

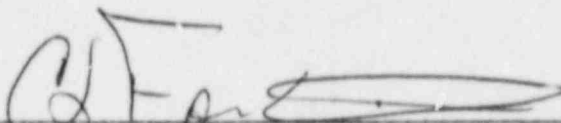
RIVER BEND STATION, UNIT 1

SEMIANNUAL RADIOACTIVE

EFFLUENT RELEASE REPORT

REPORT PERIOD: January 1, 1988 Through June 30, 1988

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SEMIANNUAL RADIOACTIVE EFFLUENT
RELEASE REPORT

FACILITY: River Bend Station, Unit 1
LICENSEE: Gulf States Utilities
REPORT PERIOD: January 1, 1988 through June 30, 1988

I. INTRODUCTION

Enclosed is the Semiannual Radioactive Effluent Release Report for the period of January 1, 1988 through June 30, 1988. This report is submitted in accordance with Technical Specification 6.9.1.8 of Appendix A to River Bend Station (RBS) License Number NPF-47.

II. SUPPLEMENTAL INFORMATION

A. Regulatory Limits

1. 10CFR20 Limits

a. Fission and Activation Gases

In accordance with Technical Specification 3.11.2.1, the dose rate due to noble gases released in gaseous effluents from the site to areas at and beyond the SITE BOUNDARY shall be limited to less than or equal to 500 mrems/yr to the total body and less than or equal to 3000 mrems/yr to the skin:

$$DR_{TB} = \text{Dose rate to the total body in mrems/yr}$$

$$= 3.15 \times 10^7 \sum_{i=1}^n K_i (X/Q) Q_i \leq 500 \text{ mrems/yr}$$

and

$$DR_{\text{skin}} = \text{Dose rate to the skin in mrems/yr}$$

$$= 3.15 \times 10^7 \sum_{i=1}^n (L_i + 1.1M_i)(X/Q) Q_i \leq 3000 \text{ mrems/yr}$$

(above terms defined in RBS ODCM).

b. Radioiodines and Particulates

In accordance with Technical Specification 3.11.2.1, the dose rate due to iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days released in gaseous effluents from the site to areas at and beyond the SITE BOUNDARY shall be limited to less than or equal to 1500 mrems/yr to any organ:

$$DR_{I\&8DPt} = \text{Dose rate to the organ } t \text{ for the age group of interest from iodines, tritium, and 8 day particulates via the inhalation pathway in mrems/yr}$$

$$= \sum_{i=1}^n P_i (\overline{X/Q})_D Q_i \leq 1500 \text{ mrems/yr}$$

(above terms defined in RBS ODCM)

c. Liquid Effluents

In accordance with Technical Specification 3.11.1.1, the concentration of radioactive material released in liquid effluents to UNRESTRICTED AREAS shall be limited to the concentrations specified in 10CFR20, Appendix B, Table II, Column 2 for radionuclides other than dissolved and entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to 2×10^{-4} microcuries/ml total activity.

2. 10CFR50, Appendix I Limits

a. Fission and Activation Gases

In accordance with Technical Specification 3.11.2.2, the air dose due to noble gases released in gaseous effluents to areas at or beyond the SITE BOUNDARY shall be limited to:

$D_{\text{Gamma-Air}}$ = The gamma air dose from radioactive noble gases in mrad

$$= \sum_{i=1}^n M_i (\overline{X/Q}) Q_i \leq 5 \text{ mrad/qtr} \\ \leq 10 \text{ mrad/yr}$$

$D_{\text{Beta-Air}}$ = Beta air dose from radioactive noble gases in mrad

$$= \sum_{i=1}^n N_i (\overline{X/Q}) Q_i \leq 10 \text{ mrad/qtr} \\ \leq 20 \text{ mrad/yr}$$

(above terms defined in RBS ODCM)

b. Radioiodines and Particulates

In accordance with Technical Specification 3.11.2.3, the dose to a MEMBER OF THE PUBLIC from iodine-131, iodine-133, and all radionuclides in particulate form with half-lives greater than 8 days, in gaseous effluents releases to areas at and beyond the SITE BOUNDARY shall be limited to:

$D_{\text{I\&8DP}\tau}$ = Dose in mrem to the organ (τ) of a specified age group from radioiodines, tritium, and 8 day particulates via the pathway of interest

$$= 3.17 \times 10^{-8} \sum_{i=1}^n R_{it} \frac{(X/Q)_D Q_i}{D}$$

and/or

$$= 3.17 \times 10^{-8} \sum_{i=1}^n R_{it} \frac{(D/Q) Q_i}{D}$$

and

D_τ = Dose in mrem to the organ (τ) of a specified age group from radioiodines, tritium, and 8 day particulates from all pathways

$$= \sum_{z=1}^n D_{I\&8DP\tau} \leq 7.5 \text{ mrem/qtr}$$

$$\leq 15 \text{ mrem/yr}$$

(above terms defined RBS ODCM)

c. Liquid Effluents

In accordance with Technical Specification 3.11.1.2, the dose or dose commitment to a MEMBER OF THE PUBLIC from radioactive materials in liquid effluents released to UNRESTRICTED AREAS shall be limited to:

$D_{TOTAL\tau}$ = Total dose commitment to the organ (τ) due to all releases during the desired time interval in mrem

where: $D_{TOTAL\tau} = \sum_{i=1}^n (D_{\tau a})_i$

and $D_{\tau a} = \sum_{i=1}^n D_{it} = \sum_{i=1}^n \frac{A_{it} \Delta t_1 Q_{i1}}{(DF)_1 D_w}$

and	D_{TOTAL}	\leq	1.5 mrems/qtr
	Total Body		
		\leq	3 mrems/yr
	D_{TOTAL}	\leq	5 mrems/qtr
	ANY ORGAN		
		\leq	10 mrems/yr

(above terms defined in RBS ODCM)

3. 40CFR190 Limits

In accordance with Technical Specification 3.11.4, the annual (calendar year) dose or dose commitment to any MEMBER OF THE PUBLIC, due to releases of radioactivity and to radiation from uranium fuel cycle sources, shall be limited to:

- \leq 25 mrems to the total body or any organ (except the thyroid)
- \leq 75 mrems to the thyroid

4. Miscellaneous Limits

a. Ventilation Exhaust Treatment System

In accordance with Technical Specification 3.11.2.5, the VENTILATION EXHAUST TREATMENT SYSTEM shall be used to reduce radioactive materials in gaseous waste prior to their discharge when the projected doses, due to gaseous effluent releases to areas at and beyond the SITE BOUNDARY would exceed 0.3 mrem to any organ in a 31 day period.

b. Liquid Radwaste Treatment System

In accordance with Technical Specification 3.11.1.3, the liquid radwaste treatment system shall be used to reduce the radioactive materials in liquid wastes prior to their discharge when the projected doses, due to the liquid effluent, to UNRESTRICTED AREAS would exceed 0.06 mrem to the total body or 0.2 mrem to any organ in a 31 day period.

B. Maximum Permissible Concentrations

1. Gaseous Releases

The RBS Radiological Effluents Technical Specifications (RETS) for gaseous releases are based on the dose rate restrictions of 10CFR20, rather than the Maximum Permissible Concentrations (MPC) listed in 10CFR20 Appendix B, Table II, Column 1.

2. Liquid Releases

The Maximum Permissible Concentration of radioactive materials in liquid effluents is limited by 10CFR20, Appendix B, Table II, Column 2. The MPC chosen is the most conservative value (i.e., the lowest) of either the soluble or insoluble MPC for each radionuclide.

C. Average Energy

Not applicable to RBS RETS

D. Measurements and Approximations of Total Radioactivity

1. Gaseous Effluents

a. Fission and Activation Gases

Periodic grab samples are obtained from the Main Plant Exhaust Duct, Fuel Building Exhaust Vent and Radwaste Building Exhaust Vent. These samples are analyzed utilizing high resolution germanium detectors coupled to computerized pulse height analyzers. The sampling and analysis frequencies are described in Table 1. Sampling and analysis of these effluent streams provide noble gas radionuclide relative abundances which can then be applied to the noble gas gross activity and gross activity release rate to obtain nuclide specific activities and release rates. The noble gas gross activity released within a specific time period is determined by integrating the stack monitor release rate over the considered time period. An average correction factor of 0.015 has been utilized for this report period due to the infrequent detection of noble gas radionuclides in the effluent stream. If no activity was detected between stack grab samples and significant increase in hourly averages were recorded, the nuclide relative abundances of the last sample which indicated the presence of activity was utilized to obtain nuclide specific activities.

b. Particulates and Iodines

Particulates and iodines are continuously sampled from each of the three release points utilizing a particulate filter and charcoal cartridge in line with a sample pump (stack monitor pump). These filters and charcoal cartridges are removed and analyzed in accordance with the frequencies specified in Table 1. Analysis is performed to identify and quantify radionuclides utilizing high resolution germanium detectors coupled to computerized pulse height analyzers. Given the nuclide specific activity concentrations, process flow rate, and time which the sample covered; the nuclide specific activity released to the environment can be obtained. Due to the continuous sampling process, it is assumed that the radioactive material is released to the environment at a constant rate within the sampling period. Sr-89 and Sr-90 are quantitatively analyzed by counting the digested filter precipitate with a gas flow proportional counter. Gross alpha analysis is performed using a zinc sulfide scintillation counter.

c. Tritium

Tritium grab samples are obtained from the three release points at the specified frequencies listed in Table 1 utilizing an ice bath condensation collection method. The collected sample is then analyzed utilizing a Liquid Scintillation Counter. Given the tritium concentration, process flow rate, and time period for which the sample is obtained, the tritium activity released to the environment can be determined. Due to the frequency of sampling, it is assumed that the tritium is released to the environment at a constant rate within the time period for which the sample is obtained.

2. Liquid Effluents

Representative grab samples are obtained from the appropriate sample recovery tank and analyzed prior to release of the tank in accordance with the frequencies listed in Table 2. Analysis for gamma emitting nuclides (including dissolved and entrained noble gases) is performed utilizing a high resolution germanium detector coupled to a computerized pulse height analyzer. Tritium concentration is determined utilizing a Liquid Scintillation Counter. Sr-89 and Sr-90 are quantitatively analyzed by counting the precipitate with a gas flow proportional counter. Fe-55 is counted with a Liquid Scintillation Counter after digestion of the iron. Gross alpha analysis is performed using a zinc sulfide scintillation counter.

Given the nuclide specific activity concentration and total volume of the tank that was released, the activity of each nuclide released to the environment can be determined.

E. Batch Releases

1. Liquid

1st Quarter 1988

a. Number of batch releases	:	128
b. Total time period for batch releases	:	815.03 hr
c. Maximum time period for batch releases	:	7.57 hr
d. Average time period for batch releases	:	6.37 hr
e. Minimum time period for a batch release	:	3.47 hr
f. Average stream flow during periods of release of effluent into a flowing stream	:	730,000 ft ³ /sec

2nd Quarter 1988

a. Number of batch releases	:	61
b. Total time period for batch releases	:	383.48 hr
c. Maximum time period for batch releases	:	8.17 hr
d. Average time period for batch releases	:	6.29 hr
e. Minimum time period for a batch release	:	0.07 hr
f. Average stream flow during periods of release of effluent into a flowing stream	:	393,000 ft ³ /sec

2. Gaseous

During this reporting period all gaseous releases were considered continuous releases, and no batch releases occurred.

III. GASEOUS EFFLUENTS SUMMARY INFORMATION

Refer to Tables 3, 4 and 5 for Summation of All Releases and Nuclides Released, respectively. It should be noted that an entry of "0.00E+00" Ci or uCi/sec in this section does not indicate the absence of a radionuclide; but, rather, indicates that the concentration of the particular radionuclide was below the Lower Limit of Detection (LLD) as listed in Table 1.

IV. LIQUID EFFLUENTS SUMMARY INFORMATION

Refer to Table 6 for Summation of All Releases and Nuclides Released. It should be noted that an entry of "0.00E+00" Ci or uCi/ml in this section does not indicate the absence of a radionuclide; but, rather, indicates that the concentration of the particular radionuclide was below the Lower Limit of Detection (LLD) as listed in Table 2.

V. SOLID WASTE

Refer to Table 7

VI. RADIOLOGICAL IMPACT ON MAN

This information will be provided in the end-of-year report as described in Technical Specification 5.9.1.8.

VII. METEOROLOGICAL DATA

This information will be provided in the end-of-year report as described in Technical Specification 6.9.1.8.

VIII. RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION OPERABILITY

The minimum number of channels required to be OPERABLE as described in Table 3.3.7.10-1 of Technical Specification 3.3.7.10 were, if inoperable at any time in the period 1/1/88 through 6/30/88, restored to operable status within the required time. Reporting of the inoperable channels in this report is, therefore, not required.

IX. RADIOACTIVE G/SEOUS EFFLUENT MONITORING INSTRUMENTATION OPERABILITY

The minimum number of channels required to be OPERABLE as described in Table 3.3.7.11-1 of Technical Specification 3.3.7.11 were, if inoperable at any time in the period 1/1/88 through 6/30/88, restored to operable status within the required time. Reporting of these inoperable channels in this report is, therefore, not required.

X. LIQUID HOLD UP TANKS

The maximum quantity of radioactive material, excluding tritium and dissolved or entrained noble gases, contained in any unprotected outdoor tank during the period of 1/1/88 through 6/30/88 was less than or equal to the 10 curie limit as required by Technical Specification 3.11.1.4.

XI. RADIOLOGICAL ENVIRONMENTAL MONITORING

There were no changes in sampling locations for the Radiological Environmental Monitoring Program (REMP) during the reporting period 1/1/88 through 6/30/88.

XII. LAND USE CENSUS

This information will be presented in the end-of-year report. The Land Use Census results will be available in September 1988.

XIII. OFFSITE DOSE CALCULATION MANUAL (ODCM)

There were no changes to the Offsite Dose Calculation Manual (ODCM) during the reporting period 1/1/88 through 6/30/88.

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

There were no major changes to the radioactive liquid, gaseous, and solid waste treatment systems for the period of 1/1/88 through 6/30/88.

XV. PROCESS CONTROL PROGRAM (PCP)

No changes were made to the RBS Process Control Program (PCP) for the period 1/1/88 through 6/30/88.

TABLE 1

RADIOACTIVE GASEOUS WASTE SAMPLING AND ANALYSIS PROGRAM

Gaseous Release Type	Sampling Frequency	Minimum Analysis Frequency	Type of Activity Analysis	Lower Limit of Detection (LLD) (uCi/ml)
A. Main Plant Exhaust Duct	M Grab Sample	M	Principal Gamma Emitters	1×10^{-4}
			H-3	1×10^{-6}
B. Fuel Building Ventilation Exhaust Duct	M Grab Sample	M	Principal Gamma Emitters	1×10^{-4}
			H-3	1×10^{-6}
C. Radwaste Building Ventilation Exhaust Duct	M Grab Sample	M	Principal Gamma Emitters	1×10^{-4}
D. All Release Types as listed in A,B, C above.	Continuous	W Charcoal Sample	I-131	1×10^{-12}
			I-133	1×10^{-10}
	Continuous	W Particulate Sample	Principal Gamma Emitters (I-131, Others)	1×10^{-11}
	Continuous	M Composite Particulate Sample	Gross Alpha	1×10^{-11}
	Continuous	Q Composite Particulate Sample	SR-89, SR-90	1×10^{-11}

W = At least once per 7 days
M = At least once per 31 days
Q = At least once per 92 days

TABLE 2

RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSIS PROGRAM

Liquid Release Type	Sampling Frequency	Minimum Analysis Frequency	Type of Activity Analysis	Lower Limit of Detection (LLD) (uCi/ml)
A. Batch Waste Release (Liquid Radwaste Recovery Sample Tanks)	P Each Batch	P Each Batch	Principal Gamma Emitters; except for Ce-144	5×10^{-7}
				5×10^{-6}
			I-131	1×10^{-6}
	P One Batch/M	M	Dissolved and Entrained Gases (Gamma Emitters)	1×10^{-5}
	P Each Batch	M Composite	H-3	1×10^{-5}
Gross Alpha			1×10^{-7}	
P Each Batch	Q Composite	Sr-89, Sr-90	5×10^{-8}	
		Fe-55	1×10^{-6}	

P = Prior to each radioactive release

M = At least once per 31 days

Q = At least once per 92 days

TABLE 3

Effluent and Waste Disposal Semi-Annual Report 1988 Year
 Gaseous Effluents - Summation of All Releases 1/2 Quarters

	Unit	Quarter 1	Quarter 2	Est. Total Error, %
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A. Noble Gases

1. Total release	Ci	1.65E+00	0.00E+00	3.70E+01
2. Average release rate for period	uCi/sec	2.09E-01	0.00E+00	
3. Percent of technical specification limit (1)	%	5.42E-02	0.00E+00	

B. Iodines

1. Total I-131 and I-133	I-131 Ci	2.70E-05	1.24E-04	1.86E+01
	I-133 Ci	3.58E-04	1.12E-03	1.86E+01
2. Average release rate for period	I-131 uCi sec	3.43E-06	1.57E-05	
	I-133	4.54E-05	1.42E-04	
3. I-131 + I-133 contribu- tion percent of techni- cal specification limit	%	1.52E+00	6.81E+00	

C. Particulates

1. Particulates with half- lives of > 8 days	Ci	7.95E-05	(2)	1.86E+01
2. Average release rate for period	uCi/sec	1.01E-05	(2)	
3. Percent of technical specification limit	%	1.93E-01	(2)	
4. Gross alpha radioactivity	Ci	0.00E+00	0.00E+00	

	Unit	Quarter 1	Quarter 2	Est. Total Error, %
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D. Tritium

1. Total release	Ci	2.89E-01	1.19E+00	1.82E+01
2. Average release rate for period	uCi/sec	3.67E-02	1.51E-01	
3. Percent of technical specification limit	%	1.06E-03	4.36E-03	

(1) Gamma airdose limit of 5 mrads/qtr (T.S.3.11.2.2.a).

(2) Not available for submission at this time, supplemental report to follow.

TABLE 4

Effluent and Waste Disposal Semi-Annual Report 1988 Year
 Gaseous Effluents - Conditionally Elevated Releases 1/2 Quarters

Nuclides Released	Unit	Continuous Mode		Batch Mode	
		Quarter 1	Quarter 2	Quarter 1	Quarter 2
1. Fission Gases					
Argon-41	Ci	0.00E+00	0.00E+00	N/A	N/A
Krypton-85m	Ci	0.00E+00	0.00E+00	N/A	N/A
Krypton-85	Ci	0.00E+00	0.00E+00	N/A	N/A
Krypton-87	Ci	0.00E+00	0.00E+00	N/A	N/A
Krypton-88	Ci	0.00E+00	0.00E+00	N/A	N/A
Xenon-133m	Ci	0.00E+00	0.00E+00	N/A	N/A
Xenon-133	Ci	0.00E+00	0.00E+00	N/A	N/A
Xenon-135m	Ci	0.00E+00	0.00E+00	N/A	N/A
Xenon-135	Ci	1.65E+00	0.00E+00	N/A	N/A
Xenon-137	Ci	0.00E+00	0.00E+00	N/A	N/A
Xenon-138	Ci	0.00E+00	0.00E+00	N/A	N/A
unidentified	Ci	N/A	N/A	N/A	N/A
Total for period	Ci	1.65E+00	0.00E+00	N/A	N/A

2. Gaseous Iodines

Iodine-131	Ci	2.70E-05	1.24E-04	N/A	N/A
Iodine-132	Ci	0.00E+00	0.00E+00	N/A	N/A
Iodine-133	Ci	3.58E-04	1.12E-03	N/A	N/A
Iodine-134	Ci	0.00E+00	0.00E+00	N/A	N/A
Iodine-135	Ci	0.00E+00	0.00E+00	N/A	N/A
Total	Ci	3.85E-04	1.24E-03	N/A	N/A

Nuclides Released	Unit	Continuous Mode		Batch Mode	
		Quarter 1	Quarter 2	Quarter 1	Quarter 2

3. Particulates

Strontium-89	Ci	5.80E-06	(1)	N/A	N/A
Strontium-90	Ci	0.00E+00	(1)	N/A	N/A
Cesium-134	Ci	0.00E+00	0.00E+00	N/A	N/A
Cesium-137	Ci	0.00E+00	0.00E+00	N/A	N/A
Barium-lanthanum-140	Ci	0.00E+00	0.00E+00	N/A	N/A
Cobalt-60	Ci	0.00E+00	0.00E+00	N/A	N/A
Chromium-51	Ci	0.00E+00	0.00E+00	N/A	N/A
Zirconium-niobium-95	Ci	0.00E+00	0.00E+00	N/A	N/A
Zinc-65	Ci	0.00E+00	0.00E+00	N/A	N/A
Iron-59	Ci	0.00E+00	0.00E+00	N/A	N/A
Manganese-54	Ci	7.30E-05	0.00E+00	N/A	N/A
Iodine-131	Ci	0.00E+00	0.00E+00	N/A	N/A
Cerium-141	Ci	0.00E+00	0.00E+00	N/A	N/A
Cerium-144	Ci	0.00E+00	0.00E+00	N/A	N/A
Cobalt-58	Ci	0.00E+00	0.00E+00	N/A	N/A
Silver-110m	Ci	0.00E+00	0.00E+00	N/A	N/A
Molybdenum-99	Ci	0.00E+00	0.00E+00	N/A	N/A
unidentified	Ci	N/A	N/A	N/A	N/A
Total for period	Ci	7.88E-05	(1)	N/A	N/A

Nuclides Released	Unit	Continuous Mode		Batch Mode	
		Quarter 1	Quarter 2	Quarter 1	Quarter 2

4.0 Tritium

Hydrogen-3	Ci	2.24E-01	1.14E+00	N/A	N/A
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(1) Not available for submission at this time, supplemental report to follow.

Main Plant Exhaust Duct is considered a conditionally elevated release point.

TABLE 5

Effluent and Waste Disposal Semi-Annual Report 1988 Year
 Gaseous Effluents - Ground Level Releases 1/2 Quarters

Nuclides Released	Unit	Continuous Mode		Batch Mode	
		Quarter 1	Quarter 2	Quarter 1	Quarter 2
1. Fission Gases					
Argon-41	Ci	0.00E+00	0.00E+00	N/A	N/A
Krypton-85m	Ci	0.00E+00	0.00E+00	N/A	N/A
Krypton-85	Ci	0.00E+00	0.00E+00	N/A	N/A
Krypton-87	Ci	0.00E+00	0.00E+00	N/A	N/A
Krypton-88	Ci	0.00E+00	0.00E+00	N/A	N/A
Xenon-133m	Ci	0.00E+00	0.00E+00	N/A	N/A
Xenon-133	Ci	0.00E+00	0.00E+00	N/A	N/A
Xenon-135m	Ci	0.00E+00	0.00E+00	N/A	N/A
Xenon-135	Ci	0.00E+00	0.00E+00	N/A	N/A
Xenon-137	Ci	0.00E+00	0.00E+00	N/A	N/A
Xenon-138	Ci	0.00E+00	0.00E+00	N/A	N/A
unidentified	Ci	N/A	N/A	N/A	N/A
Total for period	Ci	0.00E+00	0.00E+00	N/A	N/A

2. Gaseous Iodines

Iodine-131	Ci	0.00E+00	0.00E+00	N/A	N/A
Iodine-132	Ci	0.00E+00	0.00E+00	N/A	N/A
Iodine-133	Ci	0.00E+00	0.00E+00	N/A	N/A
Iodine-134	Ci	0.00E+00	0.00E+00	N/A	N/A
Iodine-135	Ci	0.00E+00	0.00E+00	N/A	N/A
Total	Ci	0.00E+00	0.00E+00	N/A	N/A

Continuous Mode

Batch Mode

Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 1	Quarter 2
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3. Particulates

Strontium-89	Ci	0.00E+00	(1)	N/A	N/A
Strontium-90	Ci	0.00E+00	(1)	N/A	N/A
Cesium-134	Ci	0.00E+00	0.00E+00	N/A	N/A
Cesium-137	Ci	0.00E+00	0.00E+00	N/A	N/A
Barium-lanthanum-140	Ci	0.00E+00	0.00E+00	N/A	N/A
Cobalt-60	Ci	7.02E-07	0.00E+00	N/A	N/A
Chromium-51	Ci	0.00E+00	0.00E+00	N/A	N/A
Zirconium-niobium-95	Ci	0.00E+00	0.00E+00	N/A	N/A
Zinc-65	Ci	0.00E+00	0.00E+00	N/A	N/A
Iron-59	Ci	0.00E+00	0.00E+00	N/A	N/A
Manganese-54	Ci	0.00E+00	0.00E+00	N/A	N/A
Iodine-131	Ci	0.00E+00	0.00E+00	N/A	N/A
Iodine-132	Ci	0.00E+00	0.00E+00	N/A	N/A
Iodine-133	Ci	0.00E+00	0.00E+00	N/A	N/A
Cerium-141	Ci	0.00E+00	0.00E+00	N/A	N/A
Cerium-144	Ci	0.00E+00	0.00E+00	N/A	N/A
Cobalt-58	Ci	0.00E+00	0.00E+00	N/A	N/A
Silver-110m	Ci	0.00E+00	0.00E+00	N/A	N/A
Molybdenum-99	Ci	0.00E+00	0.00E+00	N/A	N/A
unidentified	Ci	N/A	N/A	N/A	N/A
Total for period	Ci	7.02E-07	(1)	N/A	N/A

Nuclides Released	Unit	Continuous Mode		Batch Mode	
		Quarter 1	Quarter 2	Quarter 1	Quarter 2

4.0 Tritium

Hydrogen-3	Ci	6.48E-02	4.63E-02	N/A	N/A
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(1) Not available for submission at this time, supplemental report to follow.

Fuel Building Exhaust Vent and Radwaste Building Exhaust Vent are considered ground level release points.

TABLE 6

Effluent and Waste Disposal Semi-Annual Report 1988 Year
Liquid Effluents - Summation of All Releases

	Unit	Quarter 1	Quarter 2	Est. Total Error, %
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A. Fission and activation products

1. Total release (not including tritium, gases, alpha)	Ci	6.69E-02	1.02E-01	1.42E+01
2. Average diluted concentration during period	uCi/ml	1.08E-07	3.38E-07	
3. Percent of applicable limit (1)	%	5.35E+00	8.13E+00	

B. Tritium

1. Total release	Ci	1.47E+00	1.16E+00	1.42E+01
2. Average diluted concentration during period	uCi/ml	2.37E-06	3.87E-06	
3. Percent of applicable limit (2)	%	7.91E-02	1.29E-01	

C. Dissolved and entrained gases

1. Total release	Ci	3.43E-03	6.77E-04	1.42E+01
2. Average diluted concentration during period	uCi/ml	5.53E-09	2.25E-09	
3. Percent of applicable limit (3)	%	2.76E-03	1.13E-03	

	Unit	Quarter 1	Quarter 2	Est. Total Error, %
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D. Gross alpha radioactivity

1. Total release	Ci	0.00E+00	0.00E+00	1.42E+01
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E. Volume of waste released
(prior to dilution)

liters	7.65E+06	3.56E+06	8.73E-01
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F. Volume of dilution water
used during period

liters	6.13E+08	2.97E+08	5.70E-01
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- (1) One quarter of 5 Ci annual limit (1.25 Ci) for liquid releases except for tritium and dissolved or entrained noble gases from 10CFR50 Appendix I.
- (2) 10CFR20, Appendix B, Table II, Column 2 MPC limit of 3.00E-03 uCi/ml.
- (3) Technical Specification 3.11.1.1 limit of 2.0E-04 uCi/ml for dissolved or entrained noble gases in liquid effluents.

Effluent and Waste Disposal Semi-Annual Report 1988 Year
 G. Liquid Effluents 1/2 Quarters

Nuclides Released	Unit	Continuous Mode		Batch Mode	
		Quarter 1	Quarter 2	Quarter 1	Quarter 2
Hydrogen-3	Ci	N/A	N/A	1.47E+00	1.16E+00
Arsenic-76	Ci	N/A	N/A	1.42E-04	2.26E-04
Strontium-89	Ci	N/A	N/A	0.00E+00	(1)
Strontium-90	Ci	N/A	N/A	0.00E+00	(1)
Cesium-134	Ci	N/A	N/A	0.00E+00	0.00E+00
Cesium-137	Ci	N/A	N/A	0.00E+00	0.00E+00
Iodine-131	Ci	N/A	N/A	0.00E+00	0.00E+00
Iodine-132	Ci	N/A	N/A	0.00E+00	0.00E+00
Iodine-133	Ci	N/A	N/A	0.00E+00	0.00E+00
Iodine-134	Ci	N/A	N/A	0.00E+00	0.00E+00
Iodine-135	Ci	N/A	N/A	0.00E+00	0.00E+00
Sodium-24	Ci	N/A	N/A	0.00E+00	0.00E+00
Cobalt-58	Ci	N/A	N/A	2.13E-03	5.40E-04
Cobalt-60	Ci	N/A	N/A	1.63E-02	2.37E-03
Iron-55	Ci	N/A	N/A	1.30E-02	(1)
Iron-59	Ci	N/A	N/A	8.40E-04	0.00E+00
Zinc-65	Ci	N/A	N/A	1.25E-03	3.27E-04
Manganese-54	Ci	N/A	N/A	7.74E-03	9.26E-04
Manganese-56	Ci	N/A	N/A	0.00E+00	0.00E+00
Chromium-51	Ci	N/A	N/A	3.76E-02	9.69E-02
Zirconium-Niobium-95	Ci	N/A	N/A	0.00E+00	0.00E+00
Molybdenum-99	Ci	N/A	N/A	1.04E-04	1.06E-04
Technicium-99m	Ci	N/A	N/A	1.25E-04	1.34E-04
Copper - 64	Ci	N/A	N/A	0.00E+00	0.00E+00
Tin - 113	Ci	N/A	N/A	0.00E+00	0.00E+00

Nuclides Released	Unit	Continuous Mode		Batch Mode	
		Quarter 1	Quarter 2	Quarter 1	Quarter 2
Barium-lanthanum-140	Ci	N/A	N/A	0.00E+00	0.00E+00
Cerium-141	Ci	N/A	N/A	0.00E+00	0.00E+00
Cerium-144	Ci	N/A	N/A	0.00E+00	0.00E+00
Antimony-122	Ci	N/A	N/A	1.56E-05	0.00E+00
Antimony-124	Ci	N/A	N/A	1.26E-04	0.00E+00
Rhodium - 105	Ci	N/A	N/A	0.00E+00	0.00E+00
Bromine - 82	Ci	N/A	N/A	0.00E+00	0.00E+00
Neptunium - 239	Ci	N/A	N/A	0.00E+00	0.00E+00
Niobium - 97	Ci	N/A	N/A	4.65E-04	1.05E-04
Total for period	Ci	N/A	N/A	1.55E+00	1.26E+00

H. Dissolved and Entrained Gases

Nuclides Released	Unit	Continuous Mode		Batch Mode	
		Quarter 1	Quarter 2	Quarter 1	Quarter 2
Argon 41	Ci	N/A	N/A	0.00E+00	0.00E+00
Krypton-85m	Ci	N/A	N/A	0.00E+00	0.00E+00
Krypton-85	Ci	N/A	N/A	0.00E+00	0.00E+00
Krypton-87	Ci	N/A	N/A	0.00E+00	0.00E+00
Krypton-88	Ci	N/A	N/A	0.00E+00	0.00E+00
Xenon-133m	Ci	N/A	N/A	0.00E+00	0.00E+00
Xenon-133	Ci	N/A	N/A	1.57E-03	3.57E-04
Xenon-135m	Ci	N/A	N/A	0.00E+00	0.00E+00
Xenon-135	Ci	N/A	N/A	1.86E-03	3.20E-04
Xenon-137	Ci	N/A	N/A	0.00E+00	0.00E+00
Xenon-138	Ci	N/A	N/A	0.00E+00	0.00E+00
unidentified	Ci	N/A	N/A	N/A	N/A
Total for period	Ci	N/A	N/A	3.43E-03	6.77E-04

(1) Not available at this time, supplemental report to follow.

TABLE 7

Effluent and Waste Disposal Semiannual Report 1988 YearSolid Waste and Irradiated Fuel Shipments
Reporting Period 01/01/88 to 06/01/88 Qtr 1/2

A. Solid Waste Shipped for Burial or Disposal (Not irradiated fuel)

1. Type of waste	Unit	6-month Period	Waste Class	Est. Total Error, %
a. Spent resins, filter sludges evaporator bottoms, etc.	m ³	7.00E+01	A-U	
	Ci	1.16E+02	A-S	2.24E+01
b. Dry compressible waste, contaminated equip, etc.	m ³	2.09E+01	N/A	2.87E+01
	Ci	4.43E-01		
c. Irradiated components, control rods, etc.	m ³	0.00E+00	N/A	0.00E+00
	Ci	0.00E+00		
d. Other (None)	m ³	0.00E+00	N/A	
	Ci	0.00E+00		0.00E+00

2.

TYPE OF WASTE	Spent Resins, filter sludges, evaporator bottoms, etc.	Dry compressible waste, contaminated equip, etc.	Irradiated Components control rods, etc.	Other (None)
Principle Radionuclides (Identify and % Abundance)	H-3 1.31E-02	C-14 1.01E-01	N/A	N/A
	C-14 2.97E-01	Cr-51 7.09E-03		
	Na-24 0.00E+00	Mn-54 9.98E+00		
	Cr-51 3.63E+00	Fe-55 5.92E+01		
	Mn-54 2.55E+01	Co-58 9.64E-04		
	Co-57 1.66E-02	Fe-59 1.45E-03		
	Co-58 4.52E+00	Co-60 2.78E+01		
	Fe-59 5.65E-01	Ni-63 3.93E-01		
	Co-60 4.91E+01	Zn-65 2.51E+00		
	Ni-63 1.03E+00	Am-241 5.89E-02		
	Cu-64 0.00E+00	Pu-241 2.17E-04		
	Zn-65 4.37E+00			
	As-76 0.00E+00			
	Nb-95 5.15E-02			
	Zr-95 0.00E+00			
	Mo-99 0.00E+00			
	Ag-110m 4.72E-02			
	Sn-113 1.23E-02			
	Sb-122 0.00E+00			
	Sb-124 1.35E-01			
	I-131 0.00E+00			
	I-133 0.00E+00			
	Te-131m 0.00E+00			
	Te-132 0.00E+00			
	Ba-140 0.00E+00			
	La-140 0.00E+00			
	Ce-141 0.00E+00			
	Ce-144 0.00E+00			
	W-187 0.00E+00			
	Np-239 0.00E+00			
	Gr-242 1.81E-04			
	Sc-46 0.00E+00			
	Gr-244 1.44E-04			
	Am-241 1.48E-04			
	Fe-55 1.07E+01			
	Pu-241 8.83E-03			
	Pu-238 3.24E-04			
	Pu-239 2.38E-04			
	TRU 0.00E+00			

TYPE OF WASTE	Spent Resins, filter sludges, evaporator bottoms, etc.	Dry compressible waste, contaminated equip, etc.	Irradiated Components control rods, etc.	Other (None)
Above Determined by: A. measurement B. estimation C. measurement and correlation	C	C	N/A	N/A
TYPE OF CONTAINER	Strong, Tight Liners	Strong, Tight Drum	N/A	N/A
SOLIDIFICATION AGENT OR ABSORBANT	Cement	N/A	N/A	N/A

3. SOLID WASTE DISPOSITION

Number of Shipments
13

Mode of Transportation
Truck, Exclusive Use

Destination
CNSI, Barnwell,
South Carolina

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments
0

Mode of Transportation
N/A

Destination
N/A



GULF STATES UTILITIES COMPANY

RIVER BEND STATION POST OFFICE BOX 220 ST. FRANCISVILLE, LOUISIANA 70775
AREA CODE 504 835-8284 346-1481

August 31, 1988
RBG- 28747
File Nos. G9.5, G9.25.1.5

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Gentlemen:

River Bend Station - Unit 1
Docket No. 50-458

Enclosed is the Semiannual Radioactive Effluent Release Report for the period of January 1 to June 30, 1988. This report is submitted in accordance with Technical Specification 6.9.1.8 of Appendix A to River Bend Station (RBS) License Number NPF-47.

Information unavailable for this report will be provided in a future addendum.

Sincerely,

J. E. Booker
Manager-River Bend Oversight
River Bend Nuclear Group

JEH/LAE/^{JK}ch

cc: U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, TX 76011

Senior Resident Inspector
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