

EFFLUENT RELEASE DATA

(January 1, 1984 Through June 30, 1984)

8503210051 850301
PDR ADCCK 05000280
R PDR

REPORT OF RADIOACTIVE EFFLUENTS

PAGE 1

Facility: Surry Power Station

DOCKET: 50-280 and 50-281

YEAR: 1984

1. LIQUID RELEASES

	UNITS	January	February	March	April	May	June	TOTAL	% Error
1. Gross Radioactivity (Bq)									
(a) Total Release	Curies	4.78E-1	8.06E-1	5.84E-1	6.26E-1	1.13E+0	1.42E-1		
(b) Avg. Concentration Released	µCi/ml	2.85E-9	4.75E-9	2.98E-9	3.93E-9	5.09E-9	6.44E-10		
(c) Maximum Concentration Released	µCi/ml	6.13E-9	1.27E-8	3.90E-9	8.56E-9	9.64E-9	1.11E-9		
2. Tritium									
(a) Total Released	Curies	1.39E+2	8.49E+1	5.55E+1	7.26E+1	8.09E+1	7.81E+1	5.07E+2	4.31E+1
(b) Avg. Concentration Released	µCi/ml	7.30 E-7	4.47E-7	2.80E-7	4.40E-7	3.56E-7	3.47E-7		
3. Dissolved Noble Gases									
(a) Total Release	Curies	6.54E+0	3.39E+0	3.06E-1	2.88E+0	2.21E+0	1.83E+0	1.72E+1	1.46E+0
(b) Avg. Concentration Released	µCi/ml	3.54E-8	1.78E-8	1.55E-9	1.75E-8	9.72E-9	8.13E-9		
4. Gross Alpha Radioactivity									
(a) Total Released	Curies	2.11E-5	5.99E-6	1.13E-5	*	4.80E-6	1.43E-6	4.46E-5	3.79E-6
(b) Avg. Concentration Released	µCi/ml	1.21E-13	3.28E-14	5.83E-14	*	2.14E-14	7.18E-15		
5. Vol. of Liquid to Disch. Canal	Liters	3.27E+7	3.45E+7	3.92E+7	3.59E+7	3.80E+7	3.65E+7	2.17E+8	
6. Vol. of Dilution Water	Liters	1.85E+11	1.90E+11	1.98E+11	1.65E+11	2.27E+11	2.25E+11	1.19E+12	
7. Isotopes Released MPC µCi/ml	Curies								
I-131 3 x 10 ⁻⁷		1.41E-1	1.06E-1	7.00E-2	6.20E-2	1.08E-1	1.18E-1	6.05E-1	5.14E-2
I-132 8 x 10 ⁻⁸		6.67E-6	5.70E-5	2.43E-4	*	7.20E-5	1.51E-4	5.30E-4	4.51E-5
I-133 1 x 10 ⁻⁸		2.09E-2	2.55E-2	1.44E-3	3.41E-3	1.35E-2	4.49E-3	6.92E-2	5.88E-3
I-134 2 x 10 ⁻⁸		*	*	*	*	*	*	*	*
I-135 4 x 10 ⁻⁸		1.00E-3	2.60E-3	1.11E-4	3.99E-4	5.50E-4	4.86E-4	5.15E-3	4.38E-4
Cs-134 9 x 10 ⁻⁸		1.49E-1	3.05E-2	5.94E-2	2.37E-1	1.33E-1	3.28E-2	6.42E-1	5.46E-2
Cs-136 6 x 10 ⁻⁸		1.34E-3	*	1.03E-4	*	6.56E-5	5.11E-4	2.02E-3	1.72E-4
Cs-137 2 x 10 ⁻⁸		2.84E-1	6.92E-2	1.26E-1	4.94E-1	2.83E-1	8.01E-2	1.34E+0	1.14E-1
Kr-85 3 x 10 ⁻⁸		*	*	*	*	*	*	*	*
Cu-57 4 x 10 ⁻⁸		1.46E-4	2.72E-4	2.39E-4	2.79E-5	4.78E-4	*	1.16E-3	9.86E-5
Co-58 9 x 10 ⁻⁸		3.06E-2	2.62E-2	1.42E-1	8.21E-2	4.31E-2	3.04E-2	3.54E-1	3.01E-2
Co-60 3 x 10 ⁻⁸		8.08E-2	1.27E-1	1.32E-1	1.99E-1	1.41E-1	4.92E-2	7.29E-1	6.20E-2
Mn-54 1 x 10 ⁻⁸		3.00E-3	4.43E-3	4.83E-3	3.40E-3	6.74E-3	1.68E-3	2.41E-2	2.05E-3
Na-24 3 x 10 ⁻⁸		4.50E-6	2.24E-5	4.32E-4	8.69E-5	4.56E-6	1.36E-5	5.64E-4	4.79E-5
Cr-51 2 x 10 ⁻⁸		2.69E-4	1.07E-3	1.64E-2	5.32E-3	7.19E-3	9.97E-3	4.02E-2	3.42E-3
Fe-59 5 x 10 ⁻⁸		*	1.49E-3	2.68E-4	1.24E-3	6.23E-4	1.98E-4	3.82E-3	3.25E-4
Nb-95 1 x 10 ⁻⁸		1.21E-4	6.74E-4	8.29E-4	6.76E-4	9.66E-4	1.55E-3	4.82E-3	4.10E-4
Ba-La-140 2 x 10 ⁻⁸		*	5.97E-3	2.23E-3	8.98E-5	3.23E-3	4.03E-3	1.55E-2	1.32E-3
Rb-88 -		3.35E-4	*	*	1.77E-4	4.80E-3	4.46E-3	9.77E-3	8.30E-4
Rb-124 2 x 10 ⁻⁸		1.43E-5	*	2.69E-2	6.24E-3	2.96E-4	7.61E-4	3.42E-2	2.91E-3
Rb-125 1 x 10 ⁻⁸		5.23E-4	1.89E-3	1.52E-2	6.41E-3	1.81E-3	4.06E-3	2.99E-2	2.54E-3

REPORT OF RADIOACTIVE EFFLUENTS

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FACILITY: Berry Power Station

DOCKET: 50-280 and 50-281

YEAR: 1984

I. LIQUID RELEASES (CON'T)

	UNITS	January	February	March	April	May	June	TOTAL	± Error
7. Isotopes Released MPC uCi/ml	Curies								
Ce-141	9×10^{-3}	*	8.69E-5	*	4.79E-5	1.86E-4	3.56E-5	3.56E-4	3.03E-5
Ce-144	1×10^{-3}	*	1.26E-3	1.24E-3	1.67E-4	2.98E-4	2.14E-3	5.11E-3	4.34E-4
Xe-131m	3×10^{-6}	1.54E-1	2.15E-2	3.24E-3	4.30E-2	1.29E-2	2.52E-2	2.60E-1	2.21E-2
Xe-133	3×10^{-6}	6.21E+0	3.10E+0	2.67E-1	2.76E+0	1.84E+0	1.61E+0	1.58E+1	1.34E+0
Xe-135	3×10^{-6}	1.33E-1	1.75E-1	3.50E-2	5.89E-2	2.93E-1	1.58E-1	8.53E-1	7.25E-2
Xe-133m	3×10^{-6}	4.03E-2	5.96E-2	6.91E-4	1.17E-2	4.05E-2	1.94E-2	1.72E-1	1.46E-2
Ar-41	3×10^{-6}	*	*	1.46E-5	5.06E-5	4.88E-5	1.78E-5	1.32E-4	1.12E-5
Br-89	3×10^{-6}	*	*	*	2.17E-4	2.29E-4	1.84E-4	6.30E-4	5.36E-5
Br-90	3×10^{-7}	*	*	*	*	*	*	*	*
C-14	8×10^{-4}	8.17E-3	5.06E-3	4.82E-3	3.77E-3	3.97E-4	3.20E-3	2.54E-2	2.16E-3
8. Percent of 10CFR20	Percent	1.46E+0	7.94E-1	1.81E-1	7.43E-1	5.01E-1	4.50E-1		
II. AIRBORNE RELEASES									
1. Total Noble Gases	Curies	1.47E+2	1.02E+3	6.21E+2	1.93E+3	1.84E+3	5.80E+2	6.14E+3	5.22E+2
2. Total Halogens	Curies	3.21E-3	6.03E-2	1.78E-2	1.12E-2	3.06E-3	3.97E-3	9.95E-2	8.46E-3
3. Total Particulate Gross Radioactivity (Bq)	Curies	7.26E-4	6.33E-4	1.16E-4	7.24E-4	7.20E-5	9.69E-5	2.37E-3	2.01E-4
4. Total Tritium	Curies	9.34E-1	1.68E+0	1.38E+0	1.52E+0	1.39E+1	3.39E+0	2.28E+1	1.94E+0
5. Total Particulate Gross Alpha Radioactivity	Curies	8.25E-7	5.08E-7	1.56E-7	5.83E-7	1.49E-7	3.68E-7	2.59E-6	2.20E-7
6. Maximum Noble Gas Release Rate	uCi/sec	1.89E+4	4.23E+4	5.55E+2	4.46E+4	4.37E+4	2.32E+3		
7. Percent of Applicable Limit for Technical Specifications									
(a) Noble Gases	Percent	9.20E-2	6.77E-1	4.10E-1	1.35E+0	1.29E+0	4.36E-1		
(b) Halogens	Percent	2.61E-2	3.30E-1	4.45E-2	9.43E-2	2.47E-2	3.99E-2		
(c) Particulates	Percent	7.55E-3	3.59E-3	1.35E-3	9.50E-3	3.88E-3	2.03E-3		
8. Isotopes Released:	Curies								
(a) Particulates									
Ce-134		1.81E-4	7.16E-5	1.91E-5	1.19E-4	8.45E-5	3.48E-5	5.10E-4	4.34E-5
Cr-51		*	*	*	*	*	*	*	*
Ce-137		4.39E-4	2.08E-4	7.10E-5	4.50E-4	1.65E-4	1.01E-4	1.43E-3	1.22E-4
Ce-138		*	1.72E-4	*	*	1.47E-5	*	1.87E-4	1.59E-5
Co-58		6.60E-6	1.58E-7	1.19E-5	3.23E-5	6.12E-6	5.63E-7	5.76E-5	4.90E-6
Co-60		4.57E-5	1.99E-5	1.85E-5	1.45E-4	9.03E-5	3.51E-5	3.55E-4	3.02E-5
Hu-54		3.91E-7	4.10E-8	1.43E-7	2.75E-7	*	3.51E-6	4.36E-6	3.71E-7
Fe-59		*	*	*	*	*	*	*	*
Rb-88		*	4.62E-4	3.02E-4	1.19E-3	8.55E-4	7.30E-4	3.54E-3	3.01E-4

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II. AIRBORNE RELEASES (CONT'D.)

	January	February	March	April	May	June	TOTAL	± Error
8. Isotopes Released (con'tv)								
(a) Particulates (con't.)								
Nb-95	*	*	*	*	*	*	*	
Zn-65	1.27E-7	*	*	*	*	*	1.27E-7	1.08E-8
Zr-95	*	*	*	*	*	*	*	
Ru-103	*	*	*	*	*	*	*	
(b) Halogens								
I-131	2.33E-3	2.75E-2	3.97E-3	8.13E-3	2.21E-3	3.45E-3	4.76E-2	4.05E-3
I-132	*	2.75E-4	3.83E-3	2.09E-4	2.52E-4	1.04E-6	4.57E-3	3.88E-4
I-133	8.86E-4	2.49E-2	3.67E-3	1.68E-3	5.96E-4	5.17E-4	3.22E-2	2.74E-3
I-134	*	*	*	*	*	*	*	
I-135	*	7.70E-3	6.31E-3	1.17E-3	*	*	1.52E-2	1.29E-3
(c) Gases								
Xe-133	1.47E+2	1.00E+3	6.02E+2	1.85E+3	1.72E+3	5.33E+2	5.85E+3	4.97E+2
Xe-133m	*	6.71E+0	1.98E-1	7.79E+0	9.18E+0	2.77E-1	2.42E+1	2.06E+0
Xe-135	2.42E-1	4.66E+0	1.85E+1	8.00E+1	1.12E+2	4.58E+1	2.61E+2	2.22E+1
Kr-85m	*	8.15E-2	*	6.65E-2	2.67E-1	3.44E-1	7.59E-1	6.45E-2
Kr-85	*	*	*	*	*	*	*	
Kr-87	*	*	*	*	*	*	*	
Kr-88	*	*	*	*	7.17E-2	3.38E-1	4.10E-1	3.49E-2
Ar-41	*	*	*	*	*	*	*	
III. SOLID RADIOACTIVE WASTE DISPOSAL								
(a) Total Amount Solid Waste Packaged	ft³	3.92E+3	4.58E+3	2.87E+3	1.93E+3	2.84E+3	2.94E+3	
(b) Estimated Total Activity	Curies	3.52E+0	1.13E+2	4.81E+0	1.71E+0	9.19E+0	2.24E+0	
(c) Date of Shipment and Disposition		Barnwell, S.C.	Barnwell S.C.	Barnwell S.C.	Barnwell, S.C.	Barnwell, S.C.	Barnwell, S.C.	
		1-24, 25, 26, 27	2-9, 14, 15, 20, 23, 24, 27, 28	3-1, 8, 13, 16, 22, 28, 29	4-3, 24, 25, 27	5-2, 3, 24, 29	6-6, 13, 27	

EFFLUENT RELEASE DATA

(July 1, 1984 Through December 31, 1984)

TABLE 2A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
 PERIOD: 7/ 1/84 TO 12/31/84
 LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

Attachment 1
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SURRY POWER STATION UNITS 1&2	UNIT	THIRD QTR.	FOURTH QTR.	% EST. ERROR
A. FISSION AND ACTIVATION PRODUCTS				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CI	1.94E 00	3.94E 00	2.50E 01
2. AVG DIL. CONC. DURING PERIOD	UCI/ML	2.70E-09	1.08E-08	
3. PERCENT OF APPLICABLE LIMIT	%	5.95E-02	8.82E-02	
B. TRITIUM				
1. TOTAL RELEASE	CI	1.75E 02	1.30E 02	2.50E 01
2. AVG DIL. CONC. DURING PERIOD	UCI/ML	2.44E-07	3.55E-07	
3. PERCENT OF APPLICABLE LIMIT	%	8.12E-03	1.18E-02	
C. DISSOLVED AND ENTRAINED GASES				
1. TOTAL RELEASE	CI	1.33E 00	9.77E-02	2.50E 01
2. AVG DIL. CONC. DURING PERIOD	UCI/ML	1.85E-09	2.67E-10	
3. PERCENT OF APPLICABLE LIMIT	%	9.25E-04	1.33E-04	
D. GROSS ALPHA RADIOACTIVITY				
1. TOTAL RELEASE	CI	1.71E-05	9.56E-04	2.50E 01
E. VOLUME OF WASTE RELEASED (PRIOR TO DILUTION)				
	LITERS	6.47E 08	9.91E 08	3.50E 00
F. VOLUME OF DILUTION WATER USED DURING PERIOD				
	LITERS	7.20E 11	3.66E 11	3.50E 00

TABLE 1A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
 PERIOD: 7/ 1/84 TO 12/31/84
 GASEOUS EFFLUENT-SUMMATION OF ALL RELEASES

Attachment 1
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SURRY POWER STATION UNITS 1&2		UNIT	THIRD QTR.	FOURTH QTR.	% EST. ERROR
A. FISSION & ACTIVATION GASES					
1. TOTAL RELEASE	CI		5.01E 02	3.16E 02	2.50E 01
2. AVG RELEASE RATE FOR PERIOD	UCI/SEC		6.31E 01	3.97E 01	
B. IODINE					
1. TOTAL I-131	CI		3.09E-03	2.28E-03	2.50E 01
2. AVG RELEASE RATE FOR PERIOD	UCI/SEC		3.88E-04	2.87E-04	
C. PARTICULATE					
1. HALF-LIVES >8 DAYS	CI		1.79E-03	1.60E-03	2.50E 01
2. AVG RELEASE RATE FOR PERIOD	UCI/SEC		2.25E-04	2.01E-04	
3. GROSS ALPHA RADIOACTIVITY	CI		1.71E-06	1.97E-06	
D. TRITIUM					
1. TOTAL RELEASE	CI		5.47E 00	1.02E 01	2.50E 01
2. AVG RELEASE RATE FOR PERIOD	UCI/SEC		6.89E-01	1.28E 00	
PERCENTAGE OF T.S. LIMITS					
CRITICAL ORGAN DOSE RATE	%		2.71E-02	2.34E-02	
TOTAL BODY DOSE RATE	%		2.24E-01	9.04E-02	
SKIN DOSE RATE	%		8.72E-02	3.57E-02	

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
 PERIOD: 7/ 1/84 TO 12/31/84
 GASEOUS EFFLUENTS-MIXED-MODE RELEASES

		CONTINUOUS MODE		BATCH MODE		
SURREY POWER STATION UNITS 1&2		UNIT	THIRD QUARTER	FOURTH QUARTER	THIRD QUARTER	FOURTH QUARTER
1. FISSION & ACTIVATION GASES						
KR-85	CI	0.00E-01	0.00E-01	1.43E-01	0.00E-01	
KR-85M	CI	2.89E-02	0.00E-01	1.59E-02	0.00E-01	
KR-87	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01	
KR-88	CI	0.00E-01	0.00E-01	1.72E-02	0.00E-01	
XE-133	CI	2.76E 01	4.60E 01	3.18E 01	6.57E 01	
XE-135	CI	9.92E-01	0.00E-01	2.72E-01	2.13E-02	
XE-135M	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01	
XE-138	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01	
XE-133M	CI	1.71E-01	3.45E-01	2.05E-01	5.44E-01	
XE-131M	CI	0.00E-01	6.35E-01	6.38E-01	5.83E-01	
AR-41	CI	0.00E-01	0.00E-01	3.07E-03	3.80E-03	
TOTAL FOR PERIOD		CI	2.88E 01	4.70E 01	3.31E 01	6.68E 01
2. IODINES						
I-131	CI	1.28E-05	2.33E-07	2.73E-06	9.08E-05	
I-133	CI	1.89E-06	0.00E-01	3.35E-07	4.11E-07	
I-135	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01	
I-132	CI	0.00E-01	0.00E-01	0.00E-01	6.06E-07	
TOTAL FOR PERIOD		CI	1.47E-05	2.33E-07	3.06E-06	9.18E-05
3. PARTICULATES						
SR-89	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01	
SR-90	CI	0.00E-01	1.91E-10	0.00E-01	0.00E-01	
CS-134	CI	6.38E-07	3.71E-07	1.94E-08	3.94E-08	
CS-137	CI	1.80E-06	1.17E-06	5.42E-08	1.99E-07	
BA-140	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01	
LA-140	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01	
CO-58	CI	2.61E-07	2.22E-08	0.00E-01	5.56E-08	
CO-60	CI	1.03E-05	3.80E-06	0.00E-01	0.00E-01	
RB-88	CI	0.00E-01	0.00E-01	2.85E-03	6.62E-06	
CS-138	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01	
MN-54	CI	3.36E-07	7.55E-08	0.00E-01	5.12E-08	
SB-125	CI	1.56E-07	0.00E-01	0.00E-01	0.00E-01	
CO-57	CI	2.12E-08	2.12E-09	0.00E-01	0.00E-01	
SR-92	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01	
TC-99M	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01	
CR-51	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01	
NB-95	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01	
RU-103	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01	

TABLE 1C

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
 PERIOD: 7/ 1/84 TO 12/31/84
 GASEOUS EFFLUENTS-GROUND LEVEL RELEASES

Attachment 1
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		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	0.00E-01	0.00E-01	0.00E-01	2.66E-03
KR-85M	CI	0.00E-01	0.00E-01	0.00E-01	1.72E-05
KR-87	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01
KR-88	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01
XE-133	CI	1.52E 02	0.00E-01	2.72E 02	2.02E 02
XE-135	CI	1.25E 01	0.00E-01	2.74E 00	1.50E-02
XE-135M	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01
XE-138	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01
XE-133M	CI	0.00E-01	0.00E-01	0.00E-01	2.85E-03
XE-131M	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01
AR-41	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01
TOTAL FOR PERIOD	CI	1.65E 02	0.00E-01	2.75E 02	2.02E 02
2. IODINES					
I-131	CI	1.74E-03	3.81E-04	1.33E-03	1.81E-03
I-133	CI	2.66E-03	3.57E-04	2.30E-04	7.26E-05
I-135	CI	9.64E-04	3.87E-04	0.00E-01	1.74E-05
I-132	CI	3.12E-04	0.00E-01	3.40E-05	5.85E-05
TOTAL FOR PERIOD	CI	5.68E-03	1.13E-03	1.59E-03	1.96E-03
3. PARTICULATES					
SR-89	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SR-90	CI	3.17E-07	8.01E-08	1.16E-06	2.85E-08
CS-134	CI	2.40E-04	2.58E-04	1.25E-05	1.45E-05
CS-137	CI	1.34E-03	7.69E-04	3.33E-05	5.03E-05
BA-140	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01
LA-140	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CO-58	CI	7.11E-06	1.15E-04	9.17E-08	4.89E-05
CO-60	CI	1.21E-04	3.01E-04	1.29E-05	2.97E-05
RB-88	CI	1.54E-02	0.00E-01	0.00E-01	5.71E-05
CS-138	CI	4.30E-04	0.00E-01	0.00E-01	0.00E-01
MN-54	CI	4.49E-06	0.00E-01	7.28E-07	1.64E-09
SB-125	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CO-57	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01
SR-92	CI	4.16E-06	0.00E-01	0.00E-01	0.00E-01
TC-99M	CI	0.00E-01	0.00E-01	0.00E-01	3.74E-06
CR-51	CI	0.00E-01	0.00E-01	0.00E-01	7.87E-08
NB-95	CI	0.00E-01	7.74E-07	0.00E-01	0.00E-01
RU-103	CI	0.00E-01	3.27E-06	0.00E-01	0.00E-01

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
 PERIOD: 7/ 1/84 TO 12/31/84
 LIQUID EFFLUENTS

SURREY POWER STATION UNITS 1&2	UNIT	CONTINUOUS MODE		BATCH MODE	
		THIRD QUARTER	FOURTH QUARTER	THIRD QUARTER	FOURTH QUARTER
SR-89	CI	0.00E-01	0.00E-01	0.00E-01	5.69E-04
SR-90	CI	0.00E-01	0.00E-01	0.00E-01	0.00E-01
CS-134	CI	5.53E-02	9.76E-02	3.99E-01	2.99E-01
CS-137	CI	1.41E-01	2.99E-01	8.71E-01	6.85E-01
I-131	CI	6.26E-04	2.20E-04	9.26E-02	5.53E-02
CO-58	CI	7.49E-05	6.77E-03	6.63E-02	1.10E 00
CO-60	CI	8.17E-04	4.52E-03	2.51E-01	6.46E-01
FE-59	CI	0.00E-01	0.00E-01	1.50E-04	2.49E-03
ZN-65	CI	0.00E-01	0.00E-01	2.54E-04	1.32E-04
MN-54	CI	0.00E-01	0.00E-01	7.73E-03	1.35E-02
CR-51	CI	0.00E-01	3.20E-03	2.77E-03	3.29E-01
ZR-95	CI	0.00E-01	0.00E-01	6.39E-04	3.92E-02
NB-95	CI	0.00E-01	1.93E-04	2.67E-03	4.55E-02
MO-99	CI	0.00E-01	0.00E-01	4.75E-04	3.14E-04
TC-99M	CI	3.37E-05	2.19E-05	1.03E-03	3.68E-04
BA-140	CI	5.64E-03	0.00E-01	6.17E-05	1.86E-05
LA-140	CI	0.00E-01	0.00E-01	3.20E-03	8.56E-03
CE-141	CI	1.95E-05	1.05E-05	2.10E-04	3.96E-03
I-133	CI	3.76E-04	5.90E-05	6.11E-03	7.04E-04
CS-136	CI	0.00E-01	0.00E-01	1.65E-03	8.54E-04
SB-125	CI	6.33E-05	4.53E-05	3.74E-03	5.90E-02
RB-88	CI	0.00E-01	0.00E-01	2.21E-03	0.00E-01
NA-24	CI	0.00E-01	7.52E-05	4.36E-05	1.20E-02
SB-124	CI	0.00E-01	0.00E-01	1.50E-04	6.22E-02
RU-103	CI	0.00E-01	2.11E-05	3.15E-04	1.34E-02
CE-144	CI	1.69E-03	0.00E-01	8.23E-04	2.19E-02
TE-132	CI	7.99E-04	2.31E-04	6.90E-05	2.07E-03
CO-57	CI	0.00E-01	9.17E-06	4.02E-04	2.50E-03
AG-110M	CI	0.00E-01	0.00E-01	1.98E-03	2.03E-02
SR-92	CI	0.00E-01	0.00E-01	5.82E-04	7.46E-03
I-132	CI	0.00E-01	0.00E-01	1.98E-04	3.60E-03
I-135	CI	0.00E-01	0.00E-01	1.20E-04	0.00E-01
I-134	CI	0.00E-01	0.00E-01	3.44E-05	0.00E-01
ND-147	CI	0.00E-01	1.84E-03	6.19E-06	6.94E-05
BI-207	CI	0.00E-01	0.00E-01	2.29E-05	0.00E-01
NA-22	CI	0.00E-01	0.00E-01	2.42E-06	0.00E-01
FE-55	CI	0.00E-01	0.00E-01	1.93E-02	8.89E-02
NP-239	CI	0.00E-01	0.00E-01	0.00E-01	6.03E-04
TOTAL FOR PERIOD	CI	2.07E-01	4.14E-01	1.74E 00	3.53E 00
XE-133	CI	6.66E-02	2.39E-03	1.12E 00	7.36E-02
XE-135	CI	4.07E-04	7.40E-06	1.25E-01	1.89E-02
KR-85M	CI	0.00E-01	0.00E-01	1.39E-03	4.73E-04
XE-133M	CI	1.08E-04	0.00E-01	8.80E-03	1.55E-04
KR-88	CI	5.25E-05	0.00E-01	1.32E-03	1.23E-04
AR-41	CI	0.00E-01	0.00E-01	5.02E-05	2.04E-04
XE-131M	CI	3.81E-04	2.22E-04	1.98E-03	1.42E-03
XE-135M	CI	0.00E-01	0.00E-01	1.60E-03	1.72E-04
KR-87	CI	0.00E-01	0.00E-01	0.00E-01	2.23E-05

TABLE 3

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

PERIOD: 7/01/84-12/31/84

SURRY POWER STATION

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

1. Type of waste	Unit	6-month Period	Est. Total Error, %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m ³ Ci	4.49E+01 1.02E+03	5.00E+00 3.00E+01
b. Dry compressible waste, contaminated equip., etc.	m ³ Ci	3.52E+02 6.79E+00	5.00E+00 3.00E+01
c. Irradiated components, control rods, etc.	m ³ Ci	0.00E+00 0.00E+00	0.00E+00 0.00E+00
d. Other (describe) Solidified Oil	m ³ Ci	7.86E+00 2.12E-01	5.00E+00 3.00E+01

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

a. Co-60	%	4.16E+01
Co-58	%	1.61E+01
Cs-137	%	1.52E+01
Fe-55	%	8.30E+00
Ni-63	%	8.13E+00
Cs-134	%	4.79E+00
Mn-54	%	2.21E+00
Cr-51	%	1.20E+00
b. Cs-137	%	2.59E+01
Fe-55	%	2.23E+01
Co-60	%	2.02E+01
Cs-134	%	1.32E+01
H-3	%	9.54E+00
Ni-63	%	4.17E+00
Co-58	%	3.78E+00
c. ———	%	0.00E+00
d. H-3	%	9.73E+01
Cs-137	%	1.04E+00

3. Solid Waste Disposition

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
12	Truck	Barnwell, SC
12	Truck	Richland, WA

B. IRRADIATED FUEL SHIPMENTS (Disposition)

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
0	Not Applicable	Not Applicable

Curies - Mixed Mode Airborne Releases

The following activity represents mixed mode releases for the first six months of 1984. This activity is included in the tables listed on pages 1-3 of Attachment 1:

<u>Isotope</u>	<u>Activity (Curies)</u>
Xe-133	6.33E+2
Xe-133m	2.35E+0
Xe-135	1.36E+1
Xe-131m	2.10E+0
KR-85m	5.75E-1
KR-88	4.10E-1
I-131	2.08E-4
I-132	1.57E-7
I-133	3.83E-5
I-135	5.37E-6
H-3	1.50E+1
Cs-134	2.07E-5
Cs-137	3.77E-5
Co-58	8.42E-6
Co-60	6.52E-5
Mn-54	1.14E-6
Rb-88	1.14E-5

ANNUAL AND QUARTERLY DOSES

	<u>LIQUID</u>			<u>GASEOUS</u>		
	Total Body (mRem)	Thyroid (mRem)	GI-LLI (mRem)	Gamma (mRad)	Beta (mRad)	Thyroid (mRem)
1st Quarter	6.70 E-3	2.54 E-2	1.37 E-2	1.11 E+0	3.24 E+0	6.69 E-1
2nd Quarter	1.03 E-2	2.19 E-2	1.59 E-2	3.35 E+0	8.60 E+1	2.72 E-1
3rd Quarter	9.34 E-3	5.87 E-3	8.92 E-3	3.32 E-1	8.94 E-1	6.12 E-2
4th Quarter	2.22 E-2	5.76 E-3	2.20 E-1	1.37 E-1	4.08 E-1	4.48 E-2
Annual	4.85 E-2	5.89 E-2	2.58 E-1	4.93 E+0	1.31 E+1	1.05 E+0

REVISIONS TO OFFSITE DOSE CALCULATION MANUAL (ODCM)

There were no licensee initiated changes made to the Offsite Dose Calculation Manual during the period July 1, 1984 through December 31, 1984.

REVISIONS TO THE PROCESS CONTROL PROGRAM (PCP)

1. A revision to the Process Control Program was approved on November 27, 1984.
 - a. Surry Power Station currently does not operate a permanent system to solidify radioactive wastes onsite and therefore, relies upon vendor supplied systems. When solidification is required, a vendor will supply a temporary onsite solidification system, set of operating procedures and a PCP. Upon approval by the Station Nuclear Safety and Operating Committee, the procedures would be incorporated into appropriate operations and/or Health Physics Procedures as an Attachment. Incorporating vendor operating procedures and PCP into station procedures requires wide distribution to all holders of Health Physics and/or Operations procedures. The change made to the PCP in November provided the flexibility to incorporate vendor supplied procedures and PCP as an Attachment or by reference.
 - b. The Surry PCP lists criteria which vendor supplied PCP's must comply with to insure the overall conformance of the solidified waste product. This revision did not alter these criteria, therefore, the change did not reduce the overall conformance of the solidified waste product.
 - c. The following pages contain a copy of the changes to the PCP and documentation that the change was reviewed by the Station Nuclear Safety and Operating Committee.

<p align="center">SURRY POWER STATION PROCEDURE</p>	<p align="right">(1)</p> <p>PROCEDURE Process NUMBER: Contr. Prog.</p>																		
	<p align="right">(2)</p> <p>DATE: NOV 27 1984</p>																		
<p>TYPE PROCEDURE: PROCESS CONTROL PROGRAM</p>	<p align="right">(3)</p> <p align="right">(4)</p> <p>UNIT #: 1 & 2</p>																		
<p>TITLE: RADIOACTIVE WASTE PROCESS CONTROL PROGRAM</p>																			
<p align="right">(5)</p> <p align="right">(6)</p> <p align="center"><u>LIST OF EFFECTIVE REVISIONS:</u></p> <table border="1"> <thead> <tr> <th><u>SECTION</u></th><th><u>DATE</u></th></tr> </thead> <tbody> <tr><td>1.0</td><td>08-02-84</td></tr> <tr><td>2.0</td><td>08-02-84</td></tr> <tr><td>3.0</td><td>NOV 27 1984</td></tr> <tr><td>4.0</td><td>NOV 27 1984</td></tr> <tr><td>5.0</td><td>08-02-84</td></tr> <tr><td>6.0</td><td>NOV 27 1984</td></tr> <tr><td>7.0</td><td>08-02-84</td></tr> <tr><td>8.0</td><td>08-02-84</td></tr> </tbody> </table>		<u>SECTION</u>	<u>DATE</u>	1.0	08-02-84	2.0	08-02-84	3.0	NOV 27 1984	4.0	NOV 27 1984	5.0	08-02-84	6.0	NOV 27 1984	7.0	08-02-84	8.0	08-02-84
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8.0	08-02-84																		
<p align="center">THINK ALARA</p>																			
<p>RECOMMEND APPROVAL:</p> <p><i>Lida Chen</i></p>	<p align="right">(7)</p> <p align="right">(8)</p> <p>DATE: 11-5-84</p>																		
<p>QUALITY CONTROL REVIEW:</p> <p><i>Joe G. Gitter</i></p>	<p align="right">(9)</p> <p align="right">(10)</p> <p>DATE: 11-20-84</p>																		
<p>APPROVED STATION NUCLEAR SAFETY AND OPERATING COMMITTEE:</p> <p><i>David L. Benson</i></p>	<p align="right">(11)</p> <p align="right">(12)</p> <p>DATE: 11-27-84</p>																		

NOV 27 1984

3.0 System Description [continued]

3.2 Solidification System [continued]

The system operating procedures for solidification will be submitted to Vepco for determination of compliance with the Process Control Program. Upon approval by the Station Nuclear Safety and Operating Committee, the procedures will be incorporated into the appropriate Operations and/or Health Physics Procedures as an attachment or by reference.

The solidification system will not be considered operable until the operating procedures are approved by Vepco.

NOV 27 1984

4.0 Waste Sources and Characteristics [continued]

4.2 Filter Elements

Mechanical filters normally using wound cartridge are used for removing particulate matter from systems described in Section 4. Spent filter elements are removed from systems and placed in storage bunkers to await processing and shipment. The filter elements are stabilized by cement encapsulation prior to shipment. Methods and procedures for encapsulation have been approved by the Burial Site operators. Alternate packaging methods such as placement in high integrity containers may be considered. Utilization of these methods would be subject to approval by the Burial site.

4.3 Organic Waste

Oil used in systems for cooling and lubrication which comes into contact with radioactive contamination, must be processed to ensure compliance with Burial site requirements. Oily waste is generated by system leakage or from normal system replacement and stored until the batch can be processed. All contaminated waste oil requiring burial at a radioactive waste burial grounds will be stabilized by solidification. Solidification equipment, materials and procedures will be supplied by the contractor and included as an attachment to, or referenced by station approved procedures.

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6.0 Contractor Services/Station Interface and Requirements

Currently there is no installed solidification system onsite to process wastes that require solidification. In the event such services are required, a contractor will be requested to submit, for approval, solidification system operating procedures, a list of physical interfaces, materials required, and a list of expected utility/contractor responsibilities.

The solidification system operating procedures will be reviewed in accordance with the Process Control Program to determine adequate station control and Quality Assurance criteria are met. Once approved by the Station Nuclear Safety Operating Committee, the system operating procedures will be incorporated into, or referenced by existing Health Physics and/or Operations Controlling Procedures.

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 during the period of July 1, 1984 through December 31, 1984.

INOPERABILITY OF RADIOACTIVE LIQUID AND GASEOUS
EFFLUENT MONITORING INSTRUMENTATION

Technical Specification 3.7.E.2 requires the Semi-Annual Report to include an explanation why monitors required by Technical Specification Tables 3.7-5 (a) and 3.7-5 (b) which were determined inoperable, were not returned to operable status within 30 days.

Three monitors require explanation under this criteria for the period of July 1, 1984 through December 31, 1984. They are the Component Cooling Service Water Monitor, Unit #2 Discharge Tunnel Monitor and the Waste Gas Holdup System Explosive Gas Oxygen Monitor.

1. The Component Cooling Service Water Monitor (RM-SW-107) was inoperable prior to this reporting period. The offline Radiation Monitor is operable but pumps bringing service water to the monitor failed. Repeated efforts to return the pumps to operable status failed and on June 4, 1984, a Design Change (84-25) was initiated to replace the monitoring system.

Grab Sampling, required by Table 3.7-5 (a) when the monitor is out of service, has been performed since the monitor became inoperable. The Grab Sampling will continue until Design Change 84-25 is completed.

2. The Unit #2 Discharge Tunnel Monitor (RM-SW-220) was determined inoperable prior to this reporting period. The inline monitor housing experienced corrosion problems and requires redesign to provide stronger support. An Engineering Work Request (EWR 83-12) was initiated on October 28, 1983.

All Effluent Releases via this pathway have been diverted to the Unit #1 Discharge Tunnel.

3. The Waste Gas Holdup System Explosive Gas Oxygen Monitor (GW-102A and GW-102B) was inoperable prior to this reporting period. Repeated attempts to return the monitor to service during the months of June, July and August of 1984 failed and an Engineering Work Request (EWR 84-268) was initiated on August 31, 1984 to correct the problem.

Grab Sampling, required by Technical Specification Table 3.7-5 (b) when the monitor is out of service, has been performed since the monitor became inoperable. The Grab Sampling will continue to satisfy the monitoring requirements until the installation of the new monitors.

UNPLANNED RELEASES

There have been no Unplanned Liquid or Gaseous Releases that exceeded Technical Specification 3.11.A.1.a or 3.11.B.1.a during the period of July 1, 1984 through December 31, 1984.