Attachment I

Oconee Nuclear Site

Effluent Release Data

OCONEE NUCLEAR STATION

EFFLUENT RELEASE DATA

(January 1, 2008 through December 31, 2008)

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 1/1/08 TO 1/1/09
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

Oconee Nuclear Station Units 1, 2, & 3

REPORT FOR 2008	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
A. Fission and Activation Gases						
1. Total Release	Ci	1.30E+00	3.02E+00	7.77E-01	1.25E+01	1.76E+01
2. Avg. Release Rate	µCi/sec	1.65E-01	3.84E-01	9.77E-02	1.57E+00	5.56E-01
B. Iodine-131						
1. Total Release	Ci	0.00E+00	4.39E-06	2.73E-10	1.15E-04	1.19E-04
2. Avg. Release Rate	µCi/sec	0.00E+00	5.58E-07	3.44E-11	1.45E-05	3.77E-06
C. Particulates Half Life >= 8 days						
1. Total Release	Ci	0.00E+00	3.15E-06	0.00E+00	1.41E-06	4.55E-06
2. Avg. Release Rate	µCi/sec	0.00E+00	4.00E-07	0.00E+00	1.77E-07	1.44E-07
D. Tritium						
1. Total Release	Ci	1.09E+01	1.08E+01	1.21E+01	1.57E+01	4.95E+01
2. Avg. Release Rate	µCi/sec	1.39E+00	1.38E+00	1.52E+00	1.97E+00	1.57E+00
E. Gross Alpha Radioactivity						
1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Avg. Release Rate	µCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE 1B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/08 TO 1/1/09
GASEOUS EFFLUENTS - ELEVATED RELEASES - CONTINUOUS MODE

Oconee Nuclear Station Units 1, 2, & 3

REPORT FOR 2008	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
1. Fission and Activation Gases						
AR-41	Ci	0.00E+00	0.00E+00	0.00E+00	1.03E-01	1.03E-01
XE-133	Ci	3.99E-01	0.00E+00	4.16E-01	1.25E+00	2.07E+00
XE-135	Ci	2.28E-01	0.00E+00	0.00E+00	1.53E-02	2.43E-01
Totals for Period...	Ci	6.27E-01	0.00E+00	4.16E-01	1.37E+00	2.41E+00
2. Iodines						
I-131	Ci	0.00E+00	1.63E-06	0.00E+00	1.11E-04	1.13E-04
I-133	Ci	0.00E+00	1.98E-06	0.00E+00	2.02E-05	2.22E-05
Totals for Period...	Ci	0.00E+00	3.61E-06	0.00E+00	1.32E-04	1.35E-04
3. Particulates Half Life >= 8 days						
CS-137	Ci	0.00E+00	2.87E-06	0.00E+00	0.00E+00	2.87E-06
Totals for Period...	Ci	0.00E+00	2.87E-06	0.00E+00	0.00E+00	2.87E-06
4. Tritium						
H-3	Ci	9.77E+00	9.70E+00	1.12E+01	1.40E+01	4.47E+01
Totals for Period...	Ci	9.77E+00	9.70E+00	1.12E+01	1.40E+01	4.47E+01
5. Gross Alpha Radioactivity						
** No Nuclide Activities **		.....	.....	.....	.....	.....

TABLE 1B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/08 TO 1/1/09
GASEOUS EFFLUENTS - ELEVATED RELEASES - BATCH MODE

Oconee Nuclear Station Units 1, 2, & 3

REPORT FOR 2008	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
1. Fission and Activation Gases						
AR-41	Ci	5.35E-03	1.80E-02	3.67E-02	0.00E+00	6.00E-02
C-11	Ci	0.00E+00	2.14E-04	0.00E+00	0.00E+00	2.14E-04
KR-85	Ci	6.37E-01	2.58E+00	2.83E-01	2.70E+00	6.19E+00
XE-131M	Ci	1.69E-03	2.38E-03	0.00E+00	1.01E-01	1.05E-01
XE-133	Ci	2.53E-02	4.21E-01	3.99E-02	8.27E+00	8.75E+00
XE-133M	Ci	0.00E+00	1.33E-03	0.00E+00	4.84E-02	4.97E-02
XE-135	Ci	2.36E-04	3.49E-03	9.73E-04	1.18E-02	1.65E-02
Totals for Period...	Ci	6.70E-01	3.02E+00	3.60E-01	1.11E+01	1.52E+01
2. Iodines						
I-131	Ci	0.00E+00	2.76E-06	2.73E-10	4.45E-07	3.21E-06
I-133	Ci	0.00E+00	5.04E-07	0.00E+00	0.00E+00	5.04E-07
Totals for Period...	Ci	0.00E+00	3.27E-06	2.73E-10	4.45E-07	3.71E-06
3. Particulates Half Life >= 8 days						
CS-137	Ci	0.00E+00	0.00E+00	0.00E+00	1.75E-11	1.75E-11
K-40	Ci	0.00E+00	1.52E-07	0.00E+00	0.00E+00	1.52E-07
Totals for Period...	Ci	0.00E+00	1.52E-07	0.00E+00	1.75E-11	1.52E-07
4. Tritium						
H-3	Ci	2.37E-03	3.38E-02	2.17E-02	9.01E-02	1.48E-01
Totals for Period...	Ci	2.37E-03	3.38E-02	2.17E-02	9.01E-02	1.48E-01
5. Gross Alpha Radioactivity						
** No Nuclide Activities **		.....	.....	.....	.....	.....

TABLE 1C

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/08 TO 1/1/09
GASEOUS EFFLUENTS - GROUND RELEASES - CONTINUOUS MODE

Oconee Nuclear Station Units 1, 2, & 3

REPORT FOR 2008	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
1. Fission and Activation Gases						
** No Nuclide Activities **		.....	.....	.....	.....	.....
2. Iodines						
I-131	Ci	0.00E+00	0.00E+00	0.00E+00	3.07E-06	3.07E-06
Totals for Period...	Ci	0.00E+00	0.00E+00	0.00E+00	3.07E-06	3.07E-06
3. Particulates Half Life >= 8 days						
CO-58	Ci	0.00E+00	0.00E+00	0.00E+00	1.41E-06	1.41E-06
CS-137	Ci	0.00E+00	1.18E-07	0.00E+00	0.00E+00	1.18E-07
Totals for Period...	Ci	0.00E+00	1.18E-07	0.00E+00	1.41E-06	1.53E-06
4. Tritium						
H-3	Ci	1.15E+00	1.09E+00	8.44E-01	1.57E+00	4.65E+00
Totals for Period...	Ci	1.15E+00	1.09E+00	8.44E-01	1.57E+00	4.65E+00
5. Gross Alpha Radioactivity						
** No Nuclide Activities **		.....	.....	.....	.....	.....

TABLE 1C

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/08 TO 1/1/09
GASEOUS EFFLUENTS - GROUND RELEASES - BATCH MODE

Oconee Nuclear Station Units 1, 2, & 3

REPORT FOR 2008	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						
H-3	Ci	6.41E-04	3.33E-07	0.00E+00	3.40E-07	6.42E-04
Totals for Period...	Ci	6.41E-04	3.33E-07	0.00E+00	3.40E-07	6.42E-04
5. Gross Alpha Radioactivity						
** No Nuclide Activities **		.....	.....	.....	.....	.....

TABLE 2A

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/08 TO 1/1/09
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

Oconee Nuclear Station Units 1, 2, & 3

REPORT FOR 2008	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
A. Fission and Activation Products						
1. Total Release	Ci	1.26E-02	4.97E-03	2.13E-03	1.35E-03	2.11E-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	7.46E-10	2.94E-10	1.24E-10	7.92E-11	3.10E-10
B. Tritium						
1. Total Release	Ci	6.05E+01	1.98E+02	1.87E+02	3.10E+02	7.56E+02
2. Average Diluted Concentration						
a. Continuous Releases	µCi/ml	1.70E-08	1.34E-08	1.20E-08	1.46E-08	1.43E-08
b. Batch Releases	µCi/ml	3.56E-06	1.17E-05	1.09E-05	1.81E-05	1.11E-05
C. Dissolved and Entrained Gases						
1. Total Release	Ci	0.00E+00	0.00E+00	1.08E-02	1.16E-03	1.20E-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	0.00E+00	0.00E+00	6.34E-10	6.79E-11	1.76E-10
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	5.60E+08	5.22E+08	5.00E+08	6.45E+08	2.23E+09
2. Batch Releases	liters	8.50E+05	2.85E+06	1.12E+06	3.70E+06	8.52E+06
F. Volume of Dilution Water						
1. Continuous Releases	liters	1.69E+10	1.69E+10	1.71E+10	1.71E+10	6.80E+10
2. Batch Releases	liters	1.69E+10	1.69E+10	1.71E+10	1.71E+10	6.80E+10

TABLE 2B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/08 TO 1/1/09
LIQUID EFFLUENTS - CONTINUOUS MODE

Oconee Nuclear Station Units 1, 2, & 3

REPORT FOR 2008	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
1. Fission and Activation Products						
** No Nuclide Activities **		.....	.....	.....	.....	.....
2. Tritium						
H-3	Ci	2.97E-01	2.34E-01	2.12E-01	2.58E-01	1.00E+00
Totals for Period...	Ci	2.97E-01	2.34E-01	2.12E-01	2.58E-01	1.00E+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 1/1/08 TO 1/1/09
LIQUID EFFLUENTS - BATCH MODE

Oconee Nuclear Station Units 1, 2, & 3

REPORT FOR 2008	Unit	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
1. Fission and Activation Products						
AG-110M	Ci	8.12E-03	1.84E-03	5.16E-04	2.84E-05	1.05E-02
CO-58	Ci	3.94E-03	3.02E-03	1.43E-03	2.71E-04	8.66E-03
CO-60	Ci	5.30E-04	2.26E-05	7.14E-05	0.00E+00	6.24E-04
CS-137	Ci	2.53E-05	9.39E-05	3.76E-05	6.96E-05	2.26E-04
NB-95	Ci	0.00E+00	0.00E+00	2.55E-05	0.00E+00	2.55E-05
SB-125	Ci	0.00E+00	0.00E+00	4.71E-05	9.86E-04	1.03E-03
Totals for Period...	Ci	1.26E-02	4.97E-03	2.13E-03	1.35E-03	2.11E-02
2. Tritium						
H-3	Ci	6.02E+01	1.98E+02	1.87E+02	3.10E+02	7.55E+02
Totals for Period...	Ci	6.02E+01	1.98E+02	1.87E+02	3.10E+02	7.55E+02
3. Dissolved and Entrained Gases						
KR-85	Ci	0.00E+00	0.00E+00	1.08E-02	0.00E+00	1.08E-02
XE-133	Ci	0.00E+00	0.00E+00	0.00E+00	1.16E-03	1.16E-03
Totals for Period...	Ci	0.00E+00	0.00E+00	1.08E-02	1.16E-03	1.20E-02
4. Gross Alpha Radioactivity						
** No Nuclide Activities **		.....	.....	.....	.....	.....

Attachment II

Oconee Nuclear Site

Supplemental Information

OCONEE NUCLEAR STATION

2008 EFFLUENT AND WASTE DISPOSAL SUPPLEMENTAL INFORMATION

I. REGULATORY LIMITS - STATION

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

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

C. IODINE - 131 AND 133, TRITIUM, PARTICULATES W/T 1/2 > 8 DAYS - ORGAN DOSE
1. CALENDAR QUARTER = 22.5 MREM
2. CALENDAR YEAR = 45 MREM

II. MAXIMUM PERMISSIBLE 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

ANALYSES OF SPECIFIC RADIONUCLIDES IN SELECTED OR COMPOSITED SAMPLES AS DESCRIBED IN THE SELECTED LICENSEE COMMITMENTS ARE USED TO DETERMINE THE RADIONUCLIDE COMPOSITION OF THE EFFLUENT. SUPPLEMENTAL REPORT, PAGE 2, PROVIDES A SUMMARY DESCRIPTION OF THE METHOD USED FOR ESTIMATING OVERALL ERRORS ASSOCIATED WITH RADIOACTIVITY MEASUREMENTS.

V. BATCH RELEASES

A. LIQUID EFFLUENT
1. 1.05E+02 = TOTAL NUMBER OF BATCH RELEASES
2. 2.14E+04 = TOTAL TIME (MIN.) FOR BATCH RELEASES.
3. 2.60E+02 = MAXIMUM TIME (MIN.) FOR A BATCH RELEASE.
4. 2.04E+02 = AVERAGE TIME (MIN.) FOR A BATCH RELEASE.
5. 1.00E+00 = MINIMUM TIME (MIN.) FOR A BATCH RELEASE.
6. 3.41E+04 = AVERAGE DILUTION WATER FLOW DURING RELEASES (GPM).

B. GASEOUS EFFLUENT
1. 6.80E+01 = TOTAL NUMBER OF BATCH RELEASES.
2. 1.30E+05 = TOTAL TIME (MIN.) FOR BATCH RELEASES.
3. 3.56E+04 = MAXIMUM TIME (MIN.) FOR A BATCH RELEASE.
4. 1.91E+03 = AVERAGE TIME (MIN.) FOR A BATCH RELEASE.
5. 1.00E+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) = 8.90E-02 Ci (Noble Gases), 3.21E-10 Ci (Iodine), 6.70E-06 Ci (H3)
(See "Unplanned Releases" Enclosure for further information)

SUPPLEMENTAL REPORT PAGE 2

OCONEE NUCLEAR STATION

The estimated percentage of error for both Liquid and Gaseous effluent release data at Oconee Nuclear Station has been determined to be ± 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 = ±20%

(2) Counting error = ±15%

(3) Sample preparation error = ± 3%

OCONEE NUCLEAR STATION

INFORMATION TO SUPPORT THE NUCLEAR ENERGY INSTITUTE (NEI) GROUNDWATER PROTECTION INITIATIVE

ARERR Groundwater Well Data Section Rev. 1

Duke Energy implemented a Ground Water Protection program in 2007. This initiative was developed to ensure timely and effective management of situations involving inadvertent releases of licensed material to ground water. As part of this program, Oconee has forty-nine ground water monitoring wells in place. These wells are generally sampled quarterly, with some state required wells being sampled semi-annually or annually. All samples are being analyzed for tritium and gamma emitters. No gamma activity (other than naturally occurring radionuclides) was identified in any of the well samples during 2008.

Results from sampling during 2008 are shown in the table below.

Well Name	Well Location	Avg. Tritium Conc.(pCi/l)	Conc. Range	# of Samples
BG-4	Ball Field	<	<	4
MW-3	Landfill	<	<	2
MW-11	Landfill	<	<	2
MW-11D	Landfill	<	<	2
MW-13	Landfill	<	<	2
MW-16	Landfill	<	<	2
MW-RP01	Landfarm/Burial	<	<	4
MW-RP02	Landfarm/Burial	<	<	4
MW-RP03	Landfarm/Burial	<	<	4
MW A-1	CTP-1/2	1,950	1,780-2,120	2
MW A-2	CTP-1/2	321	< - 489	4
MW A-8	CTP-1/2	174	< - 174	2
1MW A-9	CTP-1/2	2,265	1,790-2,740	2
MW A-10	CTP-3	457	346-534	4
MW A-11	CTP-3	278	< - 278	4
MW A-12	CTP-3	<	<	4
MW A-13	CTP-1/2	1,037	786-1,410	4
MW A-14	CTP-1/2	1,418	1,340-1,540	4
MW A-17	CTP-1/2	271	159-382	4
MW A-18	CTP-1/2	<	<	4
GM-1R	CTP-1/2	739	629-886	4
GM-2R	U-1/2 SFP	3,713	2,620-4,280	4
GM-2DR	U-1/2 SFP	1,106	620-1,660	4
GM-3R	U-3 SFP	196	< - 241	4
GM-3DR	U-3 SFP	224	176-252	4
GM-4	WH-10	362	297-426	4
GM-5	Rdwst. Bldg.	170	163-177	4
GM-5R	Rdwst. Bldg.	<	<	4
GM-6	Outflow to CTP-3	<	<	5
GM-6R	Outflow to CTP-3	<	<	5
GM-7	525 kv Sw. Yard	14,183	11,000-19,800	6

GM-7R	525 kv Sw. Yard	3,842	2,670-5,570	6
GM-8	E of U-3 TB	274	227-339	4
GM-8R	E of U-3 TB	289	239-357	4
GM-9	E of U-2 TB	214	< - 214	4
GM-9R	E of U-2 TB	<	<	4
GM-10	525 kv Sw. Yard	<	<	4
GM-10R	525 kv Sw. Yard	<	<	4
GM-11	525 kv Sw. Yard	<	<	4
GM-11R	525 kv Sw. Yard	<	<	4
GM-12	E of Access Rd.	<	<	4
GM-12R	E of Access Rd.	<	<	4
GM-13	525 kv Sw. Yard	<	<	4
GM-13R	525 kv Sw. Yard	<	<	4
GM-14	Mnt. Trg. Facility	<	<	4
GM-14R	Mnt. Trg. Facility	<	<	4
*011 (IW-1)	Ball Field	<	<	4
*013 (IW-2)	WH-5	<	<	4
*015	Brown's Bottom	<	<	4

*These are irrigation wells and may not meet current requirements for ground water well construction.

pCi/l - pico curies per liter

< - less than minimum detectable activity, typically 250 pCi/liter

20,000 pCi/l - the Environmental Protection Agency drinking water standard for tritium. This standard applies only to water that is used for drinking.

1,000,000 pCi/l - the 10CFR20, Appendix B, Table 2, Column 2, Effluent Concentration limit for tritium.

Attachment III

Oconee Nuclear Site

Solid Waste Disposal Report

OCONEE NUCLEAR STATION SOLID RADWASTE REPORT
REPORT PERIOD: JANUARY - DECEMBER
WASTE TYPE: SECONDARY FILTERS

OF CONTAINERS SHIPPED TO DURATEK 2 # OF CONTAINERS SHIPPED TO CNSI / ENVIROCARE 0

OF SHIPMENTS TO DURATEK 1 # OF SHIPMENTS TO CNSI / ENVIROCARE 0

ISOTOPE:																				TOTAL	AVE.
CR-51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MN-54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO-57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO-58	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.71	0.71
CO-60	1.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.82	1.82
NB-95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ZR-95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-134	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.64
RU-103	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AG-110m	1.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.45	1.45
SB-125	4.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.63	4.63
I-131	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-137	14.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.55	14.55
H-3	58.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	58.64	58.64
NI-63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FE-55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SR-90	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.42
TE-125m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-136	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XE-133	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C-14	16.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.81	16.81
PU-241	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TRU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FE-59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SB-124	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RU-106	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CE-144	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CM-243	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PU-238	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PU-239	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AM-241	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08
CM-242	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SR-89	0.21																				
TOTAL	100.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.75	99.75
CLASS C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
CLASS B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
CLASS AS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
CLASS AU	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
CURIES	0.002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.002	
FT3 Shipped	142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	142	
CU. M Shipped	4.0211	0.0000	0.0000	0.0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.02107	
FT3 Buried	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
CU. M Buried	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0	
RSR#	**08-2051**																				

Attachment IV

Oconee Nuclear Site

Inoperable Monitoring Equipment

There were no monitoring instruments out of service greater than 30 days.

Attachment V

Oconee Nuclear Site

Unplanned Offsite Releases

OCONEE NUCLEAR STATION

UNPLANNED RELEASES

(January 1, 2008 through December 31, 2008)

There were no unplanned liquid radioactive effluent releases, and one unplanned gas radioactive effluent release to the environment in 2008. Please see the following page for a description of the unplanned gas radioactive effluent release.

April 6, 2009

Memorandum To: 2008 Annual Radioactive Effluent Release Report

CC: L.E. Haynes, C.D. Ingram, W.S. Pursley

From: Rick Bowser
RP Staff
Radiation Protection
Oconee Nuclear Station

Re: Unplanned release of 3C Gaseous Waste Decay Tank (GWDT) Reference PIP 0-08-1828.

Event Summary:

See referenced PIP for details.

On April 8, 2008 the 1C GWDT was being released to permit the investigation and repair of two GWD sampling valves. During the investigation a third valve, 3GWD-229 the manual isolation valve for 3C GWDT, was found separated from its remote operating rod. Questions about the position of the 3C GWDT were answered when the pressure trend for the 1C and 3C GWDTs were reviewed and found to indicate release of both GWDT. Additional investigation concluded the leakage between the two GWDTs was through the common sample line.

The release of 1C GWDT appeared uneventful with no effluent radiation monitor response in excess of the predicted setpoint. Following discovery of the unplanned release, effluent accountability was conducted using GWDT Volume/Pressure graphs and sample analysis results. The total unplanned release activity from 3C GWDT was 8.90E-02 curies of noble gases, 3.21E-10 curies of iodine, and 6.7E-6 curies of tritium. The release is documented as Gaseous Waste Release 2008013.

Safety Significance:
The health and safety of the public were not compromised by this event. Calculated dose and dose rate to the Total Body, Skin, Gamma Air, and Beta Air were all less than one percent (<1.0%) of the limits specified by Selected Licensee Commitments and Code of Federal Regulations.

Sequence of events:

- 4/7/2008 WGDT 1C was sampled for a planned release on 4/8//08.
- 4/8/08 at 0300 hours, WGDT 1C release started.
- 1C release was uneventful and was terminated normally on 4/8/08 at 0815 hours.
- Following release of WGDT 1C, valve tag out for repair of GWD sample valves GWD-227 and GWD-228, 3GWD-229 was found separated from its remote operator.
- Following identification of 3GWD-229 being separated from its remote operator, Pressure trends of 1C and 3C WGDT were reviewed. The pressure trends indicated an unplanned release of 3C WGDT.

Attachment VI

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

OCONEE NUCLEAR STATION

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

(January 1, 2008 through December 31, 2008)

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 8 km of Oconee 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 1/1/08 TO 1/1/09
GASEOUS ANNUAL DOSE SUMMARY REPORT

Oconee Nuclear Station Units 1, 2, & 3

1st Quarter 2008

=== IODINE, H3, and PARTICULATE DOSE LIMIT ANALYSIS======== Quarter 1 2008 ====

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q1 - Maximum Organ Dose	CHILD	LUNG	3.42E-03	2.25E+01	1.52E-02

Maximum Organ Dose Receptor Location: 1.0 Mile SW
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 2008 ====

Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Q1 - Maximum Gamma Air Dose	3.44E-05	1.50E+01	2.29E-04

Maximum Gamma Air Dose Receptor Location: 1.0 Mile SW

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
XE-135	6.75E+01
XE-133	2.31E+01
AR-41	7.66E+00

Q1 - Maximum Beta Air Dose	1.20E-04	3.00E+01	4.01E-04

Maximum Beta Air Dose Receptor Location: 1.0 Mile SW

Major Contributors (5% or greater to total)

Nuclide	Percentage
KR-85	5.48E+01
XE-135	2.47E+01
XE-133	1.96E+01

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/08 TO 1/1/09
GASEOUS ANNUAL DOSE SUMMARY REPORT

Oconee Nuclear Station Units 1, 2, & 3

2nd Quarter 2008

=== IODINE, H3, and PARTICULATE DOSE LIMIT ANALYSIS======= Quarter 2 2008 ====

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q2 - Maximum Organ Dose	CHILD	THYROID	3.47E-03	2.25E+01	1.54E-02

Maximum Organ Dose Receptor Location: 1.0 Mile SW
Critical Pathway: Vegetation

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	9.72E+01

=== NOBLE GAS DOSE LIMIT ANALYSIS========== Quarter 2 2008 ====

Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Q2 - Maximum Gamma Air Dose	1.95E-05	1.50E+01	1.30E-04

Maximum Gamma Air Dose Receptor Location: 1.0 Mile SW

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
AR-41	4.55E+01
XE-133	4.04E+01
KR-85	1.20E+01

Q2 - Maximum Beta Air Dose	2.93E-04	3.00E+01	9.78E-04

Maximum Beta Air Dose Receptor Location: 1.0 Mile SW

Major Contributors (5% or greater to total)

Nuclide	Percentage
KR-85	9.07E+01
XE-133	7.99E+00

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/08 TO 1/1/09
GASEOUS ANNUAL DOSE SUMMARY REPORT

Oconee Nuclear Station Units 1, 2, & 3

3rd Quarter 2008

=== IODINE, H3, and PARTICULATE DOSE LIMIT ANALYSIS======= Quarter 3 2008 ====

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q3 - Maximum Organ Dose	CHILD	THYROID	3.63E-03	2.25E+01	1.61E-02

Maximum Organ Dose Receptor Location: 1.0 Mile SW
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 2008 ====

Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Q3 - Maximum Gamma Air Dose	2.70E-05	1.50E+01	1.80E-04

Maximum Gamma Air Dose Receptor Location: 1.0 Mile SW

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
AR-41	6.70E+01
XE-133	3.16E+01

Q3 - Maximum Beta Air Dose	6.11E-05	3.00E+01	2.04E-04

Maximum Beta Air Dose Receptor Location: 1.0 Mile SW

Major Contributors (5% or greater to total)

Nuclide	Percentage
KR-85	4.79E+01
XE-133	4.15E+01
AR-41	1.04E+01

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/08 TO 1/1/09
GASEOUS ANNUAL DOSE SUMMARY REPORT

Oconee Nuclear Station Units 1, 2, & 3

4th Quarter 2008

=== IODINE, H3, and PARTICULATE DOSE LIMIT ANALYSIS======= Quarter 4 2008 ====

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q4 - Maximum Organ Dose	CHILD	THYROID	7.11E-03	2.25E+01	3.16E-02

Maximum Organ Dose Receptor Location: 1.0 Mile SW
Critical Pathway: Vegetation

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	6.87E+01
I-131	3.11E+01

=== NOBLE GAS DOSE LIMIT ANALYSIS========== Quarter 4 2008 ====

Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Q4 - Maximum Gamma Air Dose	2.36E-04	1.50E+01	1.57E-03

Maximum Gamma Air Dose Receptor Location: 1.0 Mile SW

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
XE-133	7.55E+01
AR-41	2.16E+01

Q4 - Maximum Beta Air Dose	8.40E-04	3.00E+01	2.80E-03

Maximum Beta Air Dose Receptor Location: 1.0 Mile SW

Major Contributors (5% or greater to total)

Nuclide	Percentage
XE-133	6.31E+01
AR-41	3.32E+01

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/08 TO 1/1/09
GASEOUS ANNUAL DOSE SUMMARY REPORT

Oconee Nuclear Station Units 1, 2, & 3

ANNUAL 2008

=== IODINE, H3, and PARTICULATE DOSE LIMIT ANALYSIS======= Annual 2008 ========

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Yr - Maximum Organ Dose	CHILD	THYROID	1.76E-02	4.50E+01	3.92E-02

Maximum Organ Dose Receptor Location: 1.0 Mile SW
Critical Pathway: Vegetation

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
H-3	8.68E+01
I-131	1.30E+01

=== NOBLE GAS DOSE LIMIT ANALYSIS========== Annual 2008 =======

Period-Limit	Dose (mrad)	Limit (mrad)	% of Limit
Yr - Maximum Gamma Air Dose	3.17E-04	3.00E+01	1.06E-03

Maximum Gamma Air Dose Receptor Location: 1.0 Mile SW

Major Isotopic Contributors (5% or greater to total)

Nuclide	Percentage
XE-133	6.39E+01
AR-41	2.54E+01
XE-135	8.34E+00

Yr - Maximum Beta Air Dose	1.31E-03	6.00E+01	2.19E-03

Maximum Beta Air Dose Receptor Location: 1.0 Mile SW

Major Contributors (5% or greater to total)

Nuclide	Percentage
KR-85	4.87E+01
XE-133	4.58E+01

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/08 TO 1/1/09
LIQUID ANNUAL DOSE SUMMARY REPORT

Oconee Nuclear Station Units 1, 2, & 3

1st Quarter 2008

=== BATCH LIQUID RELEASES ========== Quarter 1 2008 ======

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q1 - Maximum Organ Dose	CHILD	LIVER	6.07E-03	1.50E+01	4.04E-02
Q1 - Total Body Dose	ADULT		5.48E-03	4.50E+00	1.22E-01

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

Nuclide	Percentage
H-3	6.89E+01
CS-137	2.66E+01

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

Nuclide	Percentage
H-3	7.35E+01
CS-137	2.04E+01

=== CONTINUOUS LIQUID RELEASES (CTP 3) ========== Quarter 1 2008 ======

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q1 - Maximum Organ Dose	CHILD	LIVER	2.00E-05	1.50E+01	1.33E-04
Q1 - Total Body Dose	CHILD		2.00E-05	4.50E+00	4.44E-04

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

Nuclide	Percentage
H-3	1.00E+02

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

Nuclide	Percentage
H-3	1.00E+02

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/08 TO 1/1/09
LIQUID ANNUAL DOSE SUMMARY REPORT

Oconee Nuclear Station Units 1, 2, & 3

2nd Quarter 2008

=== BATCH LIQUID RELEASES ========== Quarter 2 2008 ======

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q2 - Maximum Organ Dose	CHILD	LIVER	1.98E-02	1.50E+01	1.32E-01
Q2 - Total Body Dose	ADULT		1.75E-02	4.50E+00	3.89E-01

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

Nuclide	Percentage
H-3	6.94E+01
CS-137	3.02E+01

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

Nuclide	Percentage
H-3	7.56E+01
CS-137	2.38E+01

=== CONTINUOUS LIQUID RELEASES (CTP 3) ========== Quarter 2 2008 ======

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q2 - Maximum Organ Dose	CHILD	LIVER	1.58E-05	1.50E+01	1.05E-04
Q2 - Total Body Dose	CHILD		1.58E-05	4.50E+00	3.50E-04

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

Nuclide	Percentage
H-3	1.00E+02

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

Nuclide	Percentage
H-3	1.00E+02

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/08 TO 1/1/09
LIQUID ANNUAL DOSE SUMMARY REPORT

Oconee Nuclear Station Units 1, 2, & 3

3rd Quarter 2008

=== BATCH LIQUID RELEASES ========== Quarter 3 2008 ======

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q3 - Maximum Organ Dose	ADULT	GI-LLI	1.79E-02	1.50E+01	1.19E-01
Q3 - Total Body Dose	ADULT		1.42E-02	4.50E+00	3.16E-01

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

Nuclide	Percentage
H-3	7.00E+01
NB-95	2.73E+01

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

Nuclide	Percentage
H-3	8.79E+01
CS-137	1.17E+01

=== CONTINUOUS LIQUID RELEASES (CTP 3) ========== Quarter 3 2008 ======

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q3 - Maximum Organ Dose	CHILD	LIVER	1.43E-05	1.50E+01	9.52E-05
Q3 - Total Body Dose	CHILD		1.43E-05	4.50E+00	3.17E-04

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

Nuclide	Percentage
H-3	1.00E+02

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

Nuclide	Percentage
H-3	1.00E+02

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/08 TO 1/1/09
LIQUID ANNUAL DOSE SUMMARY REPORT

Oconee Nuclear Station Units 1, 2, & 3

4th Quarter 2008

=== BATCH LIQUID RELEASES ========== Quarter 4 2008 ======

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q4 - Maximum Organ Dose	CHILD	LIVER	2.59E-02	1.50E+01	1.73E-01
Q4 - Total Body Dose	ADULT		2.38E-02	4.50E+00	5.28E-01

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

Nuclide	Percentage
H-3	8.29E+01
CS-137	1.71E+01

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

Nuclide	Percentage
H-3	8.70E+01
CS-137	1.29E+01

=== CONTINUOUS LIQUID RELEASES (CTP 3) ========== Quarter 4 2008 ======

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Q4 - Maximum Organ Dose	CHILD	LIVER	1.73E-05	1.50E+01	1.15E-04
Q4 - Total Body Dose	CHILD		1.73E-05	4.50E+00	3.84E-04

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

Nuclide	Percentage
H-3	1.00E+02

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

Nuclide	Percentage
H-3	1.00E+02

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/08 TO 1/1/09
LIQUID ANNUAL DOSE SUMMARY REPORT

Oconee Nuclear Station Units 1, 2, & 3

ANNUAL 2008

=== BATCH LIQUID RELEASES ========== Annual 2008 =========

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Yr - Maximum Organ Dose	CHILD	LIVER	6.72E-02	3.00E+01	2.24E-01
Yr - Total Body Dose	ADULT		6.10E-02	9.00E+00	6.78E-01

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

Nuclide	Percentage
H-3	7.80E+01
CS-137	2.15E+01

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

Nuclide	Percentage
H-3	8.27E+01
CS-137	1.64E+01

=== CONTINUOUS LIQUID RELEASES (CTP 3) ========== Annual 2008 =========

Period-Limit	Critical Age	Critical Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Yr - Maximum Organ Dose	CHILD	LIVER	6.73E-05	3.00E+01	2.24E-04
Yr - Total Body Dose	CHILD		6.73E-05	9.00E+00	7.48E-04

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

Nuclide	Percentage
H-3	1.00E+02

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

Nuclide	Percentage
H-3	1.00E+02

Oconee Nuclear Station
2008 Radioactive Effluent Releases
40CFR190 Uranium Fuel Cycle Dose Calculation Results

In accordance with the requirements of 40CFR190, the annual dose commitment to any member of the general public shall be calculated to assure that doses are limited to 25 millirems to the total body or any organ with the exception of the thyroid which is limited to 75 millirems. The fuel cycle dose assessment for Oconee Nuclear Station only includes liquid and gaseous effluent dose contributions from Oconee and direct and air-scatter dose from Oconee's onsite Independent Spent Fuel Storage Installation (ISFSI) since no other uranium fuel cycle facility contributes significantly to Oconee's maximum exposed individual. The combined dose to a maximum exposed individual from Oconee's effluent releases and direct and air-scatter dose from Oconee's ISFSI is well below 40CFR190 limits as shown by the following summary:

I. 2008 Oconee 40CFR190 Effluent Dose Summary

The 40CFR190 effluent dose analysis to the maximum exposed individual from liquid and gas releases includes the dose from noble gases (i.e., total body and skin).

Maximum Total Body Dose = 7.17E-02 mrem

Maximum Location: 1.0 Mile, South-West Sector
Critical Age: Adult
Gas non-NG Contribution: 15%
Gas NG Contribution: <1%
Liquid Contribution: 85%

Maximum Organ (other than TB) Dose = 8.24E-02 mrem

Maximum Location: 1.0 Mile, South-West Sector
Critical Age: Child
Critical Organ: Liver
Gas Contribution: 19%
Liquid Contribution: 81%

II. 2008 Oconee 40CFR190 ISFSI Dose Summary

Direct and air-scatter radiation dose contributions from the onsite Independent Spent Fuel Storage Installation (ISFSI) at Oconee have been calculated and documented in the "Oconee Nuclear Site 10CFR72.212 Written Evaluations" report. The maximum dose rate to the nearest resident from the Oconee ISFSI assuming 100% occupancy time is estimated to be much less than 1 mrem/yr. The following excerpt, "C. 10CFR72.212(b)(2)(i)(C)- Requirements of 72.104", from the "Oconee Nuclear Site 10CFR72.212 Written Evaluations" report is provided to document the method used to estimate the Oconee ISFSI dose to the nearest "real individual".

The following three pages are taken from the Oconee Nuclear Site, "Independent Spent Fuel Storage Installation", 10CFR72.212 Evaluation report.

C. 10CFR72.212(b)(2)(i)(C)- Requirements of 72.104

"...the requirements of § 72.104 have been met."

10 CFR 72.104, as clarified by ISG-13[38], stipulates that the licensee perform dose evaluations which establish that any real individual beyond the controlled area boundary not sustain a dose equivalent in excess of 0.25 mSv (25 mrem) due to direct radiation from the Independent Spent Fuel Storage Installation and other

fuel cycle operations in the area. This same dose limit is stipulated by the EPA for the fuel cycle in 40 CFR 190.10(a).

In accordance with these requirements, Duke Energy Corporation has performed dose calculations that model the characteristics (initial enrichment, burnup and cooling time) of existing fuel in Phases I – IV of the Oconee ISFSI, together with the characteristics of assumed "design basis" fuel in Phase V of the Oconee ISFSI.[39] Calculation OSC-8675[40] develops the radiation source terms used in subsequent shielding and skyshine calculations using the SCALE Code System.

More specifically, the SAS2 Module of the SCALE Code System[41] was used to create a problem-dependent pin-cell model for the purpose of building cell-weighted, multigroup cross section sets for use in subsequent depletion calculations. The ORIGEN-S Module[42]of the SCALE Code System was used to perform the fuel depletion and characterization calculations using the cross section sets created by SAS2. These characterization calculations yielded the photon and neutron source terms to be used as input to subsequent shielding calculations. As mentioned above, problem-dependent cross section sets were developed for these analyses since ORIGEN-S was used within the SAS2 sequence. Duke Energy Corporation Radiological Engineering is experienced in the use of the SCALE Code System, and the SCALE Code System is installed and maintained under the purview of the pertinent software and data quality assurance program.

The results of the radiation source term calculation were used as input to Calculation OSC-8706[43] to evaluate the shielding characteristics of a single Horizontal Storage Module. The MCNP Monte Carlo particle transport computer code[44] was used to perform the transport calculations and to write a surface flux file for use in subsequent skyshine calculations.

Appropriate software quality controls have been implemented for the computer codes and data used in these analyses (specifically, Calculation DPC-1201.30-00-0010[45] contains the verification and validation for MCNP5, while SDQA-70321-COM documents the quality control measures in place for MCNP5) .

Calculation OSC-8716[46] uses the surface flux files developed in OSC-8706 in a repeating array representing all of the Horizontal Storage Modules in the ISFSI, including Phase V fully loaded with spent fuel. The source description in the MCNP input is constructed with source probabilities for each Horizontal Storage Module to represent the appropriate decay time associated with each HSM. Finally, a skyshine calculation is performed to obtain near- and far-field dose results from Phases I – V of the Oconee ISFSI. The results demonstrate that (conservatively assuming 2000 hours of occupancy per year) the annual dose at the nearest controlled area boundary (approximately 300 meters) is below the

10 CFR 72.104(a) and 40 CFR 190.10(a) limit of 25 mrem from direct and skyshine radiation. Since it is demonstrated that with a conservative occupancy assumption the doses at the controlled area boundary are within limits, it can easily be concluded that the dose to a "real individual" is within the same limits. The closest residence to the ISFSI is in the SW-SSW direction approximately 1 mile (~1600 meters) from the ISFSI, or 1.36 miles from the centerline of the site.[47]

OCONEE NUCLEAR STATION

2008 METEOROLOGICAL JOINT FREQUENCY DISTRIBUTIONS

OF WIND SPEED, WIND DIRECTION, AND ATMOSPHERIC STABILITY

USING WINDS AT THE 10 METER LEVEL

(Hours of Occurrence)

OCONEE NUCLEAR STN. METEOROLOGY (2008) PROG=XOQFREQ
10M WIND SPEED/DIRECTION/DELTA-T STABILITY
STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

PASQUILL STABILITY A

	WIND SPEED CLASS										
	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.
SECTOR											
-N-	.	.	1	2	2	1	.	.	.	.	6
-NNE-	.	1	.	1	2	3	.	.	.	.	7
-NE-	.	.	2	1	4	5	2	.	.	.	14
-ENE-	.	.	1	3	6	1	2	.	.	.	13
-E-	.	.	1	.	1	3	.	.	.	.	5
-ESE-	.	.	.	.	2	.	.	.	.	.	2
-SE-	.	.	.	1	.	.	.	.	.	.	1
-SSE-	1	.	.	.	2	.	.	.	.	.	3
-S-	1	.	1	3	3	.	2	.	.	.	10
-SSW-	.	.	1	6	6	10	.	.	.	.	23
-SW-	.	.	.	5	23	15	3	.	.	.	46
-WSW-	.	.	.	1	13	1	.	.	.	3	18
-W-	.	.	1	2	3	1	.	.	.	.	7
-WNW-	.	1	.	1	3	4	6	.	1	.	16
-NW-	1	.	1	.	.	1	1	2	2	.	8
-NNW-	.	.	1	1	1	1	.	1	.	.	5
TOTAL	3	2	10	27	71	46	16	3	3	3	184

OCONEE NUCLEAR STN. METEOROLOGY (2008) PROG=XOQFREQ
10M WIND SPEED/DIRECTION/DELTA-T STABILITY
STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

PASQUILL STABILITY B

	WIND SPEED CLASS								
	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.
SECTOR									
-N-	.	1	1	1	.	.	.	.	3
-NNE-	.	3	2	1	.	.	.	.	6
-NE-	.	2	3	1	.	.	.	.	6
-ENE-	.	.	3	8	3	.	.	.	14
-E-	.	.	1	3	.	.	.	.	4
-ESE-	1	.	1	1	.	.	.	.	3
-S-	.	.	2	.	.	.	.	.	2
-SSW-	2	3	17	10	.	.	.	.	32
-SW-	1	5	28	14	3	.	1	1	53
-WSW-	.	5	12	3	1	1	1	.	23
-W-	1	1	4	.	4	.	.	.	10
-WNW-	.	1	1	3	6	.	1	.	12
-NW-	.	1	.	5	1	.	4	2	13
-NNW-	.	.	1	2	2	1	.	.	6
TOTAL	5	22	76	52	20	2	7	3	187

OCONEE NUCLEAR STN. METEOROLOGY (2008) PROG=XOQFREQ
10M WIND SPEED/DIRECTION/DELTA-T STABILITY
STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

PASQUILL STABILITY C

	WIND SPEED CLASS										
	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.
SECTOR											
-N-	.	1	.	.	6	4	.	.	.	.	11
-NNE-	.	.	.	2	4	7	.	.	.	.	13
-NE-	.	.	.	1	7	3	1	.	.	.	12
-ENE-	.	1	.	.	12	13	6	2	.	.	34
-E-	.	.	.	1	10	1	1	.	.	.	13
-SE-	.	.	.	1	.	.	.	.	.	.	1
-SSE-	.	.	.	.	1	.	.	.	.	.	1
-S-	.	.	1	.	2	1	.	.	.	.	4
-SSW-	.	2	.	13	31	24	8	.	.	.	78
-SW-	.	1	5	17	61	30	10	2	4	.	130
-WSW-	.	.	2	6	25	5	5	2	5	1	51
-W-	.	.	.	2	6	3	1	1	1	.	14
-WNW-	1	.	.	4	3	1	4	5	2	.	20
-NW-	.	.	.	.	1	4	5	5	7	.	22
-NNW-	.	.	1	2	.	3	1	4	.	.	11
TOTAL	1	5	9	49	169	99	42	21	19	1	415

OCONEE NUCLEAR STN. METEOROLOGY (2008) PROG=XOQFREQ
10M WIND SPEED/DIRECTION/DELTA-T STABILITY
STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

PASQUILL STABILITY D

	WIND SPEED CLASS											
	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.
SECTOR												
-N-	1	13	4	17	23	8	3	2	.	.	.	71
-NNE-	1	3	19	22	55	33	3	.	.	.	.	136
-NE-	.	5	11	17	57	137	47	17	1	.	.	292
-ENE-	2	7	5	21	110	289	168	23	.	.	.	625
-E-	1	4	7	13	63	91	19	1	.	.	.	199
-ESE-	1	6	12	12	29	29	3	1	.	.	.	93
-SE-	1	10	10	16	31	18	.	.	.	.	.	86
-SSE-	1	10	12	19	35	13	2	.	.	.	.	92
-S-	2	6	12	14	35	12	.	1	.	.	.	82
-SSW-	1	4	14	23	54	123	80	14	.	.	.	313
-SW-	2	11	18	26	95	172	117	66	25	14	.	546
-WSW-	1	6	16	27	59	103	46	60	53	41	2	414
-W-	.	6	14	18	37	32	48	34	33	21	8	251
-WNW-	2	13	23	18	29	30	42	52	26	16	5	256
-NW-	.	5	12	16	21	16	27	18	12	12	1	140
-NNW-	2	8	16	26	22	16	19	6	4	2	.	121
TOTAL	18	117	205	305	755	1122	624	295	154	106	16	3717

OCONEE NUCLEAR STN. METEOROLOGY (2008) PROG=XOQFREQ
10M WIND SPEED/DIRECTION/DELTA-T STABILITY
STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

PASQUILL STABILITY E

	WIND SPEED CLASS										
	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	TOTAL
	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.
SECTOR											
-N-	19	57	43	23	11	11	.	.	.	.	164
-NNE-	11	29	29	19	24	7	3	.	.	.	122
-NE-	5	31	18	21	48	31	2	.	.	.	156
-ENE-	7	20	22	32	76	50	8	.	.	.	215
-E-	2	25	24	33	46	22	.	.	.	.	152
-ESE-	8	20	15	36	36	13	1	.	.	.	129
-SE-	5	16	16	18	39	13	.	.	.	.	107
-SSE-	5	14	19	31	39	14	.	.	.	.	122
-S-	4	16	26	23	43	13	1	.	.	.	126
-SSW-	8	27	28	18	38	54	13	6	1	.	193
-SW-	7	25	43	29	44	58	22	27	8	.	263
-WSW-	10	40	25	27	34	31	35	11	7	1	221
-W-	8	54	40	27	13	17	14	7	2	.	182
-WNW-	13	105	52	25	15	17	10	4	1	1	243
-NW-	21	97	62	26	13	6	3	.	.	.	228
-NNW-	20	90	62	51	13	5	3	.	.	.	244
-CALM-	3	.	.	.	.	.	.	.	.	.	3
TOTAL	156	666	524	439	532	362	115	55	19	2	2870

OCONEE NUCLEAR STN. METEOROLOGY (2008) PROG=XOQFREQ
10M WIND SPEED/DIRECTION/DELTA-T STABILITY
STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

PASQUILL STABILITY F

	WIND SPEED CLASS								
	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	TOTAL
	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.
SECTOR									
-N-	3	4	4	1	.	.	.	.	12
-NNE-	2	3	2	1	.	.	.	.	8
-NE-	.	.	1	1	1	2	.	.	5
-ENE-	1	1	1	1	.	1	.	.	5
-E-	.	3	.	7	2	1	.	.	13
-ESE-	.	5	3	3	4	5	.	.	20
-SE-	.	.	1	4	3	3	.	.	11
-SSE-	1	2	1	2	1	2	.	.	9
-S-	.	3	1	1	.	.	.	.	5
-SSW-	2	4	7	1	.	1	.	.	15
-SW-	2	10	7	2	6	3	.	.	30
-WSW-	4	9	4	2	3	3	1	1	27
-W-	5	18	8	1	.	1	.	.	33
-WNW-	13	57	47	23	3	1	.	.	144
-NW-	7	22	43	24	6	.	.	.	102
-NNW-	5	6	10	3	.	.	.	.	24
TOTAL	45	147	140	77	29	23	1	1	463

OCONEE NUCLEAR STN. METEOROLOGY (2008) PROG=XOQFREQ
10M WIND SPEED/DIRECTION/DELTA-T STABILITY
STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

PASQUILL STABILITY G

	WIND SPEED CLASS							
	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	TOTAL
	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.
SECTOR								
-N-	.	.	1	.	.	.	.	1
-NNE-	.	.	.	1	.	.	.	1
-E-	.	1	.	.	.	.	.	1
-ESE-	.	1	1	.	.	.	.	2
-SE-	.	.	1	.	.	.	.	1
-SSE-	.	1	.	.	.	.	1	2
-SSW-	.	1	.	1	.	.	.	2
-SW-	.	.	.	.	1	1	.	2
-WSW-	.	2	1	1	1	.	.	5
-W-	1	4	2	.	1	.	.	8
-WNW-	.	7	14	11	.	.	.	32
-NW-	.	4	3	6	.	.	.	13
-CALM-	1	.	.	.	.	.	.	1
TOTAL	2	21	23	20	3	1	1	71

OCONEE NUCLEAR STN. METEOROLOGY (2008) PROG=XOQFREQ
10M WIND SPEED/DIRECTION/DELTA-T STABILITY
STABILITY CLASSES BASED ON DELTA-T BETWEEN UPPER-LOWER LEVELS

ALL STABILITY CLASSES

	WIND SPEED CLASS											
	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.
SECTOR												
-N-	23	74	53	42	37	28	9	2	.	.	.	268
-NNE-	14	35	51	43	85	48	17	.	.	.	.	293
-NE-	5	36	30	41	110	184	58	20	1	.	.	485
-ENE-	10	28	29	55	189	361	198	34	2	.	.	906
-E-	3	33	31	54	112	126	26	2	.	.	.	387
-ESE-	9	32	31	52	69	50	5	1	.	.	.	249
-SE-	6	26	28	38	75	34	.	.	.	.	.	207
-SSE-	7	28	32	52	75	32	3	.	.	.	.	229
-S-	6	26	39	40	81	32	2	3	.	.	.	229
-SSW-	11	36	51	46	114	232	137	28	1	.	.	656
-SW-	11	46	69	63	173	346	198	109	35	19	1	1070
-WSW-	15	57	46	59	109	187	91	78	63	48	6	759
-W-	14	82	64	48	56	63	66	46	36	22	8	505
-WNW-	28	183	137	77	53	55	60	72	32	21	5	723
-NW-	28	129	120	73	41	23	40	25	19	25	3	526
-NNW-	27	104	88	82	38	23	28	9	10	2	.	411
-CALM-	4	.	.	.	.	.	.	.	.	.	.	4
TOTAL	221	955	899	865	1417	1824	938	429	199	137	23	7907

Attachment VII

SLC 16.11 Radiological Effluent Controls

16.11 RADIOLOGICAL EFFLUENTS CONTROL

16.11.1 Radioactive Liquid Effluents

COMMITMENT Establish conditions for the controlled release of radioactive liquid effluents. Implement the requirements of 10 CFR 20, 10 CFR 50.36a, Appendix A to 10 CFR 50, Appendix I to 10 CFR 50, 40 CFR 141 and 40 CFR 190.

a. Concentration

The concentration of radioactive material released at anytime from the site boundary for liquid effluents to Unrestricted Areas [denoted in Figure 2.1-4(a) of the Oconee Nuclear Station Updated Final Safety Analysis Report] shall be limited to 10 times the effluent concentrations specified in 10 CFR Part 20, Appendix B, Table 2, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases the concentration shall be limited to 2×10^{-4} μCi/ml total activity.

b. Dose

The dose or dose commitment to a Member Of The Public from radioactive materials in liquid effluents to Unrestricted Areas shall be limited to:

1. during any calendar quarter:

   ≤ 4.5 mrem to the total body

   ≤ 15 mrem to any organ; and

2. during any calendar year:

   ≤ 9 mrem to the total body

   ≤ 30 mrem to any organ.

c. Liquid Waste Treatment

The appropriate subsystems of the liquid radwaste treatment system shall be used to reduce the radioactive materials in liquid waste prior to their discharge, if the projected dose due to liquid effluent releases to unrestricted areas, when averaged over 31 days would exceed 0.18 mrem to the total body or 0.6 mrem to any organ.

----------NOTE----------
Appendix I dose limits for radioactive liquid effluent releases are applicable only during normal operating conditions which include expected operational occurrences, and are not applicable during unusual operating conditions that result in activation of the *Oconee Emergency Plan*.

APPLICABILITY: At all times

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Concentration of radioactive material released in liquid effluents to Unrestricted Areas exceeds the limits specified in Commitment a.	A.1 Restore concentration to within the limit.	Immediately

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Calculated dose from the release of radioactive materials in liquid effluents exceeds any of the limits in Commitment b.	B.1 ----------NOTE---------- Not required during unusual operating conditions that result in activation of the Oconee Emergency Plan. ----------	
	Submit report to the regional NRC Office which includes the following: a. Cause(s) for exceeding the limit(s). b. A description of the program of corrective action initiated to: reduce the releases of radioactive materials in liquid effluents, and to keep these levels of radioactive materials in liquid effluents in compliance with the above limits, or as low as reasonably achievable. c. Results of radiological analyses of the drinking water source and the radiological impact on finished drinking water supplies with regard to the requirements of 40 CFR 141.	30 days from the end of the quarter during which the release occurred

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Radioactive liquid waste is discharged without treatment and in excess of the specified limit.	C.1 Submit report to the regional NRC Office which includes the following: a. Cause of equipment or subsystem inoperability. b. Corrective action to restore equipment and prevent recurrence.	30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 16.11.1.1 N/A	N/A

BASES

The concentration commitment is provided to ensure that the concentration of radioactive materials released in liquid waste effluents from the site to unrestricted areas will be less than 10 times the effluent concentration levels specified in 10 CFR Part 20, Appendix B, Table 2, Column 2. The concentration limit for noble gases is based upon the assumption that Xe-135 is the controlling radioisotope and its EC in air (submersion) was converted to an equivalent concentration in water using the methods described in International Commission on Radiological Protection (ICRP) Publication 2.

The basic requirements for Selected Licensee Commitments concerning effluent from nuclear power reactors are stated in 10 CFR 50.36a. Compliance with effluent Selected Licensee Commitments will ensure that average annual releases of radioactive material in effluents will be small percentages of the limits specified in the old 10 CFR 20.106 (new 10 CFR 20.1302). The requirements contained in 10 CFR 50.36a further indicate that operational flexibility is allowed, compatible with considerations of health and safety, which may temporarily result in releases higher than such small percentages, but still within the limits specified in the old 10 CFR 20.106 which references Appendix B, Table II concentrations (MPCs). These referenced concentrations are specific values which relate to an annual dose of 500 mrem. It is further indicated in 10 CFR 50.36a that when using operational flexibility, best efforts shall be exerted to keep levels of radioactive materials in effluents as low as reasonably achievable (ALARA) as set forth in 10 CFR 50 Appendix I. Also, for fresh water sites with drinking water supplies which can be potentially affected by plant operations, there is reasonable assurance that the operation of the facility will not result in radionuclide concentrations in the finished drinking water that are in excess of the requirements of 40 CFR 141. Therefore, to accommodate operational flexibility needed for effluent releases, the limits associated with this SLC are based on ten times the instantaneous dose rate value of 50 mrem/year to apply at all times. Compliance with the limits of the new 10 CFR 20.1001 will be demonstrated by operating within the limits of 10 CFR 50, Appendix I, 40 CFR 141 and 4O CFR 190.

Section I of Appendix I of 10 CFR 50 states that this appendix provides specific numerical guides for design objectives and limiting conditions for operation, to assist holders of licenses for light water cooled nuclear power reactors in meeting the requirements to keep releases of radioactive material to unrestricted areas as low as practical and reasonably achievable, during normal reactor operations, including expected operational occurrences. Using the flexibility granted during unusual operating conditions, and the stated applicability of the design objectives for the Oconee Nuclear Station, Appendix I dose limits for radioactive liquid effluent releases are concluded to be not applicable during unusual operating conditions that result in the activation of the Oconee Emergency Plan.

For units with shared radwaste treatment systems, the liquid effluents from the shared system are proportioned among the units sharing that system.

The requirements that the appropriate portions of this system be used when specified provides assurance that the releases of radioactive materials in liquid effluents will be kept "as low as is reasonably achievable." This SLC implements the requirements of 10 CFR Part 50.36a. General Design Criterion 60 of Appendix A to 10 CFR Part 50 and design objective Section II.D of Appendix A to 10 CFR Part 50.

REFERENCES:

1. 10 CFR Part 20, Appendix B.
2. 40 CFR Part 141.
3. 10 CFR Part 50, Appendices A and I.
4. 40 CFR Part 190.
5. Offsite Dose Calculation Manual.
6. Regulatory Guide 1.109.
7. NUREG-1301

16.11 RADIOLOGICAL EFFLUENTS CONTROL

16.11.2 Radioactive Gaseous Effluents

COMMITMENT Establish conditions for the controlled release of radioactive gaseous effluents. Implement the requirements of 10 CFR 20, 10 CFR 50.36a, Appendix A to 10 CFR 50, Appendix I to 10 CFR 50, and 40 CFR 190.

a. Dose Rate

The instantaneous dose rate at the site (exclusion area) boundary for gaseous effluents [Figure 2.1-4(a) of the Oconee Nuclear Station Updated Final Safety Analysis Report] due to radioactive materials released in gaseous effluents from the site shall be limited to the following values:

1. The dose rate limit for noble gases shall be:

   ≤ 500 mrem/yr to the total body

   ≤ 3000 mrem/yr to the skin; and

2. The dose rate limit for all radioiodines and for all radioactive materials in particulate form and radionuclides other than noble gases with half-lives greater than 8 days shall be ≤ 1500 mrem/yr to any organ.

b. Dose

1. The air dose due to noble gases released in gaseous effluent from the site shall be limited to the following:

   i. During any calendar quarter:

      ≤ 15 mrad for gamma radiation

      ≤ 30 mrad for beta radiation

   ii. During any calendar year:

      ≤ 30 mrad for gamma radiation

      ≤ 60 mrad for beta radiation

2. The dose to a Member Of The Public from radioiodines, tritium and radioactive materials in particulate form with half-lives greater than 8 days in gaseous effluents released from the site, shall be limited to the following:

i. During any calendar quarter:

≤ 22.5 mrem to any organ

ii. During any calendar year:

≤ 45 mrem to any organ.

c. Gaseous Radwaste Treatment

1. The Gaseous Radwaste Treatment System shall be used to reduce the noble gases in gaseous wastes prior to their discharge, if the projected gaseous effluent air dose due to gaseous effluent release from the site, when averaged over 31 days exceeds 0.6 mrad for gamma radiation and 1.2 mrad for beta radiation.

2. The Ventilation Treatment Exhaust System shall be used to reduce radioactive materials other than noble gases in gaseous waste prior to their discharge when the projected doses due to effluent releases to unrestricted areas when averaged over 31 days would exceed 0.9 mrem to any organ.

d. Used Oil Incineration

During incineration of used oil contaminated by radioactive material in the Station Auxiliary Boiler, the dose to a Member Of The Public from radioiodines, tritium and radioactive materials in particulate form with half-lives greater than 8 days in gaseous effluents released from the Station Auxiliary Boiler shall be ≤ 0.045 mrem to any organ in any calendar year.

----------NOTE----------
The requirement of c.2 does not apply to the Auxiliary Building Exhaust System since it is not "treated" prior to release.

APPLICABILITY: At all times

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Dose rate exceeds the limits specified in Commitment a.	A.1 Restore release rate to within limits.	Immediately
B. Calculated dose exceeds specified limits.	B.1 Submit report to the regional NRC Office which includes the following: a. Cause(s) for exceeding the limit(s), and b. A description of the program of corrective action initiated to: reduce the releases of radioactive materials in gaseous effluents, and to keep these levels of radioactive materials in gaseous effluents in compliance with the specified limits or as low as reasonably achievable.	30 days from the end of the quarter during which the release occurred

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Radioactive gaseous waste is discharged greater than limits specified in Commitment c.1 or c.2. AND Radioactive gaseous waste is discharged without treatment for more than 31 days.	C.1 Submit a report to the regional NRC Office which includes the following: a. Cause of equipment or subsystems inoperability, and b. Corrective action to restore equipment and prevent recurrence.	30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 16.11.2.1 N/A	N/A

BASES

The basic requirements for Selected Licensee Commitments concerning effluent from nuclear power reactors are stated in l0CFR50.36. Compliance with effluent Selected Licensee Commitments will ensure that average annual releases of radioactive material in effluents will be small percentages of the limits specified in the old l0CFR20.106 (new l0CFR20.1302). The requirements contained in l0CFR50.36a further indicate that operational flexibility is allowed, compatible with considerations of health and safety, which may temporarily result in releases higher than such small percentages, but still within the limits specified in the old l0CFR20.106 which references Appendix B, Table II concentrations (MPCs). These referenced concentrations are specific values which relate to an annual dose of 500 mrem to the total body, 3000 mrem to the skin, and 1500 mrem to an infant via the milk animal-milk-infant pathway. It is further indicated in l0CFR50.36a that when using operational flexibility, best efforts shall be exerted to keep levels of radioactive materials in effluents as low as reasonably achievable (ALARA) as set forth in l0CFR50 Appendix I. Therefore, to accommodate operational flexibility needed for effluent releases, the limits associated with gaseous release rate SLCs will be maintained at the current instantaneous dose rate limit for noble gases of 500 mrem/year to the total body and 3000 mrem/year to the skin; and for Iodine-131, for Iodine-133, for tritium, and for all radionuclides in particulate form with half-lives greater than 8 days. an instantaneous dose rate limit of 1500 mrem/year.

The ODCM calculational methods for calculating the doses due to the actual release rates of the subject materials will be consistent with the methodology provided in Regulatory Guide 1.109, "Calculating of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," Revision 1,. October 1977 and Regulatory Guide 1.111, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors."

Equations in the ODCM are provided for determining the actual doses based upon the historical average atmospheric conditions. The release rate commitments for radioiodines, radioactive material in particulate form and radionuclides other than noble gases are dependent on the existing radionuclide pathways to man, in the unrestricted area. The pathways which are examined in the development of these calculations are: 1) individual inhalation of airborne radionuclides, 2) deposition of radionuclides into green leafy vegetation with subsequent consumption by man, 3) deposition onto grassy areas where milk animals and meat producing animals graze with consumption of the milk and meat by man, and 4) deposition on the ground with subsequent exposure of man.

The requirement that the appropriate portions of these systems be used when specified provides reasonable assurance that the release of radioactive materials in gaseous effluents will be kept "as low as is reasonably achievable." This commitment implements the requirements of 10 CFR Part 50.36a, General Design Criterion 60 of Appendix A to 10 CFR Part 50, and design objective Section IID of Appendix I to 10 CFR Part 50.

REFERENCES:

1 10 CFR Part 20, Appendix 8.
2. 10 CFR Part 50, Appendices A and I.
3. Regulatory Guide 1.109.
4. 40 CFR Part 190.
5. Offsite Dose Calculation Manual.

16.11 RADIOLOGICAL EFFLUENTS CONTROL

16.11.3 Radioactive Effluent Monitoring Instrumentation

COMMITMENT Radioactive Effluent Monitoring Instrumentation shall be OPERABLE as follows:

a. Liquid Effluents

The radioactive liquid effluent monitoring instrumentation channels shown in Table 16.11.3-1 shall be OPERABLE with their alarm/trip setpoints set to ensure that the limits of SLC 16.11.1.a are not exceeded.

b. Gaseous Process and Effluents

The radioactive gaseous process and effluent monitoring instrumentation channels shown in Table 16.11.3-2 shall be OPERABLE with their alarm/trip setpoints set to ensure that the limits of SLC 16.11.2.a are not exceeded.

c. The setpoints shall be determined in accordance with the methodology described in the ODCM and shall be recorded.

----------NOTE----------
Correction to setpoints determined in accordance with Commitment c may be permitted without declaring the channel inoperable.

APPLICABILITY: According to Table 16.11.3-1 and Table 16.11.3-2.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Alarm/trip setpoint less conservative than required for one or more effluent monitoring instrument channels.	A.1	Declare channel inoperable.	Immediately
	OR		
	A.2	Suspend release of effluent monitored by the channel.	Immediately

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. One or more required liquid effluent monitoring instrument channels inoperable.	B.1	Enter the Condition referenced in Table 16.11.3-1 for the function.	Immediately
	AND		
	B.2	Restore the instrument(s) to OPERABLE status.	30 days
C. One or more required gaseous effluent monitoring instrument channels inoperable.	C.1	Enter the Condition referenced in Table 16.11.3-2 for the function.	Immediately
	AND		
	C.2	Restore the instrument(s) to OPERABLE status.	30 days
D. Required Action and associated Completion Time of Required Action B.2 or C.2 not met.	D.1	Explain in next Annual Radiological Effluent Release Report why inoperability was not corrected in a timely manner.	April 30 of following calendar year

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. As required by Required Action B.1 and referenced in Table 16.11.3-1. (RIA-33)	E.1.1 Analyze two independent samples in accordance with SLC 16.11.4.	Prior to initiating subsequent release
	AND	
	E.1.2 Conduct two independent data entry checks for release rate calculations	Prior to initiating subsequent release
	AND	
	E.1.3 Conduct two independent valve lineups of the effluent pathway.	Prior to initiating subsequent release
	OR	
	E.2 Suspend release of radioactive effluents by this pathway.	Immediately
F. As required by Required Action B.1 and referenced in Table 16.11.3-1. (RIA-54)	F.1 Suspend release of radioactive effluents by this pathway.	Immediately
	OR	
	F.2 Collect and analyze grab samples for gross radioactivity (beta and/or gamma) at a lower limit of detection of at least 10^{-7} μCi/ml.	Prior to each discrete release of the sump

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. As required by Required Action B.1 and referenced in Table 16.11.3-1. (Liquid Radwaste Effluent Line Flow Rate Monitor)	----------NOTE---------- Not required during short, controlled outages of liquid effluent monitoring instrumentation. Short controlled outages are defined as planned removals from service for durations not to exceed 1 hour, for purposes of sample filter changeouts, setpoint adjustments, service checks, and/or routine maintenance procedures. This guidance may be applied successively, provided that time between successive short, controlled outages is always at least equal to duration of immediately preceding outage. ---------- G.1 Suspend release of radioactive effluents by this pathway. OR G.2 Estimate flow rate during actual releases.	Immediately Immediately AND Once per 4 hours thereafter

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. As required by Required Action B.1 and referenced in Table 16.11.3-1. (RIA-35, #3 Chemical Treatment Pond Composite Sampler and Sampler Flow Monitor (Turbine Building Sumps Effluent))	----------NOTE---------- Not required during short, controlled outages of liquid effluent monitoring instrumentation. Short controlled outages are defined as planned removals from service for durations not to exceed 1 hour, for purposes of sample filter changeouts, setpoint adjustments, service checks, and/or routine maintenance procedures. This guidance may be applied successively, provided that time between successive short, controlled outages is always at least equal to duration of immediately preceding outage. ----------	
	H.1 Suspend release of radioactive effluents by this pathway.	Immediately
	OR	
	H.2 Collect and analyze grab samples for gross radioactivity (beta and/or gamma) at a lower limit of detection of at least 10^{-7} µCi/ml.	Immediately AND Once per 12 hours thereafter

CONDITION	REQUIRED ACTION	COMPLETION TIME
I. As required by Required Action C.1 and referenced in Table 16.11.3-2 for effluent releases from waste gas tanks (RIA-37, RIA-38) or containment purges (RIA-45).	----------NOTE---------- Not required during short, controlled outages of gaseous effluent monitoring instrumentation. Short controlled outages are defined as planned removals from service for durations not to exceed 1 hour, for purposes of sample filter changeouts, setpoint adjustments, service checks, and/or routine maintenance procedures. This guidance may be applied successively, provided that time between successive short, controlled outages is always at least equal to duration of immediately preceding outage. ----------	
	I.1.1 Analyze two independent samples.	Prior to initiating subsequent release
	AND	
	I.1.2 Conduct two independent data entry checks for release rate calculations	Prior to initiating subsequent release
	AND	
	I.1.3 Conduct two independent valve lineups of the effluent pathway.	Prior to initiating subsequent release
	OR	
	I.2 Suspend release of radioactive effluents by this pathway.	Immediately

CONDITION	REQUIRED ACTION	COMPLETION TIME
J. As required by Required Action C.1 and referenced in Table 16.11.3-2. (Effluent Flow Rate Monitor (Unit Vent, Containment Purge, Interim Radwaste Exhaust, Hot Machine Shop Exhaust, Radwaste Facility Exhaust, Waste Gas Discharge))	----------NOTE---------- Not required during short, controlled outages of gaseous effluent monitoring instrumentation. Short controlled outages are defined as planned removals from service for durations not to exceed 1 hour, for purposes of sample filter changeouts, setpoint adjustments, service checks, and/or routine maintenance procedures. This guidance may be applied successively, provided that time between successive short, controlled outages is always at least equal to duration of immediately preceding outage. ---------- J.1 Suspend release of radioactive effluents by this pathway. OR J.2 Estimate flow rate	Immediately Immediately AND Once per 4 hours thereafter

CONDITION	REQUIRED ACTION	COMPLETION TIME
K. As required by Required Action C.1 and referenced in Table 16.11.3-2. (RIA-45, RIA-53, 4RIA-45)	----------NOTE---------- Not required during short, controlled outages of gaseous effluent monitoring instrumentation. Short controlled outages are defined as planned removals from service for durations not to exceed 1 hour, for purposes of sample filter changeouts, setpoint adjustments, service checks, and/or routine maintenance procedures. This guidance may be applied successively, provided that time between successive short, controlled outages is always at least equal to duration of immediately preceding outage. ----------	
	K.1 Suspend release of radioactive effluents by this pathway.	Immediately
	OR	
	K.2.1 Collect grab sample.	Immediately AND Once per 8 hours
	AND	
	K.2.2 Analyze grab samples for gross activity (beta and/or gamma).	24 hours from collection of sample

CONDITION	REQUIRED ACTION	COMPLETION TIME
L. As required by Required Action C.1 and referenced in Table 16.11.3-2. (Unit Vent Monitoring Iodine Sampler, Unit Vent Monitoring Particulate Sampler, Interim Radwaste Building Ventilation Monitoring Iodine Sampler, Interim Radwaste Building Ventilation Monitoring Particulate Sampler, Hot Machine Shop Iodine Sampler, Hot Machine Shop Particulate Sampler, Radwaste Facility Iodine Sampler, Radwaste Facility Particulate Sampler)	----------NOTE---------- Not required during short, controlled outages of gaseous effluent monitoring instrumentation. Short controlled outages are defined as planned removals from service for durations not to exceed 1 hour, for purposes of sample filter changeouts, setpoint adjustments, service checks, and/or routine maintenance procedures. This guidance may be applied successively, provided that time between successive short, controlled outages is always at least equal to duration of immediately preceding outage. ----------	
	L.1 Suspend release of radioactive effluents by this pathway.	Immediately
	OR	
	L.2.1 ----------NOTE---------- The collection time of each sample shall not exceed 7 days. ---------- Collect samples continuously using auxiliary sampling equipment.	Immediately
	AND	
	L.2.2 Analyze each sample.	48 hours from end of each sample collection

CONDITION	REQUIRED ACTION	COMPLETION TIME
M. As required by Required Action C.1 and referenced in Table 16.11.3-2 for effluent from ventilation system or condenser air ejectors. (RIA-40)	----------NOTE---------- Not required during short, controlled outages of gaseous effluent monitoring instrumentation. Short controlled outages are defined as planned removals from service for durations not to exceed 1 hour, for purposes of sample filter changeouts, setpoint adjustments, service checks, and/or routine maintenance procedures. This guidance may be applied successively, provided that time between successive short, controlled outages is always at least equal to duration of immediately preceding outage. ----------	
	M.1 Continuously monitor release through the unit vent.	Immediately
	OR	
	M.2 Suspend release of radioactive effluents by this pathway.	Immediately
	OR	
	M.3.1 Collect grab sample.	Immediately AND Once per 8 hours
	AND	
	M.3.2 Analyze grab sample for gross activity (beta and/or gamma).	24 hours from collection of grab sample

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 16.11.3.1	----------NOTE---------- The Channel Response check shall consist of verifying indications during periods of release. Channel response checks shall be made at least once per calendar day on days in which continuous, periodic or batch releases are made. ---------- Perform Channel Response Check.	During each release via this pathway
SR 16.11.3.2	----------NOTE---------- The Channel Response check shall consist of verifying indications during periods of release. Channel response checks shall be made at least once per calendar day on days in which continuous, periodic or batch releases are made. ---------- Perform Channel Response Check.	24 hours
SR 16.11.3.3	Perform Source Check.	24 hours
SR 16.11.3.4	Perform Source Check.	31 days
SR 16.11.3.5	Perform Source Check.	92 days

	SURVEILLANCE	FREQUENCY
SR 16.11.3.6	----------NOTE---------- The CHANNEL FUNCTIONAL TEST shall also demonstrate that automatic isolation of this pathway and control room annunciation occurs if any of the following conditions exist: 1. Instrument indicates measured levels above the alarm/trip setpoint. 2. Circuit failure (downscale only). ---------- Perform CHANNEL FUNCTIONAL TEST.	92 days
SR 16.11.3.7	----------NOTE---------- The CHANNEL FUNCTIONAL TEST shall also demonstrate that control room annunciation occurs if any of the following conditions exist: 1. Instrument indicates measured levels above the alarm/trip setpoint. 2. Circuit failure (downscale only). ---------- Perform CHANNEL FUNCTIONAL TEST.	92 days
SR 16.11.3.8	Perform CHANNEL FUNCTIONAL TEST.	92 days

	SURVEILLANCE	FREQUENCY
SR 16.11.3.9	----------NOTE---------- The initial CHANNEL CALIBRATION shall be performed using one or more of the reference standards certified by the National Bureau of Standards or using standards that have been obtained from suppliers that participate in measurement assurance activities with the National Institute of Standards and Technology (NIST). The standards shall permit calibrating the system over its intended range of energy and measurement. For subsequent CHANNEL CALIBRATION, sources that have been related to the initial calibration shall be used. (Operating plants may substitute previously established calibration procedures for these requirements.) ---------- Perform CHANNEL CALIBRATION.	12 months
SR 16.11.3.10	Perform CHANNEL CALIBRATION.	12 months
SR 16.11.3.11	Perform leak test.	When cylinder gates or wicket gates are reworked
SR 16.11.3.12	Perform Source Check.	Within 24 hours prior to each release via associated pathway

Table 16.11.3-1
LIQUID EFFLUENT MONITORING INSTRUMENTATION
OPERATING CONDITIONS AND SURVEILLANCE REQUIREMENTS

	INSTRUMENT	MINIMUM OPERABLE CHANNELS	APPLICABILITY	SURVEILLANCE REQUIREMENTS	CONDITION REFERENCED FROM REQUIRED ACTION B.1
1.	Monitors Providing Automatic Termination of Release				
	a. Liquid Radwaste Effluent Line Monitor, RIA-33	1	At all times	SR 16.11.3.1 SR 16.11.3.3 SR 16.11.3.6 SR 16.11.3.9	E
	b. Turbine Building Sump, RIA-54	1	At all times	SR 16.11.3.2 SR 16.11.3.4 SR 16.11.3.7 SR 16.11.3.9	F
2.	Monitors not Providing Automatic Termination of Release				
	Low Pressure Service Water RIA-35	1	At all times	SR 16.11.3.2 SR 16.11.3.4 SR 16.11.3.7 SR 16.11.3.9	H
3.	Flow Rate Measuring Devices				
	a. Liquid Radwaste Effluent Line Flow Rate Monitor (0LW CR0725 or 0LW SS0920)	1	At all times	SR 16.11.3.1 SR 16.11.3.10	G
	b. Liquid Radwaste Effluent Line Minimum Flow Device	NA	NA	SR 16.11.3.1 SR 16.11.3.10	NA
	c. Turbine Building Sump Minimum Flow Device	NA	NA	SR 16.11.3.1 SR 16.11.3.10	NA
	d. Low Pressure Service Water Minimum Flow Device	NA	NA	SR 16.11.3.1 SR 16.11.3.10	NA

Table 16.11.3-1
LIQUID EFFLUENT MONITORING INSTRUMENTATION
OPERATING CONDITIONS AND SURVEILLANCE REQUIREMENTS

	INSTRUMENT	MINIMUM OPERABLE CHANNELS	APPLICABILITY	SURVEILLANCE REQUIREMENTS	CONDITION REFERENCED FROM REQUIRED ACTION B.1
e.	Keowee Hydroelectric Tailrace Discharge [(a)]	NA	NA	SR 16.11.3.11	NA
4.	Continuous Composite Sampler				
	#3 Chemical Treatment Pond Composite Sampler and Sampler Flow Monitor (Turbine Building Sumps Effluent)	1	At all times	SR 16.11.3.2 SR 16.11.3.10	H

(a) Flow is determined from the number of hydro units operating. If no hydro units are operating, leakage flow will be assumed to be 38 cfs based on historical data.

Table 16.11.3-2
GASEOUS EFFLUENT MONITORING INSTRUMENTATION
OPERATING CONDITIONS AND SURVEILLANCE REQUIREMENTS

	INSTRUMENT	MINIMUM OPERABLE CHANNELS (PER RELEASE PATH)	APPLICABILITY	SURVEILLANCE REQUIREMENTS	CONDITION REFERENCED FROM REQUIRED ACTION C.1
1.	Unit Vent Monitoring System				
a.	Noble Gas Activity Monitor Providing Alarm and Automatic Termination of Containment Purge Release (RIA-45 - Purge Isolation Function)	1	At All Times	SR 16.11.3.2 SR 16.11.3.4 SR 16.11.3.7 SR 16.11.3.9	I
b.	Noble Gas Activity Monitor Providing Alarm. (RIA-45 - Vent Stack Monitor Function)	1	At all times	SR 16.11.3.2 SR 16.11.3.4 SR 16.11.3.7 SR 16.11.3.9	K
c.	Iodine Sampler	1	At All Times	SR 16.11.3.2	L
d.	Particulate Sampler	1	At All Times	SR 16.11.3.2	L
e.	Effluent Flow Rate Monitor (Unit Vent Flow) (MSC CR0001)	1	At All Times	SR 16.11.3.2 SR 16.11.3.10	J
f.	Sampler Flow Rate Monitor [(a)] (Annunciator)	1	At All Times	SR 16.11.3.2 SR 16.11.3.10	NA
g.	Effluent Flow Rate Monitor (Containment Purge)(MSC CR0001)	1	During Containment Purge Operation	SR 16.11.3.2 SR 16.11.3.10	J
h.	CSAE Off Gas Monitor (RIA-40)	1	During Operation of CSAE	SR 16.11.3.2 SR 16.11.3.5 SR 16.11.3.8 SR 16.11.3.9	M
2.	Interim Radwaste Building Ventilation Monitoring System				
a.	Noble Gas Activity Monitor (RIA - 53)	1	At All Times	SR 16.11.3.2 SR 16.11.3.4 SR 16.11.3.7 SR 16.11.3.9	K
b.	Iodine Sampler	1	At All Times	SR 16.11.3.2	L
c.	Particulate Sampler	1	At All Times	SR 16.11.3.2	L
d.	Effluent Flow Rate Monitor (Interim Radwaste Exhaust) (GWD FT0082)	1	At All Times	SR 16.11.3.2 SR 16.11.3.10	J
e.	Sampler Flow Rate Monitor[(a)] (Annunciator)	1	At All Times	SR 16.11.3.2 SR 16.11.3.10	NA

Table 16.11.3-2
GASEOUS EFFLUENT MONITORING INSTRUMENTATION
OPERATING CONDITIONS AND SURVEILLANCE REQUIREMENTS

	INSTRUMENT	MINIMUM OPERABLE CHANNELS (PER RELEASE PATH)	APPLICABILITY	SURVEILLANCE REQUIREMENTS	CONDITION REFERENCED FROM REQUIRED ACTION C.1
3.	*Hot Machine Shop Ventilation* Sampling System				
a.	Iodine Sampler	1	At All Times	SR 16.11.3.2	L
b.	Particulate Sampler	1	At All Times	SR 16.11.3.2	L
c.	Effluent Flow Rate Monitor (Hot Machine Shop Exhaust) (Totalizer)	1	At All Times	SR 16.11.3.2 SR 16.11.3.10	J
d.	Sampler Flow Rate Monitor [(a)] (Annunciator)	1	At All Times	SR 16.11.3.2 SR 16.11.3.10	NA
4.	Radwaste Facility Ventilation Monitoring System				
a.	Noble Gas Activity Monitor (4-RIA-45)	1	At All Times	SR 16.11.3.2 SR 16.11.3.4 SR 16.11.3.7 SR 16.11.3.9	K
b.	Iodine Sampler	1	At All Times	SR 16.11.3.2	L
c.	Particulate Sampler	1	At All Times	SR 16.11.3.2	L
d.	Effluent Flow Rate Monitor (Radwaste Facility Exhaust) (0VS CR2060)	1	At All Times	SR 16.11.3.2 SR 16.11.3.10	J
e.	Sampler Flow Rate Monitor [(a)] (Annunciator)	1	At All Times	SR 16.11.3.2 SR 16.11.3.10	NA
5.	Waste Gas Holdup Tanks				
a.	Noble Gas Activity Monitor - Providing Alarm and Automatic Termination of Release (RIA-37,-38)[b]	1	During Waste Gas Holdup Tank Releases	SR 16.11.3.1 SR 16.11.3.6 SR 16.11.3.9 SR 16.11.3.12	I
b.	Effluent Flow Rate Monitor (Waste Gas Discharge Flow) (MSC CR0001)	1	During Waste Gas Holdup Tank Releases	SR 16.11.3.1 SR 16.11.3.10	J

(a)Alarms indicating low flow may be substituted for flow measuring devices.
(b)Either Normal or High Range monitor is required dependent upon activity in tank being released.

BASES

The radioactive liquid effluent instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in liquid effluents during actual or potential releases. The alarm/trip setpoints for these instruments shall be calculated in accordance with NRC approved methods in the ODCM to assure that the alarm/trip will occur prior to exceeding 10 times the limits of 10 CFR Part 20. The operability and use of this instrumentation is consistent with the requirements of General Design Criteria 60, 63, and 64 of Appendix A to 10 CFR Part 50.

The radioactive gaseous effluent instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in gaseous effluents during actual or potential releases. The alarm/trip setpoints for these instruments shall be calculated in accordance with NRC approved methods in the ODCM to assure that the alarm/trip will occur prior to exceeding applicable dose limits in SLC 16.11.2. The operability end use of this instrumentation is consistent with the requirements of General Design Criteria 60, 63, and 64 of Appendix A to 10 CFR Part 50.

For certain applicable cases, grab samples or flow estimates are required at frequencies between every 4 hours end every 12 hours upon RIA removal from service. SLC 16.11.3 does not explicitly require Action (grab samples or flow estimates) to be initiated immediately upon RIA removal from service, when removal is for the purposes of sample filter changeouts, setpoint adjustments, service checks, or routine maintenance. Therefore, during the defined short, controlled outages, Action is not required.

For the cases in which Action is defined as continuous sampling by auxiliary equipment (Action L) initiation of continuous sampling by auxiliary sampling equipment requires approximately 1 hour. One hour is the accepted reasonable time to initiate collect and change samples. Therefore. for the defined short, controlled outages (not to exceed 1 hour), Action is not required.

Failures such as blown instrument fuses, defective indicators, and faulted amplifiers are, in many cases, revealed by alarm or annunciator action. Comparison of output and/or state of independent channels measuring the same variable supplements this type of built-in surveillance. Based on experience in operation of both conventional and nuclear systems, when the unit is in operation, the minimum checking frequency stated is deemed adequate.

REFERENCES:

1. 10 CFR Part 20.
2. 10 CFR Part 50, Appendix A.
3. Offsite Dose Calculation Manual.
4. UFSAR, Section 7.2.3.4.

16.11 RADIOLOGICAL EFFLUENTS CONTROL

16.11.4 Operational Safety Review

COMMITMENT Required sampling should be performed as detailed in Table 16.11.4-1.

APPLICABILITY: At all times

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. NA	A.1 NA	NA

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 16.11.4.1 N/A	N/A

Table 16.11.4-1
Minimum Sampling Frequency and Analysis Program

Item		Check		Frequency	Lower Limit of Detection (b) of Lab Analysis for Waste
1.	Condensate Test Tank, Condensate Monitoring Tank, Laundry-Hot Shower Tank, Waste and Recycle Monitor Tanks	a.	Principal Gamma Emitters(c) including Dissolved Noble Gases	Composite Grab Sample prior to release of each batch(h)	<5E-06 µCi/ml (Ce-144) <5E-07 µCi/ml (Other Gamma Nuclides) <1E-05 µCi/ml (Dissolved Gases) <1E-06 µCi/ml (I-131)
		b.	Radiochemical Analysis Sr-89 and Sr-90	Quarterly from all composited batches(f)	<5E-08 µCi/ml
		c.	Tritium	Monthly Composite	<1E-05 µCi/ml
		d.	Gross Alpha Activity	Monthly Composite	<1E-07 µCi/ml
2.	Unit Vent Sampling (Includes Waste Gas Decay Tanks, Reactor Building Purges, Auxiliary Building Ventilation, Spent Fuel Pool Ventilation, Air Ejectors)	a.	Iodine Spectrum (a)	Continuous monitor, weekly sample(e)	<1E-10 µCi/cc (I-133)(j) <1E-12 µCi/cc (I-131)(j)
		b.	Particulates (a)		
		i.	Ce-144 & Mo-99	Weekly Composite(e)	<5E-10 µCi/cc(j)
		ii.	Other Principle Gamma Emitters (d)	Weekly Composite(e)	<1E-11 µCi/cc(j)
		iii.	Gross Alpha Activity	Monthly, using composite samples of one week	<1E-11 µCi/cc
		iv.	Radiochemical Analysis Sr-89, Sr-90	Quarterly Composite	<1E-11 µCi/cc
		c.	Gases by Principle Gamma Emitters(d)	Weekly Grab Sample	<1E-04 µCi/cc
		d.	Tritium	Weekly Grab Sample	<1E-06 µCi/cc
3.	Waste Gas Decay Tank	a.	Principle Gamma Emitters(d)	Grab Sample prior to release of each batch	<1E-04 µCi/cc (gases) <1E-10 µCi/cc (particulates and iodines) <5E-09 µCi/cc (Ce-144 and Mo-99)
		b.	Tritium	Grab Sample prior to release of each batch	<1E-06 µCi/cc
4.	Reactor Building	a.	Principle Gamma Emitters(d)	Grab sample each purge	<1E-04 µCi/cc (gases) <1E-10 µCi/cc (particulates and iodines) <5E-09 µCi/cc (Ce-144 and Mo-99)
		b.	Tritium	Grab sample each purge	<1E-06 µCi/cc

Table 16.11.4-1
Minimum Sampling Frequency and Analysis Program

Item		Check	Frequency	Lower Limit of Detection (b) of Lab Analysis for Waste
5.	Backwash Receiving Tanks	Principle Gamma Emitters including dissolved Noble Gases	Grab Sample prior to release of each batch	NA
6.	#3 Chemical Treatment Pond Effluent[f]	a. Principle Gamma Emitters(c)	Weekly Continuous Composite(g)	<5E-07 µCi/ml
		b. I-131	Weekly Continuous Composite(g)	<1E-06 µCi/ml
		c. Tritium	Monthly Continuous Composite(g)	<1E-05 µCi/ml
		d. Gross Alpha Activity	Monthly Continuous Composite(g)	<1E-07 µCi/ml
		e. Sr-89 & Sr-90	Quarterly Continuous Composite(g)	<5E-08 µCi/ml
		f. Dissolved and Entrained gases (Gamma Emitters)	Monthly Grab	<1E-05 µCi/ml
	Radwaste Facility Ventilation	a. Iodine Spectrum(a)	Continuous monitor, weekly sample(e)	(I-133) <1E-09 µCi/cc (I-131) <1E-11 µCi/cc
		b. Particulate(a)		
		i. Ce-144 and Mo-99	Weekly Composite(e)	<5E-10 µCi/cc(j)
		ii. Other Principle Gamma Emitters(d)	Weekly Composite(e)	<1E-11 µCi/cc(j)
		iii. Gross Alpha Activity	Monthly, using composite samples of one week	<1E-11 µCi/cc
		iv. Radiochemical Analysis Sr-89, Sr-90	Quarterly Composite	<1E-11 µCi/cc
		c. Gases by Principle Gamma(d) Emitters	Weekly Grab Sample	<1E-04 µCi/cc
		d. Tritium	Weekly Grab Sample	<1E-06 µCi/cc

Table 16.11.4-1
Minimum Sampling Frequency and Analysis Program

Item		Check		Frequency	Lower Limit of Detection (b) of Lab Analysis for Waste
8.	Hot Machine Shop Ventilation	a.	Iodine Spectrum	Weekly Sample[e]	(I-133) <1E-10 µCi/cc(j) (I-131) <1E-12 µCi/cc(j)
		b.	Particulate		
		i.	Ce-144 and Mo-99	Weekly Composite[e]	<5E-10 µCi/cc(j)
		ii.	Other Principle Gamma Emitters [d]	Weekly Composite[e]	<1E-11 µCi/cc(j)
		iii.	Gross Alpha Activity	Monthly, using composite samples of one week	<1E-11 µCi/cc
		iv.	Radiochemical Analysis Sr-89, Sr-90	Quarterly Composite	<1E-11 µCi/cc
		c.	Gases by Principle Gamma Emitters	NA	NA
		d.	Tritium	NA	NA
	Interim Radwaste Building Ventilation	a.	Iodine Spectrum	Weekly sample(e)	(I-133) <1E-10 µCi/cc(j) (I-131) <1E-12 µCi/cc(j)
		b.	Particulate		
		i.	Ce-144 and Mo-99	Weekly Composite(e)	<5E-10 µCi/cc(j)
		ii.	Other Principle Gamma Emitters(d)	Weekly Composite(e)	<1E-11 µCi/cc(j)
		iii.	Gross Alpha Activity	Monthly, using composite samples of one week	<1E-11 µCi/cc
		iv.	Radiochemical Analysis Sr-89, Sr-90	Quarterly Composite	<1E-11 µCi/cc
		c.	Gases by Principle Gamma(d) Emitters	Weekly Grab Sample	<1E-04 µCi/cc
		d.	Tritium	Weekly Grab Sample	<1E-06 µCi/cc

(a) Samples shall be changed at least once every 24 hours and analysis shall be completed within 48 hours after changing (on or after removal from sampler).

(b) The LLD is defined for purposes of these commitments as the smallest concentration of radioactive material in a sample that would be detected with 95% probability with 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system (which may include radiochemical separation) :

$$LLD = \frac{4.66\ sb}{E \times V \times 2.22E06 \times Y \times \exp(-\lambda \Delta t)}$$

Where:

LLD is the "a priori" lower limit of detection as defined above (as micro Curies per unit mass or volume),

sb is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute),

E is the counting efficiency (as counts per disintegration),

V is the sample size (in units of mass or volume),

2.22E06 is the number of disintegrations per minute per micro Curie,

Y is the fractional radiochemical yield (when applicable),

λ is the radioactive decay constant for the particular nuclide

Δ t is the elapsed time between midpoint of sample collection and time of counting (for plant effluents, not environmental samples). NOTE: This assumes decay correction is applied (at the time of analysis) for the duration of sample collection, for the time between collection and analysis, and for the duration of the counting. Additionally, it does not apply to isolated systems such as Waste Gas Decay Tanks and Waste Monitor Tanks.

Typical values of E, V, Y and Δ t should be used in the calculation.

It should be recognized that the LLD is an a priori (before the fact) limit representing the capability of a measurement system and not an a posteriori (after the fact) limit for a particular measurement.

(c) The principal gamma emitters for which the LLD control applies include the following radionuclides: Mn-54. Fe-59, Co-58, Co-60. Zn-65, Mo-99, Cs-134, Cs-137. and Ce-141. Ce-144 shall also be measured, but with a LLD of 5E-06 µCi/ml. This list does not mean that only these nuclides are to be considered. 0ther gamma peaks that are identifiable, together with the above nuclides shall also be analyzed and reported in the Annual Radioactive Effluent Release Report.

(d) The principal gamma emitters for which the LLD commitment applies exclusively are the following radionuclides: Kr-87. Kr-88, Xe-133. Xe-133m, Xe-135. and Xe-138 for gaseous emissions and Mn-54, Fe-59. Co-58, Co-60, Zn-65. Mo-99, Cs-134, Cs-137, Ce-141, and Ce-144 for particulates. This list does not mean that only these nuclides are to be detected and reported. 0ther peaks which are measurable and identifiable, together with the above nuclides shall also be identified and reported.

(e) The ratio of the sample flow rate to the sampled stream flow rate shall be known for the time period covered by each dose or dose rate calculation made in accordance with SLC 16.11.2.a, SLC 16.11.2.b.1, and SLC 16.11.2.b.2.

(f) A composite sample is one in which the quantity of liquid sampled is proportional to the quantity of liquid waste discharged and in which the method of sampling employed results in a specimen which is representative of the liquids released.

(g) To be representative of the quantities and concentrations of radioactive materials in liquid effluents, samples shall be collected continuously in proportion to the rate of flow of the effluent stream. Prior to analysis, all samples taken for the composite shall be thoroughly mixed in order for the composite sample to be representative of the effluent release.

(h) A batch release is the discharge of liquid wastes of a discrete volume. Prior to sampling for analysis, each batch shall be isolated, and then thoroughly mixed, to assure representative sampling.

(i) A continuous release is the discharge of liquid wastes of a non-discrete volume, e.g., from a volume of a system that has an input flow during the continuous release.

(j) When samples collected for 24 hours are analyzed, the corresponding LLDs may be increased by a factor of 10.

BASES

N/A

REFERENCES:

N/A

16.11 RADIOLOGICAL EFFLUENTS CONTROL

16.11.5 Solid Radioactive Waste

COMMITMENT

Radioactive wastes shall be processed and packaged to ensure compliance with the applicable requirements of 10 CFR Part 20, 10 CFR Part 61, 10 CFR Part 71, and State regulations governing the transportation and disposal of radioactive wastes.

The Solid Radwaste System or an approved alternative process shall be used in accordance with a Process Control Program (PCP), for the solidification of liquid or wet radioactive wastes or the dewatering of wet radioactive wastes to be shipped for direct disposal at a 10 CFR 61 licensed disposal site. Wastes shipped for off site processing in accordance with the processor's specifications and transportation requirements are not required to be solidified or dewatered to meet disposal requirements.

- The PCP describes administrative and operational controls used for the solidification of liquid or wet solid radioactive wastes in order to meet applicable 10 CFR 61 waste form requirements.
- The PCP describes the administrative and operational controls used for the dewatering of wet radioactive wastes to meet 10 CFR 61 free standing water requirements.
- The process parameters used in establishing the PCP shall be based on demonstrated processing of actual or simulated liquid or wet solid wastes and must adequately verify that the final product of solidification or dewatering meets all applicable Federal, State and disposal site requirements.

APPLICABILITY: At all times

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Applicable regulatory requirements for solidified or dewatered wastes are not satisfied.	A.1 Suspend shipments of defectively packaged solid radioactive wastes from the site. AND A.2 Initiate action to correct PCP, procedures, or solid waste equipment as necessary to prevent recurrence.	Immediately Prior to next shipment for disposal of solidified or dewatered wastes
B. A solidification test as described in the PCP fails to verify Solidification.	B.1 Suspend solidification of the batch under test and follow PCP guidance for test failures until solidification of the batch is verified by subsequent tests. AND B.2 The PCP shall be modified as required to assure Solidification of subsequent batches of waste.	Immediately Prior to next solidification for shipment of waste for disposal at a 10 CFR 61 disposal site

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. With solidification or dewatering for disposal not performed in accordance with the PCP.	C.1 Reprocess or repackage the waste in accordance with PCP requirements. OR C.2 Follow PCP or procedure guidance for alternative free standing liquid verification to ensure the waste in each container meets disposal requirements and take appropriate administrative action to prevent recurrence.	Prior to shipment for disposal of the inadequately processed waste that requires solidification or dewatering
D. With the solid waste equipment incapable of meeting commitment or not in service.	D.1 Restore the equipment to OPERABLE status or provide for alternative capability to process wastes as necessary to satisfy all applicable disposal requirements.	In a time frame that supports the commitment

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 16.11.5.1	The Process Control Program shall be used to verify the solidification of at least one representative test specimen from at least every tenth batch of each type of radioactive waste to be solidified for disposal at a 10 CFR 61 disposal site.	Every tenth batch of each type of radioactive waste to be solidified.

BASES

This commitment implements the requirements of 10 CFR Part 50.36a, General Design Criterion 60 of 10 CFR Part 50, Appendix A and requirements to use a Process Control Program to meet applicable 10CFR61 waste form criteria for solidified and dewatered radioactive wastes.

REFERENCES:

1. 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities".
2. 10 CFR Part 50, Appendix A.
3. 10 CFR20, "Standards for Protection Against Radiation".
4. 10 CFR61, "Licensing Requirements for Land Disposal of Radioactive Waste".
5. 10 CFR71, "Packaging and Transportation of Radioactive Materials".
6. DPCo Process Control Program Manual.
7. NRC Generic Letter 87-12, "Compliance with 10 CFR Part 61 And Implementation Of the Radiological Effluent Technical Specifications (Rets) and Attendant Process Control Program (PCP)".
8. NRC Generic Letter 89-01, "Implementation of Programmatic Controls for Radiological Effluent Technical Specifications In the Administrative Controls Section of the Technical Specifications and the Relocation of Procedural Details of Rets to the Offsite Dose Calculation Manual or to the Process Control Program".

16.11 RADIOLOGICAL EFFLUENTS CONTROL

16.11.6 Radiological Environmental Monitoring

COMMITMENT

a. The radiological environmental monitoring samples shall be collected in accordance with Table 16.11.6-1 and shall be analyzed pursuant to the requirements of Tables 16.11.6-1, 16.11.6-2 and 16.11.6-3.

b. A land use census shall be conducted and shall identify the location of the nearest milk animal and the nearest residence in each of the 16 meteorological sectors within a distance of eight kilometers (five miles). Broad leaf vegetation sampling shall be performed at the site boundary in the direction sector with the highest D/Q in lieu of the garden census.

c. Analyses shall be performed on radioactive materials supplied as part of an Interlaboratory Comparison Program. A summary of the results obtained as part of the Interlaboratory Comparison Program shall be included in the Annual Radiological Environmental Operating Report. The Interlaboratory Comparison Program shall be described in the Annual Radiological Environmental Operating Report.

d. The results of the land use census shall be included in the Annual Radiological Environmental Operating Report.

----------NOTE----------

If samples required by Commitment part a, become permanently unavailable from any of the required sample locations, the locations from which samples were unavailable may then be deleted from the program provided replacement samples were obtained and added to the environmental monitoring program, if available. These new locations will be identified in the Annual Radioactive Effluent Release Report.

APPLICABILITY: At all times

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Radiological environmental monitoring program is not conducted as required.	A.1 Submit a description of the reason for not conducting the program as required and plans to prevent a recurrence shall be included in the Annual Radiological Environmental Operating Report.	May 15 of following calendar year
B. Land use census identifies a Location which yields a calculated dose or dose commitment (via the same exposure pathway) 20% greater than a location from which samples are currently being obtained.	B.1 ----------NOTE---------- The sampling location having the lowest calculated dose or dose commitment (via the same exposure pathway) may be deleted from this monitoring program after October 31 of the year in which this land use census was conducted. ---------- Add new location to the radiological environmental monitoring program.	30 days
	AND	
	B.2 Identify new locations in the next Annual Radioactive Effluent Release Report.	April 30 of following calendar year

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Interlaboratory Comparison Program analyses not performed as required.	C.1 Report corrective actions in the Annual Radiological Environmental Operating Report.	May 15 of following calendar year

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 16.11.6.1	Conduct land use census during growing season using that information that will provide the best results, such as by a door-to-door survey, aerial survey, or by consulting local agriculture authorities.	12 months

Table 16.11.6-1
Radiological Environmental Monitoring Program

Exposure Pathway and/or Sample	Number of Sample Locations (b)	Sampling and Collection Frequency (d)	Time and Frequency of Analysis
1. AIRBORNE			
Radioiodine and Particulates	5	Continuous sampler operation with sample collection weekly, or more frequently if required by dust loading.	Radioiodine canister: I-131 analysis weekly. Particulate sampler: Gross beta radioactivity analysis following filter change; and gamma isotopic analysis of composite (by location) quarterly. (c)
2. DIRECT RADIATION	40	Quarterly.	Gamma dose quarterly.
3. WATERBORNE			
a. Surface	2	Composite (a) sample over a 1-month period.	Gamma isotopic analysis monthly. Composite for tritium analysis quarterly.
b. Drinking	3	Composite (a) sample over a 1-month period.	Composite for gross beta and gamma isotopic analyses monthly. Composite for tritium analysis quarterly.
c. Sediment from Shoreline	2	Semiannually.	Gamma isotopic analysis semiannually.

Table 16.11.6-1
Radiological Environmental Monitoring Program

Exposure Pathway and/or Sample	Number of Sample Locations (b)	Sampling and Collection Frequency (d)	Time and Frequency of Analysis
4. INGESTION			
a. Milk	4(e)	Semimonthly when animals are on pasture; monthly at other times.	Gamma isotopic and I-131 analysis semimonthly when animals are on pasture; monthly at other times.
b. Fish	2	Semiannually. One sample each commercially and recreationally important species.	Gamma isotopic analysis semiannually on edible portion.
c. Broad-leaf Vegetation	2	Monthly.	Gamma isotopic analysis monthly.

(a) Composite samples shall be collected by collecting an aliquot at intervals not exceeding 2 hours.

(b) Sample locations are identified in the ODCM.

(c) Airborne particulate sample filters shall be analyzed for gross beta radioactivity 24 hours or more after sampling to allow radon and thoron daughter decay. If gross beta activity in air particulate samples is greater than 10 times the yearly mean of control samples, gamma isotopic analysis shall be performed on the individual samples.

(d) Deviations are permitted from the required sampling schedule if specimens are unobtainable due to hazardous conditions, seasonal unavailability, or to malfunction of automatic sampling equipment. If the latter, every effort shall be made to complete corrective action prior to the end of the next sampling period.

(e) Samples from milking animals in three locations within 5 km distance having the highest dose potential. If there are none, then one sample from milking animals in each of three areas between 5 to 8 km distant where doses are calculated to be greater than 1 mrem per year. One sample from milking animals at a control location, as for example 15 to 30 km distant and in the least prevalent wind direction.

Table 16.11.6-2
Maximum Values for the Lower Limits of Detection (LLD) (a) (c)

Analysis	Water (pCi/l)	Airborne Particulate or Gases (pCi/m^3)	Fish (pCi/kg, wet)	Milk (pCi/l)	Broad-leaf Vegetation (pCi/kg, wet)	Sediment (pCi/kg, dry)
Gross Beta	4	1E-02				
H_3	2,000					
Mn-54	15		130			
Fe-59	30		260			
Co-58	15		130			
Co-60	15		130			
Zn-65	30		260			
Zr-95	15					
Nb-95	15					
I-131	15(b)	7E-02		1	60	
Cs-134	15	5E-02	130	15	60	150
Cs-137	18	6E-02	150	18	80	180
Ba-140	15			60		
La-140	15			15		

(a) The LLD is defined, for purposes of these commitments, as the smallest concentration of radioactive material in a sample with 95% probability of detection and with 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system (which may include radiochemical separation):

$$LLD = \frac{4.66\ Sb}{E \times V \times 2.22 \times Y \times \exp(-\lambda\Delta t)}$$

Where:

LLD is the lower limit of detection as defined above (as pCi per unit mass or volume)

Sb is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute)

Table 16.11.6-2
Maximum Values for the Lower Limits of Detection (LLD) (a) (c)

E is the counting efficiency (as counts per disintegration)

V is the sample size (in units of mass or volume)

2.22 is the number of disintegrations per minute per picocurie

Y is the fractional radiochemical yield (when applicable)

λ is the radioactive decay constant for the particular radionuclide

Δt is the elapsed time between sample collection (or end of the sample collection period) and time of counting

Typical values of E, V, Y and Δt should be used in the calculation.

The LLD is defined as an a priori (before the fact) limit representing the capability of a measurement system and not as a posteriori (after the fact) limit for a particular measurement.

Analyses shall be performed in such a manner that the stated LLDs will be achieved under routine conditions. Occasionally background fluctuations, unavoidably small sample sizes, the presence of interfering nuclides, or other uncontrollable circumstances, may render these LLDs unachievable. In such cases, the contributing factors will be identified and described in the Annual Radiological Environmental Operating Report.

(b) LLD for gamma isotopic analysis for I-131 in drinking water samples. Low level I-131 analysis on drinking water will not be routinely performed because the calculated dose from I-131 in drinking water at all locations is less than 1 mrem per year. Low level I-131 analyses will be performed if abnormal releases occur which could reasonably result in > 1 pCi/liter of I-131 in drinking water. For low level analyses of I-131 an LLD of 1 pCi/liter will be achieved.

(c) Other peaks which are measurable and identifiable, together with the radionuclides in Table 16.11.6-2, shall be identified and reported.

Table 16.11.6-3
Reporting Levels for Radioactivity Concentrations in Environmental Samples

Analysis	Water (pCi/l)	Airborne Particulate or Gases (pCi/m^3)	Fish (pCi/kg, wet)	Milk (pCi/l)	Broad-leaf Vegetation (pCi/kg, wet)
H-3	2E04(a)				
Mn-54	1E03		3E04		
Fe-59	4E02		1E04		
Co-58	1E03		3E04		
Co-60	3E02		1E04		
Zn-65	3E02		2E04		
Zr-Nb-95	4E02				
I-131	2(b)	0.9		3	1E02
Cs-134	30	10	1E03	60	1E03
Cs-137	50	20	2E03	70	2E03
Ba-La-140	2E02			3E02	

(a) For drinking water samples. This is 40 CFR Part 141 value.

(b) If low level I-131 analyses are performed.

BASES

The environmental monitoring program required by this commitment provides measurements of radiation and of radioactive materials in those exposure pathways and for those radionuclides which lead to the highest potential radiation exposures of individuals resulting from the station operation. This monitoring program thereby supplements the radiological effluent monitoring program by verifying that the measurable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of the effluent measurements and modeling of exposure pathways. The initially specified monitoring program will be effective for at least the first three years of commercial operation. Following this period, program changes may be initiated based on operational experience.

The detection capabilities required by Table 16.11.6-2 are considered optimum for routine environmental measurements in industrial laboratories. The specified lower limits of detection correspond to less than the 10 CFR 50. Appendix I, design objective dose-equivalent of 45 mrem/year for atmospheric releases to the most sensitive organ and individual. The land use census commitment is provided to assure that changes in the use of unrestricted areas are identified and that modifications to the monitoring program are provided if required by the results of this census.

The requirements for participation in an Interlaboratory Comparison Program is provided to assure that independent checks on the precision and accuracy of the measurements of radioactive material in environmental sample matrices are performed as part of a quality assurance program for environmental monitoring in order to demonstrate that the results are reasonably valid.

The following requirement(s) were relocated from the CTS 6.4.4.f during the conversion to ITS.

The station shall have a program to monitor the radiation and radionuclides in the environs of the plant. The program shall provide (1) representative measurements of radioactivity in the highest potential exposure pathways, and (2) verification of the accuracy of the effluent monitoring program and modeling of environmental exposure pathways. The program shall (1) be contained in UFSAR Chapter 16, (2) conform to the guidance of Appendix I to 10 CFR Part 50, and (3) include the following:

1. Monitoring, sampling, analysis, and reporting of radiation and radionuclides in the environment in accordance with the methodology and parameters in the ODCM;

2. A Land Use Census to ensure that changes in the use of areas at and beyond the SITE BOUNDARY are identified and that modifications to the monitoring program are made if required by the results of this census; and,

3. Participation in an Interlaboratory Comparison Program to ensure that independent checks on the precision and accuracy of the measurements of radioactive materials in environmental sample matrices are performed as part of the quality assurance program for environmental monitoring.

REFERENCES:

1. 10 CFR Part 50, Appendix I.
2. Offsite Dose Calculation Manual.

16.11 RADIOLOGICAL EFFLUENTS CONTROL

16.11.7 Dose Calculations

COMMITMENT The annual (calendar year) dose or dose commitment, to any Member of the Public due to releases of radioactivity and to radiation from uranium fuel cycle sources shall be limited to ≤ 25 mrems to the total body or to any organ, except the thyroid, which shall be limited to ≤ 75 mrems.

APPLICABILITY: At all times

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Calculated doses from the release of radioactive materials in liquid or gaseous effluents exceeding twice the limits of SLC 16.11.1.b, SLC 16.11.2.b.1, or SLC 16.11.2.b.2	A.1 Determine by calculation, including direct radiation contributions from the reactor units and from outside storage tanks, whether the limits of Commitment 16.11.7 have been exceeded.	None

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Calculated dose exceeds limits of Commitment 16.11.7.	----------NOTE---------- This Special Report, as defined in 10 CFR Part 20.2203(a), shall include an analysis that estimates the radiation exposure (dose) to a Member of the Public from uranium fuel cycle sources, (including all effluent pathways and direct radiation), for the calendar year that includes the release(s) covered by this report. It shall also describe the levels of radiation and concentration of radioactive material involved, and the cause of the exposure levels or concentrations. ---------- B.1 Prepare and submit to the Commission a Special Report that defines the corrective action to be taken to reduce subsequent releases to prevent recurrence of exceeding the specified limits and includes the schedule for achieving conformance with the specified limits.	30 days

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Calculated dose exceeds limit of Commitment 16.11.7. AND Release condition resulting in violation of 40 CFR 190 not corrected at time of report submittal.	C.1 ----------NOTE---------- Submittal of the report is considered a timely request, and a variance is granted until staff action on the request is complete. ---------- Include a request for a variance in accordance with the provisions of 40 CFR Part 190.	30 days from exceeding the limit

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 16.11.7.1	Determine cumulative dose contributions from liquid effluents in accordance with Offsite Dose Calculation Manual.	31 days
SR 16.11.7.2	Determine cumulative dose contributions from gaseous effluents in accordance with Offsite Dose Calculation Manual.	31 days

BASES

The dose commitment is provided to assure that the release of radioactive material in liquid and gaseous effluents will be kept "as low as is reasonably achievable." The dose calculations in the ODCM implement the requirements in Section III.A of Appendix I in that conformance with the guides of Appendix I is to be shown by calculations and procedures based on models and data such that the actual exposure of an individual through appropriate pathways is unlikely to be substantially underestimated.

REFERENCES:

1. 10 CFR Part 20.
2. 40 CFR Part 190.
3. Offsite Dose Calculation Manual.
4. 10 CFR Part 50, Appendix I.

16.11 RADIOLOGICAL EFFLUENTS CONTROL

16.11.8 Reports

COMMITMENT Special reports shall be submitted to the Regional Administrator, Region II, within the time period specified for each report. These reports shall be submitted covering the activities identified below pursuant to the requirements of the applicable SLC:

a. Radioactive Liquid Effluents,
Dose, SLC 16.11.1.b
Liquid Waste Treatment, SLC 16.11.1.c
Chemical Treatment Ponds, SLC 16.11.1.d

b. Radioactive Gaseous Effluents,
Dose, SLC 16.11.2.b
Gaseous Radwaste Treatment, SLC 16.11.2.c

c. Radiological Environmental Monitoring Program, SLC 16.11.6.a, b, and c

d. Land Use Census, SLC 16.11.6.d

e. Dose Calculations, SLC 16.11.7

APPLICABILITY: At all times.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Individual milk samples show I-131 concentrations of 10 picocuries per liter or greater.	A.1 Submit plan advising the NRC of the proposed action to ensure the plant related annual doses will be within the design objective of 45 mrem/yr to the thyroid of any individual.	7 days

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Milk samples collected over a calendar quarter show I-131 average concentrations of 4.8 picoCuries per liter or greater	B.1 Submit a plan advising the NRC of the proposed action to ensure the plant related annual doses will be within the design objective of 45 mrem/yr to the thyroid of any individual.	30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 16.11.8.1 NA	NA

BASES

Reference applicable commitments.

REFERENCES:

1. 10 CFR Part 20.
2. 40 CFR Part 190.
3. Offsite Dose Calculation Manual.

16.11 RADIOLOGICAL EFFLUENTS CONTROL

16.11.9 Radioactive Effluent Release Report

COMMITMENT

The Annual Radioactive Effluent Release Report covering the operation of the unit during the previous calendar year shall be submitted before May 1 of each year.

A single submittal may be made for a multiple unit station. The submittal shall combine those sections that are common to all units at the station; however, for units with separate radwaste systems, the submittal shall specify the release of radioactive material from each unit.

The Annual Radioactive Effluent Release Report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the station during the reporting period.

The annual Radioactive Effluent Release Report shall include a summary of the meteorological conditions concurrent with the release of gaseous effluents during each quarter.

The Annual Radioactive Effluent Release Report shall include an assessment of the radiation dose from radioactive effluents to members of the public due to their activities inside the unrestricted area boundary during the reporting period. All assumptions used in making these assessments (e.g., specific activity, exposure time and location) shall be included in these reports.

The Annual Radioactive Effluent Release Report shall include the following information for all unplanned releases to unrestricted areas of radioactive materials in gaseous and liquid effluents:

a. A description of the event and equipment involved;

b. Cause(s) for the unplanned release;

c. Actions taken to prevent recurrence; and,

d. Consequences of the unplanned release.

The Annual Radioactive Effluent Release Report shall include an assessment of radiation doses from the radioactive liquid and gaseous effluents released from the station during each calendar quarter. In addition, the unrestricted area boundary maximum noble gas gamma air and beta air doses shall be evaluated. The annual average meteorological conditions shall be used for determining the gaseous pathway doses. Approximate and conservative approximate methods are acceptable. The assessment of radiation doses shall be performed in

accordance with the Offsite Dose Calculation Manual.

The Annual Radioactive Effluent Release Report shall include an explanation of why the inoperability of liquid or gaseous effluent monitoring instrumentation out of service for greater than 30 days was not corrected in a timely manner per SLC 16.11.3.

The Annual Radioactive Effluent Release Report shall include the following information for each type of solid waste shipped offsite during the report period:

a. Total container volume (cubic meters);

b. Total curie quantity (determined by measurement or estimate);

c. Principal radionuclides (determined by measurement or estimate);

d. Type of waste, (e.g., spent resin, compacted dry waste evaporator bottoms);

e. Number of shipments; and,

f. Solidification agent (e.g., cement, or other approved agents (media)).

The Annual Radioactive Effluent Release Report shall include a list and description of unplanned releases from the site to Unrestricted Areas of radioactive materials in gaseous and liquid effluents made during the reporting period.

The Annual Radioactive Effluent Release Report shall include any changes made during the reporting period to the Offsite Dose Calculation Manual (ODCM), as well as a listing of new locations for dose calculations and/or environmental monitoring identified by the land use census.

The Annual Radioactive Effluent Release Report shall also include an assessment of radiation doses to the likely most exposed Member of the Public from reactor releases and other nearby uranium fuel cycle sources (including doses from primary effluent pathways and direct radiation) for the previous calendar year to show conformance with 40 CFR 190, Environmental Radiation Protection Standards for Nuclear Power Operation. Methods for calculating the dose contribution from liquid and gaseous effluents are given in the ODCM.

APPLICABILITY: At all times.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. N/A	A.1 N/A	N/A

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 16.11.9.1 N/A	N/A

BASES

N/A

REFERENCES:

1. Oconee ITS.
2. Offsite Dose Calculation Manual.

16.11 RADIOLOGICAL EFFLUENTS CONTROL

16.11.10 Radiological Environmental Operating Report

COMMITMENT

Routine Radiological Environmental Operating Reports covering the operation of the unit during the previous calendar year shall be submitted prior to May 15 of each year.

The Annual Radiological Environmental Operating Report shall include summaries, interpretations. and statistical evaluation of the results of the radiological environmental surveillance activities for the report period, including a comparison with preoperational studies, operational controls (as appropriate), and previous environmental surveillance reports and an assessment of the observed impacts of the plant operation on the environment. The reports shall also include the results of the land use censuses. If harmful effects are detected by the monitoring, the report shall provide an analysis of the problem and a planned course of action to alleviate the problem.

The Annual Radiological Environmental Operating Report shall include a summary of the results obtained as part of the required Interlaboratory Comparison Program. The Interlaboratory Comparison Program shall be described in the Annual Radiological Environmental Operating Report.

The Annual Radiological Environmental Operating Report shall include summarized and tabulated results of the radiological environmental samples required by SLCs taken during the report period. In the event that some results are not available for inclusion with the report, the report shall be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted as soon as practical in a supplementary report.

The initial report shall also include the following: a summary description of the radiological environmental monitoring program including sampling methods for each sample type, size and physical characteristics of each sample type, sample preparation methods, analytical methods, and measuring equipment used; a map of all sampling locations keyed to a table giving distances and directions from one reactor; and, the result of land use censuses. Subsequent reports shall describe all substantial changes in these aspects.

APPLICABILITY: At all times.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. NA	A.1 NA	NA

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 16.11.10.1 NA	NA

BASES

NA

REFERENCES:

1. Oconee ITS
2. Offsite Dose Calculation Manual

16.11 RADIOLOGICAL EFFLUENTS CONTROL

16.11.11 Iodine Radiation Monitoring Filters

COMMITMENT Assure that the iodine radiation monitoring filters perform their intended function.

APPLICABILITY: At all times.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. NA	A.1 NA	NA

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 16.11.11.1	Remove and replace iodine radiation monitoring filters in RIA-44.	30 days of operation
SR 16.11.11.2	Discard spare iodine radiation monitoring filters.	After 24 months of shelf life.

BASES

The purpose of this commitment is to assure the reliability of the iodine radiation monitoring charcoal filters.

REFERENCES:

1. Oconee CTS Amendment No. 3/3 SER date July, 1974.

16.11 RADIOLOGICAL EFFLUENTS CONTROL

16.11.12 Radioactive Material in Outside Temporary Tanks Exceeding Limit

COMMITMENT The quantity of radioactive material in outside temporary storage tanks shall not exceed the limit specified in ITS 5.5.13.c.

APPLICABILITY: At all times.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The quantity of radioactive material in outside temporary storage tank not within limit.	A.1 Suspend addition of radioactive material to tank.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 16.11.12.1	Verify the quantity of radioactive material contained in each of the outside temporary tanks is within the limit by analyzing a representative sample of the tanks' contents. OR Verify the quantity of radioactive material in each of the outside temporary tanks does not result in exceeding the limit by analyzing a representative sample of radioactive material to be added.	Within 7 days after addition of radioactive materials to an outside temporary tank Prior to addition of radioactive materials to an outside temporary tank.

BASES

The requirement(s) of this SLC section were relocated from CTS 3.9.1.c during the conversion to ITS.

The tanks included in this specification are all those outdoor radwaste liquid storage tanks that are not surrounded by liners, dikes, or walls capable of holding the tank contents and that do not have tank overflows and surrounding area drains connected to the liquid radwaste treatment system. Restricting the quantity of radioactive material contained in the specified tanks provides assurance that in the event of an uncontrolled release of a tank's contents, the resulting concentrations would be less than the limits of 10CFR Part 20, Appendix B, Table II, Column 2, at the nearest potable water supply and the nearest surface water supply in an UNRESTRICTED AREA.

REFERENCES

N/A

16.11 RADIOLOGICAL EFFLUENTS CONTROL

16.11.13 Radioactive Material in Waste Gas Holdup Tank Exceeding Limit

COMMITMENT The quantity of radioactive material in the Waste Gas Holdup tanks shall not exceed the limit specified in ITS 5.5.13.b.

APPLICABILITY: At all times.

ACTIONS

----------NOTE----------
Separate Condition Entry is allowed for each tank.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The quantity of radioactive material in the Waste Gas Holdup tank not within limit.	A.1 Suspend addition of radioactive material to tank. AND A.2 Reduce tank contents to within limit.	Immediately 48 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 16.11.13.1	Verify quantity of radioactive materials in each tank is within limit.	24 hours when tank is being filled

BASES

The requirement(s) of this SLC section were relocated from CTS 3.10.1.b and 3.10.1.c during the conversion to ITS.

Restricting the quantity of radioactivity contained in each waste gas holdup tank provides assurance that in the event of an uncontrolled release of the tank contents, the resulting total body exposure to an individual at the exclusion area boundary will not exceed 0.5 rem.

REFERENCE

UFSAR, Section 15.10

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 16.11.14.1	Verify Hydrogen concentration in Waste Gas Holdup Tank is ≤ 3% by volume.	5 times/week on each tank when in service AND once within 24 hours after isolation of the tank

BASES

The requirement(s) of this SLC section were relocated from CTS 3.10.2 and Table 4.1-3, Item 13 during the conversion to ITS.

This Commitment is provided to ensure that the concentration of potentially explosive gas mixtures contained in the Waste Gas Holdup Tanks is maintained below the flammability limits of hydrogen. (Administrative controls are used to prevent the hydrogen concentrations from reaching the flammability limit.) These controls include sampling each tank 5 times a week while in service, and/or once in 24 hours after isolation of the tank; injection of dilutants to reduce the concentration of hydrogen below its flammability limits provides assurance that the releases of radioactive material will be controlled in conformance with the requirements of GDC 60 of Appendix A to CFR Part 50.

REFERENCES

N/A

16.11 RADIOLOGICAL EFFLUENTS CONTROL

16.11.14 Explosive Gas Mixture

COMMITMENT The concentration of Hydrogen in the Waste Gas Holdup Tanks shall be ≤ 3% by volume.

APPLICABILITY: At all times.

ACTIONS

----------NOTE----------
Separate Condition Entry is allowed for each tank.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Concentration of Hydrogen in Waste Gas Holdup tank is > 3% and ≤ 4% by volume.	A.1 Reduce Concentration of Hydrogen to within limit.	48 hours
B. Concentration of Hydrogen in Waste Gas Holdup tank is > 4% by volume.	B.1 Suspend addition of waste gases to tank. AND B.2 Reduce Concentration of Hydrogen to within limit.	Immediately 24 hours

Enclosure

- ODCM Manual

Note: There were no changes to the PCP Manual in 2008.