10 CFR 50.36a(a)(2)
TS 5.6.3

Progress Energy

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United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23

2009 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

Ladies and Gentlemen:

Attached is the Annual Radioactive Effluent Release Report for the period of January 1, 2009, through December 31, 2009, for H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2. This report is submitted in accordance with 10 CFR 50.36a(a)(2) and the HBRSEP, Unit No. 2, Technical Specifications Section 5.6.3.

If you have any questions concerning this report, please contact me at 843-857-1626.

Sincerely,

C A Castell

C. A. Castell
Supervisor - Licensing/Regulatory Programs

RAC/rac

Attachment

c: L. A. Reyes, NRC, Region II
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NRR

EFFLUENT AND WASTE DISPOSAL

ANNUAL REPORT

January 1, 2009 - December 31, 2009

PROGRESS ENERGY CAROLINAS

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

FACILITY OPERATING LICENSE NO. DPR-23

DOCKET NO. 50-261

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I. EXECUTIVE SUMMARY

A. Discussion

1. Effluent Controls

The H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, Offsite Dose Calculation Manual specifies controls and dose limits pertaining to releases of radioactivity to the environment. None of these controls or dose limits were exceeded during 2009.

2. Protection Standards

The main objective in the control of radiation is to ensure that any exposure is kept not only within regulatory limits, but As Low As Reasonably Achievable (ALARA). The ALARA concept applies to reducing radiation exposure both to workers at HBRSEP, Unit No. 2, and to the general public. Reasonably achievable means that radiation exposure reduction is based on sound environmental practices, economic decisions, and operating practices. By practicing ALARA, HBRSEP and Progress Energy Carolinas, Inc., minimize health risk and environmental detriment, and ensure that exposures are maintained well below regulatory limits.

3. Sources of Radioactivity Released

During normal operations of a nuclear power station, most of the fission products are retained within the fuel and fuel cladding. However, small quantities of radioactive fission and activation products are present in the reactor coolant water. The types of radioactive material released are noble gases, iodines and particulates, and tritium.

The noble gas fission products in the reactor coolant water are released as a gas when the coolant is depressurized. These gases are collected by a system designed for collection and storage for radioactive decay prior to release to the environment.

Small releases of radioactivity in liquids may occur from equipment associated with the reactor coolant system. These liquids are collected and processed for radioactivity removal, prior to and during release.

4. Noble Gas

Some of the fission products released in airborne effluents are radioactive isotopes of noble gases, such as argon and xenon. Noble gases are by nature inert and do not concentrate in humans or other organisms. Noble gases contribute to human radiation exposure as external exposure.

5. Iodines and Particulates

The main contribution of radioactive iodine to human exposure is to the thyroid gland, where the body concentrates iodine. The particulates contribute to internal exposure of tissues such as the muscle, liver, and intestines. These particulates can also be a source of exposure if deposited on the ground.

6. Tritium

Tritium, a radioactive isotope of hydrogen, is a predominate radionuclide in liquid and gaseous effluents. Tritium is produced in the reactor via a number of processes. Tritium is a weak beta particle emitter and contributes very little radiation exposure to the human body, and when tritium is inhaled, ingested, or absorbed it is dispersed throughout the body until eliminated.

7. Processing and Monitoring

Effluents are strictly controlled and monitored to ensure that radioactivity released to the environment is minimal and within regulatory limits. Effluent controls include the operation of radiation monitoring systems, in-plant and environmental sampling and analyses, quality assurance programs for both in-plant and environmental sampling and analyses, and procedures that address effluent and environmental monitoring.

The plant radiation monitoring system provides monitors that are designed to ensure that releases are below regulatory limits. Each instrument provides indication of the amount of radioactivity present and is equipped with alarms and indicators in the control room. The alarm setpoints are set below the regulatory limits, i.e., typically at less than 50 percent of the regulatory limit, to ensure that the limits are not exceeded. If a monitor alarms, a release to the environment from a tank is automatically suspended. Additionally, releases are sampled and analyzed in the laboratory prior to discharge to the environment. The sampling and analysis done in the laboratory provides a more sensitive and precise method of determining pre-effluent composition than in-plant monitoring instruments.

The plant has a meteorological tower, which is linked to computers that record the meteorological data. This meteorological data and the results of the Land Use Census are used to verify the ground level dispersion factors contained in the ODCM that are used in calculating the dose to the public.

In addition to in-plant equipment, the company maintains a Radiological Environmental Monitoring Program, which consists of devices used to sample the air and water in the environment. The samples collected from the surrounding environment are analyzed to determine the presence of radioactive material in the environment.

8. Exposure Pathways

Radiological exposure pathways are the methods by which people may become exposed to radioactive material. The major pathways of concern are those which could cause the highest calculated radiation dose. The projected pathways are determined from the type and amount of radioactive material that may have been released, the environmental transport mechanism, and the use of the environment.

Environmental transport mechanisms include, but are not limited to, hydrological (i.e., water) and meteorological (i.e., weather) characteristics of the area. Information on water flow, wind speed and direction, dietary intake of residents, recreational use of the area, and location of homes and farms in the area are some of the many factors used to calculate the potential exposure to offsite personnel.

The release of radioactive gaseous effluents includes pathways such as external whole body exposure, deposition on plants and soils, and human inhalation. The release of radioactive material in liquid effluents includes pathways such as fish consumption and direct exposure from the lake at the shoreline.

Even though radionuclides can reach humans by many different pathways, some radionuclides result in more exposure than others. The critical pathway is the one that, for a specific radionuclide, will result in the greatest exposure to a population, or a specific group of the population, called the critical group. The critical group may vary depending on the radionuclides involved, the age and diet of the group, and other cultural factors. The exposure may be received by the whole body or to a specific organ, with the organ receiving the largest fraction of the exposure called the critical organ.

The exposures to the general public in the area surrounding HBRSEP, Unit No. 2, are calculated for gaseous and liquid releases. The exposure due to radioactive material released in gaseous effluents is calculated using factors such as the amount of radioactive material released, the concentration beyond the site boundary, locations of exposure pathways, and usage factors. The exposures calculated due to radioactive materials released in liquid effluents are calculated using factors such as the total volume of liquid, the total volume of dilution water, and usage factors.

9. Plant Operation

With the exception of two brief maintenance outages in April and November of 2009, HBRSEP, Unit No. 2, operated continuously during 2009.

10. Results

The Radioactive Effluent Release Report is a detailed listing of the radioactivity released from the HBRSEP, Unit No. 2, during the period from January 1, 2009 through December 31, 2009. Some of the gaseous and liquid release parameters for this reporting period are summarized below:

GASEOUS EFFLUENTS

	Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Fission & Act. Gas	Ci	6.92E-02	5.83E-02	3.26E-02	7.64E-02
I-131	Ci	4.53E-07	4.48E-07	6.26E-07	8.13E-07
Part. >8 Day Half-Lives	Ci	ND[1]	ND	ND	1.08E-07
Tritium	Ci	1.35E+00	1.33E+00	2.00E+00	1.59E+00

LIQUID EFFLUENTS

	Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Fission & Act. Products	Ci	5.21E-04	7.51E-04	1.49E-03	1.14E-04
Tritium	Ci	1.45E+01	7.58E+01	1.28E+01	1.27E+02
Dilution Volume	Liters	2.77E+11	2.87E+11	2.91E+11	2.88E+11
Waste Volume	Liters	1.91E+05	1.65E+06	1.83E+05	2.06E+05

During the period of January 1, 2009 through December 31, 2009, the estimated maximum individual offsite dose due to radioactivity released in effluents was:

Liquid Effluents:

- Total Body Dose 0.0000423 millirem
- Critical Organ Dose 0.0000476 millirem, Liver

Note – an additional 0.12 mrem was estimated based on the evaporation of tritium from Lake Robinson. This is based on Lake Robinson 2009 environmental sample results and represents the dose from the buildup in the lake. This conservatively bounds the dose due to 2009 tritium effluents.

Gaseous Effluents:

- Beta Air Dose 0.00133 millirad
- Gamma Air Dose 0.00268 millirad
- Critical Organ Dose 0.0867 millirem, Thyroid

[1] ND, No Detectable Activity

B. Significant Variances

1. No variances in historical data of significance were identified during this period.

C. Regulatory Compliance

1. The 10 CFR 50, Appendix I, doses were calculated using the Canberra Effluent Management System (EMS[1]). The EMS Software provides day-by-day dose estimates that are conservative because all releases are assigned to the limiting receptor, using the continuous ground level dispersion factors calculated from 1978 meteorology. When projected on a day-by-day basis, utilizing conservative meteorological conditions, the dose commitment from gaseous and liquid effluents is a small fraction of the 10 CFR 50, Appendix I, limits. The direct radiation assessment to the most likely exposed member of the public is reported in the Annual Radiological Environmental Operating Report. During 2009, the results of the direct radiation assessment demonstrated no measurable effect above background for plant operations.

2. There were no changes to the waste solidification Process Control Program (PCP) during this reporting period. See page 36.

3. There were no changes to the Radioactive Waste Systems (i.e., liquid, gaseous, or solid) during this reporting period. See page 36.

4. There was one reportable instrumentation inoperability event during this reporting period. See page 36.

5. There were no outside liquid holdup tanks that exceeded the 10 curie limit during this reporting period. See page 36.

6. There were no Waste Gas Decay Tanks that exceeded the 1.9E+04 curie limit during this reporting period. See page 37.

7. There were no instances of missed compensatory samples during this reporting period. See page 37.

8. There were two revisions to the ODCM during this reporting period. See page 35.

[1] EMS, Effluent Management System Software is a product of Canberra Nuclear Industries used for determining dose from radioactive effluent releases.

9. There were no dose calculations performed or special reports made as a result of any spills or leaks during this period. See page 37.

10. There was one event associated with a failure to meet an ODCM specified sampling frequency. See page 37.

II. SUPPLEMENTAL INFORMATION

A. Regulatory Limits

1. Fission and Activation Gases:

10 CFR 20 Limits (Instantaneous Release Rate)
Total Body Dose ≤500 mrem/yr
Skin Dose ≤3000 mrem/yr
10 CFR 50, Appendix I
For Calendar Quarter
Gamma Dose ≤5 mrad
Beta Dose ≤10 mrad
For Calendar Year
Gamma Dose ≤10 mrad
Beta Dose ≤20 mrad

2. Iodine-131 and 133, Tritium, and Particulates >8 day half-lives:

10 CFR 20 Limits (Instantaneous Release Rate)
Dose from Inhalation (only) to a child to any organ ≤1500 mrem/yr
10 CFR 50, Appendix I (Organ Doses)
For Calendar Quarter ≤7.5 mrem
For Calendar Year ≤15 mrem

3. Liquids:

Concentrations are 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 2.00E-04 μCi/ml total activity.

10 CFR 50, Appendix I
For Calendar Quarter
Total Body Dose ≤1.5 mrem
Any Organ Dose ≤5 mrem
For Calendar Year
Total Body Dose ≤3 mrem
Any Organ Dose ≤10 mrem

B. Measurements and Approximations of Total Radioactivity

1. Continuous Gaseous Releases

a) Fission and Activation Gases - The total activity released is determined from the net count rate of the gaseous monitor, its calibration factor, and the total exhaust flow. The activity of radioactive gas is determined by the fraction of that radioactive gas in the isotopic analysis for that period.

b) Iodines - The activity released as Iodine-131, 133, and 135 is based on isotopic analysis of the charcoal cartridge and particulate filter, and the total exhaust flow.

c) Particulates - The activity released via particulates with half-lives greater than eight days is determined by isotopic analysis of particulate filters and the total exhaust flow.

d) Tritium - The activity released as tritium is based on weekly grab sample analysis and total exhaust flow.

2. Batch Gaseous Releases

a) Fission and Activation Gases - The activity released is based on the volume released and the activity of the individual nuclides obtained from an isotopic analysis of the grab sample taken prior to the release.

b) Iodines - The iodines from mixed mode batch releases are included in the iodine determination from the mixed mode continuous Reactor Auxiliary Building release.

c) Particulates - The particulates from mixed mode batch releases are included in the particulate determination from the mixed mode continuous Reactor Auxiliary Building release.

d) Tritium - The activity released as tritium is based on the grab sample analysis of each batch and the batch volume.

3. Liquid Releases

a) Fission and Activation Products - The total release values (not including tritium, gases, and alpha) are comprised of the sum of the individual radionuclide activities in each release to the discharge canal for the respective quarter. These values represent the activity known to be present in the liquid radwaste effluent.

b) Tritium - The activity released as tritium is based on the grab sample analysis of each batch and the batch volume. For continuous releases, the activity released as tritium is based on analysis of a weekly composite sample. For continuous releases without a composite sampler, the tritium activity is based on analysis of daily grab samples or a composite of grab samples.

c) Alpha - The measured alpha concentration in a monthly composite sample is used to calculate the total release and average diluted concentration during each period.

d) Strontium-89, 90, and Iron-55 - The total release values are measured quarterly from composite samples.

C. Estimated Total Errors

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

2. Estimated total errors for liquid effluents are based on uncertainties in counting equipment calibration, counting statistics, non-steady release flow rate, sampling and mixing losses, and volume determinations.

3. Estimated total errors for solid waste are based on uncertainties in equipment calibration, dose rate measurements, geometry, and volume determinations.

III. GASEOUS EFFLUENTS

A. Batch Releases

	Jan - June 2009	July - Dec 2009
Number of batch releases	53	51
Total time period for batch releases	2.15E+04 min	3.94E+04 min
Maximum time period for a batch release	6.35E+02 min	1.01E+04 min
Average time period for a batch release	4.06E+02 min	7.72E+02 min
Minimum time period for a batch release	3.60E+01 min	1.30E+01 min

B. Abnormal Releases

	Jan - June 2009	July – Dec 2009
Number of releases	0	0
Total activity released	0.00E+00 Ci	0.00E+00 Ci

C. Data Tables

The following tables provide the details of gaseous releases:

Table III-A Summation of All Releases
Table III-B Ground Level and Mixed Mode Releases
Table III-C Typical Lower Limits of Detection for Gaseous Effluents

TABLE III-A
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT - 2009
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

	Unit	Quarter 1	Quarter 2	Est. Total Error %
A. Fission and Activation Gases				
1. Total release	Ci	6.92E-02	5.83E-02	3.63E+01
2. Average release rate for period	µCi/sec	8.90E-03	7.42E-03	
B. Iodines				
1. Total Iodine-131	Ci	4.53E-07	4.48E-07	1.74E+01
2. Average release rate for period	µCi/sec	5.82E-08	5.70E-08	
C. Particulates				
1. Particulates with half-lives >8 days	Ci	ND	ND	1.05E+01
2. Average release rate for period	µCi/sec	ND	ND	
3. Gross alpha radioactivity	Ci	ND	ND	
D. Tritium				
1. Total release	Ci	1.35E+00	1.33E+00	2.31E+01
2. Average release rate for period	µCi/sec	1.74E-01	1.69E-01	
E. Percent of 10 CFR 50, Appendix I				
1. Quarterly limit				
Gamma air	%	1.37E-02	1.35E-02	
Beta air	%	3.41E-03	3.75E-03	
Organ: Thyroid	%	2.49E-01	2.45E-01	
2. Annual limit*				
Gamma air	%	6.85E-03	1.36E-02	
Beta air	%	1.71E-03	3.58E-03	
Organ: Thyroid	%	1.25E-01	2.47E-01	

*Cumulative total for the year-to-date using the methodology in the ODCM.

TABLE III-A
(Continued)
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT - 2009
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

	Unit	Quarter 3	Quarter 4	Est. Total Error %
A. Fission and Activation Gases				
1. Total release	Ci	3.26E-02	7.64E-02	3.63E+01
2. Average release rate for period	µCi/sec	4.10E-03	9.61E-03	
B. Iodines				
1. Total Iodine-131	Ci	6.26E-07	8.13E-07	1.74E+01
2. Average release rate for period	µCi/sec	7.87E-08	1.02E-07	
C. Particulates				
1. Particulates with half-lives >8 days	Ci	ND	1.08E-07	1.05E+01
2. Average release rate for period	µCi/sec	ND	1.36E-08	
3. Gross alpha radioactivity	Ci	ND	ND	
D. Tritium				
1. Total release	Ci	2.00E+00	1.59E+00	2.31E+01
2. Average release rate for period	µCi/sec	2.51E-01	2.00E-01	
E. Percent of 10 CFR 50, Appendix I				
1. Quarterly limit				
Gamma air	%	1.24E-02	1.41E-02	
Beta air	%	2.35E-03	3.79E-03	
Organ: Thyroid	%	3.68E-01	2.94E-01	
2. Annual limit*				
Gamma air	%	1.98E-02	2.68E-02	
Beta air	%	4.76E-03	6.65E-03	
Organ: Thyroid	%	4.31E-01	5.78E-01	

*Cumulative total for the year-to-date using the methodology in the ODCM.

TABLE III-B
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT - 2009
GASEOUS EFFLUENTS - GROUND LEVEL AND MIXED MODE RELEASES

		Continuous Mode		Batch Mode	
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 1	Quarter 2
1. Fission Gases					
Ar-41	Ci	ND	ND	2.72E-02	2.82E-02
Kr-85	Ci	ND	ND	ND	2.45E-02
Xe-131m	Ci	ND	ND	ND	1.65E-03
Xe-133	Ci	4.08E-02	ND	1.25E-03	4.04E-03
Xe-135	Ci	ND	ND	ND	3.50E-05
Total for Period	Ci	4.08E-02	ND	2.84E-02	5.83E-02
2. Iodines[1]					
I-131	Ci	4.53E-07	4.48E-07	ND	ND
I-133	Ci	3.20E-06	1.69E-06	ND	ND
Total for Period	Ci	3.65E-06	2.13E-06	ND	ND
3. Particulates[1]					
Co-60	Ci	ND	ND	ND	ND
Cs-137	Ci	ND	ND	ND	ND
Total for Period	Ci	ND	ND	ND	ND

[1]Mixed mode continuous accountability includes mixed mode batch accountability (excludes tritium).

TABLE III-B
(Continued)
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT - 2009
GASEOUS EFFLUENTS - GROUND LEVEL AND MIXED MODE RELEASES

		Continuous Mode		Batch Mode	
Nuclides Released	Unit	Quarter 3	Quarter 4	Quarter 3	Quarter 4
1. Fission Gases					
Ar-41	Ci	ND	ND	2.58E-02	2.79E-02
Kr-85	Ci	ND	ND	ND	6.11E-03
Xe-131m	Ci	ND	ND	ND	5.27E-05
Xe-133	Ci	1.81E-03	3.68E-02	5.04E-03	5.56E-03
Xe-133m	Ci	ND	ND	ND	3.49E-05
Total for Period	Ci	1.81E-03	3.68E-02	3.08E-02	3.96E-02
2. Iodines[1]					
I-131	Ci	6.15E-07	8.13E-07	1.10E-08	ND
I-133	Ci	ND	3.55E-06	ND	ND
Total for Period	Ci	6.15E-07	4.36E-06	1.10E-08	ND
3. Particulates[1]					
Co-60	Ci	ND	ND	ND	1.08E-07
Cs-137	Ci	ND	ND	ND	ND
Total for Period	Ci	ND	ND	ND	1.08E-07

[1]Mixed mode continuous accountability includes mixed mode batch accountability (excludes tritium).

TABLE III-C
TYPICAL LOWER LIMITS OF DETECTION FOR GASEOUS EFFLUENTS

Nuclide	LLD (μCi/cc)
H-3	6.74E-09
Ar-41	3.41E-08
Mn-54	1.12E-14
Co-58	1.13E-14
Fe-59	4.50E-14
Co-60	1.86E-14
Zn-65	3.07E-14
Br-82	2.52E-13
Kr-85	4.83E-06
Kr-85m	1.51E-08
Kr-87	3.84E-08
Kr-88	4.94E-08
Sr-89	2.57E-15
Sr-90	1.11E-15
Mo-99	2.66E-13
I-131	2.90E-14
Xe-131m	5.84E-07
I-133	5.88E-13
Xe-133	2.70E-08
Xe-133m	1.18E-07
Cs-134	1.37E-14
I-135	2.45E-08
Xe-135	7.70E-09
Xe-135m	3.55E-07
Cs-137	1.74E-14
Xe-138	8.17E-07
Ba-140	7.91E-14
La-140	2.47E-14
Ce-141	1.29E-14
Ce-144	4.73E-14
Gross Alpha	3.44E-15

IV. LIQUID EFFLUENTS

A. Batch Releases

	Jan - June 2009	July - Dec 2009
Number of batch releases	18	18
Total time period for batch releases	5.20E+04 min	5.34E+04 min
Maximum time period for a batch release	1.89E+04 min	1.04E+04 min
Average time period for a batch release	2.89E+03 min	2.96E+03 min
Minimum time period for a batch release	8.50E+01 min	1.35E+02 min
Average stream flow during release periods	5.72E+05 gpm	5.77E+05 gpm

B. Abnormal Releases

	Jan - June 2009	July - Dec 2009
Number of releases	0	0
Total activity released	0.00E+00 Ci	0.00E+00 Ci

C. Data Tables

The following tables provide the details of liquid releases:

Table IV-A Summation of All Releases
Table IV-B Continuous Mode and Batch Mode Releases
Table IV-C Typical Lower Limits of Detection for Liquid Effluents

TABLE IV-A
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT - 2009
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

	Unit	Quarter 1	Quarter 2	Est. Total Error %
A. Fission and Activation Products				
1. Total release (not including tritium, gases, alpha)	Ci	5.21E-04	7.51E-04	1.07E+01
2. Average diluted concentration during period	µCi/ml	1.88E-12	2.62E-12	
B. Tritium				
1. Total release	Ci	1.45E+01	7.58E+01	9.20E+00
2. Average diluted concentration during period	µCi/ml	5.22E-08	2.64E-07	
C. Dissolved and entrained gases				
1. Total release	Ci	2.31E-03	7.26E-04	9.60E+00
2. Average diluted concentration during period	µCi/ml	8.34E-12	2.53E-12	
3. Percent of applicable limit	%	4.17E-06	1.27E-06	
D. Gross alpha radioactivity				
1. Total release	Ci	ND	ND	1.83E+01
E. Volume of waste released prior to dilution	Liters	1.91E+05	1.65E+06	
F. Volume of dilution water used during period	Liters	2.77E+11	2.87E+11	
G. Percent of 10 CFR 50, Appendix I				
1. Quarterly Limit				
Organ: GI-LLI[1]	%	1.83E-05	5.21E-04	
Total body	%	4.62E-05	1.16E-03	
2. Annual Limit*				
Organ: GI-LLI	%	9.15E-06	2.70E-04	
Total body	%	2.31E-05	6.03E-04	

*Cumulative total for the year-to-date using the methodology in the ODCM.

[1] GI-LLI, gastrointestinal-lower large intestine

TABLE IV-A
(Continued)
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT - 2009
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

	Unit	Quarter 3	Quarter 4	Est. Total Error %
A. Fission and Activation Products				
1. Total release (not including tritium, gases, alpha)	Ci	1.49E-03	1.14E-04	1.07E+01
2. Average diluted concentration during period	µCi/ml	5.13E-12	3.95E-13	
B. Tritium				
1. Total release	Ci	1.28E+01	1.27E+02	9.20E+00
2. Average diluted concentration during period	µCi/ml	4.39E-08	4.42E-07	
C. Dissolved and entrained gases				
1. Total release	Ci	9.29E-06	1.32E-02	9.60E+00
2. Average diluted concentration during period	µCi/ml	3.19E-14	4.59E-11	
3. Percent of applicable limit	%	1.60E-08	2.30E-05	
D. Gross alpha radioactivity				
1. Total release	Ci	ND	ND	1.83E+01
E. Volume of waste released prior to dilution	Liters	1.83E+05	2.06E+05	
F. Volume of dilution water used during period	Liters	2.91E+11	2.88E+11	
G. Percent of 10 CFR 50, Appendix I				
1. Quarterly Limit Organ: Liver Total body	 % %	 4.36E-04 1.12E-03	 1.50E-04 4.95E-04	
2. Annual Limit* Organ: Liver Total body	 % %	 4.01E-04 1.16E-03	 4.76E-04 1.41E-03	

*Cumulative total for the year-to-date using the methodology in the ODCM.

TABLE IV-B
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT - 2009
LIQUID EFFLUENTS - CONTINUOUS MODE AND BATCH MODE RELEASES

		Continuous Mode		Batch Mode	
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 1	Quarter 2
H-3	Ci	ND	ND	1.44E+01	7.58E+01
F-18	Ci	ND	1.27E-06	ND	ND
Fe-55	Ci	ND	ND	1.45E-05	9.42E-05
Co-57	Ci	ND	ND	ND	2.53E-06
Co-58	Ci	ND	ND	1.56E-04	2.49E-04
Co-60	Ci	ND	ND	2.44E-04	2.94E-04
Sn-117m	Ci	ND	ND	ND	5.51E-06
Te-123m	Ci	ND	ND	3.81E-05	1.22E-05
Sb-125	Ci	ND	ND	6.92E-05	8.60E-05
Cs-134	Ci	ND	ND	ND	3.43E-07
Cs-137	Ci	ND	ND	ND	5.30E-06
Total for Period	Ci	ND	1.27E-06	5.21E-04	7.49E-04
Kr-85	Ci	ND	ND	2.15E-03	5.11E-04
Xe-133	Ci	ND	ND	1.62E-04	2.15E-04
Total for Period	Ci	ND	ND	2.31E-03	7.26E-04

TABLE IV-B
(Continued)
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT - 2009
LIQUID EFFLUENTS - CONTINUOUS MODE AND BATCH MODE RELEASES

		Continuous Mode		Batch Mode	
Nuclides Released	Unit	Quarter 3	Quarter 4	Quarter 3	Quarter 4
H-3	Ci	ND	ND	1.28E+01	1.27E+02
F-18	Ci	ND	ND	1.20E-07	ND
Fe-55	Ci	ND	ND	3.37E-04	1.34E-05
Co-58	Ci	ND	ND	1.42E-04	6.26E-06
Co-60	Ci	ND	ND	7.45E-04	7.55E-05
Sn-117m	Ci	ND	ND	9.91E-06	ND
Te-123m	Ci	ND	ND	1.02E-05	ND
Sb-125	Ci	ND	ND	2.36E-04	1.70E-05
Cs-134	Ci	ND	ND	3.34E-07	ND
Cs-137	Ci	ND	ND	1.06E-05	1.65E-06
Total for Period	Ci	ND	ND	1.49E-03	1.14E-04
Kr-85	Ci	ND	ND	ND	1.04E-03
Xe-131m	Ci	ND	ND	ND	1.79E-04
Xe-133	Ci	ND	ND	9.29E-06	1.20E-02
Xe-133m	Ci	ND	ND	ND	3.53E-05
Total for Period	Ci	ND	ND	9.29E-06	1.32E-02

TABLE IV-C
TYPICAL LOWER LIMITS OF DETECTION FOR LIQUID EFFLUENTS

Nuclide	LLD (μCi/ml)
H-3	4.21E-06
Cr-51	2.24E-07
Mn-54	1.93E-08
Fe-55	1.12E-07
Co-57	1.46E-08
Co-58	1.91E-08
Fe-59	6.62E-08
Co-60	2.89E-08
Zn-65	4.89E-08
Sr-89	4.04E-08
Sr-90	1.57E-08
Nb-95	1.82E-08
Zr-95	3.22E-08
Mo-99	1.74E-07
Tc-99m	1.94E-08
Ag-110m	2.80E-08
Sn-113	3.38E-08
Sb-122	3.52E-08
Te-123m	1.66E-08
Sb-124	2.10E-08
Sb-125	9.54E-08
Xe-127	2.53E-08
I-131	3.01E-08
Xe-131m	9.34E-07
Te-132	2.28E-08
Xe-133	4.86E-08
Xe-133m	2.35E-07
Cs-134	2.56E-08
Xe-135	6.49E-08
Cs-137	3.19E-08
Ba-140	1.23E-07
La-140	3.73E-08
Ce-141	2.85E-08
Ce-144	1.15E-07
Gross Alpha	7.81E-08

V. SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
Report Time Period: January 1, 2009, through December 31, 2009

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (not irradiated fuel)

Waste Class A

1.	Type of Waste	Waste Volume (m^3)	Activity (Ci)	Estimated Error (%)	No. Ship.
a.	Spent resins, filter sludge, evaporator bottoms, etc.	3.85E+00	4.89E-01	2.00E+01	1
b.	Dry compressible waste, contaminated equipment, etc.	1.18E+02	2.60E-01	2.00E+01	3
c.	Irradiated components, control rods, etc.	N/A	N/A	N/A	N/A
d.	Other: Soil	2.69E+00	1.52E-02	2.00E+01	1

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

		%	Ci
a.	Ni-63	7.49E+01	3.66E-01
	Co-60	9.74E+00	4.76E-02
	Fe-55	8.21E+00	4.01E-02
	C-14	4.75E+00	2.32E-02
	Mn-54	8.29E-01	4.05E-03
	Co-58	4.97E-01	2.43E-03
	Cs-137	4.32E-01	2.11E-03
	Sb-125	4.30E-01	2.10E-03
	Co-57	1.33E-01	6.50E-04
	Ce-144	6.37E-02	3.11E-04
b.	Fe-55	6.42E+01	1.67E-01
	Co-60	1.56E+01	4.04E-02
	Ni-63	1.05E+01	2.74E-02
	Cs-137	2.03E+00	5.26E-03
	Co-58	1.93E+00	5.00E-03
	Sb-125	1.88E+00	4.87E-03
	Nb-95	1.09E+00	2.83E-03
	Cs-134	9.13E-01	2.37E-03
	Zr-95	5.88E-01	1.53E-03
	Mn-54	5.48E-01	1.42E-03
	Ag-110m	4.04E-01	1.05E-03
	Co-57	1.24E-01	3.23E-04
	Others *	2.05E-01	5.31E-04
c.	Fe-55	6.35E+01	9.67E-03
	Co-60	1.39E+01	2.12E-03
	Ni-63	9.30E+00	1.42E-03
	Co-58	3.30E+00	5.02E-04
	Nb-95	2.74E+00	4.17E-04
	Cs-137	1.94E+00	2.95E-04
	Sb-125	1.86E+00	2.83E-04
	Zr-95	1.07E+00	1.63E-04
	Cs-134	9.29E-01	1.42E-04
	Mn-54	5.94E-01	9.05E-05
	Ag-110m	4.56E-01	6.95E-05
	Sn-113	1.54E-01	2.35E-05
	Others **	2.40E-01	3.65E-05
d.	N/A	N/A	N/A

* Others include C-14, Sn-113, Ce-144, Pu-238, Pu-239, Am-241, Pu-241, Cm-242, Cm-243
** Others include Co-57 & Ce-144

Total Curie Quantity and Principle Radionuclides were determined by estimate.

3. Solid Waste Deposition

Number of Shipments:	4
Mode of Transportation	Exclusive Use – Highway
Destination	Duratek (Energy Solutions) / Barnwell

V. SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
Report Time Period: January 1, 2009, through December 31, 2009

B. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (not irradiated fuel)

Waste Class B

1.	Type of Waste	Waste Volume (m^3)	Activity (Ci)	Estimated Error (%)	No. Ship.
a.	Spent resins, filter sludge, evaporator bottoms, etc.	N/A	N/A	N/A	N/A
b.	Dry compressible waste, contaminated equipment, etc.	N/A	N/A	N/A	N/A
c.	Irradiated components, control rods, etc.	N/A	N/A	N/A	N/A
d.	Other: N/A	N/A	N/A	N/A	N/A

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

		%	Ci
a.	N/A	N/A	N/A
b.	N/A	N/A	N/A
c.	N/A	N/A	N/A
d.	N/A	N/A	N/A

3. Solid Waste Deposition

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

V. SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
Report Time Period: January 1, 2009, through December 31, 2009

C. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (not irradiated fuel)

Waste Class C

2.	Type of Waste	Waste Volume (m^3)	Activity (Ci)	Estimated Error (%)	No. Ship.
a.	Spent resins, filter sludge, evaporator bottoms, etc.	N/A	N/A	N/A	N/A
b.	Dry compressible waste, contaminated equipment, etc.	N/A	N/A	N/A	N/A
c.	Irradiated components, control rods, etc.	N/A	N/A	N/A	N/A
d.	Other: Filters	7.69E+00	1.35E+01	2.00E+01	2

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

		%	Ci
a.	N/A	N/A	N/A
b.	N/A	N/A	N/A
c.	N/A	N/A	N/A
d.	Fe-55	4.14E+01	5.60E+00
	Co-60	2.92E+01	3.95E+00
	Ni-63	1.93E+01	2.61E+00
	Co-58	2.62E+00	3.54E-01
	C-14	1.53E+00	2.07E-01
	Sb-125	1.01E+00	1.37E-01
	H-3	1.00E+00	1.36E-01
	Zr-95	9.42E-01	1.27E-01
	Ce-144	7.81E-01	1.06E-01
	Nb-95	7.76E-01	1.05E-01
	Mn-54	5.62E-01	7.60E-02
	Cs-137	1.50E-01	2.03E-02
	Others *	6.40E-01	8.65E-02

* Others include Na-22, Cl-36, Cr-51, Co-57, Fe-59, Zn-65, Sr-89, Sr-90, Tc-99, Ru-103, Ag-110m, Sn-113, Sn-117m, Te-123m, Sb-124, Ba-133, Cs-134, Eu-152, Tl-204, Po-210, Th-230, Pu-238, Pu-239, Pu-241, Am-241, Cm-242, & Cm-243

3. Solid Waste Deposition

Number of Shipments:	2
Mode of Transportation	Exclusive Use – Highway
Destination	Barnwell

VI. 40 CFR 190 DOSE CONFORMANCE

The direct radiation assessment to the most likely exposed member of the public is reported in the Annual Radiological Environmental Operating Report. The results of the assessment demonstrate no measurable affect above background from plant operations. Since no 10 CFR 50, Appendix I, limits have been exceeded and the evaluation of the Independent Spent Fuel Storage Installations indicate only a small fraction of the total dose to the environs, this demonstrates conformance with 40 CFR 190, "Environmental Radiation Protection Standards for Nuclear Power Operation."

VII. METEOROLOGICAL DATA

A. Continuous Release Diffusion Analysis

Table VII-A presents the number and frequency of wind direction occurrences by wind speed class as recorded at the onsite meteorological system during continuous release, for the period January 1, 2009, through December 31, 2009.

The frequencies are presented as a percent of total occurrences for each stability class, as well as a summary for all classes for the lower (11 meter) sensor elevation.

Pertinent information available from the tables is as follows:

1. Stability

Percent occurrence Pasquill Stability categories based on lower level (11 meter) wind distribution:

A	B	C	D	E	F	G
3.38	5.15	7.05	50.01	20.56	8.07	5.76

2. Wind Speed — 11 Meter

Average Speed (mph)	5.25
Percent Calm	3.10
Percent Less than 3.5 mph	34.17

3. Wind Direction — 11 Meter

Prevailing	SSW
Percent Occurrence	10.9

TABLE VII-A JOINT OCCURRENCE FREQUENCIES FOR LOWNDDEG AND LOWNDSPD - CONTINUOUS RELEASES

ATMOSPHERIC STABILITY CLASS A

MAX (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01
3.35	0.00	0.03	0.01	0.02	0.07	0.07	0.13	0.09	0.11	0.21	0.49	0.39	0.22	0.03	0.03	0.00	1.90
5.59	0.04	0.02	0.01	0.01	0.00	0.01	0.00	0.04	0.18	0.33	0.34	0.23	0.03	0.02	0.02	0.00	1.30
8.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.04	0.03	0.00	0.05	0.00	0.00	0.15
11.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
24.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.04	0.05	0.02	0.03	0.07	0.08	0.13	0.13	0.31	0.54	0.88	0.65	0.25	0.12	0.05	0.00	3.38

ATMOSPHERIC STABILITY CLASS B

MAX (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.56	0.00	0.00	0.01	0.00	0.00	0.04	0.04	0.03	0.01	0.01	0.03	0.02	0.00	0.00	0.00	0.00	0.21
3.35	0.12	0.07	0.15	0.20	0.24	0.25	0.29	0.19	0.18	0.27	0.32	0.33	0.22	0.07	0.03	0.00	2.93
5.59	0.23	0.10	0.02	0.00	0.02	0.00	0.02	0.05	0.11	0.30	0.28	0.13	0.14	0.13	0.14	0.05	1.75
8.27	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.03	0.03	0.02	0.05	0.02	0.01	0.26
11.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.37	0.17	0.19	0.20	0.27	0.30	0.35	0.28	0.31	0.64	0.66	0.52	0.39	0.25	0.20	0.07	5.15

ATMOSPHERIC STABILITY CLASS C

MAX (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.56	0.01	0.00	0.03	0.04	0.03	0.17	0.12	0.07	0.09	0.05	0.05	0.02	0.03	0.00	0.00	0.01	0.74
3.35	0.35	0.22	0.29	0.24	0.29	0.13	0.38	0.37	0.17	0.40	0.40	0.30	0.27	0.17	0.14	0.03	4.13
5.59	0.22	0.14	0.03	0.01	0.02	0.00	0.01	0.10	0.10	0.21	0.31	0.05	0.14	0.20	0.22	0.12	1.90
8.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.11	0.02	0.03	0.01	0.07	0.00	0.02	0.28
11.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.59	0.37	0.35	0.30	0.34	0.30	0.51	0.53	0.37	0.77	0.78	0.41	0.45	0.43	0.37	0.19	7.05

ATMOSPHERIC STABILITY CLASS D

MAX (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.34	0.01	0.02	0.02	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.19
1.56	0.31	1.04	1.40	1.38	0.87	0.97	0.88	0.79	0.41	0.84	0.53	0.67	0.50	0.51	0.32	0.24	11.68
3.35	2.69	5.00	2.58	1.74	1.04	0.77	0.98	2.08	2.41	2.30	1.14	0.59	0.92	0.52	0.63	1.16	26.55
5.59	2.10	1.40	0.35	0.08	0.05	0.00	0.02	0.60	1.27	1.04	0.63	0.32	0.18	0.27	0.43	1.26	10.01
8.27	0.23	0.07	0.01	0.00	0.00	0.02	0.01	0.03	0.21	0.19	0.05	0.04	0.02	0.02	0.04	0.62	1.58
11.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
24.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	5.34	7.53	4.37	3.22	1.98	1.79	1.92	3.51	4.31	4.39	2.36	1.64	1.62	1.32	1.43	3.29	50.01

TABLE VII-A (Continued) JOINT OCCURRENCE FREQUENCIES FOR LOWNDDEG AND LOWNDSPD - CONTINUOUS RELEASES

ATMOSPHERIC STABILITY CLASS E

MAX (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.34	0.03	0.02	0.02	0.01	0.00	0.01	0.01	0.04	0.07	0.07	0.05	0.04	0.04	0.03	0.03	0.03	0.50
1.56	0.48	0.44	0.40	0.24	0.01	0.11	0.19	0.84	1.34	1.39	0.93	0.81	0.67	0.49	0.50	0.49	9.32
3.35	0.50	0.08	0.15	0.11	0.01	0.00	0.01	0.80	1.60	1.68	0.81	0.56	0.46	0.37	0.86	1.54	9.55
5.59	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.23	0.15	0.12	0.08	0.01	0.01	0.02	0.41	1.13
8.27	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.05
11.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
24.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	1.05	0.54	0.57	0.37	0.02	0.12	0.21	1.73	3.27	3.33	1.92	1.49	1.19	0.89	1.41	2.46	20.56

ATMOSPHERIC STABILITY CLASS F

MAX (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.34	0.04	0.01	0.01	0.00	0.00	0.00	0.00	0.06	0.09	0.08	0.08	0.08	0.05	0.05	0.07	0.08	0.71
1.56	0.29	0.04	0.04	0.03	0.00	0.03	0.01	0.50	0.71	0.60	0.59	0.63	0.40	0.39	0.51	0.62	5.39
3.35	0.04	0.01	0.01	0.00	0.00	0.00	0.00	0.19	0.11	0.13	0.13	0.09	0.09	0.13	0.39	0.63	1.96
5.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02
8.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.37	0.06	0.06	0.04	0.00	0.04	0.01	0.75	0.91	0.81	0.80	0.80	0.54	0.57	0.97	1.34	8.07

ATMOSPHERIC STABILITY CLASS G

MAX (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.34	0.12	0.03	0.03	0.00	0.00	0.01	0.02	0.17	0.17	0.13	0.12	0.17	0.09	0.16	0.25	0.25	1.70
1.56	0.27	0.07	0.05	0.00	0.00	0.01	0.03	0.37	0.37	0.29	0.27	0.38	0.20	0.34	0.55	0.54	3.73
3.35	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.02	0.00	0.01	0.08	0.13	0.33
5.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.45	0.10	0.08	0.00	0.00	0.02	0.05	0.54	0.54	0.42	0.39	0.57	0.29	0.51	0.88	0.92	5.76
Total	8.21	8.81	5.65	4.15	2.68	2.63	3.18	7.47	10.02	10.90	7.80	6.08	4.73	4.10	5.32	8.27	100.00

ADDENDUM 1

CHANGES TO ODCM, PCP, AND
RADIOACTIVE WASTE SYSTEMS

TABLE OF CONTENTS

I. CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL (ODCM)

There were two revisions to the ODCM during this reporting period. Summaries of the revisions are shown below. A complete copy of the updated ODCM is being submitted in a separate letter.

ODCM, Revision 29
Description of Changes

1) Revised Table 2.6-1 (Radioactive Liquid Effluent Monitoring Instrumentation) Item 6 (Composite Sampler for Settling Ponds). Revised compensatory measures to require that grab samples be collected and composited at least 3 times per week and analyzed in accordance with Table 2.8-1. This frequency meets the intent of NUREG 1301 by ensuring that representative sampling of the volume discharged through a week is obtained.
2) Revised Cumulation of Doses Section 3.5.3.1 to change the frequency of Land Use Census from biennial to annual. This increase in frequency will return the frequency of performing the Land Use Census to that specified in NUREG 1301.
3) Revised Surveillance Requirement 4.4.1 (Land Use Census) to change the frequency from 1/24 months to 1/12 months. This increase in frequency will return the frequency of performing the Land Use Census to that specified in NUREG 1301.
4) Revised Table 4.5-1 (HB Robinson Radiological Environmental Monitoring Program) to add point #67. This point will be used to perform broadleaf sampling in the South sector. This is an improvement to the RNP environmental sampling based on the latest D/Q analysis trend. Additionally revised footnote 9 for this same table and the maps on Figure 4-1 (Radiological Sample Locations Near Site) and 4-2 (Radiological Samples Distant Locations) to reflect this change.
5) Deleted 9.1.10 (Annual Radioactive Effluent Release Report – Reporting Requirements) which required the submission of any dose calculations that were performed as a result of any leaks or spills in the Radioactive Effluent Release Report. This requirement was recently added in response to an earlier un-finalized Industry Ground Water Protection Initiative. This reporting requirement is not needed as it is not part of the final NEI 07-07 Industry Ground Water Protection Initiative Guidance.
6) Revised 9.3.a.2 (Special Radiological Effluent Reports) to correct the grammar error which repeated the word "gas" twice,
7) Corrected reference within Section 9.4 (Special Ground Water Protection Reports) which incorrectly referenced 9.4.d vice 9.4.f.
8) Revised 9.4.e (Special Ground Water Protection Reports for leak or spills) to require notification if there is a potential for the spill or leak to enter groundwater. Previously there was an additional requirement that notification was only required if the groundwater is or may be used for drinking water. This change will align the ODCM with the final NEI 07-07 Industry Ground Water Protection Initiative Guidance.
9) Revised Table D-1 (Liquid Process Monitors) to reflect the new Liquid Radwaste Flow Indicator that was installed with EC 60209.

ODCM, Revision 30
Description of Changes

1) Revised Table 4.1-1 (Radiological Environmental Monitoring Program) to reflect the addition of 14 groundwater sample points. These additional points were added as part of the Industry Ground Water Protection Initiative.
2) Revised Table 4.1-2 (Reporting Levels for Radioactivity Concentrations in Environmental Samples) to lower the H-3 and I-131 reporting levels to those of that specified for drinking water as specified in NUREG 1301.
3) Revised Table 4.1-3 (Lower Limits of Detection (LLD)) to lower the H-3 and I-131 LLD limits to those of that specified for drinking water as specified in NUREG 1301.
4) Revised Table 4.5-1 (H.B. Robinson Radiological Environmental Monitoring Program) to reflect the addition of 14 groundwater sample points. These additional points were added as part of the Industry Ground Water Protection Initiative.
5) Revised Figure 4-1 (Radiological Sample Locations Near Site) and Figure 4-2 (Radiological Sample Distant Locations) to reflect the addition of 14 groundwater sample points. These additional points were added as part of the Industry Ground Water Protection Initiative.
6) Revised Section 9.4.e (Special Ground Water Protection Reports) to align the reporting requirements of the ODCM with regard to groundwater protection to that of NEI 07-07 Industry Ground Water Protection Initiative Guidance.
7) Revised Section 9.4.f (Special Ground Water Protection Reports) to add American Nuclear Insurers (ANI) as a designated office for notification in the event that a Special Groundwater Report notification is required.

II. CHANGES TO THE RADIOACTIVE WASTE SYSTEMS

There were no changes to the Radioactive Waste Systems during this reporting period.

III. CHANGES TO THE PROCESS CONTROL PROGRAM (PCP)

There were no changes to the Process Control Program during this reporting period.

IV. CHANGES TO THE LAND USE CENSUS

The Land Use Census is currently performed every 12 months and was last performed in 2009. The results of the 2009 Land Use Census and average meteorological data for the last 10 years identified no changes that required an ODCM change. The next Land Use Census will be performed in 2010.

V. INSTRUMENT INOPERABILITY

There was one reportable instrumentation inoperability event during this reporting period. R-20 (Lower Fuel Handling Building gaseous effluent monitor) was removed from service on 3/24/09 for spiking associated with the monitor. The monitor was out of service for 73 days due to extensive troubleshooting required to determine the cause of the spiking. (NCR 332425)

VI. LIQUID HOLDUP TANK CURIE LIMIT

There were no outside liquid holdup tanks that exceeded the ten curie limit during this reporting period.

VII. WASTE GAS DECAY TANK CURIE LIMIT

There were no waste gas decay tanks with a curie content that exceeded the 1.90E+04 curie limit during this reporting period.

VIII. MISSED COMPENSATORY SAMPLES

There were no instances of missed compensatory samples during this reporting period.

IX. SPECIAL GROUND WATER PROTECTION REQUIREMENTS

There were no dose calculations performed or special reports made as a result of any spills or leaks during this period.

Additional groundwater monitoring wells were sampled and analyzed starting in the second quarter of 2009 as part of the NEI Groundwater Protection Initiative. There were a total of twenty-one wells monitored, sixteen of which are described in the ODCM and will be addressed in the Annual Radiological Environmental Operating Report. For the five wells not in the ODCM program, no plant related gamma activity was detected. Low level tritium activity was found in three of the background wells. The following are the tritium results from the five additional wells:

Groundwater Tritium - 2009 pCi/L			
Well ID	2nd Quarter	3rd Quarter	4th Quarter
MW-01A	ND	ND	ND
TS-04B	550	573	706
PSW-04	361	308	515
PSW-05	440	447	558
PDW-01	ND	ND	ND

X. MISSED ODCM SAMPLES

There was one event of a failure to meet an ODCM specified sample analysis frequency during this reporting period. The 2009 1st quarter composite filters for the RadWaste Building were lost during shipment and therefore no Sr-89 or Sr-90 analysis was able to be performed for this effluent pathway for 1st quarter 2009. Based on historical data back to 2001, which has never shown any detectable Sr-89 and Sr-90 for this effluent sample point, and the fact that the gamma scan did not show any licensed material, no Sr-89 or Sr-90 would have been expected to be detected. (NCR 332850).

ADDENDUM 2

CORRECTIONS TO PREVIOUS REPORTS

TABLE OF CONTENTS

I. DISCUSSION

There are no corrections to previous reports.

Progress Energy

10 CFR 20.2206

Serial: RNP-RA/10-0037

APR 2 7 2010

REIRS Project Manager
Office of Nuclear Regulatory Research
United States Nuclear Regulatory Commission
Washington, DC 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
INDEPENDENT SPENT FUEL STORAGE INSTALLATION
DOCKET NO. 72-3/LICENSE NO. SNM-2502

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
INDEPENDENT SPENT FUEL STORAGE INSTALLATION
DOCKET NO. 72-60

ANNUAL REPORT OF INDIVIDUAL EXPOSURE MONITORING FOR 2009

Ladies and Gentlemen:

In accordance with 10 CFR 20.2206, individual exposure monitoring data for the year 2009 for H. B. Robinson Steam Electric Plant, Unit No. 2, has been submitted directly to the Radiation Exposure Information and Reporting System (REIRS) web site. The attachment is the confirmation documentation that the data was successfully loaded to the REIRS web site.

If you have any questions on this subject, please contact me at (843) 857-1626.

Sincerely,

C. A. Castell
Supervisor – Licensing/Regulatory Programs

RAC/rac
Attachment

c: L. A. Reyes, NRC, Region II
T. Orf, NRC, NRR
NRC Resident Inspector, HBRSEP
Document Control Desk

Progress Energy Carolinas, Inc.
Robinson Nuclear Plant
3581 West Entrance Road
Hartsville, SC 29550

United States Nuclear Regulatory Commission
Attachment to Serial: RNP-RA/10-0037
3 Pages (including cover page)

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

ANNUAL REPORT OF INDIVIDUAL EXPOSURE MONITORING FOR 2009

CONFIRMATION DOCUMENTATION FROM THE RADIATION EXPOSURE INFORMATION AND REPORTING SYSTEM

Report Radiation Exposure

File Submission Form

File Submission Form Help

Contact Us

Related Links

Public Meeting Schedule

Reports of Individual Monitoring (10 CFR 20.2206)

Other Related Sites

File Successfully Submitted

Below is a listing of the information you just submitted to REIRS. ***Please print this page for your records.***

- If the submittal is an annual report submitted under 10 CFR 20.2206, you will receive a communication by fax or e-mail containing a dose distribution report, number of records processed, total number of individuals and total collective dose (TEDE and CEDE).
- If this is not an annual submittal, you will be contacted by the REIRS Project Manager if there are any further questions or issues concerning your submittal.

If you have any questions regarding this process, or your submittal, please contact Technical Support at **(865)241-3615**.

To: Yollie.McCormick@orise.orau.gov
From: brenda.pulliam@pgnmail.com
Name: Brenda Pulliam
Company: Progress Energy/Robinson
Title: Sr. RC Specialist
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Incoming File Name: NRC file RNP 2009.txt
TimeStamp: 20100414150716

04/14/2010
File: Y:\CER-REIRS\REIRS\DATA\2009Data\2009EDisks\E09048.dat
License No: DPR-23
Licensee Name: **CP&L/ROBINSON**
Contact Person: CURTIS CASTELL
Associated Licenses:

	Number	TEDE
No measurable exp.	971	0.000
Meas. - 0.100	111	3.793
0.100 - 0.250	13	2.221
0.250 - 0.500	2	0.629
0.500 - 0.750	0	0.000
0.750 - 1.000	0	0.000
1.000 - 2.000	0	0.000
2.000 - 3.000	0	0.000
3.000 - 4.000	0	0.000
4.000 - 5.000	0	0.000
5.000 - 6.000	0	0.000
6.000 - 7.000	0	0.000
7.000 - 8.000	0	0.000
8.000 - 9.000	0	0.000
9.000 - 10.00	0	0.000
10.00 - 11.00	0	0.000
11.00 - 12.00	0	0.000
> 12.00	0	0.000
Number with Measurable:	126	
Total Monitored:	1097	
Total Collective TEDE (rem):		6.643
Total CDE:		0.000
Total CEDE:		0.000
Number of Intake Records:	0	

Validation Status:
Errors: 0
Warnings: 0