

5

DUKE POWER COMPANY
POWER BUILDING
422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

February 28, 1978

TELEPHONE: AREA 704
373-4083

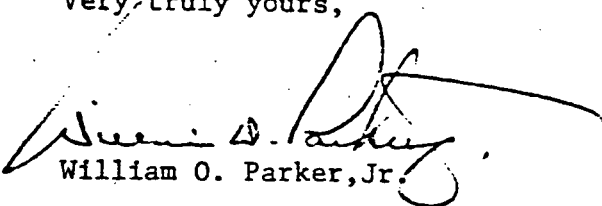
Mr. J. P. O'Reilly, Director
U. S. Nuclear Regulatory Commission
Suite 1217
230 Peachtree Street, Northwest
Atlanta, Georgia 30303

RE: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287

Dear Mr. O'Reilly:

Pursuant to 10CFR 50.36a and Oconee Technical Specifications 6.6.1.2(c), please find attached data concerning radioactive effluents released from Oconee Nuclear Station. This information is reported on a semi-annual basis for the last six months of 1977.

Very truly yours,


William O. Parker, Jr.

LJB:ge
Attachment

cc: Director of Inspection and Enforcement

269, 270, 287
Envi Semi-Annual

RADIOACTIVE EFFLUENT RELEASESLIQUID AND AIRBORNE RELEASES

Liquid and airborne releases are reported in attached tables.

SOLID WASTES

Total volume of solid waste packated (cubic feet) 37,895.4

Total estimated activity involved (curies) 7,366.7

*Disposal of materials shipped off-site:

<u>DATE</u>	<u>CU. FT.</u>	<u>CURIES</u>
7-5	238	28.11
7-5	599.2	1.17
7-7	238	.561
7-7	480	.003
7-8	185	9.14
7-8	384.1	101.19
7-9	238	31.93
7-11	185	10.37
7-12	7.5	12.75
7-13	185	4.3
7-14	710.5	.82
7-15	7.4	1.70
7-18	185	11.27
7-18	185	.79
7-20	538.2	100.45
7-20	238	24.26
7-21	238	8.83
7-22	238	2.59
7-22	410.9	.65
7-23	100	2.30
7-25	100	1.47
7-26	100	1.83
7-26	238	25.48
7-27	238	20.69
7-27	100	.20
7-27	238	11.24
7-28	402.3	.71
7-28	238	24.38
7-29	238	2.30
7-28	111.28	10.42
7-29	100	2.30
7-30		

<u>DATE</u>	<u>CU. FT.</u>	<u>CURIES</u>
7-31	238	52.84
8-1	100	2.17
8-3	238	13.60
8-3	616.32	.73
8-4	100	1.05
8-5	7.4	3.40
8-5	100	1.45
8-7	100	.76
8-8	238	23.47
8-8	100	.45
8-8	85.6	15.58
8-8	316.7	.46
8-9	238	.54
8-10	332.4	5.45
8-10	100	1.18
8-11	100	.65
8-12	238	87.62
8-12	100	.55
8-13	100	1.59
8-13	100	1.2
8-14	85.6	2441.4
8-15	100	1.95
8-15	185	2.24
8-16	238	820.76
8-17	185	2.55
8-17	759.2	.54
8-18	185	5.82
8-19	40	408.8
8-20	110	3.58
8-22	110	2.69
8-22	238	45.69
8-22	607.4	.46

<u>DATE</u>	<u>CU. FT.</u>	<u>CURIES</u>
8-23	100	2.62
8-24	105	2.41
8-24	238	2.27
8-25	110	2.82
8-26	60	280.5
8-26	316.7	2.24
8-29	110	2.45
8-29	110	1.16
8-31	110	3.27
8-31	376.6	3.33
8-31	60	510
9-1	110	2.30
9-1	7.5	100
9-2	110	2.3
9-2	238	71.65
9-3	185	6.76
9-5	110	.93
9-5	238	34.5
9-6	7.5	500
9-6	185	11.99
9-6	479.36	.44
9-7	110	.79
9-8	238	42.09
9-9	75	43.07
9-9	77.04	.07
9-9	185	1.89
9-10	185	1.71
9-11	110	1.34
9-11	185	1.21

<u>DATE</u>	<u>CU. FT.</u>	<u>CURIES</u>
9-13	185	1.18
9-13	1018.64	1.52
9-13	77.04	14.96
9-15	110	3.30
9-15	50	425
9-18	185	3.37
9-18	185	3.20
9-20	881.28	.53
9-23	238	2.68
9-25	238	12.42
9-26	573.52	1.01
9-28	238	6.09
9-28	238	500
9-30	419.44	1.03
10-1	238	4.06
10-3	185	4.73
10-4	7.4	2.0
10-5	185	11.53
10-5	308	.19
10-6	914.72	1.00
10-6	238	2.86
10-7	185	.95
10-9	238	8.65
10-9	185	1.4
10-10	185	1.5
10-11	185	2.32
10-12	7.5	8.5
10-14	684.8	2.50
10-14	110	5.66
10-17	110	1.98

<u>DATE</u>	<u>CU. FT.</u>	<u>CURIES</u>
10-18	110	1.71
10-19	110	2.32
10-19	110	2.82
10-21	110	3.68
10-24	659.12	1.33
10-28	607.36	1.21
10-31	238	12.24
11-2	256	.12
11-7	110	1.56
11-8	130	2.43
11-8	445.12	.37
11-9	205	4.51
11-12	238	4.73
11-15	238	9.98
11-16	667.68	.94
11-18	7.5	1.00
11-19	238	2.33
11-25	205	1.3
11-28	975.84	.78
11-30	238	10.41
12-1	320	.08
12-2	238	2.38
12-4	238	.80
12-5	7.5	.85
12-6	238	4.08
12-10	185	18.44
12-13	804.64	.28
12-15	185	.163
12-20	205	2.29

<u>DATE</u>	<u>CU. FT.</u>	<u>CURIES</u>
12-30	205	
12-31		3.18
	452.62	
12-22		2.44
	205	
12-22		2.99
	75	
12-27		24.45
	102.72	
12-27		15.84
	205	
12-29		3.26
	428	
12-30		.69
	205	
		3.87

*Disposition: All shipments to Chem-Nuclear Systems
Waste Disposal Facility at Barnwell, South Carolina

1. LIQUID RELEASES		UNITS	JULY	AUGUST	SEPTEMBER	SUB-TOTAL
1. GROSS RADIOACTIVITY						
A. TOTAL RELEASE	CURIES	1.48E+00	2.07E+00	5.36E-01	4.18E+00	
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	3.50E-08	3.98E-08	5.73E-09	2.39E-08	
C. MAXIMUM CONCENTRATION RELEASED	UCI/ML	3.50E-08	3.98E-08	3.83E-08	2.39E-08	
2. TRITIUM						
A. TOTAL RELEASE	CURIES	2.31E+02	1.30E+02	9.51E+01	4.56E+02	
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	5.45E-05	3.66E-06	3.54E-07	2.60E-06	
3. DISSOLVED NOBLE GASES						
A. TOTAL RELEASE	CURIES	4.34E+00	5.27E-01	2.07E+00	5.94E+00	
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	1.02E-07	2.29E-08	1.89E-03	3.96E-08	
4. GROSS ALPHA RADIOACTIVITY						
A. TOTAL RELEASE	CURIES	0.	0.	0.	0.	
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	0.	0.	0.	0.	
5. VOLUME OF LIQUID WASTE TO DISCHARGE CANAL						
	LITERS	5.57E+08	1.02E+08	6.15E+07	7.20E+08	
6. VOLUME OF DILUTION WATER						
	LITERS	4.24E+10	2.30E+10	1.10E+11	1.75E+11	
7. ISOTOPES RELEASED						
9A-LA-140		6.83E-03	4.90E-03	1.13E-03	1.29E-02	
SR-89		2.45E-01	1.22E-02	9.83E-03	2.67E-01	
I-131		4.59E-02	2.15E-02	2.97E-02	9.71E-02	
I-133		5.38E-03	1.81E-03	7.16E-04	7.91E-03	
XE-133		4.05E+00	4.74E-01	2.00E+00	5.52E+00	
XE-135		2.14E-01	2.96E-02	1.42E-02	2.58E-01	
CS-137		8.36E-02	1.78E-01	1.14E-01	3.81E-01	
CS-134		5.01E-02	1.01E-01	5.90E-02	2.10E-01	
CO-60		2.87E-02	1.29E+00	7.67E-02	1.40E+00	
CO-58		6.36E-01	2.70E-01	2.12E-01	1.12E+00	
CR-51		1.11E-01	4.45E-02	2.44E-02	1.80E-01	
MN-54		2.92E-02	1.27E-02	1.05E-02	5.25E-02	
KR-87		1.28E-05	1.25E-05	0.	2.53E-05	
ZR-97		2.01E-03	4.07E-03	1.53E-03	7.61E-03	
NB-97		5.70E-02	5.59E-02	3.31E-02	1.61E-01	
XE-133A		4.92E-02	4.02E-03	9.81E-03	6.30E-02	
I-132		1.32E-04	2.01E-05	0.	1.52E-04	
CS-136		1.34E-03	1.63E-03	1.35E-03	4.81E-03	
KR-85A		8.42E-04	0.	1.27E-04	9.68E-04	
KR-88		2.03E-03	5.36E-05	1.37E-04	2.23E-03	
ZN-65		0.	2.26E-05	0.	2.26E-05	
SR-90		1.56E-02	1.63E-03	1.23E-03	1.84E-02	
SR-92		0.	0.	0.	0.	
CE-144		8.16E-04	5.78E-05	2.01E-03	2.38E-03	
MN-56		0.	0.	0.	0.	
MO-99		6.79E-04	1.64E-04	2.66E-03	3.50E-03	
SB-122		0.	0.	0.	0.	
AG-110A		4.83E-02	3.97E-02	2.69E-02	1.15E-01	
SA-139		0.	0.	0.	0.	
NB-95		2.18E-03	5.78E-03	6.92E-03	1.59E-02	
FE-59		7.35E-03	1.56E-03	9.48E-04	9.35E-03	
SB-124		0.	0.	0.	0.	
I-135		3.19E-04	0.	0.	3.19E-04	
I-167		0.	0.	0.	0.	
CS-135A		0.	0.	0.	0.	
XE-131A		2.33E-02	7.18E-04	3.90E-03	3.29E-02	
ZR-95		4.44E-03	2.83E-03	2.55E-03	9.82E-03	
NP-239		0.	0.	0.	0.	
CO-57		1.36E-03	9.53E-04	7.64E-04	3.08E-03	
TC-99M		5.70E-04	1.37E-04	4.43E-04	1.30E-03	
NA-24		2.98E-02	5.36E-05	9.58E-06	2.98E-02	
CO-115A		0.	0.	0.	0.	
Y-92		0.	0.	0.	0.	
IN-115A		0.	0.	0.	0.	
CO-115		0.	0.	0.	0.	
CE-134		0.	0.	0.	0.	
AR-41		1.30E-04	0.	2.71E-04	4.01E-04	
I-134		0.	0.	0.	0.	
RB-83		1.56E-02	3.70E-04	3.40E-03	1.99E-02	
SN-125A		0.	0.	0.	0.	
CS-138		7.34E-05	1.59E-04	2.51E-04	4.33E-04	
KR-85		3.79E-04	1.93E-02	5.13E-02	7.10E-02	
RU-103		0.	0.	0.	0.	
SB-125		8.15E-03	3.41E-04	0.	8.49E-03	
SN-125		1.07E-02	4.55E-04	3.79E-03	2.00E-02	
XE-138		0.	0.	0.	0.	
SN-123A		3.73E-05	0.	0.	3.73E-05	
F-18		2.39E-02	0.	0.	2.39E-02	
AG-108A		1.07E-04	5.69E-05	3.52E-04	5.15E-04	
XE-135A		3.63E-04	0.	0.	3.63E-04	

8. PERCENT OF TECHNICAL SPECIFICATIONS
LIMIT (15 CI) FOR TOTAL ACTIVITY RE-

RADIOACTIVE EFFLUENT RELEASES

YEAR 1977

1. LIQUID RELEASES	UNITS	OCTOBER	NOVEMBER	DECEMBER	SUB-TOTAL
1. GROSS RADIOACTIVITY					
A. TOTAL RELEASE	CURIES	3.14E-01	5.50E-01	7.03E-01	1.57E+0
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	2.73E-09	1.02E-08	7.83E-09	5.05E-0
C. MAXIMUM CONCENTRATION RELEASED	UCI/ML	1.21E-08	5.09E-08	7.79E-08	3.43E-0
2. TRITIUM					
A. TOTAL RELEASE	CURIES	7.41E+01	4.33E+01	5.73E+01	1.35E+0
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	6.44E-07	3.00E-07	7.50E-07	7.13E-0
3. DISSOLVED NOBLE GASES					
A. TOTAL RELEASE	CURIES	9.09E-01	4.56E-01	7.56E-01	2.12E+0
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	7.90E-09	3.42E-09	3.42E-09	3.19E-0
4. GROSS ALPHA RADIOACTIVITY					
A. TOTAL RELEASE	CURIES	0.	0.	0.	0.
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	0.	0.	0.	0.
5. VOLUME OF LIQUID WASTE TO DISCHARGE CANAL	LITERS	9.57E+07	4.00E+07	3.34E+07	1.59E+
6. VOLUME OF DILUTION WATER	LITERS	1.15E+11	5.42E+10	3.97E+10	2.59E+
7. ISOTOPES RELEASED	CURIES				
3A-LA-140		4.73E-04	4.93E-04	1.24E-03	2.21E-
SR-90		1.44E-02	1.92E-02	1.57E-02	4.93E-
I-131		2.58E-02	4.50E-02	3.93E-02	1.11E-
I-133		3.38E-04	3.96E-03	3.53E-03	3.39E-
XE-133		3.34E-01	4.32E-01	7.33E-01	2.05E+
XE-135		1.56E-02	1.72E-02	1.39E-02	4.68E-
CS-137		5.75E-02	3.93E-02	2.74E-01	4.14E-
CS-134		3.07E-02	5.17E-02	1.55E-01	2.37E-
CC-60		4.15E-02	4.22E-02	2.32E-02	1.07E-
CC-58		9.57E-02	3.31E-02	3.60E-02	2.55E-
CR-51		7.58E-03	1.02E-02	9.72E-03	2.75E-
4N-54		7.34E-03	5.96E-03	3.15E-03	2.15E-
KR-67		0.	0.	0.	0.
ZR-97		1.58E-04	3.18E-05	1.33E-04	3.73E-
YB-97		1.20E-02	3.46E-03	2.62E-03	1.31E-
XE-133A		9.32E-03	3.86E-03	7.88E-03	2.11E-
I-132		6.42E-06	4.36E-06	0.	1.13E-
CS-135		1.99E-04	3.68E-04	7.24E-04	1.29E-
KR-85M		1.97E-04	1.34E-03	0.	2.03E-
KR-85		0.	5.55E-04	0.	5.55E-
ZN-65		0.	0.	0.	0.
SR-90		2.59E-03	2.08E-03	1.77E-03	6.44E-
SR-92		0.	0.	0.	0.
CE-144		1.44E-03	1.04E-05	1.34E-03	2.53E-
4N-56		0.	0.	0.	0.
40-99		1.14E-03	1.08E-04	1.40E-03	3.15E-
SB-122		0.	0.	0.	0.
AG-110A		8.23E-03	7.00E-03	7.72E-03	2.29E-
3A-139		0.	0.	0.	0.
NB-95		3.20E-03	1.96E-03	2.33E-03	7.49E-
FE-59		5.59E-04	6.38E-04	1.15E-03	2.43E-
SB-124		0.	0.	0.	0.
I-135		6.24E-06	2.25E-04	3.04E-03	3.27E-
4-137		0.	3.13E-04	0.	3.13E-
CS-135A		0.	0.	0.	0.
XE-131A		0.	5.29E-04	0.	5.29E-
ZR-95		6.29E-04	4.47E-05	1.79E-04	6.73E-
NP-239		0.	0.	0.	0.
CD-57		3.45E-04	2.23E-04	5.24E-03	5.91E-
TC-99M		2.71E-05	2.33E-04	1.29E-03	1.54E-
NA-24		1.50E-04	3.55E-05	0.	1.50E-
CD-115M		0.	0.	0.	0.
Y-92		0.	0.	0.	0.
IN-115A		0.	0.	4.32E-05	4.32E-
CD-115		0.	9.98E-05	5.31E-04	5.31E-
CE-134		0.	0.	0.	0.
AR-41		3.91E-04	1.57E-04	2.94E-04	7.43E-
I-134		0.	0.	0.	0.
RB-86		1.42E-03	4.35E-03	2.12E-02	2.75E-
SN-125A		0.	0.	0.	0.
CS-138		0.	3.62E-04	0.	3.62E-
KR-85		0.	0.	0.	0.
PU-103		0.	0.	0.	0.
SB-125		1.76E-03	3.94E-02	4.32E-03	4.32E-
SN-125		3.49E-03	1.37E-01	2.47E-02	2.47E-
XE-135		0.	0.	0.	0.
SN-123A		0.	0.	0.	0.
P-18		0.	1.74E-05	0.	1.74E-
AG-108M		1.67E-04	0.	0.	1.67E-
XE-135A		2.18E-04	0.	0.	2.18E-

	UNITS	1st QUARTER	2nd QUARTER	3rd QUARTER	4th QUARTER	TOTAL
1. GROSS RADIOACTIVITY						
A. TOTAL RELEASE	CURIES	4.06E+00	3.57E+00	4.13E+00	1.57E+00	1.35E+01
B. AVERAGE CONCENTRATION RELEASED	UCI/4L	1.52E-08	1.24E-08	2.39E-08	5.05E-09	1.35E-07
C. MAXIMUM CONCENTRATION RELEASED	UCI/4L	3.35E-08	1.30E-08	2.39E-08	3.43E-08	2.35E-07
2. TRITIUM						
A. TOTAL RELEASE	CURIES	7.23E+02	5.54E+02	4.54E+02	1.35E+02	1.92E+03
B. AVERAGE CONCENTRATION RELEASED	UCI/4L	2.39E-06	1.38E-06	2.60E-06	7.13E-07	1.95E-05
3. DISSOLVED NOBLE GASES						
A. TOTAL RELEASE	CURIES	2.01E+00	1.17E+01	5.94E+00	2.12E+00	2.24E+01
B. AVERAGE CONCENTRATION RELEASED	UCI/4L	3.02E-09	3.95E-08	3.94E-08	3.19E-09	2.32E-07
4. GROSS ALPHA RADIOACTIVITY						
A. TOTAL RELEASE	CURIES	0.	0.	0.	0.	0.
B. AVERAGE CONCENTRATION RELEASED	UCI/4L	0.	0.	0.	0.	0.
5. VOLUME OF LIQUID WASTE TO DISCHARGE CANAL	LITERS	4.49E+08	7.56E+08	7.20E+08	1.59E+08	2.09E+09
6. VOLUME OF DILUTION WATER	LITERS	2.50E+11	2.96E+11	1.75E+11	2.59E+11	9.80E+11
7. ISOTOPES RELEASED	CURIES					
SA-LA-140		1.51E-03	9.54E-03	1.29E-02	2.21E-03	2.53E-02
SR-99		2.73E-01	3.34E-01	2.57E-01	4.93E-02	9.73E-01
I-131		2.92E+00	5.70E-01	9.71E-02	1.11E-01	3.93E+00
I-133		1.36E-02	5.39E-02	7.91E-03	3.39E-03	9.34E-02
XE-133		1.74E+00	1.13E+01	5.52E+00	2.05E+00	2.15E+01
XE-135		2.05E-01	1.67E-01	2.55E-01	4.58E-02	6.77E-01
CS-137		4.58E-01	9.97E-01	3.31E-01	4.14E-01	2.25E+00
CS-134		2.37E-01	6.52E-01	2.10E-01	2.37E-01	1.39E+00
CO-60		1.31E-02	6.77E-02	1.40E+00	1.07E-01	1.51E+00
CO-54		7.00E-02	3.98E-01	1.12E+00	2.55E-01	1.85E+00
CR-51		3.92E-03	3.11E-02	1.80E-01	2.75E-02	2.43E-01
MN-54		4.23E-03	1.93E-02	5.25E-02	2.15E-02	9.75E-02
KR-87		1.57E-05	0.	2.53E-05	0.	4.10E-05
ZR-97		0.	3.00E-05	7.51E-03	3.73E-04	3.01E-02
NB-97		1.31E-03	6.01E-03	1.51E-01	1.31E-02	1.36E-01
XE-133A		0.	1.03E-01	5.30E-02	2.11E-02	1.87E-01
I-132		0.	7.28E-04	1.52E-04	1.13E-05	3.91E-04
CS-136		3.14E-03	1.53E-02	4.31E-03	1.29E-03	2.55E-02
KR-85M		2.21E-03	2.18E-03	9.68E-04	2.03E-03	7.39E-03
KR-88		1.01E-03	1.02E-03	2.23E-03	5.55E-04	4.91E-03
ZN-65		0.	0.	2.26E-05	0.	2.26E-05
SR-90		7.43E-03	1.99E-02	1.34E-02	5.44E-03	5.22E-02
SR-92		0.	0.	0.	0.	0.
CE-144		0.	2.49E-02	2.38E-03	2.33E-03	3.06E-02
MN-56		0.	4.10E-06	0.	0.	4.10E-06
AO-99		7.70E-06	2.03E-02	3.50E-03	3.15E-03	2.70E-02
SB-122		0.	0.	0.	0.	0.
AG-110M		1.51E-03	1.25E-02	1.15E-01	2.29E-02	1.52E-01
SA-139		0.	0.	0.	0.	0.
NB-95		1.49E-05	1.04E-04	1.59E-02	7.49E-03	2.35E-02
FE-59		3.39E-04	2.17E-02	9.85E-03	2.40E-03	3.43E-02
SB-124		0.	0.	0.	0.	0.
I-135		0.	1.46E-03	3.19E-04	3.27E-03	1.00E-02
N-167		0.	0.	0.	3.13E-04	3.13E-04
CS-135A		0.	0.	0.	0.	0.
XE-131A		5.22E-02	4.12E-02	3.29E-02	5.29E-04	1.37E-01
ZR-95		1.35E-04	7.90E-04	9.32E-03	8.73E-04	1.17E-02
NP-239		0.	0.	0.	0.	0.
CO-57		4.33E-04	9.00E-04	3.08E-03	5.31E-03	1.03E-02
TC-99M		3.15E-04	9.43E-03	1.30E-03	1.54E-03	1.26E-02
HA-24		5.75E-04	1.10E-03	2.98E-02	1.36E-04	3.17E-02
CO-115A		0.	2.35E-04	0.	0.	2.35E-04
Y-92		0.	0.	0.	0.	0.
LN-115A		0.	2.40E-05	0.	4.33E-05	7.43E-05
CO-115		2.12E-03	3.51E-04	0.	5.31E-04	3.55E-03
CE-134		7.50E-04	0.	0.	0.	7.50E-04
AR-41		1.63E-05	2.14E-03	4.50E-04	3.43E-04	3.45E-03
I-134		0.	5.46E-06	0.	0.	5.46E-06
RB-88		5.14E-03	5.16E-02	1.99E-02	2.75E-02	1.04E-01
SN-125A		0.	4.51E-05	0.	0.	4.51E-05
CS-136		1.56E-04	0.	4.33E-04	5.42E-04	1.50E-03
KR-85		0.	2.53E-02	7.10E-02	0.	9.53E-02
RU-103		0.	5.46E-06	0.	0.	5.46E-06
SB-125		0.	1.29E-02	3.49E-03	4.58E-02	5.32E-02
SN-125		0.	2.22E-02	2.70E-02	1.56E-01	2.03E-01
XE-135		0.	0.	0.	0.	0.
SN-123A		0.	0.	3.73E-05	0.	3.73E-05
FE-10		0.	0.	2.39E-02	1.74E-05	2.39E-02
AO-108A		0.	0.	5.15E-04	1.47E-04	5.32E-04
XE-135A		0.	0.	3.53E-04	2.13E-04	5.51E-04

8. PERCENT OF TECHNICAL SPECIFICATIONS
LIMIT (15.0) FOR TOTAL ACTIVITY RE-

RADIOACTIVE EFFLUENT RELEASES

YEAR 1977

1. LIQUID RELEASES

1. GROSS RADIOACTIVITY

- A. TOTAL RELEASE
- B. AVERAGE CONCENTRATION RELEASED
- C. MAXIMUM CONCENTRATION RELEASED

UNITS	3rd QUARTER	4th QUARTER
CURIES	4.18E+00	1.57E+00
UCI/ML	2.39E-08	6.75E-09
UCI/ML	3.39E-08	3.43E-08

SUB-TOTAL

5.75E-
1.32E-
2.40E-

2. TRITIUM

- A. TOTAL RELEASE
- B. AVERAGE CONCENTRATION RELEASED

CURIES	4.56E+02	1.35E+02
UCI/ML	2.60E-06	7.13E-07

6.41E+
1.48E-

3. DISSOLVED NOBLE GASES

- A. TOTAL RELEASE
- B. AVERAGE CONCENTRATION RELEASED

CURIES	5.94E+00	2.12E+00
UCI/ML	3.96E-08	8.19E-09

9.06E+
2.09E-

4. GROSS ALPHA RADIOACTIVITY

- A. TOTAL RELEASE
- B. AVERAGE CONCENTRATION RELEASED

CURIES	0.	0.
UCI/ML	0.	0.

0.
0.

5. VOLUME OF LIQUID WASTE DISCHARGE CANAL

LITERS	7.20E+08	1.59E+08
--------	----------	----------

8.39E+

6. VOLUME OF DILUTION WATER

LITERS	1.75E+11	2.59E+11
--------	----------	----------

4.34E+

7. ISOTOPES RELEASED

CURIES

IA-140	1.29E-02	2.21E-03
SR-90	2.47E-01	4.93E-02
I-131	9.71E-02	1.11E-01
I-133	7.91E-03	3.39E-03
KE-133	5.52E+00	2.05E+00
KE-135	2.58E-01	4.68E-02
CS-137	3.31E-01	4.14E-01
CS-134	2.10E-01	2.37E-01
CO-60	1.40E+00	1.77E-01
CO-58	1.12E+00	2.45E-01
CR-51	1.80E-01	2.75E-02
AN-24	5.25E-02	2.15E-02
KR-87	2.33E-05	0.
ZR-97	7.51E-03	3.73E-04
RB-97	1.51E-01	1.31E-02
KE-1334	5.30E-02	2.11E-02
I-132	1.52E-04	1.13E-05
CS-136	4.31E-03	1.29E-03
KR-854	9.48E-04	2.03E-03
KR-86	2.23E-03	5.55E-04
NI-63	2.24E-05	0.
SR-90	1.34E-02	5.44E-03
SR-92	0.	0.
CE-144	2.38E-03	2.33E-03
AN-26	0.	0.
AG-99	3.50E-03	3.15E-03
SB-122	0.	0.
AG-1104	1.15E-01	2.29E-02
BA-139	0.	0.
IB-95	1.59E-02	7.49E-03
FE-59	9.35E-03	2.40E-03
SB-124	0.	0.
I-135	3.19E-04	5.27E-03
I-137	0.	3.13E-04
CS-1354	0.	0.
KE-1311	3.29E-02	5.29E-04
CR-95	9.32E-03	3.73E-04
NP-239	0.	0.
CO-57	3.08E-03	5.31E-03
TC-994	1.30E-03	1.54E-03
IA-24	2.94E-02	1.36E-04
CO-1154	0.	0.
I-92	0.	0.
IN-1154	0.	4.33E-05
CO-115	0.	5.31E-04
CE-134	0.	0.
AR-41	4.50E-04	3.43E-04
I-134	0.	0.
RB-98	1.99E-02	2.75E-02
SN-1254	0.	0.
CS-136	4.33E-04	5.52E-04
KR-85	7.10E-02	0.
RU-103	0.	0.
SB-125	3.49E-03	4.68E-02
SN-125	2.70E-02	1.56E-01
KE-135	0.	0.
SN-1234	3.73E-05	0.
P-13	2.39E-02	1.74E-05
AG-1034	5.15E-04	1.57E-04
KE-1354	3.53E-04	2.15E-04

1.51E-
3.15E-
2.08E-
1.63E-
3.57E-
3.05E-
7.95E-
4.47E-
1.51E-
1.39E-
2.07E-
7.40E-
2.53E-
7.99E-
1.79E-
3.41E-
1.63E-
5.10E-
3.00E-
2.89E-
2.24E-
2.48E-
5.71E-
0.
5.65E-
0.
1.38E-
0.
2.34E-
1.23E-
0.
3.59E-
3.13E-
0.
3.34E-
1.07E-
0.
3.59E-
2.34E-
3.70E-
0.
4.33E-
5.31E-
0.
1.29E-
0.
4.74E-
0.
1.34E-
0.
0.
0.
1.71E-
2.29E-
5.52E-
5.31E-

RADIOACTIVE EFFLUENT RELEASES

YEAR 1977

AIRBORNE RELEASES		UNITS	JULY	AUGUST	SEPTEMBER	SUB-TOTAL
TOTAL NOBLE GASES	CURIES		1.04E+03	1.35E+03	2.60E+03	4.99E+03
TOTAL HALOGENS	CURIES		9.87E-02	5.62E-04	7.41E-02	1.73E-01
TOTAL PARTICULATE GROSS BETA-GAMMA	CURIES		1.86E-01	1.32E-05	7.52E-03	1.94E-01
TOTAL TRITIUM	CURIES		3.59E-01	2.17E+00	2.03E+00	5.06E+00
TOTAL PARTICULATE GROSS ALPHA ACTIVITY	CURIES		0.	0.	0.	0.
MAXIMUM NOBLE GAS RELEASE RATE	UCI/SEC		1.60E+03	1.60E+03	1.60E+03	1.60E+03
PERCENT OF APPLICABLE LIMIT FOR:						
A. NOBLE GASES	%		2.03E+00	2.66E+00	5.09E+00	7.78E+00
B. HALOGENS	%		2.60E+01	1.74E-01	1.95E+01	4.56E+01
C. PARTICULATES	%		1.69E+01	1.20E-03	5.93E-01	1.76E+01
ISOTOPES RELEASED		CURIES				
PARTICULATES						
CS-137			1.26E-03	1.78E-06	2.45E-04	1.51E-03
BA-LA-140			0.	0.	1.82E-06	1.82E-06
SR-90			1.60E-10	1.70E-10	1.48E-10	4.78E-10
CS-134			4.42E-05	9.55E-07	7.57E-05	1.21E-04
SR-89			7.97E-10	3.45E-10	7.36E-10	2.38E-09
CO-58			4.03E-03	2.90E-06	1.58E-03	5.61E-03
CS-136			0.	3.87E-09	2.14E-04	2.14E-04
CS-138			1.01E-02	1.27E-07	9.98E-04	1.11E-02
WN-54			3.18E-05	1.74E-09	5.08E-06	3.69E-05
VO-99			3.99E-04	3.69E-09	1.31E-05	4.12E-04
NB-95			0.	0.	0.	0.
CO-60			7.28E-04	9.32E-07	6.72E-04	1.40E-03
NA-24			1.98E-07	2.20E-08	0.	2.20E-07
AG-110M			3.50E-06	7.94E-09	1.09E-05	1.44E-05
CR-51			0.	1.33E-08	0.	1.33E-08
EA-123A			0.	0.	0.	0.
TC-99M			0.	6.19E-09	3.96E-05	3.96E-05
AG-103M			0.	1.34E-08	1.03E-08	2.37E-08
EB-58			1.69E-01	6.42E-06	2.12E-03	1.72E-01
NP-239			0.	0.	0.	0.
CO-115			0.	0.	0.	0.
CE-144			0.	0.	0.	0.
SR-91			0.	0.	0.	0.
Y-91M			0.	0.	0.	0.
RU-103			0.	0.	0.	0.
WH-56			4.78E-07	0.	5.36E-07	1.01E-06
BA-113			0.	0.	0.	0.
BA-125A			0.	0.	0.	0.
SA-92			0.	0.	0.	0.
CO-57			6.09E-07	0.	0.	6.09E-07
FE-59			1.37E-07	0.	0.	1.37E-07
CR-95			0.	2.06E-08	1.54E-03	1.54E-03
VB-97			0.	7.63E-09	0.	7.63E-09
CR-97			0.	0.	0.	0.
A-167			0.	0.	0.	0.
HALOGENS						
I-131			3.03E-02	4.52E-04	5.85E-02	1.39E-01
I-133			2.89E-03	2.26E-05	1.45E-02	1.74E-02
I-135			2.50E-06	2.54E-07	3.27E-04	3.30E-04
I-132			1.50E-06	1.87E-04	7.61E-05	2.65E-04
I-134			2.06E-06	0.	9.95E-06	1.20E-05
Br-13			1.55E-02	0.	3.90E-06	1.55E-02
GASES						
KR-85			1.54E+00	1.07E+01	9.83E-01	1.33E+01
XE-133			1.01E+03	1.31E+03	2.43E+03	4.75E+03
KR-86			3.86E-01	9.02E-04	2.29E+00	2.67E+00
KR-97			3.36E-01	0.	6.95E-01	1.03E+00
KR-95M			2.58E-01	4.29E-01	3.70E+00	4.39E+00
XE-136			4.33E-02	0.	1.23E-01	1.67E-01
XE-135M			4.18E-01	0.	1.06E+00	1.48E+00
XE-135			2.30E+01	2.11E+01	1.05E+02	1.50E+02
AR-41			2.29E+00	2.90E+00	1.37E+00	5.56E+00
XE-133M			5.38E-01	1.35E+01	4.25E+01	5.67E+01
XE-131M			4.43E-01	1.57E-01	1.05E+00	3.65E+00

AIRBORNE RELEASES

RADIOACTIVE EFFLUENT RELEASES

YEAR 1977

	UNITS	OCTOBER	NOVEMBER	DECEMBER	SUB-TOTAL
TOTAL NOBLE GASES	CURIES	1.44E+03	1.08E+03	3.63E+03	6.39E+03
TOTAL HALOGENS	CURIES	1.90E-03	2.15E-03	3.99E-03	6.04E-03
TOTAL PARTICULATE GROSS BETA-GAMMA	CURIES	3.10E-03	1.41E-03	1.21E-03	5.72E-03
TOTAL TRITIUM	CURIES	4.16E+00	1.01E+00	9.52E-01	6.13E+00
TOTAL PARTICULATE GROSS ALPHA ACTIVITY	CURIES	0.	0.	0.	0.
MAXIMUM NOBLE GAS RELEASE RATE	UCI/SEC	1.60E+03	1.60E+03	1.60E+03	1.60E+03

PERCENT OF APPLICABLE
LIMIT FOR:

A. NOBLE GASES	%	3.21E+00	2.11E+00	7.21E+00	1.25E+01
B. HALOGENS	%	5.00E-01	5.66E-01	1.05E+00	2.12E+00
C. PARTICULATES	%	2.32E-01	1.23E-01	1.10E-01	5.20E-01

ISOTOPES RELEASED

CURIES

PARTICULATES

CS-137	2.53E-06	1.02E-06	2.13E-06	5.68E-06
SA-LA-140	1.32E-08	9.59E-07	0.	9.72E-07
SR-90	2.33E-10	4.07E-11	1.48E-11	2.88E-10
CS-134	1.49E-06	6.82E-07	5.32E-06	7.99E-06
SR-90	3.36E-09	5.88E-10	2.14E-10	4.16E-09
CO-60	1.55E-04	2.74E-04	9.51E-08	4.29E-04
CS-136	1.78E-08	2.07E-08	1.72E-07	2.11E-07
CS-138	2.86E-03	9.93E-04	1.51E-04	4.00E-03
AN-24	2.48E-08	5.79E-08	1.21E-07	2.74E-07
MO-99	2.33E-09	3.48E-07	0.	3.50E-07
NE-25	0.	0.	0.	0.
CO-60	9.06E-06	2.24E-07	3.42E-08	3.37E-06
NA-24	2.09E-05	3.24E-09	6.63E-08	2.10E-05
AG-110M	3.37E-08	1.14E-06	1.16E-06	2.34E-06
CR-51	0.	0.	0.	0.
SN-123M	0.	0.	0.	0.
TC-99M	2.07E-07	1.52E-06	5.22E-09	1.74E-06
AG-108A	2.10E-09	6.25E-09	0.	3.35E-09
RS-35	5.49E-05	1.28E-04	9.98E-04	1.19E-03
NP-239	0.	0.	0.	0.
CO-115	1.36E-06	5.08E-06	5.09E-05	5.73E-05
CE-144	2.60E-08	1.53E-08	5.42E-09	4.68E-08
SR-90	0.	0.	1.51E-06	1.51E-06
Y-91A	0.	0.	0.	0.
RU-103	2.33E-09	0.	0.	2.33E-09
AN-25	3.51E-08	5.62E-08	4.12E-07	5.03E-07
SA-139	0.	0.	0.	0.
SN-125A	0.	0.	0.	0.
SR-90	0.	0.	0.	0.
CE-137	0.	0.	0.	0.
CE-139	0.	5.71E-08	0.	5.71E-08
CR-99	0.	1.18E-09	0.	1.18E-09
AB-97	1.67E-09	5.16E-09	0.	5.83E-09
AB-97	1.30E-09	0.	0.	1.30E-09
CR-97	3.47E-07	1.84E-07	0.	5.30E-07
AB-107	0.	0.	5.18E-09	5.18E-09

HALOGENS

I-131	1.05E-03	6.88E-04	1.33E-03	3.06E-03
I-133	2.63E-04	3.17E-04	7.92E-04	1.87E-03
I-135	1.00E-04	9.23E-05	1.03E-04	2.96E-04
I-132	1.04E-05	1.76E-05	5.25E-05	3.06E-05
I-134	2.33E-06	4.16E-06	5.24E-06	1.27E-05
Br-81	4.74E-04	5.34E-04	1.70E-03	2.71E-03

GASES

CR-99	2.08E+01	5.36E-01	3.50E-01	2.23E+01
AE-133	1.45E+03	9.49E+02	3.13E+03	5.59E+03
CR-99	6.95E+00	5.56E+00	7.32E+01	3.58E+01
CR-99	5.19E+00	5.73E+00	5.41E+01	7.53E+01
CE-139	5.31E+00	5.27E+00	1.11E+01	2.17E+01
CE-139A	5.90E+00	5.90E+00	4.55E+00	1.94E+01
CE-135	5.39E+00	5.62E+00	1.23E+01	2.43E+01
AN-24	3.55E+01	3.25E+01	1.93E+02	3.51E+02
AE-133A	4.17E+00	7.94E-01	5.12E+00	1.01E+01
AE-131A	1.27E+01	3.45E+00	3.25E+01	5.37E+01
AE-137	2.80E+01	7.41E+00	9.55E+01	1.29E+02

RADIOACTIVE EFFLUENT RELEASES

YEAR 19

II. AIRBORNE RELEASES

	UNITS	3rd QUARTER	4th QUARTER	SUB-TOTAL
1. TOTAL NOBLE GASES	CURIES	4.99E+03	6.39E+03	1.14E
2. TOTAL HALOGENS	CURIES	1.73E-01	3.74E-03	1.31E
3. TOTAL PARTICULATE GROSS BETA-GAMMA	CURIES	1.94E-01	5.72E-03	2.00E
4. TOTAL TRITIUM	CURIES	5.06E+00	6.13E+00	1.12E
5. TOTAL PARTICULATE GROSS ALPHA ACTIVITY	CURIES	0.	0.	0.
6. MAXIMUM NOBLE GAS RELEASE RATE	UCI/SEC	1.60E+03	1.60E+03	1.60E
7. PERCENT OF APPLICABLE LIMIT FOR:				
a. NOBLE GASES	%	9.73E+00	1.25E+01	2.23E
b. HALOGENS	%	4.56E+01	2.12E+00	4.77E
c. PARTICULATES	%	1.76E+01	5.20E-01	1.31E
8. ISOTOPES RELEASED	CURIES			
PARTICULATES				
CS-137		1.51E-03	5.58E-06	1.52E
SA-140		1.32E-06	9.72E-07	2.79E
SR-90		4.79E-10	2.38E-10	7.56E
CS-134		1.21E-04	7.99E-06	1.29E
SR-89		2.38E-09	4.15E-09	5.54E
CS-58		5.61E-03	4.29E-04	6.04E
CS-136		2.14E-04	2.11E-07	2.14E
CS-135		1.11E-02	4.00E-03	1.51E
AN-24		3.59E-05	2.74E-07	3.71E
AD-99		4.12E-04	3.50E-07	4.12E
ID-95		0.	0.	0.
CS-50		1.40E-03	6.37E-06	1.41E
IA-24		2.20E-07	2.10E-05	2.12E
AD-110M		1.44E-05	2.34E-06	1.67E
CR-51		1.33E-08	0.	1.33E
SI-123M		0.	0.	0.
IC-144		3.96E-05	1.74E-06	4.13E
AD-105M		2.37E-08	6.35E-09	3.20E
RI-106		1.72E-01	1.18E-03	1.73E
AP-239		0.	0.	0.
CU-115		0.	5.73E-05	5.73E
CE-144		0.	4.58E-08	4.58E
SR-91		0.	1.51E-06	1.51E
Z-914		0.	0.	0.
RU-103		0.	2.33E-08	2.33E
AI-26		1.01E-06	5.03E-07	1.51E
SA-139		0.	0.	0.
SI-125M		0.	0.	0.
SR-92		0.	0.	0.
CS-57		6.09E-07	6.71E-05	5.76E
TE-99		1.37E-07	1.16E-09	1.38E
CR-95		1.54E-03	6.33E-09	1.54E
RI-97		7.63E-09	1.30E-09	8.93E
CR-97		0.	5.30E-07	5.30E
AI-137		0.	5.18E-09	5.18E
HALOGENS				
I-131		1.39E-01	3.06E-03	1.42E
I-133		1.74E-02	1.37E-03	1.93E
I-135		3.30E-04	2.96E-04	1.13E
I-132		2.45E-04	3.06E-05	3.46E
I-134		1.20E-05	1.27E-05	2.47E
I-136		1.55E-02	2.71E-03	1.82E
GASES				
AR-36		1.33E+01	2.23E+01	3.56E
AE-133		4.75E+03	5.59E+03	1.03E
KR-80		2.67E+00	3.56E+01	3.63E
XE-135		1.73E+00	7.53E+01	7.63E
KR-84		4.39E+00	2.17E+01	2.61E
AE-133		1.57E-01	1.94E-01	1.96E
AE-135		1.48E+00	2.43E+01	2.58E
AE-136		1.50E+02	3.51E+02	5.11E
AE-134		6.56E+00	1.71E+01	1.67E
AE-133M		5.47E+01	5.37E+01	1.10E
AE-131M		3.55E+00	1.29E+02	1.33E
AE-137		5.57E+00	1.27E+00	1.27E

RADIOACTIVE EFFLUENT RELEASES

YEAR 1977

II. AIRBORNE RELEASES

	UNITS	1st QUARTER	2nd QUARTER	3rd QUARTER	4th QUARTER	TOTAL
1. TOTAL NOBLE GASES	CURIES	1.54E+04	5.31E+03	4.99E+03	5.39E+03	3.56E+04
2. TOTAL HALOGENS	CURIES	4.15E-02	1.47E-01	1.73E-01	5.04E-03	3.70E-01
3. TOTAL PARTICULATE GROSS BETA-GAMMA	CURIES	2.34E-03	5.47E-03	1.94E-01	5.72E-03	2.09E-01
4. TOTAL TRITIUM	CURIES	1.48E+01	3.56E+01	5.06E+00	5.13E+00	5.26E+01
5. TOTAL PARTICULATE GROSS ALPHA ACTIVITY	CURIES	0.	0.	0.	0.	0.
6. MAXIMUM NOBLE GAS RELEASE RATE	UCI/SEC	1.50E+03	1.50E+03	1.50E+03	1.50E+03	1.50E+03
7. PERCENT OF APPLICABLE LIMIT FOR:						
A. NOBLE GASES	%	3.02E+01	1.73E+01	9.73E+00	1.25E+01	5.98E+01
B. HALOGENS	%	1.79E+01	3.36E+01	4.56E+01	2.12E+00	9.72E+01
C. PARTICULATES	%	2.12E-01	5.38E-01	1.75E+01	5.20E-01	1.39E+01
d. ISOTOPES RELEASED	CURIES					
PARTICULATES						
CS-137		9.05E-07	1.95E-03	1.51E-03	5.58E-06	3.47E-03
SA-LA-140		5.02E-07	0.	1.82E-06	9.72E-07	3.39E-06
SR-90		2.15E-07	5.29E-04	4.73E-10	2.38E-10	6.29E-04
CS-134		4.91E-07	1.19E-03	1.21E-04	7.99E-06	1.32E-03
SR-89		6.61E-06	1.48E-03	2.38E-09	4.15E-09	1.49E-03
CO-58		6.72E-07	1.10E-04	5.51E-03	4.29E-04	6.15E-03
CS-136		0.	0.	2.14E-04	2.11E-07	2.14E-04
CS-133		4.15E-04	2.32E-05	1.11E-02	4.00E-03	1.55E-02
NI-64		1.44E-07	2.76E-06	3.69E-05	2.04E-07	4.00E-05
MO-99		0.	0.	4.12E-04	3.50E-07	4.12E-04
NI-65		0.	0.	0.	0.	0.
CU-60		1.21E-06	1.79E-04	1.40E-03	3.37E-06	1.59E-03
NA-24		5.97E-08	0.	2.20E-07	2.10E-05	2.13E-05
AD-110M		0.	2.03E-05	1.44E-05	2.34E-06	3.70E-05
CR-51		0.	1.37E-04	1.33E-08	0.	1.37E-04
SN-123M		0.	0.	0.	0.	0.
MO-99M		2.70E-07	1.35E-04	3.96E-05	1.74E-06	1.77E-04
AG-106M		0.	0.	2.37E-08	3.35E-09	3.20E-08
RE-16		1.39E-03	1.18E-04	1.72E-01	1.13E-03	1.75E-01
NP-239		0.	0.	0.	0.	0.
CO-115		5.22E-07	0.	0.	5.73E-05	5.79E-05
CE-144		0.	4.96E-04	0.	4.68E-08	4.96E-04
SR-91		0.	0.	0.	1.51E-06	1.51E-06
Y-91M		0.	0.	0.	0.	0.
RU-103		0.	0.	0.	2.33E-08	2.33E-08
AN-26		0.	3.10E-11	1.01E-06	5.03E-07	1.51E-06
SA-139		1.15E-05	0.	0.	0.	1.15E-05
SN-126M		1.96E-06	0.	0.	0.	1.96E-06
SR-92		1.12E-06	0.	0.	0.	1.12E-06
CU-67		0.	1.23E-09	5.09E-07	5.71E-03	5.77E-03
FE-59		0.	0.	1.37E-07	1.13E-09	1.38E-07
ZR-95		0.	0.	1.54E-03	5.83E-09	1.54E-03
NB-97		0.	0.	7.63E-09	1.30E-09	3.93E-09
ZR-97		0.	0.	0.	5.30E-07	5.30E-07
N-167		0.	0.	0.	5.18E-09	5.18E-09
HALOGENS						
I-131		4.13E-02	1.43E-01	1.39E-01	3.06E-03	3.25E-01
I-133		1.32E-05	3.34E-03	1.74E-02	1.37E-03	2.25E-02
I-135		0.	0.	3.30E-04	2.96E-04	1.13E-03
I-132		2.03E-04	4.29E-05	2.65E-04	3.06E-05	5.92E-04
I-134		0.	4.55E-10	1.20E-05	1.27E-05	2.47E-05
F-18		0.	3.75E-07	1.55E-02	2.71E-03	1.32E-01
GASES						
KR-85		1.03E+01	7.54E+01	1.33E+01	2.23E+01	1.21E+02
XE-133		1.50E+04	3.53E+03	4.75E+03	5.59E+03	3.40E+04
KR-88		2.43E+01	1.44E+00	2.57E+00	4.53E+01	1.15E+02
KR-87		5.56E+00	7.47E-01	1.03E+00	7.53E+01	3.36E+02
KR-85M		1.15E+01	1.44E+00	4.39E+00	2.17E+01	3.91E+01
XE-133		5.29E-01	7.34E-01	1.57E-01	1.94E+01	2.09E+01
XE-135M		2.34E+00	4.23E-01	1.43E+00	2.43E+01	2.36E+01
XE-135		2.34E+02	1.98E+01	1.50E+02	3.51E+02	7.55E+02
135-AT		5.31E+00	1.27E+00	5.54E+00	1.01E+01	2.42E+01