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Vice President

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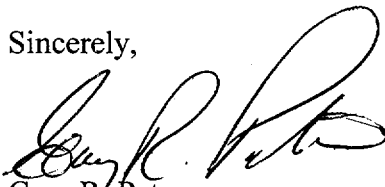
Subject: Catawba Nuclear Stations, Units 1 and 2
Docket Nos. 50-413 and 50-414
1999 Annual Radioactive Effluent Release Report

Pursuant to Catawba Nuclear Station Technical Specification 5.6.3 and Selected Licensee Commitment 16.11-16.2, please find enclosed the Catawba Annual Radioactive Effluent Release Report for the period of January 1, 1999 through December 31, 1999.

Attachment I - Radioactive Effluent Releases
Attachment II - Supplemental Information
Attachment III - Fuel Cycle Dose Calculation Results
Attachment IV - Solid Waste Disposal Report
Attachment V - Meteorological Data
Attachment VI - Unplanned Offsite Releases
Attachment VII - Assessment of Radiation Dose from Radioactive
Effluents to Members of the Public
Attachment VIII - ODCM/PCP Manual Changes

Questions concerning this report may be directed to Kay Nicholson at 803-831-3237.

Sincerely,



Gary R. Peterson

Attachment

xc: L. A. Reyes, Regional Administrator
C. P. Patel, ONRR
D. J. Roberts, SRI

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ATTACHMENT I

Summary of Liquid and Gaseous Effluents Report

CATAWBA NUCLEAR STATION

EFFLUENT RELEASE DATA

(January 1, 1999 through December 31, 1999)

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 1/1/99 TO 1/1/00
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

Catawba Nuclear Station Units 1 & 2

REPORT FOR 1999	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
A. Fission and Activation Gases						
1. Total Release	Ci	1.58E+01	2.35E+01	1.86E+01	9.60E+00	6.75E+01
2. Average Release Rate	µCi/sec	2.04E+00	2.99E+00	2.34E+00	1.21E+00	2.14E+00
B. Iodine-131						
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Release Rate	µCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C. Particulates Half Life >= 8 days						
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Release Rate	µCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
D. Tritium						
1. Total Release	Ci	4.39E+01	7.76E+01	4.93E+01	4.79E+01	2.19E+02
2. Average Release Rate	µCi/sec	5.64E+00	9.86E+00	6.20E+00	6.02E+00	6.93E+00

TABLE 1B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
 PERIOD 1/1/99 TO 1/1/00
 GASEOUS EFFLUENTS - ELEVATED RELEASES - CONTINUOUS MODE

Catawba Nuclear Station Units 1 & 2

REPORT FOR 1999	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 1/1/99 TO 1/1/00
GASEOUS EFFLUENTS - ELEVATED RELEASES - BATCH MODE

Catawba Nuclear Station Units 1 & 2

REPORT FOR 1999	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 1C

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/99 TO 1/1/00
GASEOUS EFFLUENTS - GROUND RELEASES - CONTINUOUS MODE

Catawba Nuclear Station Units 1 & 2

REPORT FOR 1999	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
1. Fission and Activation Gases						
XE-133	Ci	1.54E+01	2.33E+01	1.84E+01	9.30E+00	6.64E+01
Totals for Period...	Ci	1.54E+01	2.33E+01	1.84E+01	9.30E+00	6.64E+01
2. Iodines						
** No Nuclide Activities **						
3. Particulates Half Life >= 8 days						
** No Nuclide Activities **						
4. Tritium						
H-3	Ci	4.37E+01	7.74E+01	4.92E+01	4.78E+01	2.18E+02
Totals for Period...	Ci	4.37E+01	7.74E+01	4.92E+01	4.78E+01	2.18E+02

TABLE 1C

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
 PERIOD 1/1/99 TO 1/1/00
 GASEOUS EFFLUENTS - GROUND RELEASES - BATCH MODE

Catawba Nuclear Station Units 1 & 2

REPORT FOR 1999	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR

1. Fission and Activation Gases						
AR-41	Ci	2.49E-01	1.01E-01	1.53E-01	1.82E-01	6.85E-01
KR-85	Ci	0.00E+00	0.00E+00	1.31E-02	0.00E+00	1.31E-02
KR-85M	Ci	0.00E+00	0.00E+00	5.95E-04	0.00E+00	5.95E-04
XE-131M	Ci	0.00E+00	4.79E-04	0.00E+00	0.00E+00	4.79E-04
XE-133	Ci	1.35E-01	7.90E-02	6.72E-02	1.11E-01	3.92E-01
XE-135	Ci	1.93E-03	1.97E-03	2.07E-04	7.00E-04	4.80E-03
		-----	-----	-----	-----	-----
Totals for Period...	Ci	3.86E-01	1.82E-01	2.34E-01	2.94E-01	1.10E+00
2. Iodines						
** No Nuclide Activities **						
3. Particulates Half Life >= 8 days						
** No Nuclide Activities **						
4. Tritium						
H-3	Ci	1.37E-01	1.03E-01	6.77E-02	5.79E-02	3.65E-01
		-----	-----	-----	-----	-----
Totals for Period...	Ci	1.37E-01	1.03E-01	6.77E-02	5.79E-02	3.65E-01

TABLE 2A

**EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/99 TO 1/1/00
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES**

Catawba Nuclear Station Units 1 & 2

REPORT FOR 1999	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
A. Fission and Activation Products						
1. Total Release	Ci	2.04E-02	4.72E-02	9.96E-03	1.15E-02	8.90E-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	8.66E-10	2.11E-09	4.70E-10	5.86E-10	1.03E-09
B. Tritium						
1. Total Release	Ci	1.79E+02	7.70E+02	1.12E+02	1.80E+02	1.24E+03
2. Average Diluted Concentration						
a. Continuous Releases	µCi/ml	8.11E-08	2.81E-07	2.62E-07	1.58E-07	1.95E-07
b. Batch Releases	µCi/ml	7.60E-06	3.45E-05	5.27E-06	9.12E-06	1.43E-05
C. Dissolved and Entrained Gases						
1. Total Release	Ci	0.00E+00	1.30E-06	2.60E-06	0.00E+00	3.90E-06
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	5.81E-14	1.23E-13	0.00E+00	4.50E-14
D. Gross Alpha Radioactivity						
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
E. Volume of Liquid Waste						
1. Continuous Releases	liters	5.62E+07	9.82E+07	9.14E+07	5.78E+07	3.04E+08
2. Batch Releases	liters	7.21E+05	2.32E+06	5.22E+05	5.81E+05	4.14E+06
F. Volume of Dilution Water						
1. Continuous Releases	liters	2.35E+09	2.23E+09	2.12E+09	1.97E+09	8.67E+09
2. Batch Releases	liters	2.35E+10	2.23E+10	2.12E+10	1.97E+10	8.67E+10

TABLE 2B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/99 TO 1/1/00
LIQUID EFFLUENTS - CONTINUOUS MODE

Catawba Nuclear Station Units 1 & 2

REPORT FOR 1999	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
1. Fission and Activation Gases						
** No Nuclide Activities **						
2. Tritium						
H-3	Ci	1.95E-01	6.54E-01	5.80E-01	3.21E-01	1.75E+00
Totals for Period...	Ci	1.95E-01	6.54E-01	5.80E-01	3.21E-01	1.75E+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 1/1/99 TO 1/1/00
LIQUID EFFLUENTS - BATCH MODE**

Catawba Nuclear Station Units 1 & 2

REPORT FOR 1999	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
1. Fission and Activation Gases						
AG-110M	Ci	2.47E-05	6.40E-05	6.28E-06	0.00E+00	9.50E-05
CO-57	Ci	2.87E-05	4.20E-05	4.46E-05	2.92E-05	1.45E-04
CO-58	Ci	2.93E-03	1.47E-02	6.65E-03	2.62E-03	2.69E-02
CO-60	Ci	5.50E-03	4.59E-03	2.25E-03	4.46E-03	1.68E-02
CR-51	Ci	2.20E-04	4.48E-03	1.02E-04	2.81E-04	5.08E-03
CS-134	Ci	3.06E-05	1.54E-05	0.00E+00	1.61E-06	4.75E-05
CS-136	Ci	0.00E+00	0.00E+00	2.64E-05	0.00E+00	2.64E-05
CS-137	Ci	6.67E-05	5.14E-04	4.32E-05	1.38E-04	7.62E-04
F-18	Ci	1.47E-05	9.86E-07	7.68E-07	0.00E+00	1.65E-05
FE-59	Ci	0.00E+00	3.02E-04	1.73E-05	0.00E+00	3.19E-04
I-131	Ci	0.00E+00	1.43E-06	0.00E+00	0.00E+00	1.43E-06
I-133	Ci	0.00E+00	2.65E-06	0.00E+00	0.00E+00	2.65E-06
MN-54	Ci	5.51E-04	6.68E-04	2.85E-04	2.54E-04	1.76E-03
MO-99	Ci	0.00E+00	0.00E+00	5.17E-05	0.00E+00	5.17E-05
NB-95	Ci	8.03E-05	1.75E-04	6.31E-05	1.13E-05	3.30E-04
NB-97	Ci	9.69E-05	1.06E-04	3.92E-05	2.25E-05	2.64E-04
SB-124	Ci	8.98E-04	8.09E-04	0.00E+00	2.07E-05	1.73E-03
SB-125	Ci	9.84E-03	2.06E-02	3.76E-04	3.69E-03	3.45E-02
SR-92	Ci	1.74E-05	9.15E-06	2.23E-06	0.00E+00	2.88E-05
Y-92	Ci	5.65E-05	0.00E+00	0.00E+00	0.00E+00	5.65E-05
ZN-65	Ci	0.00E+00	0.00E+00	0.00E+00	2.04E-05	2.04E-05
ZR-95	Ci	0.00E+00	1.33E-04	0.00E+00	5.98E-06	1.39E-04
Totals for Period...	Ci	2.04E-02	4.72E-02	9.96E-03	1.16E-02	8.91E-02
2. Tritium						
H-3	Ci	1.79E+02	7.69E+02	1.12E+02	1.80E+02	1.24E+03
Totals for Period...	Ci	1.79E+02	7.69E+02	1.12E+02	1.80E+02	1.24E+03
3. Dissolved and Entrained Gases						
AR-41	Ci	0.00E+00	0.00E+00	2.60E-06	0.00E+00	2.60E-06
XE-135	Ci	0.00E+00	1.30E-06	0.00E+00	0.00E+00	1.30E-06
Totals for Period...	Ci	0.00E+00	1.30E-06	2.60E-06	0.00E+00	3.90E-06
4. Gross Alpha Radioactivity						
** No Nuclide Activities **						

CATAWBA NUCLEAR STATION
SUPPLEMENTAL INFORMATION

CATAWBA NUCLEAR STATION

1999 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. $1.51\text{E}+02$ = TOTAL NUMBER OF BATCH RELEASES
2. $9.04\text{E}+03$ = TOTAL TIME (MIN.) FOR BATCH RELEASES.
3. $1.80\text{E}+02$ = MAXIMUM TIME (MIN.) FOR A BATCH RELEASE.
4. $5.99\text{E}+01$ = AVERAGE TIME (MIN.) FOR A BATCH RELEASE.
5. $1.80\text{E}+01$ = MINIMUM TIME (MIN.) FOR A BATCH RELEASE.
6. $4.35\text{E}+04$ = AVERAGE DILUTION WATER FLOW DURING RELEASES (GPM).

B. GASEOUS EFFLUENT

1. $8.60\text{E}+01$ = TOTAL NUMBER OF BATCH RELEASES.
2. $9.93\text{E}+05$ = TOTAL TIME (MIN.) FOR BATCH RELEASES.
3. $4.73\text{E}+04$ = MAXIMUM TIME (MIN.) FOR A BATCH RELEASE.
4. $1.15\text{E}+04$ = AVERAGE TIME (MIN.) FOR A BATCH RELEASE.
5. $6.00\text{E}+01$ = MINIMUM TIME (MIN.) FOR A BATCH RELEASE.

VI. ABNORMAL RELEASES

A. LIQUID

1. NUMBER OF RELEASES = 1
2. TOTAL ACTIVITY RELEASED (CURIES) = $1.48\text{E}-03$ (gamma), $3.11\text{E}+00$ (H-3) (See Attachment)

B. GASEOUS

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

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 $\pm 25.2\%$. 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 = $\pm 20\%$
- (2) Counting error = $\pm 15\%$
- (3) Sample preparation error = $\pm 3\%$

ATTACHMENT III

Fuel Cycle Dose Calculation Results

**Catawba Nuclear Station
1999 Radioactive Effluent Releases
40CFR190 Uranium Fuel Cycle Dose* Calculation Results**

Maximum Total Body Dose = 1.11E+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 = 6.28E-02 mrem = 6% of total

Critical Path = Potable Water
Major Contributors = H-3 (82.9%)
 Cs-137 (9.0%)
 Co-60 (5.4%)

Gas Effluent Dose = 1.04E+00 mrem = 94% of total

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

Maximum Organ Dose = 1.14E+00 mrem

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

Liquid and Gas Effluent Contribution to Maximum Organ Dose

Liquid Effluent Dose = 9.69E-02 mrem = 8% of total

Critical Path = Fish
Major Contributors = H-3 (53.7%)
 Cs-137 (39.2%)

Gas Effluent Dose = 1.04E+00 mrem = 92% 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 IV

The Solid Waste Disposal Report

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

REPORT PERIOD 1/1/99 THROUGH 12/31/99

<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</u>		<u>Total Activity</u>
					<u>(ft³)</u>	<u>(m³)</u>	<u>(Curies)</u>
1. Waste from Liquid Systems							
(A) Dewatered Secondary Resins	0	0	N/A	N/A	0	0	0
(B) Dewatered Primary Resins	3	3	1AS,2B	3HIC	446.4	12.64	160.1
(C) Evaporator Concentrates	0	0	N/A	N/A	0	0	0
(D) Dewatered Mechanical Filters	0	0	N/A	N/A	0	0	0
(E) Dewatered Demineralizers	0	0	N/A	N/A	0	0	0
(F) Solidified (Cement) Acids, Oils, Sludges (brokered)	2	2	2AS	2HIC	240.6	6.81	20.08
2. Dry Solid Waste							
(A) Dry Active Waste (compacted)	0	0	N/A	N/A	0	0	0
(B) Dry Active Waste (non-compacted)	2	2	2AS	2HIC	326.1	9.24	4.390
(C) Dry Active Waste (brokered)	---	---	---	---	424.5	12.02	2.418
(D) Irradiated Components	0	0	N/A	N/A	0	0	0
3. All Solid Waste	7 ^a	7 ^a	---	---	1437.6	40.71	186.9880

^aDoes not include brokered Dry Active Waste totals

CATAWBA NUCLEAR STATION - SOLID RADIOACTIVE WASTE

SUMMARY OF PRINCIPAL RADIONUCLIDE COMPOSITION

REPORT PERIOD 1/1/99 THROUGH 12/31/99

<u>Type of Waste</u>	<u>Radionuclide</u>	<u>% Abundance</u> *
1. Waste from Liquid Systems		
(A) Dewatered Secondary Resins	(none shipped this period)	
(B) Dewatered Primary Resins	Cr-51	1.0
	Mn-54	4.5
	Co-57	0.3
	Co-58	4.6
	Fe-59	0.1
	Co-60	11.6
	Sn-113	0.1
	Sb-125	0.3
	Cs-134	0.6
	Cs-137	1.6
	Ni-59	0.2
	C-14	0.2
	Fe-55	36.3
	Ni-63	38.3
(C) Evaporator Concentrates	(none shipped this period)	
(D) Dewatered Mechanical Filters	(none shipped this period)	
(E) Dewatered Demineralizers	(none shipped this period)	
(F) Solidified Acids, Oils, Sludges	H-3	21.8
	Cr-51	0.6
	Mn-54	0.5
	Co-58	0.5
	Co-60	11.5
	Nb-95	1.5
	Zr-95	3.3
	Ag-110m	0.2
	Sb-124	0.1
	Sb-125	0.2
	Cs-134	0.1
	Cs-137	1.2
	Ce-144	1.9
	Ba/La-140	1.7
	Fe-55	47.4
	Ni-63	7.6

* 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 1/1/99 THROUGH 12/31/99

<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	1.5
	Cr-51	1.6
	Mn-54	1.9
	Co-57	0.1
	Co-58	12.3
	Co-60	13.9
	Nb-95	0.4
	Zr-95	0.3
	Ag-110m	0.2
	Sb-124	0.1
	Sb-125	0.5
	Cs-134	0.1
	Cs-137	0.1
	Ce-144	0.1
	Ba/La-140	0.2
	Fe-55	57.5
	Ni-63	9.1
(C) Dry Active Waste (brokered)	H-3	1.5
	Cr-51	1.5
	Mn-54	1.9
	Co-57	0.1
	Co-58	12.1
	Co-60	14.0
	Nb-95	0.4
	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
	Ba/La-140	0.2
	Fe-55	57.8
	Ni-63	9.2
(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 1/1/99 THROUGH 12/31/99

<u>Type of Waste</u>	<u>Radionuclide</u>	<u>% Abundance</u> *
3. All Solid Waste	H-3	2.4
	Cr-51	1.0
	Mn-54	4.0
	Co-57	0.3
	Co-58	4.4
	Fe-59	0.1
	Co-60	11.7
	Nb-95	0.2
	Zr-95	0.4
	Sn-113	0.1
	Sb-125	0.3
	Cs-134	0.5
	Cs-137	1.5
	Ce-144	0.2
	Ba/La-140	0.2
	Ni-59	0.2
	C-14	0.2
	Fe-55	38.3
	Ni-63	34.0

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

ATTACHMENT V

Meteorological Data

CATAWBA NUCLEAR STATION
1999 METEOROLOGICAL JOINT FREQUENCY DISTRIBUTIONS
OF WIND SPEED, WIND DIRECTION, AND ATMOSPHERIC
STABILITY
USING WINDS AT THE 10M LEVEL
(Hours of Occurrence)

CATAWBA NUCLEAR STN. METEOROLOGY (1999):PROG=XOQFREQ
 10M WIND SPEED/DIRECTION
 (60-10M DELTA-T) TOWER STABILITY CLASSES

11:36 Friday, February 18, 2000

PASQUILL STABILITY A

	WIND SPEED CLASS								
	1.25-!	1.50-!	2.00-!	3.00-!	4.00-!	5.00-!	6.00-!	8.00-!	
	1.49	1.99	2.99	3.99	4.99	5.99	7.99	9.99	TOTAL
	Hours!	Hours!	Hours!	Hours!	Hours!	Hours!	Hours!	Hours!	Hours!
SECTOR									
-N-	!	!	3!	22!	30!	16!	6!	!	77!
-NNE-	!	!	4!	17!	33!	26!	13!	1!	94!
-NE-	!	!	!	4!	2!	8!	!	!	14!
-ENE-	!	!	1!	!	!	!	!	!	1!
-E-	!	!	5!	!	!	!	!	!	5!
-ESE-	!	!	2!	!	!	!	!	!	3!
-SE-	!	1!	1!	6!	3!	!	!	!	11!
-SSE-	!	!	7!	9!	!	!	!	!	16!
-S-	!	!	3!	7!	5!	!	!	!	15!
-SSW-	!	1!	1!	7!	26!	18!	4!	1!	58!
-SW-	!	!	!	16!	20!	18!	10!	1!	65!
-WSW-	!	!	!	13!	10!	9!	1!	!	33!
-W-	!	!	1!	4!	11!	3!	1!	!	20!
-WNW-	!	!	!	1!	7!	4!	2!	!	14!
-NW-	!	!	!	1!	1!	4!	5!	5!	16!
-NNW-	!	!	!	3!	4!	4!	6!	2!	19!
TOTAL	!	2!	4!	76!	141!	130!	79!	28!	461!

10M WIND SPEED/DIRECTION

(60-10M DELTA-T) TOWER STABILITY CLASSES

PASQUILL STABILITY B

	WIND SPEED CLASS									
	1.00-	1.25-	1.50-	2.00-	3.00-	4.00-	5.00-	6.00-	8.00-	
	1.24	1.49	1.99	2.99	3.99	4.99	5.99	7.99	9.99	TOTAL
	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours
SECTOR										
-N-	..	..	..	8	24	22	12	1	..	67
-NNE-	..	..	1	4	22	21	15	7	3	73
-NE-	..	..	..	5	2	3	3	1	..	14
-ENE-	..	..	..	5	1	2	..	..	..	8
-E-	..	..	..	1	..	..	..	..	..	1
-ESE-	..	..	1	2	1	1	..	..	..	5
-SE-	..	..	1	11	2	2	..	..	..	16
-SSE-	..	..	1	20	9	..	..	..	..	30
-S-	..	..	1	9	8	4	..	..	..	22
-SSW-	..	..	1	22	22	12	4	2	..	63
-SW-	..	..	..	23	17	10	4	4	..	58
-WSW-	..	..	4	14	7	..	..	..	..	25
-W-	..	..	1	4	1	1	..	..	..	7
-WNW-	..	1	..	..	4	2	3	..	..	10
-NW-	..	..	..	2	3	2	2	..	..	9
-NNW-	1	..	..	..	12	8	6	2	..	29
TOTAL	1	1	11	130	135	90	49	17	3	437

CATAWBA NUCLEAR STN. METEOROLOGY (1999):PROG=XOQFREQ
 10M WIND SPEED/DIRECTION
 (60-10M DELTA-T) TOWER STABILITY CLASSES

11:36 Friday, February 18, 2000

PASQUILL STABILITY C

	WIND SPEED CLASS						
	1.50-	2.00-	3.00-	4.00-	5.00-	6.00-	
	1.99	2.99	3.99	4.99	5.99	7.99	TOTAL
	Hours	Hours	Hours	Hours	Hours	Hours	Hours
SECTOR							
-N-	.!	22!	55!	15!	5!	1!	98!
-NNE-	.!	15!	27!	42!	19!	16!	119!
-NE-	1!	4!	4!	10!	9!	1!	29!
-ENE-	.!	4!	7!	1!	1!	.!	13!
-E-	.!	3!	.!	1!	.!	.!	4!
-ESE-	1!	2!	.!	.!	.!	.!	3!
-SE-	1!	10!	2!	.!	.!	.!	13!
-SSE-	7!	30!	7!	.!	.!	.!	44!
-S-	3!	14!	4!	1!	.!	.!	22!
-SSW-	4!	38!	25!	9!	.!	1!	77!
-SW-	3!	35!	10!	8!	3!	2!	61!
-WSW-	9!	19!	4!	.!	3!	.!	35!
-W-	4!	12!	4!	3!	1!	.!	24!
-WNW-	2!	17!	6!	.!	1!	.!	26!
-NW-	1!	8!	4!	3!	1!	1!	18!
-NNW-	2!	10!	13!	7!	5!	3!	40!
TOTAL	38!	243!	172!	100!	48!	25!	626!

CATAWBA NUCLEAR STN. METEOROLOGY (1999):PROG=XOQFREQ

11:36 Friday, February 18, 2000

10M WIND SPEED/DIRECTION

(60-10M DELTA-T) TOWER STABILITY CLASSES

PASQUILL STABILITY D

	WIND SPEED CLASS											
	0.45-	0.75-	1.00-	1.25-	1.50-	2.00-	3.00-	4.00-	5.00-	6.00-	8.00-	
	0.74	0.99	1.24	1.49	1.99	2.99	3.99	4.99	5.99	7.99	9.99	TOTAL
	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours
SECTOR												
-N-	.!	.!	.!	6!	23!	126!	159!	115!	38!	26!	3!	496!
-NNE-	.!	.!	.!	1!	7!	53!	133!	134!	41!	31!	7!	407!
-NE-	.!	1!	.!	1!	10!	31!	41!	60!	28!	11!	.!	183!
-ENE-	.!	.!	.!	1!	9!	14!	10!	7!	3!	.!	.!	44!
-E-	.!	.!	.!	1!	9!	16!	6!	.!	3!	.!	.!	35!
-ESE-	.!	.!	.!	5!	12!	13!	3!	.!	1!	.!	.!	34!
-SE-	.!	.!	2!	7!	21!	34!	24!	5!	.!	.!	.!	93!
-SSE-	.!	2!	2!	15!	47!	89!	44!	6!	2!	1!	.!	208!
-S-	1!	2!	7!	9!	51!	100!	30!	9!	2!	.!	.!	211!
-SSW-	.!	.!	7!	15!	71!	146!	56!	30!	7!	.!	.!	332!
-SW-	.!	1!	2!	13!	56!	75!	32!	16!	11!	3!	.!	209!
-WSW-	.!	3!	9!	14!	13!	24!	12!	6!	1!	.!	.!	82!
-W-	1!	3!	7!	9!	18!	17!	9!	2!	2!	1!	.!	69!
-WNW-	.!	2!	2!	10!	22!	29!	11!	8!	4!	2!	.!	90!
-NW-	.!	1!	3!	4!	10!	27!	10!	5!	5!	3!	.!	68!
-NNW-	.!	.!	3!	10!	23!	73!	41!	21!	20!	7!	1!	199!
-CALM-	1!	.!	.!	.!	.!	.!	.!	.!	.!	.!	.!	1!
TOTAL	3!	15!	44!	121!	402!	867!	621!	424!	168!	85!	11!	2761!

CATAWBA NUCLEAR STN. METEOROLOGY (1999):PROG=XOQFREQ

11:36 Friday, February 18, 2000

10M WIND SPEED/DIRECTION

(60-10M DELTA-T) TOWER STABILITY CLASSES

PASQUILL STABILITY E

	WIND SPEED CLASS											
	0.45-	0.75-	1.00-	1.25-	1.50-	2.00-	3.00-	4.00-	5.00-	6.00-	8.00-	
	0.74	0.99	1.24	1.49	1.99	2.99	3.99	4.99	5.99	7.99	9.99	TOTAL
	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours
SECTOR												
-N-	.	1	2	6	16	92	80	23	3	2	.	225
-NNE-	.	.	2	1	2	14	17	14	2	2	1	55
-NE-	.	.	1	.	5	4	9	16	9	7	.	51
-ENE-	.	.	.	1	5	11	5	1	2	.	.	25
-E-	.	.	1	.	3	6	3	.	.	.	.	13
-ESE-	.	.	4	4	11	13	3	2	1	.	.	38
-SE-	.	2	3	5	10	35	25	9	1	.	.	90
-SSE-	.	3	7	13	43	67	32	10	3	.	.	178
-S-	1	5	7	20	88	115	36	6	1	.	.	279
-SSW-	.	6	5	31	80	89	41	8	1	.	.	261
-SW-	.	8	12	40	51	60	15	7	1	.	.	194
-WSW-	1	9	17	18	30	24	14	.	.	.	.	113
-W-	.	7	7	15	28	20	1	.	.	.	.	78
-WNW-	1	6	10	13	28	38	5	3	.	.	.	104
-NW-	.	1	12	12	27	59	13	4	3	.	.	131
-NNW-	.	2	5	11	32	117	73	24	4	4	1	273
TOTAL	3	50	95	190	459	764	372	127	31	15	2	2108

CATAWBA NUCLEAR STN. METEOROLOGY (1999):PROG=XOQFREQ

11:36 Friday, February 18, 2000

10M WIND SPEED/DIRECTION

(60-10M DELTA-T) TOWER STABILITY CLASSES

PASQUILL STABILITY F

	WIND SPEED CLASS									
	0.45-!	0.75-!	1.00-!	1.25-!	1.50-!	2.00-!	3.00-!	4.00-!	5.00-!	
	0.74 !	0.99 !	1.24 !	1.49 !	1.99 !	2.99 !	3.99 !	4.99 !	5.99 !	TOTAL !
	Hours!	Hours!	Hours!	Hours!	Hours!	Hours!	Hours!	Hours!	Hours!	Hours!
SECTOR										
-N-	!	!	!	3!	1!	10!	47!	14!	!	75!
-NNE-	!	!	!	!	!	!	!	2!	!	2!
-NE-	!	!	!	1!	!	!	1!	!	1!	4!
-ENE-	!	1!	!	!	!	!	!	1!	!	2!
-E-	!	!	!	1!	!	1!	!	1!	!	3!
-ESE-	!	!	!	!	!	!	3!	1!	!	4!
-SE-	!	!	!	!	!	4!	1!	11!	8!	24!
-SSE-	!	!	1!	3!	8!	24!	12!	3!	4!	55!
-S-	!	1!	1!	11!	35!	73!	22!	!	!	143!
-SSW-	!	1!	5!	11!	35!	54!	23!	!	!	129!
-SW-	!	!	10!	9!	19!	19!	2!	!	!	59!
-WSW-	!	!	10!	9!	18!	18!	4!	!	!	59!
-W-	!	1!	5!	13!	14!	25!	7!	!	!	65!
-WNW-	!	!	3!	10!	21!	24!	28!	2!	!	88!
-NW-	!	1!	1!	4!	17!	24!	27!	8!	!	82!
-NNW-	!	1!	2!	3!	12!	45!	103!	7!	!	173!
-CALM-	!	1!	!	!	!	!	!	!	!	1!
TOTAL	!	7!	38!	78!	180!	321!	280!	50!	13!	968!

CATAWBA NUCLEAR STN. METEOROLOGY (1999):PROG=XOQFREQ
 10M WIND SPEED/DIRECTION
 (60-10M DELTA-T) TOWER STABILITY CLASSES

11:36 Friday, February 18, 2000

PASQUILL STABILITY G

	WIND SPEED CLASS							
	0.45-	0.75-	1.00-	1.25-	1.50-	2.00-	3.00-	
	0.74	0.99	1.24	1.49	1.99	2.99	3.99	TOTAL
	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours
SECTOR								
-N-	.	1	2	.	6	28	6	43
-NNE-	.	.	1	.	.	.	.	1
-NE-	.	.	1	.	.	.	.	1
-E-	.	1	.	.	.	.	.	1
-SE-	.	.	.	.	.	1	.	1
-SSE-	1	4	3	10	21	4	.	43
-S-	2	9	23	50	51	8	.	143
-SSW-	1	9	24	54	37	4	.	129
-SW-	3	15	22	27	27	9	.	103
-WSW-	2	10	16	17	16	3	.	64
-W-	4	13	7	13	9	14	.	60
-WNW-	2	19	17	19	22	6	2	87
-NW-	7	14	30	26	12	5	.	94
-NNW-	4	3	13	38	43	48	.	149
-CALM-	3	.	.	.	.	.	.	3
TOTAL	29	98	159	254	244	130	8	922

CATAWBA NUCLEAR STN. METEOROLOGY (1999):PROG=XOQFREQ

11:36 Friday, February 18, 2000

10M WIND SPEED/DIRECTION

(60-10M DELTA-T) TOWER STABILITY CLASSES

ALL STABILITY CLASSES

	WIND SPEED CLASS											
	0.45-	0.75-	1.00-	1.25-	1.50-	2.00-	3.00-	4.00-	5.00-	6.00-	8.00-	
	0.74	0.99	1.24	1.49	1.99	2.99	3.99	4.99	5.99	7.99	9.99	TOTAL
	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours
SECTOR												
-N-	.!	2!	7!	13!	55!	326!	360!	205!	74!	36!	3!	1081!
-NNE-	.!	.!	3!	2!	10!	90!	218!	244!	103!	69!	12!	751!
-NE-	.!	1!	3!	1!	16!	45!	60!	92!	58!	20!	.!	296!
-ENE-	1!	.!	.!	2!	14!	35!	24!	11!	6!	.!	.!	93!
-E-	.!	1!	2!	1!	13!	31!	10!	1!	3!	.!	.!	62!
-ESE-	.!	.!	4!	9!	26!	35!	8!	3!	2!	.!	.!	87!
-SE-	.!	2!	5!	13!	38!	98!	67!	24!	1!	.!	.!	248!
-SSE-	1!	10!	15!	46!	143!	229!	104!	20!	5!	1!	.!	574!
-S-	5!	17!	48!	114!	267!	271!	85!	25!	3!	.!	.!	835!
-SSW-	2!	20!	47!	136!	248!	329!	170!	77!	16!	4!	.!	1049!
-SW-	3!	34!	45!	99!	156!	220!	94!	59!	29!	10!	.!	749!
-WSW-	3!	32!	51!	67!	90!	101!	47!	15!	5!	.!	.!	411!
-W-	6!	28!	34!	51!	86!	78!	26!	9!	4!	1!	.!	323!
-WNW-	3!	30!	39!	64!	98!	119!	37!	17!	10!	2!	.!	419!
-NW-	8!	17!	49!	59!	74!	129!	39!	18!	16!	9!	.!	418!
-NNW-	5!	7!	25!	71!	145!	354!	150!	64!	41!	18!	2!	882!
-CALM-	5!	.!	.!	.!	.!	.!	.!	.!	.!	.!	.!	5!
TOTAL	42!	201!	377!	748!	1479!	2490!	1499!	884!	376!	170!	17!	8283!

ATTACHMENT VI

Unplanned Offsite Releases

CATAWBA NUCLEAR STATION

UNPLANNED RELEASES

(January 1, 1999 through December 31, 1999)

There was 1 unplanned liquid release a Catawba Nuclear Station in 1999. There were no unplanned gaseous radioactivity releases to the environment in 1999.

Occurred: 12/01/99 10:35 (Refer to PIP 0-C99-04847)

During 1999 there was one recorded Abnormal Effluent Release at Catawba Nuclear Station. "Waste Monitor Tank -A" was sampled on 11/30/99 at 12:55 by Radwaste Chemistry. The 1000 ml sample was analyzed by the Count Room on 11/30/99 at 14:05. RP Compliance created the Liquid Waste Release (LWR) Pre-Release package (LWR 1999152) at 14:37. The results for the sample were as follows ($\mu\text{Ci}/\text{ml}$):

Mn-54	7.72E-07
Co-58	2.28E-06
Co-60	9.36E-06
Cs-137	4.13E-07
H-3	2.67E-01

The calculated or "Expected EMF 49(L) reading" (cpm) was 1.06E+04
Trip 2 Setpoint was 1.20E+05 cpm
Trip 1 Setpoint was 8.40E+04 cpm

The release was initiated on 12/1/99 at 10:09. The Trip 2 Alarm (EMF 49L) occurred at 10:35. The release was immediately secured and control valve 1WL124 closed. A total of 2100 gallons were released from the tank. PIP 0-C99-04847 was initiated by Radwaste Chemistry at 11:06.

As a result of this occurrence, RP Staff and Chemistry Staff investigated possible causes for the Trip 2 alarm. Radwaste Chemistry responded to the alarm by obtaining additional samples from the tank. The samples were analyzed in the Count Room and the results were as follows ($\mu\text{Ci}/\text{ml}$):

	Sample 1 (12/1/99 @ 15:55)	Sample 2 (12/1/99 @ 16:00)
Mn-54	1.57E-06	2.10E-06
Co-58	4.18E-06	3.62E-06
Co-60	6.53E-06	7.07E-05
Sb-125	1.16E-06	1.27E-06
Cs-137	3.53E-06	3.27E-06

RP Staff evaluated the samples and created a correlation between EMF 49(L) cpm output at the Trip 2 alarm point (~125,000 cpm). When the count rate was converted directly to a "Cs-137 based" equivalence concentration, the total tank concentration would have been $\sim 3.6\text{E-}04 \mu\text{Ci}/\text{cc}$.

The correlated concentration was obtained by using each identified isotope's higher value from the two samples (from table above) and converted to a concentration to come up with the Trip 2 concentrations, the following data was obtained (μCi/cc):

Mn-54	4.92E-06
Co-58	9.53E-06
Co-60	1.61E-04
Sb-125	2.89E-06
Cs-137	8.04E-06

Gamma Total: 1.86E-04

H-3	3.91E-01 [concentration obtained (per SLC 16.11-1) for Monthly Composite from 11/99 WL release samples]
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Radiological Consequences:

The WMT-A sample collected as the original sample for creation of the LWR Pre-Release package was clearly not representative of the tank contents released on 12/1/99. According to Chemistry Staff, the tank contents had been stirred and/or agitated prior to the release, but following the original sampling. The agitation could have broken up solids and caused a particle or more solid media to travel through EMF 49(L). A Trip 2 alarm is an extremely "non-routine" occurrence here at Catawba. Based on the information given by Chemistry personnel, the samples collected following the Trip 2 were more indicative of the tank concentration. The LWR Closed Permit report for the release, when calculated with the appropriate, known Nuclear Service Water (RL) system dilution rate resulted in the following "Diluted EC Ratios":

Mn-54	3.30E-04
Co-58	9.60E-04
Co-60	1.08E-01
Sb-125	1.94E-04
Cs-137	1.62E-02
H-3	7.88E-01

10CFR20, Appendix B, Table 2, Column 2 provides the basis for the EC limits in liquid offsite releases. SLC Bases allow a limit of "not to exceed 10 times the stated EC limits in 10CFR20 Appendix B, Table 2, Column2. Therefore, the Diluted EC Ratios for the correlated isotope mixture did not meet or exceed the set limits.

Conclusion:

As a result of this unplanned (abnormal) release here at Catawba, no effluent release limits were approached or exceeded. The EMF monitors performed all designed functions and the liquid waste release was terminated effectively. The actions taken by Site personnel to prevent this type of event from occurring in the future should be documented in the PIP.

ATTACHMENT VII

Assessment of Radiation Dose from

Radioactive Effluents to

Members of the Public

CATAWBA NUCLEAR STATION

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

(January 1, 1999 through December 31, 1999)

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 1/1/99 TO 1/1/00
GASEOUS ANNUAL DOSE SUMMARY REPORT**

Catawba Nuclear Station Units 1 & 2

1st Quarter 1999

=== IODINE, H3, AND PARTICULATE DOSE LIMIT ANALYSIS===== Quarter 1 1999 ===

Period-Limit	Critical Group	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q1 - Maximum Organ Dose	CHILD	LIVER	2.09E-01	1.50E+01	1.39E+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 1999 ===

Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Q1 - Maximum Gamma Air Dose	8.70E-03	1.00E+01	8.70E-02

Maximum Gamma Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
XE-133	7.03E+01
AR-41	2.96E+01

Q1 - Maximum Beta Air Dose	1.91E-02	2.00E+01	9.55E-02
----------------------------	----------	----------	----------

Maximum Beta Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
XE-133	9.52E+01

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/99 TO 1/1/00
GASEOUS ANNUAL DOSE SUMMARY REPORT

Catawba Nuclear Station Units 1 & 2

2nd Quarter 1999

```

=== IODINE, H3, AND PARTICULATE DOSE LIMIT ANALYSIS===== Quarter 2 1999 ====
Period-Limit          Critical Critical Dose      Limit  Max % of
                        Group    Organ  (mrem)  (mrem)  Limit
-----
Q2 - Maximum Organ Dose  CHILD    LIVER   3.70E-01  1.50E+01  2.47E+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 1999 ====
Period-Limit          Dose      Limit  % of
                        (mrad)    (mrad)  Limit
-----
Q2 - Maximum Gamma Air Dose  1.02E-02  1.00E+01  1.02E-01
  
```

Maximum Gamma Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

```

Nuclide      Percentage
-----
XE-133       8.98E+01
AR-41        1.02E+01
  
```

```

Q2 - Maximum Beta Air Dose  2.77E-02  2.00E+01  1.39E-01
  
```

Maximum Beta Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

```

Nuclide      Percentage
-----
XE-133       9.87E+01
  
```

**EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/99 TO 1/1/00
GASEOUS ANNUAL DOSE SUMMARY REPORT**

Catawba Nuclear Station Units 1 & 2

3rd Quarter 1999

=== IODINE, H3, AND PARTICULATE DOSE LIMIT ANALYSIS===== Quarter 3 1999 ===

Period-Limit	Critical Group	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q3 - Maximum Organ Dose	CHILD	LIVER	2.35E-01	1.50E+01	1.57E+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 1999 ===

Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Q3 - Maximum Gamma Air Dose	8.83E-03	1.00E+01	8.83E-02

Maximum Gamma Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
XE-133	8.20E+01
AR-41	1.79E+01

Q3 - Maximum Beta Air Dose	2.21E-02	2.00E+01	1.11E-01
----------------------------	----------	----------	----------

Maximum Beta Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
XE-133	9.73E+01

**EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/99 TO 1/1/00
GASEOUS ANNUAL DOSE SUMMARY REPORT**

Catawba Nuclear Station Units 1 & 2

4th Quarter 1999

=== IODINE, H3, AND PARTICULATE DOSE LIMIT ANALYSIS===== Quarter 4 1999 ===

Period-Limit	Critical Group	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q4 - Maximum Organ Dose	CHILD	LIVER	2.28E-01	1.50E+01	1.52E+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 4 1999 ===

Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Q4 - Maximum Gamma Air Dose	5.58E-03	1.00E+01	5.58E-02

Maximum Gamma Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
XE-133	6.63E+01
AR-41	3.37E+01

Q4 - Maximum Beta Air Dose	1.17E-02	2.00E+01	5.85E-02
----------------------------	----------	----------	----------

Maximum Beta Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
XE-133	9.43E+01
AR-41	5.69E+00

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/99 TO 1/1/00
GASEOUS ANNUAL DOSE SUMMARY REPORT

Catawba Nuclear Station Units 1 & 2

ANNUAL 1999

=== IODINE, H3, AND PARTICULATE DOSE LIMIT ANALYSIS===== Annual 1999 =====

Period-Limit	Critical Group	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Yr - Maximum Organ Dose	CHILD	LIVER	1.04E+00	3.00E+01	3.47E+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===== Annual 1999 =====

Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Yr - Maximum Gamma Air Dose	3.33E-02	2.00E+01	1.67E-01

Maximum Gamma Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
XE-133	7.87E+01
AR-41	2.12E+01

Yr - Maximum Beta Air Dose	8.06E-02	4.00E+01	2.02E-01
----------------------------	----------	----------	----------

Maximum Beta Air Dose Receptor Location: 0.5 Mile NNE

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
XE-133	9.68E+01

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/99 TO 1/1/00
LIQUID ANNUAL DOSE SUMMARY REPORT

Catawba Nuclear Station Units 1 & 2

1st Quarter 1999

=== BATCH LIQUID RELEASES ===				Quarter 1 1999 =====	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
-----	-----	-----	-----	-----	-----
Q1 - Maximum Organ Dose	ADULT	GI-LLI	2.23E-02	1.00E+01	2.23E-01
Q1 - Total Body Dose	ADULT		1.17E-02	3.00E+00	3.90E-01

Maximum Organ

Critical Pathway: Fresh Water Fish

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
-----	-----
NB-95	4.90E+01
H-3	3.15E+01
CO-60	1.37E+01

Total Body

Critical Pathway: Fresh Water Fish

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
-----	-----
H-3	5.98E+01
CS-137	1.79E+01
CS-134	1.39E+01
CO-60	7.44E+00

=== CONTINUOUS LIQUID RELEASES (WC) ===				Quarter 1 1999 =====	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
-----	-----	-----	-----	-----	-----
Q1 - Maximum Organ Dose	ADULT	LIVER	7.49E-05	1.00E+01	7.49E-04
Q1 - Total Body Dose	ADULT		7.49E-05	3.00E+00	2.50E-03

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 1/1/99 TO 1/1/00
LIQUID ANNUAL DOSE SUMMARY REPORT

Catawba Nuclear Station Units 1 & 2

2nd Quarter 1999

=== BATCH LIQUID RELEASES ===				Quarter 2 1999 =====	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
-----	-----	-----	-----	-----	-----
Q2 - Maximum Organ Dose	ADULT	GILLI	6.48E-02	1.00E+01	6.48E-01
Q2 - Total Body Dose	ADULT		5.15E-02	3.00E+00	1.72E+00

Maximum Organ

Critical Pathway: Fresh Water Fish

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
-----	-----
H-3	4.97E+01
NB-95	3.92E+01

Total Body

Critical Pathway: Fresh Water Fish

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
-----	-----
H-3	6.25E+01
CS-137	3.35E+01

=== CONTINUOUS LIQUID RELEASES (WC) ===				Quarter 2 1999 =====	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
-----	-----	-----	-----	-----	-----
Q2 - Maximum Organ Dose	ADULT	LIVER	2.62E-04	1.00E+01	2.62E-03
Q2 - Total Body Dose	ADULT		2.62E-04	3.00E+00	8.73E-03

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 1/1/99 TO 1/1/00
LIQUID ANNUAL DOSE SUMMARY REPORT

Catawba Nuclear Station Units 1 & 2

3rd Quarter 1999

=== BATCH LIQUID RELEASES ===				Quarter 3 1999 ===	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
-----	-----	-----	-----	-----	-----
Q3 - Maximum Organ Dose	ADULT	GI-LLI	1.79E-02	1.00E+01	1.79E-01
Q3 - Total Body Dose	ADULT		7.33E-03	3.00E+00	2.44E-01

Maximum Organ

Critical Pathway: Fresh Water Fish

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
-----	-----
NB-95	5.43E+01
H-3	2.78E+01
CO-60	7.90E+00
CO-58	7.13E+00

Total Body

Critical Pathway: Fresh Water Fish

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
-----	-----
H-3	6.78E+01
CS-137	2.10E+01
CO-60	5.50E+00

=== CONTINUOUS LIQUID RELEASES (WC) ===				Quarter 3 1999 ===	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
-----	-----	-----	-----	-----	-----
Q3 - Maximum Organ Dose	ADULT	LIVER	2.48E-04	1.00E+01	2.48E-03
Q3 - Total Body Dose	ADULT		2.48E-04	3.00E+00	8.27E-03

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 1/1/99 TO 1/1/00
LIQUID ANNUAL DOSE SUMMARY REPORT

Catawba Nuclear Station Units 1 & 2

4th Quarter 1999

=== BATCH LIQUID RELEASES ===				Quarter 4 1999 =====	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q4 - Maximum Organ Dose	TEEN	LIVER	1.87E-02	1.00E+01	1.87E-01
Q4 - Total Body Dose	ADULT		1.50E-02	3.00E+00	5.00E-01

Maximum Organ

Critical Pathway: Fresh Water Fish

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
CS-137	4.54E+01
H-3	3.41E+01
CO-60	1.79E+01

Total Body

Critical Pathway: Fresh Water Fish

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	5.72E+01
CS-137	3.53E+01
CO-60	5.72E+00

=== CONTINUOUS LIQUID RELEASES (WC) ===				Quarter 4 1999 =====	
Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q4 - Maximum Organ Dose	ADULT	LIVER	1.49E-04	1.00E+01	1.49E-03
Q4 - Total Body Dose	ADULT		1.49E-04	3.00E+00	4.97E-03

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 1/1/99 TO 1/1/00
LIQUID ANNUAL DOSE SUMMARY REPORT

Catawba Nuclear Station Units 1 & 2

ANNUAL 1999

=== BATCH LIQUID RELEASES === Annual 1999 ===

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Yr - Maximum Organ Dose	ADULT	GI-LLI	1.22E-01	2.00E+01	6.10E-01
Yr - Total Body Dose	ADULT		8.67E-02	6.00E+00	1.45E+00

Maximum Organ

Critical Pathway: Fresh Water Fish

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	4.39E+01
NB-95	4.05E+01
CO-60	8.40E+00

Total Body

Critical Pathway: Fresh Water Fish

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	6.17E+01
CS-137	3.04E+01

=== CONTINUOUS LIQUID RELEASES (WC) === Annual 1999 ===

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Yr - Maximum Organ Dose	ADULT	LIVER	7.30E-04	2.00E+01	3.65E-03
Yr - Total Body Dose	ADULT		7.30E-04	6.00E+00	1.22E-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

ATTACHMENT VIII

Revisions to

Offsite Dose Calculation Manual (ODCM)

and

Process Control Program (PCP) Manual



M. S. Tuckman
Executive Vice President
Nuclear Generation

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February 3, 1999

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

Enclosed are revisions made to the Duke Power Company Offsite Dose Calculations Manual effective January 1, 1999. A complete copy of the entire ODCM is hereby transmitted as required by McGuire and Catawba Technical Specifications Section 5.5.1.c.

The following sections are affected by this revision.

Revision 42	Generic Section
Revision 39	Oconee Nuclear Station
Revision 40	McGuire Nuclear Station
Revision 41	Catawba Nuclear Station

By copy of this letter, the revised pages of the above ODCM sections are transmitted 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 for each section. For these copies, please insert revised pages according to the insertion instructions found on the approval letters. The approval letter for the Generic Manual along with the justification for Revision 42 should be placed in front of the entire manual. Each station approval letter (including justifications) should be placed in the front of the respective station manual sections.

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

Very truly yours,

M. S. Tuckman



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M. S. Tuckman
Executive Vice President
Nuclear Generation

January 6, 1999

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

Subject: Oconee Nuclear Station, Docket No. 50-269, 50-270, 50-287
McGuire Nuclear Station, Docket No. 50-369, 50-370
Catawba Nuclear Station, Docket No. 50-413, 50-414
Corporate Process Control Program Manual

Please find attached 6 copies of Revision 12 to the Duke Power Company Process Control Program Manual. These copies are provided for manual numbers 26, 27, 28, 29, 30, and 31.

By copy of this letter, Revision 12 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: 1 - Corp. PCP Intro and Background
 2 - CNS PCP Rev Approval Pg
 3 - MNS PCP Rev Approval Pg
 4 - ONS PCP Rev Approval Pg
 5 - Corp. PCP Table of Contents
 6 - Corp. PCP (Pgs 1 - 16)
 7 - Memorandum Summary (3 pgs)