



Gary R. Peterson  
Vice President

**Duke Power**  
*Catawba Nuclear Station*  
4800 Concord Road  
York, SC 29745  
(803) 831-4251 OFFICE  
(803) 831-3221 FAX

May 1, 2001

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

Subject: Catawba Nuclear Station, Units 1 and 2  
Docket Nos. 50-413 and 50-414  
2000 Annual Radioactive Effluent Release Report

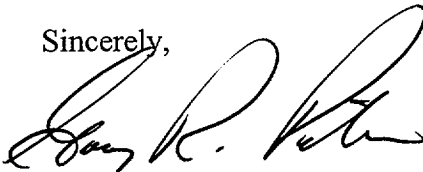
Pursuant to Catawba Nuclear Station Technical Specification 5.6.3 and Selected Licensee Commitment 16.11-16.2, please find attached the Catawba Annual Radioactive Effluent Release Report for the period of January 1, 2000 through December 31, 2000.

Attachment I	Radioactive Effluent Releases
Attachment II	Supplemental Information
Attachment III	Solid Waste Disposal Report
Attachment IV	Meteorological Data
Attachment V	Unplanned Offsite Releases
Attachment VI	Assessment of Radiation Dose from Radioactive Effluents to Members of the Public (includes fuel cycle dose calculation results)
Attachment VII	ODCM/PCP Manual Changes

There are no commitments contained in this submittal.

Any questions concerning this report should be directed to Kay Nicholson at 803.831.3237.

Sincerely,



Gary R. Peterson

Attachment

xc: L. A. Reyes, Regional Administrator, Region II  
C. P. Patel, NRR Senior Project Manager  
D. J. Roberts, Senior Resident Inspector

IE48

**ATTACHMENT I**

**Summary of Liquid and Gaseous Effluents Report**

CATAWBA NUCLEAR STATION

EFFLUENT RELEASE DATA

(January 1, 2000 through December 31, 2000)

This attachment includes a summary of the quantities of radioactive liquid and gaseous effluents as outlined in Regulatory Guide 1.21, Appendix B.

TABLE 1A

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT  
 PERIOD 1/1/00 TO 1/1/01  
 GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

Catawba Nuclear Station Units 1 & 2

REPORT FOR 2000	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
<b>A. Fission and Activation Gases</b>						
1. Total Release	Ci	2.70E+01	1.20E+01	1.39E+01	7.48E+00	6.03E+01
2. Avg. Release Rate	µCi/sec	3.43E+00	1.52E+00	1.75E+00	9.41E-01	1.91E+00
<b>B. Iodine-131</b>						
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	2.10E-05	2.10E-05
2. Avg. Release Rate	µCi/sec	0.00E+00	0.00E+00	0.00E+00	2.64E-06	6.64E-07
<b>C. Particulates Half Life &gt;= 8 days</b>						
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	2.00E-05	2.00E-05
2. Avg. Release Rate	µCi/sec	0.00E+00	0.00E+00	0.00E+00	2.52E-06	6.34E-07
<b>D. Tritium</b>						
1. Total Release	Ci	6.70E+01	4.64E+01	6.03E+01	7.99E+01	2.53E+02
2. Avg. Release Rate	µCi/sec	8.52E+00	5.90E+00	7.58E+00	1.00E+01	8.02E+00

TABLE 1B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT  
 PERIOD 1/1/00 TO 1/1/01  
 GASEOUS EFFLUENTS - ELEVATED RELEASES - CONTINUOUS MODE

Catawba Nuclear Station Units 1 & 2

REPORT FOR 2000	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
1. Fission and Activation Gases						
** No Nuclide Activities **		.....	.....	.....	.....	.....
2. Iodines						
** No Nuclide Activities **		.....	.....	.....	.....	.....
3. Particulates Half Life >= 8 days						
** No Nuclide Activities **		.....	.....	.....	.....	.....
4. Tritium						
** No Nuclide Activities **		.....	.....	.....	.....	.....

TABLE 1B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT  
 PERIOD 1/1/00 TO 1/1/01  
 GASEOUS EFFLUENTS - ELEVATED RELEASES - BATCH MODE

Catawba Nuclear Station Units 1 & 2

REPORT FOR 2000	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
1. Fission and Activation Gases						
** No Nuclide Activities **		.....	.....	.....	.....	.....
2. Iodines						
** No Nuclide Activities **		.....	.....	.....	.....	.....
3. Particulates Half Life $\geq$ 8 days						
** No Nuclide Activities **		.....	.....	.....	.....	.....
4. Tritium						
** No Nuclide Activities **		.....	.....	.....	.....	.....

TABLE 1C

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT  
PERIOD 1/1/00 TO 1/1/01  
GASEOUS EFFLUENTS - GROUND RELEASES - CONTINUOUS MODE

Catawba Nuclear Station Units 1 & 2

REPORT FOR 2000	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
<b>1. Fission and Activation Gases</b>						
KR-85M	Ci	0.00E+00	0.00E+00	0.00E+00	1.92E-02	1.92E-02
KR-88	Ci	0.00E+00	0.00E+00	0.00E+00	1.92E-02	1.92E-02
XE-133	Ci	2.66E+01	1.15E+01	1.33E+01	6.14E+00	5.76E+01
XE-133M	Ci	0.00E+00	0.00E+00	0.00E+00	6.81E-02	6.81E-02
XE-135	Ci	0.00E+00	0.00E+00	0.00E+00	5.78E-01	5.78E-01
XE-135M	Ci	0.00E+00	0.00E+00	0.00E+00	5.50E-03	5.50E-03
Totals for Period...	Ci	2.66E+01	1.15E+01	1.33E+01	6.83E+00	5.83E+01
<b>2. Iodines</b>						
I-131	Ci	0.00E+00	0.00E+00	0.00E+00	2.05E-05	2.05E-05
Totals for Period...	Ci	0.00E+00	0.00E+00	0.00E+00	2.05E-05	2.05E-05
<b>3. Particulates Half Life &gt;= 8 days</b>						
CO-58	Ci	0.00E+00	0.00E+00	0.00E+00	2.00E-05	2.00E-05
Totals for Period...	Ci	0.00E+00	0.00E+00	0.00E+00	2.00E-05	2.00E-05
<b>4. Tritium</b>						
H-3	Ci	6.69E+01	4.63E+01	6.01E+01	7.85E+01	2.52E+02
Totals for Period...	Ci	6.69E+01	4.63E+01	6.01E+01	7.85E+01	2.52E+02

TABLE 1C

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT  
 PERIOD 1/1/00 TO 1/1/01  
 GASEOUS EFFLUENTS - GROUND RELEASES - BATCH MODE

Catawba Nuclear Station Units 1 & 2

REPORT FOR 2000	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
<b>1. Fission and Activation Gases</b>						
AR-41	Ci	2.05E-01	2.53E-01	2.80E-01	1.39E-01	8.77E-01
KR-85	Ci	1.30E-04	5.04E-03	0.00E+00	0.00E+00	5.17E-03
XE-131M	Ci	0.00E+00	0.00E+00	0.00E+00	1.52E-02	1.52E-02
XE-133	Ci	1.51E-01	2.02E-01	2.62E-01	4.94E-01	1.11E+00
XE-133M	Ci	1.61E-03	0.00E+00	5.12E-03	1.12E-03	7.85E-03
XE-135	Ci	1.76E-03	1.46E-03	2.25E-03	1.03E-03	6.46E-03
Totals for Period...	Ci	3.59E-01	4.62E-01	5.49E-01	6.50E-01	2.02E+00
<b>2. Iodines</b>						
I-131	Ci	0.00E+00	0.00E+00	0.00E+00	4.83E-07	4.83E-07
Totals for Period...	Ci	0.00E+00	0.00E+00	0.00E+00	4.83E-07	4.83E-07
<b>3. Particulates Half Life &gt;= 8 days</b>						
** No Nuclide Activities **		.....	.....	.....	.....	.....
<b>4. Tritium</b>						
H-3	Ci	7.09E-02	6.97E-02	1.88E-01	1.36E+00	1.69E+00
Totals for Period...	Ci	7.09E-02	6.97E-02	1.88E-01	1.36E+00	1.69E+00



TABLE 2A

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT  
 PERIOD 1/1/00 TO 1/1/01  
 LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

Catawba Nuclear Station Units 1 & 2

REPORT FOR 2000	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
<b>A. Fission and Activation Products</b>						
1. Total Release	Ci	1.78E-02	2.60E-02	7.88E-03	3.15E-02	8.32E-02
2. Average Diluted Concentration						
a. Continuous Releases	µCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
b. Batch Releases	µCi/ml	7.55E-10	1.17E-09	3.37E-10	1.23E-09	8.79E-10
<b>B. Tritium</b>						
1. Total Release	Ci	1.50E+02	1.76E+02	1.84E+02	2.07E+02	7.18E+02
2. Average Diluted Concentration						
a. Continuous Releases	µCi/ml	3.30E-07	0.00E+00	0.00E+00	8.17E-07	3.10E-07
b. Batch Releases	µCi/ml	6.31E-06	7.94E-06	7.88E-06	8.04E-06	7.55E-06
<b>C. Dissolved and Entrained Gases</b>						
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	1.01E-04	1.01E-04
2. Average Diluted Concentration						
a. Continuous Releases	µCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
b. Batch Releases	µCi/ml	0.00E+00	0.00E+00	0.00E+00	3.94E-12	1.06E-12
<b>D. Gross Alpha Radioactivity</b>						
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Diluted Concentration						
a. Continuous Releases	µCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
b. Batch Releases	µCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
<b>E. Volume of Liquid Waste</b>						
1. Continuous Releases	liters	1.55E+08	0.00E+00	0.00E+00	1.50E+08	3.05E+08
2. Batch Releases	liters	1.56E+06	1.01E+06	6.92E+05	1.80E+06	5.06E+06
<b>F. Volume of Dilution Water</b>						
1. Continuous Releases	liters	2.36E+09	2.22E+09	2.34E+09	2.55E+09	9.47E+09
2. Batch Releases	liters	2.36E+10	2.22E+10	2.34E+10	2.55E+10	9.47E+10

TABLE 2B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT  
 PERIOD 1/1/00 TO 1/1/01  
 LIQUID EFFLUENTS - CONTINUOUS MODE

Catawba Nuclear Station Units 1 & 2

REPORT FOR 2000	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
1. Fission and Activation Gases						
** No Nuclide Activities **		.....	.....	.....	.....	.....
2. Tritium						
H-3	Ci	8.29E-01	0.00E+00	0.00E+00	2.21E+00	3.03E+00
Totals for Period...	Ci	8.29E-01	0.00E+00	0.00E+00	2.21E+00	3.03E+00
3. Dissolved and Entrained Gases						
** No Nuclide Activities **		.....	.....	.....	.....	.....
4. Gross Alpha Radioactivity						
** No Nuclide Activities **		.....	.....	.....	.....	.....

TABLE 2B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT  
PERIOD 1/1/00 TO 1/1/01  
LIQUID EFFLUENTS - BATCH MODE

Catawba Nuclear Station Units 1 & 2

REPORT FOR 2000	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
<b>1. Fission and Activation Gases</b>						
AG-110M	Ci	2.41E-04	4.10E-05	8.01E-05	4.73E-05	4.10E-04
BA-139	Ci	2.00E-06	0.00E+00	0.00E+00	0.00E+00	2.00E-06
BE-7	Ci	2.59E-04	0.00E+00	4.45E-05	3.95E-04	6.98E-04
CO-57	Ci	6.28E-05	7.84E-05	2.61E-05	5.59E-05	2.23E-04
CO-58	Ci	6.45E-03	1.58E-02	2.76E-03	1.56E-02	4.06E-02
CO-60	Ci	7.19E-03	4.11E-03	1.28E-03	4.34E-03	1.69E-02
CR-51	Ci	9.07E-04	2.54E-03	0.00E+00	3.71E-03	7.15E-03
CS-134	Ci	5.31E-07	0.00E+00	0.00E+00	0.00E+00	5.31E-07
CS-137	Ci	1.50E-04	3.53E-05	2.02E-05	1.53E-04	3.58E-04
F-18	Ci	8.28E-07	1.02E-06	0.00E+00	5.09E-07	2.36E-06
FE-59	Ci	6.19E-05	2.51E-04	0.00E+00	5.39E-04	8.52E-04
I-133	Ci	1.19E-06	0.00E+00	0.00E+00	0.00E+00	1.19E-06
MN-54	Ci	1.15E-03	7.61E-04	2.08E-04	7.33E-04	2.85E-03
NB-95	Ci	1.74E-04	1.65E-04	5.22E-06	1.73E-04	5.17E-04
NB-97	Ci	4.52E-05	6.72E-05	1.16E-04	1.35E-04	3.64E-04
SB-124	Ci	0.00E+00	1.52E-04	7.70E-05	1.32E-04	3.61E-04
SB-125	Ci	9.47E-04	1.95E-03	3.27E-03	5.22E-03	1.14E-02
SN-113	Ci	7.71E-05	1.34E-06	0.00E+00	0.00E+00	7.85E-05
TC-99M	Ci	2.73E-07	0.00E+00	0.00E+00	0.00E+00	2.73E-07
ZN-65	Ci	1.85E-06	0.00E+00	0.00E+00	1.39E-05	1.58E-05
ZR-95	Ci	1.11E-04	8.81E-05	0.00E+00	1.38E-04	3.38E-04
ZR-97	Ci	0.00E+00	0.00E+00	0.00E+00	4.06E-05	4.06E-05
Totals for Period...	Ci	1.78E-02	2.60E-02	7.89E-03	3.14E-02	8.32E-02
<b>2. Tritium</b>						
H-3	Ci	1.49E+02	1.76E+02	1.84E+02	2.05E+02	7.15E+02
Totals for Period...	Ci	1.49E+02	1.76E+02	1.84E+02	2.05E+02	7.15E+02
<b>3. Dissolved and Entrained Gases</b>						
XE-133	Ci	0.00E+00	0.00E+00	0.00E+00	1.01E-04	1.01E-04
Totals for Period...	Ci	0.00E+00	0.00E+00	0.00E+00	1.01E-04	1.01E-04
<b>4. Gross Alpha Radioactivity</b>						
** No Nuclide Activities **		.....	.....	.....	.....	.....

**ATTACHMENT II**

**Supplemental Information**

**to the**

**Liquid and Gaseous Effluents Report**

CATAWBA NUCLEAR STATION  
SUPPLEMENTAL INFORMATION

CATAWBA NUCLEAR STATION

2000 EFFLUENT AND WASTE DISPOSAL SUPPLEMENTAL INFORMATION

I. REGULATORY LIMITS - PER UNIT

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 EFFLUENT CONCENTRATIONS

- A. GASEOUS EFFLUENTS - INFORMATION FOUND IN OFFSITE DOSE CALCULATION MANUAL
- B. LIQUID EFFLUENTS - INFORMATION FOUND IN 10CFR20, APPENDIX B, TABLE 2, 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. 1.92E+02 = TOTAL NUMBER OF BATCH RELEASES
2. 1.03E+04 = TOTAL TIME (MIN.) FOR BATCH RELEASES.
3. 1.24E+02 = MAXIMUM TIME (MIN.) FOR A BATCH RELEASE.
4. 5.39E+01 = AVERAGE TIME (MIN.) FOR A BATCH RELEASE.
5. 3.30E+01 = MINIMUM TIME (MIN.) FOR A BATCH RELEASE.
6. 4.75E+04 = AVERAGE DILUTION WATER FLOW DURING RELEASES (GPM).

B. GASEOUS EFFLUENT

1. 9.50E+01 = TOTAL NUMBER OF BATCH RELEASES.
2. 9.72E+05 = TOTAL TIME (MIN.) FOR BATCH RELEASES.
3. 4.43E+04 = MAXIMUM TIME (MIN.) FOR A BATCH RELEASE.
4. 1.02E+04 = AVERAGE TIME (MIN.) FOR A BATCH RELEASE.
5. 3.00E+00 = MINIMUM TIME (MIN.) FOR A BATCH RELEASE.

VI. ABNORMAL RELEASES

A. LIQUID

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

B. GASEOUS

1. NUMBER OF RELEASES = 1
2. TOTAL ACTIVITY RELEASED (CURIES) = 6.83 (See Attachment)

SUPPLEMENTAL REPORT PAGE 2

CATAWBA NUCLEAR STATION

Values represented by "0.00E+00" within the body of the Annual report are below the minimum detectable limits of the Catawba counting systems. Typical MDA's for the Catawba counting systems are listed below:

<u>ISOTOPE</u>	<u>ENERGY</u> (Kev)	<u>AVERAGE</u> <u>MDA</u>
Xe-133	80	3.50E-08
Ce-144	133	3.00E-07
Kr-88	196	3.60E-08
Xe-135	249	1.15E-08
Kr-87	402	3.15E-08
Cs-137	661	2.50E-08
Mo-99	778	1.45E-07
Mn-54	834	2.65E-08
Zn-65	1115	6.85E-08
Co-60	1332	2.95E-08

SUPPLEMENTAL REPORT PAGE 3

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  $\pm 16.1\%$ . This value was derived by taking the square root of the sum of the squares of the following discrete individual estimates of error:

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



**ATTACHMENT III**

**Solid Waste Disposal Report**

CATAWBA NUCLEAR STATION - SOLID RADIOACTIVE WASTE SHIPPED TO A DISPOSAL FACILITY

REPORT PERIOD 1/1/2000 THROUGH 12/31/2000

<u>Type of Waste Shipped</u>	<u>Number of Shipments</u>	<u>Number of Containers</u>	<u>Waste Class</u>	<u>Container Type</u>	<u>Burial Volume (ft<sup>3</sup>)</u>	<u>Total Activity (Curies)</u>
1. Waste from Liquid Systems						
(A) Dewatered Secondary Resins	0	0	N/A	N/A	0	0
(B) Dewatered Primary Resins	0	0	N/A	N/A	0	0
(C) Evaporator Concentrates	0	0	N/A	N/A	0	0
(D) Dewatered Mechanical Filters	3	3	3C	3HIC	360.9	10.22 1337.
(E) Dewatered Demineralizers	0	0	N/A	N/A	0	0
(F) Solidified (Cement) Acids, Oils, Sludges	0	0	N/A	N/A	0	0
2. Dry Solid Waste						
(A) Dry Active Waste (compacted)	0	0	N/A	N/A	0	0
(B) Dry Active Waste (non-compacted)	2	2	2AS	2HIC	240.6	6.81 5.260
(C) Dry Active Waste (brokered)	---	---	---	---	336.2	9.52 0.5851
(D) Irradiated Components	0	0	N/A	N/A	0	0
3. All Solid Waste	5 <sup>a</sup>	5 <sup>a</sup>	---	---	937.7	26.56 1342.8451

<sup>a</sup>Does not include brokered Dry Active Waste totals

CATAWBA NUCLEAR STATION - SOLID RADIOACTIVE WASTE

SUMMARY OF PRINCIPAL RADIONUCLIDE COMPOSITION

REPORT PERIOD 1/1/2000 THROUGH 12/31/2000

<u>Type of Waste</u>	<u>Radionuclide</u>	<u>% Abundance</u> <sup>*</sup>
1. Waste from Liquid Systems		
(A) Dewatered Secondary Resins	(none shipped this period)	
(B) Dewatered Primary Resins	(none shipped this period)	
(C) Evaporator Concentrates	(none shipped this period)	
(D) Dewatered Mechanical Filters	Mn-54	1.8
	Co-57	0.1
	Co-58	0.4
	Co-60	14.5
	Zn-65	0.4
	Nb-95	0.3
	Ag-110m	0.1
	Sb-125	0.6
	Fe-55	68.8
	Ni-63	12.8
(E) Dewatered Demineralizers	(none shipped this period)	
(F) Solidified Acids, Oils, Sludges	(none shipped this period)	

\* Average percent abundance for all shipments during period (unlisted if <0.1%)

CATAWBA NUCLEAR STATION - SOLID RADIOACTIVE WASTE

SUMMARY OF PRINCIPAL RADIONUCLIDE COMPOSITION

REPORT PERIOD 1/1/2000 THROUGH 12/31/2000

<u>Type of Waste</u>	<u>Radionuclide</u>	<u>% Abundance</u> *
2. Dry Solid Waste		
(A) Dry Active Waste (compacted)	(none shipped this period)	
(B) Dry Active Waste (non-compacted)	H-3	1.6
	Cr-51	0.8
	Mn-54	1.9
	Co-57	0.1
	Co-58	9.8
	Co-60	14.6
	Nb-95	0.2
	Zr-95	0.2
	Ag-110m	0.2
	Sb-124	0.1
	Sb-125	0.5
	Cs-134	0.1
	Cs-137	0.1
	Ce-144	0.1
	Fe-55	59.8
	Ni-63	9.7
(C) Dry Active Waste (brokered)	H-3	1.5
	Cr-51	1.3
	Mn-54	1.9
	Co-57	0.1
	Co-58	11.4
	Co-60	14.2
	Nb-95	0.3
	Zr-95	0.2
	Ag-110m	0.2
	Sb-124	0.1
	Sb-125	0.5
	Cs-134	0.1
	Cs-137	0.1
	Ba/La-140	0.1
	Ce-144	0.1
	Fe-55	58.4
	Ni-63	9.3
(D) Irradiated Components	(none shipped this period)	

\* Average percent abundance for all shipments during period (unlisted if <0.1%)

CATAWBA NUCLEAR STATION - SOLID RADIOACTIVE WASTE

SUMMARY OF PRINCIPAL RADIONUCLIDE COMPOSITION

REPORT PERIOD 1/1/2000 THROUGH 12/31/2000

<u>Type of Waste</u>	<u>Radionuclide</u>	<u>% Abundance</u> <sup>*</sup>
3. All Solid Waste	Mn-54	1.8
	Co-57	0.1
	Co-58	0.5
	Co-60	14.5
	Zn-65	0.4
	Nb-95	0.3
	Ag-110m	0.1
	Sb-125	0.6
	Fe-55	68.8
	Ni-63	12.7

\* Average percent abundance for all shipments during period (unlisted if <0.1%)

**ATTACHMENT IV**

**Meteorological Data**

CATAWBA NUCLEAR STATION  
2000 METEOROLOGICAL JOINT FREQUENCY DISTRIBUTIONS  
OF WIND SPEED, WIND DIRECTION, AND ATMOSPHERIC  
STABILITY  
USING WINDS AT THE 10 M LEVEL  
(Hours of Occurrence)

10M WIND SPEED/DIRECTION/DELTA-T STABILITY  
STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

PASQUILL STABILITY A

SECTOR	WIND SPEED CLASS										NO.
	1.25-1.49	1.50-1.99	2.00-2.99	3.00-3.99	4.00-4.99	5.00-5.99	6.00-6.99	7.00-7.99	8.00-8.99	9.00-9.99	
-N-	.	.	5	12	20	14	5	5	56		
-NNE-	.	.	2	8	23	18	4	55			
-NE-	.	.	.	2	2	4	.	8			
-ENE-	.	.	1	1	.	.	.	2			
-E-	.	.	1	.	.	.	.	1			
-ESE-	.	2	.	.	.	.	.	2			
-SE-	.	2	5	1	.	.	.	8			
-SSE-	1	5	15	4	.	.	.	25			
-S-	.	2	13	4	3	.	.	22			
-SSW-	.	1	43	46	24	3	2	119			
-SW-	.	2	37	61	29	11	2	142			
-WSW-	.	4	26	14	6	.	.	50			
-W-	.	4	11	4	1	.	.	20			
-WNW-	.	1	5	8	3	.	.	17			
-NW-	.	.	1	3	2	.	5	11			
-NNW-	.	1	3	1	9	10	14	38			
TOTAL	1	24	168	169	122	60	32	576			



10M WIND SPEED/DIRECTION/DELTA-T STABILITY  
STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

PASQUILL STABILITY B

SECTOR	WIND SPEED CLASS										NO.
	1.25-1.49	1.50-1.99	2.00-2.99	3.00-3.99	4.00-4.99	5.00-5.99	6.00-6.99	7.00-7.99	8.00-8.99	9.00-9.99	
-N-	.	.	6	25	20	10	2				63
-NNE-	.	.	4	10	21	17	2				54
-NE-	.	.	1	3	4	2	.				10
-E-	.	1	.	.	.	.	.				1
-ESE-	.	1	1	.	.	.	.				2
-SE-	1	2	2	4	.	.	.				9
-SSE-	.	1	16	4	.	.	.				21
-S-	.	.	11	7	3	.	.				21
-SSW-	.	3	30	21	9	1	.				64
-SW-	.	1	30	20	5	3	.				59
-WSW-	.	3	12	4	1	2	.				22
-W-	.	3	2	2	.	.	.				7
-WNW-	.	.	9	10	2	1	1				23
-NW-	.	1	6	4	1	1	.				13
-NNW-	.	1	3	3	10	3	.				20
TOTAL	1	17	133	117	76	40	5				389

10M WIND SPEED/DIRECTION/DELTA-T STABILITY  
 STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

PASQUILL STABILITY C

SECTOR	WIND SPEED CLASS												TOTAL
	1.00- 1.24	1.25- 1.49	1.50- 1.99	2.00- 2.99	3.00- 3.99	4.00- 4.99	5.00- 5.99	6.00- 7.99	NO.	NO.	NO.	NO.	
-N-	.	.	1	16	46	22	3	3	91				
-NNE-	.	.	.	11	22	62	53	15	163				
-NE-	.	.	.	1	5	14	6	.	26				
-ENE-	.	.	.	3	3	1	1	.	8				
-E-	.	2	2	2	1	.	.	.	7				
-ESE-	.	.	2	3	3	.	.	.	8				
-SE-	.	2	8	2	3	.	.	.	15				
-SSE-	.	.	8	29	6	1	.	.	44				
-S-	1	2	4	13	3	2	1	.	26				
-SSW-	.	.	5	50	25	6	4	1	91				
-SW-	.	3	8	27	18	8	2	.	66				
-WSW-	.	1	6	18	6	3	1	2	37				
-W-	.	.	5	7	3	1	1	.	17				
-WNW-	.	1	.	7	10	3	1	.	22				
-NW-	.	.	1	7	7	4	4	1	24				
-NNW-	.	.	4	5	11	5	4	2	31				
TOTAL	1	11	54	201	172	132	81	24	676				

10M WIND SPEED/DIRECTION/DELTA-T STABILITY  
STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

PASQUILL STABILITY D

SECTOR	WIND SPEED CLASS																TOTAL
	0.45-0.74	0.75-0.99	1.00-1.24	1.25-1.49	1.50-1.99	2.00-2.99	3.00-3.99	4.00-4.99	5.00-5.99	6.00-7.99	8.00-9.99					TOTAL	
	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.
-N-	.	.	2	10	39	124	161	109	38	12	1	496					
-NNE-	.	.	1	3	15	55	202	162	38	9	.	485					
-NE-	.	.	3	4	9	17	55	67	28	1	.	184					
-ENE-	.	1	1	4	3	13	12	15	4	.	.	53					
-E-	.	.	.	5	6	14	6	2	.	.	.	33					
-ESE-	.	.	1	9	16	11	3	1	.	.	.	41					
-SE-	.	4	4	9	20	18	10	1	2	1	.	69					
-SSE-	.	1	7	16	44	74	27	5	.	.	.	174					
-S-	.	1	10	24	62	123	47	16	5	3	.	291					
-SSW-	.	2	7	22	80	136	68	39	10	.	.	364					
-SW-	.	10	10	17	47	87	47	14	7	.	.	239					
-WSW-	1	5	17	20	35	48	16	4	2	.	.	148					
-W-	1	4	11	18	34	28	6	1	2	1	.	106					
-WNW-	.	3	6	12	27	32	16	6	2	3	.	107					
-NW-	.	1	2	12	21	26	21	12	1	4	.	100					
-NNW-	.	.	3	11	28	57	37	29	14	9	1	189					
TOTAL	2	32	85	196	486	863	734	483	153	43	2	3079					

10M WIND SPEED/DIRECTION/DELTA-T STABILITY  
 STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

PASQUILL STABILITY E

SECTOR	WIND SPEED CLASS														NO.								
	0.45-0.74	0.75-1.00	1.00-1.25	1.25-1.50	1.50-1.75	1.75-2.00	2.00-2.25	2.25-2.50	2.50-2.75	2.75-3.00	3.00-3.25	3.25-3.50	3.50-3.75	3.75-4.00		4.00-4.25	4.25-4.50	4.50-4.75	4.75-5.00	5.00-5.25	5.25-5.50	5.50-5.75	5.75-6.00
-N-	.	2	1	2	17	54	71	12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	161
-NNE-	.	.	4	.	2	17	9	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	36
-NE-	1	1	1	.	5	3	6	7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	26
-ENE-	.	2	.	1	3	4	3	5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	21
-E-	.	.	2	2	.	3	2	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10
-ESE-	.	.	3	3	7	4	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	25
-SE-	.	3	2	7	6	14	12	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	54
-SSE-	.	2	9	26	28	41	18	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	125
-S-	.	4	15	28	128	133	38	7	2	2	2	2	2	2	2	2	2	2	2	2	2	2	355
-SSW-	.	2	17	40	135	122	50	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	375
-SW-	.	8	25	36	51	54	26	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	206
-WSW-	1	7	17	31	37	16	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	111
-W-	.	7	17	21	19	16	1	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	83
-WNW-	1	5	12	11	31	67	13	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	141
-NW-	1	5	12	12	30	40	15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	119
-NNW-	.	1	2	10	38	107	82	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	251
TOTAL	4	49	139	230	537	695	353	71	12	12	12	12	12	12	12	12	12	12	12	12	12	12	2099

10M WIND SPEED/DIRECTION/DELTA-T STABILITY  
STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

PASQUILL STABILITY F

SECTOR	WIND SPEED CLASS														NO.
	0.45-	0.75-	1.00-	1.25-	1.50-	2.00-	3.00-	4.00-	5.00-					NO.	
	0.74	0.99	1.24	1.49	1.99	2.99	3.99	4.99	5.99	TOTAL					
NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	
-N-	1	.	.	2	9	49	12	.	.	1	74				
-NNE-	1	.	.	.	.	2	.	.	.	.	3				
-NE-	.	.	1	.	.	.	1	.	.	.	2				
-ENE-	.	.	.	.	.	1	.	.	.	.	1				
-ESE-	.	.	1	.	.	.	.	.	.	.	1				
-SE-	.	.	.	.	.	1	.	.	.	.	4				
-SSE-	.	.	.	3	9	13	11	.	.	.	36				
-S-	.	2	12	25	65	13	2	.	.	.	119				
-SSW-	2	3	10	25	56	15	.	.	.	.	111				
-SW-	1	10	17	32	29	6	.	.	.	.	95				
-WSW-	1	11	10	15	25	3	.	.	.	.	65				
-W-	2	6	9	13	26	14	.	.	.	.	70				
-WNW-	1	6	11	14	33	20	1	.	.	.	86				
-NW-	.	12	10	15	26	25	1	.	.	.	89				
-NNW-	.	.	9	21	51	83	12	.	.	.	176				
TOTAL	9	50	93	171	334	243	29	4	1	934					

10M WIND SPEED/DIRECTION/DELTA-T STABILITY  
STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

PASQUILL STABILITY G

SECTOR	WIND SPEED CLASS										TOTAL	
	0.45-0.74	0.75-0.99	1.00-1.24	1.25-1.49	1.50-1.99	2.00-2.99	3.00-3.99					
	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.
-N-	1	2	1	1	11	32	2					50
-NNE-	.	.	.	.	.	.	1					1
-NE-	1	.	.	.	.	.	.					1
-SE-	1	.	.	.	.	.	.					1
-SSE-	.	4	3	6	13	1						27
-S-	3	15	17	44	46	1						126
-SSW-	5	16	18	37	35	5						116
-SW-	2	19	28	24	19	3						95
-WSW-	6	14	13	16	9	1						59
-W-	3	11	17	14	9	4						58
-WNW-	7	12	19	12	12	3						65
-NW-	9	25	20	29	15	1						99
-NDW-	4	14	20	31	55	30						154
TOTAL	42	132	156	214	224	81	3					852

10M WIND SPEED/DIRECTION/DELTA-T STABILITY  
 STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

ALL STABILITY CLASSES

SECTOR	WIND SPEED CLASS														TOTAL
	0.45-0.74	0.75-0.99	1.00-1.24	1.25-1.49	1.50-1.99	2.00-2.99	3.00-3.99	4.00-4.99	5.00-5.99	6.00-7.99	8.00-9.99	NO.	NO.	NO.	
-N-	2	4	4	15	77	286	329	183	67	23	1	991			
-NNE-	1	.	5	3	17	91	252	272	126	30	.	797			
-NE-	2	1	5	4	14	22	72	94	41	2	.	257			
-ENE-	.	3	1	5	6	22	19	21	8	.	.	85			
-E-	.	.	2	9	9	20	9	3	.	.	.	52			
-ESE-	.	.	5	12	28	19	11	2	1	1	.	79			
-SE-	1	7	6	19	39	42	30	11	3	4	.	162			
-SSE-	.	7	22	58	112	187	59	7	.	.	.	452			
-S-	3	22	55	123	307	307	101	31	8	3	.	960			
-SSW-	7	23	52	124	315	401	210	86	19	3	.	1240			
-SW-	3	47	80	112	157	244	172	62	23	2	.	902			
-WSW-	9	37	57	83	119	124	42	14	5	2	.	492			
-W-	6	28	54	66	100	82	16	5	3	1	.	361			
-WNW-	9	26	48	50	104	143	58	15	4	4	.	461			
-NW-	10	43	44	68	94	106	51	20	7	12	.	455			
-NNW-	4	15	34	73	178	288	146	62	32	26	1	859			
TOTAL	57	263	474	824	1676	2384	1577	888	347	113	2	8605			

**ATTACHMENT V**

**Unplanned Offsite Releases**



CATAWBA NUCLEAR STATION

UNPLANNED RELEASES

(January 1, 2000 through December 31, 2000)

There was 1 unplanned gaseous release at Catawba Nuclear Station in 2000.  
There were no unplanned liquid radioactivity releases to the environment in 2000.

## **Unplanned Release through Unit 1 Vent on 10/14/00, 1618 to 1713**

### **Sequence of Events**

Radiation Protection (RP) personnel informed the control room of pressurizer vapor space sampling by Chemistry personnel in the 543 elevation sample lab. The Pressurizer Steam Space was aligned to the sample sink to vent hydrogen as per standard shutdown practice. Pre-outage indications of a "tight leaker" did not show enough activity to cause the venting to be questioned. During plant shutdown, some iodine spiking did occur, but this was expected. During hydrogen venting, the "tight leaker" subsequently opened to a larger leaker that could not be validated by sampling. Sampling was secured and counts returned to normal. Counts of approximately 10,000 cpm on EMF41 and approximately 5,000 cpm on 1EMF36 were observed.

Following the response to the Trip 2 alarm on 1EMF 36L (Unit Vent Noble Gas Monitor), RP staff investigated the event. A grab sample was collected by an RP technician at 1655. Sample results as well as OAC data for 1EMF35L, 1EMF36L, 1EMF37L, and EMF41 (Auxiliary Building Area Monitor) were evaluated. Total projected noble gas activity, which is monitored during the process, would have resulted in less than 500 cpm on Unit Vent 1EMF36L. Grab sample activity (collected shortly after Trip 2 alarm occurred) was approximately 40 times expected activity and the maximum response of 1EMF36L was 4,300 cpm.

### **Safety Significance**

This event was not LER reportable. No radiation effluent release limits were exceeded. Final dose commitment calculations for the Unit Vent Release resulted in a Total Noble Gas Site Boundary EC Ratio of 0.246 and a Gamma Air Dose at the Site Boundary for the maximum receptor of 4.04E-03 mrad. The total noble gas activity released from this event was approximately 6.83 Curies and was documented in Gaseous Waste Release Document #2000109.

This event has been assessed by the Catawba Safety Review Group and is documented in PIP C-01-0130. Proposed corrective actions to provide enhanced procedural sampling guidance and improved communications will be evaluated and tracked in the licensee's corrective action program.

**ATTACHMENT VI**

**Assessment of Radiation Dose from**

**Radioactive Effluents to**

**Members of the Public**

**(includes fuel cycle dose calculation results)**

## CATAWBA NUCLEAR STATION

### Assessment of Radiation Dose from Radioactive Effluents to Members of the Public

(January 1, 2000 through December 31, 2000)

This attachment includes an assessment of radiation doses to the maximum exposed member of the public due to radioactive liquid and gaseous effluents released from the site for each calendar quarter for the calendar year of this report, as well as the total dose for the calendar year. This attachment also includes an assessment of radiation doses to the maximum exposed member of the public from all uranium fuel cycle sources within 10 miles of Catawba for the calendar year of this report to show conformance with 40 CFR 190. Methods for calculating the dose contribution from liquid and gaseous effluents are given in the ODCM.

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT  
 PERIOD 1/1/00 TO 1/1/01  
 GASEOUS ANNUAL DOSE SUMMARY REPORT

Catawba Nuclear Station Units 1 & 2

1<sup>st</sup> Quarter 2000

=== IODINE, H3, AND PARTICULATE DOSE LIMIT ANALYSIS===== Quarter 1 2000 ===

Period-Limit	Critical Group	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q1 - Maximum Organ Dose	CHILD	LIVER	3.19E-01	1.50E+01	2.13E+00

Maximum Organ Dose Receptor Location: 0.5 Mile NE  
 Critical Pathway: Vegetation

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

=== NOBLE GAS DOSE LIMIT ANALYSIS===== Quarter 1 2000 ===

Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Q1 - Maximum Gamma Air Dose	1.26E-02	1.00E+01	1.26E-01

Maximum Gamma Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
XE-133	8.32E+01
AR-41	1.67E+01

Q1 - Maximum Beta Air Dose	3.20E-02	2.00E+01	1.60E-01
----------------------------	----------	----------	----------

Maximum Beta Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
XE-133	9.76E+01

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT  
 PERIOD 1/1/00 TO 1/1/01  
 GASEOUS ANNUAL DOSE SUMMARY REPORT

Catawba Nuclear Station Units 1 & 2

2<sup>nd</sup> Quarter 2000

=== IODINE, H3, AND PARTICULATE DOSE LIMIT ANALYSIS===== Quarter 2 2000 ===					
Period-Limit	Critical Group	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q2 - Maximum Organ Dose	CHILD	LIVER	2.21E-01	1.50E+01	1.47E+00

Maximum Organ Dose Receptor Location: 0.5 Mile NE  
 Critical Pathway: Vegetation

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

=== NOBLE GAS DOSE LIMIT ANALYSIS===== Quarter 2 2000 ===				
Period-Limit		Dose (mrad)	Limit (mrad)	% of Limit
Q2 - Maximum Gamma Air Dose		7.23E-03	1.00E+01	7.23E-02

Maximum Gamma Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
XE-133	6.37E+01
AR-41	3.63E+01

Q2 - Maximum Beta Air Dose		1.46E-02	2.00E+01	7.31E-02
----------------------------	--	----------	----------	----------

Maximum Beta Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
XE-133	9.36E+01
AR-41	6.32E+00

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT  
 PERIOD 1/1/00 TO 1/1/01  
 GASEOUS ANNUAL DOSE SUMMARY REPORT

Catawba Nuclear Station Units 1 & 2

3<sup>rd</sup> Quarter 2000

=== IODINE, H3, AND PARTICULATE DOSE LIMIT ANALYSIS===== Quarter 3 2000 ===					
Period-Limit	Critical Group	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q3 - Maximum Organ Dose	CHILD	LIVER	2.87E-01	1.50E+01	1.91E+00

Maximum Organ Dose Receptor Location: 0.5 Mile NE  
 Critical Pathway: Vegetation

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

=== NOBLE GAS DOSE LIMIT ANALYSIS===== Quarter 3 2000 ===			
Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Q3 - Maximum Gamma Air Dose	8.25E-03	1.00E+01	8.25E-02

Maximum Gamma Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
XE-133	6.47E+01
AR-41	3.52E+01

Q3 - Maximum Beta Air Dose	1.69E-02	2.00E+01	8.46E-02
----------------------------	----------	----------	----------

Maximum Beta Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
XE-133	9.39E+01
AR-41	6.05E+00

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT  
 PERIOD 1/1/00 TO 1/1/01  
 GASEOUS ANNUAL DOSE SUMMARY REPORT

Catawba Nuclear Station Units 1 & 2

4<sup>th</sup> Quarter 2000

=== IODINE, H3, AND PARTICULATE DOSE LIMIT ANALYSIS===== Quarter 4 2000 ===					
Period-Limit	Critical Group	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q4 - Maximum Organ Dose	CHILD	THYROID	3.83E-01	1.50E+01	2.55E+00

Maximum Organ Dose Receptor Location: 0.5 Mile NE  
 Critical Pathway: Vegetation

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	9.93E+01

=== NOBLE GAS DOSE LIMIT ANALYSIS===== Quarter 4 2000 ===			
Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Q4 - Maximum Gamma Air Dose	5.68E-03	1.00E+01	5.68E-02

Maximum Gamma Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
XE-133	4.59E+01
AR-41	2.53E+01
XE-135	2.18E+01
KR-88	5.71E+00

Q4 - Maximum Beta Air Dose	1.01E-02	2.00E+01	5.04E-02
----------------------------	----------	----------	----------

Maximum Beta Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
XE-133	7.68E+01
XE-135	1.57E+01
AR-41	5.04E+00



EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT  
 PERIOD 1/1/00 TO 1/1/01  
 GASEOUS ANNUAL DOSE SUMMARY REPORT

Catawba Nuclear Station Units 1 & 2

ANNUAL 2000

=== IODINE, H3, AND PARTICULATE DOSE LIMIT ANALYSIS===== Annual 2000 =====

Period-Limit	Critical Group	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Yr - Maximum Organ Dose	CHILD	THYROID	1.21E+00	3.00E+01	4.03E+00

Maximum Organ Dose Receptor Location: 0.5 Mile NE  
 Critical Pathway: Vegetation

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	9.98E+01

=== NOBLE GAS DOSE LIMIT ANALYSIS===== Annual 2000 =====

Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Yr - Maximum Gamma Air Dose	3.38E-02	2.00E+01	1.69E-01

Maximum Gamma Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
XE-133	6.83E+01
AR-41	2.68E+01

Yr - Maximum Beta Air Dose	7.37E-02	4.00E+01	1.84E-01
----------------------------	----------	----------	----------

Maximum Beta Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
XE-133	9.31E+01

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT  
 PERIOD 1/1/00 TO 1/1/01  
 LIQUID ANNUAL DOSE SUMMARY REPORT

Catawba Nuclear Station Units 1 & 2

1<sup>st</sup> Quarter 2000

=== BATCH LIQUID RELEASES ===			Quarter 1 2000 =====		
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q1 - Maximum Organ Dose	ADULT	GI-LLI	3.65E-02	1.00E+01	3.65E-01
Q1 - Total Body Dose	TEEN		1.21E-02	3.00E+00	4.02E-01

Maximum Organ  
 Critical Pathway: Fresh Water Fish  
 Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
NB-95	6.52E+01
H-3	1.61E+01
CO-60	1.10E+01

Total Body  
 Critical Pathway: Fresh Water Fish  
 Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
CO-60	3.87E+01
H-3	3.61E+01
CS-137	2.21E+01

=== CONTINUOUS LIQUID RELEASES (WC) ===			Quarter 1 2000 =====		
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q1 - Maximum Organ Dose	ADULT	LIVER	3.08E-04	1.00E+01	3.08E-03
Q1 - Total Body Dose	ADULT		3.08E-04	3.00E+00	1.03E-02

Maximum Organ  
 Critical Pathway: Fresh Water Fish  
 Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

Total Body  
 Critical Pathway: Fresh Water Fish  
 Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT  
 PERIOD 1/1/00 TO 1/1/01  
 LIQUID ANNUAL DOSE SUMMARY REPORT

Catawba Nuclear Station Units 1 & 2

2<sup>nd</sup> Quarter 2000

=== BATCH LIQUID RELEASES ===				Quarter 2 2000 =====	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q2 - Maximum Organ Dose	ADULT	GI-LLI	3.80E-02	1.00E+01	3.80E-01
Q2 - Total Body Dose	ADULT		9.74E-03	3.00E+00	3.25E-01

Maximum Organ  
 Critical Pathway: Fresh Water Fish  
 Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
NB-95	6.31E+01
H-3	1.95E+01
CO-58	7.51E+00
CO-60	6.42E+00

Total Body  
 Critical Pathway: Fresh Water Fish  
 Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	7.61E+01
CS-137	1.22E+01
CO-60	7.16E+00

=== CONTINUOUS LIQUID RELEASES (WC) ===				Quarter 2 2000 =====	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q2 - Maximum Organ Dose	N/A	N/A	0.00E+00	1.00E+01	0.00E+00
Q2 - Total Body Dose	N/A	N/A	0.00E+00	3.00E+00	0.00E+00

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT  
 PERIOD 1/1/00 TO 1/1/01  
 LIQUID ANNUAL DOSE SUMMARY REPORT

Catawba Nuclear Station Units 1 & 2

3<sup>rd</sup> Quarter 2000

=== BATCH LIQUID RELEASES ===				Quarter 3 2000 =====	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q3 - Maximum Organ Dose	ADULT	GI-LLI	9.66E-03	1.00E+01	9.66E-02
Q3 - Total Body Dose	ADULT		8.37E-03	3.00E+00	2.79E-01

Maximum Organ  
 Critical Pathway: Fresh Water Fish  
 Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	7.70E+01
NB-95	7.55E+00
CO-60	7.53E+00

Total Body  
 Critical Pathway: Fresh Water Fish  
 Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	8.88E+01
CS-137	7.80E+00

=== CONTINUOUS LIQUID RELEASES (WC) ===				Quarter 3 2000 =====	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q3 - Maximum Organ Dose	N/A	N/A	0.00E+00	1.00E+01	0.00E+00
Q3 - Total Body Dose	N/A	N/A	0.00E+00	3.00E+00	0.00E+00

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT  
 PERIOD 1/1/00 TO 1/1/01  
 LIQUID ANNUAL DOSE SUMMARY REPORT

Catawba Nuclear Station Units 1 & 2

4<sup>th</sup> Quarter 2000

=== BATCH LIQUID RELEASES ===				Quarter 4 2000 =====	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q4 - Maximum Organ Dose	ADULT	GI-LLI	3.60E-02	1.00E+01	3.60E-01
Q4 - Total Body Dose	ADULT		1.32E-02	3.00E+00	4.41E-01

Maximum Organ  
 Critical Pathway: Fresh Water Fish  
 Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
NB-95	6.15E+01
H-3	2.11E+01
CO-58	6.91E+00
CO-60	6.29E+00

Total Body  
 Critical Pathway: Fresh Water Fish  
 Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	5.74E+01
CS-137	3.44E+01

=== CONTINUOUS LIQUID RELEASES (WC) ===				Quarter 4 2000 =====	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q4 - Maximum Organ Dose	ADULT	LIVER	7.71E-04	1.00E+01	7.71E-03
Q4 - Total Body Dose	ADULT		7.71E-04	3.00E+00	2.57E-02

Maximum Organ  
 Critical Pathway: Fresh Water Fish  
 Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

Total Body  
 Critical Pathway: Fresh Water Fish  
 Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT  
 PERIOD 1/1/00 TO 1/1/01  
 LIQUID ANNUAL DOSE SUMMARY REPORT

Catawba Nuclear Station Units 1 & 2

ANNUAL 2000

=== BATCH LIQUID RELEASES ===== Annual 2000 =====

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Yr - Maximum Organ Dose	ADULT	GI-LLI	1.21E-01	2.00E+01	6.03E-01
Yr - Total Body Dose	ADULT		4.37E-02	6.00E+00	7.28E-01

Maximum Organ

Critical Pathway: Fresh Water Fish

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
NB-95	5.88E+01
H-3	2.35E+01
CO-60	7.86E+00
CO-58	5.75E+00

Total Body

Critical Pathway: Fresh Water Fish

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	6.49E+01
CS-137	2.61E+01
CO-60	6.19E+00

=== CONTINUOUS LIQUID RELEASES (WC) ===== Annual 2000 =====

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Yr - Maximum Organ Dose	ADULT	LIVER	1.17E-03	2.00E+01	5.83E-03
Yr - Total Body Dose	ADULT		1.17E-03	6.00E+00	1.94E-02

Maximum Organ

Critical Pathway: Fresh Water Fish

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

Total Body

Critical Pathway: Fresh Water Fish

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	1.00E+02

**Catawba Nuclear Station  
2000 Radioactive Effluent Releases  
40CFR190 Uranium Fuel Cycle Dose\* Calculation Results**

**Maximum Total Body Dose = 1.24E+00 mrem**

Maximum Location: 0.5 Mile, North-East Sector  
Critical Age = Child

**Liquid and Gas Effluent Contribution to Maximum Total Body Dose**

Liquid Effluent Dose = 3.45E-02 mrem = 3% of total

Critical Path = Potable Water  
Major Contributors = H-3 (80.0%)  
                          Co-60 (9.0%)  
                          Cs-137 (7.1%)

Gas Effluent Dose = 1.21E+00 mrem = 97% of total

Critical Path = Vegetation  
Major Contributor = H-3 (100%)

**Maximum Organ Dose = 1.26E+00 mrem**

Maximum Location: 0.5 Mile, North-East Sector  
Critical Age = Child  
Critical Organ = GI-LLI

**Liquid and Gas Effluent Contribution to Maximum Organ Dose**

Liquid Effluent Dose = 5.24E-02 mrem = 4% of total

Critical Path = Fresh Water Fish  
Major Contributors = H-3 (52.7%)  
                          Nb-95 (34.3%)  
                          Co-60 (7.6%)

Gas Effluent Dose = 1.21E+00 mrem = 96% of total

Critical Path = Vegetation  
Major Contributor = H-3 (100%)

\* Annual dose limits from 40CFR190.10(a) of 25 mrem whole body, 75 mrem to the thyroid, and 25 mrem to any other organ.

**ATTACHMENT VII**

**Revisions to the**

**Offsite Dose Calculation Manual (ODCM)**

**and**

**Process Control Program (PCP) Manual**





Duke Power Company  
A Duke Energy Company  
EC07H  
526 South Church Street  
P.O. Box 1006  
Charlotte, NC 28201-1006

M. S. Tuckman  
Executive Vice President  
Nuclear Generation

(704) 382-2200 OFFICE  
(704) 382-4360 FAX

January 31, 2000

U. S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

Subject: Duke Energy Corporation  
Oconee Nuclear Station, Units 1, 2, and 3  
Docket Nos. 50-269, 50-270, 50-287  
McGuire Nuclear Station, Units 1 and 2  
Docket Nos. 50-369, 50-370  
Catawba Nuclear Station, Units 1 and 2  
Docket Nos. 50-413, 50-414  
Offsite Dose Calculation Manual (ODCM) Revisions

Pursuant to Technical Specifications (TS) Section 5.5.1.c for Oconee, McGuire, and Catawba Nuclear Stations, enclosed are revisions to the Duke Power Company ODCM effective January 1, 2000. A complete copy of the entire ODCM is hereby transmitted with the original of this letter.

Also enclosed are copies of the revised pages of the ODCM to be inserted in Control Copy No. 33 (assigned to ONRR) and Control Copy No. 34 (assigned to Region II) along with an approval letter and justifications for the revisions for each section. For these copies, please insert the revised pages as follows:

The approval letter for the Generic Information section along with the justification for Revision 43 should be placed in front of the entire manual behind the Generic Information tab. The revised pages should be inserted according to the insertion instructions on the Generic Information approval letter.

The approval letter for the Oconee section along with the justification for Revision 40 should be placed behind the Oconee tab. The revised pages should be inserted according to the insertion instructions on the Oconee approval letter.

The approval letter for the McGuire section along with the justification for Revision 41 should be placed behind the McGuire tab. The revised pages should be inserted according to the insertion instructions on the McGuire approval letter.

January 31, 2000  
Document Control Desk  
Page 2

The approval letter for the Catawba section along with the justification for Revision 42 should be placed behind the Catawba tab. The revised pages should be inserted according to the insertion instructions on the Catawba approval letter.

If you have any questions, please contact L. B. Jones at (704) 382-4753.

Very truly yours,



M. S. Tuckman

Attachments (Original only - entire copy of updated ODCM)  
1 - Generic Information  
2 - Oconee  
3 - McGuire  
4 - Catawba

xc: With Attachments (Revised Pages)

D. E. LaBarge, Project Manager  
ONRR

T. R. Decker, Chief, Radiological Effluents & Chemistry  
Region II

Dale Dusenbury  
State of North Carolina, Division of Radiation Protection

Without Attachments

L. A. Reyes, Administrator, Region II  
F. Rinaldi, Project Manager, ONRR  
C. P. Patel, Project Manager, ONRR  
M. C. Shannon, Senior Resident Inspector, ONS  
S. M. Shaeffer, Senior Resident Inspector, MNS  
D. J. Roberts, Senior Resident Inspector, CNS



M. S. Tuckman  
Executive Vice President  
Nuclear Generation

Duke Power Company  
A Duke Energy Company  
EC07H  
526 South Church Street  
P.O. Box 1006  
Charlotte, NC 28201-1006

(704) 382-2200 OFFICE  
(704) 382-4360 FAX

July 27, 2000

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555

Subject: Duke Energy Corporation  
Catawba Nuclear Station Units 1 and 2  
Docket Nos. 50-413 and 50-414  
Process Control Program (PCP) Manual

Please find attached 6 copies of Revision 9 to the Duke Power Company Catawba Nuclear Station (CNS) Process Control Program (PCP) Manual. These copies are provided for manual numbers 26, 27, 28, 29, 30, and 31. Please discard all pages behind the Chapter "V. CATAWBA PCP" tab in the PCP Manual and replace with the attached pages for each manual.

By copy of this letter, Revision 9 is also being provided to Region II for manual number 22.

If you have any questions, please contact L. B. Jones at (704) 382-4753.

Very truly yours,

M. S. Tuckman

Attachments:

xc: Mr. L. A. Reyes, Regional Administrator  
U. S. Nuclear Regulatory Commission  
Region II  
Atlanta, GA 30303

w/o attachments

Mr. C. P. Patel, Project Manager, CNS, ONRR  
Mr. D. J. Roberts, Sr. Res. Inspector, CNS