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SEMIANNUAL RADIOACTIVE EFFLUENT

RELEASE REPORT

1/1/87 - 6/30/87

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEG PLANT - UNIT 2

FACILITY OPERATING LICENSE NO. DPR-23

DOCKET NO. 50-261

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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 for release of 15 minutes was reported for gaseous batch releases. This release was a low volume Waste Gas Decay Tank released because of its hydrogen/oxygen ratio.

2. The Total Fission and Activation Gases released in Gaseous Effluents in the First Quarter was 583 Curies. The Total Fission and Activation Gases released in the Second Quarter was 24.2 Curies, a factor of 24 lower. Iodine -131 released in Gaseous effluents during the First Quarter was 20.2 millicuries compared to 0.31 millicuries released in the Second Quarter. These variances were due to small fuel failures during the First Quarter and processing water via boric acid evaporators. The Second Quarter releases are significantly lower due to the refueling outage which started March 28 and ended June 16.

3. The Total Tritium released in liquid effluents in the First Quarter was 154 Curies. The Total Tritium released in the Second Quarter was 14 Curies, a factor of 11 lower than the First Quarter. This variance was due to the following:

Month	H-3 Conc. from Monthly Composite μCi/cc	Gal. Released from Monitor Tanks	Gal. Released from Waste Sample Tanks
Jan	1.23E-01	7.26E+04	0.00E+00
Feb	8.16E-02	2.40E+04	1.23E+05
Mar	5.75E-02	2.65E+05	9.21E+04
Apr	2.09E-02	0.00E+00	9.05E+04
May	5.10E-03	4.30E+04	1.33E+05
Jun	3.53E-03	0.00E+00	1.73E+05

The higher monthly tritium concentration during January, February, and March are attributed to the composites being composed mainly of Monitor Tank releases from processing CVCS tanks. At the end of fuel cycle, these tanks contain a higher concentration of tritium.

4. The total Fission and Activation products excluding tritium and noble gases in liquid effluents was 0.141 Curies during the First Quarter which was a factor of 2.3 lower than the Second Quarter (0.326 Curies). The quarterly doses for critical organ changed from the liver (2.47% of Technical Specifications) during the First Quarter to GI-LLI (3.72% of

Technical Specifications) for the Second Quarter. This was caused by a shift in isotopic distribution due to the use of the new demineralization system. The predominent radionuclide released during the Second Quarter was Sb-124 (0.109 Curie) where the predominant radionuclides during the First Quarter were Co-60 (0.046 Ci), Fe-55 (0.048 Ci), and Cs-137 (0.014 Ci).

5. The total volume of liquid released (6.79E+07 liters) during the first six months of 1987 is significantly higher compared to the second six months of 1986 (3.75E6 liters) and previous reports due to the detectable Fe-55 activity in the Steam Generator Blowdown and the Condensate Polisher Liquid Wastes.

B. Regulatory Compliance

The projected dose calculated on a day-by-day basis utilizing conservative meteorological conditions demonstrates the dose commitment from gaseous and liquid effluents is a small fraction of the 10CFR50, Appendix I limits using the methodology in the Offsite Dose Calculation Manual (ODCM).

There were no changes to the waste solidification process control program (PCP) during the first six months of 1987.

There was a change to the Liquid Radioactive Waste Systems during the first six months of 1987. See Enclosure II.

There were no reportable instrumentation inoperability events during the first six months of 1987.

There were no changes to the ODCM during the first six months of 1987.

There were no outside Liquid Holdup Tanks that exceeded the 10 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 $\leq$500 mrem/yr
     - Skin Dose $\leq$3000 mrem/yr
   - 10CFR50, Appendix I
     - For Calendar Quarter
       - Gamma Dose $\leq$5 mrad
       - Beta Dose $\leq$10 mrad
     - For Calendar Year
       - Gamma Dose $\leq$10 mrad
       - Beta Dose $\leq$20 mrad

2. Iodine - 131, 133, and 135; Tritium, and Particulates $\geq$8 day half-lives:
   - 10CFR20 Limits (Instantaneous Release Rate)
     - Dose from Inhalation (only) to a child to any organ $\leq$1500 mrem/yr
   - 10CFR50, Appendix I (Organ Doses)
     - For Calendar Quarter $\leq$7.5 mrem
     - For Calendar Year $\leq$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 μCi/ml total activity.
   - 10CFR50, Appendix I
     - For Calendar Quarter
       - Total Body Dose $\leq$1.5 mrem
       - Any Organ Dose $\leq$5 mrem
     - For Calendar Year
       - Total Body Dose $\leq$3 mrem
       - Any Organ Dose $\leq$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 and 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 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	8.10E+01	
2.	Total Time Period for Batch Releases	2.61E+04	Min
3.	Maximum Time Period for a Batch Release	2.84E+03	Min
4.	Average Time Period for Batch Releases	3.22E+02	Min
5.	Minimum Time Period for a Batch Release	1.50E+01	Min

B. Abnormal Releases

1.	Number of Releases	0.00E+00	
2.	Total Activity Released	0.00E+00	Curies

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 SEMIANNUAL REPORT
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

		UNITS	1ST QUARTER	2ND QUARTER
A.	Fission and Activation Gases:			
1.	Total Release	Ci	5.83E+02	2.42E+01
2.	Estimated Total Error	%	6.00E+01	6.00E+01
3.	Average Release Rate for Period	µCi/sec	7.50E+01	3.08E+00
4.	Percent of 10CFR50 Appendix I			
	Quarterly Limit			
	Gamma Air	%	1.43E+01	5.02E-01
	Beta Air	%	1.77E+01	3.60E-01
	Annual Limit			
	Gamma Air	%	7.17E+00 *	7.42E+00 *
	Beta Air	%	8.84E+00 *	9.02E+00 *
B.	Iodines, Particulates, and Tritium:			
	Iodines			
1.	Total Iodine - 131	Ci	2.02E-02	3.10E-04
2.	Estimated Total Error	%	4.00E+01	4.00E+01
3.	Average Release Rate	µCi/sec	2.60E-03	3.94E-05
	Particulates			
1.	Particulates with Half-Lives ≥8 days	Ci	3.01E-06	1.22E-05
2.	Estimated Total Error	%	4.00E+01	4.00E+01
3.	Average Release Rate for Period	µCi/sec	3.87E-07	1.55E-06
4.	Gross Alpha Radioactivity	Ci	<LLD	<LLD
	Tritium			
1.	Total Release	Ci	9.74E-01	6.68E-01
2.	Estimated Total Error	%	3.00E+01	3.00E+01
3.	Average Release Rate for Period	µCi/sec	1.25E-01	8.50E-02
	Percent of 10CFR50 Appendix I			
	Quarterly Limit			
	Organ Thyroid	%	4.71E+01	6.32E-01
	Annual Limit			
	Organ Thyroid	%	2.35E+01 *	2.39E+01 *

*Cumulative total for the year-to-date.

TABLE III-B
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
GASEOUS EFFLUENTS GROUND LEVEL RELEASES

		CONTINUOUS MODE		BATCH MODE	
	UNITS	1ST QUARTER	2ND QUARTER	1ST QUARTER	2ND QUARTER
1. FISSION GASES					
Ar-41	Ci	<LLD	6.86E-01	1.17E-01	6.03E-06
Kr-85	Ci	<LLD	9.33E-02	2.56E+00	6.75E-01
Kr-85m	Ci	3.01E+00	<LLD	2.40E-01	<LLD
Kr-87	Ci	<LLD	<LLD	1.77E-02	<LLD
Kr-88	Ci	<LLD	<LLD	8.73E-02	<LLD
Xe-131m	Ci	<LLD	<LLD	2.61E+00	2.25E-01
Xe-133	Ci	3.47E+02	1.59E+01	1.81E+02	6.53E+00
Xe-133m	Ci	1.08E+00	<LLD	2.56E+00	5.64E-02
Xe-135	Ci	3.49E+01	<LLD	7.83E+00	1.41E-03
	Ci				
Total for Period	Ci	3.86E+02	1.67E+01	1.97E+02	7.49E+00
2. IODINES[1]					
I-131	Ci	2.02E-02	2.16E-04	<LLD	9.44E-05
I-133	Ci	4.12E-04	1.53E-06	<LLD	<LLD
I-135	Ci	<LLD	<LLD	<LLD	<LLD
	Ci				
	Ci				
Total for Period	Ci	2.06E-02	2.18E-04	<LLD	9.44E-05
3. PARTICULATES[1]					
H-3	Ci	9.25E-01	6.66E-01	4.88E-02	1.79E-03
Co-58	Ci	3.48E-07	2.85E-06	<LLD	<LLD
Cs-134	Ci	1.09E-07	<LLD	<LLD	3.69E-06
Cs-137	Ci	2.55E-06	6.74E-07	<LLD	4.96E-06
	Ci				
	Ci				
	Ci				
	Ci				
	Ci				
	Ci				
	Ci				
	Ci				
	Ci				
	Ci				
	Ci				
	Ci				
	Ci				
	Ci				
Total for Period	Ci	9.25E-01	6.66E-01	4.88E-02	1.80E-03

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

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

Nuclide	LLD (μCi/cc)
H-3	1.00E-06
Ar-41	2.00E-06
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-85	8.90E-05
Kr-85m	3.50E-04
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	1.20E-06
I-133	1.00E-10
Xe-133	1.00E-04
Xe-133m	1.00E-04
Cs-134	1.00E-11
I-135	1.60E-09
Xe-135	1.00E-04
Xe-135m	9.30E-05
Cs-137	1.00E-11
Xe-138	1.00E-04
Ba/La-140	1.00E-13
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	1.38E+02	
2.	Total Time Period for Batch Releases	2.61E+04	Min
3.	Maximum Time Period for a Batch Release	9.60E+02	Min
4.	Average Time Period for Batch Releases	1.89E+02	Min
5.	Minimum Time Period for a Batch Release	2.00E+01	Min
6.	Average Stream Flow During Release Periods	2.37E+05	GPM

B. Abnormal Releases

1.	Number of Releases	0.00E+00	
2.	Total Activity Released	0.00E+00	Curies

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
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

		UNITS	1ST QUARTER	2ND QUARTER
A.	FISSION AND ACTIVATION PRODUCTS			
	1. Total Releases	Ci	1.41E-01	3.26E-01
	2. Total Estimated Error	%	2.00E+01	2.00E+01
	3. Average Diluted Concentration	μCi/ml	5.73E-10	3.02E-09
B.	TRITIUM			
	1. Total Release	Ci	1.54E+02	1.40E+01
	2. Estimated Total Error	%	1.00E+01	1.00E+01
	3. Average Diluted Concentration	μCi/ml	6.26E-07	1.30E-07
C.	DISSOLVED AND ENTRAINED GASES			
	1. Total Release	Ci	2.10E+01	6.60E-02
	2. Estimated Total Error	%	2.00E+01	2.00E+01
	3. Average Diluted Concentration	μCi/ml	8.54E-08	6.11E-10
	4. Percent of Applicable Limit	%	4.27E-02	3.06E-04
D.	GROSS ALPHA RADIOACTIVITY			
	1. Total Release	Ci	<LLD	<LLD
	2. Estimated Total Error	%	6.00E+01	6.00E+01
E.	VOLUME OF WASTE RELEASED	Liters	5.73E+07	1.06E+07
F.	VOLUME OF DILUTION WATER	Liters	2.46E+11	1.08E+11
G.	PERCENT OF 10CFR50 APPENDIX I			
	Quarterly Limit			
	Organ Liver	%	2.47E+00	2.68E+00
	Total Body	%	5.89E+00	5.88E+00
	Organ GI-LLI	%	1.20E-01	3.72E+00
	Annual Limit			
	Organ Liver	%	1.24E+00*	2.58E+00*
	Total Body	%	2.95E+00*	5.88E+00*
	Organ GI-LLI	%	6.02E-02*	1.92E+00*

*Cumulative total for the year-to-date.

TABLE IV-B
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT - 1987
LIQUID EFFLUENTS

1. PARTICULATES	UNITS	CONTINUOUS MODE 1ST QUARTER	CONTINUOUS MODE 2ND QUARTER	BATCH MODE 1ST QUARTER	BATCH MODE 2ND QUARTER
Cr-51	Ci	<LLD	<LLD	2.69E-05	1.15E-02
Mn-54	Ci	<LLD	<LLD	9.98E-04	1.18E-02
Fe-55	Ci	4.80E-02	5.97E-04	1.02E-03	2.45E-03
Fe-59	Ci	<LLD	<LLD	<LLD	4.68E-03
Co-57	Ci	<LLD	<LLD	5.36E-05	3.69E-04
Co-58	Ci	<LLD	<LLD	6.31E-03	1.24E-01
Co-60	Ci	<LLD	<LLD	4.59E-02	2.71E-02
Sr-89	Ci	<LLD	<LLD	<LLD	7.09E-06
Sr-90	Ci	<LLD	<LLD	<LLD	6.31E-06
Zr-95	Ci	<LLD	<LLD	5.25E-06	3.32E-04
Nb-95	Ci	<LLD	<LLD	2.22E-05	2.43E-03
Ru-106	Ci	<LLD	<LLD	<LLD	5.13E-04
Ag-110m	Ci	<LLD	<LLD	2.51E-03	9.11E-03
Sn-113	Ci	<LLD	<LLD	1.10E-05	1.77E-04
Sb-124	Ci	<LLD	<LLD	4.58E-03	1.09E-01
Sb-125	Ci	<LLD	<LLD	9.89E-03	1.63E-02
I-131	Ci	<LLD	<LLD	1.27E-03	2.71E-04
I-133	Ci	<LLD	<LLD	4.98E-05	<LLD
Cs-134	Ci	<LLD	<LLD	5.57E-03	2.40E-05
Cs-137	Ci	<LLD	<LLD	1.37E-02	4.86E-03
Ba-139	Ci	<LLD	<LLD	6.34E-04	<LLD
Ba/La-140	Ci	<LLD	<LLD	<LLD	2.14E-04
	Ci				
	Ci				
	Ci				
	Ci				
	Ci				
	Ci				
Total for Period	Ci	4.80E-02	5.97E-04	9.26E-02	3.25E-01

2. GASES	UNITS	CONTINUOUS MODE 1ST QUARTER	CONTINUOUS MODE 2ND QUARTER	BATCH MODE 1ST QUARTER	BATCH MODE 2ND QUARTER
Kr-85m	Ci	<LLD	<LLD	1.59E-05	<LLD
Kr-85	Ci	<LLD	<LLD	1.83E-01	7.58E-03
Xe-131m	Ci	<LLD	<LLD	3.21E-01	4.90E-03
Xe-133m	Ci	<LLD	<LLD	1.67E-01	5.25E-03
Xe-133	Ci	<LLD	<LLD	2.03E+01	4.67E-02
Xe-135	Ci	<LLD	<LLD	2.81E-02	1.57E-03
Total for Period	Ci	<LLD	<LLD	2.10E+01	6.60E-02

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

NUCLIDE	LLD (µCi/ml)
H-3	1.00E-05
Cr-51	7.10E-06
Mn-54	5.00E-07
Co-57	1.20E-07
Co-58	5.00E-07
Fe-59	5.00E-07
Co-60	5.00E-07
Zn-65	5.00E-07
Kr-85m	3.00E-08
Kr-85	4.10E-06
Sr-89	5.00E-08
Sr-90	5.00E-08
Nb-95	1.10E-07
Zr-95	2.00E-07
Mo-99	5.00E-07
Tc-99m	6.60E-08
Ru-106	2.20E-07
Ag-110m	2.40E-08
Sn-113	2.10E-08
Sb-124	1.20E-07
Sb-125	5.10E-08
I-131	1.00E-06
I-133	2.70E-08
Xe-131m	4.00E-07
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	1.70E-06
Ba-La-140	2.40E-07
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 YEAR 1987

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	2.31E+01 2.25E+00	2.00E+01	cement	STP	Solidified	3
b.	Dry compressible waste, contaminated equip., etc.	m^3 Ci	2.89E+01 4.49E+00	2.00E+01	NA	STP	Compacted Uncompacted	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

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

		%	Ci
a.	Cr-51	5.20	1.18E-01
	Fe-55	13.66	3.07E-01
	Ce-58	25.18	5.67E-01
	Co-60	10.20	2.30E-01
	Ni-63	6.61	1.49E-01
	Cs-134	3.92	8.83E-02
	Cs-137	10.02	2.26E-01
	H-3	20.67	4.66E-01
	Others*	4.53	1.02E-01
b.	Fe-55	28.93	1.30E+00
	Co-58	10.13	4.55E-01
	Co-60	24.26	1.09E+00
	Ni-63	5.07	2.28E-01
	Cs-134	7.10	3.19E-01
	Cs-137	19.01	8.54E-01
	H-3	4.27	1.92E-01
	Others **	1.22	5.50E-02

* Others include: Mn-54, Fe-59, Co-57, Sr-89, Sr-90, Zr-95, I-131, Te-125m, Nb-95, Tc-99, Ag-110m, Sn-113, Sb-124, Sb-125, Cs-136, Xe-131m, Ce-141, Ce-144, Pu-238, Pu-239, Pu-241, Am-241, Cm-242, Cm-244, C-14, Zn-65, Xe-133, Na-24

** Others include: Mn-54, Co-57, Nb-95, Pu-238, Cm-242

3. Solid Waste Disposition

Number of Shipments	10
Mode of Transportation	Sole Use Vehicle
Destination	Barnwell, S. C.

V. SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
REPORT TIME PERIOD JANUARY 1 TO JUNE 30 YEAR 1987

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	3.37E+00 9.36E+01	2.00E+01	NA	HIC, STP	Dewatered Bead Resin	1
b. Dry compressible waste, contaminated equip., etc.	m^3 Ci	0.00E+00 0.00E+00	NA	NA	NA	NA	0
c. Irradiated components, control rods, etc.	m^3 Ci	0.00E+00 0.00E+00	NA	NA	NA	NA	0
d. Other (describe)	m^3 Ci	0.00E+00 0.00E+00	NA	NA	NA	NA	0

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

a.

	%	Ci
Mn-54	2.50	2.33E+00
Co-58	6.40	5.99E+00
Co-60	17.50	1.64E+01
Cs-134	15.90	1.49E+01
Cs-137	27.70	2.59E+01
Fe-55	6.90	6.48E+00
Ni-63	22.70	2.12E+01
Others*	0.40	4.00E-01

* Others include: Co-57, C-14, Sr-90, Tc-99, I-129, Pu-238, Pu-240, Pu-241, Am-241, Cm-242, Cm-243, Pu-239, Cm-244, H-3

3. Solid Waste Disposition

Number of Shipments	1
Mode of Transportation	Sole Use Vehicle
Destination	Barnwell, S. C.

V. SOLID WASTE AND IRRADIATED FUEL SHIPMENTS
REPORT TIME PERIOD JANUARY 1 TO JUNE 30 YEAR 1987

C. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	0
Mode of Transportation	NA
Destination	NA

VI. ANNUAL GASEOUS DOSE ASSESSMENTS

The annual gaseous dose assessment to demonstrate 10CFR50, Appendix I, compliance were calculated using the conservative Nuclear Data LRW/GRW (ODCM methodology) release permit generating system. The true annual gaseous dose commitment using concurrent meteorology in conjunction with GASPAR will be sent with the Second Six Months Semiannual Radioactive Effluent Release Report.

VII. ANNUAL LIQUID DOSE ASSESSMENTS

The annual liquid dose assessment to demonstrate 10CFR50, Appendix I, compliance were calculated using the conservative Nuclear Data LRW/GRW (ODCM methodology) release generating system. The true annual liquid dose commitment using Regulatory Guide 1.109 in conjunction with LAPTAP will be sent with the Second Six Months Semiannual Radioactive Effluent Release Report.

VIII. METEOROLOGICAL DATA

The meteorological data for this report period is on file in the format of Regulatory Guide 1.21 and is available to the NRC upon request. This data will be sent within 60 days after January 1, 1988, with the Second Six Months Semiannual Radioactive Effluent Release Report.

CHANGES TO ODCM, PCP, AND
RADIOACTIVE WASTE SYSTEMS

TABLE OF CONTENTS

I. CHANGES TO OFFSITE DOSE CALCULATION MANUAL (ODCM)

There were no changes to the ODCM during this reporting period.

II. LAND USE CENSUS CHANGES

There were no changes to the environmental sampling program and land use census during this reporting period.

III. CHANGES TO LIQUID RADWASTE SYSTEMS

Pursuant to H. B. Robinson Technical Specification 6.9.d.7, the utilization of the Waste Water Demineralization System (WWDS) to process reactor coolant and miscellaneous liquid radwaste streams as an alternative to evaporation is discussed below:

1.0 SUMMARY OF 10 CFR PART 50.59 REVIEWS

1.1 Plant Modification M-897

The H. B. Robinson modification, M-897, has been performed on the Chemical Volume Control, Waste Disposal, Station Air, and Primary Water Systems to allow operation of a Waste Water Demineralization System. The addition of the cross-connect between CVCS and Waste Disposal results in a change to the facility.

1.1.1 FSAR Review

H. B. Robinson, Unit 2 updated FSAR Sections 9.3.4.2.1 and Figures 9.3.4-4 and 11.2.2-2 will be changed through the update process. The following sections of the FSAR do not require update:

Section No.	Title
1.2.2.4	Waste Disposal System
3.1.1.2.5	Reactivity Control
3.1.2	Evaluation per General Design Criteria
9.3.1	Station and Instrument Air Systems
9.3.4	Chemical and Volume Control System
11.2.2.1	Liquid Radioactive Waste Processing
11.2.2.2	Components
15.4.6	CVCS Malfunction that results in a decrease in the Boron Concentration in the Reactor Coolant
15.7.2	Liquid Waste System Leak or Failure

1.1.2 10 CFR 50.59 Review of Plant Modification M-897

The addition of the CVCS to Waste Disposal cross-connect, B waste evaporator to C waste evaporator room piping connections, and primary water and station air connections in C waste evaporator room is not considered to involve an unreviewed safety question based on the following:

- The probability of an accident is not increased. The new piping and valves added into the Chemical and Volume Control System and Waste Disposal System meet or exceed the design and functional requirements imposed on the existing piping and valves. All tie-ins are isolable with double isolation valves. The double isolation valves protect against leakage or release of contents due to a pipe break, an accident previously analyzed in Section 15.7.2 of the FSAR. Double isolation also

1.0 SUMMARY OF 10 CFR PART 50.59 REVIEWS (Continued)

protects against backflow from the Waste Disposal System, preventing both the introduction of chlorides into the CVCS, and dilution of boron in the CVCS, an accident previously analyzed in Section 15.4.6 of the FSAR. All additions by this modification package are contained in the Reactor Auxiliary Building, which is a Class I structure. Any leakage from the valves or piping will be collected in the building sump to be pumped back into the Waste Disposal System. It is therefore concluded that the additions do not have the potential to increase the probability of occurrence of any accident previously evaluated in the FSAR, or of a different type than previously analyzed.

- The new piping and valves do not increase the probability of malfunction of equipment important to safety. The piping and valves are added into the nonsafety related portion of the Chemical and Volume Control System and the Waste Disposal System. The Instrument and Station Air System and Primary and Demineralized Make-up Water System are both classified as nonsafety systems. The additions to these systems are therefore nonsafety related. The changes actually enhance the reliability of the CVCS Holdup Tanks by providing an alternate treatment path and increasing their availability.

- The new piping and valves do not increase the consequences of any accident. All changes are made in the Reactor Auxiliary Building (Class I structure) where any accident would be minimized by the double isolation valves provided at all tie-ins and would be contained in the Reactor Auxiliary Building. These consequences have been discussed in Section 15.7.2 of the updated FSAR. Therefore, offsite dose consequences from any accident would not be increased and the margin of safety as defined in the Technical Specifications would not be reduced.

1.1.3 Plant Technical Specifications Review

Review of the Plant Technical Specifications did not identify any required revisions as a result of adding a cross-tie between the Chemical and Volume Control Systems and Waste Disposal System, and between the B and C waste evaporator rooms, or adding primary water and station air connections to C waste evaporator room.

1.1.4 Regulatory Guide 1.143

The changes installed by this modification were evaluated against the design provisions for controlling releases of radioactive liquids as presented in Regulatory Guide 1.143. These changes are made in the Reactor Auxiliary Building (Class I structure) where all spills are collected and processed by the Waste Disposal System. Valves and piping are designed to meet USAS B31.1 (1967) requirements or better.

1.0 SUMMARY OF 10 CFR PART 50.59 REVIEWS (Continued)

1.1.5 Regulatory Guide 1.21 Review
The changes installed by this modification were evaluated against the criteria for radiological controls in Regulatory Guide 1.21. No unrestricted releases are possible as a result of these changes.

1.1.6 Structural Analysis
The additional loads imposed on the Reactor Auxiliary Building by pipe supports have been analyzed, and it has been determined that the loads do not impact the structural integrity of the RAB or its ability to function as originally designed. Therefore, the attachments and installation are nonsafety related. This analysis was design verified in the calculation document 86558-C-11-F.

The station air penetrations through the south wall of the drumming room and the drumming room ceiling have been analyzed, and it has been determined that the penetrations are acceptable based on "Procedure of Concrete Drilling and Boring of Penetrations" (Ebasco, October 9, 1984). This analysis is design verified in calculation document 86558-C-11-F. The penetrations are safety related and both are fire barrier penetrations. Fire barrier penetration seals will be designed and installed in accordance with the Corrective Maintenance Procedure CM-621.

1.1.7 ALARA
ALARA reviews were conducted on the modification (MOD-897) to ensure that the new lines would have no adverse effect on plant site exposure, both in the installation phase and operational phase. Specifically, butt welds were used in high personnel traffic areas, whereas socket welds were used in inaccessible areas to minimize welding time. Lines that were routed through personnel traffic areas were also analyzed for shielding addition, should the need arise.

1.1.8 Summary of Modification M-897 Safety Evaluation
Based on these reviews and analyses, it is concluded that the installation of piping and valves in the Chemical and Volume Control System, Liquid Waste Disposal System, Primary and Demineralized Make-up Water System, and Instrument and Station Air System does not involve an unreviewed safety question, does not present a hazard to any plant system, and does not adversely affect the health and safety of the general public. Installation of the piping and valves does require changes to the FSAR as described in Section 2.0, FSAR Review, of this attachment.

1.2 Waste Water Demineralization System Operations
During the WWDS demonstration period, the waste and boric acid evaporators will be maintained in a state of readiness. Operation of the evaporators will be optional.

1.0 SUMMARY OF 10 CFR PART 50.59 REVIEWS (Continued)

1.2.1 FSAR Reviews

The following sections of the H. B. Robinson, Unit 2 Updated FSAR were reviewed:

Section	Titles
9.3.4	Chemical Volume Control System
11.0	Radioactive Waste Management
15.7	Radioactive Release from a Subsystem of Component

There are no changes to the CVCS section as result of the operation of the WWDS. Since this is temporary situation, no changes to Section 11.0 are required. Any liquid waste spills are contained with the Reactor Auxiliary Building. None of the WWDS vessels are larger than the CVC-holdup tanks. The concentration of radioactive gases will be reduced by decay in the CVC-holdup tanks and some will be removed to the Waste Gas Decay Tanks for further decay and processing. The remaining gases are released from the Waste Holdup Tank or Waste Condensate Tank vents via the Plant vent, or released as dissolved gases in liquid effluent, both of which are monitored. Thus, the accidents discussed in the section of the FSAR bound the similar accidents which could be postulated from the operation of the Waste Water Demineralization System.

1.2.2 10 CFR 50.59 Review of WWDS Operation

The following aspects of WWDS installation and operation have been reviewed per 10 CFR 50.59 to determine if an unreviewed safety question will be created:

1. Areas of responsibility
2. Releases of radioactivity to the environment
3. Mixing CVCS water with Waste Disposal Water
4. Storage of processed water in Waste Condensate Tanks
5. Spills in "C" Waste Evaporator Room and outside the Reactor Auxiliary Building
6. Use of warm air to dry spent media
7. Floor loadings in "C" Waste Evaporator Room
8. Transportation of WWDS equipment up the "C" Waste Evaporator Room
9. Operability of the existing waste processing equipment
10. ALARA

1.2.2.1 Area of Responsibility

The operation of the Waste Water Demineralization System (WWDS) will be the responsibility of the system's operator supplied by the vendor, who will be supported by Radiation Control, Chemistry, and Operations in processing waste water. The WWDS operator will report to the Shift Foreman at the beginning of each work period. Technical Support has overall responsibility for the demonstration project.

1.0 SUMMARY OF 10 CFR PART 50.59 REVIEWS (Continued)

1.2.2.2 Releases of Radioactive Material to the Environment

Release of liquid radioactive effluent from the WWDS is via a Waste Condensate Tank. The sampling, analysis, control, and accountability of liquid effluent produced by the WWDS is by the same methodology as utilized to release liquid radioactive effluent produced by the operation of the Boric Acid Evaporators and "B" Waste Evaporator. Liquid releases are monitored on a batch basis. No new sources of radionuclides in liquid effluent will be created by the operation of WWDS.

Release of gaseous radioactive materials during WWDS operation is via equipment and tank vents which are collected by the Reactor Auxiliary Building ventilation. The sampling, analysis, control, and accountability of gaseous effluent produced by the operation of the WWDS is by the same methodology as utilized to release gaseous radioactive effluent produced by the operation of the Boric Acid Evaporators and the "B" Waste Evaporator. Gaseous releases are monitored on a continuous basis. No new sources of radionoble gases will be created by the operation of WWDS.

Radioactive iodine has been the most restrictive material released via the Reactor Auxiliary Building Vent. Operation of the WWDS will reduce the release of radioactive iodine since the Boric Acid and Waste Evaporator vents will not be in operation. Evaporator vents are not subject to decontamination by charcoal absorption prior to release via the Plant vent. Since WWDS operation is under positive pressure with specific absorbers and ion exchangers present a reduction in the release of radioactive iodine in gaseous effluent from the Plant vent is expected. No new sources of radioactive gases are created by operation of the WWDS.

The release of radionoble gases during operation of WWDS will be via the Waste Holdup Tank and Waste Condensate Tank Vents, which operate at ambient temperature and pressure, via the Reactor Auxiliary Building vent stack and as dissolved gases in liquid effluent. Operation of Boric Acid and Waste Evaporators results in the release of radionoble gases through vents to the Reactor Auxiliary Building ventilation system and as dissolved gases in liquid effluents. No new sources of radionoble gases are created by operation of the WWDS.

Solidified evaporator bottoms accounted for 58.1% of the solid radwaste generated during 1986 at H. B. Robinson, Unit 2. Solid wastes produced by the operation of Boric Acid and "B" Waste Evaporators are eliminated by the operation by WWDS. The solid radwaste forms produced from operation of WWDS are exhausted filtration, absorption, and ion exchange media. A significant reduction in the volume of solid radwaste occurs as a result of WWDS operations and no solidification is required.

1.0 <u>SUMMARY OF 10 CFR PART 50.59 REVIEWS</u> (Continued)

1.2.2.3 Mixing CVCS Water with Waste Disposal Water

Water from any one of the three CVC holdup tanks can be transferred to the Waste Holdup Tank (WHUT) or to the WWDS for processing. The effluent is stored in Waste Condensate Tanks (WCT). Administrative controls have been provided to isolate CVC-HUTs for at least 48 hours with appropriate circulation and equilibration of dissolved gases. The decay of short half-live nuclides is accomplished by this isolation. Base and Cation Demineralizers may be utilized to reduce the activity in the CVCS prior to transfer to the Waste Disposal System.

Check valves have been installed in the cross-connect between CVCS and the Waste Disposal System to prevent backflow of waste water containing chlorides. When water contained in the CVCS is to be reused in the Reactor Coolant System, the concentration of boron and chloride would be determined prior to use. The CVC-HUTs are not a normal source of water for the charging pumps. A special valve lineup with its own special procedure would be required to feed the contents of a CVC-HUT into the Reactor Coolant System.

The concentrations of hydrogen gas in the CVC-HUTs liquid are not enough to create a safety hazard upon transfer to the Waste Holdup Tank or to a Waste Condensate Tank. The CVC-HUT will be circulated before transfer to ensure that dissolved hydrogen is in equilibrium with the cover gas space. The Waste Holdup Tank is vented to the Reactor Auxiliary Building ventilation; thus, no hydrogen should accumulate in this tank. The Waste Condensate Tanks are vented through a common vent to the Safety Injection Pump Room. As a WCT is filled, its cover gas should be expelled through this vent. Measurements of the hydrogen concentration will be taken as part of the operational testing of the WWDS, to ensure that excessive hydrogen accumulation is not detected.

1.2.2.4 Storage of Processed Water in Waste Condensate Tanks

The processed water from the WWDS will be collected in the WCTs. There it will be sampled to determine release criteria. During the processing, the effluent will be periodically monitored and samples will be taken if required. The processing will be stopped if the activity exceeds 10^{-4} μCi/cc, excluding tritium and dissolved or entrained noble gases to permit an investigation. The Chemistry Supervisor or his designee will be contacted for further direction. If it is determined that a WCT is not releasable, it can be pumped back to the WHUT for reprocessing. This arrangement is consistent with "B" W/E operation.

1.0 SUMMARY OF 10 CFR PART 50.59 REVIEWS (Continued)

1.2.2.5 Spills in "C" Waste Evaporator Room and Outside Auxiliary Building

- Spills in "C" W/E
  The radiological consequences of spills associated with the WWDS were postulated by assuming that the contents of one pressure vessel was released during media sluicing operations. During sluicing operations, the pressure vessel is isolated, thereby, assuring that the contents of the other four vessels would be secured.

  The "C" W/E Room in which the WWDS will be operating is equipped with a floor drain and raised doorway, so any liquid spills would drain into the #1 Reactor Auxiliary Building sump. Resin spills will be trapped in the room by the screen over the drain.

  During the transfer, a line is assumed to rupture and the entire contents of the vessel released. The water would go down the drain, leaving approximately 20 ft^3 of media on the floor. Airborne radioactivity would be minimal as the radioactive isotopes are chemically bound to the media. Calculated radiation exposure rates for this accident would be approximately 6 R/hr at 18 inches above the media and 0.17 R/hr at the room entrance. The WWDS operator would have a radiation survey instrument to monitor exposure rates at all times and avoid potential overexposure during accident conditions. Cleanup could be accomplished with minimal man-rem expenditures after ALARA preplanning.

- Spills Outside Auxiliary Building
  The moving of spent media from the Spent Media Holding Tank (SMHT) to a High Integrity Container (HIC) for offsite shipment involves the transfer of radioactive material outside of the RAB. It was assumed that the contents of the SMHT were deposited on the ground due to a hose rupture. Exposure rates associated with this scenario would be very similar to those for the resin spill in "C" W/E Room if identical isotopic distributions and activity levels are assumed.

  Airborne radioactivity would again be minimal as the isotopes are bound to the media. Very little activity would be contained in the liquid spill as the water would be relatively clean. Media transfer operations, such as this, require continuous Health Physics monitoring so inadvertent overexposures from this accident would be avoided. Cleanup operations for this spill would require ALARA preplanning similar to that for the "C" W/E Room spill to minimize man-rem expenditures.

1.0 SUMMARY OF 10 CFR PART 50.59 REVIEWS (Continued)

The WWDS equipment has safety features which make spills very unlikely. The temporary hoses connecting the WD system with the WWDS are rated at twice the setting of the system's relief valve. All the hoses are hydrostatically tested by the vendor, and the Special Procedure provides for leak testing the system when connections are reconnected.

The media transfer is unlikely to result in spilled media because of the three levels of protection used. Controls are provided to limit the amount of water used to sluice the resin. The dewatering pump is automatically turned on by high level probe in the HIC. Finally, another probe above the high level probe closes off the feed to the HIC. In addition, the WWDS operator and RC personnel will be present to observe the HIC's level.

In summary, the postulated worst case accidents described above would produce no overexposures and no offsite releases. With proper ALARA preplanning, Plant personnel would not be exposed to extremely hazardous or unusual radiological conditions during cleanup operations.

1.2.2.6 Use of Warm Air to Dry Spent Resin
The WWDS includes a device which uses warm air to drive off excess water from spent resin. Service air is heated and fed down the dewatering lines to the bottom of the HIC. From there, the air flows up through the spent resin and out a vent which has a HEPA filter on it. Through testing, the vendor has shown that this process removes the extra water but does not "dry" the resin. No smearable activity has been detected in their testing at the HEPA inlet. Thus, no releases to the environment will occur.

1.2.2.7 Floor Loadings in "C" W/E Room
The floor and foundation piles loadings resulting from putting the WWDS in "C" W/E Room have been analyzed and found to be satisfactory.

1.2.2.8 Transportation of the WWDS Equipment up to "C" W/E Room
The concern is that one of the parts of the WWDS equipment will be a "heavy load" and will be lifted over safety-related equipment. The lifting path will be from the area east of the rollup door in the Drumming Room directly up to the hatch in "C" W/E Room. Diesel Generator "B" Room is below the Drumming Room, but no safety-related equipment is under the lift path in an exposed situation. If an item is dropped, its maximum weight is 1800 pounds which is not enough to penetrate the floor of "C" W/E Room <u>and</u> the Drumming Room roof. In addition, the lifting devices will have a safety factor of 10.

1.0 SUMMARY OF 10 CFR PART 50.59 REVIEWS (Continued)

1.2.2.9 Operability of the Existing Waste Processing Equipment
Since this Special Procedure is to permit the demonstration of the WWDS, it is considered temporary. The existing waste processing equipment will be maintained even though they probably will not be used.

1.2.2.10 ALARA: WWDS Design
The layout of the equipment has been designed with ALARA in mind. The equipment will have a concrete wall on three sides and portable shielding on the fourth. Furthermore, a personnel barrier will be installed. This barrier will prevent personnel from coming too close to high radiation components without preplanning. In the extreme case, this barrier can be used to form a locked high radiation area. The valves should be operated from outside the barrier, so that only a few entries will be made behind the barrier. The barrier will be made of fencing material with the poles attached to the floor using 3/8 inch self-drilling anchors. These anchors are shorter than the depth of the rebar; thus no rebar will be cut and no safety concern exists.

The vendor has an ALARA goal. This objective is reviewed by the Plant ALARA Unit on a regular basis.

1.2.3 Plant Technical Specifications Review
The following sections of the H. B. Robinson Technical Specifications were reviewed:

Section No.	Title and Comments
3.2	Chemical Volume Control System - No changes were noted.
3.9	Radioactive Effluents - The radiological effects of using the WWDS sluice pathway have been analyzed and are within the limits of this section. Processing liquid radwaste through the WWDS will not result in releases of radioactive materials that exceed the limits of the Section 3.9 of Plant Technical Specifications.
3.16	Radioactive Waste Systems - The existing waste processing equipment (Boric Acid Evaporators and "B" Waste Evaporator) will be maintained during this demonstration period. The gross activity level in each Waste Condensate Tank will be controlled to a level three orders of magnitude below that corresponding to 10 curies.

1.0 SUMMARY OF 10 CFR PART 50.59 REVIEWS (Continued)

Section No.	Title and Comments
4.10	Radioactive Effluents – The controlling procedures for gaseous and liquid effluent releases and the Offsite Dose Calculation Manual provide for sampling, analysis, and accountability of radioactive materials released from the Auxiliary Building. Release rates are based on concentration and nuclide distribution such that widely varying nuclide mixtures can be compared to, and controlled within, the above specifications. Administrative controls are provided so that changes in the liquid radwaste influent and effluent can be monitored and corrective actions taken to preclude the routine release radioactive materials in excess of the above specifications.
4.20	Radioactive Waste Systems – The operating procedures for the WWDS specify the methods for ensuring that a Waste Condensate Tank does not contain <10 curies.

1.2.4 Summary of WWDS Safety Evaluation

Based on the above reviews, the operation of the Waste Water Demineralization System to remove radioactive material from waste streams at the H. B. Robinson Plant can be done without creating an unreviewed safety question.

- This process of filtration, absorption, and ion exchange is similar to those processes already used to remove radioactive materials from the liquid contained in the CVCS and Waste Disposal Systems.
- As previously shown, this process will not result in any offsite doses in excess of those calculated in Chapter 15 of the FSAR. The concentration of radioactive materials in gaseous or liquid effluent do not exceed those produced during operation of the Boric Acid and Waste Evaporator nor is the gross activity in outside tanks being increased. Thus, no accident worse than those already analyzed is credible.
- No margin of any H. B. Robinson Technical Specifications is reduced.

2.0 REASON FOR CHANGE

The overall objectives of Waste Water Demineralization System are to:

- Eliminate dependency on evaporation as a liquid radwaste process.

2.0 REASON FOR CHANGE (Continued)

- Accomplish the following improvements in operating parameters when compared to 1986 influent and effluent values and normalized to three million gallons per year.

Operating Parameters	Evaporators 1986	WWDS Forecast 1987
Operational exposure, man-rem	24	2
Solid radwaste volume, cu. ft.	9400	630
Evaporator maintenance, Manhours	1800	50

3.0 DESCRIPTION OF WASTE WATER DEMINERALIZATION SYSTEM

The Auxiliary Building Liquid Radwaste System has been modified to provide for the operation of the demonstration system. A functional diagram for the WWDS system is shown in Figure A, Page 17. Liquid waste is processed from the Chemical Volume Control System (CVCS) Holdup Tanks and Waste Holdup Tank through a combination of modular filters, absorbers, and ion exchangers. The appropriate combination of modules is determined from chemical and radiochemical characteristics of the influent and effluent streams. The effluent from WWDS is transferred to Waste Condensate Tanks for sampling prior to release. Initially the process modules will be leased by Carolina Power and Light Company and operated by a contractor. The process modules are located in and operated from the "C" Waste Evaporator Room. Quick disconnects are provided in the evaporator room for station air, demineralized water, waste influent and effluent. Exhausted filter, absorption, and ion exchange media are transferred to shipping containers and processed for burial as solid waste.

Figure B, Page 18, shows the arrangement of connections between the CVCS holdup tanks, the "C" evaporator room, and the waste holdup tank. This modification provides a pathway for transfer of CVCS water to the waste holdup tank or directly to the "C" Waste Evaporator Room where the WWDS is located.

While the Waste Water Demineralization System is in service, the waste and boric acid evaporators will be maintained in a state of readiness. Operation of the evaporators will be optional.

4.0 EVALUATION OF SOLID, LIQUID AND GASEOUS EFFLUENT PREDICTIONS

4.1 Solid Radwaste

The concentrates produced by the operation of the evaporators are eliminated by the operation of WWDS during the demonstration period. The projected volume of spent filtration, absorption, and ion exchange media is 630 cubic feet based on processing three million gallons of liquid by the WWDS. This volume of solid waste is in lieu of 9400 cubic feet of solidified evaporator bottoms produced from 2.3 million gallons of waste processed during 1986. The spend media from the operation of WWDS are dewatered and shipped in high integrity containers with appropriate shielding.

4.2 Liquid Radwaste

The volume of liquid waste produced during the demonstration period is not expected to increase as a result of WWDS operation. During 1986 the volume of liquid waste processed through the evaporators was 2.3 million gallons. The average concentration of radionuclides in the evaporator distillate was 2.09 E-05 microcuries per milliliter excluding tritium and dissolved gases. The performance goal for the WWDS is to average 7.00E-06 microcuries per milliliter for 1987 or 33.4 percent of the 1986 average. The following table compares the performance of H. B. Robinson Waste Disposal System for 1986 using LADTAP and including current irrigation pathways to the 10CFR50, Appendix I submittal of 1976:

Maximum Individual	1986 Waste Disposal System	1976 Appendix I Base Case	Appendix I Limit
Age Group	Teenager	Adult	Any Age
Organ	Liver	Liver	Any Organ
Mrem per Year	8 E-03	2 E+00	1 E+01
Total Body			
Age Group	Adult	Adult	Any Age
Mrem per Year	5 E-03	1 E+00	3 E+00
Integrated Population			
Organ	Liver	Thyroid	
Manrem per Year	6 E-03	2 E+00	
Total Body			
Manrem per Year	5 E-03	2 E+00	

The calculated doses for 1986 are well within the Appendix I base case for H. B. Robinson. Since the 1987 performance objective for the WWDS is one third the 1986 average radionuclide concentration, projected doses are bounded by the reference 10CFR50, Appendix I values.

4.0 EVALUATION OF SOLID, LIQUID AND GASEOUS EFFLUENT PREDICTIONS (Continued)

4.3 Gaseous Radwaste

Radioiodines have been the most restrictive nuclides released via the Reactor Auxiliary Building Vent. Operation of the WWDS will reduce the release of radioiodine since the Boric Acid and Waste Evaporator vents will not be in operation. The evaporator vents are not subject to decontamination by charcoal absorption prior to release via the Plant vent. Since WWDS operation is under positive pressure with specific absorbers and/or ion exchangers present, a reduction in the release of radioiodine in gaseous effluent from the Plant Vent is expected. The release of radionoble gases during operation of WWDS is via the Waste Holdup Tank and Waste Condensate Tank vents and Plant stack. Dissolved gases are also released in liquid effluent. Operation of the evaporators resulted in the release of radionoble gases through vents to the Reactor Auxiliary Building Ventilation system. Dissolved gases were also released in liquid effluent. No new sources of gaseous effluent are created by the operation of WWDS.

5.0 EVALUATION OF EXPOSURE TO OPERATIONAL PERSONNEL

The projected dose for 1987 during the demonstration of the Waste Water Demineralization System are approximately two man-rem as distributed below.

Activity	Dose, man-rem
WWDS Operations	1.50
Chemistry and Health Physics	0.45
Shipping	0.20

The WWDS demonstration will play a major role in reducing onsite exposure during 1987.

Figure A : Functional Diagram

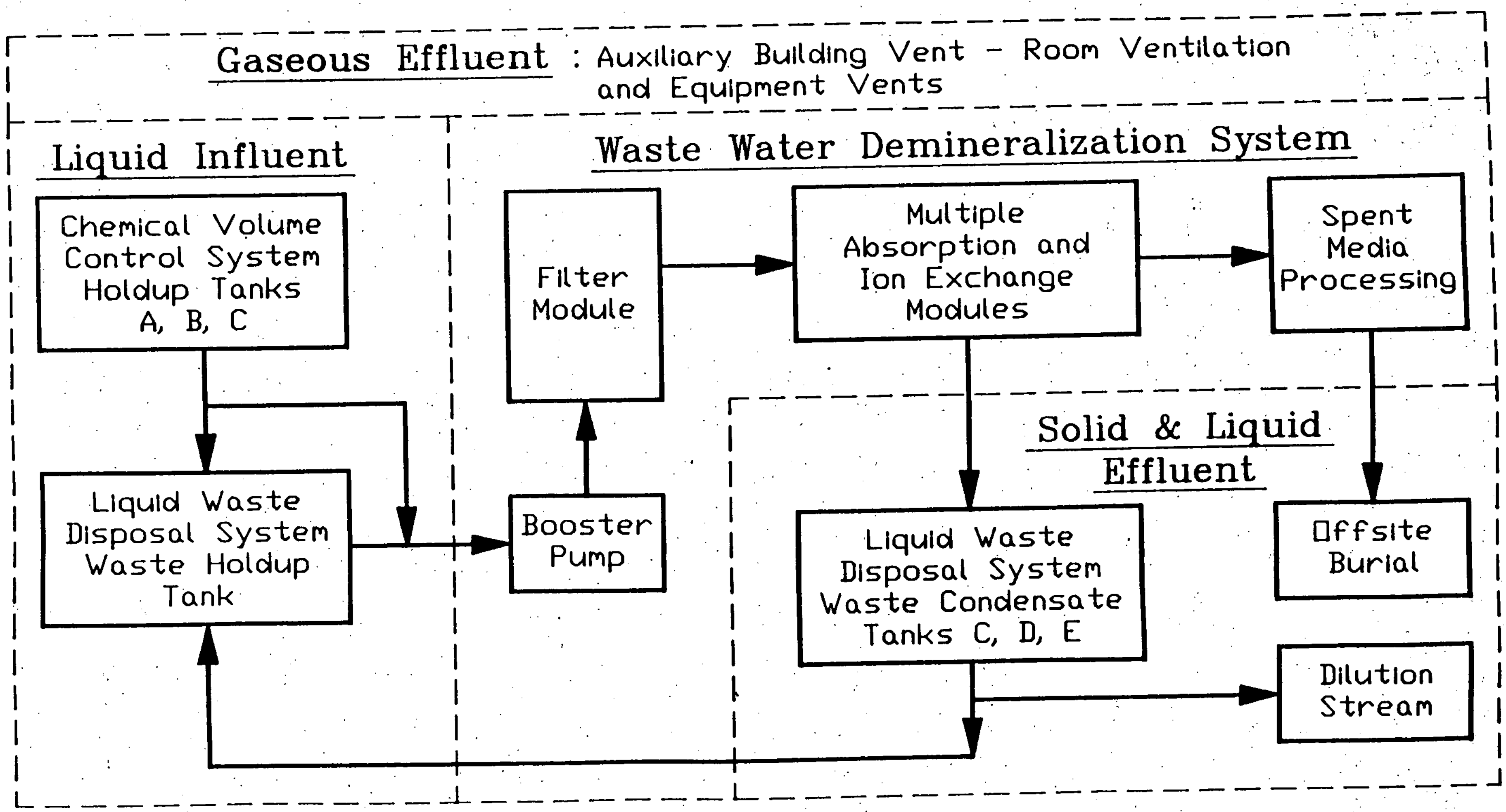
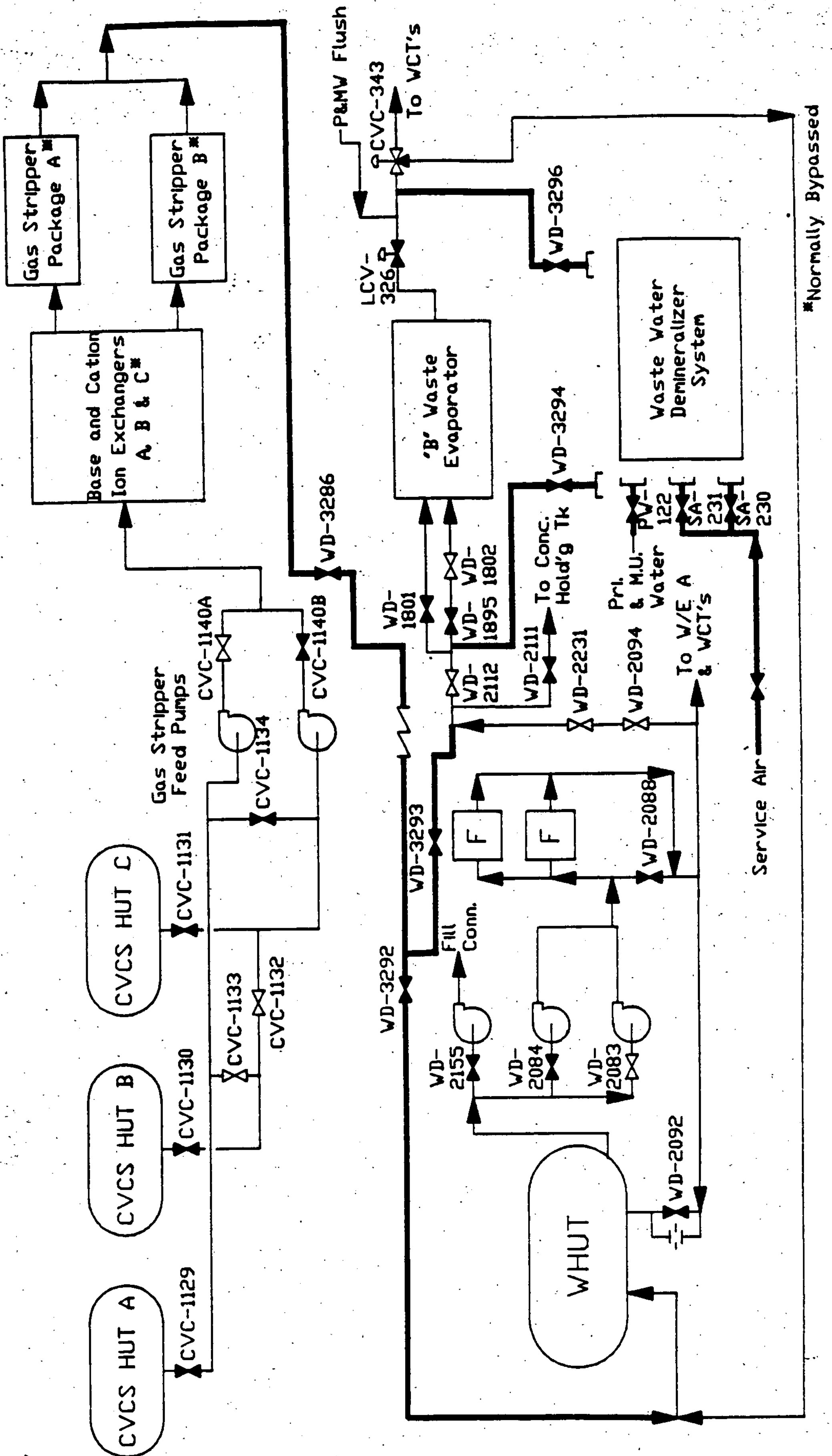


Figure B : Liquid Waste Disposal



6.0 PNSC MINUTES OF JANUARY 29, 1987, REVIEW AND ACCEPTANCE OF RADIOACTIVE LIQUID TREATMENT SYSTEM

Plant Nuclear Safety Committee (PNSC) Meeting No. 1204 (Special) of January 29, 1987, convened to approve details of the semiannual report to the NRC on the use of DURATEK as a temporary research-and-development change to the Plant radioactive waste processing system. The minutes of the meeting were published under Robinson Nuclear Project Department Letter, Serial No. RNPD/87-1219 of April 24, 1987. The change was reviewed and found acceptable by the PNSC.

Form 244

CP&L

Carolina Power & Light Company

Company Correspondence

ROBINSON NUCLEAR PROJECT DEPARTMENT
POST OFFICE BOX 790
HARTSVILLE, SOUTH CAROLINA 29550
APR 2 4 1987

Robinson File No: 11020

Serial: RNPD/87-1219

PLANT NUCLEAR SAFETY COMMITTEE MEETING NO. 1204 (SPECIAL)
MINUTES OF JANUARY 29, 1987

ATTENDANCE

J. M. Curley - Acting Chairman
B. G. Rieck - Member
D. R. Quick - Member
A. R. Wallace - Member
R. M. Smith - Member
H. J. Young - Member
J. F. Benjamin - Alternate
E. M. Harris - Extra
J. L. Harrison - Extra
J. R. Davis - Extra
R. M. Reynolds - Extra
M. C. Morrow - Extra
D. A. Sayre - Acting Secretary

This PNSC Committee convened at 1330 hours.

AGENDA

The purpose of this meeting was to approve details of the semiannual report to the NRC on the use of DURATEK (as a temporary R&D change to the radwaste processing system). The concept of DURATEK had previously been addressed by the PNSC.

J. R. Davis presented the results of J. L. Harrison's evaluation of the requirement to report major changes to the radwaste system to the NRC.

Mr. Harrison discussed RNPD/87-360 of January 29, 1987 (Harrison/Morgan re: Waste Water Demineralization Modification). Attachment 2 to the letter is a draft of the semiannual radiological effluent release report for January through June, 1986, changes to the liquid radwaste systems per Technical Specification 6.9.d.7.

Mr. Davis was to look into all requirements on WDS operability per OP-305 and OP-701.

The chairman recommended followup on: 1) Technical Support to investigate BAE operability, and 2) Regulatory Compliance to check the temporary versus permanent aspects of requirements in Technical Specifications.

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M. C. Morrow then presented information concerning PNSC Action Item 86-05. In addition, he presented information on the upcoming February exercise to address the weaknesses and IFI in the RII-86-30 report: Weaknesses: 1) Failure to conduct detailed review of exercise messages with lead controllers prior to the exercise; 2) Lack of sufficient communications staff for timely activation of the TSC & EOF and delay in activation by emergency organizations; 3) Unsatisfactory onsite response to medical emergency with regard to arrival of the first aid team; and 4) Significant events not reported to the state and counties. The IFI: No posting of significant events on TSC/EOF status boards.

Mr. Morrow presented the February drill as it was to be discussed with the NRC (Bill Sartor). A 3-hour drill, from 0900-1200 hours, involving the Shift Foreman, SEC, and Control Room/TSC communicator to improve data flow. The TSC will undergo full activation (command room only); minimum staff will be maintained in the OSC for the medical emergency; full activation of the EOF without the HE&EC personnel. Everything else will be simulated.

DASayre
D. A. Sayre
Acting Secretary

RDC:leh

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J. M. Curley

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Reviewed by Guy P. Beatty, Jr.

IV. CHANGES TO THE PCP

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

V. INSTRUMENTATION INOPERABILITY

There were no reportable instrumentation inoperability events during this reporting period.

VI. LIQUID HOLDUP TANK CURIE LIMIT

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

CP&L

Carolina Power & Light Company

ROBINSON NUCLEAR PROJECT DEPARTMENT
POST OFFICE BOX 790
HARTSVILLE, SOUTH CAROLINA 29550

AUG 26 1987

Robinson File No: 12510E

Serial: RNPD/87-3753
(10CFR50.36a)

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

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261
LICENSE NO. DPR-23
SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

Dear Sir:

The enclosed Semiannual Radioactive Effluent Release Report for the period of January 1 through June 30, 1987, 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 1987. 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,

REMorgan

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

DAS:jch

Enclosure

cc: J. N. Grace
H. E. P. Krug

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