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Carolina Power & Light Company

ROBINSON NUCLEAR PROJECT DEPARTMENT
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(10CFR50.36a)

U. S. Nuclear Regulatory Commission
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SUBJECT: Effluent and Waste Disposal Semiannual Report

Dear Sir:

The enclosed Semiannual Radioactive Effluent Release Report for the period of January 1 through June 30, 1988, is submitted pursuant to 10CFR50.36a(a)(2). The Report specifies the quantity of each of the principal radionuclides released to unrestricted areas in liquid and in gaseous effluents during the first six months of operation in 1988. This Report is to provide the NRC with information to estimate maximum potential annual radiation doses to the public resulting from effluent releases at Robinson Unit 2.

Should you require additional or other information, please contact my staff.

Very truly yours,

R. E. Morgan
General Manager
H. B. Robinson S. E. Plant

JMH:jch

Enclosures

cc: Mr. L. W. Garner
Dr. J. N. Grace

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EFFLUENT AND WASTE DISPOSAL

SEMIANNUAL REPORT

1/1/88 - 6/30/88

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEG PLANT - UNIT 2

FACILITY OPERATING LICENSE NO. DPR-23

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I. EXECUTIVE SUMMARY

Significant Variances

A. The following are explanations of significant variances in this Semiannual Report:

1. A minimum time of 12 minutes was reported for gaseous batch releases. This release was for a Waste Gas Decay tank which was used for the Plant Stack Gaseous Effluent Monitor (R-14) calibration.
2. The total airborne particulate curies released in the second quarter of 1988 was $1.63\text{E}-05$ versus $4.82\text{E}-07$ curies released in the first quarter. This is a factor of 33.8 increase and is due to cobalt-60 activity released during a Spent Fuel Cask decontamination project. This is also reflected in the average particulate release rate which also increased by a factor of 33.8.
3. The percent of the annual gaseous organ (thyroid) dose limit through the second quarter of 1988 is 0.9% versus 23.9% for the same period in 1987. This difference results from 1987 iodine releases which were made due to fuel cladding failures and the use of boric acid evaporators to process the RCS letdown. In 1988, a contractor demineralization system was used instead of evaporators and better fuel integrity has been achieved following a refueling outage in 1987.
4. A minimum time of 1 minute was reported for liquid batch releases. This release was terminated automatically by the effluent radiation alarm. The release tank was recirculated again, resampled, and released successfully.
5. The average liquid dilution stream flow for this reporting period is $2.44\text{E}+05$ gallons per minute compared to $3.83\text{E}+05$ gallons per minute for the second six months of 1987. This decrease, a factor of 1.6, is due primarily to the unit being off-line from January 29, 1988 through March 10, 1988 with two or less circulating water pumps in service. Also, following this outage, the unit operated with two circulating water pumps for approximately 70 days. This is in contrast to the second half of 1987 when more steady-state operations were achieved.

6. During the first quarter of 1988, 3.25 times more CVCS water was processed than WHUT. The average Tritium and Noble gas concentration in the CVCS HUT system is approximately $2.00\text{E}-01$ uCi/ml and $2.50\text{E}-03$ uCi/ml, respectively, which is a power of ten higher concentration than the normal concentrations found in Waste Holdup Tank liquid. During the 2nd Quarter 1988, processing CVCS HUT liquid was not started until May. For this reason the curie totals and average diluted concentrations for Tritium and Dissolved and Entrained Gases were significantly higher in the first quarter when compared to the second quarter 1988.

B. Regulatory Compliance

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 10CFR50, Appendix I limits. The direct radiation assessment to the likely most exposed member of the public is reported in the Annual Radiological Environmental Operating Report. Since no 10CFR50 Appendix I limits have been exceeded, and there are no other nearby uranium fuel cycle sources to be considered, this demonstrates conformance with 40CFR190, Environmental Radiation Protection Standards for Nuclear Power Operation.

There were no changes to the waste solidification process control program (PCP) during the first six months of 1988.

There were no changes to the Radioactive Waste Systems (liquid, gaseous, or solid) during the first six months of 1988 with the exception of a change in the vendor which supplies the liquid waste demineralization system.

There was a reportable instrumentation inoperability event during this reporting period. See Enclosure II.

No revisions were made to the Offsite Dose Calculation Manual (ODCM) during the first six months of 1988.

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

There were no waste gas decay tanks that exceeded the $1.9\text{E}+04$ curie limit during this reporting period.

II. SUPPLEMENTAL INFORMATION

A. Regulatory Limits

1. Fission and Activation Gases:

10CFR20 Limits (Instantaneous Release Rate)

Total Body Dose ≤ 500 mrem/yr

Skin Dose ≤ 3000 mrem/yr

10CFR50, 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:

10CFR20 Limits (Instantaneous Release Rate)

Dose from Inhalation (only) to a child to any organ
 ≤ 1500 mrem/yr

10CFR50, Appendix I (Organ Doses)

For Calendar Quarter ≤ 7.5 mrem

For Calendar Year ≤ 15 mrem

3. Liquids:

Concentrations are specified in 10CFR20, Appendix B, Table II, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to $2.00E-04$ $\mu\text{Ci/ml}$ total activity.

10CFR50, 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 radiogas is determined by the fraction of that radiogas 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, the particulate filter, and the total vent 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 vent flow.
- d. Tritium - The activity released as tritium is based on weekly grab sample analysis and total vent 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 batch releases are included in the iodine determination from the continuous Auxiliary Building release.
- c. Particulates - The particulates from batch releases are included in the particulate determination from the continuous 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, strontium, iron-55, and alpha) are comprised of the sum of the individual radionuclide activities in each batch released to the discharge canal for the respective quarter. These values represent the activity known to be present in the liquid radwaste effluent.
- b. Tritium & Alpha - The measured tritium and alpha concentrations in a monthly composite sample are used to calculate the total release and average diluted concentration during each period.
- c. 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, vent flow rates, vent 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

1.	Number of Batch Releases	<u>1.17E+02</u>	
2.	Total Time Period for Batch Releases	<u>6.09E+04</u>	Min
3.	Maximum Time Period for a Batch Release	<u>3.78E+03</u>	Min
4.	Average Time Period for Batch Releases	<u>5.20E+02</u>	Min
5.	Minimum Time Period for a Batch Release	<u>1.20E+01</u>	Min

B. Abnormal Releases

1.	Number of Releases	<u>0.00E+00</u>	
2.	Total Activity Released	<u>0.00E+00</u>	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	Lower Limits of Detection

TABLE III-A
EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT - 1988
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

	<u>UNITS</u>	<u>1ST QUARTER</u>	<u>2ND QUARTER</u>
A. Fission and Activation Gases:			
1. Total Release	Ci	<u>9.82E+01</u>	<u>1.30E+02</u>
2. Estimated Total Error	%	<u>6.00E+01</u>	<u>6.00E+01</u>
3. Average Release Rate for Period	µCi/sec	<u>1.25E+01</u>	<u>1.64E+01</u>
4. Percent of 10CFR50, Appendix I			
<u>Quarterly Limit</u>			
Gamma Air	%	<u>2.06E+00</u>	<u>2.63E+00</u>
Beta Air	%	<u>2.83E+00</u>	<u>4.19E+00</u>
<u>Yearly Limit</u>			
Gamma Air	%	<u>1.03E+00*</u>	<u>2.34E+00*</u>
Beta Air	%	<u>1.41E+00*</u>	<u>3.51E+00*</u>
B. Iodines, Particulates, and Tritium:			
<u>Iodines</u>			
1. Total Iodine - 131	Ci	<u>1.48E-04</u>	<u>2.01E-04</u>
2. Estimated Total Error	%	<u>4.00E+01</u>	<u>4.00E+01</u>
3. Average Release Rate	µCi/sec	<u>1.88E-05</u>	<u>2.56E-05</u>
<u>Particulates</u>			
1. Particulates with Half-Lives >8 days	Ci	<u>4.82E-07</u>	<u>1.63E-05</u>
2. Estimated Total Error	%	<u>4.00E+01</u>	<u>4.00E+01</u>
3. Average Release Rate for Period	µCi/sec	<u>6.13E-08</u>	<u>2.07E-06</u>
4. Gross Alpha Radioactivity	Ci	<u><LLD</u>	<u><LLD</u>
<u>Tritium</u>			
1. Total Release	Ci	<u>1.87E+00</u>	<u>3.10E+00</u>
2. Estimated Total Error	%	<u>3.00E+01</u>	<u>3.00E+01</u>
3. Average Release Rate for Period	µCi/sec	<u>2.38E-01</u>	<u>2.67E-01</u>
Percent of 10CFR50, Appendix I			
<u>Quarterly Limit</u>			
<u>Organ Thyroid</u>	%	<u>6.94E-01</u>	<u>1.11E+00</u>
<u>Yearly Limit</u>			
<u>Organ Thyroid</u>	%	<u>3.47E-01*</u>	<u>9.02E-01*</u>

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

TABLE III-B
EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT - 1988
GASEOUS EFFLUENTS - GROUND LEVEL AND MIXED MODE RELEASES

UNITS	CONTINUOUS MODE		BATCH MODE	
	1ST QUARTER	2ND QUARTER	1ST QUARTER	2ND QUARTER
1. FISSION GASES				
Ar-41 Ci	<LLD	<LLD	1.23E-01	1.34E-01
Kr-85 Ci	1.54E+00	1.73E+01	5.51E-01	2.00E-01
Kr-85m Ci	<LLD	1.40E-01	9.32E-04	5.76E-02
Kr-87 Ci	<LLD	<LLD	<LLD	7.29E-05
Kr-88 Ci	<LLD	<LLD	4.23E-04	3.51E-02
Xe-131m Ci	<LLD	<LLD	5.21E-01	2.55E-01
Xe-133 Ci	7.36E+01	8.32E+01	1.84E+01	2.24E+01
Xe-133m Ci	<LLD	<LLD	8.73E-02	3.76E-01
Xe-135 Ci	3.32E+00	4.23E+00	4.24E-02	1.10E+00
Total for Period Ci	7.85E+01	1.05E+02	1.97E+01	2.46E+01
2. IODINES ¹				
I-131 Ci	1.48E-04	2.01E-04	<LLD	<LLD
I-133 Ci	3.13E-05	1.72E-04	<LLD	<LLD
Total for Period Ci	1.79E-04	3.73E-04	<LLD	<LLD
3. PARTICULATES ^{1,2}				
H-3 Ci	1.57E+00	2.42E+00	3.01E-01	6.78E-01
Co-58 Ci	4.82E-07	<LLD	<LLD	<LLD
Co-60 Ci	<LLD	<LLD	<LLD	1.55E-05
Cs-137 Ci	<LLD	<LLD	<LLD	8.16E-07
Total for Period Ci	1.57E+00	2.42E+00	3.01E-01	6.78E-01

¹Continuous Accountability includes Batch Accountability (excludes H-3).

²Second quarter batch particulates are the result of the Spent Fuel Cask Decontamination project effluent which is not a part of the continuous accountability pathway.

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

GRAB SAMPLE ANALYSIS

<u>Nuclide</u>	<u>LLD ($\mu\text{Ci/cc}$)</u>
Ar-41	1.68E-08
Mn-54	1.00E-11
Co-58	1.00E-11
Fe-59	1.00E-11
Co-60	1.00E-11
Zn-65	1.00E-11
Kr-85m	4.45E-09
Kr-87	1.00E-04
Kr-88	1.00E-04
Sr-89	1.00E-11
Sr-90	1.00E-11
Mo-99	1.00E-11
I-131	1.00E-12
Xe-131m	2.77E-07
I-133	1.00E-10
Xe-133m	1.00E-04
Cs-134	1.00E-11
I-135	2.76E-14
Xe-135m	8.33E-11
Cs-137	1.00E-11
Xe-138	1.00E-04
Ba/La-140	2.56E-14
Ce-141	1.00E-11
Ce-144	1.00E-11
Gross Alpha	1.00E-11

IV. LIQUID EFFLUENTS

A. Batch Releases

1. Number of Batch Releases	<u>7.10E+01</u>
2. Total Time Period for Batch Releases	<u>1.21E+04</u> Min
3. Maximum Time Period for a Batch Release	<u>5.12E+02</u> Min
4. Average Time Period for Batch Releases	<u>1.70E+02</u> Min
5. Minimum Time Period for a Batch Release	<u>1.00E+00</u> Min
6. Average Stream Flow During Release Periods	<u>2.44E+05</u> GPM

B. Abnormal Releases

1. Number of Releases	<u>0.00E+00</u>
2. Total Activity Released	<u>0.00E+00</u> Ci

C. Data Tables

The following tables provide the details of liquid releases:

Table IV-A	Summation of all Releases
Table IV-B	Liquid Effluents
Table IV-C	Lower Limits of Detection

TABLE IV-A
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT - 1988
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

	UNITS	1st QUARTER	2nd QUARTER
<u>A. FISSION AND ACTIVATION PRODUCTS</u>			
1. Total Releases	Ci	<u>8.53E-02</u>	<u>9.06E-02</u>
2. Estimated Total Error	%	<u>2.00E+01</u>	<u>2.00E+01</u>
3. Average Diluted Concentration	µCi/ml	<u>4.70E-10</u>	<u>3.70E-10</u>
<u>B. TRITIUM</u>			
1. Total Release	Ci	<u>2.41E+02</u>	<u>1.94E+01</u>
2. Estimated Total Error	%	<u>1.00E+01</u>	<u>1.00E+01</u>
3. Average Diluted Concentration	µCi/ml	<u>1.33E-06</u>	<u>7.92E-08</u>
<u>C. DISSOLVED AND ENTRAINED GASES</u>			
1. Total Release	Ci	<u>2.07E+00</u>	<u>1.36E+00</u>
2. Estimated Total Error	%	<u>2.00E+01</u>	<u>2.00E+01</u>
3. Average Diluted Concentration	µCi/ml	<u>1.14E-08</u>	<u>5.55E-09</u>
4. Percent of Applicable Limit	%	<u>5.70E-03</u>	<u>2.78E-03</u>
<u>D. GROSS ALPHA RADIOACTIVITY</u>			
1. Total Release	Ci	<u><LLD</u>	<u><LLD</u>
2. Estimated Total Error	%	<u>6.00E+01</u>	<u>6.00E+01</u>
<u>E. VOLUME OF WASTE RELEASED</u>			
	Liters	<u>1.40E+06</u>	<u>7.40E+05</u>
<u>F. VOLUME OF DILUTION WATER</u>			
	Liters	<u>1.82E+11</u>	<u>2.45E+11</u>
<u>G. PERCENT OF 10CFR50 APPENDIX I</u>			
<u>Quarterly Limit</u>			
Organ Liver	%	<u>3.24E-01</u>	<u>3.00E-01</u>
Total Body	%	<u>7.82E-01</u>	<u>7.35E-01</u>
<u>Yearly Limit</u>			
Organ Liver	%	<u>1.62E-01*</u>	<u>3.12E-01*</u>
Total Body	%	<u>3.91E-01*</u>	<u>7.58E-01*</u>

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

TABLE IV-B
EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT - 1988
LIQUID EFFLUENTS

		<u>CONTINUOUS MODE</u>		<u>BATCH MODE</u>	
1. PARTICULATES					
	<u>UNITS</u>	<u>1st QUARTER</u>	<u>2nd QUARTER</u>	<u>1st QUARTER</u>	<u>2nd QUARTER</u>
H-3	Ci	<LLD	<LLD	2.41E+02	1.94E+01
Cr-51	Ci	<LLD	<LLD	1.24E-03	6.26E-03
Mn-54	Ci	<LLD	<LLD	4.83E-03	2.03E-03
Fe-55	Ci	<LLD	<LLD	1.05E-02	3.27E-03
Fe-59	Ci	<LLD	<LLD	5.38E-04	4.17E-04
Co-57	Ci	<LLD	<LLD	8.10E-05	2.47E-04
Co-58	Ci	<LLD	<LLD	3.80E-02	1.77E-02
Co-60	Ci	<LLD	<LLD	2.19E-02	4.63E-02
Zn-65	Ci	<LLD	<LLD	1.31E-05	<LLD
Sr-90	Ci	<LLD	<LLD	4.06E-07	2.05E-06
Sr-92	Ci	<LLD	<LLD	<LLD	1.19E-06
Zr-95	Ci	<LLD	<LLD	<LLD	1.50E-04
Nb-95	Ci	<LLD	<LLD	1.12E-04	3.34E-04
Nb-97	Ci	<LLD	<LLD	<LLD	3.49E-06
Tc-99m	Ci	<LLD	<LLD	<LLD	1.51E-04
Ru-106	Ci	<LLD	<LLD	1.13E-06	<LLD
Ag-110m	Ci	<LLD	<LLD	9.03E-04	5.65E-03
Sn-113	Ci	<LLD	<LLD	4.69E-06	<LLD
Sb-124	Ci	<LLD	<LLD	4.22E-03	1.42E-03
Sb-125	Ci	<LLD	<LLD	2.00E-03	4.85E-03
I-131	Ci	4.08E-05	<LLD	2.19E-05	5.04E-05
I-133	Ci	1.34E-05	<LLD	<LLD	2.43E-05
Cs-134	Ci	<LLD	<LLD	1.54E-04	4.89E-04
Cs-137	Ci	<LLD	<LLD	7.35E-04	1.10E-03
Ba-139	Ci	<LLD	<LLD	<LLD	9.67E-05
Ce-139	Ci	<LLD	<LLD	<LLD	2.26E-05
Total for Period	Ci	5.42E-05	<LLD	2.41E+02	1.95E+01
2. Gases					
Kr-85	Ci	<LLD	<LLD	3.51E-02	2.04E-03
Xe-131m	Ci	<LLD	<LLD	5.84E-02	1.55E-02
Xe-133m	Ci	<LLD	<LLD	6.38E-03	1.36E-02
Xe-133	Ci	1.62E-05	<LLD	1.97E+00	1.31E+00
Xe-135	Ci	<LLD	<LLD	2.60E-05	1.52E-02
Total for Period	Ci	1.62E-05	<LLD	2.07E+00	1.36E+00

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

<u>NUCLIDE</u>	<u>LLD ($\mu\text{Ci/ml}$)</u>
H-3	1.00E-05
Cr-51	1.11E-07
Mn-54	5.00E-07
Fe-55	5.00E-07
Co-57	7.00E-09
Co-58	5.00E-07
Fe-59	5.00E-07
Co-60	5.00E-07
Zn-65	5.00E-07
Kr-85	4.01E-06
Sr-89	5.00E-08
Sr-90	5.00E-08
Sr-92	6.39E-09
Nb-95	2.51E-08
Zr-95	4.55E-08
Nb-97	2.18E-10
Mo-99	5.00E-07
Tc-99m	2.71E-09
Ru-106	2.12E-07
Ag-110m	2.31E-08
Sn-113	2.06E-09
Sb-124	1.11E-07
Sb-125	4.97E-08
Xe-131m	3.75E-07
I-131	1.00E-06
I-133	1.52E-08
Xe-133	1.00E-05
Xe-133m	1.00E-05
Cs-134	5.00E-07
Xe-135	1.00E-05
Cs-137	5.00E-07
Ba-139	5.48E-10
Ce-139	8.28E-09
Ba/La-140	7.39E-08
Ce-141	5.00E-07
Ce-144	5.00E-07
Gross Alpha	1.00E-07

V. SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
REPORT TIME PERIOD JANUARY 1 TO JUNE 30, 1988

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

WASTE CLASS A

1. Type of waste	Unit	6-month Period	Est. Total Error %	Solid. Agent	Cont. Type	Form	No. Ship.
a. Spent resins, filter sludges, evaporator bottoms, etc.	m ³ Ci	9.13E+00 6.39E+01	2.00E+01	NA	HIC	Dewatered Resin	2
b. Dry compressible waste, contaminated equip., etc.	m ³ Ci	1.47E+01 3.22E-01	2.00E+01	NA	STP	Compacted	7
c. Irradiated components, control rods, etc.	m ³ Ci	0.00E+00 0.00E+00	NA	NA	NA	NA	NA
d. Other (describe)	m ³ Ci	0.00E+00 0.00E+00	NA	NA	NA	NA	NA

HIC - High Integrity Container
STP - Strong Tight Package

2. Estimate of major nuclide composition (by type of waste) 3. Solid Waste Disposition

		%	Ci
a.	Fe-55	8.14E+01	5.20E+01
	Co-58	1.32E+01	8.46E+00
	Co-60	3.62E+00	2.31E+00
	Ni-63	1.45E+00	9.25E-01
	Others*	3.30E-01	2.05E-01
b.	H-3	5.18E+01	1.67E-01
	Cr-51	4.58E+00	1.48E-02
	Mn-54	2.08E+00	6.72E-03
	Fe-55	3.97E+00	1.28E-02
	Co-58	1.90E+01	6.13E-02
	Fe-59	1.57E+00	5.05E-03
	Co-60	1.20E+01	3.86E-02
	Ni-63	1.35E+00	4.35E-03
	Cs-134	1.00E+00	3.23E-03
	Cs-137	2.53E+00	8.15E-03
	Others**	1.20E-01	3.86E-04

Number of Shipments
Mode of Transportation
Destination

9
Sole Use Vehicle
Barnwell, S. C.

* Others include: Cs-137, H-3, C-14

** Others include: C-14

V. SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
REPORT TIME PERIOD JANUARY 1 TO JUNE 30, 1988

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

WASTE CLASS B

1. Type of waste	Unit	6-month Period	Est. Total Error %	Solid. Agent	Cont. Type	Form	No. Ship.
a. Spent resins, filter sludges, evaporator bottoms, etc.	m ³ Ci	3.41E+00 1.75E+02	2.00E+01	NA	HIC	Dewatered Resin	1
b. Dry compressible waste, contaminated equip., etc.	m ³ Ci	0.00E+00 0.00E+00	NA	NA	NA	NA	NA
c. Irradiated components, control rods, etc.	m ³ Ci	0.00E+00 0.00E+00	NA	NA	NA	NA	NA
d. Other (describe)	m ³ Ci	0.00E+00 0.00E+00	NA	NA	NA	NA	NA

HIC - High Integrity Container

2. Estimate of major nuclide composition (by type of waste) 3. Solid Waste Disposition

		%	Ci
a.	Mn-54	2.16E+00	3.78E+00
	Co-58	3.02E+00	5.29E+00
	Co-60	1.46E+01	2.55E+01
	Ni-63	2.42E+01	4.24E+01
	Cs-134	2.34E+01	4.09E+01
	Cs-137	3.25E+01	5.68E+01
	Others*	1.20E-01	3.30E-01

Number of Shipments
Mode of Transportation
Destination

1
Sole Use Vehicle
Barnwell, S. C.

*Others include: C-14, H-3, Sr-90

C. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments 0
Mode of Transportation NA
Destination NA

CHANGES TO ODCM, PCP, AND
RADIOACTIVE WASTE SYSTEMS

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

There were no changes to the Offsite Dose Calculation Manual (ODCM) during this reporting period.

II. CHANGES TO THE RADIOACTIVE WASTE SYSTEMS

There were no changes to the Radioactive Waste Systems during the first six months of 1988 with the exception of a change in the vendor which supplies the liquid waste demineralization system.

III. PROCESS CONTROL PROGRAM CHANGES

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

IV. CHANGES IN LAND USE CENSUS

There were no changes to the environmental sampling program as a result of the Land Use Census during this reporting period.

V. INSTRUMENT INOPERABILITY

On March 31, 1988, a monthly source check surveillance test was performed on the Plant Stack Gaseous Radiation Monitor (R-14). This monitor's response was not within the acceptable response range; therefore, the monitor was removed from service. On May 5, 1988, the monitor was returned to operable status. The monitor's inoperability greater than 30 days was due to the unavailability of replacement detectors onsite and the inability of the vendor to supply new detectors in a timely manner. Throughout the duration, the Plant Stack Radiation Monitor (R-34) was operable monitoring effluents as required by Plant Technical Specifications, Table 3.5-7, Item Number 1.b.

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 DELAY TANK CURIE LIMIT

There was no waste gas decay tank curie content that exceeded the $1.9\text{E}+04$ curie limit.

VIII. H. B. ROBINSON UNIT NO. 1 CHEMICAL CLEANING

Pursuant to 10CFR20.302(a) and USNRC IE Information Notice 86-90, a chemical cleaning of the H. B. Robinson Unit No. 1 boiler (Fossil Unit) was performed during May 23 through May 25, 1988, under the approval of the South Carolina Department of Health and Environmental Control. The acid cleaning process consisted of 24,000 gallons of neutralized hydrochloric acid solution and 24,000 gallons of 0.1 percent citric acid rinse which were released to the ash ponds onsite. A total of $4.72\text{E-}04$ curies of Co-60 were released to these ponds during this process.

The above $4.72\text{E-}04$ Curies of Co-60 released to the ash ponds onsite are not included in Section IV, Liquid Effluents, of Enclosure 1 of this report.

SUPPLEMENTS TO PREVIOUS
SEMIANNUAL REPORTS

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I. DISCUSSION

There are no supplements to previous Effluent and Waste Disposal Semiannual Reports during this report period.