ALABAMA POWER COMPANY

FARLEY NUCLEAR PLANT UNIT NO. ONE

LICENSE NO. NPF-2

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

JANUARY 1, 1980 THROUGH JUNE 30, 1980

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TABLES

INTRODUCTION

This semi-annual radioactive release report for the period JANUARY 1 to JUNE 30, 1980 is submitted in accordance with Appendix B to Farley Nuclear Plant License No. NPF-2. Appendix B will hereinafter be referred to an the Environmental Technical Specifications or ETS.

All liquid and airborne discharges to the environment during this reporting period were analyzed in accordance with requirements in the ETS. For all effluent releases, the concentrations of radioactive material were within ETS limits.

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT SUPPLEMENTARY INFORMATION

1. Regulatory Limits

a. Fission and Activation Gases

The release rate limit at any time of noble gases to areas at or beyond the site boundary shall be such that

$$10^6 \frac{\text{pCi}}{\text{uCi}} \sum_{i}^{14} \left[K_i \sum_{v}^{2} \left[(\overline{\chi/Q})_v \; Q_{iv} \right] \right] \quad < 500 \text{ mrem/yr}$$

and

$$10^6 \frac{\text{pCi}}{\text{uCi}} \sum_{i}^{14} \left[(L_i + 1.1 M_i) \sum_{v}^{2} \left[(\overline{\chi/Q})_v \; Q_{iv} \right] \right] < 3000 \text{ mrem/yr}$$

where the terms are defined in section 2.3 of the ETS

b. Iodines and Particulates

The release rate limit for sampling period of all radioiodines and radioactive materials in particulate form and radionuclides other than noble gases released to the environs as part of the gaseous wastes from the site shall be such that

$$10^6 \frac{\text{pCi}}{\text{uCi}} \sum_{i}^{18} P_i \left[\sum_{v}^{2} \left[(\overline{\chi/Q})_{mv} \; Q_{iv} \right] \right] \quad < 6.3 \text{ mrem/yr}$$

where the terms are defined in Section 2.3 of ETS

c. Liquid Effluents

The concentration of radioactive materials released in liquid effluents to unrestricted areas from all reactors at the site shall not exceed at any time the values specified in 10 CFR Part 20, Appendix B, Table II, Column 2. The concentration of dissolved or entrained noble gases, released in liquid effluents to unrestricted areas from all reactors at the site, shall not exceed at any time 4 E-5 μCi/ml in water.

2. Maximum Permissible Concentrations

a. Airborne - The maximum permissible concentration of radioactive materials in gaseous effluents is limited by the dose rate restrictions of 10CFR20. In this case, the maximum permissible concentrations are actually determined by the dose factors in Table 2.5, 2.6 and 2.7 of the ETS.

b. Liquid - 10 CFR Part 20, Appendix B Table II, Column 2.*

*NOTE: The MPC chosen is the most conservative value of either the soluble or insoluble MPC for each isotope.

3. Average Energy

Not Applicable for Farley's ETS.

4. Measurements and Approximations of Total Activity

The following discussion details the methods used to measure and approximate total activity for the following:

a. Fission and Activation Gases
b. Iodines
c. Particulates
d. Liquid Effluents

Tables 5 and 6 give sampling frequencies and minimum detectable sensitivity requirements for the analysis of liquid and gaseous effluent streams.

Values in the attached tables given as zero do not mean that the nuclides were not present. A zero indicates that the nuclide was not present at levels greater than the sensitivity requirements shown in Tables 5 and 6. For some nuclides, lower detection limits than required may be readily achievable; when a nuclide is measured below its stated limits it is reported.

Fission and Activation Gases

The following noble gases are considered in evaluating gaseous airborne discharge:

Ar-41	Kr-89	Xe-133m
Kr-85m	Kr-90	Xe-135m
Kr-85	Xe-131m	Xe-135
Kr-87	Xe-133	Xe-137
Kr-88		Xe-138

Periodic grab samples from plant effluent streams are analyzed by a computerized pulse height analyzer system utilizing high resolution germanium detectors. (See Table 6 for sampling and analytical requirements). Isotopic values thus obtained are used for dose release rate calculations as given in section 1a of this report. Only those nuclides that are detected are used in this computation. During the period between grab samples, the amount of radioactivity released is based on the effluent monitor readings. Monitors are assigned a calibration factor based upon the last isotopic analysis using the following relationship:

$$Ci = \mu i \div m, \quad \text{where}$$

Ci = isotopic calibration factor for isotope i.

μi = concentration of isotope i in the grab sample, in $\mu Ci/ml$.

m = net monitor reading associated with the effluent stream. (determined at time of grab sample)

These calibration factors along with the hourly effluent monitor readings are input to the laboratory computer where the release rates for individual nuclides are calculated and stored.

To ensure that isotopic distributions do not change significantly during major operational occurences, the frequency of grab sampling is increased to satisfy the requirements of footnote "C" of Table 6, "Radioactive Gaseous Waste, Sampling and Analysis", (ETS Table 2-2).

Particulate and Iodine

The radioiodines and radioactive materials in particulate forms to be considered are:

Zn-65	Sr-89	Cs-134
Cr-51	Sr-90	Cs-136
Mn-54	Zr-95	Cs-137
Fe-59	Sb-124	Ba-140
Co-58	I-131	Ce-141
Co-60	I-133	Other nuclides with half-life greater than 8 days

Continuous Releases

Continuous sampling is performed on the continuous release points (i.e. the Plant Vent Stack, Containment Purge and the Turbine Building Vent). Particulate material is collected by filtration. Iodines are collected by adsorption on a charcoal filter. Periodically these filters are removed and analyzed on the pulse height analyzer to identify and quantify radioactive materials collected on the filters. Particulate filters are then analyzed for gross alpha, and Strontium 89 and 90, as required. Gross alpha determinations are made using a 2 pi gas flow proportional counter. Sr-89 and 90 values are obtained by chemical separation and subsequent analysis using 2 pi gas flow proportional counters.

Batch Releases

The processing of batch type releases (from Containment Purge and Waste Gas Decay Tanks) is analogous to that for continuous releases, except that the release is not commenced until grab samples have been obtained and analyzed.

Liquid Effluents

The radionuclides listed below are considered when evaluating liquid effluents:

H-3	Sr-91	Cs-134
Co-58	Mo-90	Cs-136
Co-60	Te-99m	Cs-137
Fe-59	Ru-103	Ba-140
Zn-65	Ru-106	La-140
Mn-54	I-131	Ce-141
Cr-51	I-132	Ce-144
Sr-89	I-133	
Sr-90	I-135	

Batch Releases - Representative pre-release grab samples are obtained and analyzed per Table 5. Isotopic analyses are performed using the computerized pulse height analysis system previously described. Aliquots of each pre-release sample proportional to the waste volume released, are composited in accordance with requirements in Table 5. Strontium determinations are made by performing a chemical separation and counting the strontium thus separated using a 2 pi gas flow proportional counter. Gross beta-gamma and gross alpha determinations are made using 2 pi gas flow proportional counters. Tritium concentrations are determined by using liquid scintillation techniques. Dissolved gases are determined employing grab sampling techniques and then counting on the pulse height analyzer system.

Continuous Releases

Continuous Releases (from the Steam Generator Blowdown) are analogous to that of the batch releases except that they are to be analyzed on a weekly composite basis per Table 5.

5. Batch Releases

a. Liquid

1.	Number of batch releases:	169
2.	Total time period for batch releases:	16,120 minutes
3.	Maximum time period for a batch release:	219 minutes
4.	Average time period for a batch release:	95 minutes
5.	Minimum time period for a batch release:	24 minutes
6.	Average stream flow during periods of release of effluent into a flowing stream:	1,290 cfs

b. Gaseous

1.	Number of batch releases:	0

2. Total time period for batch releases: 0 hours

3. Maximum time period for a batch release: 0 hours

4. Average time period for a batch release: 0 hours

5. Minimum time period for a batch release: 0 hours

6. Abnormal Release

a. Liquid

1. Number of releases: None

2. Total activity released: N/A

NOTE 1: See Table 7 for listing of Liquid Batch releases that did not meet specified detection limits.

b. Gaseous

1. Number of releases: None

2. Total activity released: N/A

7. Estimate of Total Error

a. Liquid

1. The maximum error associated with volume and flow measurements, based upon plant calibration practice is estimated to be ± 10%.

2. The average error associated with counting is estimated to be less than ± 15%.

b. Gaseous

1. The maximum errors associated with monitor readings, sample flow, vent flow, sample collection, monitor calibration and laboratory procedure are collectively estimated to be:

Fission and Activation Gases	Iodine	Particulates	Tritium
75%	60%	50%	45%

2. The average error associated with counting is estimated to be:

Fission and Activation Gases	Iodine	Particulates	Tritium
6%	18%	19%	12%

c. Solid Radwaste

The error involved in determining the contents of solid radwaste shipments is estimated to less than ± 15%.

8. Solid Waste

See Table 3

9. Radiological Impact On Man

a. Water Related Exposure Pathways

	1st Quarter	2nd Quarter
Total Body =	6.1E-03 mrem	5.5E-02 mrem
Bone =	4.6E-03 mrem	4.0E-02 mrem
Liver =	8.2E-03 mrem	7.3E-02 mrem
Thyroid =	1.3E-03 mrem	7.4E-03 mrem
Kidney =	2.9E-03 mrem	2.4E-02 mrem
Lungs =	1.1E-03 mrem	8.4E-03 mrem
GI Tract =	8.9E-03 mrem	9.3E-03 mrem

b. Gaseous Related Exposure Pathways

	1st Quarter	2nd Quarter
Total Body =	1.0E-01 mrem	2.5E-02 mrem
Skin =	6.8E-02 mrem	1.1E-02 mrem

c. Particulate and Iodine

	1st Quarter	2nd Quarter
Organ Dose =	3.5E-03 mrem	1.3E-02 mrem

10. Meteorological Data

See Table 4A.

1st Quarter Continuous

2nd Quarter Continuous

11. Liquid Release "Principal Gamma Emitter" Evaluation

Detectable limits for activity analyses are based upon the technical feasibility and on the potential significance in the environment of the quantities released. In practice, when an isotope's LLD could not be met due to other nuclides being present in much greater concentrations, computations were made to determine if the isotope(s) of interest were actually "Principal Gamma Emitters" by the following definition:

"Principal Gamma Emitters" - Those gamma emitters when quantified represent greater than 1% of the total activity or total dose commitment of the effluent release in question.

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TABLE 1A

GASEOUS EFFLUENTS--SUMMATION OF ALL RELEASES

	UNITS	QTR 1
A. Fission & activation gases:		
1. Total release	Ci	3.50E 03
2. Average Release rate for period	uCi/sec	1.08E 03
3. % of Technical specification limit	%	1.44E-01*
	%	2.18E-01**
B. Iodines		
1. Total iodine-131	Ci	1.77E-04
2. Average Release rate for period	uCi/sec	2.25E-05
3. % of Technical specification limit	%	3.38E-07***
C. Particulates		
1. Particulates with T1/2>8 days	Ci	2.00E-05
2. Average Release rate for period	uCi/sec	2.55E-06
3. % of Technical specification limit	%	1.41E-06***
4. Gross alpha radioactivity	Ci	0.00E 00
D. Tritium		
1. Total release	Ci	1.50E 01
2. Average Release rate for period	uCi/sec	1.91E 00
3. % of Technical specification limit	%	1.79E-07***

*: Whole body limit (<500 mrem/yr)
**: Extrem. limit (<3000 mrem/yr)
***: % of 6.3 mrem/yr for all 19 isotopes

1980

TABLE 1A

GASEOUS EFFLUENTS--SUMMATION OF ALL RELEASES

	UNITS	QTR 2
A. Fission & activation gases:		
1. Total release	Ci	1.05E 03
2. Average Release rate for period	uCi/sec	1.34E 02
3. % of Technical specification limit	%	6.56E-03*
	%	1.15E-02**
B. Iodines		
1. Total iodine-131	Ci	8.22E-05
2. Average Release rate for period	uCi/sec	1.04E-06
3. % of Technical specification limit	%	3.37E-09***
C. Particulates		
1. Particulates with T1/2>8 days	Ci	1.12E-05
2. Average Release rate for period	uCi/sec	1.43E-06
3. % of Technical specification limit	%	2.70E-07***
4. Gross alpha radioactivity	Ci	0.00E 00
D. Tritium		
1. Total release	Ci	1.14E 01
2. Average Release rate for period	uCi/sec	1.45E 00
3. % of Technical specification limit	%	1.45E-07****

*: Whole body limit (<500 mrem/yr)
**: Extrem. limit (<3000 mrem/yr)
***: % of 6.3 mrem/yr for all 19 isotopes

TABLE IB

GASEOUS EFFLUENTS--ELEVATED RELEASE

Nuclides Released	Unit	CONTINUOUS Mode QTR# 1	BATCH Mode QTR# 1
1. Fission gases			
Ar-41	Ci	2.97E 03	0.00E 00
Xe-137	Ci	0.00E 00	0.00E 00
Kr-90	Ci	0.00E 00	0.00E 00
Xe-135M	Ci	0.00E 00	0.00E 00
Kr-85	Ci	0.00E 00	0.00E 00
Xe-138	Ci	0.00E 00	0.00E 00
Kr-87	Ci	0.00E 00	0.00E 00
Kr-85M	Ci	6.35E 00	0.00E 00
Xe-135	Ci	2.48E 02	0.00E 00
Xe-133M	Ci	0.00E 00	0.00E 00
Kr-89	Ci	0.00E 00	0.00E 00
Kr-88	Ci	0.00E 00	0.00E 00
Xe-131M	Ci	1.18E 00	0.00E 00
Xe-133	Ci	4.71E 03	0.00E 00
Total for period	Ci	7.94E 03	0.00E 00
2. Iodines			
I-133	Ci	1.14E-04	0.00E 00
I-131	Ci	5.11E-05	0.00E 00
Total for period	Ci	1.65E-04	0.00E 00
3. Particulates			
Sb-124	Ci	0.00E 00	0.00E 00
Co-60	Ci	3.96E-06	0.00E 00
Zn-65	Ci	0.00E 00	0.00E 00
Fe-59	Ci	0.00E 00	0.00E 00
Mn-54	Ci	3.56E-07	0.00E 00
Cs-136	Ci	0.00E 00	0.00E 00
Co-58	Ci	2.58E-07	0.00E 00
Zr-95	Ci	0.00E 00	0.00E 00
Cs-137	Ci	3.47E-06	0.00E 00
Cs-134	Ci	1.09E-07	0.00E 00
Ba-140	Ci	0.00E 00	0.00E 00
I-133	Ci	1.14E-04	0.00E 00
I-131	Ci	2.75E-06	0.00E 00
Cr-51	Ci	0.00E 00	0.00E 00
Ce-141	Ci	0.00E 00	0.00E 00
Sr-89	Ci	7.31E-06	0.00E 00
Sr-90	Ci	0.00E 00	0.00E 00
Total for period	Ci	1.32E-04	0.00E 00
4. Tritium			
H-3	Ci	1.40E 01	0.00E 00

TABLE IB

GASEOUS EFFLUENTS--ELEVATED RELEASE

Nuclides Released	Unit	CONTINUOUS Mode QTR# 2	BATCH Mode QTR# 2
1. Fission gases			
Ar-41	Ci	1.00E 02	0.00E 00
Xe-137	Ci	1.12E-01	0.00E 00
Kr-90	Ci	0.00E 00	0.00E 00
Xe-135M	Ci	0.00E 00	0.00E 00
Kr-85	Ci	0.00E 00	0.00E 00
Xe-138	Ci	0.00E 00	0.00E 00
Kr-87	Ci	1.17E 00	0.00E 00
Kr-85M	Ci	0.00E 00	0.00E 00
Xe-135	Ci	5.28E 01	0.00E 00
Xe-133M	Ci	0.00E 00	0.00E 00
Kr-89	Ci	0.00E 00	0.00E 00
Kr-88	Ci	0.00E 00	0.00E 00
Xe-131M	Ci	7.51E 01	0.00E 00
Xe-133	Ci	7.93E 02	0.00E 00
Total for period	Ci	1.02E 03	0.00E 00
2. Iodines			
I-133	Ci	7.93E-05	0.00E 00
I-131	Ci	8.08E-06	0.00E 00
Total for period	Ci	8.74E-05	0.00E 00
3. Particulates			
Sb-124	Ci	0.00E 00	0.00E 00
Co-60	Ci	5.88E-07	0.00E 00
Zn-65	Ci	0.00E 00	0.00E 00
Fe-59	Ci	0.00E 00	0.00E 00
Mn-54	Ci	0.00E 00	0.00E 00
Cs-136	Ci	0.00E 00	0.00E 00
Co-58	Ci	1.64E-06	0.00E 00
Zr-95	Ci	0.00E 00	0.00E 00
Cs-137	Ci	3.47E-07	0.00E 00
Cs-134	Ci	1.56E-07	0.00E 00
Ba-140	Ci	0.00E 00	0.00E 00
I-133	Ci	7.93E-05	0.00E 00
I-131	Ci	2.19E-09	0.00E 00
Cr-51	Ci	1.93E-07	0.00E 00
Ce-141	Ci	6.70E-09	0.00E 00
Sr-89	Ci	7.21E-06	0.00E 00
Sr-90	Ci	0.00E 00	0.00E 00
Total for period	Ci	8.95E-05	0.00E 00
4. Tritium			
H-3	Ci	1.08E 01	0.00E 00

TABLE IC

GASEOUS EFFLUENTS--GROUND-LEVEL RELEASE

Nuclides Released	Unit	CONTINUOUS Mode QTR# 2	BATCH Mode QTR# 2
1. Fission gases			
Ar-41	Ci	2.71E 00	0.00E 00
Xe-137	Ci	1.01E-02	0.00E 00
Kr-90	Ci	0.00E 00	0.00E 00
Xe-135M	Ci	1.49E-01	0.00E 00
Kr-85	Ci	0.00E 00	0.00E 00
Xe-138	Ci	1.05E-01	0.00E 00
Kr-87	Ci	2.15E-01	0.00E 00
Kr-85M	Ci	0.00E 00	0.00E 00
Xe-135	Ci	2.46E 00	0.00E 00
Xe-133M	Ci	0.00E 00	0.00E 00
Kr-89	Ci	0.00E 00	0.00E 00
Kr-88	Ci	2.52E-03	0.00E 00
Xe-131M	Ci	1.06E 00	0.00E 00
Xe-133	Ci	2.35E 01	0.00E 00
Total for period	Ci	3.02E 01	0.00E 00
2. Iodines			
I-133	Ci	4.13E-05	0.00E 00
I-131	Ci	1.40E-07	0.00E 00
Total for period	Ci	4.15E-05	0.00E 00
3. Particulates			
Sb-124	Ci	0.00E 00	0.00E 00
Co-60	Ci	4.74E-03	0.00E 00
Zn-65	Ci	0.00E 00	0.00E 00
Fe-59	Ci	0.00E 00	0.00E 00
Mn-54	Ci	0.00E 00	0.00E 00
Cs-136	Ci	0.00E 00	0.00E 00
Co-58	Ci	2.65E-03	0.00E 00
Zr-95	Ci	0.00E 00	0.00E 00
Cs-137	Ci	3.03E-09	0.00E 00
Cs-134	Ci	2.68E-09	0.00E 00
Ba-140	Ci	0.00E 00	0.00E 00
I-133	Ci	4.13E-05	0.00E 00
I-131	Ci	1.40E-11	0.00E 00
Cr-51	Ci	1.12E-03	0.00E 00
Ce-141	Ci	4.94E-10	0.00E 00
Sr-89	Ci	9.83E-07	0.00E 00
Sr-90	Ci	0.00E 00	0.00E 00
Total for period	Ci	4.24E-05	0.00E 00
4. Tritium			
H-3	Ci	5.87E-01	0.00E 00

TABLE IC

GASEOUS EFFLUENTS--GROUND-LEVEL RELEASE

Nuclides Released	Unit	CONTINUOUS Mode QTR# 1	BATCH Mode QTR# 1
1. Fission gases			
Ar-41	Ci	2.11E 02	0.00E 00
Xe-137	Ci	0.00E 00	0.00E 00
Kr-90	Ci	0.00E 00	0.00E 00
Xe-135M	Ci	4.74E-03	0.00E 00
Kr-85	Ci	9.17E-02	0.00E 00
Xe-138	Ci	5.20E-04	0.00E 00
Kr-87	Ci	5.09E-03	0.00E 00
Kr-85M	Ci	2.07E-01	0.00E 00
Xe-135	Ci	1.82E 01	0.00E 00
Xe-133M	Ci	0.00E 00	0.00E 00
Kr-89	Ci	0.00E 00	0.00E 00
Kr-88	Ci	7.02E-03	0.00E 00
Xe-131M	Ci	7.41E-02	0.00E 00
Xe-133	Ci	3.37E 02	0.00E 00
Total for period	Ci	5.67E 02	0.00E 00
2. Iodines			
I-133	Ci	3.93E-06	0.00E 00
I-131	Ci	1.25E-04	0.00E 00
Total for period	Ci	1.29E-04	0.00E 00
3. Particulates			
Sb-124	Ci	0.00E 00	0.00E 00
Co-60	Ci	3.79E-07	0.00E 00
Zn-65	Ci	0.00E 00	0.00E 00
Fe-59	Ci	0.00E 00	0.00E 00
Mn-54	Ci	2.83E-08	0.00E 00
Cs-136	Ci	0.00E 00	0.00E 00
Co-58	Ci	3.10E-06	0.00E 00
Zr-95	Ci	0.00E 00	0.00E 00
Cs-137	Ci	2.62E-07	0.00E 00
Cs-134	Ci	1.30E-08	0.00E 00
Ba-140	Ci	0.00E 00	0.00E 00
I-133	Ci	3.89E-06	0.00E 00
I-131	Ci	2.20E-07	0.00E 00
Cr-51	Ci	0.00E 00	0.00E 00
Ce-141	Ci	0.00E 00	0.00E 00
Sr-89	Ci	8.79E-07	0.00E 00
Sr-90	Ci	0.00E 00	0.00E 00
Total for period	Ci	5.71E-06	0.00E 00
4. Tritium			
H-3	Ci	1.03E 00	0.00E 00

TABLE 2A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1980

LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

	Unit	Quarter 1, 80	Quarter 2, 80
A. Fission and activation products			
1. Total release (not including H-3)	Ci	9.17E-03	3.31E-02
2. Average diluted concentration During period Note (1)	uCi/ml	2.89E-09	7.29E-10
3. Percent of applicable limit During period Note (1)	%	4.24E-02	2.27E-02
B. Tritium			
1. Total release	Ci	2.68E 01	4.25E 01
2. Average diluted concentration During period Note (1)	uCi/ml	8.46E-06	9.37E-07
3. Percent of applicable limit During period Note (1)	%	2.82E-01	3.12E-02
C. Dissolved and entrained gases			
1. Total release	Ci	1.28E-03	4.91E-03
2. Average diluted concentration During period Note (1)	uCi/ml	4.04E-10	1.08E-10
3. Percent of applicable limit During period Note (1)	%	1.01E-03	2.71E-04
D. Gross alpha radioactivity 1. Total release	Ci	0.00E 00	0.00E 00
E. Volume of waste released (prior to dilution)	liters	6.40E 06	4.31E 07
F. Volume of dilution water used During period Note (1)	liters	3.17E 09	4.53E 10

NOTE:

(1) During period of discharge

TABLE 2B

LIQUID EFFLUENTS-ALL SOURCES Jan. 80 THROUGH June 80

Nuclides released	Unit	Quarter 1, 80 Batches	Quarter 1, 80 Continuous	Quarter 2, 80 Batches	Quarter 2, 80 Continuous
Sr-89	Ci	0.00E 00	0.00E 00	0.00E 00	1.51E-04
Sr-90	Ci	0.00E 00	0.00E 00	4.50E-07	0.00E 00
Co-57	Ci	1.77E-05	0.00E 00	8.53E-06	0.00E 00
Ce-144	Ci	0.00E 00	0.00E 00	8.71E-06	0.00E 00
Tc-99M	Ci	0.00E 00	0.00E 00	1.35E-06	0.00E 00
Ce-141	Ci	0.00E 00	0.00E 00	0.00E 00	0.00E 00
Nb-239	Ci	0.00E 00	0.00E 00	9.95E-06	0.00E 00
Cr-51	Ci	2.30E-04	0.00E 00	6.87E-05	4.57E-04
I-131	Ci	7.14E-05	1.84E-04	2.84E-05	1.12E-03
Ru-103	Ci	0.00E 00	0.00E 00	1.40E-06	0.00E 00
I-133	Ci	5.06E-06	2.12E-04	3.29E-06	4.39E-03
Ba.-140	Ci	0.00E 00	0.00E 00	4.55E-06	0.00E 00
As.-76	Ci	0.00E 00	0.00E 00	0.00E 00	0.00E 00
Cs.-134	Ci	3.13E-05	8.33E-05	3.50E-04	1.37E-03
Ru-106	Ci	5.91E-05	0.00E 00	1.32E-05	1.01E-03
Cs.-137	Ci	4.97E-05	1.42E-04	6.35E-04	1.31E-03
Mo-99	Ci	0.00E 00	0.00E 00	1.12E-05	0.00E 00
Zr-95	Ci	2.76E-06	0.00E 00	2.24E-07	0.00E 00
Nb.-95	Ci	1.26E-04	0.00E 00	3.73E-05	7.77E-05
I-132	Ci	0.00E 00	2.01E-05	1.51E-06	3.61E-03
Co-58	Ci	1.70E-03	0.00E 00	1.40E-03	2.40E-03
Cs-136	Ci	2.00E-05	0.00E 00	0.00E 00	0.00E 00
Mn-54	Ci	6.88E-04	5.72E-05	4.53E-04	5.07E-04
Ag-110M	Ci	4.38E-04	2.73E-06	1.12E-04	5.94E-04
Sr-91	Ci	0.00E 00	0.00E 00	0.00E 00	0.00E 00
Zn-65	Ci	1.70E-06	0.00E 00	0.00E 00	0.00E 00
I-135	Ci	1.55E-06	1.63E-04	0.00E 00	3.16E-03
Fe.-59	Ci	6.06E-05	0.00E 00	2.54E-05	2.30E-04
Co-60	Ci	4.68E-03	3.29E-05	4.20E-03	2.91E-03
Cu-64	Ci	0.00E 00	0.00E 00	0.00E 00	0.00E 00
Na-24	Ci	7.25E-07	6.69E-05	9.26E-06	2.38E-03
La-140	Ci	1.28E-05	0.00E 00	3.10E-05	2.55E-05
Ni-65	Ci	2.59E-06	0.00E 00	0.00E 00	0.00E 00
Zr-97	Ci	3.90E-06	0.00E 00	0.00E 00	0.00E 00
Totals	Ci	8.20E-03	9.63E-04	7.39E-03	2.57E-02
Xe-133	Ci	1.17E-03	0.00E 00	2.97E-03	1.21E-03
Xe-135	Ci	7.36E-05	4.15E-05	2.86E-05	7.11E-04

TABLE 3

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1979

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

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

1. Type of Waste	UNIT	6-MONTH
a. Spent resins, filter sludges, evaporator bottoms, etc.	m^3	8.8 E 01
	Ci	1.8 E 02
b. Dry compressible waste, contaminated equip, etc.	m^3	1.4 E 02
	Ci	3.4 E 01
c. Irradiated components, control rods, etc.	m^3	None
	Ci	
d. Other (describe)	m^3	None

2. Estimate of major nuclide composition	%	Ci
a. Cobalt-58	1.6 E 01	2.8 E 01
Manganese-54	1.2 E 01	2.2 E 01
Cobalt-60	6.6 E 01	1.2 E 02
b. Cobalt-58	5.0 E 00	1.7 E 00
Manganese-54	1.2.E 01	4.0 E 00
Iron-59	7.0 E 01	2.4 E 01

TABLE 3 (con't)

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1979

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
18	Chem-Nuclear Transport	Chem-Nuclear Systems, Incorporated Farnwell, South Carolina

4. Type Of Container (1a)

LSA, 300 ft^3 cylindrical container

Type of Container (1b)

DOT17H (55 gal drums), 128 ft^3 wooden boxes

5. Solidification Agent (1a)

Urea-formaldehyde

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination
None	N/A	N/A

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Table 4A

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4-1-60 - 6-30-80
STABILITY CLASS: A
ELEVATION: 45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	1	1	0	0	0	0	2
	0	0	0	0	0	0	0

Total
Periods of calm(hours): 2
Hours of missing data: 0

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Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1-1-80 + 3-31-80
STABILITY CLASS: A
ELEVATION: 45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	0	1	3	0	1	1	6
	0	0	0	0	0	0	0

Total
Periods of calm(hours): 4
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1-1-80 + 3-31-80
STABILITY CLASS: A
ELEVATION: 10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	0	3	2	1	0	0	6
	0	0	0	0	0	0	0

Total
Periods of calm(hours): 4
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1-1-80 - 3-31-80
STABILITY CLASS: B
ELEVATION: 45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	1	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	0	1	0	0	0	0	1
	0	0	1	0	0	0	1

Total
Periods of calm(hours): 0
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1-1-80 - 3-31-80
STABILITY CLASS: B
ELEVATION: 10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	0	2	0	0	0	0	2
	0	0	0	0	0	0	0

Total
Periods of calm(hours): 0
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1-1-80 - 3-31-80
STABILITY CLASS: C
ELEVATION: 45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	1	0	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	2	0	0	2
W	0	0	0	0	0	0	0
WNW	0	0	0	1	0	0	1
NW	0	0	0	0	1	0	1
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	3	0	0	3
	0	1	0	3	1	0	5

Total
Periods of calm(hours): 0
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1-1-80 + 3-31-80
STABILITY CLASS: C
ELEVATION: 10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	0	1	0	0	1
NNE	0	0	0	1	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	1	0	0	1
NNW	0	0	0	0	0	0	0
VARIABLE	0	1	1	3	0	0	5
	0	0	0	3	0	0	3

Total
Periods of calm(hours): 0
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1-1-80 - 3-31-80
STABILITY CLASS: D
ELEVATION: 45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	6	7	3	0	0	16
NNE	0	2	2	3	0	0	7
NE	1	2	7	0	0	0	10
ENE	0	2	3	0	0	0	5
E	0	1	9	0	0	0	10
ESE	0	3	2	0	0	0	5
SE	0	2	7	3	1	0	13
SSE	0	1	2	2	0	0	5
S	0	1	0	3	3	0	7
SSW	0	0	6	8	1	1	16
SW	0	1	4	10	3	0	18
WSW	0	5	10	2	0	0	17
W	3	2	5	1	0	0	11
WNW	1	1	6	8	10	1	27
NW	0	0	5	23	7	0	35
NNW	0	2	13	12	0	0	27
VARIABLE	22	201	175	75	20	2	495
	5	31	88	73	25	2	229

Total
Periods of calm(hours): 2
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1 -1-80 + 3-31-80
STABILITY CLASS: D
ELEVATION: 10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	1	6	5	1	0	13
NNE	0	2	23	11	0	0	36
NE	0	2	18	3	0	0	23
ENE	0	4	5	0	0	0	9
E	0	2	2	0	0	0	4
ESE	0	2	4	0	0	0	6
SE	0	3	5	0	0	0	8
SSE	0	5	5	0	0	0	10
S	0	4	2	0	0	0	6
SSW	0	2	6	1	0	0	9
SW	0	0	1	0	1	0	2
WSW	0	1	2	2	1	0	6
W	0	2	8	6	0	0	16
WNW	0	2	9	8	0	0	19
NW	0	3	9	0	0	0	12
NNW	3	2	3	1	0	0	9
VARIABLE	32	255	190	37	2	0	516
	3	37	108	37	3	0	188

Total
Periods of calm(hours): 22
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1 -1-80 + 3-31-80
STABILITY CLASS: E
ELEVATION: 45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	10	12	2	0	0	24
NNE	0	5	6	0	0	0	11
NE	0	6	12	0	0	0	18
ENE	0	5	20	1	0	0	26
E	0	3	14	2	0	0	19
ESE	0	4	16	0	0	0	20
SE	0	7	10	2	0	0	19
SSE	0	4	10	12	1	0	27
S	0	2	7	8	2	0	19
SSW	0	5	36	32	3	1	77
SW	0	10	31	23	0	0	64
WSW	0	5	9	0	0	0	14
W	0	1	3	1	1	0	6
WNW	0	5	4	3	0	0	12
NW	0	7	25	20	5	0	57
NNW	1	12	23	25	0	0	61
VARIABLE	34	191	273	62	6	2	568
	1	91	238	131	12	1	474

Total
Periods of calm(hours): 0
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1-1-80 → 3-31-80
STABILITY CLASS: E
ELEVATION: 10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	4	8	2	0	0	14
NNE	4	16	18	4	2	0	44
NE	2	12	20	1	0	0	35
ENE	2	10	1	0	0	0	13
E	1	9	1	0	0	0	11
ESE	1	3	0	0	0	0	4
SE	0	11	8	0	0	0	19
SSE	1	5	5	0	0	0	11
S	0	7	4	0	0	0	11
SSW	1	8	3	0	0	0	12
SW	1	4	8	2	0	0	15
WSW	0	1	5	1	1	0	8
W	1	17	24	7	0	0	49
WNW	3	24	26	2	0	0	55
NW	1	8	0	0	0	0	9
NNW	1	2	2	0	0	0	5
VARIABLE	166	366	155	26	0	0	713
	19	141	133	19	3	0	315

Total
Periods of calm(hours): 14
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1-1-80 + 3-31-80
STABILITY CLASS: F
ELEVATION: 45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	4	6	0	0	0	10
NNE	0	0	9	0	0	0	9
NE	0	5	4	0	0	0	9
ENE	0	1	4	0	0	0	5
E	0	1	3	0	0	0	4
ESE	0	0	3	0	0	0	3
SE	0	0	2	1	0	0	3
SSE	0	0	0	1	0	0	1
S	0	1	3	0	0	0	4
SSW	1	2	0	0	0	0	3
SW	0	0	4	1	0	0	5
WSW	0	5	5	0	0	0	10
W	1	2	0	0	0	0	3
WNW	0	1	3	1	0	0	5
NW	0	0	11	0	0	0	11
NNW	0	1	6	0	0	0	7
VARIABLE	9	42	65	2	0	0	118
	2	23	63	4	0	0	92

Total
Periods of calm(hours): 0
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1-1-80 - 3-31-80
STABILITY CLASS: F
ELEVATION: 10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	6	3	1	0	0	0	10
NNE	2	1	0	0	0	0	3
NE	3	9	0	0	0	0	12
ENE	5	4	0	0	0	0	9
E	1	1	0	0	0	0	2
ESE	0	1	0	0	0	0	1
SE	0	1	0	0	0	0	1
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	2	0	0	0	0	2
SW	0	2	0	0	0	0	2
WSW	0	0	0	0	0	0	0
W	0	2	0	0	0	0	2
WNW	1	2	0	0	0	0	3
NW	2	3	0	0	0	0	5
NNW	1	0	1	0	0	0	2
VARIABLE	85	64	1	0	0	0	150
	21	31	2	0	0	0	54

Total
Periods of calm(hours): 6
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE CHAPTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1-1-80 - 3-31-80
STABILITY CLASS: G
ELEVATION: 45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	2	10	1	0	0	13
NNE	0	3	4	0	0	0	7
NE	0	3	8	0	0	0	11
ENE	0	1	6	0	0	0	7
E	0	0	3	0	0	0	3
ESE	0	2	1	0	0	0	3
SE	0	0	0	0	0	0	0
SSE	0	1	1	1	0	0	3
S	0	0	0	0	0	0	0
SSW	0	1	0	0	0	0	1
SW	1	1	0	0	0	0	2
WSW	0	1	2	0	0	0	3
W	0	4	1	0	0	0	5
WNW	0	2	1	0	0	0	3
NW	0	3	9	0	0	0	12
NNW	0	5	4	1	0	0	10
VARIABLE	17	47	36	3	0	0	103
	1	29	50	3	0	0	83

Total
Periods of calm(hours): 0
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1-1-80 - 3-31-80
STABILITY CLASS: G
ELEVATION: 10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	1	2	1	0	0	4
NNE	3	3	0	0	0	0	6
NE	12	7	0	0	0	0	19
ENE	4	1	0	0	0	0	5
E	3	1	0	0	0	0	4
ESE	3	0	0	0	0	0	3
SE	1	1	0	0	0	0	2
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	1	0	0	0	0	1
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	1	1	2	0	0	0	4
NNW	1	0	1	0	0	0	2
VARIABLE	109	14	0	0	0	0	123
	28	16	5	1	0	0	50

Total
Periods of calm(hours): 13
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-80 + 5-30-80
STABILITY CLASS: A
ELEVATION: 10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	2	1	0	0	0	0	3
	0	0	0	0	0	0	0

Total
Periods of calm(hours): 1
Hours of missing data: 0

Table 44

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-80 - 6-30-80
STABILITY CLASS: B
ELEVATION: 45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	1	1	0	0	2
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	4	1	0	0	5
	0	0	1	1	0	0	2

Total
Periods of calm(hours): 0
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-80 - 6-30-80
STABILITY CLASS: B
ELEVATION: 10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	1	0	0	0	0	1
NW	0	0	1	0	0	0	1
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	5	0	0	0	5
	0	1	1	0	0	0	2

Total
Periods of calm(hours): 0
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-80 - 6-30-80
STABILITY CLASS: C
ELEVATION: 45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	1	0	0	0	1
S	0	0	0	0	0	0	0
SSW	0	0	1	0	0	0	1
SW	0	1	1	0	0	0	2
WSW	0	0	1	2	0	0	3
W	0	0	1	0	0	0	1
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	0	6	9	2	0	0	17
	0	1	5	2	0	0	8

Total
Periods of calm(hours): 0
Hours of missing data: 0

Table 4

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-80 + 6-30-80
STABILITY CLASS: C
ELEVATION: 10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	1	0	0	0	1
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	1	0	0	0	1
NW	0	0	1	0	0	0	1
NNW	0	0	1	0	0	0	1
VARIABLE	0	10	9	2	0	0	21
	0	0	4	0	0	0	4

Total
Periods of calm(hours): 0
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-80 - 6-30-80
STABILITY CLASS: D
ELEVATION: 45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	2	4	1	0	0	0	7
NNE	0	2	3	1	0	0	6
NE	0	2	0	0	0	0	2
ENE	0	2	0	0	0	0	2
E	1	2	7	0	0	0	10
ESE	1	3	6	0	0	0	10
SE	0	6	8	1	0	0	15
SSE	0	0	0	0	0	0	0
S	0	4	5	0	0	0	9
SSW	1	6	8	6	1	0	22
SW	1	8	11	0	0	0	20
WSW	0	5	12	10	1	0	28
W	0	5	14	7	0	0	26
WNW	0	7	9	5	0	0	21
NW	0	2	1	0	0	0	3
NNW	0	3	3	3	0	0	9
VARIABLE	53	279	208	48	5	1	594
	6	61	88	33	2	0	190

Total
Periods of calm(hours): 0
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4-1-80 - 6-30-80
STABILITY CLASS: D
ELEVATION: 10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	2	4	0	0	0	6
NNE	0	1	0	0	0	0	1
NE	0	4	1	0	0	0	5
ENE	0	3	0	0	0	0	3
E	1	7	4	0	0	0	12
ESE	0	2	0	0	0	0	2
SE	0	1	0	0	0	0	1
SSE	0	7	0	0	0	0	7
S	0	6	8	0	0	0	14
SSW	0	1	1	0	1	0	3
SW	0	0	2	0	0	0	2
WSW	1	3	10	0	0	0	14
W	1	5	12	3	0	0	21
WNW	3	5	15	0	0	0	23
NW	0	4	7	2	0	0	13
NNW	0	4	18	0	0	0	22
VARIABLE	63	379	132	11	0	0	635
	6	55	82	5	1	0	149

Total
Periods of calm(hours): 0
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-80 - 6-30-80
STABILITY CLASS: E
ELEVATION: 45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	2	4	0	0	0	6
NNE	0	0	1	0	0	0	1
NE	0	5	0	0	0	0	5
ENE	0	3	0	0	0	0	3
E	1	4	5	2	0	0	12
ESE	1	4	3	2	0	0	10
SE	1	5	4	4	0	0	14
SSE	0	5	1	1	2	0	9
S	1	1	5	11	1	2	21
SSW	0	15	28	6	0	0	49
SW	2	10	29	7	1	0	49
WSW	1	9	3	1	0	0	14
W	1	4	8	4	0	0	17
WNW	0	2	4	5	0	0	11
NW	0	3	11	1	0	0	15
NNW	0	10	15	0	0	0	25
VARIABLE	68	252	205	48	10	1	584
	8	82	121	44	4	2	261

Total
Periods of calm(hours): 2
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4-1-80 - 6-30-80
STABILITY CLASS: E
ELEVATION: 10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	4	10	3	0	0	0	17
NNE	8	9	0	0	0	0	17
NE	2	3	0	0	0	0	5
ENE	3	5	0	0	0	0	8
E	1	3	0	0	0	0	4
ESE	0	2	0	0	0	0	2
SE	2	5	1	0	0	0	8
SSE	1	5	6	0	0	0	12
S	1	6	1	0	0	0	8
SSW	1	3	0	3	0	0	7
SW	0	0	0	2	1	0	3
WSW	1	10	23	0	0	0	34
W	6	35	19	4	0	0	64
WNW	0	5	1	1	0	0	7
NW	1	2	0	0	0	0	3
NNW	2	7	3	0	0	0	12
VARIABLE	248	279	77	13	2	0	619
	33	110	57	10	1	0	211

Total
Periods of calm(hours): 17
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4-1-80 - 6-30-80
STABILITY CLASS: F
ELEVATION: 45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	3	0	0	0	3
NNE	0	1	1	0	0	0	2
NE	0	1	0	0	0	0	1
ENE	0	0	0	0	0	0	0
E	0	1	4	0	0	0	5
ESE	0	1	5	0	0	0	6
SE	0	1	3	2	0	0	6
SSE	1	3	1	1	0	0	6
S	0	1	0	1	0	0	2
SSW	0	0	4	0	0	0	4
SW	0	3	8	0	0	0	11
WSW	1	8	1	0	0	0	10
W	0	1	10	4	0	0	15
WNW	0	1	7	0	0	0	8
NW	0	3	8	0	0	0	11
NNW	0	1	8	0	0	0	9
VARIABLE	22	79	79	3	0	0	183
	2	26	63	8	0	0	99

Total
Periods of calm(hours): 2
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-80 + 6-30-80
STABILITY CLASS: F
ELEVATION: 10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	2	5	0	0	0	0	7
NNE	5	5	0	0	0	0	10
NE	0	0	0	0	0	0	0
ENE	2	1	0	0	0	0	3
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	1	1	0	0	0	0	2
SSE	1	2	0	0	0	0	3
S	0	3	0	0	0	0	3
SSW	2	0	0	0	0	0	2
SW	0	0	0	0	0	0	0
WSW	0	1	1	0	0	0	2
W	0	10	1	0	0	0	11
WNW	1	2	0	0	0	0	3
NW	4	0	0	0	0	0	4
NNW	1	10	0	0	0	0	11
VARIABLE	143	68	1	0	0	0	212
	19	40	2	0	0	0	61

Total
Periods of calm(hours): 11
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER 1 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-80 - 6-30-80
STABILITY CLASS: G
ELEVATION: 45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	1	1	1	0	0	0	3
NNE	0	1	2	0	0	0	3
NE	1	1	4	0	0	0	6
ENE	0	0	0	0	0	0	0
E	1	2	1	0	0	0	4
ESE	0	3	7	0	0	0	10
SE	0	1	2	0	0	0	3
SSE	0	0	0	0	0	0	0
S	0	2	0	0	0	0	2
SSW	0	0	0	0	0	0	0
SW	0	3	2	0	0	0	5
WSW	0	1	2	0	0	0	3
W	0	2	7	0	0	0	9
WNW	2	6	8	2	0	0	18
NW	0	5	5	1	0	0	11
NNW	0	8	8	0	0	0	16
VARIABLE	22	62	53	1	0	0	138
	5	36	49	3	0	0	93

Total
Periods of calm(hours): 2
Hours of missing data: 0

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-80 + 6-30-80
STABILITY CLASS: G
ELEVATION: 10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						
	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	8	3	0	0	0	0	11
NNE	9	4	0	0	0	0	13
NE	7	1	0	0	0	0	8
ENE	0	0	0	0	0	0	0
E	1	0	0	0	0	0	1
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	1	0	0	0	0	0	1
S	1	0	1	0	0	0	2
SSW	0	0	0	0	0	0	0
SW	0	0	1	0	0	0	1
WSW	0	0	0	0	0	0	0
W	0	1	0	0	0	0	1
WNW	0	0	0	0	0	0	0
NW	3	0	0	0	0	0	3
NNW	2	3	0	0	0	0	5
VARIABLE	155	21	0	0	0	0	176
	32	12	2	0	0	0	46

Total
Periods of calm(hours): 11
Hours of missing data: 0

TABLE 4B

CLASSIFICATION OF ATMOSPHERIC STABILITY

Stability Classification	Pasquill Categories	$\sigma\theta$[a] (degrees)	Temperature change with height (°C/100m)
Extremely unstable	A	25.0	<-1.9
Moderately unstable	B	20.0	-1.9 to -1.7
Slightly unstable	C	15.0	-1.7 to -1.5
Neutral	D	10.0	-1.5 to -0.5
Slightly stable	E	5.0	-0.5 to 1.5
Moderately stable	F	2.5	1.5 to 4.0
Extremely stable	G	1.7	>4.0

[a] Standard deviation of horizontal wind direction fluctuation over a period of 15 minutes to 1 hour. The values shown are average for each stability classification.

TABLE 5

RADIOACTIVE LIQUID SAMPLING AND ANALYSIS

Liquid Source[f]	Sampling Frequency	Type of Activity Analysis	Detectable Concentrations (μCi/ml)[a]
A. Waste Monitor Tank Releases	Each Batch	Principal Gamma Emitters	5×10^{-7}[b]
	One Batch/Month	Dissolved Gases	10^{-5}
	Weekly Composite[e]	Ba-La-140, I-131	10^{-6}
	Monthly Composite[c]	H-3	10^{-5}
		Gross Alpha	10^{-7}
		Gross Beta	5×10^{-7}
	Quarterly Composite[c]	Sr-89, Sr-90	5×10^{-8}
B. Steam Generator Blowdown[d]	Weekly Composite	Principal Gamma Emitters	5×10^{-7}[b]
		Ba-La-140, I-131	10^{-6}
	One sample/month	Dissolved Gases	10^{-5}
	Monthly Composite	H-3	10^{-5}
		Gross alpha	10^{-7}
		Gross Beta	5×10^{-7}
	Quarterly Composite	Sr-89, Sr-90	5×10^{-8}
C. Turbine Building Sump[d]	Each Batch	Principal Gamma Emitters	5×10^{-7}[b]

[a] The detectability limits for activity analysis are based on the technical feasibility and on the potential significance in the environment of the quantities released. For some nuclides, lower detection limits may be readily achievable, and when nuclides are measured below the stated limits, they should also be reported.

[b] For certain mixtures of gamma emitters, it may not be possible to measure radionuclides in concentrations near their sensitivity limits when other nuclides are present in the sample in much greater concentrations. Under these circumstances, it will be more appropriate to calculate the concentrations of such radionuclides using measured ratios with those radionuclides which are routinely identified and measured.

[c] A composite sample is one in which the quantity of liquid sampled is proportional to the quantity of liquid waste discharged.

[d] Sampled and analyzed only in the event of primary to secondary leakage and then only if to be discharged to the environs.

[e] If the required sensitivity (10^{-6}) can be obtained with the gamma scan on each batch, the weekly composite will not be required.

[f] A batch release is the discharge of liquid waste of a discrete volume. A continuous release is the discharge of liquid waste of a nondiscrete volume: a nondiscrete volume has an uninterrupted discharge flow during the continuous release.

TABLE 6

RADIOACTIVE GASEOUS WASTE SAMPLING AND ANALYSIS

Gaseous Source[c]	Sampling Frequency	Types of Activity Analysis	Detectable Concentrations (μCi/ml)[a]
A. Waste Gas Decay Tank Releases	Tank to be released	Principal Gamma Emitters	10^{-4}
		H-3	10^{-6}
B. Containment Purge Releases	Each Purge[c] or Weekly for Continuous Purge	Principal Gamma Emitters	10^{-4}
		H-3	10^{-6}
C. Condenser Steam Jet Air Ejector	Monthly (Gas Samples)[c]	Principal Gamma Emitters[b]	10^{-4}
		H-3	10^{-6}
D. Environmental Release Points (Plant Vent Stack)	Monthly (Gas Samples)[c]	Principal Gamma Emitters[b]	10^{-4}
		H-3	10^{-6}
	Weekly (Charcoal Sample)[d]	I-131 I-133	10^{-12} 10^{-10}
	Weekly (Particulates)[d]	Principal Gamma Emitters (Ba-La-140, I-131 and others)	10^{-11}
	Monthly Composite (Particulates)	Gross alpha	10^{-11}
	Quarterly Composite (Particulates)	Sr-89, Sr-90	10^{-11}

[a] The above detectability limits for activity analysis are based on technical feasibility and on the potential significance in the environment of the quantities released. For some nuclides, lower detection limits may be readily achievable, and when nuclides are measured below the stated limits, they should also be reported.

[b] For certain mixtures of gamma emitters, it may not be possible to measure radionuclides at levels near their sensitivity limits when other nuclides are present in the sample at much higher levels. Under these circumstances, it will be more appropriate to calculate the levels of such radionuclides using measured ratios with those radionuclides which are measurable.

[c] Analyses shall also be performed following each refueling, startup, or similar operational occurence which could alter the mixture of radionuclides.

[d] Analyses shall also be performed daily for a week following each refueling, startup or similar operational occurrence which could lead to significant increase or decrease in radioiodine releases.

[e] A batch release is the discharge of gaseous waste of a discrete volume. A continuous release is the discharge of gaseous waste of a nondiscrete volume; a nondiscrete volume has an uninterrupted discharge flow during the continuous release.

TABLE 7

LIQUID DISCHARGES NOT MEETING SPECIFIED DETECTION LIMITS

Batch#	Date	Count Time Sec.	Volume Discharged gallons	Dilution Water gallons	Total Isotopic Activity(1)	Isotope of Interest	LLD Measured	% of Total Isotopic Activity	% of Total Dose
127	5/25/80	15,628	4,000	1.2 E 06	1.4 E-05	Ce-144	<5.8 E-07	1.0 E 00(2)	5.9 E-06
						Np-239	<5.5 E-07	1.1 E 00	3.9 E-08
						Cr-51	<7.5 E-07	1.3 E 00	2.8 E-05
						Ru-106	<8.7 E-07	1.5 E 00	1.1 E-04
						Mo-99	<7.4 E-07	1.3 E 00	1.6 E-03

(1) Does not include Tritium

(2) Did not meet < 1.0% isotopic criteria.
Computed using the most conservative (highest) dose received for Whole Body or organ.