RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2004

Brunswick Steam Electric Plant
Radioactive Effluent Release Report
January 1, through December 31, 2004

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Attachment 1
Effluent and Waste Disposal Report Supplemental Information

Facility: Brunswick Steam Electric Plant
Licensee: Carolina Power & Light Company, now doing business as Progress Energy Carolinas, Inc.

1. Regulatory Limits
   A. Fission and activation gases (Off-Site Dose Calculation Manual Specification (ODCMS) 7.3.8)
      (1) Calendar Quarter[1]
         (a) ≤ 10 mrad gamma
         (b) ≤ 20 mrad beta
      (2) Calendar Year
         (a) ≤ 20 mrad gamma
         (b) ≤ 40 mrad beta
   B. Iodine-131, iodine-133, tritium, and particulates with half-lives greater than eight days (ODCMS 7.3.9)
      (1) Calendar Quarter[1]
         (a) ≤ 15 mrem to any organ
      (2) Calendar Year
         (a) ≤ 30 mrem to any organ
      (3) Calendar Quarter for Burning Contaminated Oil[1]
         (a) < 0.1 % of limits for calendar quarter of (1)
         (b) 436 μCi (ODCM Appendix H)
      (4) Calendar Year for Burning Contaminated Oil
         (a) < 0.1% of limits for calendar year
         (b) 872 μCi (ODCM Appendix H)
   C. Liquid Effluents (ODCMS 7.3.4)
      (1) Calendar Quarter[2]
         (a) ≤ 3 mrem to total body
         (b) ≤ 10 mrem to any organ
      (2) Calendar Year
         (a) ≤ 6 mrem to total body
         (b) ≤ 10 mrem to any organ

NOTE: Dose calculations are determined in accordance with the ODCM
[1] Used for percent of ODCMS limit determination in Attachment 2, Table 1A
[2] Used for percent of ODCMS limit determination in Attachment 2, Table 2A

2. Maximum permissible concentration and dose rates which determine maximum instantaneous release rates.

   A. Fission and activation gases (ODCMS 7.3.7.a)

      (1) ≤ 500 mrem/year to total body
      (2) ≤ 3000 mrem/year to the skin

   B. Iodine-131, iodine-133, tritium, and particulates with half-lives greater than eight days (ODCMS 7.3.7.b)

      (1) ≤ 1500 mrem/year to any organ

   C. Liquid effluents (ODCMS 7.3.3)

   The concentration of radioactive material released in liquid effluents to unrestricted areas after dilution in the discharge canal shall be limited to 10 times the concentrations specified in Appendix B, Table 2, Column 2 to 10 CFR 20.1001 - 20.2401 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to the value given in the ODCM specifications.

      (1) Tritium: limit = 1.00E-03 μCi/ml [3]
      (2) Dissolved and entrained noble gases: limit = 2.00E-04 μCi/ml [3]

3. Measurements and Approximations of Total Radioactivity

   A. Fission and activation gases

      (1) Analyses for specific radionuclides in representative grab samples by gamma spectroscopy.

   B. Iodines

      (1) Analysis for specific radionuclides collected on charcoal cartridges by gamma spectroscopy.

   C. Particulates

      (1) Analysis for specific radionuclides collected on filter papers by gamma spectroscopy.

   D. Particulates for Burning Oil

      (1) Analysis for specific radionuclides by grab samples of each batch of oil to be burned.

   E. Liquid Effluents

      (1) Analysis for specific radionuclides of individual releases by gamma spectroscopy.

[3] Used as applicable limits for Attachment 2, Table 2A

Nuclear counting statistics are reported utilizing 1-sigma error. Total error where reported represents a best effort to approximate the total of all individual and sampling errors.

4. Batch Releases

   A. Liquid

(1) Number of batch releases:	1.50E+01
(2) Total time period for batch releases:	7.32E+02 Minutes
(3) Maximum time period for a batch release:	2.02E+02 Minutes
(4) Average time period for a batch release:	4.88E+01 Minutes
(5) Minimum time period for a batch release:	5.00E+00 Minutes
(6) Average stream flow during periods of release of effluent into a flowing stream:	8.09E+05 Gallons per Minute

   B. Gaseous

(1) Number of batch releases:	0.00E+00
(2) Total time period for batch releases:	0.00E+00 Minutes
(3) Maximum time period for a batch release:	0.00E+00 Minutes
(4) Average time period for a batch release:	0.00E+00 Minutes
(5) Minimum time period for a batch release:	0.00E+00 Minutes

5. Abnormal Releases[4]

   A. Liquid

(1) Number of releases:	0.00E+00
(2) Total activity released:	0.00E+00 Curies

   B. Gaseous

(1) Number of releases:	0.00E+00
(2) Total activity released:	0.00E+00 Curies

[4] There were no abnormal releases that exceeded 10 CFR 20 or 10 CFR 50 limits. See page 5 for a discussion of release events that occurred.

Attachment 1
Effluent and Waste Disposal Report Supplemental Information

Discussion of tritium in the Storm Drain Stabilization Pond

Approximately 3.47E+07 gallons containing 5.16E+01 curies of tritium were released from the Storm Drain Stabilization Pond (SDSP) to the intake canal during this reporting period. This resulted in an estimated maximum dose to the individual of 6.81E-05 mrem. The SDSP is a permitted release point.

Discussion of releases from the Storm Drain Collector Basin

Due to heavy rains from Hurricane Charley, the Storm Drain Collector Basin (SDCB) was released directly to the discharge canal on one occasion in 2004. The SDCB is a permitted release point during periods of inclement weather to protect plant personnel and equipment. On August 14th, the SDCB overboard valves were open for 8.2 hours and approximately 1.47E+05 gallons containing 1.29E-02 curies of tritium were released. This resulted in an estimated maximum dose to the individual of 7.51E-09 mrem.

Summary

The SDSP and SDCB curie totals are included in the quarterly summaries for FISSION AND ACTIVIATION PRODUCTS and TRITIUM on Attachment 2, Table 2A when applicable.

The quantity of rainwater released from the SDSP and/or the SDCB is not included in the average diluted concentration determination or VOLUME OF WASTE RELEASED on Attachment 2, Table 2A.

Attachment 2
Effluent and Waste Disposal Data

Attachment 2
Effluent and Waste Disposal Data

Table 1A: Gaseous Effluents - Summation of all Releases

A. FISSION AND ACTIVATION GASES

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Estimated Total Percent Error
1. Total release	Ci	2.96E+01	1.77E+01	3.33E+01	3.23E+01	4.50E+01
2. Average release rate for period	µCi/sec	3.76E+00	2.25E+00	4.19E+00	4.06E+00	NA
3. Percent of ODCM limit	%	5.63E-03	2.07E-03	5.63E-03	6.45E-03	NA

B. IODINES

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Estimated Total Percent Error
1. Total Iodine - 131 release	Ci	2.79E-03	2.62E-03	2.79E-03	2.23E-03	3.50E+01
2. Average release rate for period	µCi/sec	3.55E-04	3.34E-04	3.51E-04	2.80E-04	NA

C. PARTICULATES

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Estimated Total Percent Error
1. Total release	Ci	6.69E-04	1.68E-04	1.86E-04	1.52E-04	3.50E+01
2. Average release rate for period	µCi/sec	8.51E-05	2.14E-05	2.35E-05	1.91E-05	NA
3. Gross Alpha	Ci	2.06E-07	0.00E+00	0.00E+00	0.00E+00	3.50E+01

D. TRITIUM

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Estimated Total Percent Error
1. Total release	Ci	4.29E+01	2.79E+01	4.51E+01	4.54E+01	3.00E+01
2. Average release rate for period	µCi/sec	5.46E+00	3.55E+00	5.68E+00	5.71E+00	NA

Attachment 2
Effluent and Waste Disposal Data

Table 1A: Gaseous Effluents - Summation of all Releases

E. IODINE-131, IODINE-133, TRITIUM AND PARTICULATES

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
1. Total release	Ci	4.29E+01	2.79E+01	4.51E+01	4.54E+01
2. Average release rate for period	µCi/sec	5.46E+00	3.55E+00	5.68E+00	5.72E+00
3. Percent of ODCM limit	%	1.29E-01	8.93E-02	9.73E-02	8.07E-02

F. PARTICULATES VIA BURINING CONTAMINATED OIL

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
1. Total release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average release rate for period	µCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Percent of ODCM limit	%	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Attachment 2
Effluent and Waste Disposal Data

Table 1B: Gaseous Effluents - Elevated Releases
Continuous Release

Nuclides Released

1. FISSION GASES

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
krypton-85m	Ci	3.98E-01	5.99E-01	1.92E+00	1.45E+00
krypton-87	Ci	≤LLD	≤LLD	8.29E-02	3.34E-01
krypton-88	Ci	≤LLD	≤LLD	1.46E-01	2.76E-01
xenon-133	Ci	1.08E+01	1.33E+01	1.69E+01	1.13E+01
xenon-133m	Ci	≤LLD	7.76E-02	≤LLD	≤LLD
xenon-135	Ci	1.44E+00	1.36E+00	2.52E+00	4.63E+00
xenon-135m	Ci	1.63E+00	1.07E+00	1.41E+00	6.11E+00
xenon-137	Ci	≤LLD	≤LLD	1.10E+00	≤LLD
xenon-138	Ci	7.02E+00	4.51E-01	4.79E+00	7.26E+00
total for period	Ci	2.13E+01	1.69E+01	2.88E+01	3.13E+01

2. GASEOUS IODINES

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
iodine-131	Ci	1.73E-03	2.51E-03	2.66E-03	2.15E-03
iodine-132	Ci	7.29E-03	9.30E-03	1.62E-02	2.15E-02
iodine-133	Ci	7.46E-03	8.55E-03	1.30E-02	1.69E-02
iodine-134	Ci	7.76E-03	1.13E-02	2.09E-02	4.07E-02
iodine-135	Ci	1.10E-02	1.36E-02	2.22E-02	2.90E-02
total for period	Ci	3.52E-02	4.53E-02	7.51E-02	1.10E-01

3. PARTICULATES

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
chromium-51	Ci	9.90E-06	1.95E-05	≤LLD	≤LLD
manganese-54	Ci	6.08E-06	≤LLD	≤LLD	≤LLD
cobalt-58	Ci	7.45E-06	1.06E-05	≤LLD	≤LLD
cobalt-60	Ci	2.83E-05	1.14E-05	1.60E-06	≤LLD
zinc-65	Ci	5.14E-06	≤LLD	≤LLD	≤LLD
strontium-89	Ci	2.78E-05	1.83E-05	2.60E-05	3.11E-05
strontium-90	Ci	4.24E-07	3.61E-07	3.20E-07	4.06E-07
cesium-134	Ci	2.73E-06	≤LLD	≤LLD	≤LLD
cesium-137	Ci	5.27E-06	≤LLD	≤LLD	9.66E-07
barium-140	Ci	7.91E-05	2.28E-05	5.45E-05	5.37E-05
lanthanum-140	Ci	1.47E-04	1.79E-05	8.11E-05	4.17E-05
total for period	Ci	3.19E-04	1.01E-04	1.63E-04	1.28E-04

4. TRITIUM

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
hydrogen-3	Ci	5.10E+00	1.22E+01	2.27E+01	1.81E+01

Attachment 2
Effluent and Waste Disposal Data

Table 1C: Gaseous Effluents - Ground Level Releases
Continuous Release

Nuclides Released

1. FISSION GASES

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
xenon-133	Ci	7.07E+00	≤ LLD	3.51E+00	≤ LLD
xenon-135	Ci	1.18E+00	8.04E-01	9.22E-01	9.68E-01
total for period	Ci	8.25E+00	8.04E-01	4.43E+00	9.68E-01

2. GASEOUS IODINES

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
iodine-131	Ci	1.07E-03	1.11E-04	1.38E-04	8.07E-05
iodine-132	Ci	2.36E-06	4.15E-07	≤ LLD	1.13E-06
iodine-133	Ci	8.85E-04	4.58E-04	3.97E-04	6.31E-04
iodine-134	Ci	≤ LLD	≤ LLD	≤ LLD	≤ LLD
iodine-135	Ci	≤ LLD	≤ LLD	≤ LLD	≤LLD
total for period	Ci	1.96E-03	5.70E-04	5.35E-04	7.13E-04

3. PARTICULATES

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
chromium-51	Ci	2.08E-04	2.44E-05	≤ LLD	≤ LLD
manganese-54	Ci	2.58E-06	1.86E-06	7.56E-07	≤ LLD
cobalt-58	Ci	1.96E-05	5.79E-06	1.96E-06	1.35E-05
cobalt-60	Ci	1.11E-04	2.77E-05	1.13E-05	1.01E-05
zinc-65	Ci	≤ LLD	≤ LLD	≤ LLD	≤ LLD
strontium-89	Ci	6.38E-06	1.19E-06	≤ LLD	≤ LLD
strontium-90	Ci	≤ LLD	≤ LLD	≤ LLD	2.77E-07
cesium-134	Ci	≤ LLD	1.85E-06	3.67E-06	≤ LLD
cesium-137	Ci	2.38E-06	4.54E-06	5.24E-06	≤ LLD
barium-140	Ci	≤ LLD	≤ LLD	≤ LLD	≤ LLD
lanthanum-140		≤ LLD	≤ LLD	≤ LLD	≤ LLD
total for period	Ci	3.50E-04	6.73E-05	2.30E-05	2.39E-05

4. TRITIUM

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
hydrogen-3	Ci	3.78E+01	1.57E+01	2.24E+01	2.73E+01

Attachment 2
Effluent and Waste Disposal Data

Table 1D: Gaseous Effluents - Ground Level Releases For Burning Contaminated Oil

Nuclides Released

1. PARTICULATES

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
No releases made	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Attachment 2
Effluent and Waste Disposal Data

Table 2A: Liquid Effluents - Summation of all Releases

A. FISSION AND ACTIVATION PRODUCTS (NOTE 1)

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Estimated Total Percent Error
1. Total release (excluding tritium, gases, and alpha)	Ci	3.77E-04	8.14E-04	6.77E-05	0.00E+00	4.00E+01
2. Average diluted concentration (NOTE 2)	µCi/ml	3.05E-10	8.99E-10	6.69E-10	0.00E+00	NA
3. Percent of applicable limit	%	9.39E-04	1.05E-03	8.05E-05	0.00E+00	NA

B. TRITIUM (NOTE 1)

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Estimated Total Percent Error
1. Total release	Ci	1.29E+01	1.20E+01	2.88E+01	0.00E+00	4.50E+01
2. Average diluted concentration (NOTE 2)	µCi/ml	1.05E-05	1.33E-05	2.85E-04	0.00E+00	NA
3. Percent of applicable limit	%	1.05E+00	1.33E+00	2.85E+01	0.00E+00	NA

C. DISSOLVED AND ENTRAINED GASES (NOTE 1)

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Estimated Total Percent Error
1. Total release	Ci	9.20E-06	4.56E-05	0.00E+00	0.00E+00	4.00E+01
2. Average diluted concentration (NOTE 2)	µCi/ml	7.45E-12	5.03E-11	0.00E+00	0.00E+00	NA
3. Percent of applicable limit	%	3.73E-06	2.52E-05	0.00E+00	0.00E+00	NA

D. GROSS ALPHA RADIOACTIVITY

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Estimated Total Percent Error
1. Total release	Ci	≤ LLD	≤ LLD	≤ LLD	≤ LLD	4.00E+01

NOTE 1: Includes radionuclides released via abnormal and/or non-routine releases
NOTE 2: Does not include rainwater (i.e. Storm Drain Collector Basin and/or Storm Drain Stabilization Pond)

Attachment 2
Effluent and Waste Disposal Data

Table 2A: Liquid Effluents - Summation of all Releases

E. VOLUME OF WASTE RELEASED (NOTE 2)

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Estimated Total Percent Error
1. Total volume	liters	1.76E+05	9.48E+04	3.54E+03	0.00E+00	1.50E+01

F. VOLUME OF DILUTION WATER

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Estimated Total Percent Error
1. Total volume (used during release for average diluted concentration)	liters	1.23E+09	9.05E+08	1.01E+08	0.00E+00	1.50E+01

G. VOLUME OF COOLING WATER DISCHARGED FROM PLANT

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Estimated Total Percent Error
1. Total volume	liters	3.58E+11	4.81E+11	5.18E+11	4.56E+11	1.50E+01

NOTE 1: Includes radionuclides released via abnormal and/or non-routine releases
NOTE 2: Does not include rainwater (i.e. Storm Drain Collection Basin and/or Storm Drain Stabilization Pond)

Attachment 2
Effluent and Waste Disposal Data

Table 2B: Liquid Effluents - Batch Mode

Nuclides Released

1. FISSION AND ACTIVATION PRODUCTS

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
magnesium-54	Ci	2.61E-06	1.39E-04	3.89E-06	≤ LLD
iron-55	Ci	6.08E-05	6.07E-05	1.40E-05	≤ LLD
cobalt-60	Ci	2.96E-04	4.55E-04	4.42E-05	≤ LLD
strontium-89	Ci	≤ LLD	≤ LLD	≤ LLD	≤ LLD
strontium-90	Ci	≤ LLD	≤ LLD	≤ LLD	≤ LLD
iodine-131	Ci	≤ LLD	≤ LLD	≤ LLD	≤ LLD
iodine-133	Ci	≤ LLD	≤ LLD	≤ LLD	≤ LLD
cesium-134	Ci	≤ LLD	2.55E-05	1.13E-06	≤ LLD
cesium-137	Ci	1.38E-05	3.20E-05	4.48E-06	≤ LLD
total for period	Ci	3.77E-04	8.14E-04	6.77E-05	≤ LLD

2. DISSOLVED AND ENTRAINED GASES

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
xenon-133	Ci	≤ LLD	1.14E-05	≤ LLD	≤ LLD
xenon-135	Ci	9.20E-06	3.42E-05	≤ LLD	≤ LLD
total for period	Ci	9.20E-06	4.56E-05	≤ LLD	≤ LLD

Attachment 2
Effluent and Waste Disposal Data

Lower Limits of Detection

Units: µCi/ml

1. LIQUID RELEASES

Alpha	1.22E-08
H-3	2.15E-06
Cr-51	1.57E-07
Mn-54	2.02E-08
Fe-55	6.05E-08
Co-58	2.14E-08
Fe-59	3.57E-08
Co-60	3.58E-08
Zn-65	3.91E-08
Sr-89	3.03E-08
Sr-90	2.27E-08
Mo-99	1.72E-07
I-131	1.50E-08
I-133	2.30E-08
I-135	6.65E-08
Cs-134	2.31E-08
Cs-137	1.90E-08
Ba-140	5.77E-08
La-140	3.55E-08
Ce-141	2.47E-08
Ce-144	1.02E-07
Kr-87	3.88E-08
Kr-88	5.53E-08
Xe-133	4.27E-08
Xe-133m	1.05E-07
Xe-135	1.80E-08
Xe-135m	8.39E-08
Xe-138	2.00E-07

2. GASEOUS RELEASES

Kr-85m	5.18E-09
Kr-87	9.31E-09
Kr-88	2.09E-08
Xe-133	9.79E-09
Xe-133m	5.24E-08
Xe-135	5.05E-09
Xe-135m	5.62E-08
Xe-137	8.42E-07
Xe-138	1.59E-07

3. IODINES AND PARTICULATES

Alpha	6.43E-16
H-3	2.25E-11
Cr-51	6.37E-13
Mn-54	3.76E-14
Co-58	3.70E-14
Fe-59	9.23E-14
Co-60	1.01E-13
Zn-65	1.65E-13
Sr-89	2.76E-15
Sr-90	1.03E-15
Mo-99	4.06E-13
I-131	5.86E-14
Cs-134	8.44E-14
Cs-137	6.22E-14
Ba-140	3.14E-13
La-140	1.31E-13
Ce-141	8.28E-14
Ce-144	3.17E-13

NOTES:

1. The above values represent typical "a priori" LLDs for isotopes where values of "≤ LLD" are indicated in Tables 1A, 1B, 1C, 2A, and 2B. Also included are isotopes specified in ODCMS 7.3.3 and 7.3.7.

2. Where activity for any nuclide is reported as "≤ LLD," that nuclide is considered not present and the LLD activity listed is not considered in the summary data.

Attachment 2
Effluent and Waste Disposal Data

Table 3A: Solid Waste and Irradiated Fuel Shipments – Waste Class A

Waste Class A

1. Total volume shipped (cubic meters) 8.66E+02

   Total curie quantity (estimated) 4.02E+01

2. Type of Waste

		Unit	Period	Estimated Total %Error
a.	Spent resins, filter, sludges	meter^3	3.39E+01	
		Curies	3.69E+01	1.00E+01
b.	Dry active waste, compacted/non-compacted	meter^3	8.33E+02	
		Curies	3.26E+00	1.00E+01
c.	Irradiated components	meters^3	0.00E+00	
		Curies	0.00E+00	N/A
d.	Others (describe)	meters^3	0.00E+00	
		Curies	0.00E+00	N/A

3. Estimate of major radionuclides composition

   a. Mn-54 3.50E+00 %
      Fe-55 7.70E+00 %
      Co-60 6.84E+01 %
      Ni-63 8.70E+00 %
      Zn-65 1.40E+00 %
      Cs-137 7.70E+00 %

   b. Mn-54 5.60E+00 %
      Fe-55 5.57E+01 %
      Co-60 3.57E+01 %
      Ni-63 1.30E+00 %

   c. N/A

   d. N/A

NOTE:

Solid Radioactive Waste listed above was shipped for processing to various waste processing services or directly shipped to a licensed disposal facility.

Attachment 2
Effluent and Waste Disposal Data

Table 3A: Solid Waste and Irradiated Fuel Shipments – Waste Class A

4. Cross reference table, waste stream, form, and container type

Stream	Form	Container Type Type A/Type B	No. of shipments
a. Resin/Filters	Dewatered	Type A or STP	7.00E+00
b. Dry active waste	Compacted/ Non-compacted	Type A or STP	1.90E+01
c. Irradiated components		N/A	N/A
d. Others (describe)		N/A	N/A

5. Shipment Disposition

a. Solid Waste

Number of Shipments	Mode of Transportation	Destination
7.00E+00	Highway	Oak Ridge, TN
3.00E+00	Highway	Erwin, TN
1.00E+00	Highway	Richland, WA
1.50E+01	Rail	Envirocare of Utah

b. Irradiated Fuel

Number of Shipments	Mode of Transportation	Destination
0	N/A	N/A

Attachment 2
Effluent and Waste Disposal Data

Table 3B: Solid Waste and Irradiated Fuel Shipments – Waste Class B

Waste Class B

1. Total volume shipped (cubic meters) 1.30E+01

   Total curie quantity (estimated) 2.97E+02

2. Type of Waste

		Unit	Period	Estimated Total %Error
a.	Spent resins, filter, sludges	meter^3	1.30E+01	
		Curies	2.97E+02	1.00E+01
b.	Dry active waste, compacted/non-compacted	meter^3	0.00E+00	
		Curies	0.00E+00	N/A
c.	Irradiated components	meters^3	0.00E+00	
		Curies	0.00E+00	N/A
d.	Others (describe)	meters^3	0.00E+00	
		Curies	0.00E+00	N/A

3. Estimate of major radionuclides composition

   a. H-3 1.40E+00 %
      Mn-54 4.00E+00 %
      Fe-55 2.07E+01 %
      Co-58 2.70E+00 %
      Co-60 5.76E+01 %
      Ni-63 4.80E+00 %
      Zn-65 3.80E+00 %
      Cs-137 3.70E+00 %

   b. N/A

   c. N/A

   d. N/A

NOTE:

Solid Radioactive Waste was shipped either directly for disposal or to a waste processor for processing and then transported for disposal by the processor.

Attachment 2
Effluent and Waste Disposal Data

Table 3B: Solid Waste and Irradiated Fuel Shipments – Waste Class B

4. Cross reference table, waste stream, form, and container type

Stream	Form	Container Type Type A/Type B	No. of shipments
a. Resin/Filters	Dewatered	Type B	3.00E+00
b. Dry active waste	Compacted/ Non-compacted	N/A	N/A
c. Irradiated components		N/A	N/A
d. Others (describe)		N/A	N/A

5. Shipment Disposition

a. Solid Waste

Number of Shipments	Mode of Transportation	Destination
3.00E+00	Highway	Erwin, TN

b. Irradiated Fuel

Number of Shipments	Mode of Transportation	Destination
0	N/A	N/A

Attachment 2
Effluent and Waste Disposal Data

Table 3C: Solid Waste and Irradiated Fuel Shipments – Waste Class C

Waste Class C

1. Total volume shipped (cubic meters) 3.30E+00

   Total curie quantity (estimated) 3.19E+04

2. Type of Waste

	Unit	Period	Estimated Total %Error
a. Spent resins, filter, sludges	meter^3	0.00E+00	
	Curies	0.00E+00	N/A
b. Dry active waste, compacted/non-compacted	meter^3	0.00E+00	
	Curies	0.00E+00	N/A
c. Irradiated components	meters^3	3.30E+00	
	Curies	3.19E+04	1.00E+01
d. Others (describe)	meters^3	0.00E+00	
	Curies	0.00E+00	N/A

3. Estimate of major radionuclides composition

   a. N/A

   b. N/A

   c.

Fe-55	2.14E+01 %
Co-60	7.53E+01 %
Ni-63	1.50E+00 %
Ta-182	1.00E+00 %

   d. N/A

NOTE:

Solid Radioactive Waste was shipped directly for disposal.

Table 3C: Solid Waste and Irradiated Fuel Shipments – Waste Class C

4. Cross reference table, waste stream, form, and container type

Stream	Form	Container Type Type A/Type B	No. of shipments
a. Resin/Filters	Dewatered	N/A	N/A
b. Dry active waste	Compacted/ Non-compacted	N/A	N/A
c. Irradiated components		Type B	2.00E+00
d. Others (describe)		N/A	N/A

5. Shipment Disposition

a. Solid Waste

Number of Shipments	Mode of Transportation	Destination
2.00E+00	Highway	Barnwell, SC

b. Irradiated Fuel

Number of Shipments	Mode of Transportation	Destination
1.30E+01	Rail	New Hill, NC

Attachment 2
Effluent and Waste Disposal Data

Combustion of Waste Oil

No contaminated waste oil was incinerated during this report period.

Enclosure 1: Milk and Vegetable Sample Location

Enclosure 2: Land Use Census

Attachment 3
Environmental Monitoring Program

Enclosure 1: Milk and Vegetable Sample Location

No milk animals are located in the area evaluated by the last Land Use Census, therefore, no milk sampling locations were available during this time period.

A vegetation sample location was added in the South sector from the plant due to recent population growth. Although not required per ODCM 7.3.16, Land Use Census, the sample point was added as an enhancement to the plant's environmental sampling program. The location (reference ODCM Table 4.0-1, Sample ID No. 804) is being established at the site boundary (0.7 miles). The nearest resident for the South sector remains at 1.1 miles from the plant center.

Attachment 3
Environmental Monitoring Program

Enclosure 2: Land Use Census

The 2004 Land Use Census did not identify any locations that are reportable in the Radioactive Effluent Release Report for 2004.

The following is a summary of the nearest resident and garden locations identified within five miles of the plant for each of the 16 meteorological sectors. No milk animals were found within five miles of the plant.

Direction	Residence	Garden
NNE	0.8 miles	None
NE	None	None
ENE	None	None
E	None	None
ESE	1.5 miles	None
SE	0.9 miles	None
SSE	1.0 miles	None
S	1.1 miles	None
SSW	1.2 miles	1.5 miles
SW	1.0 miles	2.9 miles
WSW	1.2 miles	1.2 miles
W	0.8 miles	1.1 miles
WNW	0.8 miles	1.0 miles
NW	0.9 miles	4.8 miles
NNW	0.8 miles	4.4 miles
N	0.7 miles	None

Attachment 4
Effluent Instrumentation

Enclosure 1: Radioactive Liquid Effluent Monitoring Instrumentation

Enclosure 2: Radioactive Gaseous Effluent Monitoring Instrumentation

Enclosure 3: Liquid Hold-Up Tank

Attachment 4
Effluent Instrumentation

Enclosure 1: Radioactive Liquid Effluent Monitoring Instrumentation

No Radioactive Liquid Effluent Monitoring Instruments were inoperable for a period of greater than 30 days.

Enclosure 2: Radioactive Gaseous Effluent Monitoring Instrumentation

No Radioactive Gaseous Effluent Monitoring Instruments were inoperable for a period of greater than 30 days.

Attachment 4
Effluent Instrumentation

Enclosure 3: Liquid Hold-Up Tank

No Liquid Hold-Up Tank exceeded the 10-Curie limit of ODCMS 7.3.6 during this reporting period.

Attachment 5

Major Modification To The Radioactive Waste Treatment Systems

In accordance with ODCMS 7.5.1, major changes to the liquid, gaseous, and solid Radioactive Waste Treatment Systems shall be reported to the NRC as part of the Radioactive Effluent Release Report or as part of the Updated Final Safety Analysis Report (UFSAR) update. Any major modifications to the radioactive waste treatment systems will be submitted with the UFSAR in accordance with 10 CFR 50.71(e).

Attachment 6

Meteorological Data

Per Technical Specification 5.6.3 and ODCMS 7.4.2, the annual summary of meteorological data collected over the calendar year has been retained in a file and is available for NRC review upon request.

Attachment 7

Annual Dose Assessment

Summary

Liquid Effluents [1]

Critical Age: Adult
Controlling location for liquid releases: SW sector at 0.1 miles

	(mrem)	Limit: (mrem)
GI-LLI	2.07E-04	2.00E+01
Bone	4.04E-05	2.00E+01
Liver	4.91E-05	2.00E+01
Lung	1.84E-05	2.00E+01
Total Body	3.47E-05	6.00E+00
Thyroid	3.52E-06	2.00E+01
Kidney	6.96E-06	2.00E+01

Gaseous Effluents [1]

Noble Gas: Critical Age: Infant
Controlling location: NE sector at 0.7 mile

	(mrad)	Limit: (mrad)
Gamma	1.98E-03	2.00E+01
Beta	1.43E-03	4.00E+01

Iodine, Particulates, and Tritium: Critical Age: Infant
Controlling location: NE sector at 4.75 mile
Assuming a cow milk pathway

	(mrem)	Limit: (mrem)
Thyroid	5.96E-02	3.00E+01
Kidney	1.56E-03	3.00E+01
Liver	1.54E-03	3.00E+01
Total Body	1.42E-03	3.00E+01
Skin	1.35E-03	3.00E+01
GI_LLI	1.35E-03	3.00E+01
Lung	1.35E-03	3.00E+01
Bone	2.13E-04	3.00E+01

[1] Reference – dose determined using site specific ODCM software

The PCP was not revised during the report period. ODCM Revision 28 was effective on May 4, 2004. An analysis of the four major changes is as follows:

ODCM Analysis:

1. **Updated the list of effective pages for Revision 28.**

The list of effective pages and revision bars denotes the method for tracking ODCM changes and to meet the intent for administrative controls in Technical Specifications 5.5.1.

2. **Updated Table 3.2-2 to reflect the 2003 Land Use and Garden Census.**

The Land Use and Garden Census information is included in the Off-Site Dose Calculation Manual (ODCM) to aid in evaluating worst sector receptor environmental sampling requirements. The census is required to be conducted annually to determine the location of the nearest resident, garden, and milk or beef animal in each of the 16 meteorological sectors surrounding the plant. The resident portion of the census conducted in June of 2003 identified no changes in the distance of the nearest residents for all 16 sectors. The garden portion of the census identified changes in the distances of the nearest garden in 4 sectors, with 1 in the less conservative direction. All changes have been evaluated with no changes required in current sampling locations. The changes requiring evaluation were in the S, SSW, and N sectors. Each change was evaluated against the criteria in ODCMS 7.3.16. The results conclude that the changes have a calculated dose less than the values calculated by ODCMS TR 7.3.9.1 and are $\leq$ 120% from the current sample locations identified in ODCMS Table 7.3.15-1. The evaluations were performed using 2002 annual source term. No milk animals were identified. The ODCM is being updated to reflect these new locations.

3. **Revised environmental sample locations based on an initiative to verify all locations using a 12 channel GPS.**

Progress Energy environmental groups have been tasked with utilizing new technology to confirm the locations of all environment sample points. The minor changes to the original locations were made following independent checks using global positioning system (GPS) equipment.

4. **Added broadleaf vegetation sample (804) in the South meteorological sector.**

The South sector from the plant has experienced a recent population growth. To enhance our environmental sampling program, an additional vegetation sample is being established at the site boundary (0.7 miles). The nearest resident for the South sector remains at 1.1 miles from the plant center.