

ATTACHMENT I

SUMMARY OF SOLID, LIQUID, AND GASEOUS
EFFLUENTS RELEASED

8809140071 880630
PDR ADOCK 05000413
R PNU

IE 48
1/1

I REGULATORY LIMITS

A. NOBLE GASES - AIR DOSE

1. CALENDAR QUARTER - GAMMA DOSE = 5 MRAD
2. CALENDAR QUARTER - BETA DOSE = 10 MRAD
3. CALENDAR YEAR - GAMMA DOSE = 10 MRAD
4. CALENDAR YEAR - BETA DOSE = 20 MRAD

B. LIQUID EFFLUENTS - DOSE

1. CALENDAR QUARTER - TOTAL BODY DOSE = 1.5 MREM
2. CALENDAR QUARTER - ORGAN DOSE = 5 MREM
3. CALENDAR YEAR - TOTAL BODY DOSE = 3 MREM
4. CALENDAR YEAR - ORGAN DOSE = 10 MREM

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

1. CALENDAR QUARTER = 7.5 MREM
2. CALENDAR YEAR = 15 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. 3.09E+02 = TOTAL NUMBER OF BATCH RELEASES
2. 2.98E+04 = TOTAL TIME(MIN.) FOR BATCH RELEASES
3. 1.07E+04 = MAXIMUM TIME(MIN.) FOR A BATCH RELEASE.
4. 9.64E+01 = AVERAGE TIME(MIN.) FOR A BATCH RELEASE.
5. 2.50E+01 = MINIMUM TIME(MIN.) FOR A BATCH RELEASE.
6. 3.14E+04 = AVERAGE DILUTION WATER FLOW DURING RELEASES(GPM).

B. GASEOUS EFFLUENT

1. 1.67E+02 = TOTAL NUMBER OF BATCH RELEASES
2. 4.65E+05 = TOTAL TIME(MIN.) FOR BATCH RELEASES.
3. 2.14E+04 = MAXIMUM TIME(MIN.) FOR A BATCH RELEASE.
4. 2.78E+03 = AVERAGE TIME(MIN.) FOR A BATCH RELEASE.
5. 2.10E+01 = MINIMUM TIME(MIN.) FOR A BATCH RELEASE.

VI. ABNORMAL RELEASES

A. LIQUID

1. NUMBER OF RELEASES 0
2. TOTAL ACTIVITY RELEASED(CURIEEST) N/A

B. GASEOUS

1. NUMBER OF RELEASES 0
2. TOTAL ACTIVITY RELEASED(CURIEEST) N/A

SUPPLEMENTAL REPORT PAGE 2
CATAWBA NUCLEAR STATION

VALUES REPRESENTED BY "0.00E+00" WITHIN THE BODY OF THE SEMI-ANNUAL AND/OR ANNUAL REPORT ARE BELOW THE MINIMUM DETECTABLE LIMITS OF THE CATAWBA COUNTING SYSTEMS. TYPICAL MDA'S FOR THE CATAWBA COUNTING SYSTEMS ARE LISTED BELOW:

ISOTOPE	ENERGY(keV)	AVERAGE MDA
IE-133	80	3.30E-08
CE-144	133	3.00E-07
IR-98	196	3.60E-08
XE-135	249	1.15E-08
IR-97	402	3.15E-08
CS-137	661	2.50E-08
MO-99	778	1.45E-07
MM-54	834	2.65E-08
ZN-65	1115	5.85E-08
CO-60	1332	2.95E-08

CATAWBA NUCLEAR STATION

The estimated percentage of error for both Liquid and Gaseous effluent release data at Catawba 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 = $\pm 3\%$

CATAWBA NUCLEAR STATION
UNIT 1
RADIOACTIVE EFFLUENT RELEASES
DATE : 08/16/88

I. LIQUID RELEASES

	UNITS	1ST QTR	2ND QTR	YEAR 1988 SUBTOTAL
1. GROSS RADIOACTIVITY				
A. TOTAL RELEASE	CURIES	1.80E-01	3.41E-02	2.14E-01
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	6.65E-09	1.19E-09	3.84E-09
C. MAXIMUM CONCENTRATION RELEASED	UCI/ML	5.73E-08	6.04E-09	5.73E-08
2. TRITIUM				
A. TOTAL RELEASE	CURIES	5.31E+01	8.97E+01	1.43E+02
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	1.96E-06	3.13E-06	2.56E-06
3. DISSOLVED NOBLE GASES				
A. TOTAL RELEASE	CURIES	6.58E-02	8.14E-03	7.39E-02
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	2.43E-09	2.85E-10	1.33E-09
4. GROSS ALPHA ACTIVITY				
A. TOTAL RELEASE	CURIES	0.00E+00	0.00E+00	0.00E+00
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	0.00E+00	0.00E+00	0.00E+00
5. VOLUME OF LIQUID WASTE TO DISCHARGE CANAL	LITERS	3.84E+07	4.96E+07	8.80E+07
6. VOLUME OF DILUTION WATER	LITERS	2.71E+10	2.87E+10	5.57E+10
7. RADIONUCLIDES RELEASED	CURIES			
BE-7		2.01E-04	1.69E-04	3.70E-04
F-18		3.38E-03	9.04E-04	4.28E-03
NA-24		1.39E-04	7.27E-05	2.11E-04
CR-51		1.91E-02	1.19E-03	2.03E-02
MN-54		6.24E-03	1.63E-03	7.87E-03
FE-55		4.39E-02	1.42E-02	5.81E-02
FE-59		6.38E-03	2.29E-04	6.61E-03
CO-57		1.88E-04	2.84E-05	2.17E-04
CO-58		5.47E-02	5.41E-03	6.02E-02
CO-60		1.14E-02	4.34E-03	1.58E-02
ZN-65		1.48E-04	1.49E-05	1.63E-04
SE-75		7.77E-05	0.00E+00	7.77E-05
BR-82		3.77E-05	0.00E+00	3.77E-05
BR-84		3.02E-05	0.00E+00	3.02E-05
SR-90		0.00E+00	5.34E-06	5.34E-06
SR-92		3.87E-06	0.00E+00	3.87E-06
Y-91M		9.25E-06	0.00E+00	9.25E-06
ZR-95		1.91E-03	2.20E-04	2.13E-03
NB-95		2.79E-03	3.45E-04	3.14E-03
NB-97		1.50E-04	2.01E-05	1.70E-04
NB-97M		6.51E-06	1.14E-05	1.80E-05
MO-99		3.58E-05	0.00E+00	3.58E-05
TC-99M		2.21E-04	2.36E-05	2.44E-04
RU-103		1.74E-05	0.00E+00	1.74E-05
AG-110M		4.01E-05	0.00E+00	4.01E-05
I-131		5.13E-03	9.38E-04	6.07E-03
I-132		2.93E-05	0.00E+00	2.93E-05
I-133		9.53E-04	2.84E-04	1.24E-03
I-135		3.99E-05	0.00E+00	3.99E-05
SB-122		8.07E-04	1.64E-06	8.09E-04
SB-124		5.39E-03	1.04E-04	5.50E-03
SB-125		1.12E-02	2.20E-03	1.34E-02
SN-113		3.96E-04	1.48E-05	4.11E-04
TE-131M		4.69E-06	0.00E+00	4.69E-06
CS-134		9.96E-04	5.16E-04	1.51E-03
CS-137		1.67E-03	8.82E-04	2.55E-03
CS-138		1.34E-04	0.00E+00	1.34E-04
BA-139		1.24E-05	0.00E+00	1.24E-05
BA-140		2.88E-06	0.00E+00	2.88E-06
LA-140		5.73E-04	1.16E-04	6.89E-04
W-187		2.97E-05	0.00E+00	2.97E-05
BI-214		3.18E-06	1.88E-05	2.20E-05
PB-212		3.30E-06	4.50E-06	7.79E-06
PB-214		6.75E-06	4.38E-05	5.06E-05
TL-208		1.04E-06	1.28E-04	2.32E-06
AC-228		1.91E-06	0.00E+00	1.91E-06
TH-228		1.27E-03	1.20E-04	1.39E-03
SC-46		8.27E-06	0.00E+00	8.27E-06
HF-181		1.31E-05	1.08E-06	1.41E-05
SB-126		1.19E-04	0.00E+00	1.19E-04
BR-80M		8.66E-05	0.00E+00	8.66E-05
KR-85M		7.37E-06	0.00E+00	7.37E-06
XE-131M		8.05E-05	0.00E+00	8.05E-05
XE-133		3.79E-02	5.32E-03	4.32E-02
XE-133M		1.36E-03	3.68E-05	1.40E-03
XE-135		2.64E-02	2.78E-03	2.92E-02
XE-135M		1.46E-05	0.00E+00	1.46E-05

SKIN	MAXIMUM DOSE-	6.39D-03 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	SHORE
	CO 58	6.15 %				
	CO 60	73.13 %				
	SB 125	7.47 %				
	CS 137	5.09 %				
BONE	MAXIMUM DOSE-	1.12D-01 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	FISH
	CS 134	26.93 %				
	CS 137	63.22 %				
LIVER	MAXIMUM DOSE-	1.48D-01 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	CS 134	39.95 %				
	CS 137	50.85 %				
T. BODY	MAXIMUM DOSE-	1.01D-01 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	CS 134	47.07 %				
	CS 137	46.69 %				
THYROID	MAXIMUM DOSE-	3.45D-02 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	CO 60	11.53 %				
	I 131	78.40 %				
KIDNEY	MAXIMUM DOSE-	5.31D-02 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	CO 60	7.49 %				
	CS 134	35.56 %				
	CS 137	48.63 %				
LUNG	MAXIMUM DOSE-	2.56D-02 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	H 3	5.78 %				
	CO 60	15.53 %				
	CS 134	28.42 %				
	CS 137	39.85 %				
GI-LLI	MAXIMUM DOSE-	3.78D-01 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	NB 95	90.35 %				

SKIN	MAXIMUM DOSE-	2.090-03 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	SHORE
	CO 60	80.56 %				
	CS 137	7.77 %				
BONE	MAXIMUM DOSE-	5.230-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	FISH
	CS 134	28.35 %				
	CS 137	67.75 %				
LIVER	MAXIMUM DOSE-	7.180-02 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	CS 134	40.32 %				
	CS 137	52.26 %				
T. BODY	MAXIMUM DOSE-	5.090-02 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	H 3	6.29 %				
	CS 134	45.75 %				
	CS 137	46.20 %				
THYROID	MAXIMUM DOSE-	8.950-03 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	H 3	26.37 %				
	CO 60	15.99 %				
	I 131	52.13 %				
KIDNEY	MAXIMUM DOSE-	2.630-02 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	H 3	8.96 %				
	CO 60	5.43 %				
	CS 134	35.08 %				
	CS 137	48.83 %				
LUNG	MAXIMUM DOSE-	1.300-02 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	H 3	18.22 %				
	CO 60	11.05 %				
	CS 134	27.48 %				
	CS 137	39.23 %				
GI-LLI	MAXIMUM DOSE-	4.970-02 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	H 3	6.45 %				
	NB 95	80.21 %				

SKIN	MAXIMUM DOSE-	8.40D-03 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	SHORE
	CO 58	5.03 %				
	CO 60	75.05 %				
	SB 125	6.64 %				
	CS 137	5.78 %				
BONE	MAXIMUM DOSE-	1.64D-01 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	FISH
	CS 134	27.47 %				
	CS 137	64.67 %				
LIVER	MAXIMUM DOSE-	2.19D-01 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	CS 134	40.16 %				
	CS 137	51.26 %				
T. BODY	MAXIMUM DOSE-	1.52D-01 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	CS 134	46.70 %				
	CS 137	46.45 %				
THYROID	MAXIMUM DOSE-	4.27D-02 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	H 3	9.09 %				
	CO 60	12.56 %				
	I 131	72.61 %				
KIDNEY	MAXIMUM DOSE-	7.91D-02 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	CO 60	6.78 %				
	CS 134	35.47 %				
	CS 137	48.64 %				
LUNG	MAXIMUM DOSE-	3.84D-02 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	H 3	10.11 %				
	CO 60	13.97 %				
	CS 134	28.17 %				
	CS 137	39.60 %				
GI-LLI	MAXIMUM DOSE-	4.20D-01 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	NB 95	89.12 %				

CATAWBA NUCLEAR STATION
UNIT 2
RADIOACTIVE EFFLUENT RELEASES
DATE : 08/16/88

I. LIQUID RELEASES

	UNITS	1ST QTR	2ND QTR	YEAR : 1988 SUBTOTAL
1. GROSS RADIOACTIVITY				
A. TOTAL RELEASE	CURIES	1.80E-01	3.41E-02	2.14E-01
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	6.65E-09	1.17E-09	3.84E-09
C. MAXIMUM CONCENTRATION RELEASED	UCI/ML	5.73E-08	6.04E-09	5.73E-08
2. TRITIUM				
A. TOTAL RELEASE	CURIES	5.31E+01	8.97E+01	1.43E+02
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	1.96E-06	3.13E-06	2.56E-06
3. DISSOLVED NOBLE GASES				
A. TOTAL RELEASE	CURIES	6.58E-02	8.14E-03	7.39E-02
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	2.43E-09	2.84E-10	1.33E-09
4. GROSS ALPHA ACTIVITY				
A. TOTAL RELEASE	CURIES	0.00E+00	0.00E+00	0.00E+00
B. AVERAGE CONCENTRATION RELEASED	UCI/ML	0.00E+00	0.00E+00	0.00E+00
5. VOLUME OF LIQUID WASTE TO DISCHARGE CANAL	LITERS	3.84E+07	4.96E+07	8.80E+07
6. VOLUME OF DILUTION WATER	LITERS	2.71E+10	2.87E+10	5.57E+10
7. RADIONUCLIDES RELEASED	CURIES			
BE-7		2.01E-04	1.69E-04	3.70E-04
F-18		3.38E-03	9.04E-04	4.28E-03
NA-24		1.39E-04	7.27E-05	2.11E-04
CR-51		1.91E-02	1.19E-03	2.03E-02
MN-54		6.24E-03	1.63E-03	7.87E-03
FE-55		4.39E-02	1.42E-02	5.81E-02
FE-59		6.38E-03	2.29E-04	6.61E-03
CO-57		1.88E-04	2.84E-05	2.17E-04
CO-58		5.47E-02	5.41E-03	6.02E-02
CO-60		1.14E-02	4.34E-03	1.58E-02
ZN-65		1.48E-04	1.49E-05	1.63E-04
SE-75		7.77E-05	0.00E+00	7.77E-05
BR-82		3.77E-05	0.00E+00	3.77E-05
BR-84		3.02E-05	0.00E+00	3.02E-05
SR-90		0.00E+00	5.34E-06	5.34E-06
SR-92		3.87E-06	0.00E+00	3.87E-06
Y-91M		9.25E-06	0.00E+00	9.25E-06
ZR-95		1.91E-03	2.20E-04	2.13E-03
NB-95		2.79E-03	3.45E-04	3.14E-03
NB-97		1.50E-04	2.01E-05	1.70E-04
NB-97M		6.51E-06	1.14E-05	1.80E-05
MO-99		3.58E-05	0.00E+00	3.58E-05
TC-99M		2.21E-04	2.36E-05	2.44E-04
RU-103		1.74E-05	0.00E+00	1.74E-05
AG-110M		4.01E-05	0.00E+00	4.01E-05
I-131		5.13E-03	9.38E-04	6.07E-03
I-132		2.93E-05	0.00E+00	2.93E-05
I-133		9.53E-04	2.84E-04	1.24E-03
I-135		3.99E-05	0.00E+00	3.99E-05
SB-122		8.07E-04	1.64E-06	8.09E-04
SB-124		5.39E-03	1.04E-04	5.50E-03
SB-125		1.12E-02	2.20E-03	1.34E-02
SN-113		3.96E-04	1.48E-05	4.11E-04
TE-131M		4.69E-06	0.00E+00	4.69E-06
CS-134		9.96E-04	5.16E-04	1.51E-03
CS-137		1.67E-03	8.82E-04	2.55E-03
CS-138		1.34E-04	0.00E+00	1.34E-04
BA-139		1.24E-05	0.00E+00	1.24E-05
BA-140		2.88E-06	0.00E+00	2.88E-06
LA-140		5.73E-04	1.16E-04	6.89E-04
W-187		2.97E-05	0.00E+00	2.97E-05
BI-214		3.18E-06	1.88E-05	2.20E-05
PB-212		3.30E-06	4.50E-06	7.79E-06
PB-214		6.75E-06	4.38E-05	5.06E-05
TL-208		1.04E-06	1.28E-06	2.32E-06
AC-228		1.91E-06	0.00E+00	1.91E-06
TH-228		1.27E-03	1.20E-04	1.39E-03
SC-46		8.27E-06	0.00E+00	8.27E-06
HF-181		1.31E-05	1.08E-06	1.41E-05
SB-126		1.19E-04	0.00E+00	1.19E-04
BR-80M		8.66E-05	0.00E+00	8.66E-05
KR-85M		7.37E-06	0.00E+00	7.37E-06
XE-131M		8.05E-05	0.00E+00	8.05E-05
XE-133		3.79E-02	5.32E-03	4.32E-02
XE-133M		1.36E-03	3.68E-05	1.40E-03
XE-135		2.64E-02	2.78E-03	2.92E-02
XE-135M		1.46E-05	0.00E+00	1.46E-05

SKIN	MAXIMUM DOSE-	6.390-03 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	SHORE
	CO 58	6.15 %				
	CO 60	73.13 %				
	SB 125	7.47 %				
	CS 137	5.09 %				
BONE	MAXIMUM DOSE-	1.120-01 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	FISH
	CS 134	26.93 %				
	CS 137	63.22 %				
LIVER	MAXIMUM DOSE-	1.480-01 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	CS 134	39.95 %				
	CS 137	50.85 %				
T. BODY	MAXIMUM DOSE-	1.010-01 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	CS 134	47.07 %				
	CS 137	46.69 %				
THYROID	MAXIMUM DOSE-	3.450-02 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	CO 60	11.53 %				
	I 131	78.40 %				
KIDNEY	MAXIMUM DOSE-	5.310-02 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	CO 60	7.49 %				
	CS 134	35.56 %				
	CS 137	48.63 %				
LUNG	MAXIMUM DOSE-	2.560-02 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	H 3	5.78 %				
	CO 60	15.53 %				
	CS 134	28.42 %				
	CS 137	39.85 %				
GI-1.II	MAXIMUM DOSE-	3.780-01 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	NB 95	90.35 %				

SKIN	MAXIMUM DOSE-	2.090-03 MREI:	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	SHORE
	CO 60	80.56 %				
	CS 137	7.77 %				
BONE	MAXIMUM DOSE-	5.230-02 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	FISH
	CS 134	28.35 %				
	CS 137	67.75 %				
LIVER	MAXIMUM DOSE-	7.180-02 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	CS 134	40.32 %				
	CS 137	52.26 %				
T. BODY	MAXIMUM DOSE-	5.090-02 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	H 3	6.29 %				
	CS 134	45.75 %				
	CS 137	46.20 %				
THYROID	MAXIMUM DOSE-	8.950-03 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	H 3	26.37 %				
	CO 60	15.99 %				
	I 131	52.13 %				
KIDNEY	MAXIMUM DOSE-	2.630-02 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	H 3	8.96 %				
	CO 60	5.43 %				
	CS 134	35.08 %				
	CS 137	48.83 %				
LUNG	MAXIMUM DOSE-	1.300-02 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	H 3	18.22 %				
	CO 60	11.05 %				
	CS 134	27.48 %				
	CS 137	39.23 %				
GI-LLI	MAXIMUM DOSE-	4.970-02 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	H 3	6.45 %				
	NB 95	80.21 %				

SKIN	MAXIMUM DOSE-	8.40D-03 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	SHORE
	CO 58	5.03 %				
	CO 60	75.05 %				
	SB 125	6.64 %				
	CS 137	5.78 %				
BONE	MAXIMUM DOSE-	1.64D-01 MREM	CRITICAL AGE-	CHILD	CRITICAL PATHWAY-	FISH
	CS 134	27.47 %				
	CS 137	64.67 %				
LIVER	MAXIMUM DOSE-	2.19D-01 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	CS 134	40.16 %				
	CS 137	51.26 %				
T. BODY	MAXIMUM DOSE-	1.52D-01 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	CS 154	46.70 %				
	CS 137	46.45 %				
THYROID	MAXIMUM DOSE-	4.27D-02 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	H 3	9.09 %				
	CO 60	12.56 %				
	I 131	72.61 %				
KIDNEY	MAXIMUM DOSE-	7.91D-02 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	CO 60	6.78 %				
	CS 134	35.47 %				
	CS 137	48.64 %				
LUNG	MAXIMUM DOSE-	3.84D-02 MREM	CRITICAL AGE-	TEEN	CRITICAL PATHWAY-	FISH
	H 3	10.11 %				
	CO 60	13.97 %				
	CS 134	28.17 %				
	CS 137	39.60 %				
GI-LLI	MAXIMUM DOSE-	4.20D-01 MREM	CRITICAL AGE-	ADULT	CRITICAL PATHWAY-	FISH
	NB 95	89.12 %				

CATAWBA NUCLEAR STATION
UNIT 1
RADIOACTIVE EFFLUENT RELEASES
DATE 08/16/88

II. AIRBORNE RELEASES		UNITS	1ST QTR	2ND QTR	YEAR SUBTOTAL	1988
1.	TOTAL NOBLE GASES	CURIES	2.82E+02	1.32E+02	4.14E+02	
2.	TOTAL HALOGENS	CURIES	2.60E-04	8.08E-04	1.07E-03	
3.	TOTAL PARTICULATE GROSS BETA-GAMMA	CURIES	3.24E-05	2.12E-04	2.44E-04	
4.	TOTAL TRITIUM	CURIES	6.91E+00	6.50E+00	1.34E+01	
5.	TOTAL PARTICULATE GROSS ALPHA ACTIVITY	CURIES	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	
7.	RADIONUCLIDES RELEASED	CURIES				
	PARTICULATES					
	F-18		4.05E-06	1.97E-04	2.01E-04	
	NA-24		1.37E-06	4.32E-09	1.37E-06	
	CR-51		6.34E-07	0.00E+00	6.34E-07	
	MN-54		1.55E-07	0.00E+00	1.55E-07	
	MN-56		8.86E-10	0.00E+00	8.86E-10	
	CO-58		1.70E-06	0.00E+00	1.70E-06	
	CO-60		1.84E-07	0.00E+00	1.84E-07	
	BR-82		1.85E-08	1.08E-07	1.26E-07	
	RB-88		2.35E-05	1.39E-05	3.74E-05	
	RB-89		1.17E-08	0.00E+00	1.17E-08	
	SR-90		0.00E+00	3.26E-07	3.26E-07	
	HB-95		7.63E-08	0.00E+00	7.63E-08	
	TC-99M		0.00E+00	3.43E-09	3.43E-09	
	AG-108M		2.38E-09	0.00E+00	2.38E-09	
	TE-131M		1.98E-09	0.00E+00	1.98E-09	
	CS-134		3.33E-08	0.00E+00	3.33E-08	
	CS-137		5.60E-08	0.00E+00	5.60E-08	
	CS-138		4.79E-07	0.00E+00	4.79E-07	
	BA-139		1.81E-08	0.00E+00	1.81E-08	
	W-187		5.26E-08	0.00E+00	5.26E-08	
	BR-80M		7.42E-08	1.13E-07	1.87E-07	
	HALOGENS					
	I-131		1.11E-04	5.45E-04	6.56E-04	
	I-132		3.80E-08	0.00E+00	3.80E-08	
	I-133		1.49E-04	2.63E-04	4.11E-04	
	GASES					
	AR-41		5.50E-01	2.07E+00	2.62E+00	
	KR-85		5.48E-01	9.76E-01	1.52E+00	
	KR-85M		1.46E-01	3.53E-01	4.99E-01	
	KR-87		1.89E-02	5.28E-02	7.17E-02	
	KR-88		1.67E-01	4.12E-01	5.79E-01	
	XE-131M		3.82E-01	3.97E-01	7.80E-01	
	XE-133		2.76E+02	1.20E+02	3.96E+02	
	XE-133M		7.64E-01	1.87E+00	2.64E+00	
	XE-135		3.81E+00	5.82E+00	9.63E+00	
	XE-135M		0.00E+00	1.38E-03	1.38E-03	
	XE-138		1.63E-03	8.86E-04	2.51E-03	

CATAMBA UNIT 1 GAS DOSE 001-091 88 RELEASE WEIGHTED MET REPORT SUMMARY 08/15/88
SPECIAL LOCATION
AT 0.50 MILES SSM

MOBILE GAS EXPOSURE:

BETA AIR DOSE = 2.93E-01 MILLIRADS
GAMMA AIR DOSE = 1.07E-01 MILLIRADS

TOTAL BODY DOSE = 6.34E-02 MILLIREM
XE133 87.48%
XE135 5.92%

TOTAL SKIN DOSE = 1.74E-01 MILLIREM
XE133 83.68%
XE135 5.72%

CATAMBA UNIT 1 GAS DOSE 001-091 88 RELEASE WEIGHTED NET REPORT SUMMARY 08/15/88
SPECIAL LOCATION
AT 0.50 MILES 5

IODINE, PARTICULATE, AND TRITIUM EXPOSURE SUMMARY:

MAXIMUM ORGAN - THYROID
CRITICAL AGE - CHILD
CRITICAL PATHWAY - VEGET 3 78.85Z
MAXIMUM ORGAN DOSE = 2.95E-02 MILLIREM
x 75.37Z
: 23.04Z

CATAMBA UNIT 1 GAS DOSE 092-182 88 RELEASE WEIGHTED NET REPORT SUMMARY 08/15/88
SPECIAL LOCATION
AT 0.50 MILES NE

MOBILE GAS EXPOSURE:

BETA AIR DOSE = 1.40E-01 MILLIRADS
GAMMA AIR DOSE = 7.40E-02 MILLIRADS

TOTAL BODY DOSE = 4.60E-02 MILLIREM
KR 88 8.83%
XE133 48.36%
XE135 15.32%
AR 41 25.64%

TOTAL SKIN DOSE = 1.11E-01 MILLIREM
KR 88 5.05%
XE133 56.88%
XE135 16.84%
AR 41 17.11%

CATAMBA UNIT 1 GAS DOSE 092-162 88 RELEASE WEIGHTED NET REPORT SUMMARY 08/15/88
SPECIAL LOCATION
AT 1.00 MILES NW

IODINE, PARTICULATE, AND TRITIUM EXPOSURE SUMMARY:

MAXIMUM ORGAN - THYROID
CRITICAL AGE - INFANT
CRITICAL PATHWAY - GOATMILK @ 97.89%
MAXIMUM ORGAN DOSE = 5.17E-02 MILLIREM
H 3 5.99%
I 131 93.49%

CATAMBA UNIT 1 GAS DOSE 001-182 88 RELEASE WEICHTED MET REPORT SUMMARY 08/15/88
SPECIAL LOCATION
AT 0.50 MILES NE

MOBILE GAS EXPOSURE :

BETA AIR DOSE = 3.18E-01 MILLIRADS
GAMMA AIR DOSE = 1.43E-01 MILLIRADS

TOTAL BODY DOSE = 8.69E-02 MILLIREM
AR 08 6.21%
XE135 62.69%
XE135 12.94%
AR 41 16.79%

TOTAL SKIN DOSE = 2.22E-01 MILLIREM
AR 08 5.35%
XE135 69.59%
XE135 13.40%
AR 41 10.51%

CATAMBA UNIT 1 GAS DOSE 001-182 88 RELEASE WEIGHTED NET REPORT SUMMARY 08/15/88
SPECIAL LOCATION
AT 0.50 MILES ENE

IODINE, PARTICULATE, AND TRITIUM EXPOSURE SUMMARY:

MAXIMUM ORGAN - THYROID
CRITICAL AGE - CHILD
CRITICAL PATHWAY - VEGET @ 78.94%
MAXIMUM ORGAN DOSE = 7.46E-02 MILLIREM
H 5 52.12%
I 151 46.10%

CATAWBA NUCLEAR STATION
UNIT 2
RADIOACTIVE EFFLUENT RELEASES
DATE : 09/16/88

II. AIRBORNE RELEASES		UNITS	1ST QTR	2ND QTR	YEAR : 1988 SUBTOTAL
1	TOTAL NOBLE GASES	CURIES	2.92E+02	1.32E+02	4.14E+02
2	TOTAL HALOGENS	CURIES	2.60E-04	8.08E-04	1.07E-03
3	TOTAL PARTICULATE GROSS BETA-GAMMA	CURIES	3.24E-05	2.12E-04	2.44E-04
4	TOTAL TRITIUM	CURIES	6.91E+00	6.50E+00	1.34E+01
5	TOTAL PARTICULATE GROSS ALPHA ACTIVITY	CURIES	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
7	RADIONUCLIDES RELEASED	CURIES			
	PARTICULATES				
	F-18		4.05E-06	1.97E-04	2.01E-04
	NA-24		1.37E-06	4.32E-09	1.37E-06
	CR-51		6.34E-07	0.00E+00	6.34E-07
	MN-54		1.55E-07	0.00E+00	1.55E-07
	MN-56		8.86E-10	0.00E+00	8.86E-10
	CO-58		1.70E-06	0.00E+00	1.70E-06
	CO-60		1.84E-07	0.00E+00	1.84E-07
	BR-82		1.85E-08	1.08E-07	1.26E-07
	RB-88		2.35E-05	1.39E-05	3.74E-05
	RB-89		1.17E-08	0.00E+00	1.17E-08
	SR-90		0.00E+00	3.26E-07	3.26E-07
	NB-95		7.63E-08	0.00E+00	7.63E-08
	TC-99M		0.00E+00	3.43E-09	3.43E-09
	AG-108M		2.38E-09	0.00E+00	2.38E-09
	TE-131M		1.98E-09	0.00E+00	1.98E-09
	CS-134		3.33E-08	0.00E+00	3.33E-08
	CS-137		5.60E-08	0.00E+00	5.60E-08
	CS-138		4.79E-07	0.00E+00	4.79E-07
	BA-139		1.81E-08	0.00E+00	1.81E-08
	W-187		5.26E-08	0.00E+00	5.26E-08
	BR-80M		7.42E-08	1.13E-07	1.87E-07
	HALOGENS				
	I-131		1.11E-04	5.45E-04	6.56E-04
	I-132		2.80E-08	0.00E+00	2.80E-08
	I-133		1.49E-04	2.63E-04	4.11E-04
	GASES				
	AR-41		5.50E-01	2.07E+00	2.62E+00
	KR-85		5.48E-01	9.76E-01	1.52E+00
	KR-85M		1.46E-01	3.53E-01	4.99E-01
	KR-87		1.89E-02	5.26E-02	7.17E-02
	KR-88		1.67E-01	4.12E-01	5.79E-01
	XE-131M		3.82E-01	3.97E-01	7.80E-01
	XE-133		2.74E+02	1.20E+02	3.94E+02
	XE-133M		7.64E-01	1.87E+00	2.64E+00
	XE-135		3.81E+00	5.82E+00	9.63E+00
	XE-135M		0.00E+00	1.38E-03	1.38E-03
	XE-138		1.63E-03	8.86E-04	2.51E-03

CATAMBA UNIT 2 GAS DOSE 001-091 88 RELEASE WEIGHTED NET REPORT SUMMARY 08/15/88
SPECIAL LOCATION
AT 0.50 MILES SSW

NOBLE GAS EXPOSURE:

BETA AIR DOSE = 2.95E-01 MILLIRADS
GAMMA AIR DOSE = 1.07E-01 MILLIRADS

TOTAL BODY DOSE = 6.34E-02 MILLIREM
XE133 87.48%
XE135 5.92%

TOTAL SKIN DOSE = 1.74E-01 MILLIREM
XE133 89.68%
XE135 5.72%

CATAMBA UNIT 2 GAS DOSE 001-091 88 RELEASE WEIGHTED NET REPORT SUMMARY 08/15/88
SPECIAL LOCATION
AT 0.50 MILES S

IODINE, PARTICULATE, AND TRITIUM EXPOSURE SUMMARY:

MAXIMUM ORGAN - THYROID
CRITICAL AGE - CHILD
CRITICAL PATHWAY - VEGET 3 78.85%
MAXIMUM ORGAN DOSE = 2.93E-02 MILLIREM
H 3 75.37%
I 131 23.04%

CATAMBA UNIT 2 GAS DOSE 092-182 88 RELEASE WEIGHED MET REPORT SUMMARY 08/15/88
SPECIAL LOCATION
AT 0.50 MILES NE

NOBLE GAS EXPOSURE:

BETA AIR DOSE = 1.40E-01 MILLIRADS
GAMMA AIR DOSE = 7.45E-02 MILLIRADS

TOTAL BODY DOSE = 4.60E-02 MILLIREM
AR 88 8.83Z
XE133 48.56Z
XE135 15.32Z
AR 41 25.64Z

TOTAL SKIN DOSE = 1.11E-01 MILLIREM
AR 88 5.05Z
XE133 56.88Z
XE135 16.84Z
AR 41 17.11Z

CATAMBA UNIT 2 GAS DOSE 092-182 88 RELEASE WEIGHTED NET REPORT SUMMARY 08/15/88
SPECIAL LOCATION
AT 1.00 MILES NH

IODINE, PARTICULATE, AND TRITIUM EXPOSURE SUMMARY:

MAXIMUM ORGAN - THYROID
CRITICAL AGE - INFANT
CRITICAL PATHWAY - GOATMILK @ 97.8%
MAXIMUM ORGAN DOSE = 5.17E-02 MILLIREM
H 5 5.9%
I 131 93.49%

CATAMBA UNIT 2 GAS DOSE 001-182 88 RELEASE WEIGHTED NET REPORT SUMMARY 08/15/88
SPECIAL LOCATION
AT 0.50 MILES NE

MOBILE GAS EXPOSURE:

BETA AIR DOSE = 3.18E-01 MILLIRADS
GAMMA AIR DOSE = 1.93E-01 MILLIRADS

TOTAL BODY DOSE = 8.64E-02 MILLIREM
RR 88 6.21Z
XE133 62.69Z
XE135 12.94Z
AR 91 10.79Z

TOTAL SKIN DOSE = 2.22E-01 MILLIREM
RR 88 3.55Z
XE133 69.59Z
XE135 13.40Z
AR 91 10.51Z

CATAMBA UNIT 2 GAS DOSE 001-162 88 RELEASE WEIGHTED NET REPORT SUMMARY 08/15/88
SPECIAL LOCATION
AT 0.50 MILES ENE

IODINE, PARTICULATE, AND TRITIUM EXPOSURE SUMMARY:

MAXIMUM ORGAN - THYROID
CRITICAL AGE - CHILD
CRITICAL PATHWAY - VEGET 3 78.9%

MAXIMUM ORGAN DOSE = 7.46E-02 MILLIREM
H 52.12Z
I 131 46.10Z

CATAWBA NUCLEAR STATION
 SOLID RADIOACTIVE WASTE SHIPPED TO A DISPOSAL FACILITY
 REPORT PERIOD 1/1/88 THROUGH 6/30/88

1	TYPES OF WASTE SHIPPED	NUMBER OF SHIPMENTS	NUMBER OF CONTAINERS	WASTE CLASS	CONT. TYPE	GROSS VOLUME		TOTAL ACT. Ci	EST. TOTAL ERROR %
						(ft ³)	(m ³)		
1	WASTE FROM LIQUID SYSTEMS								
	(A) Dewatered Secondary Resins	2	4	AU	STC	824.4	23.34	0.15	10
	(B) Dewatered Bead Resins	3	3	AS	HIC	617.4	17.48	47.16	10
	(C) Evaporator Concentrates	0	0	N/A	N/A	0	0	0	N/A
	(D) Dewatered Mechanical Filters	5*	5	4AS, 1AU	4HIC, 1STC	489.4	13.85	24.63	15
	(E) Dewatered Demineralizers	0	0	N/A	N/A	0	0	0	N/A
	(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)	2*	17	AU	STC	1564.0	44.29	7.73	15
	(B) Dry Active Waste (non-compact)	1*	2	AS	HIC	73.0	2.07	16.85	15
	(C) Dry Active Waste (brokered)	---	---	AU	STC	1933.5	54.75	2.47	15
	(D) Irradiated Components	0	0	N/A	N/A	0	0	0	N/A
TOTALS		11**	31**	---	---	5501.7	155.79	98.99	---

* denotes multiple waste stream shipments
 ** does not include brokered totals

Summary of Major Radionuclide Composition

<u>Type of Wastes</u>	<u>Radionuclide</u>	<u>% Abundance*</u>
1. Wastes from Liquid Systems		
(A) Dewatered Secondary Resins	Co-58	58.8
	Co-60	3.8
	Cs-134	10.1
	Cs-137	15.8
	Mn-54	3.5
	Fe-55	5.0
	Ni-63	2.5
(B) Dewatered Primary Resins	Co-58	33.0
	Co-60	10.9
	Cs-134	7.6
	Cs-137	13.6
	Mn-54	10.3
	Fe-55	14.4
	Ni-63	7.1
(C) Evaporator Concentrates	(none shipped this period)	
(D) Dewatered Mechanical Filters	H-3	3.8
	Cr-51	10.5
	Mn-54	5.9
	Co-58	23.3
	Fe-59	2.0
	Co-60	21.1
	Nb-95	2.1
	Fe-55	28.2
	Ni-63	3.1
(E) Dewatered Demineralizers	(none shipped this period)	
(F) Solidified Acids, Oils, Sludges	(none shipped this period)	
2. Solid Dry Waste		
(A) Dry Active Waste (compacted)	Cr-51	22.9
(B) Dry Active Waste (non-compacted)	Mn-54	5.4
	Co-58	29.5
	Co-60	12.2
	Nb-95	13.3
	Zr-95	6.0
	Fe-55	8.9
	Ni-63	1.3
(C) Dry Active Waste (brokered)	Co-58	13.3
	Co-60	51.4
	Mn-54	17.2
	Cr-51	7.8
	Nb-95	4.6
	Zr-95	2.1
	Fe-55	3.0
(D) Irradiated Components	(none shipped this period)	

*Average % abundance for all shipments

ATTACHMENT II

SUMMARY OF INOPERABLE
EFFLUENT MONITORS

(1)

Equipment: 1EMF31, Unit 1 Turbine Building Sump Monitor

Out of service for more than 30 days:

. July 26, 1987 to February 11, 1988

Why inoperability was not corrected within the time specified:

The EMF was taken out of service due to sump pump vibration problems. Required samples have been taken during this period of inoperability.

Equipment: 1EMF34, Unit 1 Steam Generator Blowdown Monitor

Out of service for more than 30 days:

. October 28, 1987 to April 14, 1988

Why inoperability was not corrected within the time specified:

The EMF was taken out of service to investigate and repair pressure relief valve 1NM268. Required samples have been taken during this period of inoperability.

Equipment: 2EMF31, Unit 2 Turbine Building Sump Monitor

Out of service for more than 30 days:

. December 2, 1987 to March 18, 1988

Why inoperability was not corrected within the time specified:

The EMF was taken out of service due to Turbine Building Sump sample pump problems. Required samples have been taken during this period of inoperability.

Equipment: 2EMF34, Unit 2 Steam Generator Blowdown Monitor

Out of service for more than 30 days:

. December 24, 1987 to March 8, 1988

Why inoperability was not corrected within the time specified:

The EMF was removed from service for maintenance due to Primary Sampling System sample flow problems. Required samples have been taken during this period of inoperability.

(2)

Equipment: EMF50, Noble Gas Activity Monitor

Out of service for more than 30 days:

. December 21, 1987 to March 16, 1988

Why inoperability was not corrected within the time specified:

The EMF was taken out of service awaiting completion of Nuclear Station Modification CN-50334 which modifies the Waste Gas System to assure the ability of controlling waste gas releases and obtaining a representative sample. Required samples have been taken during this period of inoperability.

Duke Power Company
P.O. Box 33198
Charlotte, N.C. 28242

Hal B. Tucker
Vice President
Nuclear Production
(704)373-4531



DUKE POWER

August 30, 1988

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

Subject: Catawba Nuclear Station
Docket Nos. 50-413 and 50-414
Semi-Annual Radioactive Release Report

Gentlemen:

Pursuant to Catawba Nuclear Station Technical Specification 6.9.1.7, please find attached the Semi-Annual Radioactive Release Report for the period from January, 1988 to June, 1988.

Attachment I contains information regarding radioactive effluent releases and solid radioactive waste shipped offsite. Attachment II contains information concerning the inoperability of certain effluent monitors during the report period.

Please note that no revisions were made to the Catawba site-specific Process Control Program. However, the Duke Power Corporate Process Control Program was revised during the first half of 1988 to incorporate Babcock and Wilcox as an approved solidification vendor for McGuire Nuclear Station limited to the solidification of Class A unstable waste forms only. The revision also changed approvals by Station Radwaste Chemistry Supervisor to allow approval by Station Chemistry supervisor.

Additionally, changes to the offsite Dose Calculation manual were transmitted to the NRC per my July 19, 1988 letter to the Document Control Desk.

Very truly yours,

A handwritten signature in cursive script that reads "Hal B. Tucker".

Hal B. Tucker

JGT01.D1/lcc

Attachments

TEAS
11

U. S. Nuclear Regulatory Commission
August 30, 1988
Page Two

xc: Dr. J. Nelson Grace, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Mr. P. K. VanDoorn
NRC Resident Inspector
Catawba Nuclear Station