGY JOINT FREQUENCY DISTRIBUTIONS (FOURTH QUARTER)

8:33 MONDAY, FEBRUARY 13, 1989 2

PASQUILL STABILITY B

	WIND SPEED CLASS										TOTAL
	0.45- 1.49	1.50- 2.49	2.50- 3.49	3.50- 4.49	4.50- 5.49	5.50- 6.49	6.50- 7.49	7.50- 8.49	8.50- 9.49	>9.50 M/S	
	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	
SECTOR											
-NNE-	.	.	1	.	.	1	2
-ENE-	.	.	1	1	1	3
-E-	.	.	.	1	1	1	3
-ESE-	.	.	1	1
-SSE-	1	3	4
-S-	.	.	1	1	2
-SSW-	1	7	8	11	5	2	34
-SW-	.	2	4	4	2	2	1	2	3	.	20
-WSW-	.	4	1	.	1	6
-W-	.	2	1	3
-WNW-	.	1	2	1	4
-NW-	1	.	1	.	.	2
TOTAL	2	19	18	18	10	7	1	3	5	1	84

OCONEE NUCLEAR STATION
1988 METEOROLOGY JOINT FREQUENCY DISTRIBUTIONS (FOURTH QUARTER)

8:33 MONDAY, FEBRUARY 13, 1989 4

PASQUILL STABILITY D

SECTOR	WIND SPEED CLASS										TOTAL
	0.45- 1.49	1.50- 2.49	2.50- 3.49	3.50- 4.49	4.50- 5.49	5.50- 6.49	6.50- 7.49	7.50- 8.49	8.50- 9.49	>9.50 M/S	
	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	
-N-	2	9	3	1	1	3	.	.	.	1	20
-NNE-	4	5	13	4	2	4	32
-NE-	1	10	15	53	25	4	108
-ENE-	.	15	10	29	16	6	3	.	.	.	79
-E-	3	7	16	17	8	1	2	1	.	1	56
-ESE-	3	8	5	1	17
-SE-	4	10	7	3	1	25
-SSE-	.	11	12	6	1	1	.	.	.	2	33
-S-	1	9	17	9	2	38
-SSW-	7	7	17	21	14	5	1	2	.	.	74
-SW-	6	14	11	10	23	21	29	7	6	3	130
-WSW-	5	19	5	8	15	11	11	5	1	6	86
-W-	8	2	6	5	8	7	4	4	3	1	48
-WNW-	9	3	2	4	9	16	7	3	2	2	57
-NW-	12	8	1	4	5	5	2	1	1	.	39
-NNW-	6	6	5	3	1	3	24
TOTAL	71	143	145	178	130	87	59	23	13	17	866

OCONEE NUCLEAR STATION
1988 METEOROLOGY JOINT FREQUENCY DISTRIBUTIONS (FOURTH QUARTER)

8:33 MONDAY, FEBRUARY 13, 1989

5

PASQUILL STABILITY E

SECTOR	WIND SPEED CLASS										TOTAL
	0.45- 1.49	1.50- 2.49	2.50- 3.49	3.50- 4.49	4.50- 5.49	5.50- 6.49	6.50- 7.49	7.50- 8.49	8.50- 9.49	>9.50 M/S	
	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	NØ.	
-N-	27	40	16	7	2	92
-NNE-	15	37	16	3	2	73
-NE-	10	9	12	7	1	1	40
-ENE-	6	14	12	9	8	49
-E-	4	7	5	6	6	3	.	.	.	1	32
-ESE-	6	3	7	4	1	2	23
-SE-	3	4	5	6	1	19
-SSE-	2	1	7	9	4	23
-S-	4	5	13	4	2	28
-SSW-	9	11	12	8	6	3	49
-SW-	8	9	15	12	9	3	3	.	1	1	61
-WSW-	16	19	7	12	5	8	2	3	2	.	74
-W-	20	9	.	5	6	3	1	1	.	.	45
-WNW-	29	11	12	2	5	.	3	.	.	.	62
-NW-	35	22	6	7	4	1	1	.	.	.	76
-NNW-	33	32	9	2	1	2	79
-CALM-	2	2
TOTAL	229	233	154	103	62	24	10	4	3	5	827

OCONEE NUCLEAR STATION
1988 METEOROLOGY JOINT FREQUENCY DISTRIBUTIONS (FOURTH QUARTER)

8:33 MONDAY, FEBRUARY 13, 1989 7

PASQUILL STABILITY G

	WIND SPEED CLASS				TOTAL
	0.45- 1.49	1.50- 2.49	2.50- 3.49	3.50- 4.49	
	NØ.	NØ.	NØ.	NØ.	
SECTOR					
-N-	1	.	.	.	1
-NNE-	1	.	.	.	1
-NE-	.	1	.	.	1
-ENE-	.	1	.	.	1
-SE-	.	.	.	1	1
-S-	.	.	1	.	1
-SSW-	1	1	.	.	2
-SW-	.	1	8	2	11
-WSW-	1	2	.	.	3
-W-	.	.	2	.	2
-WNW-	1	.	.	1	2
-NW-	2	1	.	.	3
-NNW-	.	2	.	.	2
TOTAL	7	9	11	4	31

Duke Power Company
Oconee Nuclear Station

Attachment 4

Radioactive Gas and Liquid Monitors
Inoperable for Greater Than 30 Days