

**Edwin I. Hatch Nuclear Plant
Joseph M. Farley Nuclear Plant
Vogtle Electric Generating Plant
Annual Radioactive Effluent Release Reports for 2011**

Enclosure 3

Vogtle Annual Radioactive Effluent Release Report for 2011

SOUTHERN NUCLEAR COMPANY
VOGTLE ELECTRIC GENERATING PLANT – UNITS 1 AND 2
NRC DOCKET NOS. 50-424 AND 50-425
FACILITY OPERATING LICENSE NOS. NPF-68 AND NPF-81
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
FOR
JANUARY 1, 2011 TO DECEMBER 31, 2011

**VOGTLE ELECTRIC GENERATING PLANT
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
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1.0 Liquid Effluents

1.1 Regulatory Requirements

1.1.1 Concentration Limits

In accordance with Technical Specification 5.5.4.b, the concentration of radioactive material released in liquid effluents to UNRESTRICTED AREAS shall be limited at all times to ten times the concentrations specified in 10 CFR 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 1 E-04 $\mu\text{Ci/ml}$ total activity.

1.1.2 Dose Limits

The dose or dose commitment to a MEMBER OF THE PUBLIC from radioactive materials in liquid effluents released, from each unit, to UNRESTRICTED AREAS shall be limited as follows:

- a. During any calendar quarter to less than or equal to 1.5 mrem to the whole body and to less than or equal to 5 mrem to any organ, and
- b. During any calendar year to less than or equal to 3 mrem to the whole body and to less than or equal to 10 mrem to any organ.

1.2 Effluent Concentration Limit (ECL)

ECL values used for determining the allowable liquid radwaste release rates and concentrations for the principal gamma emitters, I-131, tritium, Sr-89, Sr-90 and Fe-55 are taken from 10 CFR Part 20, Appendix B, Table 2, Column 2. A tolerance factor of up to 10 is utilized to allow flexibility in establishing practical monitor set points which can accommodate effluent releases at concentrations higher than the ECL values stated in 10 CFR 20, Appendix B, Table 2, Column 2.

For dissolved or entrained noble gases in liquid radwaste, the ECL is 1E-04 $\mu\text{Ci/ml}$ total activity.

For gross alpha in liquid radwaste, the ECL is 2 E-09 $\mu\text{Ci/ml}$.

For all the above radionuclides or categories of radioactivity, the overall ECL fraction is determined in accordance with 10 CFR Part 20, Appendix B. The method utilizing the ECL fraction to determine release rates and liquid radwaste effluent radiation monitor set points is described in Subsection 1.3 of this report.

1.3 Measurements and Approximations of Total Radioactivity

1.3.1 Total Radioactivity Determination

Prior to the release of any tank containing liquid radwaste, and following the required recirculation, samples are collected and analyzed in accordance with the Offsite Dose Calculation Manual (ODCM) Table 2-3 "Radioactive Liquid Waste Sampling and Analysis Program". A sample from each tank which is planned for release is analyzed for principal gamma emitters, I-131, and dissolved and entrained noble gases by gamma spectroscopy. Monthly and quarterly composites are prepared for analysis by extracting aliquots from each sample taken from the tanks, which are released. Liquid radwaste sample analyses are performed as follows:

MEASUREMENT	FREQUENCY	METHOD
1. Gamma Isotopic	Each Batch	Gamma Spectroscopy with computerized data reduction.
2. Dissolved or entrained noble gases	Each Batch	Gamma Spectroscopy with computerized data reduction
3. Tritium	Monthly Composite	Distillation and liquid scintillation counting
4. Gross Alpha	Monthly Composite	Gas flow proportional counting
5. Sr-89 & Sr-90	Quarterly Composite	Chemical separation and gas flow proportional or scintillation counting
6. Fe-55	Quarterly Composite	Chemical separation and liquid scintillation counting

1.3.1

Total Radioactivity Determination cont'd

Gamma isotopic measurements are performed using germanium detectors with a resolution of 2.1 keV or lower. A peak search of the resulting gamma ray spectrum is performed by the computer system. Energy and net count data for all significant peaks are determined, and a quantitative reduction or MDC calculation is performed. This ensures that the MDC's are met for the nuclides specified in ODCM Chapter 10 (i.e., Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141 and Ce-144). The quantitative calculations, corrections for counting time, decay time, sample volume, sample geometry, detector efficiency, baseline counts, branching ratio and MDC calculations, are made based on the counts at the location in the spectrum where the peak for that radionuclide would be located, if present.

Tritium, Gross Alpha, Sr-89, Sr-90 and Fe-55 are, in some cases, analyzed offsite.

ECL fraction is determined using radionuclide concentrations of a tank planned for release, the most current results available for tritium, gross alpha, Sr-89, Sr-90 and Fe-55 and the corresponding ECL values.

This ECL fraction is used, with appropriate safety factors, tolerance factors, and the minimum assured dilution stream flow to calculate maximum permissible release rates and a liquid effluent monitor setpoint. The monitor setpoint is calculated to assure that the limits of the Offsite Dose Calculation Manual (ODCM) are not exceeded.

A monitor reading in excess of the calculated setpoint results in an automatic termination of the liquid radwaste discharge. Liquid effluent discharge is also automatically terminated if the dilution stream flow rate falls below the minimum assured dilution flow rate used in the setpoint calculations and established as a setpoint on the dilution stream flow monitor.

Radionuclide concentrations, safety factors, dilution stream flow rate, and liquid effluent radiation monitor calibrations are entered into the computer and a pre-release printout is generated. If the release is not permissible, appropriate warnings will be displayed on the computer screen. If the release is permissible, it is approved by the Chemistry Department and sent to the Operations Department for approval and release. When the release is completed, the necessary data from the release (i.e., release volume, etc.) are provided by the Operations Department to the Chemistry Department. These data are input to the computer and a post-release printout is generated. The post release printout contains the actual release rates, release concentrations and quantities, actual dilution flow, and calculated doses to an individual.

Typically achieved liquid effluent sample analyses minimum detectable concentrations are reported in Table 1-4.

1.3.2 Total Error Estimation

The total or maximum error associated with the effluent measurement includes the cumulative errors resulting from the total operation of sampling and measurement. Because it may be very difficult to assign error terms for each parameter affecting the final measurement, detailed statistical evaluation of error is not suggested. The objective should be to obtain an overall estimate of the error associated with measurements of radioactive materials released in liquid effluents.

- a. Fission and activation total release was calculated from sample analysis results and release point flow rates.

Sampling and statistical error	10%
Counting Equipment Calibration	10%
Tank Volumes and System Flow Rates	20%
TOTAL ERROR	24.5%

- b. Total Tritium release was calculated from sample analysis results and release point volumes.

Sampling and statistical errors	10%
Counting equipment calibration	10%
Tank volumes and system flow rate	20%
TOTAL ERROR	24.5%

- c. Dissolved and entrained gases were calculated from sample analysis results and release point volumes.

Sampling and statistical error	20%
Counting equipment calibration	10%
Tank volumes and system flow rate	20%
TOTAL ERROR	30%

- d. Gross alpha radioactivity was calculated from sample analysis results and release point volumes.

Sampling and statistical error	10%
Counting Equipment calibration	10%
Tank volumes and system flowrates	20%
TOTAL ERROR	24.5%

1.3.2 Total Error Estimation cont'd

- e. Volume of waste prior to dilution was calculated from level indicators on the tanks and pump discharge flow rates and times.

Level Indicator error	10%
Operator Interpretation of gauge	10%
TOTAL ERROR	14%

- f. Volume of dilution water used was calculated from flow totalizers and pump discharge flow rates and times.

Flow totalizer error	10%
Operator interpretation of gauge	10%
TOTAL ERROR	14%

- g. Gross alpha, Sr-89, Sr-90, Fe-55 and H-3 radioactivity has an additional error associated with sample compositing.

Compositing sample error	5%
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1.4 Liquid Effluent Release Data

Regulatory Guide 1.21 Tables 2A and 2B are found in this report as Tables 1-1A, 1-1B, 1-1C, 1-2A, 1-2B and 1-2C. Data is presented on a quarterly basis as required by Regulatory Guide 1.21 for all four quarters.

1.5 Radiological Impact Due to Liquid Releases

Doses to an individual due to radioactivity in liquid effluent were calculated in accordance with the Offsite Dose Calculation Manual. Results are presented in Table 1-3A for Unit 1 and 1-3B for Unit 2, for all four quarters.

1.6 Liquid Effluents – Batch Releases

Batch release information for liquid effluents is presented in Table 1-5A for Unit 1 and Table 1-5B for Unit 2.

1.7 Liquid Effluents - Abnormal Releases

There were no abnormal liquid releases during 2011.

Table 1-1A

Vogtle Electric Generating Plant

Liquid Effluents - Summation of All Releases

Unit: 1

Starting: 1-Jan- 2011

Ending: 31-Dec-2011

Type of Effluent	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
A. Fission And Activation Products					
1. Total Release (not including tritium, gases, alpha)	Curies	2.10E-02	3.48E-03	5.03E-02	2.65E-02
2. Average diluted concentration during period	uCi/mL	3.76E-09	9.89E-10	9.99E-09	6.35E-09
3. Percent of Applicable Limit	%	*	*	*	*
B. Tritium					
1. Total Release	Curies	3.44E+02	1.60E+02	6.10E+02	5.77E+01
2. Average diluted Concentration during period	uCi/mL	6.15E-05	4.55E-05	1.21E-04	1.38E-05
3. Percent of Applicable Limit	%	*	*	*	*
C. Dissolved and Entrained Gases					
1. Total Release	Curies	5.45E-04	2.63E-04	1.06E-02	0.00E+00
2. Average diluted Concentration during period	uCi/mL	9.77E-11	7.48E-11	2.11E-09	0.00E+00
3. Percent of Applicable Limit	%	*	*	*	*
D: Gross Alpha Radioactivity					
1. Total Release	Curies	0.00E+00	1.26E-06	1.03E-04	3.93E-07
E: Waste Vol Release (Pre-Dilution)					
	Liters	3.42E+07	3.68E+07	3.44E+07	3.32E+07
F. Volume of Dilution Water Used					
	Liters	5.55E+09	3.48E+09	5.00E+09	4.14E+09

* Applicable limits are expressed in terms of dose. See Tables 1-3A and 1-3B of this report.

Table 1-1C

Vogtle Electric Generating Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Liquid Effluents - Summation Of All Releases

Unit: Site

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

<u>Type of Effluent</u>	<u>Units</u>	<u>1ST Quarter</u>	<u>2ND Quarter</u>	<u>3RD Quarter</u>	<u>4TH Quarter</u>
A. Fission And Activation Products					
1. Total Release (not including tritium, gases, alpha)	Curies	2.31E-02	3.87E-03	5.03E-02	3.04E-02
2. Average diluted concentration during period	uCi/mL	2.13E-09	5.76E-10	5.59E-09	3.63E-09
3. Percent of Applicable Limit	%	*	*	*	*
B. Tritium					
1. Total Release	Curies	4.90E+02	1.76E+02	6.27E+02	6.79E+01
2. Average diluted Concentration during period	uCi/mL	4.53E-05	2.62E-05	6.96E-05	8.09E-06
3. Percent of Applicable Limit	%	*	*	*	*
C. Dissolved and Entrained Gases					
1. Total Release	Curies	1.48E-03	2.92E-04	1.44E-02	0.00E+00
2. Average diluted Concentration during period	uCi/mL	1.37E-10	4.35E-11	1.60E-09	0.00E+00
3. Percent of Applicable Limit	%	*	*	*	*
D: Gross Alpha Radioactivity					
1. Total Release	Curies	0.00E+00	1.26E-06	1.03E-04	1.18E-06
E: Waste Vol Release (Pre-Dilution)					
	Liters	5.13E+07	4.79E+07	5.33E+07	5.31E+07
F. Volume of Dilution Water Used					
	Liters	1.08E+10	6.67E+09	8.95E+09	8.34E+09

* Applicable limits are expressed in terms of dose.
See Tables 1-3A and 1-3B of this report.

Table 1-2A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011

Liquid Effluents

Unit: 1

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Batch Mode

<u>Nuclides Released</u>	<u>Units</u>	<u>1ST Quarter</u>	<u>2ND Quarter</u>	<u>3RD Quarter</u>	<u>4TH Quarter</u>
<u>Fission & Activation</u>					
Be-7	Curies	0.00E+00	0.00E+00	3.12E-05	2.04E-04
Co-57	Curies	0.00E+00	0.00E+00	1.04E-06	0.00E+00
Co-58	Curies	7.68E-04	1.10E-03	3.93E-03	2.29E-03
Co-60	Curies	1.09E-03	2.06E-04	8.77E-04	4.38E-04
Cr-51	Curies	8.49E-05	0.00E+00	4.94E-04	2.61E-04
Fe-55	Curies	4.01E-04	3.42E-04	2.30E-03	1.12E-02
I-131	Curies	0.00E+00	0.00E+00	3.73E-04	5.94E-05
I-132	Curies	0.00E+00	0.00E+00	2.59E-03	1.87E-04
Mn-54	Curies	1.17E-05	5.52E-06	2.06E-05	2.35E-05
Nb-95	Curies	0.00E+00	0.00E+00	8.23E-05	1.29E-05
Ni-65	Curies	0.00E+00	0.00E+00	2.22E-06	0.00E+00
Sr-89	Curies	8.15E-05	8.78E-06	6.19E-04	5.51E-06
Sr-90	Curies	4.71E-06	0.00E+00	0.00E+00	0.00E+00
Zr-95	Curies	0.00E+00	0.00E+00	4.54E-05	0.00E+00
Cs-134	Curies	2.19E-04	2.08E-05	1.83E-05	9.76E-05
Cs-137	Curies	6.12E-04	9.72E-05	1.50E-04	2.90E-04
Eu-152	Curies	0.00E+00	0.00E+00	3.12E-06	0.00E+00
Np-239	Curies	0.00E+00	0.00E+00	8.65E-07	0.00E+00
Sb-122	Curies	4.24E-06	0.00E+00	8.13E-06	0.00E+00
Sb-124	Curies	0.00E+00	1.38E-05	1.11E-04	3.86E-05
Sb-125	Curies	6.72E-03	1.69E-03	2.35E-02	1.12E-02
Sb-126	Curies	0.00E+00	0.00E+00	0.00E+00	1.19E-05
Te-132	Curies	0.00E+00	0.00E+00	3.16E-04	1.59E-04
Zn-69M	Curies	0.00E+00	0.00E+00	1.98E-06	0.00E+00
Te-125M	Curies	1.10E-02	0.00E+00	1.42E-02	0.00E+00
Te-129M	Curies	0.00E+00	0.00E+00	5.91E-04	0.00E+00
Total For Period	Curies	2.10E-02	3.48E-03	5.03E-02	2.65E-02

Zeroes in this table indicates that no radioactivity was present at detectable levels.

See Table 1-4 for typical minimum detectable concentrations

Table 1-2A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011

Liquid Effluents

Unit: 1

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Batch Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Tritium					
H-3	Curies	3.43E+02	1.60E+02	6.10E+02	5.76E+01
Dissolved And Entrained Gases					
Xe-133	Curies	5.45E-04	2.63E-04	1.04E-02	0.00E+00
Xe-135	Curies	0.00E+00	0.00E+00	1.78E-04	0.00E+00
Xe-133M	Curies	0.00E+00	0.00E+00	4.00E-05	0.00E+00
Total For Period	Curies	5.45E-04	2.63E-04	1.06E-02	0.00E+00
Gross Alpha Radioactivity					
G-Alpha	Curies	0.00E+00	1.26E-06	3.08E-06	3.93E-07

Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 1-4 for typical minimum detectable concentrations.

Table 1-2A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Liquid Effluents

Unit: 1

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Continuous Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission & Activation Products					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
H-3	Curies	4.47E-02	6.03E-02	7.34E-02	8.07E-02
Dissolved And Entrained Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha Radioactivity					
G-Alpha	Curies	0.00E+00	0.00E+00	9.97E-05	0.00E+00

*Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 1-4 for typical minimum detectable concentrations.

Table 1-2B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011

Liquid Effluents

Unit: 2

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Nuclides Released	Units	Batch Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission & Activation Products					
Co-57	Curies	3.04E-06	0.00E+00	0.00E+00	0.00E+00
Co-58	Curies	7.22E-05	2.86E-05	3.76E-05	6.44E-05
Co-60	Curies	4.51E-04	1.84E-05	1.06E-05	2.81E-05
Cr-51	Curies	5.24E-05	0.00E+00	0.00E+00	0.00E+00
Fe-55	Curies	1.19E-04	1.26E-05	1.70E-06	3.69E-03
I-131	Curies	0.00E+00	0.00E+00	4.12E-06	0.00E+00
Mn-54	Curies	1.16E-05	0.00E+00	0.00E+00	0.00E+00
Sr-89	Curies	4.78E-06	5.62E-07	0.00E+00	1.73E-05
Sr-90	Curies	0.00E+00	0.00E+00	0.00E+00	1.72E-06
Cs-134	Curies	2.09E-05	1.42E-05	0.00E+00	3.45E-05
Cs-137	Curies	5.05E-05	3.15E-05	0.00E+00	1.07E-04
Eu-152	Curies	9.10E-06	0.00E+00	0.00E+00	0.00E+00
Sb-125	Curies	1.35E-03	1.76E-04	1.56E-05	0.00E+00
Total For Period	Curies	2.15E-03	2.82E-04	6.97E-05	3.94E-03
Tritium					
H-3	Curies	1.47E+02	1.61E+01	1.65E+01	1.03E+01
Dissolved And Entrained Gases					
Xe-133	Curies	9.23E-04	2.93E-05	3.65E-03	0.00E+00
Xe-135	Curies	1.25E-05	0.00E+00	3.72E-05	0.00E+00
Xe-133M	Curies	0.00E+00	0.00E+00	8.72E-05	0.00E+00
Total For Period	Curies	9.36E-04	2.93E-05	3.78E-03	0.00E+00
Gross Alpha Radioactivity					
G-Alpha	Curies	0.00E+00	0.00E+00	0.00E+00	7.88E-07

*Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 1-4 for typical minimum detectable concentrations.

Table 1-2B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011

Liquid Effluents

Unit: 2

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Continuous Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission & Activation Products					
Sr-89	Curies	0.00E+00	1.09E-04	0.00E+00	0.00E+00
Tritium					
H-3	Curies	6.37E-02	2.38E-02	5.17E-02	3.43E-02
Dissolved and Entrained Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha Radioactivity					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

*Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 1-4 for typical minimum detectable concentrations.

Table 1-2C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011

Liquid Effluents
Unit: Site

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Nuclides Released	Units	Batch Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission & Activation Products					
Be-7	Curies	0.00E+00	0.00E+00	3.12E-05	2.04E-04
Co-57	Curies	3.04E-06	0.00E+00	1.04E-06	0.00E+00
Co-58	Curies	8.40E-04	1.12E-03	3.96E-03	2.36E-03
Co-60	Curies	1.54E-03	2.24E-04	8.88E-04	4.66E-04
Cr-51	Curies	1.37E-04	0.00E+00	4.94E-04	2.61E-04
Fe-55	Curies	5.20E-04	3.55E-04	2.30E-03	1.49E-02
I-131	Curies	0.00E+00	0.00E+00	3.77E-04	5.94E-05
I-132	Curies	0.00E+00	0.00E+00	2.59E-03	1.87E-04
Mn-54	Curies	2.33E-05	5.52E-06	2.06E-05	2.35E-05
Nb-95	Curies	0.00E+00	0.00E+00	8.23E-05	1.29E-05
Ni-65	Curies	0.00E+00	0.00E+00	2.22E-06	0.00E+00
Sr-89	Curies	8.63E-05	9.35E-06	6.19E-04	2.28E-05
Sr-90	Curies	4.71E-06	0.00E+00	0.00E+00	1.72E-06
Zr-95	Curies	0.00E+00	0.00E+00	4.54E-05	0.00E+00
Cs-134	Curies	2.40E-04	3.50E-05	1.83E-05	1.32E-04
Cs-137	Curies	6.62E-04	1.29E-04	1.50E-04	3.97E-04
Eu-152	Curies	9.10E-06	0.00E+00	3.12E-06	0.00E+00
Np-239	Curies	0.00E+00	0.00E+00	8.65E-07	0.00E+00
Sb-122	Curies	4.24E-06	0.00E+00	8.13E-06	0.00E+00
Sb-124	Curies	0.00E+00	1.38E-05	1.11E-04	3.86E-05
Sb-125	Curies	8.07E-03	1.86E-03	2.35E-02	1.12E-02
Sb-126	Curies	0.00E+00	0.00E+00	0.00E+00	1.19E-05
Te-132	Curies	0.00E+00	0.00E+00	3.16E-04	1.59E-04
Zn-69M	Curies	0.00E+00	0.00E+00	1.98E-06	0.00E+00
Te-125M	Curies	1.10E-02	0.00E+00	1.42E-02	0.00E+00
Te-129M	Curies	0.00E+00	0.00E+00	5.91E-04	0.00E+00
Total for Period	Curies	2.31E-02	3.76E-03	5.03E-02	3.04E-02

*Zeroes in this table indicates that no radioactivity was present at detectable levels.

See Table 1-4 for typical minimum detectable concentrations.

Table 1-2C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011

Liquid Effluents
Unit: Site

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Nuclides Released	Units	Batch Mode			
		1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Tritium					
H-3	Curies	4.90E+02	1.76E+02	6.27E+02	6.78E+01
Dissolved And Entrained Gases					
Xe-133	Curies	1.47E-03	2.92E-04	1.40E-02	0.00E+00
Xe-135	Curies	1.25E-05	0.00E+00	2.15E-04	0.00E+00
Xe-133M	Curies	0.00E+00	0.00E+00	1.27E-04	0.00E+00
Total For Period	Curies	1.48E-03	2.92E-04	1.44E-02	0.00E+00
Gross Alpha Radioactivity					
G-Alpha	Curies	0.00E+00	1.26E-06	3.08E-06	1.18E-06

*Zeroes in this table indicates that no radioactivity was present at detectable levels.

See Table 1-4 for typical minimum detectable concentrations.

Table 1-2C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011

Liquid Effluents

Unit: Site

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Continuous Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission & Activation Products					
Sr-89	Curies	0.00E+00	1.09E-04	0.00E+00	0.00E+00
Tritium					
H-3	Curies	1.08E-01	8.41E-02	1.25E-01	1.15E-01
Dissolved and Entrained Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha Radioactivity					
G-Alpha	Curies	0.00E+00	0.00E+00	9.97E-05	0.00E+00

*Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 1-4 for typical minimum detectable concentrations.

Table 1-3A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Doses to a member of the public due to Liquid Releases
Unit: Unit 1
Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Cumulative Doses Per Quarter

<u>Organ</u>	<u>ODCM Lmt</u>	<u>Units</u>	<u>1ST Qtr</u>	<u>% ODCM</u>	<u>2ND Qtr</u>	<u>% ODCM</u>	<u>3RD Qtr</u>	<u>% ODCM</u>	<u>4TH Qtr</u>	<u>% ODCM</u>
Bone	5.00E+00	mRem	3.60E-03	7.20E-02	6.06E-04	1.21E-02	3.12E-03	6.24E-02	3.61E-03	7.22E-02
GI-Lli	5.00E+00	mRem	8.55E-03	1.71E-01	3.92E-03	7.83E-02	2.58E-02	5.15E-01	4.21E-03	8.43E-02
Kidney	5.00E+00	mRem	9.29E-03	1.86E-01	3.78E-03	7.56E-02	2.06E-02	4.13E-01	3.29E-03	6.58E-02
Liver	5.00E+00	mRem	1.11E-02	2.23E-01	4.33E-03	8.67E-02	1.84E-02	3.68E-01	6.74E-03	1.35E-01
Lung	5.00E+00	mRem	1.51E-02	3.03E-01	7.51E-03	1.50E-01	7.28E-02	1.46E+00	2.73E-02	5.45E-01
Thyroid	5.00E+00	mRem	6.26E-03	1.25E-01	3.50E-03	7.00E-02	1.70E-02	3.41E-01	1.66E-03	3.32E-02
Total Body	1.50E+00	mRem	9.67E-03	6.44E-01	4.08E-03	2.72E-01	1.77E-02	1.18E+00	5.22E-03	3.48E-01

Cumulative Doses per Year

<u>Organ</u>	<u>ODCM Lmt</u>	<u>Units</u>	<u>Year to Ending Date</u>	<u>% ODCM</u>	<u>Receptor</u>	<u>Limit</u>
Bone	1.00E+01	mRem	1.09E-02	1.09E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
GI-Lli	1.00E+01	mRem	4.24E-02	4.24E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Kidney	1.00E+01	mRem	3.70E-02	3.70E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Liver	1.00E+01	mRem	4.06E-02	4.06E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Lung	1.00E+01	mRem	1.23E-01	1.23E+00	Maximum Individual Liquid	Liquid Effluent Organ Annual
Thyroid	1.00E+01	mRem	2.84E-02	2.84E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Total Body	3.00E+00	mRem	3.67E-02	1.22E+00	Maximum Individual Liquid	Liquid Effluent TB Annual

Table 1-3B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Doses to a member of the public due to Liquid Releases

Unit: 2

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Cumulative Doses Per Quarter

<u>Organ</u>	<u>ODCM Lmt</u>	<u>Units</u>	<u>1ST Qtr</u>	<u>% ODCM</u>	<u>2ND Qtr</u>	<u>% ODCM</u>	<u>3RD Qtr</u>	<u>% ODCM</u>	<u>4TH Qtr</u>	<u>% ODCM</u>
Bone	5.00E+00	mRem	3.85E-04	7.69E-03	3.49E-04	6.99E-03	3.81E-07	7.62E-06	1.15E-03	2.31E-02
GI-Lli	5.00E+00	mRem	3.12E-03	6.25E-02	2.64E-04	5.28E-03	4.53E-04	9.06E-03	3.40E-04	6.79E-03
Kidney	5.00E+00	mRem	3.12E-03	6.25E-02	2.97E-04	5.95E-03	4.47E-04	8.93E-03	8.42E-04	1.68E-02
Liver	5.00E+00	mRem	3.52E-03	7.05E-02	4.71E-04	9.42E-03	4.47E-04	8.94E-03	2.00E-03	3.99E-02
Lung	5.00E+00	mRem	4.62E-03	9.23E-02	4.37E-04	8.74E-03	4.83E-04	9.66E-03	4.87E-04	9.73E-03
Thyroid	5.00E+00	mRem	2.92E-03	5.85E-02	2.11E-04	4.21E-03	4.53E-04	9.07E-03	2.79E-04	5.59E-03
Total Body	1.50E+00	mRem	3.36E-03	2.24E-01	4.03E-04	2.69E-02	4.47E-04	2.98E-02	1.48E-03	9.86E-02

Cumulative Doses per Year

<u>Organ</u>	<u>ODCM Lmt</u>	<u>Units</u>	<u>Year to Ending Date</u>	<u>% ODCM</u>	<u>Receptor</u>	<u>Limit</u>
Bone	1.00E+01	mRem	1.89E-03	1.89E-02	Maximum Individual Liquid	Liquid Effluent Organ Annual
GI-Lli	1.00E+01	mRem	4.18E-03	4.18E-02	Maximum Individual Liquid	Liquid Effluent Organ Annual
Kidney	1.00E+01	mRem	4.71E-03	4.71E-02	Maximum Individual Liquid	Liquid Effluent Organ Annual
Liver	1.00E+01	mRem	6.44E-03	6.44E-02	Maximum Individual Liquid	Liquid Effluent Organ Annual
Lung	1.00E+01	mRem	6.02E-03	6.02E-02	Maximum Individual Liquid	Liquid Effluent Organ Annual
Thyroid	1.00E+01	mRem	3.87E-03	3.87E-02	Maximum Individual Liquid	Liquid Effluent Organ Annual
Total Body	3.00E+00	mRem	5.69E-03	1.90E-01	Maximum Individual Liquid	Liquid Effluent TB Annual

Table 1-3C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Doses to a member of the public due to Liquid Releases
Unit: Site
Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Cumulative Doses Per Quarter

<u>Organ</u>	<u>ODCM Lmt</u>	<u>Units</u>	<u>1ST Qtr</u>	<u>% ODCM</u>	<u>2ND Qtr</u>	<u>% ODCM</u>	<u>3RD Qtr</u>	<u>% ODCM</u>	<u>4TH Qtr</u>	<u>% ODCM</u>
Bone	5.00E+00	mRem	3.98E-03	7.97E-02	9.55E-04	1.91E-02	3.12E-03	6.24E-02	4.76E-03	9.52E-02
GI-Lli	5.00E+00	mRem	1.17E-02	2.34E-01	4.18E-03	8.36E-02	2.62E-02	5.24E-01	4.55E-03	9.11E-02
Kidney	5.00E+00	mRem	1.24E-02	2.48E-01	4.08E-03	8.15E-02	2.11E-02	4.22E-01	4.13E-03	8.26E-02
Liver	5.00E+00	mRem	1.47E-02	2.93E-01	4.81E-03	9.61E-02	1.89E-02	3.77E-01	8.73E-03	1.75E-01
Lung	5.00E+00	mRem	1.97E-02	3.95E-01	7.95E-03	1.59E-01	7.33E-02	1.47E+00	2.77E-02	5.55E-01
Thyroid	5.00E+00	mRem	9.18E-03	1.84E-01	3.71E-03	7.42E-02	1.75E-02	3.50E-01	1.94E-03	3.87E-02
Total Body	1.50E+00	mRem	1.30E-02	8.68E-01	4.48E-03	2.99E-01	1.82E-02	1.21E+00	6.70E-03	4.47E-01

Cumulative Doses per Year

<u>Organ</u>	<u>ODCM Lmt</u>	<u>Units</u>	<u>Year to Ending Date</u>	<u>% ODCM</u>	<u>Receptor</u>	<u>Limit</u>
Bone	1.00E+01	mRem	1.28E-02	1.28E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
GI-Lli	1.00E+01	mRem	4.66E-02	4.66E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Kidney	1.00E+01	mRem	4.17E-02	4.17E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Liver	1.00E+01	mRem	4.71E-02	4.71E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Lung	1.00E+01	mRem	1.29E-01	1.29E+00	Maximum Individual Liquid	Liquid Effluent Organ Annual
Thyroid	1.00E+01	mRem	3.23E-02	3.23E-01	Maximum Individual Liquid	Liquid Effluent Organ Annual
Total Body	3.00E+00	mRem	4.24E-02	1.41E+00	Maximum Individual Liquid	Liquid Effluent TB Annual

Table 1-4

**Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
MINIMUM DETECTABLE CONCENTRATIONS – LIQUID SAMPLE ANALYSES**

Starting: 1-Jan-2011

Ending: 31-Dec-2011

The values in this table represent a priori Minimum Detectable Concentrations (MDC) that are typically achieved in laboratory analyses of liquid radwaste samples.

RADIONUCLIDE	MDC	UNITS
Mn-54	2.73E-08	μCi/ml
Fe-59	8.33E-08	μCi/ml
Co-58	3.78E-08	μCi/ml
Co-60	6.76E-08	μCi/ml
Zn-65	1.32E-07	μCi/ml
Mo-99	4.31E-07	μCi/ml
Cs-134	3.06E-08	μCi/ml
Cs-137	4.51E-08	μCi/ml
Ce-141	6.99E-08	μCi/ml
Ce-144	2.95E-07	μCi/ml
I-131	5.97E-08	μCi/ml
Xe-133	9.11E-08	μCi/ml
Xe-135	4.27E-08	μCi/ml
Fe-55	1.00E-06	μCi/ml
Sr-89	5.00E-08	μCi/ml
Sr-90	7.00E-09	μCi/ml
H-3	2.00E-06	μCi/ml
Gross Alpha	7.00E-08	μCi/ml

Table 1-5A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Liquid Effluents - Batch Release Summary
Unit: 1
Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Liquid Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of batch releases		22	14	34	8	78
2. Total time period for Batch releases	(Minutes)	6.94E+03	3.61E+03	1.28E+03	2.01E+03	2.53E+04
3. Maximum time period for a batch	(Minutes)	1.01E+03	4.57E+02	1.11E+03	3.71E+02	1.11E+03
4. Average time period for a batch	(Minutes)	3.15E+02	2.58E+02	3.75E+02	2.51E+02	3.24E+02
5. Minimum time period for a batch	(Minutes)	5.00E+01	4.60E+01	6.20E+01	5.50E+01	4.60E+01
6. Average stream flow during periods of release of liquid effluent into a flowing stream *	(CFS)	5910	7333	5047	3851	5535

*Average river flowrate taken from USGS Monitoring Station 02197500, Savannah River at Burton's Ferry Bridge near Millhaven, Ga. 32 miles downstream of Plant Vogtle for quarters 1,2, and 3. Qtr 4 data taken from U.S. Army Corps of Engineers Lake Thurmond Discharge rate.
<http://water.sas.usace.army.mil/cf/AvgMonthly/AvgMonthly.cfm>

Table 1-5B

Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Liquid Effluents - Batch Release Summary
Unit: 2
Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Liquid Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of batch releases		8	1	1	2	12
2. Total time period for Batch releases	(Minutes)	2.91E+03	4.09E+02	9.96E+02	5.05E+02	4.82E+03
3. Maximum time period for a batch	(Minutes)	6.97E+02	4.09E+02	9.96E+02	2.68E+02	9.96E+02
4. Average time period for a batch	(Minutes)	3.64E+02	4.09E+02	9.96E+02	2.53E+02	4.02E+02
5. Minimum time period for a batch	(Minutes)	5.10E+01	4.09E+02	9.96E+02	2.37E+02	5.10E+01
6. Average stream flow during periods of release of liquid effluent into a flowing stream *	(CFS)	5910	7333	5047	3851	5535

*Average river flowrate taken from USGS Monitoring Station 02197500, Savannah River at Burton's Ferry Bridge near Millhaven, Ga. 32 miles downstream of Plant Vogtle for quarters 1,2, and 3. Qtr 4 data taken from U.S. Army Corps of Engineers Lake Thurmond Discharge rate.
<http://water.sas.usace.army.mil/cf/AvgMonthly/AvgMonthly.cfm>

Table 1-5C

**Vogtle Electric Generating Plant
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
 Liquid Effluents - Batch Release Summary
 Unit: Site
 Starting: 1-Jan- 2011 Ending: 31-Dec-2011**

Liquid Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of batch releases		30	15	35	10	90
2. Total time period for Batch releases	(Minutes)	9.85E+03	4.02E+03	1.38E+04	2.51E+03	3.01E+04
3. Maximum time period for a batch	(Minutes)	1.01E+03	4.57E+02	1.11E+03	3.71E+02	1.11E+03
4. Average time period for a batch	(Minutes)	3.28E+02	2.68E+02	3.93E+02	2.51E+02	3.35E+02
5. Minimum time period for a batch	(Minutes)	5.00E+01	4.60E+01	6.20E+01	5.50E+01	4.60E+01
6. Average stream flow during periods of release of liquid effluent into a flowing stream *	(CFS)	5910	7333	5047	3851	5535

*Average river flowrate taken from USGS Monitoring Station 02197500, Savannah River at Burton's Ferry Bridge near Millhaven, Ga. 32 miles downstream of Plant Vogtle for quarters 1,2, and 3. Qtr 4 data taken from U.S. Army Corps of Engineers Lake Thurmond Discharge rate.
<http://water.sas.usace.army.mil/cf/AvgMonthly/AvgMonthly.cfm>

Table 1-6A

Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Liquid Effluents - Abnormal Release Summary

Unit: 1

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Liquid Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of Releases		0	0	0	0	0
2. Total Time For All Releases	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Maximum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4. Average Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5. Minimum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6. Total activity for all releases	(Curies)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 1-6B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Liquid Effluents - Abnormal Release Summary
Unit: 2
Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Liquid Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of Releases		0	0	0	0	0
2. Total Time For All Releases	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Maximum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4. Average Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5. Minimum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6. Total activity for all releases	(Curies)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 1-6C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Liquid Effluents - Abnormal Release Summary
Unit: Site
Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Liquid Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of Releases		0	0	0	0	0
2. Total Time For All Releases	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Maximum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4. Average Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5. Minimum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6. Total activity for all releases	(Curies)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

2.0 Gaseous Effluents

2.1 Regulatory Requirements

The ODCM Specifications presented in this section are for Unit 1 and Unit 2.

2.1.1 Dose Rate Limits

The dose rate due to radioactive materials released in gaseous effluents from the site to areas at and beyond the SITE BOUNDARY shall be limited to the following:

- a. For noble gases, Less than or equal to 500 mrems/yr. to the whole body and less than or equal to 3000 mrems/yr. to the skin and,
- b. For Iodine-131, for Iodine-133, for tritium and for all radionuclides in particulate form with half lives greater than 8 days: Less than or equal to 1500 mrems/yr. to any organ.

2.1.2 Air Doses Due to Noble Gases in Gaseous Releases

The air dose due to noble gases released in gaseous effluents, from each unit, to areas at and beyond the SITE BOUNDARY shall be limited to the following:

- a. During any calendar quarter: Less than or equal to 5 mrad for gamma radiation and less than or equal to 10 mrad for beta radiation, and
- b. During any calendar year: Less than or equal to 10 mrad for gamma radiation and less than or equal to 20 mrad for beta radiation.

2.1.3 Doses to a Member of the Public

The dose to a MEMBER OF THE PUBLIC from Iodine-131, Iodine-133, tritium and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released, from each unit, to areas at and beyond the SITE BOUNDARY shall be limited to the following.

- a. During any calendar quarter: Less than or equal to 7.5 mrems to any organ.
- b. During any calendar year: Less than or equal to 15 mrems to any organ.

2.2 Measurements and Approximations of Total Radioactivity

2.2.1 Sample Collection and Analysis

Gaseous Effluents at the Vogtle Electric Generating Plant are currently confined to five paths: plant vents (Unit 1 and Unit 2), the condenser air ejector, the steam packing exhaustor systems (Unit 1 and Unit 2), and the Radwaste Processing Facility.

Waste gas decay tanks are batch released through the Unit 1 plant vent. The containment purges are released through their respective plant vents. Containment atmosphere is also released via the containment equipment hatch during periods when the equipment hatch is open with containment purge/vent being stopped. Approval was granted by the NRC to open the equipment hatch during fuel movement; a release permit is generated when the equipment hatch is opened and the containment exhaust fan is not discharging to the plant vent. Any detected activity in the containment equipment hatch permit is included in the Ground Release Table of the effluent report.

All of the paths with the exception of the RPF can be continuously monitored for gaseous radioactivity. The RPF is equipped with an integrated-type sample collection device for collecting particulates. Plant vent, containment, steam jet air ejector, steam-packing exhaustor are equipped with an integrated-type sample collection device for collecting particulates and iodines. During this reporting period, there were no continuous radioactive releases through the condenser air ejector and the steam packing exhaustor system vents. Batch Waste Gas Decay Tank releases are analyzed for noble gases before each release. The containment atmosphere is analyzed for noble gases prior to each release and for tritium at least on a monthly basis.

Sample analyses results and release flow rates form the basis for calculating released quantities of radionuclide specific radioactivity, dose rates associated with gaseous releases, and cumulative doses for the current quarter and year.

With each release period and batch release, radioactivity, dose rates, and cumulative doses are calculated. Cumulative dose results are tabulated, along with the percent of the ODCM limits for each release for the current quarter and year.

Typically achieved minimum detectable concentrations for gaseous effluent sample analyses are reported in Table 2-6.

2.2.2 Total Quantities of Radioactivity, Dose Rates, and Cumulative Doses

The methods for determining release quantities of radioactivity, dose rates, and cumulative doses are as follows:

2.2.2.1 Fission and Activation Gases

The released radioactivity is determined from sample analyses results collected as described above and average release flow rates over the period represented by the collected sample. Dose rates due to noble gases, radioiodines, tritium, and particulates are calculated. Calculated dose rates are compared to the dose rate limits specified in ODCM 3.1.2 for noble gases, radioiodines, tritium, and particulates. Dose rate calculation methodology is presented in the ODCM.

Beta and gamma air doses due to noble gases are calculated for the location in the unrestricted area with the potential for the highest exposure due to gaseous releases. Air doses are calculated for each release period and cumulative totals are kept for each unit for the calendar quarter and year. Cumulative air doses are compared with the dose limits specified in ODCM 3.1.3. Current percent of the ODCM limits are shown on the printout for each release period. Air dose calculation methodology is presented in the ODCM.

2.2.2.2 Radioiodines, Tritium and Particulate Releases

The released quantities of radioiodines, tritium and particulates are determined using the weekly samples and release flow rates for the two plant vent release points.

After each quarter, the particulate filters from each plant vent are combined, for strontium analysis. Strontium concentrations are input to the composite file of the computer to be used for release dose rate and individual dose calculations.

Doses to a Member of the Public due to radioiodines, tritium and particulates are calculated for the controlling receptor, which is described in Table 3-7 of the ODCM. Doses are calculated for each release period, and cumulative totals are kept for each unit for the current calendar quarter and year. Cumulative doses are compared to the dose limits specified in ODCM 3.1.4.

Current percent of ODCM limits are shown in this report for each release period.

2.2.2.3 Gross Alpha Release

The gross alpha release is calculated each month by counting the particulate filters for each week for gross alpha activity. The four or five weeks' numbers are then recorded on a data sheet and the activity is summed at the end of the month. This concentration is used for release calculations.

2.2.3 Total Error Estimation

The total or maximum error associated with the effluent measurement will include the cumulative errors resulting from the total operation of sampling and measurement. Because it may be very difficult to assign error terms for each parameter affecting the final measurement, detailed statistical evaluation of error are not suggested.

The objective should be to obtain an overall estimate of the error associated with measurements of radioactive materials released in liquid and gaseous effluents and solid waste.

Estimated errors are based on errors in counting equipment calibration, counting statistics, vent-flow rates, vent sample flow rates, non-steady release rates, chemical yield factors, and sample losses for such items as charcoal cartridges.

- a. Fission and activation total release was calculated from sample analysis results and release point flow rates.

Sampling and statistical error in counting	10%
Counting equipment calibration	10%
Vent flow Rates	10%
Non-steady release rates	20%
TOTAL ERROR	26.5%

- b. I-131 releases were calculated from each weekly sample:

Statistical error in counting	10%
Counting equipment calibration	10%
Vent Flow Rates	10%
Vent Sample Flow Rates	50%
Non-Steady release rates	10%
Losses from charcoal cartridges	10%
TOTAL ERROR	55%

- c. Particulates with half-lives greater than 8 day releases were calculated from sample and analysis results and release point flow rates.

Statistical error at MDC concentration	10%
Counting equipment calibration	10%
Vent flow rates	10%
Vent sample flow rates	50%
Non steady release rates	10%
TOTAL ERROR	54%

2.2.3

Total Error Estimation cont'd

- d. Total tritium releases were calculated from sample analysis results and release point flow rates.

Water vapor in sample stream determination	10%
Vent flow rates	10%
Counting calibration and statistics	10%
Non-steady release rates	10%
TOTAL ERROR	20%

- e. Gross Alpha radioactivity was calculated from sample analysis results and release point flow rates.

Statistical error at MDC concentration	10%
Counting equipment calibration	10%
Vent flow rates	10%
Vent sample flow rates	50%
Non Steady release rates	10%
TOTAL ERROR	55%

2.3

Gaseous Effluent Release Data

Regulatory Guide 1.21 Tables 1A, 1B, and 1C are found in this report as Tables 2-1A, 2-1B, 2-1C, 2-2A, 2-2B, 2-2C, 2-3A, 2-3B, and 2-3C. Data are presented on a quarterly basis as required by Regulatory Guide 1.21.

To complete table 2-1A, and 2-1B, the total release for each of the four categories (fission and activation gases, iodines, particulates, and tritium) was divided by the number of seconds in the quarter to obtain a release rate in $\mu\text{Ci}/\text{second}$ for each category. However, the percent of the ODCM limits are not applicable because VEGP has no curie limits for gaseous releases. Applicable limits are expressed in terms of dose. Noble gases are limited as specified in ODCM 3.1.2. The other three categories (tritium, radioiodines, and particulates) are limited as a group as specified in ODCM 3.1.2.

Dose rates due to noble gas releases and due to radioiodines, tritium, and particulate releases were calculated as part of the pre-release and post-release permits. No limits were exceeded for this reporting period.

Gross alpha radioactivity is reported in Table 2-1A, and 2-1B as curies released in each quarter.

Limits for cumulative beta and gamma air doses due to noble gases are specified in ODCM 3.1.3. Cumulative air doses are presented in Table 2-4A, and 2-4B along with the percent of the ODCM limits.

Limits for cumulative doses to a Member of the Public due to radioiodines, tritium and particulates, are specified in ODCM 3.1.4. Cumulative doses to a Member of the Public are presented in Table 2-5A, and 2-5B along with percent of ODCM limits.

2.4 Radiological Impact Due to Gaseous Releases

Dose rates due to the release of noble gases were calculated for the site in accordance with ODCM 3.4.1.1. Dose rates due to radioiodines, tritium, and particulates in gaseous releases were calculated in accordance with ODCM 3.4.1.2.

Dose rates were calculated as part of pre-release and post release permits, no limits were exceeded for this reporting period.

Cumulative air doses due to noble gas releases were calculated for each unit in accordance with ODCM 3.4.2. These results are presented in Tables 2-4A and 2-4B.

Cumulative doses to a Member of the Public were calculated for each unit in accordance with ODCM 3.4.3. These results are presented in Tables 2-5A and 2-5B.

Dose rates and doses were calculated using the methodology presented in the Vogtle Electric Generating Plant Offsite Dose Calculation Manual.

2.5 Gaseous Effluents - Batch Releases

Other data pertinent to batch releases of radioactive gaseous effluent from Unit 1 and Unit 2 are listed in Table 2-7A and 2-7B.

2.6 Gaseous Effluents - Abnormal Releases

During disposal of a Unit 2 Reactor Coolant System filter into a High Integrity Container (HIC) in the Radwaste Processing Facility's (RPF), Radiation Monitor 16980A (radioactive particulate building exhaust) air channel went into alarm. The alarm was in for approximately 20 seconds and then cleared. The alarm was not due to any particulate being present. When the filter was dropped into the HIC, a small, immeasurable puff of noble gas reached the radiation monitor (most likely Xe-133). A permit was not needed for the sparse amount released. However, this work activity was closely monitored throughout the rest of the year. There were no more occurrences of alarms during HIC transfer and drop.

Table 2-1A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Gaseous Effluents - Summation Of All Releases

Unit: 1

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Type of Effluent	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
A. Fission And Activation Gases					
1. Total Release	Curies	1.79E+00	5.98E-01	3.66E-01	5.25E-02
2. Average Release rate for period	uCi/sec	2.27E-01	7.59E-02	4.65E-02	6.66E-03
3. Percent of Applicable Limit	%	*	*	*	*
B. Radioiodines					
1. Total Iodine-131	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Percent of Applicable Limit	%	*	*	*	*
C. Particulates					
1. Particulates (Half-Lives > 8	Curies	2.67E-07	9.99E-07	0.00E+00	3.63E-07
2. Average Release rate for period	uCi/sec	3.38E-08	1.27E-07	0.00E+00	4.60E-08
3. Percent of Applicable Limit	%	*	*	*	*
D. Tritium					
1. Total Release	Curies	4.80E+00	1.12E+00	1.42E+00	5.12E+00
2. Average Release rate for period	uCi/sec	6.08E-01	1.42E-01	1.80E-01	6.50E-01
3. Percent of Applicable Limit	%	*	*	*	*
E. Gross Alpha					
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00

* Applicable limits are expressed in terms of dose. See Tables 2-4A, 2-4B, 2-5A, 2-5B of this report.

Table 2-1B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Gaseous Effluents - Summation Of All Releases

Unit: 2

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

<u>Type of Effluent</u>	<u>Units</u>	<u>1ST Quarter</u>	<u>2ND Quarter</u>	<u>3RD Quarter</u>	<u>4TH Quarter</u>
<u>A. Fission And Activation Gases</u>					
1. Total Release	Curies	6.47E+00	1.33E+01	3.33E+01	3.42E+00
2. Average Release rate for period	uCi/sec	8.21E-01	1.69E+01	4.23E+00	4.33E-01
3. Percent of Applicable Limit	%	*	*	*	*
<u>B. Radioiodines</u>					
1. Total Iodine-131	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Percent of Applicable Limit	%	*	*	*	*
<u>C. Particulates</u>					
1. Particulates (Half-Lives > 8	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Percent of Applicable Limit	%	*	*	*	*
<u>D. Tritium</u>					
1. Total Release	Curies	2.45E+00	3.66E+00	1.02E+01	1.21E+01
2. Average Release rate for period	uCi/sec	3.11E-01	4.64E-01	1.30E+00	1.54E+00
3. Percent of Applicable Limit	%	*	*	*	*
<u>E. Gross Alpha</u>					
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00

* Applicable limits are expressed in terms of dose. See Tables 2-4A, 2-4B, 2-5A, 2-5B of this report.

Table 2-1C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Gaseous Effluents - Summation Of All Releases

Unit: Site

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

<u>Type of Effluent</u>	<u>Units</u>	<u>1ST Quarter</u>	<u>2ND Quarter</u>	<u>3RD Quarter</u>	<u>4TH Quarter</u>
A. Fission And Activation Gases					
1. Total Release	Curies	8.27E+00	1.39E+01	3.37E+01	3.47E+00
2. Average Release rate for period	uCi/sec	1.05E+00	1.76E+00	4.27E+00	4.40E-01
3. Percent of Applicable Limit	%	*	*	*	*
B. Radioiodines					
1. Total Iodine-131	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Percent of Applicable Limit	%	*	*	*	*
C. Particulates					
1. Particulates (Half-Lives > 8	Curies	2.67E-07	9.99E-07	0.00E+00	3.63E-07
2. Average Release rate for period	uCi/sec	3.38E-08	1.27E-07	0.00E+00	4.60E-08
3. Percent of Applicable Limit	%	*	*	*	*
D. Tritium					
1. Total Release	Curies	7.25E+00	4.79E+00	1.17E+01	1.72E+01
2. Average Release rate for period	uCi/sec	9.19E-01	6.07E-01	1.48E+00	2.18E+00
3. Percent of Applicable Limit	%	*	*	*	*
E. Gross Alpha					
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average Release rate for period	uCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00

* Applicable limits are expressed in terms of dose. See Tables 2-4A, 2-4B, 2-5A, 2-5B of this report.

Table 2-2A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Gaseous Effluents - Mixed Mode Level Releases

Unit: 1

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Continuous Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
Be-7	Curies	0.00E+00	4.41E-07	0.00E+00	0.00E+00
Co-58	Curies	0.00E+00	5.58E-07	0.00E+00	0.00E+00
Sr-89	Curies	2.67E-07	0.00E+00	0.00E+00	3.63E-07
Total For Period	Curies	2.67E-07	9.99E-07	0.00E+00	3.63E-07
Tritium					
H-3	Curies	3.07E+00	9.43E-01	9.41E-01	5.03E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported.

Zeroes in this table indicates that no radioactivity was present at detectable levels.

See Table 2-6 for typical minimum detectable concentrations.

Table 2-2A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Gaseous Effluents - Mixed Mode Level Releases
Unit: 1
Starting: 1-Jan- 2011 Ending: 31-Dec-2011
Batch Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
Ar-41	Curies	1.78E+00	5.40E-02	3.66E-01	5.05E-02
Kr-85M	Curies	0.00E+00	1.22E-03	0.00E+00	0.00E+00
Kr-85	Curies	0.00E+00	3.64E-01	0.00E+00	0.00E+00
Xe-133M	Curies	0.00E+00	1.20E-03	0.00E+00	0.00E+00
Xe-133	Curies	0.00E+00	1.47E-01	0.00E+00	0.00E+00
Xe-135	Curies	0.00E+00	3.04E-02	0.00E+00	0.00E+00
Total For Period	Curies	1.78E+00	5.98E-01	3.66E-01	5.05E-02
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
H-3	Curies	1.65E+00	1.81E-01	4.75E-01	9.19E-02
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

Table 2-2B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Gaseous Effluents - Mixed Mode Level Releases

Unit: 2

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Continuous Mode

<u>Nuclides Released</u>	<u>Units</u>	<u>1ST Quarter</u>	<u>2ND Quarter</u>	<u>3RD Quarter</u>	<u>4TH Quarter</u>
Fission Gases					
Xe-133	Curies	0.00E+00	0.00E+00	2.94E+00	3.35E+00
Total For Period	Curies	0.00E+00	0.00E+00	2.94E+00	3.35E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
Sr-89	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
H-3	Curies	1.27E+00	3.37E+00	9.10E+00	1.20E+01
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 2-6 for typical minimum detectable concentrations.

Table 2-2B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Gaseous Effluents - Mixed Mode Level Releases

Unit: 2

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Batch Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
Ar-41	Curies	8.77E-01	6.63E-01	2.85E+00	2.12E-02
Kr-85M	Curies	0.00E+00	3.97E-02	1.31E-02	0.00E+00
Kr-85	Curies	5.74E-01	1.92E+00	0.00E+00	0.00E+00
Kr-87	Curies	0.00E+00	3.06E-03	0.00E+00	0.00E+00
Kr-88	Curies	0.00E+00	3.78E-02	0.00E+00	2.18E-02
Xe-133M	Curies	0.00E+00	1.25E-01	2.37E-02	0.00E+00
Xe-133	Curies	4.94E+00	9.46E+00	2.40E+01	4.40E-02
Xe-135	Curies	7.87E-02	1.06E+00	3.29E+00	4.73E-04
Total For Period	Curies	6.47E+00	1.33E+01	3.04E+01	6.57E-02
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
H-3	Curies	1.17E+00	2.88E-01	1.14E+00	1.17E-01
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

Table 2-2C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Gaseous Effluents - Mixed Mode Level Releases

Unit: Site

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Continuous Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
Xe-133	Curies	0.00E+00	0.00E+00	2.94E+00	3.35E+00
Total For Period	Curies	0.00E+00	0.00E+00	2.94E+00	3.35E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
Be-7	Curies	0.00E+00	4.41E-07	0.00E+00	0.00E+00
Co-58	Curies	0.00E+00	5.58E-07	0.00E+00	0.00E+00
Sr-89	Curies	2.67E-07	0.00E+00	0.00E+00	3.63E-07
Total For Period	Curies	2.67E-07	9.99E-07	0.00E+00	3.63E-07
Tritium					
H-3	Curies	4.35E+00	4.32E+00	1.00E+01	1.70E+01
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 2-6 for typical minimum detectable concentrations.

Table 2-2C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Gaseous Effluents - Mixed Mode Level Releases

Unit: Site

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Batch Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
Ar-41	Curies	2.65E+00	7.17E-01	3.21E+00	7.17E-02
Kr-85M	Curies	0.00E+00	4.09E-02	1.31E-02	0.00E+00
Kr-85	Curies	5.74E-01	2.29E+00	0.00E+00	0.00E+00
Kr-87	Curies	0.00E+00	3.06E-03	0.00E+00	0.00E+00
Kr-88	Curies	0.00E+00	3.78E-02	0.00E+00	0.00E+00
Xe-133M	Curies	0.00E+00	1.27E-01	2.37E-01	0.00E+00
Xe-133	Curies	4.94E+00	9.61E+00	2.40E+01	4.40E-02
Xe-135	Curies	7.87E-02	1.09E+00	3.29E+00	4.73E-04
Total For Period	Curies	8.25E+00	1.39E+01	3.07E+01	1.16E-01
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
H-3	Curies	2.83E+00	4.68E-01	1.61E+00	2.09E-01
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

Table 2-3A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2010
Gaseous Effluents - Ground Level Releases

Unit: 1

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Continuous Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

Table 2-3A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Gaseous Effluents - Ground Level Releases
Unit: 1
Starting: 1-Jan- 2011 Ending: 31-Dec-2011
Batch Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
Ar-41	Curies	1.58E-02	0.00E+00	0.00E+00	1.99E-03
Total For Period	Curies	1.58E-02	0.00E+00	0.00E+00	1.99E-03
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
H-3	Curies	6.91E-02	0.00E+00	0.00E+00	1.44E-03
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 2-6 for typical minimum detectable concentrations.

Table 2-3B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Gaseous Effluents - Ground Level Releases

Unit: 2

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Continuous Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

Table 2-3B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Gaseous Effluents - Ground Level Releases
Unit: 2
Starting: 1-Jan- 2011 Ending: 31-Dec-2011
Batch Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
Ar-41	Curies	0.00E+00	0.00E+00	7.74E-04	0.00E+00
Xe-133	Curies	0.00E+00	0.00E+00	5.96E-03	0.00E+00
Xe-135	Curies	0.00E+00	0.00E+00	1.07E-03	0.00E+00
Total For Period	Curies	0.00E+00	0.00E+00	7.80E-03	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
H-3	Curies	0.00E+00	0.00E+00	2.84E-03	3.05E-03
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels. See Table 2-6 for typical minimum detectable concentrations.

Table 2-3C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Gaseous Effluents - Ground Level Releases
Unit: Site
Starting: 1-Jan- 2011 Ending: 31-Dec-2011
Continuous Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 2-6 for typical minimum detectable concentrations.

Table 2-3C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Gaseous Effluents - Ground Level Releases
Unit: Site
Starting: 1-Jan- 2011 Ending: 31-Dec-2011
Batch Mode

Nuclides Released	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
Fission Gases					
Ar-41	Curies	1.58E-02	0.00E+00	7.74E-04	1.99E-03
Xe-133	Curies	0.00E+00	0.00E+00	5.96E-03	0.00E+00
Xe-135	Curies	0.00E+00	0.00E+00	1.07E-03	0.00E+00
Total For Period	Curies	1.58E-02	0.00E+00	7.80E-03	1.99E-03
Iodines					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium					
H-3	Curies	6.91E-02	0.00E+00	2.84E-03	4.49E-03
Gross Alpha					
No Nuclides Found	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00

If Not Detected, Nuclide is Not Reported. Zeroes in this table indicates that no radioactivity was present at detectable levels.
See Table 2-6 for typical minimum detectable concentrations.

Table 2-4A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Air Doses Due to Gaseous Release

Unit: 1

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Cumulative Doses Per Quarter

<u>Type of Radiation</u>	<u>ODCM</u>	<u>Units</u>	<u>1ST Qtr</u>	<u>% ODCM</u>	<u>2ND Qtr</u>	<u>% ODCM</u>	<u>3RD Qtr</u>	<u>% ODCM</u>	<u>4TH Qtr</u>	<u>% ODCM</u>
Gamma Air	5.00E+00	mRad	2.54E-04	5.08E-03	9.09E-06	1.82E-04	4.99E-05	9.98E-04	6.88E-06	1.38E-04
Beta Air	1.00E+01	mRad	8.96E-05	8.96E-04	1.64E-05	1.64E-04	1.76E-05	1.76E-04	2.43E-06	2.43E-05

Cumulative Doses Per Year

<u>Type of Radiation</u>	<u>ODCM</u>	<u>Unit</u>	<u>Year to End</u>	<u>% ODCM</u>	<u>Receptor</u>	<u>Limit</u>
Gamma Air	1.00E+01	mRad	3.20E-04	3.20E-03	Site Boundary / Child	Air Dose Gamma Annual 1.21
Beta Air	2.00E+01	mRad	1.26E-04	6.30E-04	Site Boundary / Child	Air Dose Beta Annual 1.21

Table 2-4B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Air Doses Due to Gaseous Release
Unit: 2
Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Cumulative Doses Per Quarter

<u>Type of Radiation</u>	<u>ODCM</u>	<u>Units</u>	<u>1ST Qtr</u>	<u>% ODCM</u>	<u>2ND Qtr</u>	<u>% ODCM</u>	<u>3RD Qtr</u>	<u>% ODCM</u>	<u>4TH Qtr</u>	<u>% ODCM</u>
Gamma Air	5.00E+00	mRad	1.47E-04	2.95E-03	1.80E-04	3.59E-03	6.22E-04	1.24E-02	2.04E-05	4.09E-04
Beta Air	1.00E+01	mRad	1.37E-04	1.37E-03	2.76E-04	2.76E-03	6.76E-04	6.76E-03	5.32E-05	5.32E-04

Cumulative Doses Per Year

<u>Type of Radiation</u>	<u>ODCM</u>	<u>Unit</u>	<u>Year to End</u>	<u>% ODCM</u>	<u>Receptor</u>	<u>Limit</u>
Gamma Air	1.00E+01	mRad	9.69E-04	9.69E-03	Site Boundary / Child	Air Dose Gamma Annual 1.21
Beta Air	2.00E+01	mRad	1.14E-03	5.71E-03	Site Boundary / Child	Air Dose Beta Annual 1.21

Table 2-4C
Vogle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Air Doses Due to Gaseous Release

Unit: Site
Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Cumulative Doses Per Quarter

<u>Type of Radiation</u>	<u>ODCM</u>	<u>Units</u>	<u>1ST Qtr</u>	<u>% ODCM</u>	<u>2ND Qtr</u>	<u>% ODCM</u>	<u>3RD Qtr</u>	<u>% ODCM</u>	<u>4TH Qtr</u>	<u>% ODCM</u>
Gamma Air	5.00E+00	mRad	4.01E-04	8.03E-03	1.89E-04	3.77E-03	6.72E-04	1.34E-02	2.73E-05	5.47E-04
Beta Air	1.00E+01	mRad	2.27E-04	2.27E-03	2.93E-04	2.93E-03	6.93E-04	6.93E-03	5.57E-05	5.57E-04

Cumulative Doses Per Year

<u>Type of Radiation</u>	<u>ODCM</u>	<u>Unit</u>	<u>Year to End</u>	<u>% ODCM</u>	<u>Receptor</u>	<u>Limit</u>
Gamma Air	1.00E+01	mRad	1.29E-03	1.29E-02	Site Boundary / Child	Air Dose Gamma Annual 1.21
Beta Air	2.00E+01	mRad	1.27E-03	6.34E-03	Site Boundary / Child	Air Dose Beta Annual 1.21

Table 2-5A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Doses To A Member Of The Public Due To Radioiodines, Tritium, and Particulates in Gaseous Releases
Unit: 1
Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Cumulative Doses Per Quarter

Organ	ODCM	Units	1ST Qtr	% ODCM	2ND Qtr	% ODCM	3RD Qtr	% ODCM	4TH Qtr	% ODCM
Bone	7.50E+00	mRem	3.13E-07	4.18E-06	6.64E-09	8.86E-08	0.00E+00	0.00E+00	4.26E-07	5.69E-06
GI-Lli	7.50E+00	mRem	1.10E-04	1.46E-03	2.43E-05	3.24E-04	3.06E-05	4.08E-04	1.11E-04	1.48E-03
Kidney	7.50E+00	mRem	1.10E-04	1.46E-03	2.43E-05	3.24E-04	3.06E-05	4.08E-04	1.11E-04	1.48E-03
Liver	7.50E+00	mRem	1.10E-04	1.46E-03	2.43E-05	3.24E-04	3.06E-05	4.08E-04	1.11E-04	1.48E-03
Lung	7.50E+00	mRem	1.10E-04	1.46E-03	2.43E-05	3.24E-04	3.06E-05	4.08E-04	1.11E-04	1.48E-03
Thyroid	7.50E+00	mRem	1.10E-04	1.46E-03	2.43E-05	3.24E-04	3.06E-05	4.08E-04	1.11E-04	1.48E-03
Total Body	7.50E+00	mRem	1.10E-04	1.46E-03	2.43E-05	3.24E-04	3.06E-05	4.08E-04	1.11E-04	1.48E-03

Cumulative Doses per Year

Organ	ODCM	Units	Year to Ending Date	% ODCM	Receptor	Limit
Bone	1.500E+01	mRem	7.465E-07	4.977E-06	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
GI-Lli	1.500E+01	mRem	2.751E-04	1.834E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Kidney	1.500E+01	mRem	2.751E-04	1.834E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Liver	1.500E+01	mRem	2.751E-04	1.834E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Lung	1.500E+01	mRem	2.751E-04	1.834E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Thyroid	1.500E+01	mRem	2.751E-04	1.834E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Total Body	1.500E+01	mRem	2.751E-04	1.834E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21

Table 2-5B

Vogle Electric Generating Plant
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2011

Doses To A Member Of The Public Due To Radioiodines, Tritium, and Particulates in Gaseous Releases

Unit: 2

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Cumulative Doses Per Quarter

<u>Organ</u>	<u>ODCM</u>	<u>Units</u>	<u>1ST Qtr</u>	<u>% ODCM</u>	<u>2ND Qtr</u>	<u>% ODCM</u>	<u>3RD Qtr</u>	<u>% ODCM</u>	<u>4TH Qtr</u>	<u>% ODCM</u>
Bone	7.50E+00	mRem	5.29E-05	7.06E-04	7.92E-05	1.06E-03	2.22E-04	2.96E-03	2.62E-04	3.49E-03
GI-Lli	7.50E+00	mRem	5.29E-05	7.06E-04	7.92E-05	1.06E-03	2.22E-04	2.96E-03	2.62E-04	3.49E-03
Kidney	7.50E+00	mRem	5.29E-05	7.06E-04	7.92E-05	1.06E-03	2.22E-04	2.96E-03	2.62E-04	3.49E-03
Liver	7.50E+00	mRem	5.29E-05	7.06E-04	7.92E-05	1.06E-03	2.22E-04	2.96E-03	2.62E-04	3.49E-03
Lung	7.50E+00	mRem	5.29E-05	7.06E-04	7.92E-05	1.06E-03	2.22E-04	2.96E-03	2.62E-04	3.49E-03
Thyroid	7.50E+00	mRem	5.29E-05	7.06E-04	7.92E-05	1.06E-03	2.22E-04	2.96E-03	2.62E-04	3.49E-03
Total Body	7.50E+00	mRem	5.29E-05	7.06E-04	7.92E-05	1.06E-03	2.22E-04	2.96E-03	2.62E-04	3.49E-03

Cumulative Doses per Year

<u>Organ</u>	<u>ODCM</u>	<u>Units</u>	<u>Year to Ending Date</u>	<u>% ODCM</u>	<u>Receptor</u>	<u>Limit</u>
Bone	1.500E+01	mRem	6.157E-04	4.105E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
GI-Lli	1.500E+01	mRem	6.157E-04	4.105E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Kidney	1.500E+01	mRem	6.157E-04	4.105E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Liver	1.500E+01	mRem	6.157E-04	4.105E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Lung	1.500E+01	mRem	6.157E-04	4.105E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Thyroid	1.500E+01	mRem	6.157E-04	4.105E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Total Body	1.500E+01	mRem	6.157E-04	4.105E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21

Table 2-5C

Vogle Electric Generating Plant
 RADIOACTIVE EFFLUENT RELEASE REPORT - 2011

Doses To A Member Of The Public Due To Radioiodines, Tritium, and Particulates in Gaseous Releases

Unit: Site

Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Cumulative Doses Per Quarter

Organ	ODCM	Units	1ST Qtr	% ODCM	2ND Qtr	% ODCM	3RD Qtr	% ODCM	4TH Qtr	% ODCM
Bone	7.50E+00	mRem	3.13E-07	4.18E-06	6.64E-09	8.86E-08	0.00E+00	0.00E+00	4.26E-07	5.96E-06
GI-Lli	7.50E+00	mRem	1.62E-04	2.17E-03	1.03E-04	1.38E-03	2.52E-04	3.36E-03	3.37E-04	4.97E-03
Kidney	7.50E+00	mRem	1.62E-04	2.17E-03	1.03E-04	1.38E-03	2.52E-04	3.36E-03	3.37E-04	4.97E-03
Liver	7.50E+00	mRem	1.62E-04	2.17E-03	1.03E-04	1.38E-03	2.52E-04	3.36E-03	3.37E-04	4.97E-03
Lung	7.50E+00	mRem	1.62E-04	2.17E-03	1.03E-04	1.38E-03	2.52E-04	3.36E-03	3.37E-04	4.97E-03
Thyroid	7.50E+00	mRem	1.62E-04	2.17E-03	1.03E-04	1.38E-03	2.52E-04	3.36E-03	3.37E-04	4.97E-03
Total Body	7.50E+00	mRem	1.62E-04	2.17E-03	1.03E-04	1.38E-03	2.52E-04	3.36E-03	3.37E-04	4.97E-03

Cumulative Doses per Year

Organ	ODCM	Units	Year to Ending Date	% ODCM	Receptor	Limit
Bone	1.500E+01	mRem	7.465E-07	4.977E-06	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
GI-Lli	1.500E+01	mRem	8.909E-04	5.939E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Kidney	1.500E+01	mRem	8.908E-04	5.939E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Liver	1.500E+01	mRem	8.908E-04	5.939E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Lung	1.500E+01	mRem	8.908E-04	5.939E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Thyroid	1.500E+01	mRem	8.908E-04	5.939E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21
Total Body	1.500E+01	mRem	8.909E-04	5.939E-03	Maximum Individual / Child	Iodine/Part Dose Annual 1.21

Table 2-6

Vogtle Electric Generating Plant

RADIOACTIVE EFFLUENT RELEASE REPORT – 2011

MINIMUM DETECTABLE CONCENTRATIONS
GASEOUS SAMPLE ANALYSES

Starting: 1-Jan-2011

Ending: 31-Dec-2011

RADIONUCLIDE	MDC	UNITS
Kr-87	1.82E-08	μCi/ml
Kr-88	2.53E-08	μCi/ml
Xe-133	2.05E-08	μCi/ml
Xe-133m	8.63E-08	μCi/ml
Xe-135	7.12E-08	μCi/ml
Xe-138	1.05E-07	μCi/ml
I-131	7.93E-15*	μCi/ml
Mn-54	3.94E-14*	μCi/ml
Fe-59	2.45E-14*	μCi/ml
Co-58	1.39E-14*	μCi/ml
Co-60	1.75E-14*	μCi/ml
Zn-65	2.82E-14*	μCi/ml
Mo-99	9.57E-14*	μCi/ml
Cs-134	1.12E-14*	μCi/ml
Cs-137	8.71E-15*	μCi/ml
Ce-141	8.62E-15*	μCi/ml
Ce-144	2.77E-14*	μCi/ml
Sr-89	1.00E-13	μCi/ml
Sr-90	1.00E-13	μCi/ml
H-3	9.00E-08	μCi/ml
Gross Alpha	1.00E-13	μCi/ml

* Based on an estimated sample volume of 5.7E+08 mls for particulate filters and charcoal cartridges.

Table 2-7A

Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Gaseous Effluents - Batch Release Summary
Unit: 1
Starting: 1-Jan- 2011 Ending: 31-Dec-2011

<u>Gaseous Releases</u>	<u>Units</u>	<u>1ST Quarter</u>	<u>2ND Quarter</u>	<u>3RD Quarter</u>	<u>4TH Quarter</u>	<u>Year Totals</u>
1. Number of batch releases		44	32	30	25	131
2. Total time period for batch releases	(Minutes)	3.71E+04	7.86E+03	1.27E+04	1.75E+03	5.95E+04
3. Maximum time period for a batch	(Minutes)	6.49E+03	1.74E+03	3.37E+03	1.62E+02	6.49E+03
4. Average time period for a batch	(Minutes)	8.44E+02	2.46E+02	4.24E+02	7.01E+01	4.54E+02
5. Minimum time period for a batch	(Minutes)	1.50E+01	1.50E+01	9.00E+00	2.70E+01	9.00E+00

Table 2-7B
Vogle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Gaseous Effluents - Batch Release Summary
Unit: 2
Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Gaseous Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of batch releases		21	25	38	20	104
2. Total time period for batch releases	(Minutes)	1.27E+04	2.32E+04	4.56E+04	1.11E+04	9.25E+04
3. Maximum time period for a batch	(Minutes)	4.09E+03	6.19E+03	5.71E+03	5.64E+03	6.19E+03
4. Average time period for a batch	(Minutes)	6.03E+02	9.26E+02	1.23E+03	5.54E+02	8.89E+02
5. Minimum time period for a batch	(Minutes)	3.70E+01	3.10E+01	1.00E+00	2.00E+01	1.00E+00

Table 2-7C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Gaseous Effluents - Batch Release Summary
Unit: Site
Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Gaseous Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of batch releases		65	57	68	45	235
2. Total time period for batch releases	(Minutes)	4.98E+04	3.10E+04	5.83E+04	1.28E+04	1.52E+05
3. Maximum time period for a batch	(Minutes)	6.49E+03	6.19E+03	5.71E+03	5.64E+03	6.49E+03
4. Average time period for a batch	(Minutes)	7.66E+02	5.44E+02	8.58E+02	2.85E+02	6.47E+02
5. Minimum time period for a batch	(Minutes)	1.50E+01	1.50E+01	1.00E+00	2.00E+01	1.00E+00

Table 2-8A
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Gaseous Effluents - Abnormal Release Summary
Unit: 1
Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Gaseous Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of Releases		0	0	0	0	0
2. Total Time For All Releases	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Maximum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4. Average Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5. Minimum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6. Total activity for all releases	(Curies)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
A. Fission And Activation Products						
1. Total Release (not including tritium, gases, alpha)	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2. Average diluted concentration during period	uCi/mL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
3. Percent of Applicable Limit	%	*	*	*	*	
B. Tritium						
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2. Average diluted Concentration during period	uCi/mL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
3. Percent of Applicable Limit	%	*	*	*	*	
C. Dissolved and Entrained Gases						
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2. Average diluted Concentration during period	uCi/mL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
3. Percent of Applicable Limit	%	*	*	*	*	

Table 2-8B
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Gaseous Effluents - Abnormal Release Summary
Unit: 2
Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Gaseous Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of Releases		0	0	0	0	0
2. Total Time For All Releases	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Maximum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4. Average Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5. Minimum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6. Total activity for all releases	(Curies)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
A. Fission And Activation Products						
1. Total Release (not including tritium, gases, alpha)	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2. Average diluted concentration during period	uCi/mL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
3. Percent of Applicable Limit	%	*	*	*	*	
B. Tritium						
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2. Average diluted Concentration during period	uCi/mL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
3. Percent of Applicable Limit	%	*	*	*	*	
C. Dissolved and Entrained Gases						
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2. Average diluted Concentration during period	uCi/mL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
3. Percent of Applicable Limit	%	*	*	*	*	

Table 2-8C
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Gaseous Effluents - Abnormal Release Summary
Unit: Site
Starting: 1-Jan- 2011 Ending: 31-Dec-2011

Gaseous Releases	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year Totals
1. Number of Releases		0	0	0	0	0
2. Total Time For All Releases	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Maximum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4. Average Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5. Minimum Time For A Release	(Minutes)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6. Total activity for all releases	(Curies)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
A. Fission And Activation Products						
1. Total Release (not including tritium, gases, alpha)	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2. Average diluted concentration during period	uCi/mL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
3. Percent of Applicable Limit	%	*	*	*	*	
B. Tritium						
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2. Average diluted Concentration during period	uCi/mL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
3. Percent of Applicable Limit	%	*	*	*	*	
C. Dissolved and Entrained Gases						
1. Total Release	Curies	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2. Average diluted Concentration during period	uCi/mL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
3. Percent of Applicable Limit	%	*	*	*	*	

3.0 Solid Waste

3.1 Regulatory Requirements

The ODCM requirements presented in this section are stated in part for Unit 1 and Unit 2.

3.1.1 Solid Radioactive Waste System

10.2.1 Process Control Program (PCP)

Radioactive wastes shall be solidified or dewatered in accordance with the PCP to meet shipping and transportation requirements during transit and disposal site requirements when received at the disposal site.

3.1.2 Reporting Requirements

12.1 PCP states in part:

The Radioactive Effluent Release Report, submitted in accordance with Technical Specification 5.6.3, shall include a summary of the quantities of solid radwaste released from the units, as outlined in Regulatory Guide 1.21.

3.2 Solid Waste Data

Regulatory Guide 1.21, Table 3 is found in this report as Table 3-1.

Table 3-1
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT AND WASTE DISPOSAL REPORT - 2011
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
Units 1 and 2

JANUARY 1, 2011 THROUGH JUNE 30, 2011

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Non Irradiated Fuel)

1. Type of waste

Type of Waste	Unit	6 month Period	Est. Total Error, %
a. Spent Resins, Filter sludges, evaporator Bottoms, etc	m ³ Ci	NONE	N/A
b. Dry Compressible Waste, Contaminated Equipment, etc	m ³ Ci	147.25 1.98e-1	10%
c. Irradiated components, control rods, etc	m ³ Ci	NONE	N/A
d. Other (describe) Secondary Side Resin (SGBD)	m ³ Ci	31.31 1.65E-2	10%
*As Shipped			

2. Estimate of major nuclide composition (by type of waste).

Type of waste	Nuclide		Percentage
a.	N/A	%	
	N/A	%	
	N/A	%	
b.	Co-58	%	34.454
	Co-60	%	30.192
	Ni-63	%	13.919
	Fe-55	%	8.113
	H-3	%	3.744
	Others		9.578
c.	N/A	%	
	N/A	%	
	N/A	%	
d.	Ni-63	%	33.128
	Co-60	%	33.018
	Fe-55	%	20.472
	H-3	%	7.814
	others	%	5.568

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
3	Tractor/Trailer	Energy Solutions, Oak Ridge, TN
2	Tractor/Trailer	Energy Solutions, Kingston, TN

TABLE 3-1
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT AND WASTE DISPOSAL REPORT - 2011
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
Units 1 and 2

Page 2 of 4

JANUARY 1, 2011 THROUGH JUNE 30, 2011

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination
NONE		

ADDITIONAL INFORMATION REQUIRED BY ODCM:

Shipments Sent Directly to Disposal

Shipment No.	Waste Class	Type Container	Shipping Class	Solidification Agent	Volume
NONE					

Shipments to a Waste Processor

Shipment No.	Waste Class	Type Container	Shipping Class	Solidification Agent	Processor
RVRS-11-001	A	IP-1	Limited Quantity	NONE	Energy Solutions
RVRS-11-002	A	IP-1	LSA-I	NONE	Energy Solutions
RVRS-11-003	A	IP-1	LSA-I	NONE	Energy Solutions
RVRS-11-004	A	IP-1	LSA-I	NONE	Energy Solutions
RVRS-11-005*	A	IP-1	Limited Quantity	NONE	Energy Solutions

***Steam Generator Blowdown resin goes to Energy Solutions for final evaluation and release.**

TABLE 3-1
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT - 2011
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
Units 1 and 2

Page 3 of 4

JULY 1, 2011 THROUGH DECEMBER 31, 2011

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL

1. Type of waste

Type of Waste	Unit	6 month Period	Est. Total Error, %
a. Spent Resins, Filter sludges, evaporator Bottoms, etc	m ³ Ci	13.5 2.832	25%
b. Dry Compressible Waste, Contaminated Equipment, etc	m ³ Ci	299.875 1.8	25%
c. Irradiated components, control rods, etc	m ³ Ci		
d. Other (describe) Secondary Side Resin (SGBD) **GIC Program	m ³ Ci	78.83* 1.03E-2	25%
* As Shipped			

2. Estimate of major nuclide composition (by type of waste).

Type of waste	Nuclide		Percentage
a.	Ni-63	%	45.84
	Co-60	%	25.61
	Fe-55	%	18.29
	Mn-54	%	3.18
	Cs-137	%	2.02
	Other	%	5.06
b.	Co-60	%	36.77
	Ni-63	%	20.58
	Fe-55	%	14.66
	Co-58	%	9.23
	H-3	%	11.68
	Others	%	7.08
c.	N/A	%	
	N/A	%	
	N/A	%	
D	Co-60	%	37.49
	Ni-63	%	21.14
	Fe-55	%	14.84
	Co-58	%	11.97
	H-3	%	7.90
	Others	%	6.66

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
2	Cask/Tractor/Trailer	Energy Solutions, Oak Ridge, TN
5	Tractor/Trailer	Energy Solutions, Oak Ridge, TN
4	Tractor/Trailer	Energy Solutions, Kingston, TN

TABLE 3-1
Vogtle Electric Generating Plant
RADIOACTIVE EFFLUENT AND WASTE DISPOSAL REPORT - 2010
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
Units 1 and 2

Page 4 of 4

July 1, 2011 THROUGH December 31, 2011

B. Irradiated Fuel Shipments

Number of Shipments	Mode of Transportation	Destination
NONE		

Additional Information Required by ODCM:

Shipments Sent Directly to Disposal

Shipment No.	Waste Class	Type Container	Shipping Class	Solidification Agent	Volume
NONE					

Shipments to a Waste Processor

Shipment No.	Waste Class	Type Container	Shipping Class	Solidification Agent	Processor
RVRS-11-006	A	IP-1	LSA-I	NONE	Energy Solutions
RVRS-11-007	A	IP-1	LSA-II	NONE	Energy Solutions
RVRS-11-008*	A	IP-1 (SGBD)	Limited Quantity	NONE	Energy Solutions
RVRS-11-009	A	IP-1	LSA-I	NONE	Energy Solutions
RVRS-11-010	A	IP-1	LSA-I	NONE	Energy Solutions
RVRS-11-011	A	IP-1	LSA-I	NONE	Energy Solutions
RVRS-11-012*	A	IP-I (SGBD)	Limited Quantity	NONE	Energy Solutions
RVRS-11-013	A	IP-I	LSA-I	NONE	Energy Solutions
RVRS-11-014	A	IP-I	LSA-I	NONE	Energy Solutions
RVRS-11-015*	A	IP-I (SGBD)	Limited Quantity	NONE	Energy Solutions
RVRS-11-016*	A	IP-I (SGBD)	Limited Quantity	NONE	Energy Solutions

* Steam Generator blowdown resin goes to Energy Solutions for final evaluation and release.

4.0 Doses to Members of the Public Inside the Site Boundary

4.1 Regulatory Requirements

ODCM 7.2.2.3 states in part:

"The report shall also include assessment of the radiation doses from radioactive liquid and gaseous effluents to MEMBERS OF THE PUBLIC due to their activities inside the SITE BOUNDARY during the report period; this assessment must be performed in accordance with Chapter 6. All assumptions used in making these assessments (i.e., specific activity, exposure time, and location) shall be included in the report".

4.2 Demonstration of Compliance

The location of concern within the site boundary is the Visitors Center. The activities at the Visitor Center consist of occasional attendance at meetings and/or short visits for informational purposes.

There will be no radiation dose at this location due to radioactive liquid effluents. Delineated in Table 4-1 for this location are the values of the basic data assumed in the dose assessment due to radioactive gaseous effluents. Listed in this table are distance and direction from a point midway between the center of Unit 1 and the Unit 2 reactors, the dispersion and deposition factors for any releases from the plant vent (mixed mode) and from the turbine building (ground level), and the estimated maximum occupancy factor for an individual and the assumed age group of this individual.

The source term is listed in Tables 2-2A, and 2-2B for the mixed mode releases. Similarly, it is listed in tables 2-3A and 2-3B for the ground level releases.

The maximum doses in units of mrem to a MEMBER OF THE PUBLIC due to their activities inside the site boundary during the reporting period are presented in Table 4-1.

Table 4-1

Vogtle Electric Generating Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Doses to a Member of the Public Due to Activities Inside the Site Boundary

Unit: Site

Starting: 1-Jan-2011

Ending: 31-Dec-2011

Location Name: Visitor's Center Receptor
Distance (kilometers): 4.47E-01
Sector: SE
Occupancy Factor: 4.57E-04

Age Group: Child

Ground Level Release	Noble Gas	X/Q (sec/m3): 5.93E-06	
Ground Level Release	Particulate and Radioiodine	X/Q (sec/m3): 5.58E-06	D/Q (m-2): 2.28E-08
Mixed Mode Release	Noble Gas	X/Q (sec/m3): 7.12E-07	
Mixed Mode Release	Particulate and Radioiodine	X/Q (sec/m3): 6.74E-07	D/Q (m-2): 5.77E-09

	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year
Bone	mRem	1.56E-12	1.77E-11	0.00E+00	2.13E-12	2.14E-11
Liver	mRem	9.01E-08	5.56E-08	1.36E-07	2.00E-07	4.82E-07
Total Body	mRem	9.01E-08	5.56E-08	1.36E-07	2.00E-07	4.82E-07
Thyroid	mRem	9.01E-08	5.56E-08	1.36E-07	2.00E-07	4.82E-07
Kidney	mRem	9.01E-08	5.56E-08	1.36E-07	2.00E-07	4.82E-07
Lung	mRem	9.01E-08	5.56E-08	1.36E-07	2.00E-07	4.82E-07
GI-Lli	mRem	9.01E-08	5.56E-08	1.36E-07	2.00E-07	4.82E-07
NG Total Body	mRem	2.71E-07	1.22E-07	4.38E-07	1.68E-08	8.47E-07
Whole Body Dose	mRem	3.61E-07	1.78E-07	5.74E-07	2.17E-07	1.33E-06

Table 4-1

Vogtle Electric Generating Plant

RADIOACTIVE EFFLUENT RELEASE REPORT - 2011
Doses to a Member of the Public Due to Activities Inside the Site Boundary

Unit: Site

Starting: 1-Jan-2011

Ending: 31-Dec-2011

Location Name: Units 3&4 Construction
Distance (kilometers): 4.83E-01
Sector: SW
Occupancy Factor: 2.37E-01
Age Group: Adult

Ground Level Release	Noble Gas	X/Q (sec/m3): 1.81E-05	
Ground Level Release	Particulate and Radioiodine	X/Q (sec/m3): 6.93E-06	D/Q (m-2): 2.88E-08
Ground Level Release	Particulate and Radioiodine	X/Q (sec/m3): 6.96E-06	D/Q (m-2): 2.88E-08
Mixed Mode Release	Noble Gas	X/Q (sec/m3): 9.75E-07	
Mixed Mode Release	Particulate and Radioiodine	X/Q (sec/m3): 9.17E-07	D/Q (m-2): 7.14E-09

	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year
Bone	mRem	5.61E-10	1.14E-08	0.00E+00	7.63E-10	1.27E-08
Liver	mRem	7.86E-05	4.45E-05	1.09E-04	1.61E-04	3.92E-04
Total Body	mRem	7.86E-05	4.45E-05	1.09E-04	1.61E-04	3.92E-04
Thyroid	mRem	7.86E-05	4.45E-05	1.09E-04	1.61E-04	3.92E-04
Kidney	mRem	7.86E-05	4.45E-05	1.09E-04	1.61E-04	3.92E-04
Lung	mRem	7.86E-05	4.45E-05	1.09E-04	1.61E-04	3.92E-04
GI-Lli	mRem	7.86E-05	4.45E-05	1.09E-04	1.61E-04	3.92E-04
NG Total Body	mRem	2.03E-04	8.68E-05	3.12E-04	1.20E-05	6.14E-04
Whole Body Dose	mRem	2.82E-04	1.31E-04	4.21E-04	1.73E-04	1.01E-03

5.0 Total Dose from Uranium Fuel Cycle (40CFR190)

5.1 Regulatory Requirements

ODCM 5.1 states in part that 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 less than or equal to 25 mrem to the whole body or to any organ, except the thyroid, which shall be limited to less than or equal to 75 mrem.

5.2 Demonstration of Compliance

No dose limits stated in ODCM Sections 2.1.3, 3.1.3, and 3.1.4 were exceeded. Therefore, compliance with 40 CFR 190 dose limits was demonstrated in accordance with the requirements of ODCM Section 5.1.3.

6.0 Meteorological Data

ODCM 7.2.2.2 states in part:

The Radioactive Effluent Release Report shall include an annual summary of hourly meteorological data collected over the previous year. This annual summary may be either in the form of an hour-by-hour listing of wind speed, wind direction, atmospheric stability, and precipitation (if measured) on magnetic tape; or in the form of joint frequency distributions of wind speed, wind direction and atmospheric stability.

In lieu of submission with the Radioactive Effluent Release Report, the licensee has the option of retaining this summary of required meteorological data on site in a file that shall be provided to the NRC upon request.

7.0 Program Deviations

7.1 Inoperable Liquid or Gaseous Effluent Monitoring Instrumentation

7.1.1 Regulatory Requirement

ODCM 7.2.2.6 states in part that the report shall include deviations from the liquid and gaseous effluent monitoring instrumentation operability requirements included in Sections 2.1.1 and 3.1.1, respectively. The report shall include an explanation as to why the inoperability of liquid or gaseous effluent monitoring instrumentation was not corrected within the specified time requirement.

7.1.2 Description of Deviations

The inoperability of liquid and gaseous effluent monitors not corrected within the specified time for this reporting period is detailed below:

- a. 1RE-12839C,D,E,F
1RE-12839C was experiencing multiple power resets. The Analog to Digital Converter board was replaced. The monitor was out of service greater than 30 days due to extensive troubleshooting to identify the problem in addition to the lack parts availability. 1RE-12839C,D,E was returned to service on 2/21/12. 1RE-12839F was returned to service 3/11/12.
- b. 1FT-1085A
This flow transmitter was taken out of service due to failing calibration in November 2011. This monitor remains out of service because many resources and manpower were dedicated to troubleshooting and completing repair work on 1RE-006. Due to limited resources, the work needed for this monitor was not scheduled within 30 days of the monitor being out of service.
- c. 1FT-12442
The flow transmitter for 1RE-12442 failed calibration and as a result, it was taken out of service. The correct part that is needed is scheduled to be onsite by 4/20/12. It is scheduled to be returned to service on 5/5/12.
- d. AFT-0014
This flow transmitter is used to account for flow during a waste gas release. It was repaired during a waste gas system outage in June 2011. It is awaiting functional testing during an actual waste gas release to be declared as returned to service.

e. ARE-16980

A "No Process Flow" alarm started alarming approximately every five seconds. ARE 16980F was only showing 700 to 1500 SCFM. Flow is required to be 3000 to 18000. This monitor remains out of service because many resources and manpower were dedicated to troubleshooting and completing repair work on 1RE-006. Due to limited resources, the work needed for this monitor was not scheduled within 30 days of the monitor being out of service. The expected return to service timeframe is 07/2012.

f. 2RE-12444 D,E

The D channel failed calibration with a high background. The E channel was out of service administratively since the D channel triggers the E channel to operate. Many resources and manpower was dedicated to troubleshooting and restoring 1RE-006 to service when this monitor went out of service. Due to limited resources, the work needed for this monitor was not scheduled within 30 days of the monitor being out of service. This monitor was returned to service on 2/21/12.

g. 2FT-1085B

This flow transmitter was taken out of service due to failing calibration in November 2011. This monitor remains out of service because many resources and manpower were dedicated to troubleshooting and completing repair work on 1RE-006. Due to limited resources, the work needed for this monitor was not scheduled within 30 days of the monitor being out of service.

7.2 Tanks Exceeding Curie Content Limits

7.2.1 Regulatory Requirements

ODCM 7.2.2.6 states in part that the report shall include a description of the events leading to liquid holdup tanks or gas storage tanks exceeding the limits of Technical Specifications 5.5.12.

7.2.2 Description of Deviations

Limits for outdoor liquid hold-up tanks used for radioactive liquids were not exceeded during this reporting period.

Limits for the gas storage tanks were not exceeded during this reporting period.

8.0 Changes to the Vogtle Electric Generating Plant Offsite Dose Calculation Manual (ODCM)

8.1 Regulatory Requirements

ODCM 7.2.2.5 states in part that changes to the ODCM shall be submitted with the Radioactive Effluent Release Report. These changes may be due to changes in the radiological environmental monitoring program sampling locations as required by ODCM 4.1.1.2.3 or changes to dose calculation locations as required by ODCM 4.1.2.2.2. Land uses and dose calculation locations within five miles of VEGP must be determined by a land use census as required by ODCM 4.1.2.

8.2

Description of Changes

Changes were made to the Vogtle Electric Generating Plant ODCM for the period January 1, 2011 through December 31, 2011. Revision 28 was released in February 2011. A complete copy of the ODCM will be included with this report with changes identified by bars in the right hand margin of the document.

Revision 28, February 2011

Action Statements 47 and 51 were revised to include guidance for monitoring and estimating releases from the Plant Vent during short durations when the sample line heat tracing requires immediate maintenance action to prevent failure or to address an existing failed condition.

9.0 Major Changes to Liquid, Gaseous, or Solid Radwaste Treatment Systems

9.1 Regulatory Requirements

ODCM 7.2.2.7 states in part:

As required by Sections 2.1.5 and 3.1.6, licensee initiated MAJOR CHANGES TO RADIOACTIVE WASTE TREATMENT SYSTEMS (liquid and gaseous) shall be reported to the Nuclear Regulatory Commission in the Radioactive Effluent Release Report covering the period in which the change was reviewed and accepted for implementation.

Note 1: In lieu of inclusion in the Radioactive Effluents Release Report, this same information may be submitted as part of the annual FSAR update.

PCP 12.1 states in part:

Licensee major initiated changes to the solid radioactive waste treatment system shall be reported to the Nuclear Regulatory Commission in the Radioactive Effluent Release Report for the period in which the change was implemented.

9.2 Description of Major Changes

Gaseous Radwaste System

There were no major changes to the gaseous radwaste systems in the 2011 assessment period.

Liquid Radwaste System

Major changes to the liquid radwaste facilities are those that contribute to significant changes in release; i.e., either decreases or increases in release volume or activity/dose.

There were no major changes to the liquid radwaste systems occurred during the 2011 assessment period.

Solid Radwaste System

There were no major changes to the solid radwaste systems in the 2011 assessment period.

Appendix A

Vogtle Electric Generating Plant

CARBON-14

Carbon-14 (C-14) is a naturally-occurring radionuclide with a 5730 year half life. Nuclear weapons testing in the 1950s and 1960s significantly increased the amount of C-14 in the atmosphere. Nuclear power plants also produce C-14, but the amount is infinitesimal compared to what has been distributed in the environment due to weapons testing and what is produced by natural cosmic ray interactions.

As nuclear plants have improved gaseous waste processing systems and improved fuel performance, the percentages of “principal radionuclides” in gaseous effluents have changed, and C-14 has become a larger percentage. “Principal radionuclides” are determined based on public dose contribution or the amount of activity discharged compared to other radionuclides of the same effluent type. In Revision 2 (June 2009) of Regulatory Guide 1.21 (RG 1.21), “Measuring, Evaluating, and Reporting Radioactive Material in Liquid and Gaseous Effluents and Solid Waste,” the NRC recommended re-evaluating “principal radionuclides” and reporting C-14 as appropriate. In 2010 Radioactive Effluent Release Reports, virtually all U. S. nuclear power plants started reporting C-14 amounts released and resulting doses to the maximally exposed member of the public.

Because C-14 is considered a hard-to-detect radionuclide which must be chemically separated from the effluent stream before it can be measured, RG 1.21 provides the option of calculating the C-14 source term based on power generation. The Electric Power Research Institute (EPRI) developed an accepted methodology for calculating C-14, and published the results in Technical Report 1021106 (December 2010), “Estimation of Carbon-14 in Nuclear Power Plant Gaseous Effluents.” Evaluation of C-14 in radioactive liquid effluents is not required because the quantity and dose contribution has been determined to be insignificant.

At Plant Vogtle, the annual quantity of C-14 released in gaseous effluents was estimated to be 12.08 Curies (per unit). Approximately 30% of the C-14 released is in the form of $^{14}\text{CO}_2$ and is incorporated into plants through photosynthesis. Ingestion dose results from this pathway. The remaining 70% is estimated to be organic. Both the organic and inorganic forms of C-14 contribute to inhalation dose. A child is the maximally exposed individual, and bone dose is the highest organ dose. Using the dose calculation methodology from the Vogtle ODCM, the resulting bone dose to a child located at the controlling receptor location would be 8.46E-02 mrem in a year which is 0.56% of the regulatory limit of 15 mrem per year (per unit) to any organ due to gaseous effluents. The resulting total body dose to a child located at the controlling receptor location would be 1.69E-02 mrem in a year which is 0.11% of the regulatory limit of 15 mrem per year (per unit) total body dose due to gaseous effluents.

**Attachment 1
Revised Previous Reports**

2010 Annual Radwaste Effluent Report Table 4-1 for Units 3&4 Construction

**Table 4-1
Vogtle Electric Generating Plant**

**RADIOACTIVE EFFLUENT RELEASE REPORT - 2010
Doses to a Member of the Public Due to Activities Inside the Site Boundary**

**Unit: Site
Starting: 1-Jan-2010 Ending: 31-Dec-2010**

Location Name: Units 3&4 Construction
Distance (kilometers): 4.83E-01
Sector: SW
Occupancy Factor: 2.37E-01
Age Group: Adult

Ground Level Release	Noble Gas	X/Q (sec/m3): 1.81E-05	
Ground Level Release	Particulate and Radioiodine	X/Q (sec/m3): 6.93E-06	D/Q (m-2): 2.88E-08
Ground Level Release	Particulate and Radioiodine	X/Q (sec/m3): 6.96E-06	D/Q (m-2): 2.88E-08
Mixed Mode Release	Noble Gas	X/Q (sec/m3): 9.75E-07	
Mixed Mode Release	Particulate and Radioiodine	X/Q (sec/m3): 9.17E-07	D/Q (m-2): 7.14E-09

	Units	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	Year
Bone	mRem	1.34E-06	1.17E-07	4.61E-08	2.75E-10	1.50E-06
Liver	mRem	1.13E-04	7.84E-05	9.36E-05	4.26E-05	3.28E-04
Total Body	mRem	1.13E-04	7.84E-05	9.36E-05	4.26E-05	3.28E-04
Thyroid	mRem	2.57E-04	7.84E-05	9.36E-05	4.26E-05	4.71E-04
Kidney	mRem	1.14E-04	7.84E-05	9.36E-05	4.26E-05	3.28E-04
Lung	mRem	1.13E-04	7.84E-05	9.36E-05	4.26E-05	3.28E-04
GI-Li	mRem	1.13E-04	7.84E-05	9.36E-05	4.26E-05	3.28E-04
NG Total Body	mRem	9.22E-04	1.05E-04	1.04E-04	8.33E-05	1.21E-03
Whole Body Dose	mRem	1.03E-03	1.83E-04	1.97E-04	1.26E-04	1.54E-03