

ALABAMA POWER COMPANY
FARLEY NUCLEAR PLANT UNIT NO. ONE
LICENSE NO. NPF-2

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
JANUARY 1, 1979 THROUGH JUNE 30, 1979

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INTRODUCTION

This semi-annual radioactive release report for the period JANUARY 1 to JUNE 30, 1979 is submitted in accordance with Appendix B to Farley Nuclear Plant License No. NPF-2. Appendix B will hereinafter be referred to as 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

$$10^6 \frac{\text{pCi}}{\text{uCi}} \left[\sum_i^{14} K_i \sum_v^2 \left[(\bar{X}/Q)_v Q_{iv} \right] \right] < 500 \text{ mrem/yr}$$

and

$$10^6 \frac{\text{pCi}}{\text{uCi}} \left[\sum_i^{14} (L_i + 1.1 M_i) \sum_v^2 \left[(\bar{X}/Q)_v Q_{iv} \right] \right] < 3000 \text{ mrem/yr}$$

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

$$10^6 \frac{\text{pCi}}{\text{uCi}} \left[\sum_i^{18} P_i \sum_v^2 \left[(\bar{X}/Q)_{mv} Q_{iv} \right] \right] < 6.3 \text{ mrem/yr}$$

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 4×10^{-5} $\mu\text{Ci/ml}$ in water.

2. Maximum Permissible Concentrations

- a. Airborne - The maximum permissible concentrations 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:

$$C_i = \mu_i \div m, \quad \text{where}$$

C_i = isotopic calibration factor for isotope i.

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μ_i = concentration of isotope i in the grab sample, in $\mu\text{Ci/ml}$.

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 occurrences, 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: 314
2. Total time period for batch releases: 28,407 minutes
3. Maximum time period for a batch release: 2430 minutes
4. Average time period for a batch release: 90 minutes
5. Minimum time period for a batch release: 10 minutes
6. Average stream flow during periods of release of effluent into a flowing stream: 14,120 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 minutes

6. Abnormal Release

a. Liquid:

1. Number of releases: One

2. Total activity released: 0.017 Curies

NOTE 1: This abnormal release was reported in a non-routine environmental operating report, dated July 10, 1979. The data, for this release, was not included in Table 2 of this report.

NOTE 2: 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: None

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 $\pm 10\%$.

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

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:

<u>Fission and Activation Gases</u>	<u>Iodine</u>	<u>Particulates</u>	<u>Tritium</u>
75%	60%	50%	45%

NOTE: During scheduled calibration of the gas totalizer used to record total sampling flow of the Plant Vent Stack sampling system, it was determined that a - 22% error existed at time of calibration. This instrument was in service from 12/15/78 to 6/15/79. No correction was made to data received for that system (i.e. - particulate, and iodines).

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

<u>Fission and Activation Gases</u>	<u>Iodine</u>	<u>Particulates</u>	<u>Tritium</u>
6%	18%	19%	12%

c. Solid Radwaste

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

8. Solid Waste

See Table 3

9. Radiological Impact On Man

a. Water Related Exposure Pathways

<u>1st Quarter</u>	<u>2nd Quarter</u>
Total Body = $8.5E-03$ mrem	$1.6E-03$ mrem
Bone = $7.0E-03$ mrem	$1.1E-03$ mrem
Liver = $1.2E-02$ mrem	$2.2E-03$ mrem
Thyroid = $4.7E-03$ mrem	$2.7E-04$ mrem
Kidney = $4.4E-03$ mrem	$8.7E-04$ mrem
Lungs = $1.9E-03$ mrem	$4.6E-04$ mrem
GI Tract = $1.3E-02$ mrem	$1.4E-02$ mrem

b. Gaseous Related Exposure Pathways

<u>1st Quarter</u>	<u>2nd Quarter</u>
Total Body = $4.2E-02$ mrem	$4.1E-03$ mrem
Skin = $4.9E-02$ mrem	$2.1E-02$ mrem

c. Particulate and Iodine

<u>1st Quarter</u>	<u>2nd Quarter</u>
Organ Dose = $3.2E-04$ mrem	$1.2E-04$ mrem

10. Meteorological Data

See Table 4A.

1st Quarter Continuous

1st Quarter Batch

2nd Quarter Continuous

2nd Quarter Batch

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 which when quantified represent greater than 1% of the total activity or total dose commitment of the effluent release in question.

TABLE 1A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1979

GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES

	UNIT	QUARTER #1	QUARTER #2
A. Fission & Activation Gases			
1. Total release	Ci	1.9 E 02	1.0 E 03
2. Average release rate for period	μCi/sec	2.4 E 01	1.3 E 02
3. Percent of Technical Specification limit	%	3.5 E-03	5.2 E-03 Note (1)
4. Percent of Technical Specification limit	%	6.8 E-03	9.4 E-03 Note (2)
B. Iodines			
1. Total iodine-131	Ci	1.3 E-05	9.4 E-08
2. Average release rate for period	μCi/sec	1.7 E-06	1.2 E-08
3. Percent of Technical Specification limit	%	6.2 E-09	4.5 E-11 Note (3)
C. Particulates			
1. Particulates with half-lives >8 days	Ci	2.3 E-05	3.4 E-06
2. Average release rate for period	μCi/sec	3.0 E-06	4.3 E-07
3. Percent of Technical Specification limit	%	1.5 E-06	2.2 E-07 Note (3)
D. Tritium			
1. Total release	Ci	7.9 E 00	1.5 E 00
2. Average release rate for period	μCi/sec	1.0 E 00	1.9 E-01
3. Percent of Technical Specification limit	%	9.4 E-08	1.8 E-08

Notes:

- (1) Whole Body Release Rate Limit (<500 mrem/yr)
- (2) Extremity Release Rate Limit (<3,000 mrem/yr)
- (3) 6.3 mrem/yr Inhalation Dose

TABLE 1B

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1979

GASEOUS EFFLUENTS-ELEVATED RELEASE

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE		BATCH MODE	
		QUARTER #1	QUARTER #2	QUARTER #1	QUARTER #2
1. Fission gases					
Krypton-85	Ci	0.0	0.0	0.0	0.0
Krypton-85m	Ci	0.0	0.0	0.0	0.0
Krypton-87	Ci	0.0	1.2 E 00	0.0	0.0
Krypton-88	Ci	0.0	0.0	0.0	0.0
Xenon-133	Ci	1.2 E 02	7.9 E 02	0.0	0.0
Xenon-135	Ci	5.4 E 00	5.3 E 01	0.0	0.0
Xenon-135m	Ci	0.0	0.0	0.0	0.0
Xenon-138	Ci	0.0	0.0	0.0	0.0
Argon-41	Ci	3.1 E 01	7.5 E 01	0.0	0.0
Xenon-137	Ci	0.0	0.0	0.0	0.0
Krypton-90	Ci	0.0	0.0	0.0	0.0
Xenon-133m	Ci	0.0	0.0	0.0	0.0
Krypton-89	Ci	0.0	0.0	0.0	0.0
Xenon-131m	Ci	0.0	7.5 E 01	0.0	0.0
Total for period		1.6 E 02	1.0 E 03	0.0	0.0
2. Iodines					
Iodine-131	Ci	1.2 E-05	9.2 E-08	0.0	0.0
Iodine-133	Ci	0.0	0.0	0.0	0.0
Total for period	Ci	1.2 E-05	9.2 E-08	0.0	0.0

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TABLE 1B (con't)

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1979

GASEOUS EFFLUENTS-ELEVATED RELEASE

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE		BATCH MODE	
		QUARTER #1	QUARTER #2	QUARTER #1	QUARTER #2
3. Particulates					
Strontium-89	Ci	1.5 E-06	0.0	0.0	0.0
Strontium-90	Ci	0.0	0.0	0.0	0.0
Cesium-134	Ci	0.0	0.0	0.0	0.0
Cesium-137	Ci	0.0	5.5 E-08	0.0	0.0
Barium-140	Ci	0.0	0.0	0.0	0.0
Cerium-141	Ci	0.0	0.0	0.0	0.0
Antimony-124	Ci	0.0	0.0	0.0	0.0
Cobalt-60	Ci	1.9 E-06	9.8 E-06	0.0	0.0
Zinc-65	Ci	0.0	0.0	0.0	0.0
Iron-59	Ci	0.0	0.0	0.0	0.0
Manganese-54	Ci	0.0	3.5 E-07	0.0	0.0
Cesium-136	Ci	0.0	0.0	0.0	0.0
Cobalt-58	Ci	1.9 E-05	2.3 E-05	0.0	0.0
Zirconium-95	Ci	0.0	0.0	0.0	0.0
Chromium-51	Ci	0.0	6.3 E-07	0.0	0.0
Iodine-131	Ci	0.0	0.0	0.0	0.0
Iodine-133	Ci	0.0	0.0	0.0	0.0
Total for period	Ci	2.2 E-05	3.3 E-05	0.0	0.0

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TABLE 1C

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1979

GASEOUS EFFLUENTS-GROUND-LEVEL RELEASES

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE		BATCH MODE	
		QUARTER #1	QUARTER #2	QUARTER #1	QUARTER #2
1. Fission gases					
Krypton-85	Ci	0.0	0.0	0.0	0.0
Krypton-85m	Ci	0.0	0.0	0.0	0.0
Krypton-87	Ci	3.1 E-01	1.5 E-01	0.0	0.0
Krypton-88	Ci	1.8 E-01	0.0	0.0	0.0
Xenon-133	Ci	2.1 E 01	2.3 E 01	0.0	0.0
Xenon-135	Ci	3.1 E 00	2.1 E 00	0.0	0.0
Xenon-135m	Ci	0.0	0.0	0.0	0.0
Xenon-138	Ci	2.6 E-01	0.0	0.0	0.0
Argon-41	Ci	2.9 E 00	1.9 E 00	0.0	0.0
Xenon-137	Ci	8.4 E-01	0.0	0.0	0.0
Krypton-90	Ci	0.0	0.0	0.0	0.0
Xenon-133m	Ci	0.0	0.0	0.0	0.0
Krypton-89	Ci	0.0	0.0	0.0	0.0
Xenon-131m	Ci	0.0	1.1 E 00	0.0	0.0
Total for period	Ci	2.9 E 01	2.8 E 01	0.0	0.0
2. Iodines					
Iodine-131	Ci	9.1 E-07	1.6 E-09	0.0	0.0
Iodine-133	Ci	1.4 E-08	0.0	0.0	0.0
Total for period	Ci	9.2 E-07	1.6 E-09	0.0	0.0

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TABLE 1C (con't)

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1979

GASEOUS EFFLUENTS-GROUND LEVEL RELEASES

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE		BATCH MODE	
		QUARTER #1	QUARTER #2	QUARTER #1	QUARTER #2
3. Particulates					
Strontium-89	Ci	4.3 E-08	0.0	0.0	0.0
Strontium-90	Ci	0.0	0.0	0.0	0.0
Cesium-134	Ci	0.0	0.0	0.0	0.0
Cesium-137	Ci	0.0	0.0	0.0	0.0
Barium-140	Ci	5.1 E-08	0.0	0.0	0.0
Cerium-141	Ci	0.0	0.0	0.0	0.0
Antimony-124	Ci	0.0	0.0	0.0	0.0
Cobalt-60	Ci	5.0 E-08	2.3 E-07	0.0	0.0
Zinc-65	Ci	0.0	0.0	0.0	0.0
Iron-59	Ci	0.0	0.0	0.0	0.0
Manganese-54	Ci	0.0	0.0	0.0	0.0
Cesium-136	Ci	0.0	0.0	0.0	0.0
Cobalt-58	Ci	1.0 E-06	6.1 E-07	0.0	0.0
Zirconium-95	Ci	0.0	0.0	0.0	0.0
Chromium-51	Ci	3.0 E-08	5.1 E-10	0.0	0.0
Iodine-131	Ci	0.0	0.0	0.0	0.0
Iodine-133	Ci	0.0	0.0	0.0	0.0
Total for period	Ci	1.2 E-06	8.4 E-07	0.0	0.0

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TABLE 2A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1979

LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

	Unit	Quarter 1, 79	Quarter 2, 79
A. Fission and activation products			
1. Total release (not including tritium)	Ci	1.8E-02	1.6E-02
2. Average diluted concentration during period Note (1)	uCi/ml	1.7E-09	1.5E-08
3. Percent of applicable limit during period Note (1)	%	8.6E-02	5.1E-02
B. Tritium			
1. Total release	Ci	7.0E 01	1.4E 01
2. Average diluted concentration during period Note (1)	uCi/ml	6.4E-06	1.4E-05
3. Percent of applicable limit during period Note (1)	%	2.2E-01	4.6E-01
C. Dissolved and entrained gases			
1. Total release	Ci	6.1E-03	2.4E-04
2. Average diluted concentration during period Note (1)	uCi/ml	5.6E-10	2.3E-10
3. Percent of applicable limit during period Note (1)	%	1.4E-03	5.7E-04
D. Gross alpha radioactivity			
1. Total release	Ci	0.0E 00	0.0E 00
E. Volume of waste released (prior to dilution)	liters	3.3E 07	1.9E 06
F. Volume of dilution water used During period Note (1)	liters	1.1E 10	1.0E 09

NOTE:

(1) During period of discharge

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TABLE 1

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1979

LIQUID EFFLUENTS

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE		BATCH MODE	
		QUARTER #1	QUARTER #2	QUARTER #1	QUARTER #2
Sr-89	Ci	0.0E 00	0.0E 00	0.0E 00	0.0E 00
Sr-90	Ci	0.0E 00	0.0E 00	0.0E 00	0.0E 00
Co-57	Ci	2.0E-06	0.0E 00	2.4E-05	2.2E-05
Ce-144	Ci	0.0E 00	0.0E 00	6.9E-05	2.8E-06
Tc-99M	Ci	0.0E 00	0.0E 00	1.0E-06	7.5E-08
Ce-141	Ci	4.5E-06	0.0E 00	3.6E-07	1.7E-07
Np-239	Ci	0.0E 00	0.0E 00	4.7E-05	1.7E-06
Cr-51	Ci	0.0E 00	0.0E 00	7.4E-04	1.6E-03
I-131	Ci	1.3E-03	2.6E-08	2.4E-05	4.0E-07
Ru-103	Ci	0.0E 00	0.0E 00	0.0E 00	0.0E 00
I-133	Ci	8.8E-05	0.0E 00	6.2E-06	0.0E 00
Ea-140	Ci	0.0E 00	0.0E 00	8.7E-06	2.0E-06
As-76	Ci	0.0E 00	0.0E 00	0.0E 00	0.0E 00
Cs-134	Ci	8.4E-05	9.5E-06	3.4E-05	6.6E-06
Ku-106	Ci	0.0E 00	0.0E 00	3.2E-05	3.3E-06
Cs-137	Ci	2.7E-04	2.9E-05	6.5E-05	2.1E-05
Mo-99	Ci	0.0E 00	0.0E 00	3.3E-05	2.1E-06
Zr-95	Ci	0.0E 00	0.0E 00	6.8E-05	6.2E-05
Nb-95	Ci	3.7E-05	0.0E 00	1.5E-04	1.9E-04
I-132	Ci	0.0E 00	0.0E 00	1.2E-04	4.9E-06
Co-58	Ci	1.9E-04	4.4E-05	9.4E-03	8.5E-03
Cs-136	Ci	0.0E 00	0.0E 00	0.0E 00	4.0E-06
Mn-54	Ci	1.2E-05	1.9E-04	5.1E-04	4.1E-04
Aq-110M	Ci	0.0E 00	0.0E 00	8.6E-08	9.5E-05
Sr-91	Ci	0.0E 00	0.0E 00	9.1E-06	0.0E 00
Zn-65	Ci	0.0E 00	0.0E 00	6.5E-06	4.5E-06
I-135	Ci	0.0E 00	0.0E 00	6.9E-06	0.0E 00
Fe-59	Ci	0.0E 00	0.0E 00	1.4E-04	2.4E-04
Co-60	Ci	7.1E-07	1.2E-05	2.9E-03	4.6E-03
Cu-64	Ci	0.0E 00	0.0E 00	3.0E-04	0.0E 00
Na-24	Ci	1.4E-03	0.0E 00	8.7E-05	0.0E 00
La-140	Ci	0.0E 00	0.0E 00	4.3E-06	1.5E-06
Total for period (above)	Ci	3.4E-03	2.9E-04	1.5E-02	1.6E-02

110210

TABLE2B

CONTINUED

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1979

LIQUID EFFLUENTS

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE		BATCH MODE	
		QUARTER #1	QUARTER #2	QUARTER #1	QUARTER #2
Xe-133	Ci	2.7E-05	0.0E 00	4.9E-03	2.4E-04
Xe-135	Ci	3.8E-06	0.0E 00	1.1E-03	0.0E 00
Xe-133m	Ci	0.0E 00	0.0E 00	0.0E 00	0.0E 00
Kr-87	Ci	0.0E 00	0.0E 00	0.0E 00	0.0E 00
Ar-41	Ci	0.0E 00	0.0E 00	0.0E 00	0.0E 00
Total for period (above)	Ci	3.1E-05	0.0E 00	6.1E-03	2.4E-04

270206

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 Ci	3.4 E 02 1.5 E 02
b. Dry compressible waste, contaminated equip, etc.	m^3 Ci	2.0 E 02 2.3 E 01
c. Irradiated components, control rods, etc.	m^3 Ci	None
d. Other (describe)	m^3	None
2. Estimate of major nuclide composition	%	Ci
a. Cobalt-58	5.8 E 01	8.6 E 01
Manganese-54	5.2 E 00	7.7 E 00
Cobalt-60	2.6 E 01	3.8 E 01
b. Cobalt-58	5.8 E 01	1.4 E 01
Manganese-54	6.0 E 00	1.4 E 00
Cobalt-60	2.6 E 01	6.2 E 00

507013

TABLE 3 (con't)

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1979

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

3. Solid Waste Disposition

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
35	Chem-Nuclear Transport	Chem-Nuclear Systems, Incorporated Barnwell, South Carolina

4. Type Of Container (1a) Type of Container (1b)

LSA, 300 ft ³ cylindrical container	DOT17H (55 gal drums), 189 ft ³ wooden boxes
---	--

5. Solidification Agent (1a) Solidification Agent (1b)

Urea-formaldehyde	Vermiculate, cement
-------------------	---------------------

B. IRRADIATED FUEL SHIPMENTS (Disposition)

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
None	N/A	N/A

50701A

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1 -1-79 + 3-31-79

STABILITY CLASS: A

ELEVATION: 45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
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	1	0	0	5
Total	0	0	0	0	0	0	0

Total

Periods of calm(hours): 0

Hours of missing data: 0

307015

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1-1-79 - 3-31-79

STABILITY CLASS: A

ELEVATION: 10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
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	2	2	0	0	0	5
Total	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: 1-1-79 + 3-31-79

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
N	0	0	0	0	0	0
NNE	0	0	0	0	0	0
NE	0	0	0	0	0	0
ENE	0	0	0	0	0	0
E	0	0	0	0	0	0
ESE	0	0	0	0	0	0
SE	0	0	0	0	0	0
SSE	0	0	0	0	0	0
S	0	0	0	0	0	0
SSW	0	0	0	0	0	0
SW	0	0	0	0	0	0
WSW	0	0	0	0	0	0
W	0	0	0	0	0	0
WNW	0	0	0	0	0	0
NW	0	0	0	0	0	0
NNW	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0
Total	0	0	0	0	0	0

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

907317

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1-1-79 + 3-31-79

STABILITY CLASS: B

ELEVATION: 10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
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	0	0	0	0	0	0
Total	0	0	0	0	0	0	0

Total

Periods of calm (hours): 0

Hours of missing data: 0

307318

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1 -1-79 + 3-31-79

STABILITY CLASS: C

ELEVATION: 45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
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	0	0	0	0	0	0
Total	0	0	1	0	0	0	1

Total

Periods of calm (hours): 2

Hours of missing data: 0

907319

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1 -1-79 - 3-31-79

STABILITY CLASS: C

ELEVATION: 10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	1	0	0	0	1
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	0	0	0	0	0	2
Total	0	0	1	0	0	0	1

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

307320

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1 -1-79 + 3-31-79

STABILITY CLASS: D

ELEVATION:45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	4	2	0	0	6
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	1	2	0	0	0	3
ESE	0	0	0	0	0	0	0
SE	0	0	1	0	0	0	1
SSE	0	0	3	3	0	1	7
S	0	1	1	4	1	0	7
SSW	0	0	1	2	1	0	4
SW	0	3	2	8	4	0	17
WSW	0	1	3	0	0	0	4
W	0	2	4	8	7	0	21
WNW	0	0	2	13	2	0	17
NW	0	2	3	2	0	0	7
NNW	0	0	1	0	0	0	1
VARIABLE	11	80	78	30	11	0	210
<hr/>							
	0	10	27	42	15	1	95

Total

Periods of calm (hours): 1

Hours of missing data: 0

120000

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1 -1-79 + 3-31-79

STABILITY CLASS: D

ELEVATION: 10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	9	16	13	0	0	38
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	1	0	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	1	0	0	0	0	1
SE	0	0	5	0	0	0	5
SSE	0	2	2	0	0	0	4
S	0	1	2	2	1	0	6
SSW	0	0	1	3	0	0	4
SW	0	3	0	0	0	0	3
WSW	0	1	3	0	0	0	4
W	0	4	0	2	0	0	6
WNW	0	0	9	10	0	0	19
NW	0	0	3	1	0	0	4
NNW	0	0	4	0	0	0	4
VARIABLE	16	99	77	15	0	0	207
Total	0	22	45	31	1	0	99

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 -1-79 + 3-31-79

STABILITY CLASS: E

ELEVATION: 45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	1	2	8	1	0	0	12
NNE	0	0	4	5	0	0	9
NE	1	6	2	10	0	0	19
ENE	3	3	4	2	0	0	12
E	4	10	7	2	0	0	23
ESE	1	4	33	7	1	0	46
SE	2	0	14	6	2	0	24
SSE	0	0	15	30	3	1	49
S	1	5	19	5	6	0	36
SSW	1	7	15	9	3	2	37
SW	0	6	14	12	2	0	34
WSW	1	5	5	21	5	1	38
W	3	0	17	22	8	1	51
WNW	4	5	39	32	5	2	87
NW	2	1	29	17	0	0	49
NNW	2	9	30	6	0	0	47
VARIABLE	49	200	283	110	39	6	687
	26	63	255	187	35	7	573

Total

Periods of calm(hours): 115

Hours of missing data: 0

000000

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1 -1-79 + 3-31-79

STABILITY CLASS: E

ELEVATION:10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	7	24	23	20	0	0	74
NNE	0	3	4	0	0	0	7
NE	1	8	7	0	0	0	16
ENE	4	7	9	1	0	0	21
E	7	9	1	0	0	0	17
ESE	0	21	6	1	0	0	28
SE	2	6	23	8	1	0	40
SSE	3	4	10	5	0	0	22
S	1	11	19	5	1	0	37
SSW	3	12	17	8	1	0	41
SW	4	9	2	2	0	0	17
WSW	2	3	14	0	0	0	19
W	1	8	17	12	0	0	38
WNW	4	25	48	27	1	0	105
NW	8	39	24	3	0	0	74
NNW	5	11	2	0	0	0	18
VARIABLE	195	380	187	31	5	0	798
	52	200	226	92	4	0	574

Total

Periods of calm (hours): 3

Hours of missing data: 0

30702A

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1 -1-79 + 3-31-79

STABILITY CLASS: F

ELEVATION: 45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	6	6	10	1	0	0	23
NNE	3	5	6	0	0	0	14
NE	1	0	0	0	0	0	1
ENE	2	2	2	1	0	0	7
E	0	5	2	0	0	0	7
ESE	1	2	4	0	0	0	7
SE	0	0	1	0	0	0	1
SSE	0	1	1	3	0	0	5
S	2	3	1	0	0	0	6
SSW	0	1	1	0	0	0	2
SW	0	2	1	0	0	0	3
WSW	1	2	0	0	0	0	3
W	0	1	0	1	0	0	2
WNW	1	0	3	0	0	0	4
NW	1	1	5	1	0	0	8
NNW	0	2	7	0	0	0	9
VARIABLE	81	71	47	2	0	0	201
	18	33	44	7	0	0	102

Total

Periods of calm(hours): 44

Hours of missing data: 0

007025

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1 -1-79 + 3-31-79

STABILITY CLASS: F

ELEVATION:10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	4	4	0	0	0	0	8
NNE	0	6	9	0	0	0	15
NE	1	3	0	0	0	0	4
ENE	1	2	1	0	0	0	4
E	2	4	2	0	0	0	8
ESE	4	1	2	0	0	0	7
SE	2	0	0	0	0	0	2
SSE	0	0	0	0	0	0	0
S	1	2	1	0	0	0	4
SSW	0	0	0	0	0	0	0
SW	2	1	0	0	0	0	3
WSW	1	1	0	0	0	0	2
W	1	2	0	0	0	0	3
WNW	1	3	0	0	0	0	4
NW	4	0	1	0	0	0	5
NNW	3	5	0	0	0	0	8
VARIABLE	136	113	14	0	0	0	263
	27	34	16	0	0	0	77

Total

Periods of calm (hours): 7

Hours of missing data: 0

807026

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1 -1-79 + 3-31-79

STABILITY CLASS: G

ELEVATION: 45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	1	2	0	0	0	3
NNE	3	0	0	0	0	0	3
NE	0	0	1	0	0	0	1
ENE	0	1	0	0	0	0	1
E	0	3	0	0	0	0	3
ESE	1	1	2	0	0	0	4
SE	0	0	0	0	0	0	0
SSE	0	1	0	0	0	0	1
S	0	0	0	0	0	0	0
SSW	1	1	4	0	0	0	6
SW	1	2	0	0	0	0	3
WSW	1	0	0	0	0	0	1
W	0	0	1	0	0	0	1
WNW	0	3	2	0	0	0	5
NW	1	3	1	0	0	0	5
NNW	0	1	1	0	0	0	2
VARIABLE	28	32	13	0	0	0	73
	8	17	14	0	0	0	39

Total

Periods of calm (hours): 12

Hours of missing data: 0

220106

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 1

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1 -1-79 + 3-31-79

STABILITY CLASS: G

ELEVATION: 10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	9	0	0	0	0	0	9
NNE	1	0	0	0	0	0	1
NE	1	0	0	0	0	0	1
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	1	0	0	0	0	0	1
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	1	0	0	0	0	0	1
W	1	0	1	0	0	0	2
WNW	1	0	0	0	0	0	1
NW	3	0	0	0	0	0	3
NNW	2	0	0	0	0	0	2
VARIABLE	87	9	1	0	0	0	97

	20	0	1	0	0	0	21

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

907328

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-79 - 6-30-79

STABILITY CLASS: A

ELEVATION:45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	1	5	0	0	0	6
NNE	0	2	6	0	0	0	8
NE	0	0	5	1	0	0	6
ENE	0	3	6	0	0	0	9
E	0	3	12	1	0	0	16
ESE	0	5	6	1	0	0	12
SE	1	2	5	1	0	0	9
SSE	0	3	3	0	0	0	6
S	0	0	1	0	0	0	1
SSW	0	6	6	2	0	0	14
SW	0	1	0	2	0	0	3
WSW	0	0	3	6	0	0	9
W	0	1	6	3	0	0	10
WNW	0	5	4	1	0	0	10
NW	0	3	8	2	0	0	13
NNW	0	2	18	1	0	0	21
VARIABLE	34	176	131	21	0	0	362
	1	37	94	21	0	0	153

Total

Periods of calm (hours): 52

hours of missing data: 0

POOR ORIGINAL

9070229

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-79 + 6-30-79

STABILITY CLASS: A

ELEVATION:10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	3	7	3	0	0	0	13
NNE	3	11	2	0	0	0	16
NE	5	7	1	0	0	0	13
NNE	0	2	0	0	0	0	2
E	0	1	0	0	0	0	1
ESE	2	2	3	0	0	0	7
ESE	0	10	4	0	0	0	14
SSE	0	8	2	0	0	0	10
S	0	5	2	1	0	0	8
SSW	0	0	1	0	0	0	1
SW	1	1	1	0	0	0	3
WSW	0	0	2	0	0	0	2
W	4	0	5	0	0	0	9
WNW	1	1	6	0	0	0	8
NW	2	2	4	0	0	0	8
NW	0	0	0	0	0	0	0
VARIABLE	142	192	64	1	0	0	399
	21	57	36	1	0	0	115

Total

Periods of calm (hours): 53

Hours of missing data: 0

POOR ORIGINAL

507330

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-79 + 6-30-79

STABILITY CLASS: B

ELEVATION: 45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	2	0	0	0	2
NNE	0	0	0	0	0	0	0
NE	0	1	0	0	0	0	1
ENE	0	0	0	1	0	0	1
E	0	0	0	0	0	0	0
ESE	0	0	1	0	0	0	1
SE	0	0	2	3	0	0	5
SSE	0	0	0	2	0	0	2
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	14	5	5	0	0	25
	0	1	5	6	0	0	12

Total

Periods of calm (hours): 0

hours of missing data: 0

POOR ORIGINAL

5070334

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-79 + 6-30-79

STABILITY CLASS: B

ELEVATION: 10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	1	0	0	0	1
NNE	0	0	0	0	0	0	0
E	0	1	0	0	0	0	1
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	1	0	0	0	0	1
S	0	0	2	0	0	0	2
SSW	0	0	3	1	0	0	4
SW	0	1	0	0	0	0	1
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	15	10	0	0	0	27

	0	3	6	1	0	0	10

Total

Periods of calm (hours): 0

Hours of missing data: 0

907332

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-79 + 6-30-79

STABILITY CLASS: C

ELEVATION:45.7m

Wind Speed (mph) at 45.7m level							
Wind Direction	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	1	0	0	0	1
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	1	0	0	1
ESE	0	1	2	0	0	0	3
SE	0	0	1	2	0	0	3
ESE	0	1	0	1	0	0	2
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	3	0	0	3
WNW	0	0	2	0	0	0	2
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	3	14	8	3	0	0	28
	0	2	7	7	0	0	16

Total

Periods of calm (hours): 0

Hours of missing data: 0

POOR ORIGINAL

907333

Table 4A

CONTINUOUS RELEASE NODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-79 + 6-30-79

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
N	0	0	0	0	0	0
NNE	0	0	0	0	0	0
NE	1	1	0	0	0	2
NNE	0	0	0	0	0	0
E	0	0	0	0	0	0
ESE	0	0	0	0	0	0
SE	0	0	2	0	0	2
SSE	0	1	1	0	0	2
S	0	0	2	0	0	2
SSW	0	0	2	0	0	2
SW	0	0	0	0	0	0
WSW	0	0	0	0	0	0
W	0	0	0	0	0	0
WNW	0	0	0	0	0	0
NW	0	0	0	0	0	0
NNW	0	0	0	0	0	0
VARIABLE	3	22	9	0	0	34
TOTAL	1	2	7	0	0	10

Total

Periods of calm (hours): 0

Hours of missing data: 0

POOR ORIGINAL

307334

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-79 - 6-30-79

STABILITY CLASS: D

ELEVATION: 45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	5	5	1	0	0	11
NNE	0	0	0	0	0	0	0
NE	0	3	2	2	0	0	7
NNE	1	1	1	6	0	0	9
E	0	0	9	0	0	0	9
ESE	0	0	9	0	0	0	9
SE	0	0	7	1	0	0	8
SSE	0	2	0	1	0	0	3
S	0	2	0	2	1	0	5
SSW	0	0	1	0	0	0	1
SW	0	0	6	0	0	0	6
WSW	0	0	3	0	0	0	3
W	0	1	0	0	0	0	1
WNW	0	0	4	2	0	0	6
W	0	0	4	4	0	0	8
NNW	0	0	2	1	0	0	3
VARIABLE	7	64	84	24	0	0	179
	1	14	53	20	1	0	89

Total

Periods of calm (hours): 1

Hours of missing data: 0

POOR ORIGINAL

907335

Table 4A

CONTINUOUS RELEASE NODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-79 + 6-30-79

STABILITY CLASS: D

ELEVATION: 10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	9	5	0	0	0	14
NNE	0	2	0	2	0	0	4
NE	1	5	0	0	0	0	6
NNE	0	1	0	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	0	4	0	0	0	4
SE	1	6	2	0	0	0	9
SE	0	5	2	2	0	0	9
S	0	1	4	0	0	0	5
SEW	0	0	1	0	0	0	1
SW	1	1	3	0	0	0	5
SW	0	0	0	0	0	0	0
W	0	1	1	0	0	0	2
WNW	0	2	5	0	0	0	7
W	0	2	0	0	0	0	2
NNW	0	2	0	0	0	0	2
VARIABLE	25	102	68	2	0	0	197
	5	37	27	4	0	0	71

Total

Periods of calm (hours): 1

Hours of missing data: 0

907336

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-79 + 6-30-79

STABILITY CLASS: E

ELEVATION:45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	3	16	3	0	0	22
NNE	1	3	3	2	0	0	9
NE	0	1	15	1	0	0	17
ENE	0	6	18	2	0	0	26
E	1	4	11	0	0	0	16
ESE	0	7	8	0	0	0	15
SE	0	3	1	0	0	0	4
SSE	0	7	12	1	0	0	20
S	0	6	11	10	1	0	28
SSW	1	4	1	4	1	0	11
SW	0	9	17	3	0	0	29
WSW	1	19	15	2	0	0	37
W	1	12	3	0	0	0	16
WNW	0	8	12	1	1	0	22
NW	0	8	11	3	1	0	23
NNW	0	2	14	1	0	0	17
VARIABLE	55	327	299	36	5	0	722
	5	102	168	33	4	0	312

Total

Periods of calm (hours): 0

Hours of missing data: 0

807037

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-79 + 6-30-79

STABILITY CLASS: E

ELEVATION:10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	1	18	4	3	0	0	26
NNE	3	6	0	1	0	0	10
NE	0	2	2	0	0	0	4
ENE	3	1	1	0	0	0	5
E	3	6	0	0	0	0	9
ESE	0	14	11	0	0	0	25
SE	1	13	7	0	0	0	21
SSE	0	10	13	4	0	0	27
S	0	1	3	0	0	0	4
SSW	1	10	3	0	0	0	14
SW	2	2	2	0	0	0	6
WSW	0	0	2	0	0	0	2
W	1	10	7	1	0	0	19
WNW	3	16	3	0	0	0	22
NW	2	5	0	0	0	0	7
NNW	5	4	1	0	0	0	10
VARIABLE	299	404	107	9	0	0	819
	25	118	59	9	0	0	211

Total

Periods of calm (hours): 4

hours of missing data: 0

POOR ORIGINAL

907038

Table 4A

CONTINUOUS RELEASE NODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-79 + 6-30-79

STABILITY CLASS: F

ELEVATION:45.7m

Wind Direction	Wind Speed (mph) at 45.7m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	4	2	0	0	0	6
NNE	0	0	1	0	0	0	1
NE	0	2	3	0	0	0	5
NNE	0	1	2	0	0	0	3
E	0	1	3	0	0	0	4
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	2	0	0	0	0	2
SW	0	0	3	0	0	0	3
WSW	0	0	0	0	0	0	0
W	0	2	3	0	0	0	5
WNW	0	0	0	0	0	0	0
NW	0	4	9	1	0	0	14
NW	0	2	14	0	0	0	16
VARIABLE	12	58	32	0	0	0	102
	0	18	48	1	0	0	67

Total

Periods of calm (hours): 0

Hours of missing data: 0

POOR ORIGINAL

507339

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-79 + 6-30-79

STABILITY CLASS: F

ELEVATION:10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	3	1	0	0	0	0	4
NNE	3	0	0	0	0	0	3
NE	6	1	0	0	0	0	7
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	1	0	0	0	0	1
SEE	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	2	0	0	0	0	0	2
NNW	6	0	0	0	0	0	6
VARIABLE	130	14	1	0	0	0	145
	20	3	0	0	0	0	23

Total

Periods of calm (hours): 1

hours of missing data: 0

POOR ORIGINAL

307010

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-79 + 6-30-79

STABILITY CLASS: C

ELEVATION:45.7m

wind Speed (mph) at 45.7m level							
Wind Direction	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	5	0	0	0	5
NNE	0	1	0	0	0	0	1
NE	1	1	0	0	0	0	2
ENE	0	1	0	0	0	0	1
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	1	1	0	0	2
NNW	0	0	6	0	0	0	6
VARIABLE	9	29	8	0	0	0	46
<hr/>							
	1	3	12	1	0	0	17

Total

Periods of calm (hours): 1

Hours of missing data: 0

POOR ORIGINAL

507211

Table 4A

CONTINUOUS RELEASE MODE QUARTER # 2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 4 -1-79 + 6-30-79

STABILITY CLASS: C

ELEVATION: 10.0m

Wind Direction	Wind Speed (mph) at 10.0m level						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	0	0	0	0	0	0
NNE	4	1	0	0	0	0	5
NE	1	0	0	0	0	0	1
NNE	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	1	1	0	0	0	0	2
VARIABLE	48	0	0	0	0	0	48
	6	2	0	0	0	0	8

Total

Periods of calm (hours): 8

Hours of missing data: 0

TABLE 4B

CLASSIFICATION OF ATMOSPHERIC STABILITY

Stability Classification	Pasquill Categories	$\sigma\theta^a$ (degrees)	Temperature change with height ($^{\circ}\text{C}/100\text{m}$)
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 (μ Ci/ml) ^a
A. Waste Monitor Tank Releases	Each Batch	Principal Gamma Emitters	5×10^{-7b}
	One Batch/Month	Dissolved Gases	10^{-5}
	Weekly Composite ^c	Ba-La-140, I-131	10^{-6}
	Monthly Composite ^c	H-3	10^{-5}
		Gross Alpha	10^{-7}
		Gross Beta	5×10^{-7}
B. Steam Generator Blowdown ^d	Weekly Composite	Principal Gamma Emitters	5×10^{-7b}
		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}
C. Turbine Building Sump ^d	Each Batch	Principal Gamma Emitters	5×10^{-7b}

^aThe 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.

^bFor 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.

^cA composite sample is one in which the quantity of liquid sampled is proportional to the quantity of liquid waste discharged.

^dSampled and analyzed only in the event of primary to secondary leakage and then only if to be discharged to the environs.

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

^fA 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 ($\mu\text{Ci/ml}$) ^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	10^{-12}
		I-133	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}

^aThe 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.

^bFor 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.

^cAnalyses shall also be performed following each refueling, startup, or similar operational occurrence which could alter the mixture of radionuclides.

^dAnalyses 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 radiiodine releases.

^eA 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 un-interrupted discharge flow during the continuous release.

POOR ORIGINAL

307345

TABLE 7

LIQUID DISCHARGES NOT MEETING SPECIFIED DETECTION LIMITS

Batch#	Date	Count Time Sec.	Volume Discharged gallons	Dilution Water gallons	Total Isotopic Activity	Isotope of Interest	LID Measured	% of Total Isotopic Activity	% of Total Dose ⁽²⁾
#227	4-3-79	13,000	4,150	2,340,000	6.96 E-5	Ru106	<6.0 E-7	8.6 E-1%	6.4 E-1%
#228	4-4-79	12,000	3,900	1,610,000	1.89 E-4	Sr91 I135	<1.3 E-6 <7.8 E-7	7.0 E-1% 4.0 E-1%	4.1 E-2% 1.2 E-2%
#291	5-25-79	20,000	3,600	2,410,000	8.79 E-5	Ru106	<5.9 E-7	6.7 E-1%	3.3 E-1%

907346

(1) Does not include Tritium

(2) Computed using the most conservative (highest) dose received for Whole Body or organ.