

Grand Gulf Nuclear Station

SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

January 1 - June 30, 1985

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I. INTRODUCTION

This Semiannual Radioactive Effluent Release Report for the period of January 1 through June 30, 1985, is submitted in accordance with Section 6.9.1.8 of Appendix A to Grand Gulf Nuclear Station (GGNS) License No. NPF-29. That portion of Appendix A which refers to the monitoring of radioactive effluents, Sections 3/4-11 and 3/4-12, will hereafter be referred to as the Radiological Effluent Technical Specification (RETS).

Airborne discharges at GGNS are ground level releases. All liquid and airborne discharges to the environment were analyzed in accordance with the RETS requirements. Also, all effluent releases were within the concentration and total release limits specified by the RETS.

There was one instance when Station Operations personnel were unable to restore operable status to radioactive effluent monitoring instrumentation. Additional discussion (Section II.K) has been provided to explain why this inoperability was not corrected within the time specified by GGNS Technical Specifications.

The calculations and terms utilized in this report are defined in the GGNS Offsite Dose Calculation Manual (ODCM).

II. DETAILED INFORMATION

A. Regulatory Limits

1. 10CFR20 Limits

- a. Fission and Activation Gases - The release rate limit at any time for noble gases to areas at or beyond the site boundary shall be such that:

D_{tb} = average total body dose rate in the current year (mrem/yr)

$$= \overline{X/Q} \sum_i K_i Q_i' \leq 500 \text{ mrem/yr}$$

D_s = average skin dose rate in the current year (mrem/year)

$$= \overline{X/Q} \sum_i (L_i + 1.1 M_i) Q_i' \leq 3000 \text{ mrem/yr}$$

where the terms are defined in the GGNS ODCM.

- b. Radioiodines and Particulates - The release rate limit for the sampling period for all radioiodines, tritium and radioactive materials in particulate form with half-lives greater than 8 days shall be such that:

D_o = average organ dose rate in current year (mrem/yr)

$$= \sum_i W P_i \overline{Q_i'} \leq 1500 \text{ mrem/yr}$$

where the terms are defined in the GGNS ODCM.

- c. Liquid Effluents - The concentration of radioactive materials released in liquid effluents to unrestricted areas from the reactors at the site shall not exceed at any time the values specified in 10CFR20, 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 be limited to 2×10^{-4} microcuries/ml total activity.

2. 10CFR50, Appendix I Limits

- a. Fission and Activation Gases - The dose from noble gases in gaseous effluents to areas at or beyond the site boundary shall be such that:

D_{γ} = air dose due to gamma emissions from noble gases

$$= 3.17 \times 10^{-8} \sum_i M_i \overline{X/Q'} Q_i \leq 5 \text{ mRad /qtr}$$

$$\leq 10 \text{ mRad /yr}$$

D_{β} = air dose due to beta emissions from noble gas

$$= 3.17 \times 10^{-8} \sum_i N_i \overline{X/Q'} Q_i \leq 10 \text{ mRad /qtr}$$

$$\leq 20 \text{ mRad /yr}$$

- b. Radioiodines and Particulates - The dose to an individual from tritium, I-131, I-133, and radioactive material in particulate form with half-lives greater than 8 days in gaseous effluents shall be such that:

D_p = dose to an individual from tritium, I-131, I-133, and radionuclides in particulate form with half-lives greater than 8 days (mrem)

$$= 3.17 \times 10^{-8} \sum_i R_i W' Q_i$$

$$\leq 7.5 \text{ mrem/qtr Any Organ}$$

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

Liquid Effluents - The dose from radioactive materials in liquid effluents shall be such that (where the terms are defined in the GGNS ODCM).

$$D_{\text{Tau}} = \sum_i [A_i \text{ Tau} \sum_{j=1}^m \Delta t_j C_{ij} F_i]$$

$$\leq 1.5 \text{ mrem/qtr Total Body}$$

$$\leq 5 \text{ mrem/qtr Any Organ}$$

$$\leq 3 \text{ mrem/yr Total Body}$$

$$\leq 10 \text{ mrem/yr Any Organ}$$

3. 40CFR190 Limits

Doses are calculated for Fission and Activation Gases; Radioiodines and Particulates; and Liquid Effluents according to equations contained in Sections 2.(a), (b), and (c), respectively, with the exception that the limits applied are:

≤ 25 mRem/yr, Total Body and Any Organ except thyroid

≤ 75 mRem/yr, Thyroid

≤ 10 mRad γ /qtr or ≤ 20 mRad γ /yr, Fission and Activation Gases

≤ 20 mRad β /qtr or ≤ 40 mRad β /yr, Fission and Activation Gases

≤ 15 mRem/qtr or ≤ 30 mRem/yr, Any Organ, Iodine and particulates

≤ 3 mRem/qtr or ≤ 6 mRem/yr, Total Body, Liquid Effluents

≤ 5 mRem/qtr or ≤ 20 mRem/yr, Any Organ, Liquid Effluents

B. Maximum Permissible Concentrations

1. Airborne

The Maximum Permissible Concentration (MPC) 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 2.1-1 of the GGNS ODCM.

2. Liquid

The MPC of radioactive materials in liquid effluents is limited by 10CFR20, Appendix B, Table II, Column 2. The MPC chosen is the most conservative value of either the soluble or insoluble MPC for each radioisotope.

C. Average Energy

Not Applicable for GGNS RETS.

D. Measurements and Approximations of Total Activity

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

1. Fission and Activation Gases
2. Radioiodines
3. Particulates
4. 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 necessarily infer that the radionuclides were not present. A zero indicates that the radionuclide was not present at levels greater than the sensitivity requirements shown in Tables 5 and 6. For some radionuclides lower detection limits than required may be readily achievable; when a radionuclide is measured below its stated limits it is reported.

1. For Fission and Activation Gases

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

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

Periodic grab samples from Station 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 II.A.1. of this report. Only those radionuclides 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:

$$C_i = U_i + m$$

where

$$C_i = \text{isotopic calibration factor for isotope } i$$

U_i = concentration of isotopic i in the grab sample, in Ci/ml.

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

These calibration factors, along with the hourly effluent monitor values and flow rates, are entered into the laboratory computer where the release rates for individual radionuclides are calculated and stored. If no activity is detected in the grab sample, the calibration factor for Kr-85 and the dose factor for Kr-89 are entered into the laboratory computer.

2. For Particulates and Radioiodines

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

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

3. For Continuous Releases

Continuous sampling is performed on the continuous release points (i.e., Radwaste Vent, Containment Purge, RMA vent, Turbine Building Vent). Particulate material is collected by filtration. Radioiodines are collected by adsorption onto 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. Strontium-89 and -90 values are obtained by chemical separation and subsequent analysis using 2-pi gas flow proportional counters. During major operational occurrences, the frequency of sampling is increased to satisfy the requirements of footnote "C" of Table 6, "Radioactive Gaseous Waste, Sampling and Analysis," (GGNS RETS, Table 4.11.2.1.2-1).

4. For Batch Releases: Gases

The processing of batch type releases (from Containment Purge) is analogous to that for continuous releases.

5. For Batch Releases: Liquid Effluents

The radionuclides listed below are considered when evaluating liquid effluents:

H-3	Mo-99
Co-58	Tc-99m
Co-60	I-131
Fe-55	I-132
Fe-59	I-133
Zn-65	I-135
Mn-54	Cs-134
Cr-51	Cs-140
Sr-89	Ba-140
Sr-90	La-140
Nb-95	Ce-141
Zr-95	Ce-144

Representative pre-release grab samples are obtained and analyzed as required by Table 5. Isotopic analyses are performed using the computerized pulse height analysis system previously described. Aliquots of each pre-released sample, proportional to the waste volume released, are composited in accordance with the requirements of Table 5. Strontium determinations are made by performing a chemical separation and counting the separated strontium using a 2-pi gas flow proportional counter. Gross alpha determinations are made using 2-pi gas flow proportional counters. Tritium and Iron-55 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.

E. Batch Releases

1. Liquid

1st Quarter, 1985

- a. Number of batch releases: 115
- b. Total time period for batch releases: 34374 minutes
- c. Maximum time period for a batch release: 425 minutes
- d. Average time period for batch releases: 299 minutes
- e. Minimum time period for a batch releases: 0 minutes

2nd Quarter, 1985

- a. Number of batch releases: 97
- b. Total time period for batch releases: 27110 minutes
- c. Maximum time period for a batch release: 330 minutes
- d. Average time period for batch releases: 279 minutes
- e. Minimum time period for a batch release: 0 minutes

2. Gaseous

1st and 2nd Quarter, 1985

- a. Number of batch releases: None
- b. Total time period for batch releases: 0 hours
- c. Maximum time period for a batch release: 0 hours
- d. Average time period for a batch release: 0 hours
- e. Minimum time period for a batch release: 0 hours

F. Abnormal Releases

1. Liquid

- a. Number of releases: None
- b. Total activity released: N/A

2. Gaseous

- a. Number of releases: None
- b. Total activity released: N/A

G. Estimate of Total Error

1. Liquid

The maximum errors associated with sampling, laboratory procedure and discharge volume are collectively estimated to be:

<u>Fission and Activation Gases</u>	<u>Isotopic</u>	<u>H-3</u>	<u>Fe-55</u>	<u>Sr</u>
29%	21%	26%	36%	29%

2. Gaseous

The maximum errors (not including sample line loss) associated with sample flow, vent flow, sample collection, monitor calibration and laboratory procedure are collectively estimated to be:

<u>Fission and Activation Gases</u>	<u>Iod.</u>	<u>Particulate</u>	<u>Tritium</u>
39%	43%	45%	31%

3. Counting Error

- (1) Isotopic counting errors are computed by the equation:

$$\text{Error} = 1.96 \sqrt{C_B + C_S}$$

Where: C_B = Background counts
 C_S = Sample counts

The isotopic counting errors are estimated to be 68% due to the low sample activity.

- (2) The gross counting errors associated with H-3, Sr-89, Sr-90, and Fe-55 are computed by the equation:

$$\text{Error} = 1.96 \sqrt{C_B + C_S}$$

Where: C_B = Background counts
 C_S = Sample counts

The estimated error for gross counting is estimated to be 68% due to the low sample activity.

4. Solid Radioactive Waste. (See Table 3 for error terms)

H. Solid Radioactive Waste Shipments.

(See Table 3 for shipment information)

I. Radiological Impact on Man

1. Water-Related Exposure Pathways

The values calculated in this section utilize information provided in Tables 2A, 2B and the ODCM.

Total Dose (mrem)

	<u>1st Quarter 1985</u>	<u>2nd Quarter 1985</u>
Whole-Body	1.15E-02	2.91E-02
Bone	1.63E-03	5.53E-02
Liver	3.89E-02	5.81E-02
Thyroid	4.51E-04	3.04E-03
Kidney	1.16E-02	2.30E-02
Lung	4.74E-04	2.25E-03
GI-LLI	1.11E-01	1.62E-01

2. Gas-Related Exposure Pathways

The values calculated in this section utilize information provided in Tables 1A, 1C and the ODCM.

	<u>1st Quarter 1985</u>	<u>2nd Quarter 1985</u>
Total Body	1.19E-01 mrem	4.87E-02 mrem
Skin	7.31E-02 mrem	2.98E-02 mrem

Particulate, Radioiodine and Tritium

	<u>1st Quarter 1985</u>	<u>2nd Quarter 1985</u>
Organ Dose	2.76E-03 mrem	3.47E-03 mrem

Lower Limit of Detection (LLD) Methodologies

If gaseous activity detected in the monthly isotopic analysis less than the LLDs, a Kr-85 calibration factor and a Kr-89 dose factor are inserted for the effluent monitors. The monitor net count rate is assumed to be zero whenever the monitor net count rate is less than two times the square root of the monitor background count rate.

J. Meteorological Data

(See Tables 4A and 4B).

III. 1984 RADIATION DOSE SUMMARY

This Summary will be provided in the end-of-the-year report.

IV. OFFSITE DOSE CALCULATION MANUAL/PROCESS CONTROL PROGRAM REVISIONS

a. Offsite Dose Calculation Manual (ODCM)

The ODCM has not been revised since Revision 5, which was reported in the February 25, 1985 Semiannual Radioactive Effluent Release Report.

b. Process Control Program (PCP)

The PCP has not been revised since Revision 1, which was reported in the August 31, 1984 Semiannual Radioactive Effluent Release Report.

TABLE 1A

GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES

Grand Gulf Nuclear Power Station UNIT I		Unit	Quarter 1	Quarter 2	Est. Total Error %
A. Fission & Activation Gases					
1.	Total release	Ci	6.21E+01	2.95E+01	7.80E+01
2.	Average release rate for period	uCi/sec	7.89E+00	3.75E+00	
3.	% of Technical Specification limit	%	2.16E+00	1.36E+00	
B. Iodines					
1.	Total Iodine-131	Ci	5.82E-06	7.20E-05	8.00E+01
2.	Average release rate for period	uCi/sec	7.40E-07	9.16E-06	
3.	% of Technical Specification limit	%	3.90E-02	4.68E-01	
C. Particulates					
1.	Particulates with half-lives>8 days	Ci	3.93E-05	1.01E-04	8.10E+01
2.	Average release rate for period	uCi/sec	4.99E-06	1.28E-05	
3.	% of Technical Specification limit	%	2.58E-02	1.17E-01	
4.	Gross alpha radioactivity	Ci	4.14E-07	3.91E-07	
D. Tritium					
1.	Total release	Ci	6.58E-02	3.67E-01	7.50+01
2.	Average release rate for period	uCi/sec	8.37E-03	4.67E-02	
3.	% of Technical Specification limit	%	5.69E-04	3.18E-03	
E. Tritium, radioiodines and particulates					
1.	% of Technical Specification limit	Ci	6.54E-02	5.88E-01	

TABLE 1B

Gaseous Effluents - Elevated Releases

(Not Applicable - GGNS Releases are considered ground level)

TABLE 1C

GASEOUS EFFLUENTS-GROUND-LEVEL RELEASE

Nuclides Released	Unit	CONTINUOUS MODE		BATCH MODE	
		Quarter 1	Quarter 2	Quarter 1	Quarter 2
1. Fission gases					
Xe-133	Ci	2.20E-01	4.12E-02	0.00E+00	0.00E+00
Xe-131M	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-88	Ci	3.15E+00	0.00E+00	0.00E+00	0.00E+00
Xe-133M	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135	Ci	1.90E+01	7.21E-01	0.00E+00	0.00E+00
Kr-85M	Ci	0.00E+00	1.18E-01	0.00E+00	0.00E+00
Kr-87	Ci	1.05E-01	0.00E+00	0.00E+00	0.00E+00
Xe-138	Ci	7.49E-02	1.19E+00	0.00E+00	0.00E+00
Xe-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135M	Ci	2.18E-01	2.29E-01	0.00E+00	0.00E+00
Kr-89	Ci	3.72E+01	2.60E+01	0.00E+00	0.00E+00
Ar-41	Ci	2.04E+00	1.18E+00	0.00E+00	0.00E+00
Kr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total for Period	Ci	6.21E+01	2.95E+01	0.00E+00	0.00E+00
2. Iodines					
I-131	Ci	5.82E-06	7.18E-05	0.00E+00	0.00E+00
I-133	Ci	3.86E-05	2.58E-04	0.00E+00	0.00E+00
I-132	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total for Period	Ci	4.44E-05	3.30E-04	0.00E+00	0.00E+00

TABLE 1C

GASEOUS EFFLUENTS-GROUND-LEVEL RELEASE

Nuclides Released	Unit	CONTINUOUS MODE		BATCH MODE	
		Quarter 1	Quarter 2	Quarter 1	Quarter 2
3. Particulates					
Sr-89	Ci	3.92E-07	1.96E-06	0.00E+00	0.00E+00
Sr-90	Ci	0.00E+00	3.61E-07	0.00E+00	0.00E+00
CE-141	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CR-51	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BA-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CS-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CS-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CE-144	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ZR-95	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NB-95	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-58	Ci	9.72E-06	1.97E-06	0.00E+00	0.00E+00
MN-54	Ci	5.42E-06	5.67E-07	0.00E+00	0.00E+00
FE-59	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-60	Ci	2.33E-06	2.05E-07	0.00E+00	0.00E+00
LA-140	Ci	0.00E+00	6.82E-07	0.00E+00	0.00E+00
C-14	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
P-32	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FE-55	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NI-63	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ZN-65	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Y-91	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RU-103	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RU-106	Ci	2.14E-05	9.50E-05	0.00E+00	0.00E+00
AG-110M	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CS-136	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PR-143	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	Ci	0.00E+00	2.78E-07	0.00E+00	0.00E+00
Total for period	Ci	3.93E-05	1.01E-04	0.00E+00	0.00E+00

TABLE 2A

LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

	Unit	Quarter 1	Quarter 2	Est. Total Error %
A. Fission & Activation Products				
1. Total release (not including H3, gases, alpha)	Ci	4.64E-02	6.78E-02	8.15E+01
2. Average diluted concentration during period	uCi/ml	5.27E-08	1.20E-07	
3. Percent of applicable limit	%	9.47E-02	3.96E-01	
B. Tritium				
1. Total release	Ci	1.30E+00	1.31E+00	7.65E+01
2. Average diluted concentration during period	uCi/ml	1.48E-06	2.32E-06	
3. Percent of applicable limit	%	4.03E-02	7.74E-02	
C. Dissolved and entrained gases				
1. Total release	Ci	4.43E-06	5.29E-05	7.43E+01
2. Average diluted concentration during period	uCi/ml	5.03E-12	9.39E-11	
3. Percent of applicable limit	%	5.03E-03	7.94E-02	
D. Gross alpha radioactivity				
1. Total release	Ci	0.00E+00	0.00E+00	6.80E+01
E. Volume of waste (prior to dilution)				
	liters	1.18E+07	9.14E+06	5.00E+00
F. Volume of dilution water used				
	liters	8.70E+08	5.54E+08	5.00E+00

*Percentages based on 10CFR20, Appendix B, Table II, Column 2

TABLE 2B

LIQUID EFFLUENTS-CONTINUOUS AND BATCH MODES

Nuclides Released	Unit	CONTINUOUS MODE		BATCH MODE	
		Quarter 1	Quarter 2	Quarter 1	Quarter 2
strontium-89	Ci	0.00E+00	0.00E+00	0.00E+00	3.78E-04
strontium-90	Ci	0.00E+00	0.00E+00	0.00E+00	2.06E-04
cesium-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cesium-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
iodine-131	Ci	0.00E+00	0.00E+00	0.00E+00	5.74E-06
cobalt-58	Ci	0.00E+00	0.00E+00	1.42E-02	9.64E-03
cobalt-60	Ci	0.00E+00	0.00E+00	3.57E-03	4.84E-03
iron-59	Ci	0.00E+00	0.00E+00	1.14E-04	1.13E-04
zinc-65	Ci	0.00E+00	0.00E+00	1.12E-04	4.55E-04
manganese-54	Ci	0.00E+00	0.00E+00	2.00E-02	2.50E-02
chromium-51	Ci	0.00E+00	0.00E+00	1.37E-03	1.53E-03
zirconium-niobium-95	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
molybdenum-99	Ci	0.00E+00	0.00E+00	0.00E+00	1.87E-04
technetium-99m	Ci	0.00E+00	0.00E+00	2.01E-05	4.80E-04
barium-lanthanum-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cerium-141	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
W-187	Ci	0.00E+00	0.00E+00	0.00E+00	4.06E-05
Cu-64	Ci	0.00E+00	0.00E+00	6.93E-04	4.10E-03
I-133	Ci	0.00E+00	0.00E+00	1.04E-05	1.17E-04
Mn-56	Ci	0.00E+00	0.00E+00	1.01E-05	9.65E-05
Na-24	Ci	0.00E+00	0.00E+00	3.24E-03	1.35E-02
Cs-138	Ci	0.00E+00	0.00E+00	3.61E-10	3.54E-06
As-76	Ci	0.00E+00	0.00E+00	2.28E-04	6.83E-03
Rb-86	Ci	0.00E+00	0.00E+00	8.74E-05	0.00E+00
Ru-106	Ci	0.00E+00	0.00E+00	2.15E-03	0.00E+00
Br-82	Ci	0.00E+00	0.00E+00	4.46E-06	2.36E-04
Cs-136	Ci	0.00E+00	0.00E+00	0.00E+00	3.20E-06
Sb-122	Ci	0.00E+00	0.00E+00	0.00E+00	4.33E-05
I-132	Ci	0.00E+00	0.00E+00	0.00E+00	2.15E-06
Fe-55	Ci	0.00E+00	0.00E+00	6.21E-04	0.00E+00
Total for Period (above)	Ci	0.00E+00	0.00E+00	4.64E-02	6.78E-02
xenon-133	Ci	0.00E+00	0.00E+00	0.00E+00	1.23E-05
xenon-135	Ci	0.00E+00	0.00E+00	4.43E-06	4.06E-05

TABLE 3

Solid Radioactive Waste and Irradiated Fuel Shipments

A. Solid Waste Shipped Offsite for Burial or Disposal

1. Type of Waste	Unit	6-month Period	Estimate Total Error, %
a. Spent resins, filter sludges, oil evaporator bottoms, etc.	m ³ Ci	3.19E+02 14.64E+00	7.1E+01
b. Dry compressible waste, contaminated equipment, etc.	m ³ Ci	3.02E+01 6.04E-01	10.0E+01
c. Irradiated components, control rods, etc.	m ³ Ci	None	N/A
d. Other	m ³ Ci	None	N/A
2. Estimate of major radionuclide composition (by type of waste as identified above).			
a. Cr-51	%		30.0
Co-58	%		21.6
Mn-54	%		18.8
Co-60	%		21.4
All Others	%		8.2
b. Cr-51	%		54.0
Co-58	%		11.5
Fe-59	%		12.5
Co-60	%		7.4
All Others	%		14.6
c. N/A			N/A
d. N/A			N/A
<ul style="list-style-type: none"> - Resins were dewatered in steel liners according to the requirements of the GGNS PCP and shipped LSA. - Oil was solidified with Envirostone (cement) in 55-gallon steel drums and shipped LSA. - DAW was packaged in 55-gallon steel drums and shipped LSA. 			

TABLE 3

Solid Radioactive Waste and Irradiated Fuel Shipments (cont'd)

3. Solid Waste Disposition

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
12	Truck	Barnwell, SC
9	Truck	Hanford, WA

B. Irradiated Fuel Shipments (Disposition)

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

TABLE 4A
Joint Frequency Distribution
50 Meter Level

EXTREMELY UNSTABLE STABILITY CLASS A
PERIOD OF RECORD: 1/1/85 000 Hours 4/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	4.0	6.0	1.0	.0	.0	1.0	.0	12.0	.6
NNE	3.0	5.0	.0	.0	.0	.0	.0	8.0	.3
NE	6.0	9.0	.0	.0	.0	.0	.0	15.0	.5
ENE	5.0	4.0	.0	.0	.0	.0	.0	9.0	.2
E	.0	6.0	.0	.0	.0	.0	.0	6.0	.2
ESE	.0	2.0	2.0	.0	.0	.0	.0	4.0	.2
SE	.0	3.0	2.0	.0	.0	.0	.0	5.0	.3
SSE	.0	.0	.0	.0	.0	.0	.0	.0	.0
S	.0	.0	.0	.0	.0	.0	.0	.0	.0
SSW	.0	.0	1.0	.0	.0	.0	.0	1.0	.1
WSW	.0	5.0	.0	.0	.0	.0	.0	5.0	.3
W	.0	1.0	.0	.0	.0	.0	.0	1.0	.0
WNW	.0	4.0	.0	.0	.0	.0	.0	4.0	.2
NW	.0	6.0	.0	.0	.0	.0	.0	6.0	.3
NNW	.0	14.0	1.0	.0	.0	.0	.0	15.0	.8
CALM	1.0	3.0	5.0	.0	.0	.0	.0	9.0	.5
TOTAL	19.0	68.0	12.0	.0	.0	1.0	.0	100.0	.3

0. HOURS OF BAD OR MISSING DATA OR .0 PERCENT FOR 100 HOURS

TABLE 4A (cont'd)
Joint Frequency Distribution
50 Meter Level

MODERATELY INSTABLE STABILITY CLASS B
PERIOD OF RECORD: 1/1/85 000 Hours 4/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	.0	1.8	.0	.0	.0	.0	.0	1.8	.1
NNE	.0	3.6	.0	.0	.0	.0	.0	3.6	.1
NE	3.6	5.3	1.8	.0	.0	.0	.0	10.7	.5
ENE	1.8	.0	.0	.0	.0	.0	.0	1.8	.0
D E	1.8	3.6	.0	.0	.0	.0	.0	5.3	.2
I ESE	5.3	5.3	.0	.0	.0	.0	.0	10.7	.3
R SE	.0	5.3	8.9	.0	.0	.0	.0	14.3	.9
W E SSE	3.6	1.8	3.6	.0	.0	.0	.0	8.9	.5
I C S	.0	.0	.0	.0	.0	.0	.0	.0	.0
N T SSW	.0	1.8	1.8	.0	.0	.0	.0	3.6	.2
D I SW	.0	5.3	1.8	.0	.0	.0	.0	7.1	.3
O WSW	.0	7.1	.0	.0	.0	.0	.0	7.1	.3
N W	.0	3.6	1.8	.0	.0	.0	.0	5.3	.3
WNW	.0	3.6	.0	.0	.0	.0	.0	3.6	.1
NW	.0	5.3	.0	.0	.0	.0	.0	5.3	.2
NNW	1.8	7.1	.0	.0	.0	.0	.0	8.9	.4
CALM	1.8							1.8	
TOTAL	19.6	60.7	19.6	.0	.0	.0	.0	100.0	.3

0. HOURS OF BAD OR MISSING DATA OR .0 PERCENT FOR 56 HOURS

TABLE 4A (cont'd)
Joint Frequency Distribution
50 Meter Level

SLIGHTLY UNSTABLE STABILITY CLASS C
PERIOD OF RECORD: 1/1/85 000 Hours 4/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	.0	2.8	.9	.0	.0	.0	.0	3.8	.2
NNE	2.8	.9	.0	.0	.0	.0	.0	3.8	.1
NE	.9	.9	.0	.0	.0	.0	.0	1.9	.1
ENE	.9	1.9	.0	.0	.0	.0	.0	2.8	.1
D E	1.9	.0	.0	.0	.0	.0	.0	1.9	.0
I ESE	2.8	6.7	.0	.0	.0	.0	.0	9.5	.3
R SE	.9	7.6	3.8	.9	.0	.0	.0	13.3	.7
W E SSE	.0	2.8	2.8	.9	.0	.0	.0	6.7	.4
I C S	.9	1.9	.9	.0	.0	.0	.0	3.8	.2
N T SSW	.0	.9	1.9	.0	.0	.0	.0	2.8	.2
D I SW	.0	10.5	.9	.0	.0	.0	.0	11.4	.5
O WSW	1.9	2.8	.0	.0	.0	.0	.9	5.7	.5
N W	.9	6.7	.9	.0	.0	.0	.0	8.6	.3
WNW	2.8	3.8	.0	.0	.0	.0	.0	6.7	.2
W W	.9	4.8	.0	.0	.0	.0	.0	5.7	.2
NNW	.9	8.6	1.9	.0	.0	.0	.0	11.4	.5
CALM	.0							.0	
TOTAL	19.0	63.6	14.3	1.9	.0	.0	.9	100.0	.3

2. HOURS OF BAD OR MISSING DATA OR 1.9 PERCENT FOR 107 HOURS

TABLE 4A (cont'd)
Joint Frequency Distribution
50 Meter Level

NEUTRAL STABILITY CLASS D
PERIOD OF RECORD: 1/1/85 000 Hours 4/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	2.6	11.8	2.1	.3	.0	.0	.0	16.9	.8
NNE	1.6	3.9	.0	.0	.0	.0	.0	5.6	.2
NE	1.3	2.0	.0	.0	.0	.0	.0	3.3	.1
ENE	1.1	.6	.0	.0	.0	.0	.0	1.8	.0
E	.3	1.8	.0	.0	.0	.0	.0	2.1	.1
ESE	.5	3.1	2.6	.0	.0	.0	.0	6.3	.3
SE	1.5	2.1	3.1	.0	.0	.0	.0	6.7	.3
SESE	.6	2.5	2.5	.6	.0	.0	.0	6.3	.4
S	.5	1.8	1.5	.0	.0	.0	.0	3.8	.2
SSW	1.5	1.0	.8	.0	.0	.0	.0	3.3	.1
SW	3.0	2.1	.6	.0	.0	.0	.0	5.7	.2
WSW	5.6	2.1	.0	.0	.0	.0	.0	7.7	.2
W	6.9	.6	.6	.0	.0	.0	.0	8.2	.2
WNW	5.4	2.5	.3	.0	.0	.0	.0	8.2	.2
NW	3.1	2.6	.2	.0	.0	.0	.0	5.9	.2
NNW	1.5	6.4	.2	.0	.0	.0	.0	8.0	.3
CALM	.0							.0	
TOTAL	37.2	47.2	14.6	1.0	.0	.0	.0	100.0	.3

52. HOURS OF BAD OR MISSING DATA OR 7.9 PERCENT FOR 660 HOURS

TABLE 4A (cont'd)
Joint Frequency Distribution
50 Meter Level

SLIGHTLY ST/ BLE STABILITY CLASS E
PERIOD OF RECORD: 1/1/85 000 Hours 4/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	3.2	3.9	.0	.0	.0	.0	.0	7.1	.2
NNE	4.9	3.7	.0	.0	.0	.0	.0	8.6	.2
NE	3.7	2.7	.0	.0	.0	.0	.0	6.4	.2
ENE	2.0	1.5	.0	.0	.0	.0	.0	3.5	.1
E	1.3	3.4	.3	.0	.0	.0	.0	5.0	.2
ESE	1.0	10.1	3.9	.0	.0	.0	.0	15.0	.8
SE	1.2	5.7	3.2	.0	.0	.0	.0	10.1	.5
SESE	.5	2.7	1.2	.2	.0	.0	.0	4.5	.2
SS	.7	2.0	.7	.0	.0	.0	.0	3.4	.1
SSW	1.2	6.9	.0	.0	.0	.0	.0	8.1	.3
SW	2.5	3.0	.0	.0	.0	.0	.0	5.5	.2
WSW	2.7	1.7	.2	.0	.0	.0	.0	4.5	.1
W	2.2	2.7	.3	.0	.0	.0	.0	5.2	.2
WNW	1.7	2.0	.7	.0	.0	.0	.0	4.4	.2
NW	1.3	1.5	.0	.0	.0	.0	.0	2.9	.1
NNW	2.0	3.4	.0	.0	.0	.0	.0	5.4	.2
CALM	.3							.3	
TOTAL	32.5	56.9	10.4	.2	.0	.0	.0	100.0	.2

68. HOURS OF BAD OR MISSING DATA OR 10.3 PERCENT FOR 662 HOURS

TABLE 4A (cont'd)
Joint Frequency Distribution
50 Meter Level

MODERATELY STABLE STABILITY CLASS F
PERIOD OF RECORD: 1/1/85 000 Hours 4/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	3.6	5.9	.0	.0	.0	.0	.0	9.5	.3
NNE	3.0	.6	.0	.0	.0	.0	.0	3.6	.1
NE	3.3	1.6	.0	.0	.0	.0	.0	4.9	.1
ENE	3.3	1.0	.0	.0	.0	.0	.0	4.3	.1
D E	2.3	7.2	.3	.0	.0	.0	.0	9.9	.4
I ESE	.6	6.6	1.3	.0	.0	.0	.0	8.5	.4
R SE	1.6	3.0	.3	.0	.0	.0	.0	4.9	.2
W E SSE	.6	1.3	.3	.0	.0	.0	.0	2.3	.1
I C S	1.3	1.3	.3	.0	.0	.0	.0	3.0	.1
N T SSW	2.0	2.0	.0	.0	.0	.0	.0	3.9	.1
D I SW	7.9	4.9	.3	.0	.0	.0	.0	13.1	.4
O WSW	3.3	1.3	.0	.0	.0	.0	.0	4.6	.1
N W	2.3	1.6	.6	.0	.0	.0	.0	4.6	.1
WNW	3.6	2.6	.6	.0	.0	.0	.0	6.9	.2
NW	3.6	3.0	.0	.0	.0	.0	.0	6.6	.2
NNW	5.3	2.3	.6	.0	.0	.0	.0	8.2	.3
CALM	1.0							1.0	
TOTAL	46.4	4.9	.0	.0	.0	.0	.0	100.0	.2

2. HOURS OF BAD OR MISSING DATA OR .7 PERCENT FOR 306 HOURS

TABLE 4A (cont'd)
Joint Frequency Distribution
50 Meter Level

EXTREMELY STABLE STABILITY CLASS G
PERIOD OF RECORD: 1/1/85 000 Hours 4/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	1.9	.5	.0	.0	.0	.0	.0	2.4	.0
NNE	3.4	1.0	.0	.0	.0	.0	.0	4.4	.1
NE	3.9	2.9	.0	.0	.0	.0	.0	6.8	.2
ENE	4.4	4.4	.0	.0	.0	.0	.0	8.8	.3
E	2.9	5.6	.5	.0	.0	.0	.0	9.3	.4
ESE	2.4	9.3	.5	.0	.0	.0	.0	12.2	.5
SE	2.9	4.9	.0	.0	.0	.0	.0	7.8	.3
SSE	1.9	1.9	.5	.0	.0	.0	.0	4.4	.1
CS	1.9	1.9	.0	.0	.0	.0	.0	3.9	.1
SSW	4.9	3.4	.0	.0	.0	.0	.0	8.3	.2
ISW	4.4	1.0	.0	.0	.0	.0	.0	5.4	.1
OSW	1.9	.5	.0	.0	.0	.0	.0	2.4	.0
NW	.0	1.5	1.0	.0	.0	.0	.0	2.4	.1
WNW	1.0	2.4	1.5	.0	.0	.0	.0	4.9	.2
NW	.0	3.9	.0	.0	.0	.0	.0	3.9	.2
NNW	5.8	4.9	.0	.0	.0	.0	.0	10.7	.3
CALM	1.9							1.9	
TOTAL	45.8	50.2	3.9	.0	.0	.0	.0	100.0	.2

0. HOURS OF BAD OR MISSING DATA OR .0 PERCENT FOR 205 HOURS

TABLE 4A (cont'd)
Joint Frequency Distribution
10 Meter Level

EXTREMELY UNSTABLE STABILITY CLASS A
PERIOD OF RECORD: 1/1/85 000 Hours 4/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	3.0	4.0	.0	.0	.0	1.0	.0	8.0	.4
NNE	13.0	3.0	.0	.0	.0	.0	.0	16.0	.4
NE	7.0	3.0	.0	.0	.0	.0	.0	10.0	.3
ENE	10.0	.0	.0	.0	.0	.0	.0	10.0	.2
E	4.0	1.0	.0	.0	.0	.0	.0	5.0	.1
ESE	.0	2.0	.0	.0	.0	.0	.0	2.0	.1
SE	.0	1.0	.0	.0	.0	.0	.0	1.0	.0
SESE	2.0	1.0	.0	.0	.0	.0	.0	3.0	.1
CS	.0	.0	.0	.0	.0	.0	.0	.0	.0
TSW	.0	1.0	.0	.0	.0	.0	.0	1.0	.0
ISW	.0	6.0	.0	.0	.0	.0	.0	6.0	.2
WSW	1.0	.0	.0	.0	.0	.0	.0	1.0	.0
NW	2.0	.0	.0	.0	.0	.0	.0	2.0	.0
WNW	10.0	1.0	.0	.0	.0	.0	.0	11.0	.3
NW	2.0	12.0	.0	.0	.0	.0	.0	14.0	.5
NNW	2.0	8.0	.0	.0	.0	.0	.0	10.0	.4
CALM	.0							.0	
TOTAL	56.0	43.0	.0	.0	.0	1.0	.0	100.0	.2

0. HOURS OF BAD OR MISSING DATA OR .0 PERCENT FOR 100 HOURS

TABLE 4A (cont'd)
Joint Frequency Distribution
10 Meter Level

MODERATELY UNSTABLE STABILITY CLASS B
PERIOD OF RECORD: 1/1/85 000 Hours 4/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	3.6	1.8	.0	.0	.0	.0	.0	5.3	.1
NNE	3.6	3.6	.0	.0	.0	.0	.0	7.1	.2
NE	8.9	1.8	.0	.0	.0	.0	.0	10.7	.3
ENE	1.8	.0	.0	.0	.0	.0	.0	1.8	.0
E	3.6	.0	.0	.0	.0	.0	.0	3.6	.1
ESE	1.8	1.8	.0	.0	.0	.0	.0	3.6	.1
SE	7.1	1.8	.0	.0	.0	.0	.0	8.9	.2
SSE	1.8	5.3	.0	.0	.0	.0	.0	7.1	.3
S	1.8	5.3	.0	.0	.0	.0	.0	7.1	.2
SSW	1.8	5.3	.0	.0	.0	.0	.0	7.1	.3
ISW	3.6	5.3	.0	.0	.0	.0	.0	8.9	.3
WSW	7.1	.0	.0	.0	.0	.0	.0	7.1	.2
W	1.8	.0	.0	.0	.0	.0	.0	1.8	.0
WNW	3.6	.0	.0	.0	.0	.0	.0	3.6	.1
W	1.8	3.6	.0	.0	.0	.0	.0	5.3	.2
WNW	5.3	5.3	.0	.0	.0	.0	.0	10.7	.3
CALM	.0	.0	.0	.0	.0	.0	.0	.0	.0
TOTAL	58.9	41.1	.0	.0	.0	.0	.0	100.0	.2

0. HOURS OF BAD OR MISSING DATA OR .0 PERCENT FOR 56 HOURS

TABLE 4A (cont'd)
Joint Frequency Distribution
10 Meter Level

SLIGHTLY UNSTABLE STABILITY CLASS C
PERIOD OF RECORD: 1/1/85 000 Hours 4/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	1.9	1.9	.0	.0	.0	.0	.0	3.8	.1
NNE	1.9	.9	.0	.0	.0	.0	.0	2.8	.1
NE	2.8	.0	.0	.0	.0	.0	.0	2.8	.0
ENE	.9	.9	.0	.0	.0	.0	.0	1.9	.0
E	2.8	.0	.0	.0	.0	.0	.0	2.8	.0
ESE	2.8	.9	.0	.0	.0	.0	.0	3.8	.1
SE	6.6	.0	.0	.0	.0	.0	.0	6.6	.1
ESSE	3.8	10.4	1.9	.0	.0	.0	.0	16.0	.6
ICS	1.9	2.8	.0	.0	.0	.0	.0	4.7	.2
NTSSW	.0	.9	.0	.0	.0	.0	.0	.9	.0
DISW	5.7	6.6	.0	.0	.0	.0	.0	12.3	.4
DWSW	5.7	.9	.0	.0	.0	.0	.0	6.6	.1
NW	3.8	.0	.0	.0	.0	.0	.9	4.7	.4
WNW	12.3	.0	.0	.0	.0	.0	.0	12.3	.3
NW	3.8	.0	.0	.0	.0	.0	.0	3.8	.1
NNW	6.6	7.5	.0	.0	.0	.0	.0	14.1	.4
CALM	.0							.0	
TOTAL	63.2	34.0	1.9	.0	.0	.0	.9	100.0	.2

1. HOURS OF BAD OR MISSING DATA OR .9 PERCENT FOR 107 HOURS

TABLE 4A (cont'd)
Joint Frequency Distribution
10 Meter Level

NEUTRAL STABILITY CLASS D
PERIOD OF RECORD: 1/1/85 000 Hours 4/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	8.7	8.0	.3	.0	.0	.0	.0	17.1	.5
NNE	5.1	1.5	.0	.0	.0	.0	.0	6.6	.1
NE	3.9	.2	.0	.0	.0	.0	.0	4.1	.1
ENE	2.1	.0	.0	.0	.0	.0	.0	2.1	.0
DE	1.5	.0	.0	.0	.0	.0	.0	1.5	.0
ESE	2.3	.3	.0	.0	.0	.0	.0	2.6	.1
RSE	2.5	.5	.0	.0	.0	.0	.0	2.9	.1
WESSE	2.6	5.7	.5	.0	.0	.0	.0	8.9	.3
ICS	1.5	4.3	.0	.0	.0	.0	.0	5.7	.2
NTSSW	2.9	1.3	.2	.0	.0	.0	.0	4.4	.1
DISW	5.2	1.8	.0	.0	.0	.0	.0	7.1	.2
OWSW	5.7	.2	.0	.0	.0	.0	.0	5.9	.1
NW	6.2	.0	.0	.0	.0	.0	.0	6.2	.1
WNW	7.7	.8	.0	.0	.0	.0	.0	8.5	.2
NW	5.9	.3	.0	.0	.0	.0	.0	6.2	.1
NNW	5.7	2.3	.0	.0	.0	.0	.0	8.0	.2
CALM	2.0							2.0	
TOTAL	71.7	27.2	1.0	.0	.0	.0	.0	100.0	.2

51. HOURS OF BAD OR MISSING DATA OR 7.7 PERCENT FOR 660 HOURS

TABLE 4A (cont'd)
Joint Frequency Distribution
10 Meter Level

SLIGHTLY STABLE STABILITY CLASS E
PERIOD OF RECORD: 1/1/85 000 Hours 4/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	6.7	1.3	.0	.0	.0	.0	.0	8.1	.2
NNE	5.9	.5	.0	.0	.0	.0	.0	6.4	.1
NE	6.0	.0	.0	.0	.0	.0	.0	6.0	.1
ENE	5.4	.3	.0	.0	.0	.0	.0	5.7	.1
DE	4.2	.0	.0	.0	.0	.0	.0	4.2	.1
ESE	4.7	1.2	.0	.0	.0	.0	.0	5.9	.1
RSE	4.7	1.0	.0	.0	.0	.0	.0	5.7	.1
WESSE	6.5	2.5	.2	.0	.0	.0	.0	9.2	.2
ICS	4.0	1.8	.0	.0	.0	.0	.0	5.9	.1
NTSSW	5.0	.7	.0	.0	.0	.0	.0	5.7	.1
DISW	3.9	.3	.0	.0	.0	.0	.0	4.2	.1
OWSW	3.7	.0	.0	.0	.0	.0	.0	3.7	.1
NW	2.8	.2	.0	.0	.0	.0	.0	3.0	.0
WNW	2.0	.8	.0	.0	.0	.0	.0	2.8	.0
NW	2.8	.0	.0	.0	.0	.0	.0	2.8	.0
NNW	7.0	.3	.0	.0	.0	.0	.0	7.4	.1
CALM	13.1							13.1	
TOTAL	88.7	11.1	.2	.0	.0	.0	.0	100.0	.1

67. HOURS OF BAD OR MISSING DATA OR 10.1 PERCENT FOR 662 HOURS

TABLE 4A (cont'd)
Joint Frequency Distribution
10 Meter Level

MODERATELY : TABLE STABILITY CLASS F
PERIOD OF RECORD: 1/1/85 000 Hours 4/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	4.9	3.6	.0	.0	.0	.0	.0	8.5	.2
NNE	3.6	.0	.0	.0	.0	.0	.0	3.6	.0
NE	5.6	.0	.0	.0	.0	.0	.0	5.6	.1
ENE	4.6	.0	.0	.0	.0	.0	.0	4.6	.0
D E	10.5	.6	.0	.0	.0	.0	.0	11.2	.1
I ESE	4.3	.0	.0	.0	.0	.0	.0	4.3	.0
R SE	2.0	.0	.0	.0	.0	.0	.0	2.0	.0
W E SSE	2.3	.3	.0	.0	.0	.0	.0	2.6	.0
I C S	2.0	.6	.0	.0	.0	.0	.0	2.6	.1
N T SSW	.0	.0	.0	.0	.0	.0	.0	.0	.0
D I SW	3.6	.6	.0	.0	.0	.0	.0	4.3	.1
O WSW	3.0	.0	.0	.0	.0	.0	.0	3.0	.0
N W	1.3	.0	.0	.0	.0	.0	.0	1.3	.0
WNW	3.0	.3	.0	.0	.0	.0	.0	3.3	.0
NW	3.9	.3	.0	.0	.0	.0	.0	4.3	.1
NNW	7.6	1.0	.0	.0	.0	.0	.0	8.5	.2
CALM	30.3							30.3	
TOTAL	92.4	7.6	.0	.0	.0	.0	.0	100.0	.1

2. HOURS OF BAD OR MISSING DATA OR .7 PERCENT FOR 306 HOURS

TABLE 4A (cont'd)
Joint Frequency Distribution
10 Meter Level

EXTREMELY STABLE STABILITY CLASS G
PERIOD OF RECORD: 1/1/85 000 Hours 4/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	2.9	.0	.0	.0	.0	.0	.0	2.9	.0
NNE	5.4	.0	.0	.0	.0	.0	.0	5.4	.1
NE	3.9	.0	.0	.0	.0	.0	.0	3.9	.0
ENE	8.3	.0	.0	.0	.0	.0	.0	8.3	.1
E	21.5	.0	.0	.0	.0	.0	.0	21.5	.2
ESE	6.3	.0	.0	.0	.0	.0	.0	6.3	.1
SE	5.4	.0	.0	.0	.0	.0	.0	5.4	.1
SSE	.5	.5	.0	.0	.0	.0	.0	1.0	.0
ICS	1.5	.0	.0	.0	.0	.0	.0	1.5	.0
SSW	.0	.5	.0	.0	.0	.0	.0	.5	.0
DSW	.0	.0	.0	.0	.0	.0	.0	.0	.0
WSW	1.0	.0	.0	.0	.0	.0	.0	1.0	.0
W	2.4	.0	.0	.0	.0	.0	.0	2.4	.0
WNW	1.9	1.0	.0	.0	.0	.0	.0	2.9	.1
NW	4.4	.5	.0	.0	.0	.0	.0	4.9	.1
NNW	7.8	.0	.0	.0	.0	.0	.0	7.8	.1
CALM	24.4							24.4	
TOTAL	97.6	2.4	.0	.0	.0	.0	.0	100.0	.1

0. HOURS OF BAD OR MISSING DATA OR .0 PERCENT FOR 205 HOURS

TABLE 4A (cont'd)
Joint Frequency Distribution
50 Meter Level

STABILITY CLASS A - G

PERIOD OF RECORD: 1/1/85 000 Hours 4/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	2.7	6.3	.8	.1	.0	.0	.0	9.9	.4
NNE	3.1	2.9	.0	.0	.0	.0	.0	6.0	.2
NE	2.9	2.6	.0	.0	.0	.0	.0	5.6	.2
ENE	2.3	1.6	.0	.0	.0	.0	.0	3.8	.1
D E	1.3	3.7	.2	.0	.0	.0	.0	5.2	.2
I ESE	1.1	6.6	2.3	.0	.0	.0	.0	10.0	.5
R SE	1.4	4.0	2.5	.0	.0	.0	.0	8.1	.4
W E SSE	.8	2.2	1.5	.3	.0	.0	.0	4.7	.3
I C S	.8	1.7	.8	.0	.0	.0	.0	3.2	.1
N T SSW	1.6	3.1	.4	.0	.0	.0	.0	5.2	.2
D I SW	3.3	3.4	.3	.0	.0	.0	.0	7.1	.2
U WSW	3.3	1.8	.0	.0	.0	.0	.0	5.3	.2
N W	3.2	2.1	.6	.0	.0	.0	.0	5.9	.2
WNW	3.0	2.6	.5	.0	.0	.0	.0	6.2	.2
NW	2.0	3.2	.1	.0	.0	.0	.0	5.3	.2
NNW	2.6	4.7	.5	.0	.0	.0	.0	7.8	.3
CALM	2.6							.5	
TOTAL	36.1	52.6	10.7	.4	.0	.0	.0	100.0	.2

188. HOURS OF BAD OR MISSING DATA OR 8.7 PERCENT FOR 2160 HOURS

TABLE 4A (cont'd)
Joint Frequency Distribution
10 Meter Level

STABILITY CLASS A - G

PERIOD OF RECORD: 1/1/85

000 Hours

4/1/85

000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	6.1	3.8	.1	.0	.0	.0	.0	10.1	.3
NNE	5.3	.9	.0	.0	.0	.0	.0	6.2	.1
NE	5.1	.3	.0	.0	.0	.0	.0	5.3	.1
ENE	4.4	.1	.0	.0	.0	.0	.0	4.6	.1
D E	6.0	.1	.0	.0	.0	.0	.0	6.2	.1
I ESE	3.6	.6	.0	.0	.0	.0	.0	4.3	.1
R S	3.6	.5	.0	.0	.0	.0	.0	4.1	.1
W E SSE	3.5	3.4	.3	.0	.0	.0	.0	7.2	.2
I C S	2.3	2.3	.0	.0	.0	.0	.0	4.5	.1
N T SSW	2.5	.9	.0	.0	.0	.0	.0	3.4	.1
D I SW	3.7	1.6	.0	.0	.0	.0	.0	5.3	.1
U WSW	4.0	.1	.0	.0	.0	.0	.0	4.1	.1
N W	3.6	.0	.0	.0	.0	.0	.0	3.7	.1
WNW	4.9	.7	.0	.0	.0	.0	.0	5.6	.1
NW	4.1	.9	.0	.0	.0	.0	.0	5.0	.1
NNW	6.5	1.9	.0	.0	.0	.0	.0	8.4	.2
CALM	6.5							11.7	
TOTAL	81.1	16.3	.4	.0	.0	.0	.0	100.0	.1

185. HOURS OF BAD OR MISSING DATA OR 8.6 PERCENT FOR 2160 HOURS

TABLE 4A (cont'd)

PERCENT BAD DATA REPORT

PERIOD OF RECORD: 1/1/85 000 Hours

4/1/85 000 Hours

	HOURS	PERCENT
50M DIRECTION	83.	3.84
50M WIND SPEED	124.	5.74
10M DIRECTION	85.	3.94
10M WIND SPEED	121.	5.60
TEMPERATURE	54.	2.50
DEW POINT	362.	16.76
DELTA T	64.	2.96
PRECIPITATION	2160.	100.00

TABLE 4B
Joint Frequency Distribution
50 Meter Level

EXTREMELY UP STABLE STABILITY CLASS A
PERIOD OF RECORD: 4/1/85 000 Hours 7/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	8.6	8.0	.0	.0	.0	.0	.0	16.6	5
NNE	7.4	2.4	.0	.0	.0	.0	.0	9.8	2
NE	2.4	4.9	.0	.0	.0	.0	.0	7.4	2
ENE	7.4	1.2	.0	.0	.0	.0	.0	8.6	2
E	4.3	2.4	.0	.0	.0	.0	.0	6.7	2
ESE	3.1	.6	.0	.0	.0	.0	.0	3.7	1
SE	4.9	.6	.0	.0	.0	.0	.0	5.5	1
SSE	1.2	.0	.0	.0	.0	.0	.0	1.2	0
S	.0	.6	1.8	.0	.0	.0	.0	2.4	2
SSW	.0	.0	.0	.0	.0	.0	.0	.0	0
SW	.0	.0	2.4	.0	.0	.0	.0	2.4	2
WSW	.6	.0	.0	.0	.0	.0	.0	.6	0
W	.0	.0	.0	.0	.0	.0	.0	.0	0
WNW	1.2	2.4	.0	.0	.0	.0	.0	3.7	1
NW	8.6	5.5	.0	.0	.0	.0	.0	14.1	4
NNW	7.4	9.8	.0	.0	.0	.0	.0	17.2	6
CALM	.0	.0	.0	.0	.0	.0	.0	.0	
TOTAL	57.0	36.6	4.3	.0	.0	.0	.0	100.0	.2

0. HOURS OF BAD OR MISSING DATA OR .0 PERCENT FOR 163 HOURS

TABLE 4B (cont'd)
Joint Frequency Distribution
50 Meter Level

MODERATELY UNSTABLE STABILITY CLASS B
PERIOD OF RECORD: 4/1/85 000 Hours 7/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	5.9	7.3	.0	.0	.0	.0	.0	13.2	.4
NNE	7.3	1.5	.0	.0	.0	.0	.0	8.8	.2
NF	1.5	1.5	.0	.0	.0	.0	.0	2.9	.1
FNE	4.4	.0	.0	.0	.0	.0	.0	4.4	.1
E	4.4	.0	.0	.0	.0	.0	.0	4.4	.1
ESE	5.9	1.5	.0	.0	.0	.0	.0	7.3	.2
SE	1.5	4.4	1.5	.0	.0	.0	.0	7.3	.3
SSE	1.5	2.9	1.5	.0	.0	.0	.0	5.9	.2
S	2.9	4.4	1.5	1.5	.0	.0	.0	10.3	.5
SSW	.0	.0	2.9	.0	.0	.0	.0	2.9	.2
SW	.0	.0	.0	.0	.0	.0	.0	.0	.0
WSW	2.9	.0	.0	.0	.0	.0	.0	2.9	.0
W	1.5	1.5	.0	.0	.0	.0	.0	2.9	.1
WNW	4.4	1.5	.0	.0	.0	.0	.0	5.9	.1
NW	4.4	8.8	.0	.0	.0	.0	.0	13.2	.4
NNW	4.4	2.9	.0	.0	.0	.0	.0	7.3	.2
CALM	.0	.0	.0	.0	.0	.0	.0	.0	.0
TOTAL	52.9	38.2	7.3	1.5	.0	.0	.0	100.0	.2

0. HOURS LF RAD OR MISSING DATA OR .0 PERCENT FOR 68 HOURS

TABLE 4B (cont'd)
Joint Frequency Distribution
50 Meter Level

SLIGHTLY UNSTABLE STABILITY CLASS C
PERIOD OF RECORD: 4/1/85 000 Hours 7/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	3.1	2.1	.0	.0	.0	.0	.0	5.3	.1
NNE	2.1	.0	.0	.0	.0	.0	.0	2.1	.0
NE	1.1	1.1	.0	.0	.0	.0	.0	2.1	.1
NNE	1.1	1.1	.0	.0	.0	.0	.0	2.1	.1
DE	3.1	4.2	.0	.0	.0	.0	.0	7.4	.2
DESE	2.1	4.2	.0	.0	.0	.0	.0	6.3	.2
RSE	.0	6.3	.0	.0	.0	.0	.0	6.3	.3
WESSE	2.1	2.1	1.1	.0	.0	.0	.0	5.3	.2
ICS	.0	6.3	.0	.0	.0	.0	.0	6.3	.3
NTSSW	2.1	4.2	1.1	.0	.0	.0	.0	7.4	.3
DISW	.0	4.2	2.1	.0	.0	.0	.0	6.3	.3
OWSW	2.1	1.1	.0	.0	.0	.0	.0	3.1	.1
NW	6.3	3.1	.0	.0	.0	.0	.0	9.5	.2
WNW	6.3	4.2	.0	.0	.0	.0	.0	10.5	.3
NW	8.4	3.1	.0	.0	.0	.0	.0	11.6	.3
NNW	2.1	6.3	.0	.0	.0	.0	.0	8.4	.3
CALM	.0	.0	.0	.0	.0	.0	.0	.0	.0
TOTAL	42.1	53.7	4.2	.0	.0	.0	.0	100.0	.2

0. HOURS OF BAD OR MISSING DATA OR .0 PERCENT FOR 95 HOURS

TABLE 4B (cont'd)
Joint Frequency Distribution
50 Meter Level

NEUTRAL PERIOD OF RECORD: 4/1/85 000 Hours 7/1/85 000 Hours STABILITY CLASS D

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	Avg SPEED
N	1.3	.7	.0	.0	.0	.0	.0	2.0	.0
NNE	.5	1.3	.0	.0	.0	.0	.0	1.8	.1
NF	.5	.2	.0	.0	.0	.0	.0	.7	.0
ENE	1.3	.0	.0	.0	.0	.0	.0	1.3	.0
E	.7	.4	.0	.0	.0	.0	.0	1.1	.0
ESE	2.2	.9	.0	.0	.0	.0	.0	3.1	.1
SE	1.5	3.9	.4	.0	.0	.0	.0	5.7	.2
SSE	2.4	5.3	.7	.0	.0	.0	.0	8.5	.3
S	3.7	14.8	2.4	.0	.0	.0	.0	20.8	.9
SSW	4.8	5.9	1.3	.0	.0	.0	.0	12.0	.4
TSW	7.2	6.1	.0	.0	.0	.0	.0	13.3	.4
SW	4.4	1.3	.0	.0	.0	.0	.0	5.7	.1
WSW	7.2	1.7	.0	.0	.0	.0	.0	8.8	.2
W	4.0	.9	.2	.0	.0	.0	.0	5.2	.1
WNW	3.1	2.8	.2	.0	.0	.0	.0	6.1	.2
NW	.7	2.4	.2	.0	.0	.0	.0	3.3	.1
N'W	.4	.0	.0	.0	.0	.0	.0	.4	.0
CALM	.4	.0	.0	.0	.0	.0	.0	.4	.0
TOTAL	46.1	48.5	5.3	.0	.0	.0	.0	100.0	.2

0. HOURS OF BAD OR MISSING DATA OR .0 PERCENT FOR 542 HOURS

TABLE 4B (cont'd)
Joint Frequency Distribution
50 Meter Level

SLIGHTLY ST BLE STABILITY CLASS E
PERIOD OF RECORD: 4/1/85 000 Hours 7/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	1.8	1.4	.0	.0	.0	.0	.0	3.2	.1
NNE	.9	2.1	.0	.0	.0	.0	.0	3.0	.1
NE	2.5	1.1	.0	.0	.0	.0	.0	3.6	.1
ENE	1.4	1.8	.0	.0	.0	.0	.0	3.2	.1
N E	1.4	1.6	.2	.0	.0	.0	.0	3.2	.1
ESE	2.0	5.9	.0	.0	.0	.0	.0	7.8	.3
R SE	.5	8.9	.2	.0	.0	.0	.0	9.6	.4
W E SSE	4.1	8.7	.9	.0	.0	.0	.0	13.7	.5
I C S	4.4	11.6	.5	.0	.0	.0	.0	16.6	.6
N T SSW	5.7	7.7	.9	.0	.0	.0	.0	14.3	.5
D I SW	2.5	2.3	.0	.0	.0	.0	.0	4.8	.1
W SW	2.7	1.1	.2	.0	.0	.0	.0	3.9	.1
N W	3.2	.3	.0	.0	.0	.0	.0	3.6	.1
WNW	1.6	.5	.0	.0	.0	.0	.0	2.1	.0
NW	2.5	1.6	.0	.0	.0	.0	.0	4.1	.1
NNW	1.4	1.8	.0	.0	.0	.0	.0	3.2	.1
CALM	.0							.0	
TOTAL	38.7	58.5	2.8	.0	.0	.0	.0	100.0	.7

0. HOURS OF BAD OR MISSING DATA OR .0 PERCENT FOR 561 HOURS

TABLE 4B (cont'd)
Joint Frequency Distribution
50 Meter Level

MODERATELY TABLE STABILITY CLASS F
PERIOD OF RECORD: 4/1/85 000 Hours 7/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	1.5	2.5	.0	.0	.0	.0	.0	4.0	.1
NNE	4.0	1.3	.0	.0	.0	.0	.0	5.3	.1
NE	1.7	3.3	.0	.0	.0	.0	.0	5.0	.2
ENE	3.3	3.0	.0	.0	.0	.0	.0	6.3	.2
E	4.0	2.8	.3	.0	.0	.0	.0	7.0	.2
ESE	3.5	10.0	.0	.0	.0	.0	.0	13.6	.5
SE	3.5	9.0	.3	.0	.0	.0	.0	12.8	.5
SSE	4.3	6.5	.0	.0	.0	.0	.0	10.8	.4
S	4.0	4.5	.0	.0	.0	.0	.0	8.5	.3
SSW	4.0	3.3	.0	.0	.0	.0	.0	7.3	.2
SW	6.3	1.5	.0	.0	.0	.0	.0	7.8	.2
WSW	1.7	.8	.0	.0	.0	.0	.0	2.5	.1
W	2.0	.3	.0	.0	.0	.0	.0	2.3	.0
WW	2.0	.3	.0	.0	.0	.0	.0	2.3	.0
W	.8	.0	.0	.0	.0	.0	.0	.8	.0
NNA	1.7	.5	.0	.0	.0	.0	.0	2.3	.0
CALM	1.5							1.5	
TOTAL	50.0	49.5	.5	.0	.0	.0	.0	100.0	.2

0. HOURS OF BAD OR MISSING DATA OR .0 PERCENT FOR 398 HOURS

TABLE 4B (cont'd)
Joint Frequency Distribution
50 Meter Level

EXTREMELY STABLE STABILITY CLASS G
PERIOD OF RECORD: 4/1/85 000 Hours 7/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	4.1	1.4	.0	.0	.0	.0	.0	5.5	.1
NNE	2.0	2.0	.0	.0	.0	.0	.0	4.1	.1
NE	2.4	3.8	.0	.0	.0	.0	.0	6.1	.2
ENE	2.4	4.4	.0	.0	.0	.0	.0	6.8	.2
E	2.4	5.1	.0	.0	.0	.0	.0	7.5	.3
ESE	2.7	10.2	.0	.0	.0	.0	.0	13.0	.5
SE	6.8	7.2	.0	.0	.0	.0	.0	14.0	.4
E SSE	4.4	1.4	.0	.0	.0	.0	.0	5.8	.1
ICS	8.2	2.0	.0	.0	.0	.0	.0	10.2	.2
NT SSW	3.8	1.4	.0	.0	.0	.0	.0	5.1	.1
DI SW	3.1	.0	.0	.0	.0	.0	.0	3.1	.0
W SW	4.1	.3	.0	.0	.0	.0	.0	4.4	.1
NW	1.7	.0	.0	.0	.0	.0	.0	1.7	.0
WNW	1.7	.0	.0	.0	.0	.0	.0	1.7	.0
NW	3.4	.0	.0	.0	.0	.0	.0	3.4	.0
NNW	3.4	.0	.0	.0	.0	.0	.0	3.4	.1
CALM	4.1							4.1	
TOTAL	60.7	39.2	.0	.0	.0	.0	.0	100.0	.2

0. HOURS OF BAD OR MISSING DATA OR .0 PERCENT FOR 293 HOURS

TABLE 4B (cont'd)
Joint Frequency Distribution
10 Meter Level

EXTREMELY UNSTABLE STABILITY CLASS A
PERIOD OF RECORD: 4/1/85 000 Hours 7/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	12.3	1.8	.0	.0	.0	.0	.0	14.1	.3
NNE	9.8	.6	.0	.0	.0	.0	.0	10.4	.2
NE	9.2	.0	.0	.0	.0	.0	.0	9.2	.2
ENE	8.6	.0	.0	.0	.0	.0	.0	8.6	.1
E	2.4	.0	.0	.0	.0	.0	.0	2.4	.0
ESE	1.2	.0	.0	.0	.0	.0	.0	1.2	.0
SSE	3.1	.0	.0	.0	.0	.0	.0	3.1	.0
W SSE	3.1	.6	.0	.0	.0	.0	.0	3.7	.1
ICS	.6	.6	.0	.0	.0	.0	.0	1.8	.1
NTSSW	.0	.6	.0	.0	.0	.0	.0	.6	.0
DISW	1.2	2.4	.0	.0	.0	.0	.0	3.7	.1
OWSW	1.8	.0	.0	.0	.0	.0	.0	1.8	.0
NW	1.8	.0	.0	.0	.0	.0	.0	1.8	.0
WNW	3.1	.0	.0	.0	.0	.0	.0	3.1	.0
NW	11.0	.6	.0	.0	.0	.0	.0	11.6	.2
NNW	17.8	4.3	.0	.0	.0	.0	.0	22.1	.5
CALM	.6							.6	
TOTAL	67.7	11.6	.6	.0	.0	.0	.0	100.0	.1

0. HOURS OF BAD OR MISSING DATA OR .0 PERCENT FOR 163 HOURS

TABLE 4B (cont'd)
Joint Frequency Distribution
10 Meter Level

MODERATELY UNSTABLE STABILITY CLASS B
PERIOD OF RECORD: 4/1/85 000 Hours 7/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	16.2	.0	.0	.0	.0	.0	.0	16.2	.3
NNE	7.3	.0	.0	.0	.0	.0	.0	7.3	.1
NF	2.9	.0	.0	.0	.0	.0	.0	2.9	.0
ENE	4.4	.0	.0	.0	.0	.0	.0	4.4	.0
E	.0	.0	.0	.0	.0	.0	.0	.0	.0
ESE	2.9	1.5	.0	.0	.0	.0	.0	4.4	.1
SE	.0	.0	.0	.0	.0	.0	.0	.0	.0
E SSE	4.4	1.5	.0	.0	.0	.0	.0	5.9	.2
S	5.9	4.4	1.5	.0	.0	.0	.0	11.8	.4
SSW	4.4	4.4	.0	.0	.0	.0	.0	8.8	.3
ISW	1.5	.0	.0	.0	.0	.0	.0	1.5	.0
WSW	5.9	.0	.0	.0	.0	.0	.0	5.9	.1
W	1.5	.0	.0	.0	.0	.0	.0	1.5	.0
WNW	8.8	.0	.0	.0	.0	.0	.0	8.8	.1
NW	8.8	.0	.0	.0	.0	.0	.0	8.8	.2
NNW	10.3	.0	.0	.0	.0	.0	.0	10.3	.2
CALM	1.5							1.5	
TOTAL	86.8	11.8	1.5	.0	.0	.0	.0	100.0	.2

0. HOURS OF BAD OR MISSING DATA OR .0 PERCENT FOR 68 HOURS

TABLE 4B (cont'd)
Joint Frequency Distribution
10 Meter Level

SLIGHTLY UNSTABLE STABILITY CLASS C
PERIOD OF RECORD: 4/1/85 000 Hours 7/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	4.2	1.1	.0	.0	.0	.0	.0	5.3	.1
NNE	2.1	.0	.0	.0	.0	.0	.0	2.1	.0
NE	1.1	.0	.0	.0	.0	.0	.0	1.1	.0
ENE	4.2	.0	.0	.0	.0	.0	.0	4.2	.1
E	2.1	.0	.0	.0	.0	.0	.0	2.1	.0
ESE	4.2	.0	.0	.0	.0	.0	.0	4.2	.1
SE	2.1	.0	.0	.0	.0	.0	.0	2.1	.0
SSE	5.3	.0	.0	.0	.0	.0	.0	5.3	.1
CS	2.1	7.4	.0	.0	.0	.0	.0	9.5	.3
TSSW	6.3	4.2	.0	.0	.0	.0	.0	10.5	.3
ISW	5.3	3.1	.0	.0	.0	.0	.0	8.4	.3
WSW	4.2	.0	.0	.0	.0	.0	.0	4.2	.1
W	6.3	.0	.0	.0	.0	.0	.0	6.3	.1
WNW	10.5	.0	.0	.0	.0	.0	.0	10.5	.1
NW	11.6	.0	.0	.0	.0	.0	.0	11.6	.2
NNW	12.6	.0	.0	.0	.0	.0	.0	12.6	.3
CALM	.0	.0	.0	.0	.0	.0	.0	.0	.0
TOTAL	64.2	15.8	.0	.0	.0	.0	.0	100.0	.1

0. HOURS OF BAD OR MISSING DATA OR .0 PERCENT FOR 95 HOURS

TABLE 4B (cont'd)
Joint Frequency Distribution
10 Meter Level

NEUTRAL PERIOD OF RECORD: 4/1/85 000 Hours 7/1/85 000 Hours STABILITY CLASS D

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	2.0	.2	.0	.0	.0	.0	.0	2.2	.0
NNE	2.6	.0	.0	.0	.0	.0	.0	2.6	.0
NE	1.1	.0	.0	.0	.0	.0	.0	1.1	.0
ENE	.7	.0	.0	.0	.0	.0	.0	.7	.0
E	.5	.0	.0	.0	.0	.0	.0	.5	.0
ESE	2.2	.2	.0	.0	.0	.0	.0	2.4	.0
SSE	2.0	.4	.0	.0	.0	.0	.0	2.4	.0
S	3.3	1.5	.0	.0	.0	.0	.0	4.8	.1
SSW	15.5	9.0	.0	.0	.0	.0	.0	24.5	.7
SW	10.0	2.6	.0	.0	.0	.0	.0	12.6	.3
WSW	13.6	1.1	.0	.0	.0	.0	.0	14.7	.3
W	8.1	.0	.0	.0	.0	.0	.0	8.1	.1
WNW	3.9	.0	.0	.0	.0	.0	.0	3.9	.0
WNA	7.2	.2	.0	.0	.0	.0	.0	7.4	.1
NW	5.0	.2	.0	.0	.0	.0	.0	5.2	.1
NWN	3.5	.9	.0	.0	.0	.0	.0	4.4	.1
CALM	2.4	.0	.0	.0	.0	.0	.0	2.4	.0
TOTAL	83.8	16.2	.0	.0	.0	.0	.0	100.0	.2

0. HOURS OF BAD OR MISSING DATA OR .0 PERCENT FOR 542 HOURS

TABLE 4B (cont'd)
Joint Frequency Distribution
10 Meter Level

SLIGHTLY STABLE PERIOD OF RECORD: 4/1/85 000 Hours 7/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	3.6	.0	.0	.0	.0	.0	.0	3.6	.0
NNE	4.6	.0	.0	.0	.0	.0	.0	4.6	.1
NE	2.3	.0	.0	.0	.0	.0	.0	2.3	.0
ENE	4.6	.0	.0	.0	.0	.0	.0	4.6	.0
E	3.7	.0	.0	.0	.0	.0	.0	3.7	.0
ESE	2.8	.0	.0	.0	.0	.0	.0	2.8	.0
ESE	3.4	.0	.0	.0	.0	.0	.0	3.4	.0
SE	8.4	.7	.0	.0	.0	.0	.0	9.1	.1
SSE	17.6	2.0	.0	.0	.0	.0	.0	19.6	.4
S	11.8	1.8	.0	.0	.0	.0	.0	13.5	.2
SSW	3.9	.2	.0	.0	.0	.0	.0	4.1	.1
SSW	3.6	.3	.0	.0	.0	.0	.0	3.9	.0
SW	2.8	.2	.0	.0	.0	.0	.0	3.0	.0
WSW	3.0	.0	.0	.0	.0	.0	.0	3.0	.0
W	2.0	.0	.0	.0	.0	.0	.0	2.0	.0
WNW	4.4	.0	.0	.0	.0	.0	.0	4.4	.0
W	12.1	.0	.0	.0	.0	.0	.0	12.1	.0
CALM	94.8	5.2	.0	.0	.0	.0	.0	100.0	.1
TOTAL	94.8	5.2	.0	.0	.0	.0	.0	100.0	.1

0. HOURS OF BAD OR MISSING DATA OR .0 PERCENT FOR 561 HOURS

TABLE 4B (cont'd)
Joint Frequency Distribution
10 Meter Level

MODERATELY TABLE STABILITY CLASS F
PERIOD OF RECORD: 4/1/85 000 Hours 7/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	2.3	.0	.0	.0	.0	.0	.0	2.3	.0
NNE	5.8	.0	.0	.0	.0	.0	.0	5.8	.0
NF	7.0	.0	.0	.0	.0	.0	.0	7.0	.1
FNE	9.0	.0	.0	.0	.0	.0	.0	9.0	.1
DF	6.5	.0	.0	.0	.0	.0	.0	6.5	.1
FSE	6.0	.3	.0	.0	.0	.0	.0	6.3	.1
RSE	8.3	.0	.0	.0	.0	.0	.0	8.3	.1
SSE	5.8	.0	.0	.0	.0	.0	.0	5.8	.1
CS	8.8	.0	.0	.0	.0	.0	.0	8.8	.1
TSS	3.5	.0	.0	.0	.0	.0	.0	3.5	.0
ISW	2.5	.0	.0	.0	.0	.0	.0	2.5	.0
WS	.8	.0	.0	.0	.0	.0	.0	.8	.0
WN	.8	.0	.0	.0	.0	.0	.0	.8	.0
WNW	.5	.0	.0	.0	.0	.0	.0	.5	.0
NW	1.7	.0	.0	.0	.0	.0	.0	1.7	.0
NW	1.7	.0	.0	.0	.0	.0	.0	1.7	.0
CALM	28.6	.3	.0	.0	.0	.0	.0	28.6	.0
TOTAL	99.7	.3	.0	.0	.0	.0	.0	100.0	.1

0. HOURS OF BAD OR MISSING DATA OR .0 PERCENT FOR 398 HOURS

TABLE 4B (cont'd)
Joint Frequency Distribution
10 Meter Level

EXTREMELY STABLE STABILITY CLASS G
PERIOD OF RECORD: 4/1/85 000 Hours 7/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	.7	.0	.0	.0	.0	.0	.0	.7	.0
NNE	3.4	.0	.0	.0	.0	.0	.0	3.4	.0
NE	11.9	.0	.0	.0	.0	.0	.0	11.9	.1
ENE	13.3	.0	.0	.0	.0	.0	.0	13.3	.1
E	10.9	.0	.0	.0	.0	.0	.0	10.9	.1
ESE	5.5	.0	.0	.0	.0	.0	.0	5.5	.1
ESE	3.4	.0	.0	.0	.0	.0	.0	3.4	.0
W E SSE	1.7	.0	.0	.0	.0	.0	.0	1.7	.0
I C S	1.4	.0	.0	.0	.0	.0	.0	1.4	.0
N T SSW	2.0	.0	.0	.0	.0	.0	.0	2.0	.0
D I SW	.3	.0	.0	.0	.0	.0	.0	.3	.0
D WSW	.3	.0	.0	.0	.0	.0	.0	.3	.0
N W	.7	.0	.0	.0	.0	.0	.0	.7	.0
WNW	.7	.0	.0	.0	.0	.0	.0	.7	.0
NW	.3	.0	.0	.0	.0	.0	.0	.3	.0
NNW	.3	.0	.0	.0	.0	.0	.0	.3	.0
CALM	43.0							43.0	
TOTAL	100.0	.0	.0	.0	.0	.0	.0	100.0	.1

0. HOURS OF BAD OR MISSING DATA OR .0 PERCENT FOR 293 HOURS

TABLE 4B (cont'd)
Joint Frequency Distribution
50 Meter Level

STABILITY CLASS A - G

PERIOD OF RECORD: 4/1/85 000 Hours 7/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	2.6	2.2	.0	.0	.0	.0	.0	4.8	.1
NNE	2.3	1.6	.0	.0	.0	.0	.0	4.0	.1
NE	1.7	1.9	.0	.0	.0	.0	.0	3.7	.1
ENE	2.4	1.8	.0	.0	.0	.0	.0	4.2	.1
E	2.3	2.1	.1	.0	.0	.0	.0	4.5	.1
ESE	2.6	5.4	.0	.0	.0	.0	.0	8.0	.3
SSE	2.5	6.5	.2	.0	.0	.0	.0	9.3	.3
W SSE	3.3	5.3	.5	.0	.0	.0	.0	9.1	.3
ICS	4.1	8.4	.9	.0	.0	.0	.0	13.5	.5
NTSSW	4.1	4.5	.7	.0	.0	.0	.0	9.3	.3
DISW	4.1	2.6	.3	.0	.0	.0	.0	7.0	.2
UWSW	3.0	.8	.0	.0	.0	.0	.0	3.9	.1
NW	3.6	.8	.0	.0	.0	.0	.0	4.4	.1
WNW	2.6	.8	.0	.0	.0	.0	.0	3.5	.1
NW	3.2	2.0	.0	.0	.0	.0	.0	5.3	.1
NNW	2.2	2.3	.0	.0	.0	.0	.0	4.5	.1
CALM	2.2							.9	
TOTAL	47.8	49.2	3.0	.0	.0	.0	.0	100.0	.2

64. HOURS OF BAD OR MISSING DATA OR 2.9 PERCENT FOR 2184 HOURS

TABLE 4B (cont'd)
Joint Frequency Distribution
10 Meter Level

STABILITY CLASS A - G
PERIOD OF RECORD: 4/1/85 000 Hours 7/1/85 000 Hours

WIND SPEED (m/sec)

	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	TOTAL	AVG SPEED
N	3.6	.2	.0	.0	.0	.0	.0	3.9	.1
NNE	4.5	.0	.0	.0	.0	.0	.0	4.6	.1
NF	4.7	.0	.0	.0	.0	.0	.0	4.7	.0
FNE	5.9	.0	.0	.0	.0	.0	.0	5.9	.1
ENE	4.1	.0	.0	.0	.0	.0	.0	4.1	.0
ESE	3.6	.1	.0	.0	.0	.0	.0	3.7	.0
ESE	3.8	.1	.0	.0	.0	.0	.0	3.9	.0
ESSE	5.0	.7	.0	.0	.0	.0	.0	5.7	.1
ECSS	10.8	3.3	.1	.0	.0	.0	.0	14.2	.3
ECSSW	7.0	1.5	.0	.0	.0	.0	.0	8.5	.2
ECSSW	5.4	.7	.0	.0	.0	.0	.0	6.1	.1
ECSSW	3.7	.1	.0	.0	.0	.0	.0	3.8	.0
ECSSW	2.4	.0	.0	.0	.0	.0	.0	2.5	.0
ECSSW	3.8	.0	.0	.0	.0	.0	.0	3.9	.0
ECSSW	3.8	.1	.0	.0	.0	.0	.0	3.9	.1
ECSSW	4.7	.6	.0	.0	.0	.0	.0	5.3	.1
CALM	4.7							15.2	
TOTAL	92.3	7.5	.1	.0	.0	.0	.0	100.0	.1

64. HOURS OF BAD OR MISSING DATA OR 2.9 PERCENT FOR 2184 HOURS

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TABLE 4B (cont'd)
PERCENT BAD DATA REPORT

PERIOD OF RECORD: 4/1/85 000 Hours 7/1/85 000 Hours

PERCENT BAD DATA REPORT REPORT COVERS 2184HOURS		
	HOURS	PERCENT
50M DIRECTION	14.	.64
50M WIND SPEED	14.	.64
10M DIRECTION	14.	.64
10M WIND SPEED	14.	.64
TEMPERATURE	23.	1.05
DEW POINT	114.	5.22
DELTA T	64.	2.93
PRECIPITATION	19.	.87

TABLE 4C

CLASSIFICATION OF ATMOSPHERIC STABILITY

Stability Classification	Pasquill Categories	σ_θ^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 WASTE SAMPLING AND ANALYSIS PROGRAM

Liquid Release Type	Sampling Frequency	Minimum Analysis Frequency	Type of Activity Analysis	Lower Limit of Detection (LLD) ($\mu\text{Ci/ml}$)
A. Batch Waste Release Tanks ^c	P Each Batch	P Each Batch	Principal Gamma Emitters ^d	5×10^{-7}
			I-131	1×10^{-6}
	P One Batch/M	M	Dissolved and Entrained Gases (Gamma emitters)	1×10^{-5}
	P Each Batch	M Composite ^b	H-3	1×10^{-5}
			Gross Alpha	1×10^{-7}
	P Each Batch	Q Composite ^b	Sr-89, Sr-90	5×10^{-8}
			Fe-55	1×10^{-6}
B. SSW Basin (prior to blowdown)	Each Blowdown	Each Batch	Principal Gamma Emitters ^d	5×10^{-7}
			I-131	1×10^{-6}

TABLE 6

RADIOACTIVE GASEOUS WASTE SAMPLING AND ANALYSIS PROGRAM

Gaseous Release Type		Sampling Frequency	Minimum Analysis Frequency	Type of Activity Analysis	Lower Limit of Detection (LLD) ($\mu\text{Ci}/\text{ml}$) ^a
A.	(1) Radwaste Building Ventilation Exhaust	M Grab Sample	M	Principal Gamma Emitters ^{b, c}	1×10^{-4}
				H-3	1×10^{-6}
	(2) Fuel Handling Area Ventilation Exhaust	Continuous ^d	W ^c Charcoal Sample	I-131	1×10^{-12}
				I-133	1×10^{-10}
	(3) Containment Ventilation Exhaust	Continuous ^d	W ^c Particulate Sample	Principal Gamma Emitters ^b (I-131, Others)	1×10^{-11}
	(4) Turbine Building Ventilation Exhaust	Continuous ^d	M Composite Particulate Sample	Gross Alpha	1×10^{-11}
		Continuous ^d	Q Composite Particulate Sample	Sr-89, Sr-90	1×10^{-11}
		Continuous	Noble Gas Monitor	Noble Gases Gross Beta or Gamma	1×10^{-6}
B.	(1) Offgas Post Treatment Exhaust, whenever there is flow	M Grab Sample	M	Principal Gamma Emitters ^c	1×10^{-4}
	(2) Standby Gas Treatment A Exhaust, whenever there is flow.				
	(3) Standby Gas Treatment B Exhaust, whenever there is flow.				

Note: Footnotes indicated are listed in GGNS Technical Specifications, Table 4.11.2.1.2-1.



MISSISSIPPI POWER & LIGHT COMPANY

Helping Build Mississippi

P. O. BOX 1640, JACKSON, MISSISSIPPI 39215-1640

August 30, 1985

NUCLEAR LICENSING & SAFETY DEPARTMENT

U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, N. W., Suite 2900
Atlanta, Georgia 30323

Attention: Dr. J. Nelson Grace
Regional Administrator

Dear Dr. Grace:

SUBJECT: Grand Gulf Nuclear Station
Unit 1
License No. NPF-29
Docket No. 50-416 *D*
File: 0292/15319
Semiannual Radioactive
Effluent Release Report
AECM-85/0274

Attached is Mississippi Power & Light (MP&L) Company's Grand Gulf Nuclear Station Semiannual Radioactive Effluent Release Report for the period January 1, 1985 through June 30, 1985.

Questions concerning this report should be referred to Dr. L. R. McKay at (601) 969-2432.

Yours truly,

L. F. Dale
Director

MLC/LFD:aly

Attachment

cc: Mr. J. B. Richard (w/a)
Mr. O. D. Kingsley, Jr. (w/a)
Mr. R. B. McGehee (w/a)
Mr. N. S. Reynolds (w/a)
Mr. H. L. Thomas (w/o)
Mr. R. C. Butcher (w/a)

Mr. James M. Taylor, Director (w/a)
Office of Inspection & Enforcement
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

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Certified By *Barlene Scott*

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