ATTACHMENT

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

SURRY POWER STATION UNITS 1 AND 2
LICENSE NOS. DPR-32 AND DPR-37

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

SURRY POWER STATION

(January 1, 1997 Through December 31, 1997)

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ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

FOR THE

SURRY POWER STATION

(January 1, 1997 Through December 31, 1997)

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FORWARD

This report is submitted as required by Appendix A to Operating License No.'s DPR-32 and DPR-37, Technical Specifications for Surry Power Station, Units 1 and 2, Virginia Electric and Power Company, Docket No.'s 50-280, 50-281, Section 6.6.B.3.

EXECUTIVE SUMMARY
ANNUAL RADIOLOGICAL EFFLUENT RELEASE REPORT

The Annual Radiological Effluent Release Report describes the radiological effluent control program conducted at the Surry Power Station during the 1997 calendar year. This document summarizes the quantities of radioactive liquid and gaseous effluents and solid waste released from the Surry Power Station in accordance with R. G. 1.21 and includes an assessment of radiation doses to the maximum exposed member of the public due to the radioactive liquid and gaseous effluents.

There were no unplanned gaseous effluent releases and two unplanned liquid effluent releases as classified according to the criteria in the Offsite Dose Calculation Manual during this reporting period. The releases are discussed in Attachment 6.

Based on the 1997 effluent release data, 10CFR50 Appendix I dose calculations were performed in accordance with the Offsite Dose Calculation Manual. The dose calculations are as follows:

1. The total body dose due to liquid effluents was 8.25E-04 mrem, which is 1.38E-02% of the 6 mrem dose limit. The critical organ doses due to liquid effluents, GI-LLI and Thyroid respectively, were 2.18E-03 mrem and 2.57E-04 mrem. These doses are 1.09E-02% and 1.29E-03% of the respective 20 mrem dose limit.

2. The air dose due to noble gases in gaseous effluents was 1.72E-01 mrad gamma, which is 8.60E-01% of the 20 mrad gamma dose limit, and 5.58E-01 mrad beta, which is 1.40E+00% of the 40 mrad beta dose limit.

3. The critical organ dose from gaseous effluents due to I-131, I-133, H-3, and particulates with half-lives greater than 8 days is 7.42E-02 mrem, which is 2.47E-01% of the 30 mrem dose limit.

There were no major changes to the radioactive liquid, gaseous and solid waste treatment systems during this reporting period.

There was one change to VPAP-2103, Offsite Dose Calculation Manual, during this reporting period. Attachment 3 provides the changes to VPAP-2103.

Based on the radioactivity measured and the dose calculations performed during this reporting period, the operation of Surry Nuclear Power Station has resulted in negligible radiation dose consequences to the maximum exposed member of the public in unrestricted areas.

Purpose and Scope

The Radioactive Effluent Release Report, Attachment 1, includes a summary of the quantities of radioactive liquid and gaseous effluents and solid waste as outlined in Regulatory Guide 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants", Revision 1, June 1974, with data summarized on a quarterly basis following the format of Tables 1, 2 and 3 of Appendix B thereof. Attachment 2 of this report includes an assessment of radiation doses to the maximum exposed member of the public due to radioactive liquid and gaseous effluents released from the site during the previous calendar year. Additionally, a list of unplanned releases during the reporting period is included in Attachment 6.

As required by Technical Specification 6.8.B, changes to the Offsite Dose Calculation Manual (ODCM) for the time period covered by this report are included in Attachment 3.

Major changes to the radioactive liquid, gaseous and solid waste treatment systems are reported in Attachment 4, as required by the ODCM, Section 6.7.2. If changes are made to these systems, the report shall include information to support the reason for the change and a summary of the 10CFR50.59 evaluation. In lieu of reporting major changes in this report, major changes to the radioactive waste treatment systems may be submitted as part of the annual FSAR update.

As required by the ODCM, Sections 6.2.2.b.2 and 6.3.2.b.3, a list and explanation for the inoperability of radioactive liquid and/or gaseous effluent monitoring instrumentation is provided in Attachment 5 of this report.

Discussion

The basis for the calculation of the percent of technical specification for the critical organ in Table 1A of Attachment 1 is the ODCM section, 6.3.1, which requires that the dose rate for iodine - 131, iodine - 133, for tritium, and for all radionuclides in particulate form with half-lives greater than 8 days shall be less than or equal to 1500 mRem/yr to the critical organ at or beyond the site boundary. The critical organ is the child's thyroid, inhalation pathway.

The basis for the calculation of the percent of technical specification for the total body and skin in Table 1A of Attachment 1, is the ODCM, section 6.3.1, which requires that the dose rate for noble gases to areas at or beyond site boundary shall be less than or equal to 500 mRem/yr to the total body and less than or equal to 3000 mRem/yr to the skin.

The basis for the calculation of the percent of technical specification in Table 2A of Attachment 1, is the ODCM, section 6.2.1, which states that the concentration of radioactive material releases in liquid effluents to unrestricted areas shall not exceed ten times the concentrations specified in 10CFR20, 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 microcuries/ml.

Percent of technical specification calculations are based on the total gaseous or liquid effluents released for that respective quarter.

The annual and quarterly doses, as reported in Attachment 2, were calculated according to the methodology presented in the ODCM. The beta and gamma air doses due to noble gases released from the site were calculated at the site boundary. The maximum exposed member of the public from the release of airborne iodine-131, iodine-133, tritium and all radionuclides in particulate form with half lives greater than 8 days , is defined as an infant, exposed through the grass-cow-milk pathway, with the critical organ being the thyroid gland. The maximum exposed member of the public from radioactive materials in liquid effluents in unrestricted areas is defined as an adult, exposed by either the invertebrate or fish pathway, with the critical organ being either the thyroid gland or gastrointestinal-lower large intestine. The total body dose was also determined for this individual.

Presented in Attachment 6 is a list of unplanned gaseous and liquid releases as required by the ODCM, Section 6.7.2.

The typical lower limit of detection (LLD) capabilities of the radioactive effluent analysis instrumentation are presented in Attachment 7. These LLD values are based upon conservative conditions (i.e., minimum sample volumes and maximum delay time prior to analysis). Actual LLD values may be lower. If a radioisotope was not detected when effluent samples were analyzed, then the activity of the radioisotope was reported as Not Detected (N/D) on Attachment 1 of this report. When all isotopes listed on Attachment 1 for a particular quarter and release mode are less than the lower level of detection, then the totals for this period will be designated as Not Applicable (N/A).

Supplemental Information

Section 6.6.1.b.4 of the ODCM requires the identification of the cause(s) for the unavailability of milk or if required, leafy vegetation samples, and the identification for obtaining replacement samples. As all milk samples were available for collection during this reporting period, leafy vegetation sampling was not required.

As required by the ODCM, section 6.6.2, evaluation of the Land Use Census is made to determine if new sample location(s) must be added to the Radiological Environmental Monitoring Program. Evaluation of the Land Use Census conducted for this reporting period identified no change in sample locations for the radiological environmental monitoring program.

Attachment 1

EFFLUENT RELEASE DATA

(January 1, 1997 Through December 31, 1997)

This attachment includes a summary of the quantities of radioactive liquid and gaseous effluents and solid waste as outlined in Regulatory Guide 1.21, Appendix B.

TABLE 1A

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/97 TO 12/31/97
GASEOUS EFFLUENT-SUMMATION OF ALL RELEASES

SURRY POWER STATION UNITS 1&2	UNIT	FIRST QUARTER	SECOND QUARTER	% EST. ERROR
A. FISSION & ACTIVATION GASES				
1. TOTAL RELEASE	Ci	4.66E+02	1.89E+01	1.80E+01
2. AVE RELEASE RATE FOR PERIOD	μCi/sec	5.99E+01	2.41E+00	
B. IODINE				
1. TOTAL I-131	Ci	3.54E-03	1.29E-04	2.80E+01
2. AVE RELEASE RATE FOR PERIOD	μCi/sec	4.55E-04	1.64E-05	
C. PARTICULATE				
1. HALF-LIFE >8 DAYS	Ci	1.32E-05	2.76E-05	2.80E+01
2. AVE RELEASE RATE FOR PERIOD	μCi/sec	1.70E-06	3.51E-06	
3. GROSS ALPHA RADIOACTIVITY	Ci	N/D	N/D	
D. TRITIUM				
1. TOTAL RELEASE	Ci	7.01E+00	7.77E+00	3.10E+01
2. AVE RELEASE RATE FOR PERIOD	μCi/sec	9.02E-01	9.89E-01	
PERCENTAGE OF T.S. LIMITS				
CRITICAL ORGAN DOSE RATE	%	3.41E-02	5.51E-03	
TOTAL BODY DOSE RATE	%	1.18E-01	3.98E-04	
SKIN DOSE RATE	%	4.96E-02	1.63E-04	

TABLE 1A

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD 1/1/97 TO 12/31/97
GASEOUS EFFLUENT-SUMMATION OF ALL RELEASES

SURRY POWER STATION UNITS 1&2	UNIT	THIRD QUARTER	FOURTH QUARTER	% EST. ERROR
A. FISSION & ACTIVATION GASES				
1. TOTAL RELEASE	Ci	4.59E+00	7.82E+00	1.80E+01
2. AVE RELEASE RATE FOR PERIOD	μCi/sec	5.78E-01	9.83E-01	
B. IODINE				
1. TOTAL I-131	Ci	N/D	7.46E-06	2.80E+01
2. AVE RELEASE RATE FOR PERIOD	μCi/sec	N/A	9.38E-07	
C. PARTICULATE				
1. HALF-LIFE >8 DAYS	Ci	1.33E-06	1.85E-05	2.80E+01
2. AVE RELEASE RATE FOR PERIOD	μCi/sec	1.67E-07	2.33E-06	
3. GROSS ALPHA RADIOACTIVITY	Ci	N/D	N/D	
D. TRITIUM				
1. TOTAL RELEASE	Ci	9.96E+00	1.51E+01	3.10E+01
2. AVE RELEASE RATE FOR PERIOD	μCi/sec	1.25E+00	1.89E+00	
PERCENTAGE OF T.S. LIMITS				
CRITICAL ORGAN DOSE RATE	%	5.55E-03	8.54E-03	
TOTAL BODY DOSE RATE	%	5.05E-05	7.86E-05	
SKIN DOSE RATE	%	1.89E-05	3.02E-05	

TABLE 1B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD: 1/1/97 TO 12/31/97
GASEOUS EFFLUENTS-MIXED MODE RELEASES

		CONTINUOUS MODE		BATCH MODE	
SURRY POWER STATION UNITS 1&2	UNIT	FIRST QUARTER	SECOND QUARTER	FIRST QUARTER	SECOND QUARTER
1. FISSION & ACTIVATION GASES					
Kr-85	Ci	3.08E-01	N/D	2.18E+00	8.75E-01
Kr-85m	Ci	1.19E-03	N/D	8.12E-04	1.17E-04
Kr-87	Ci	N/D	N/D	N/D	N/D
Kr-88	Ci	N/D	N/D	N/D	N/D
Xe-133	Ci	1.05E+01	2.39E-02	1.85E+02	1.62E+01
Xe-135	Ci	2.88E-02	N/D	7.36E-04	1.31E-02
Xe-135m	Ci	N/D	N/D	N/D	N/D
Xe-138	Ci	N/D	N/D	N/D	N/D
Xe-131m	Ci	1.58E-01	3.05E-02	3.70E+00	1.20E+00
Xe-133m	Ci	8.31E-02	N/D	5.88E-01	6.78E-03
Ar-41	Ci	1.51E-05	N/D	7.33E-05	N/D
TOTAL FOR PERIOD	Ci	1.11E+01	5.44E-02	1.92E+02	1.83E+01
2. IODINES					
I-131	Ci	5.54E-08	2.88E-08	N/D	N/D
I-133	Ci	N/D	N/D	N/D	N/D
I-135	Ci	N/D	N/D	N/D	N/D
TOTAL FOR PERIOD	Ci	5.54E-08	2.88E-08	N/A	N/A
3. PARTICULATES					
Sr-89	Ci	N/D	N/D	N/D	N/D
Sr-90	Ci	N/D	N/D	N/D	N/D
Cs-134	Ci	N/D	N/D	N/D	N/D
Cs-137	Ci	8.44E-09	5.38E-09	N/D	N/D
Co-58	Ci	N/D	N/D	N/D	N/D
Co-60	Ci	N/D	5.45E-09	N/D	N/D
Mn-54	Ci	N/D	N/D	N/D	N/D
Fe-59	Ci	N/D	N/D	N/D	N/D
Zn-65	Ci	N/D	N/D	N/D	N/D
Mo-99	Ci	N/D	N/D	N/D	N/D
Ce-141	Ci	N/D	N/D	N/D	N/D
Ce-144	Ci	N/D	N/D	N/D	N/D
Ba-140	Ci	N/D	N/D	N/D	N/D
La-140	Ci	N/D	N/D	N/D	N/D
TOTAL FOR PERIOD	Ci	8.44E-09	1.08E-08	N/A	N/A

TABLE 1B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD: 1/1/97 TO 12/31/97
GASEOUS EFFLUENTS-MIXED MODE RELEASES

		CONTINUOUS MODE		BATCH MODE	
SURRY POWER STATION UNITS 1&2	UNIT	THIRD QUARTER	FOURTH QUARTER	THIRD QUARTER	FOURTH QUARTER
1. FISSION & ACTIVATION GASES					
Kr-85	Ci	N/D	N/D	N/D	N/D
Kr-85m	Ci	N/D	2.11E-04	3.87E-03	4.34E-04
Kr-87	Ci	N/D	N/D	N/D	9.15E-05
Kr-88	Ci	N/D	N/D	2.26E-04	1.34E-04
Xe-133	Ci	1.00E+00	3.20E-01	3.30E+00	7.26E+00
Xe-135	Ci	8.56E-02	3.77E-03	1.42E-01	1.48E-02
Xe-135m	Ci	N/D	N/D	N/D	N/D
Xe-138	Ci	N/D	N/D	N/D	N/D
Xe-131m	Ci	N/D	3.29E-04	1.61E-03	1.71E-01
Xe-133m	Ci	N/D	2.01E-03	5.81E-02	1.90E-02
Ar-41	Ci	N/D	N/D	1.02E-03	9.55E-03
TOTAL FOR PERIOD	Ci	1.09E+00	3.26E-01	3.50E+00	7.48E+00
2. IODINES					
I-131	Ci	N/D	N/D	N/D	N/D
I-133	Ci	N/D	N/D	N/D	N/D
I-135	Ci	N/D	N/D	N/D	N/D
TOTAL FOR PERIOD	Ci	N/A	N/A	N/A	N/A
3. PARTICULATES					
Sr-89	Ci	N/D	N/D	N/D	N/D
Sr-90	Ci	N/D	N/D	N/D	N/D
Cs-134	Ci	N/D	N/D	N/D	N/D
Cs-137	Ci	5.71E-09	5.07E-09	N/D	N/D
Co-58	Ci	N/D	N/D	N/D	N/D
Co-60	Ci	4.91E-09	4.39E-10	N/D	N/D
Mn-54	Ci	N/D	N/D	N/D	N/D
Fe-59	Ci	N/D	N/D	N/D	N/D
Zn-65	Ci	N/D	N/D	N/D	N/D
Mo-99	Ci	N/D	N/D	N/D	N/D
Ce-141	Ci	N/D	N/D	N/D	N/D
Ce-144	Ci	N/D	N/D	N/D	N/D
Ba-140	Ci	N/D	N/D	N/D	N/D
La-140	Ci	N/D	N/D	N/D	N/D
TOTAL FOR PERIOD	Ci	1.06E-08	5.51E-09	N/A	N/A

TABLE 1C

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD:1/1/97 TO 12/31/97
GASEOUS EFFLUENTS-GROUND LEVEL RELEASES

SURRY POWER STATION UNITS 1&2	UNIT	CONTINUOUS MODE FIRST QUARTER	CONTINUOUS MODE SECOND QUARTER	BATCH MODE FIRST QUARTER	BATCH MODE SECOND QUARTER
1. FISSION & ACTIVATION GASES					
Kr-85	Ci	N/D	N/D	1.25E+01	N/D
Kr-85m	Ci	1.42E-03	N/D	N/D	N/D
Kr-87	Ci	1.48E-03	N/D	N/D	N/D
Kr-88	Ci	8.64E-04	N/D	N/D	N/D
Xe-133	Ci	3.65E+01	5.99E-01	2.11E+02	3.69E-03
Xe-135	Ci	1.65E-02	1.26E-04	2.47E-01	N/D
Xe-135m	Ci	7.21E-03	2.67E-04	N/D	N/D
Xe-138	Ci	1.96E-04	N/D	N/D	N/D
Xe-131m	Ci	N/D	N/D	1.15E+00	3.05E-03
Xe-133m	Ci	N/D	N/D	1.20E+00	N/D
Ar-41	Ci	2.03E-03	1.07E-04	N/D	N/D
TOTAL FOR PERIOD	Ci	3.65E+01	6.00E-01	2.26E+02	6.73E-03
2. IODINES					
I-131	Ci	3.25E-03	1.21E-04	2.87E-04	8.23E-06
I-132	Ci	N/D	N/D	1.14E-06	N/D
I-133	Ci	2.36E-04	N/D	1.01E-05	N/D
I-135	Ci	N/D	N/D	N/D	N/D
TOTAL FOR PERIOD	Ci	3.49E-03	1.21E-04	2.98E-04	8.23E-06
3. PARTICULATES					
Sr-89	Ci	N/D	N/D	N/D	N/D
Sr-90	Ci	N/D	N/D	N/D	N/D
Cs-134	Ci	N/D	N/D	N/D	N/D
Cs-137	Ci	4.69E-05	2.38E-05	N/D	N/D
Co-58	Ci	1.07E-05	1.44E-05	N/D	1.67E-08
Co-60	Ci	2.16E-05	1.53E-05	1.13E-08	N/D
Mn-54	Ci	N/D	N/D	N/D	N/D
Fe-59	Ci	N/D	N/D	N/D	N/D
Zn-65	Ci	N/D	N/D	N/D	N/D
Mo-99	Ci	N/D	N/D	N/D	N/D
Ce-141	Ci	N/D	N/D	N/D	N/D
Ce-144	Ci	N/D	N/D	N/D	N/D
Ba-140	Ci	N/D	N/D	N/D	N/D
La-140	Ci	N/D	N/D	N/D	N/D
TOTAL FOR PERIOD	Ci	7.92E-05	5.35E-05	1.13E-08	1.67E-08

TABLE 1C

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD:1/1/97 TO 12/31/97
GASEOUS EFFLUENTS-GROUND LEVEL RELEASES

SURRY POWER STATION UNITS 1&2	UNIT	CONTINUOUS MODE THIRD QUARTER	CONTINUOUS MODE FOURTH QUARTER	BATCH MODE THIRD QUARTER	BATCH MODE FOURTH QUARTER
1. FISSION & ACTIVATION GASES					
Kr-85	Ci	N/D	N/D	N/D	N/D
Kr-85m	Ci	7.91E-06	2.54E-04	N/D	N/D
Kr-87	Ci	N/D	2.38E-04	N/D	N/D
Kr-88	Ci	N/D	N/D	N/D	N/D
Xe-133	Ci	2.56E-05	5.30E-03	N/D	4.15E-03
Xe-135	Ci	7.89E-04	2.60E-03	N/D	N/D
Xe-135m	Ci	7.13E-04	7.91E-04	N/D	N/D
Xe-138	Ci	N/D	N/D	N/D	N/D
Xe-131m	Ci	N/D	N/D	N/D	N/D
Xe-133m	Ci	N/D	N/D	N/D	N/D
Ar-41	Ci	1.42E-04	1.13E-04	N/D	N/D
TOTAL FOR PERIOD	Ci	1.68E-03	9.30E-03	N/A	4.15E-03
2. IODINES					
I-131	Ci	N/D	7.45E-06	N/D	7.23E-09
I-133	Ci	N/D	N/D	N/D	N/D
I-135	Ci	N/D	N/D	N/D	N/D
TOTAL FOR PERIOD	Ci	N/A	7.45E-06	N/A	7.23E-09
3. PARTICULATES					
Sr-89	Ci	N/D	N/D	N/D	N/D
Sr-90	Ci	N/D	N/D	N/D	N/D
Cs-134	Ci	N/D	N/D	N/D	N/D
Cs-137	Ci	7.91E-07	6.19E-07	N/D	N/D
Co-58	Ci	N/D	4.54E-06	N/D	1.86E-08
Co-60	Ci	N/D	5.71E-06	N/D	N/D
Mn-54	Ci	N/D	N/D	N/D	N/D
Fe-59	Ci	N/D	N/D	N/D	N/D
Zn-65	Ci	N/D	N/D	N/D	N/D
Mo-99	Ci	N/D	N/D	N/D	N/D
Ce-141	Ci	N/D	N/D	N/D	N/D
Ce-144	Ci	N/D	N/D	N/D	N/D
Ba-140	Ci	N/D	N/D	N/D	N/D
La-140	Ci	N/D	N/D	N/D	N/D
Cr-51	Ci	N/D	7.64E-06	N/D	N/D
Se-75	Ci	5.30E-07	N/D	N/D	N/D
TOTAL FOR PERIOD	Ci	1.32E-06	1.85E-05	N/A	1.86E-08

TABLE 2A

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD: 1/1/97 TO 12/31/97
LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

SURRY POWER STATION UNITS 1&2	UNIT	FIRST QUARTER	SECOND QUARTER	% EST. ERROR
A. FISSION AND ACTIVATION PRODUCTS				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	Ci	3.06E-02	1.21E-01	2.00E+01
2. AVE DIL. CONC. DURING PERIOD	μCi/ml	4.94E-11	1.81E-10	
3. PERCENT OF APPLICABLE LIMIT	%	1.31E-04	5.03E-04	
B. TRITIUM				
1. TOTAL RELEASE	Ci	5.03E+02	1.35E+02	2.00E+01
2. AVE DIL. CONC. DURING PERIOD	μCi/ml	8.13E-07	2.02E-07	
3. PERCENT OF APPLICABLE LIMIT	%	8.13E-04	2.02E-03	
C. DISSOLVED AND ENTRAINED GASES				
1. TOTAL RELEASE	Ci	2.78E-03	9.17E-04	2.00E+01
2. AVE DIL. CONC. DURING PERIOD	μCi/ml	4.49E-11	1.37E-12	
3. PERCENT OF APPLICABLE LIMIT	%	2.25E-06	6.86E-07	
D. GROSS ALPHA RADIOACTIVITY				
1. TOTAL RELEASE	Ci	N/D	N/D	2.00E+01
E. VOLUME OF WASTE RELEASED (PRIOR TO DILUTION)	LITERS	4.94E+07	5.94E+07	3.00E+00
F. VOLUME OF DILUTION WATER USED DURING PERIOD	LITERS	6.19E+11	6.68E+11	3.00E+00

TABLE 2A

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD: 1/1/97 TO 12/31/97
LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

SURRY POWER STATION UNITS 1&2	UNIT	THIRD QUARTER	FOURTH QUARTER	% EST. ERROR
A. FISSION AND ACTIVATION PRODUCTS				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	Ci	1.72E-01	8.14E-02	2.00E+01
2. AVE DIL. CONC. DURING PERIOD	μCi/ml	2.21E-10	1.22E-10	
3. PERCENT OF APPLICABLE LIMIT	%	2.42E-04	5.14E-04	
B. TRITIUM				
1. TOTAL RELEASE	Ci	2.79E+02	1.93E+02	2.00E+01
2. AVE DIL. CONC. DURING PERIOD	μCi/ml	3.59E-07	2.89E-07	
3. PERCENT OF APPLICABLE LIMIT	%	3.59E-03	2.89E-03	
C. DISSOLVED AND ENTRAINED GASES				
1. TOTAL RELEASE	Ci	3.24E-04	1.64E-04	2.00E+01
2. AVE DIL. CONC. DURING PERIOD	μCi/ml	4.16E-13	2.46E-13	
3. PERCENT OF APPLICABLE LIMIT	%	2.08E-07	1.23E-07	
D. GROSS ALPHA RADIOACTIVITY				
1. TOTAL RELEASE	Ci	N/D	N/D	2.00E+01
E. VOLUME OF WASTE RELEASED (PRIOR TO DILUTION)	LITERS	6.64E+07	1.18E+08	3.00E+00
F. VOLUME OF DILUTION WATER USED DURING PERIOD	LITERS	7.78E+11	6.67E+11	3.00E+00

TABLE 2B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD: 1/1/97 TO 12/31/97
LIQUID EFFLUENTS

SURRY POWER STATION UNITS 1&2	UNIT	CONTINUOUS MODE		BATCH MODE	
		FIRST QUARTER	SECOND QUARTER	FIRST QUARTER	SECOND QUARTER
Sr-89	Ci	N/D	N/D	N/D	N/D
Sr-90	Ci	N/D	N/D	N/D	N/D
Cs-134	Ci	8.41E-06	N/D	3.78E-04	8.71E-03
Cs-137	Ci	2.94E-03	1.84E-04	2.47E-03	1.82E-02
I-131	Ci	N/D	N/D	4.84E-04	9.27E-05
Co-58	Ci	N/D	1.21E-07	1.66E-02	4.37E-02
Co-60	Ci	3.97E-04	7.84E-05	1.82E-03	3.87E-03
Fe-59	Ci	N/D	N/D	6.81E-05	9.61E-06
Zn-65	Ci	N/D	N/D	N/D	3.56E-06
Mn-54	Ci	N/D	N/D	2.18E-05	1.79E-05
Cr-51	Ci	N/D	N/D	2.93E-04	1.15E-03
Zr-95	Ci	N/D	N/D	2.46E-06	2.62E-06
Nb-95	Ci	N/D	N/D	2.64E-05	2.97E-05
Mo-99	Ci	N/D	N/D	N/D	3.86E-05
Tc-99m	Ci	N/D	N/D	1.15E-06	5.42E-06
Ba-140	Ci	N/D	N/D	N/D	N/D
La-140	Ci	N/D	N/D	N/D	N/D
Ce-141	Ci	N/D	N/D	6.77E-07	3.71E-06
Sb-122	Ci	N/D	N/D	2.73E-06	1.70E-05
Sb-124	Ci	N/D	N/D	9.59E-04	8.67E-04
Sb-125	Ci	N/D	N/D	4.00E-03	4.38E-02
Co-57	Ci	N/D	N/D	1.11E-05	8.51E-05
Na-24	Ci	N/D	N/D	1.33E-06	2.39E-05
Ce-139	Ci	N/D	N/D	N/D	2.80E-06
Ru-103	Ci	N/D	N/D	1.44E-06	2.26E-06
Ag-110m	Ci	N/D	N/D	2.33E-05	N/D
Te-132	Ci	N/D	N/D	3.71E-06	9.01E-06
Cs-138	Ci	N/D	N/D	5.86E-06	N/D
W-187	Ci	N/D	N/D	N/D	4.90E-06
Np-239	Ci	N/D	N/D	6.71E-06	1.40E-04
Ce-143	Ci	N/D	N/D	N/D	2.10E-05
Mn-56	Ci	N/D	N/D	1.52E-06	3.56E-06
Te-127m	Ci	N/D	N/D	N/D	2.75E-04
Ru-106	Ci	N/D	N/D	N/D	2.77E-05
Nd-147	Ci	N/D	N/D	3.41E-05	N/D
Am-241	Ci	N/D	N/D	N/D	6.46E-06
I-132	Ci	N/D	N/D	4.29E-06	N/D
I-133	Ci	N/D	N/D	3.77E-06	N/D
Ce-144	Ci	N/D	N/D	N/D	N/D
Fe-55	Ci	N/D	N/D	N/D	N/D
TOTAL FOR PERIOD	Ci	3.35E-03	2.63E-04	2.72E-02	1.21E-01
Xe-133	Ci	N/D	N/D	2.70E-03	4.10E-05
Xe-135	Ci	N/D	N/D	8.38E-06	2.78E-06
Xe-133m	Ci	N/D	N/D	N/D	2.78E-05
Xe-135m	Ci	N/D	N/D	N/D	8.34E-04
Kr-85m	Ci	N/D	N/D	1.00E-06	3.81E-06
Kr-87	Ci	N/D	N/D	N/D	2.06E-06
Kr-88	Ci	N/D	N/D	7.93E-07	5.69E-06
Ar-41	Ci	N/D	N/D	6.93E-05	N/D
TOTAL FOR PERIOD		N/A	N/A	2.78E-03	9.17E-04

TABLE 2B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
PERIOD: 1/1/97 TO 12/31/97
LIQUID EFFLUENTS

SURRY POWER STATION UNITS 1&2	UNIT	CONTINUOUS MODE		BATCH MODE	
		THIRD QUARTER	FOURTH QUARTER	THIRD QUARTER	FOURTH QUARTER
Sr-89	Ci	N/D	N/D	N/D	N/D
Sr-90	Ci	N/D	N/D	N/D	N/D
Cs-134	Ci	5.80E-06	2.70E-04	6.10E-04	1.13E-02
Cs-137	Ci	6.12E-03	5.41E-03	1.14E-03	1.25E-02
I-131	Ci	N/D	N/D	3.30E-05	2.72E-05
Co-58	Ci	N/D	8.30E-05	6.95E-02	1.95E-02
Co-60	Ci	2.23E-03	6.56E-04	1.14E-02	3.73E-03
Fe-59	Ci	N/D	N/D	N/D	N/D
Zn-65	Ci	N/D	N/D	N/D	1.05E-05
Mn-54	Ci	N/D	N/D	8.21E-06	2.18E-05
Cr-51	Ci	N/D	N/D	2.15E-03	4.10E-04
Zr-95	Ci	N/D	N/D	8.21E-06	1.77E-05
Nb-95	Ci	N/D	N/D	2.02E-06	2.14E-05
Mo-99	Ci	N/D	N/D	1.04E-05	5.70E-06
Tc-99m	Ci	N/D	N/D	N/D	2.69E-06
Ba-140	Ci	N/D	N/D	1.77E-05	1.00E-05
La-140	Ci	N/D	N/D	N/D	N/D
Ce-141	Ci	N/D	N/D	1.62E-06	N/D
Sb-122	Ci	N/D	N/D	2.75E-06	N/D
Sb-124	Ci	N/D	N/D	7.01E-04	8.18E-04
Sb-125	Ci	N/D	N/D	7.34E-02	2.52E-02
Co-57	Ci	N/D	N/D	3.89E-04	5.07E-05
Se-75	Ci	N/D	N/D	1.00E-05	5.49E-07
Ce-139	Ci	N/D	N/D	N/D	3.59E-07
Ru-103	Ci	N/D	N/D	N/D	2.96E-06
Ag-110m	Ci	N/D	N/D	9.62E-07	N/D
Te-132	Ci	N/D	N/D	1.23E-05	1.96E-06
Na-24	Ci	N/D	N/D	1.19E-05	N/D
Ru-106	Ci	N/D	N/D	3.58E-05	N/D
Np-239	Ci	N/D	N/D	3.20E-04	3.52E-05
Cs-138	Ci	N/D	N/D	1.01E-05	1.01E-04
I-133	Ci	N/D	N/D	1.41E-05	3.83E-06
Ce-144	Ci	N/D	N/D	4.21E-05	N/D
Ce-143	Ci	N/D	N/D	1.26E-05	N/D
Nd-147	Ci	N/D	N/D	2.67E-05	1.30E-05
Te-125m	Ci	N/D	N/D	2.88E-03	1.01E-03
Te-127m	Ci	N/D	N/D	7.96E-04	2.03E-04
Te-129m	Ci	N/D	N/D	4.21E-05	1.25E-04
Te-131m	Ci	N/D	N/D	4.21E-05	5.12E-06
Fe-55	Ci	N/D	N/D	N/D	N/D
TOTAL FOR PERIOD	Ci	8.36E-03	6.42E-03	1.64E-01	7.51E-02
Xe-133	Ci	N/D	N/D	6.43E-06	7.82E-06
Xe-135	Ci	N/D	N/D	3.75E-06	2.16E-06
Xe-131m	Ci	N/D	N/D	2.39E-04	N/D
Xe-133m	Ci	N/D	N/D	4.41E-05	N/D
Kr-85m	Ci	N/D	N/D	1.65E-05	N/D
Kr-85	Ci	N/D	N/D	N/D	1.50E-04
Kr-87	Ci	N/D	N/D	1.40E-05	4.21E-06
TOTAL FOR PERIOD	Ci	N/A	N/A	3.24E-04	1.64E-04

TABLE 3

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
PERIOD: 1/1/97 - 12/31/97

SURRY POWER STATION

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

1. Type of waste		12 month Period	Est. Total Error, %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m3	8.28E+01*	1.00E+01
	Ci	2.34E+02	3.00E+01
b. Dry compressible waste, contaminated equip., etc.	m3	2.70E+02**	1.00E+01
	Ci	9.68E+00	3.00E+01
c. Irradiated components, control rods, etc.	m3	0.00E+00	1.00E+01
	Ci	0.00E+00	3.00E+01
d. Other (Waste Oil, Sump Bottoms)	m3	1.00E+01***	1.00E+01
	Ci	7.26E-04	3.00E+01

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

a. Ni-63	%	2.13E+01
Co-60	%	1.79E+01
Cs-134	%	1.64E+01
Cs-137	%	1.59E+01
Co-58	%	1.14E+01
Fe-55	%	9.55E+00
H-3	%	2.02E+00
b. Co-60	%	2.93E+01
Fe-55	%	2.51E+01
Ni-63	%	1.37E+01
Co-58	%	1.05E+01
Cs-137	%	4.66E+00
Fe-59	%	4.35E+00
Cr-51	%	2.97E+00
Cs-134	%	2.92E+00
Zr-95	%	1.72E+00
Sb-125	%	1.65E+00
Nb-95	%	1.63E+00
c.	%	

TABLE 3

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
PERIOD: 1/1/97 - 12/31/97
CONT'D

SURRY POWER STATION

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

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

d.	Ce-144	%	7.11E+01
	Cs-137	%	1.39E+01
	Fe-55	%	8.03E+00
	Co-60	%	6.54E+00

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
7	Truck	Barnwell, SC (WMF)
8	Truck	Barnwell, SC (CNCF)
7	Truck	Oak Ridge, TN

B. IRRADIATED FUEL SHIPMENT (Disposition)

Number of Shipments	Mode of Transportation	Destination
0		

* NOTE 1: 6.78E+01 m3 of this was liquid shipped to a licensed waste processors for processing and/or volume reduction. Therefore, this volume is not representative of the actual volume buried. The total volume buried for this reporting period is 9.19E+00 m3.

** NOTE 2: 2.59E+02 m3 of the DAW was shipped to licensed waste processors for processing and/or volume reduction. Therefore, this volume is not representative of the actual volume buried. The total volume buried for this reporting period is 7.97E+00 m3.

*** NOTE 3: Waste oil and sump bottoms were shipped to a licensed waste processors for processing and/or volume reduction. Therefore, this volume is not representative of the actual volume buried. The total volume buried for this reporting period is 0.00E+00 m3.

WMF: Waste Management Facility
CNCF: Chem-Nuclear Consolidation Facility

ANNUAL AND QUARTERLY DOSES

An assessment of radiation doses to the maximum exposed member of the public due to radioactive liquid and gaseous effluents released from the site for each calendar quarter for the calendar year of this report, along with an annual total of each effluent pathway is made pursuant to the ODCM, section 6.7.2 requirement.

	LIQUID			GASEOUS		
	Total Body (mrem)	Thyroid (mrem)	GI-LLI (mrem)	Gamma (mrad)	Beta (mrad)	Thyroid (mrem)
1st Quarter	1.57E-04	1.32E-04	3.78E-04	1.71E-01	5.55E-01	7.05E-02
2nd Quarter	2.38E-04	3.18E-05	5.57E-04	5.98E-04	1.85E-03	2.79E-03
3rd Quarter	1.67E-04	4.74E-05	8.67E-04	7.31E-05	1.70E-04	2.86E-04
4th Quarter	2.63E-04	4.51E-05	3.76E-04	1.64E-04	3.00E-04	5.84E-04
Annual	8.25E-04	2.57E-04	2.18E-03	1.72E-01	5.58E-01	7.42E-02

REVISIONS TO OFFSITE DOSE CALCULATION MANUAL (ODCM)

As required by Technical Specification 6.8.B, revisions to the ODCM, effective for the time period covered by this report, are summarized in this attachment.

A complete revision, Revision 8, was implemented during the period January 1 to December 31, 1996. Revision 8 incorporates the previously reported changes to Revision 7 of the ODCM as well as the following changes associated with Surry Power Station:

1. Updated section 3.0 References/Commitment Documents.

2. Changed the required presentation of solid waste data in the Annual Radiological Effluent Report from a quarterly format to an annual format.

3. Clarified that separate effluent release reports are to be submitted for the power station and the Independent Spent Fuel Storage Installation, ISFSI.

4. Corrected typographical error to dose factor, Attachment 5.

5. Revised isotope listing, Attachment 10.

Revision 8 of the ODCM is included with this attachment.

MAJOR CHANGES TO RADIOACTIVE LIQUID, GASEOUS AND SOLID WASTE TREATMENT SYSTEMS

There were no major changes to Surry's Radioactive Liquid, Gaseous or Solid Waste Treatment Systems this reporting period.

INOPERABILITY OF RADIOACTIVE LIQUID AND GASEOUS EFFLUENT MONITORING INSTRUMENTATION

The Annual Radioactive Effluent Release Report shall explain why monitors required by the ODCM Attachments 1 and 14, which were determined inoperable, were not returned to operable status within 30 days. None of the above referenced monitors were inoperable for 30 days during this reporting period.

UNPLANNED RELEASES

There were no unplanned gaseous releases and two unplanned liquid releases for this reporting period. The liquid releases originated from the overpressure relief valve on the heater to the 1A Primary Grade Water Tank. The release pathway to the discharge canal was through the storm drain adjacent to the 1A Primary Grade Water Tank. The releases, summarized below, occurred 11/25/97 and 12/17/97.

Release Date	Release Duration	Isotopes Released	Concentration uCi/ml	Curies Released
11/25/97	8 hours	H-3	1.23E-06	8.38E-06
		Co-58	1.79E-08	1.22E-07
		Cs-137	2.70E-08	1.84E-07
12/17/97	55 minutes	H-3	3.06E-06	1.16E-05
		Co-60	4.49E-08	1.70E-07
		Cs-134	2.13E-08	8.06E-08

LOWER LEVEL OF DETECTION FOR EFFLUENT SAMPLE ANALYSIS

	Isotope	Required LLD	Typical LLD
GASEOUS:	Kr-87	1.00E-04	1.12E-08 - 1.61E-07
	Kr-88	1.00E-04	2.03E-08 - 2.21E-07
	Xe-133	1.00E-04	1.59E-08 - 1.70E-07
	Xe-133m	1.00E-04	4.19E-08 - 6.18E-07
	Xe-135	1.00E-04	5.77E-09 - 8.03E-08
	Xe-135m	1.00E-04	2.78E-08 - 3.06E-07
	Xe-138	1.00E-04	5.02E-08 - 7.13E-07
	I-131	1.00E-12	8.65E-14 - 1.18E-13
	I-133	1.00E-10	9.51E-14 1.30E-13
	Sr-89	1.00E-11	1.00E-15 - 4.00E-13
	Sr-90	1.00E-11	2.00E-16 - 6.00E-14
	Cs-134	1.00E-11	5.58E-14 - 1.23E-13
	Cs-137	1.00E-11	7.55E-14 - 1.59E-13
	Mn-54	1.00E-11	7.58E-14 - 1.42E-13
	Fe-59	1.00E-11	1.63E-13 - 2.66E-13
	Co-58	1.00E-11	5.19E-14 - 1.14E-13
	Co-60	1.00E-11	8.93E-14 - 1.54E-13
	Zn-65	1.00E-11	1.51E-13 - 3.60E-13
	Mo-99	1.00E-11	4.22E-13 - 8.10E-13
	Ce-141	1.00E-11	5.69E-14 - 1.07E-13
	Ce-144	1.00E-11	2.06E-13 - 4.21E-13
	Alpha	1.00E-11	1.05E-12 - 2.75E-12
	Tritium	1.00E-06	5.02E-08 - 5.47E-08
LIQUID	Sr-89	5.00E-08	1.00E-08 - 5.00E-08
	Sr-90	5.00E-08	4.00E-09 - 3.00E-08
	Cs-134	5.00E-07	1.08E-08 - 2.03E-08
	Cs-137	5.00E-07	1.42E-08 - 2.61E-08
	I-131	1.00E-06	1.12E-08 - 1.67E-08
	Co-58	5.00E-07	1.08E-08 - 1.93E-08
	Co-60	5.00E-07	1.30E-08 - 2.55E-08
	Fe-59	5.00E-07	2.70E-08 - 4.08E-08
	Zn-65	5.00E-07	2.61E-08 - 5.45E-08
	Mn-54	5.00E-07	1.23E-08 - 2.29E-08
	Mo-99	5.00E-07	6.93E-08 - 1.33E-07
	Ce-141	5.00E-07	1.48E-08 - 1.97E-08
	Ce-144	5.00E-07	5.26E-08 - 8.74E-08
	Fe-55	1.00E-06	3.00E-07 - 7.00E-07
	Alpha	1.00E-07	5.94E-09 - 1.56E-08
	Tritium	1.00E-05	2.14E-06 - 1.58E-06
	Xe-133	1.00E-05	2.26E-08 - 3.78E-08
	Xe-135	1.00E-05	7.64E-09 - 1.56E-08
	Xe-133m	1.00E-05	5.79E-08 - 1.17E-07
	Xe-135m	1.00E-05	3.38E-08 - 5.24E-08
	Xe-138	1.00E-05	6.57E-08 - 1.33E-07
	Kr-87	1.00E-05	1.46E-08 - 2.83E-08
	Kr-88	1.00E-05	2.87E-08 - 4.29E-08