

Grand Gulf Nuclear Station

Semiannual Radioactive Effluent Release Report

1st & 2nd Quarter
1983

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- INTRODUCTION -

This semi-annual radioactive release report for the period of January 1, to June 30, 1983 is submitted in accordance with Appendix A to Grand Gulf Nuclear Station (GGNS) License No. NPF-13. That portion of Appendix A that refers to the monitoring of radioactive effluents, sections 3/4-11, and 3/4-12 will hereafter be referred to as the Radiological Environmental Technical Specifications or R.E.T.S.

All liquid and airborne discharges to the environment were analyzed in accordance with the R.E.T.S. requirements. Also, all effluent releases were within the concentration and total release limits of the R.E.T.S.

There were several instances when plant operation personnel were unable to restore operable status to radioactive effluent monitoring instrumentation. As required by Grand Gulf Technical Specifications, section 3.3.7.11 and 3.3.7.12, an additional section (part B, section 11) exists to explain why these inoperabilities were not corrected within the time specified by Technical Specifications.

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

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

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

$$= \overline{X/Q} \sum_i K_i \overline{Q}_i \leq 500 \text{ mRem/yr.}$$

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

$$= \overline{X/Q} \sum_i (L_i + 1.1 M_i) \overline{Q}_i \leq 3000 \text{ mRem/yr.}$$

where the terms are defined in the GGNS ODCM.

b. Iodines and Particulates

The release rate limit for the sampling period of 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)

$$= W \sum_i P_i \overline{Q}_i \leq 1500 \text{ mRem/yr.}$$

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 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 be limited to 2×10^{-4} microcuries/ml total activity.

2. Maximum Permissible Concentrations

a. Airborne

The maximum permissible concentration of radioactive materials in gaseous effluents is limited by the dose rate restrictions of 10 CFR 20. In this case, the maximum permissible concentrations are actually determined by the dose factors in Table 2.1-1 of the ODCM.

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 GGNS's R.E.T.S.

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 on 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.

a. Fission and Activation Gases

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

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

Periodic grab samples from plant effluent streams are analyzed by a computerized pulse height analyzer system utilizing high resolution lithium drifted 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:

$$C_i = i \cdot m$$

where

C_i = isotopic calibration factor for isotope i.

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

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

These calibration factors, along with the hourly effluent monitor values and flow rates, are input to the laboratory computer where the release rates for individual nuclides are calculated and stored. If no activity is detected in the grab sample, the calibration factor for Kr⁸⁹ is input into the laboratory computer.

b. Particulate and Iodine

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

Zn-65
 Cr-51 ✓
 Mn-54
 Fe-59
 Co-58
 Co-60
 Sr-89
 Sr-90
 Zr-95
 Sb-124
 I-131

Cu⁶⁴ ?

I-133
 Cs-134
 Cs-136
 Cs-137
 Ba-140
 Ce-141
 Other nuclides
 with half-life
 greater than
 8 days.

c. Continuous Releases

Continuous sampling is performed on the continuous release points. (i.e., Radwaste Vent, Containment Purge, FHA Vent, 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. 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", (R.E.T.S. Table 4.11.2.1.2-1).

d. Batch Releases

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

e. 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-137
Sr-89		Ba-140
Sr-90		La-140
Nb-95		Ce-141
Zr-95		Ce-144

C_n 64 ?

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 and Fe-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.

5. Batch Releases

a. Batch Releases - Liquid

Quarter 1, 1983

1. Number of batch releases: 83
2. Total time period for batch releases: 31684 minutes
3. Maximum time period for a batch release: 615 minutes
4. Average time period for batch releases: 382 minutes
5. Minimum time period for a batch release: 0 minutes

Quarter 2, 1983

1. Number of batch releases: 52
2. Total time period for batch releases: 21997 minutes
3. Maximum time period for a batch release: 951 minutes
4. Average time period for batch releases: 423 minutes
5. Minimum time period for a batch release: 0 minutes

b. Batch Releases - Gaseous

1. Number of batch releases: None
2. Total time period for batch releases: 0 hours
3. Maximum time period for a batch release: 0 hours
4. Average time period for a batch release: 0 hours
5. Minimum time period for a batch release: 0 hours

6. Abnormal Release

a. Liquid

1. Number of releases: None
2. Total activity released: n/a

b. Gaseous

1. Number of releases: None
2. Total activity released: n/a

7. Estimate of Total Error

a. Liquids

The maximum errors associated with sampling, lab 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%

b. Gaseous

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

<u>Fission and Activation Gases</u>	<u>Iodine</u>	<u>Particulate</u>	<u>Tritium</u>
39%	43%	42%	31%

c. 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 60% 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 60% due to the low sample activity.

d. Solid Radwaste

N/A

8. Solid Waste

See Table 3

9. Radiological Impact On Man

a. Water Related Exposure Pathways

	Total Dose (mrem)	
	<u>Quarter 1, 1983</u>	<u>Quarter 2, 1983</u>
Whole Body	0.00E+00	0.00E+00
Bone	0.00E+00	0.00E+00
Liver	0.00E+00	0.00E+00
Thyroid	0.00E+00	0.00E+00
Kidney	0.00E+00	0.00E+00
Lung	0.00E+00	0.00E+00
GI-LLI	0.00E+00	0.00E+00

b. Gaseous Related Exposure Pathways

<u>1st Quarter</u>	<u>2nd Quarter</u>
Total Body = 3.74E-2 mrem	2.85E-2 mrem
Skin = 2.29E-2 mrem	1.74E-2 mrem

Particulate, Iodine and Tritium

<u>1st Quarter</u>	<u>2nd Quarter</u>
Organ Dose = 0 mrem	0 mrem

LLD Methodologies

If gaseous activity detected in the monthly isotopics is less than the LLDs, an efficiency for Kr-89 is assumed 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.

10. Meteorological Data

See Table 4-A.

1st Quarter Continuous

2nd Quarter Continuous

11. Radioactive Effluent Monitoring Instrumentation Inoperability Reports

During this semi-annual period, there were ten events that entered into a limiting condition for operation (LCO) where the time period as specified in the action statements were exceeded. The following explanations are provided as required by T. S. 3.3.7.11.b and 3.3.7.12.b.

a. LCO EVENT 82-109

(1)	<u>Date/Time Entered LCO</u>	<u>Affected Channel</u>	<u>#days in LCO</u>	<u>Closed Out Date/Time</u>
	9/2/82 1800	Liquid Radwaste Flow Inter-lock		Presently Open

(2) Description:

On September 27, 1982, a temporary alteration to the liquid radwaste system was approved by the PSRC to allow an increased flow rate via the radwaste discharge pathway.

The reason for the temporary change is to allow for discharging large quantities of non-radioactive water in excess of the flow rates presently allowed by radwaste interlocks. This was to reduce the present radwaste inventory and allow discharging the water slightly contaminated with glycol. (See LCO event 82-109 in the 3rd and 4th quarter semi-annual report of 1982.

The channel affected by this temporary alteration is the flow of the discharge canal. The flows indicated by this channel are being estimated every four hours during actual releases as required by T.S. 3.3.7.11.

It is intended to leave this temporary alteration in place until immediately prior to nuclear heatup.

b. LCO EVENT 82-173

(1)	<u>Date/Time Entered</u>	<u>Affected Channel</u>	<u># days in LCO</u>	<u>Closed Out Date/Time</u>
	11/9/83 1000	Containment Stack Flow	72 days 6 hrs.	1/19/83 1600

(2) Description

This LCO event was explained as item 11.d (LCO event 82-173) in the 3rd and 4th quarters semi-annual effluent waste release report 1982.

c. LCO EVENTS 83-66, 83-83, 83-89

<u>#</u>	<u>Date/Time Entered</u>	<u>Affected Channel</u>	<u>#Days</u>	<u>Closed Out Date/Time</u>
66	1/14/83 1320	Radwaste Vent Flow		Currently Open
83	1/19/83 1700	Turbine Building Vent Flow		Currently Open
89	1/22/83 1000	Fuel Handling Area Vent Flow		Currently Open

The referenced LCO's were entered to replace electrical components in three of the Air Monitoring Corporation (AMC) panels. The changes were made to correct logic function problems in each of these panels. A vendor representative was dispatched to the site to resolve the problems addressed in Design Change Package (DCP) 82-292. While the panels were inoperative additional sample probes and tubing were installed to allow the instrument to cover the complete range of flow rates during normal operation.

MWO's 24955 and 34280 were issued to install the needed modifications. These were completed on 4/8/83 and 4/23/83 respectively.

As of June 30th the panels had not been returned to service.

d. LCO EVENTS 82-172, 372

<u>#</u>	<u>Date/Time Entered</u>	<u>Affected Channel</u>	<u>#Days</u>	<u>Closed Out Date/Time</u>
172	2/28/83	Containment Vent Flow		Open
372	4/20/83	Containment Vent Flow		Open

On 2/28/83 this LCO was entered to perform a preoperational test to portions of the D17 Process Radiation Monitoring System during this same period, system modifications were implemented per DCP 83-4025 that would enhance the flow measuring range of the instrument.

The preoperational test was completed on 6/14/83 and the DCP was completed on 4/23/83. Following this work MWO 34534 was issued to remove flow divertors and replace with a spool piece. The change was a result of removing the GE Radiation Monitoring subsystem from the Eberline/AMC flow path. This work was completed on 5/12/83.

As of June 30th this panel had not been returned to service.

e. LCO EVENTS 83-323

<u>#</u>	<u>Date/Time Entered</u>	<u>Affected Channel</u>	<u>#Days</u>	<u>Closed Out Date/Time</u>
323	4/18/83	Radwaste Building Flow Channel		Open

This LCO was entered to perform a design change to the AMC panel which would make the output compatible to the Eberline SPING-4 data acquisition module (DCP-4025-2). MWO's 34200 and 36388 were issued to complete the task. Maintenance was also performed on the sample pump. The work on signal incompatibility was completed on 4/23/83.

As of June 30th the panel had not been returned to service.

f. LCO EVENTS 83-360

<u>#</u>	<u>Date/Time Entered</u>	<u>Affected Channel</u>	<u>#Days</u>	<u>Closed Out Date/Time</u>
360	5/5/83	Liquid Radwaste Effluent Monitor		Open

On 5/5/83 the Liquid Radwaste Effluent Monitor was declared out of service by the issuance of LCO 83-360. Because the length of the sampling line leading to the monitor was greater than the length of the line leading to the discharge valve, it was necessary to move the monitor to reduce the length of sample tubing leading to the monitor in order to assure proper response time before the effluent reaches the isolation valve.

The panel will be returned to service as soon as the relocation is complete.

g. LCO EVENTS 83-404

<u>#</u>	<u>Date/Time Entered</u>	<u>Affected Channel</u>	<u>#Days</u>	<u>Closed Out Date/Time</u>
404	6/8/83 1030	Radwaste Building Vent Noble Gas Channel		Open

During the performance of a surveillance on this monitor it was noted that the noble gas detector did not respond properly to source calibration. The affected channel was promptly taken out of service and parts were ordered for replacement. During the interim grab samples will be taken at least once every 8 hours and analyzed for gross activity.

It should be noted that the 30 day condition of T.S. Table 3.3.7.12-1 (Action 121) had not been exceeded prior to the end of this semi-annual reporting period, however, the condition has exceeded the 30 days during preparation of this report. Additional information will be supplied in the 3rd and 4th quarter period.

TABLE 1A

EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT 1983

GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES

	Unit	Quarter 1	Quarter 2	Est Total	Error %
Grand Gulf Nuclear Power Plant UNIT 1					
A. Fission & activation gases					
1. Total release	Ci	1.32E+01	1.08E+01	1.00E+02	
2. Average release rate for period	uCi/sec	7.27E-01	1.37E+00		
3. % of Technical specification limit	%	1.25E-02	2.35E-02		
B. Iodines					
1. Total iodine-131	Ci	0.00E+00	0.00E+00	1.00E+02	
2. Average release rate for period	uCi/sec	0.00E+00	0.00E+00		
3. % of Technical specification limit	%	0.00E+00	0.00E+00		
C. Particulates					
1. Particulates with half-lives > 8 days	Ci	0.00E+00	0.00E+00	1.00E+02	
2. Average release rate for period	uCi/sec	0.00E+00	0.00E+00		
3. % of Technical specification limit	%	0.00E+00	0.00E+00		
4. Gross alpha radioactivity	Ci	3.43E-07	1.17E-07		
D. Tritium					
1. Total release	Ci	0.00E+00	0.00E+00	1.00E+02	
2. Average release rate for period	uCi/sec	0.00E+00	0.00E+00		
3. % of Technical specification limit	%	0.00E+00	0.00E+00		

2

$$\frac{1.32 \times 10^1 \text{ Ci} \times 10^6 \text{ uCi/Ci}}{7.27 \times 10^{-1} \text{ uCi/sec}} = 18.1 \times 10^6$$

$$\frac{1.08 \times 10^1 \text{ Ci} \times 10^6}{1.37 \times 10^0 \text{ uCi/sec}} = 7.88 \times 10^6$$

60 uCi/mi
 60 mi/hr
 24 hr/day
 91 days/yr

 7.8624 x 10⁶

Table 1B

Grand Gulf Nuclear Station Unit 1
Effluent and Waste Disposal Semiannual Report, 1983

Gaseous Effluents - Elevated Release

Not applicable - Grand Gulf's releases are considered ground level.

TABLE 1C

Grand Gulf Nuclear Power Plant UNIT 1

EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT 1983

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	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-131M	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-88	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-133M	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85M	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-87	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-138	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-137	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135M	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-89	C1	<u>1.32E+01</u>	<u>1.08E+01</u>	0.00E+00	0.00E+00
Ar-41	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-90	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total for period	C1	<u>1.32E+01</u>	<u>1.08E+01</u>	0.00E+00	0.00E+00
2. Iodines					
I-131	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-133	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-132	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-134	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-135	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total for period	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Particulates					
Sr-89	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-90	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CE-141	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CR-51	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BA-140	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CS-134	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CS-137	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CE-144	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ZR-95	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NB-95	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-58	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MN-54	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FE-59	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-60	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LA-140	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C-14	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
P-32	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FE-55	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NI-63	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE 2A

Grand Gulf Nuclear Station

EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT 1983

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	0.00E+00	0.00E+00	1.00E+02	
2. Average diluted concentration during period	uCi/ml	0.00E+00	0.00E+00		
3. Percent of applicable limit	%	0.00E+00	0.00E+00		
B. Iritium					
1. Total release	Ci	0.00E+00	0.00E+00	1.00E+02	
2. Average diluted concentration during period	uCi/ml	0.00E+00	0.00E+00		
3. Percent of applicable limit	%	0.00E+00	0.00E+00		
C. Dissolved and entrained gases					
1. Total release	Ci	0.00E+00	0.00E+00	1.00E+02	
2. Average diluted concentration during period	uCi/ml	0.00E+00	0.00E+00		
3. Percent of applicable limit	%	0.00E+00	0.00E+00		
D. Gross alpha radioactivity					
1. Total release	Ci	0.00E+00	0.00E+00	1.00E+02	
E. Volume of waste (prior to dilution): liters					
		1.09E+07	1.03E+07	1.00E+02	
F. Volume of dilution water used: liters					
		3.92E+08	8.57E+08	1.00E+02	

TABLE 2B

Grand Gulf Nuclear Station

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1983

LIQUID EFFLUENTS

Nuclides Released	Unit	CONTINUOUS MODE		BATCH MODE	
		Quarter	Quarter	Quarter	Quarter
		1	2	1	2
strontium-89	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
strontium-90	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cesium-134	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cesium-137	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
iodine-131	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cobalt-58	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cobalt-60	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
iron-59	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
zinc-65	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
manganese-54	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
chromium-51	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
zirconium-niobium-95	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
molybdenum-99	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
technetium-99m	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
barium-lanthanum-140	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cerium-141	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total for period (above)	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
xenon-133	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
xenon-135	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE 3

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (YEAR)

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

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

None

B. IRRADIATED FULE SHIPMENTS (Disposition)*

None

*There were no shipments of solid waste or irradiated fuel to report for Grand Gulf during this period.

Doses Due To LRW Releases
Grand Gulf Nuclear Station
Total Dose (mrem)

	Quarter 1, 1983	Quarter 2, 1983
Whole body	0.00E+00	0.00E+00
Bone	0.00E+00	0.00E+00
Liver	0.00E+00	0.00E+00
Thyroid	0.00E+00	0.00E+00
Kidney	0.00E+00	0.00E+00
Lung	0.00E+00	0.00E+00
GI-LLI	0.00E+00	0.00E+00

GRAND GULF NUCLEAR STATION

Joint Frequency Distributions

for

January 1, 1983 through June 30, 1983

TABLE 4-A
 Joint Frequency Distribution
 50 Meter Level

EXTREMELY UNSTABLE STABILITY CLASS A
 PERIOD OF RECORD: 01/01/83 0000 Hours - 07/01/83 0000 Hours

	WIND SPEED (m/sec)						18 AND UP	TOTAL
	0-2	3-5	6-8	9-11	12-14	15-17		
N	2.6	2.6	.8	.0	.0	.0	.0	5.9
NNE	.8	.0	.0	.0	.0	.0	.0	.8
NE	3.1	.3	.0	.0	.0	.0	.0	3.3
ENE	1.3	.5	.0	.0	.0	.0	.0	1.8
D E	1.0	1.0	.0	.0	.0	.0	.0	2.1
I ESE	1.0	2.3	.5	1.3	.0	.0	.0	5.1
R SE	2.3	1.0	.3	.0	.0	.0	.0	3.6
W E SSE	1.8	2.3	.0	.0	.0	.0	.0	4.1
I C S	2.6	5.1	1.3	.0	.0	.0	.0	9.0
N T SSW	3.3	3.3	.3	.3	.0	.0	.0	7.2
D I SW	6.5	4.9	.0	.0	.0	.0	.0	13.4
O WSW	5.4	5.4	1.3	.3	.0	.0	.0	12.4
N W	4.4	4.4	.5	.0	.3	.0	.0	9.5
WNW	5.4	1.0	.3	.0	.0	.0	.0	6.7
NW	5.4	1.3	.0	.0	.0	.0	.0	6.7
NNW	2.6	4.4	.5	.0	.0	.0	.0	7.5
CALM	.8							.8
% TOTAL	52.3	39.9	5.7	1.8	.3	.0	.0	100.0

1 HOUR OF BAD OR MISSING DATA OR 0.3 PERCENT FOR 389 HOURS

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

MODERATELY UNSTABLE STABILITY CLASS B
 PERIOD OF RECORD: 01/01/83 0000 Hours - 07/01/83 0000 Hours

	WIND SPEED (m/sec)							TOTAL
	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	
N	5.3	2.9	2.9	.0	.0	.0	.0	11.2
NNE	2.4	.6	.0	.0	.0	.0	.0	2.9
NE	1.2	.6	.0	.0	.0	.0	.0	1.8
ENE	1.2	.0	.0	.0	.0	.0	.0	1.2
D E	1.8	2.9	1.2	.0	.0	.0	.0	5.9
I ESE	1.2	1.8	.0	.0	.0	.0	.0	2.9
R SE	1.8	4.1	.0	.0	.0	.0	.0	5.9
W E SSE	2.4	5.9	.0	.0	.0	.0	.0	8.3
I C S	.6	2.4	.0	.0	.0	.0	.0	2.9
N T SSW	2.4	1.8	1.8	1.2	.0	.0	.0	7.1
D I SW	2.4	1.8	.6	.0	.0	.0	.0	4.7
O WSW	2.9	2.9	.6	.0	.0	.0	.0	6.5
N W	3.5	1.2	.0	.0	.0	.0	.0	4.7
WNW	5.9	4.1	.6	.0	.0	.0	.0	10.6
NW	10.0	.6	.0	.0	.0	.0	.0	10.6
NNW	4.7	5.9	1.2	.0	.0	.0	.0	11.8
CALM	.6							.6
% TOTAL	50.3	39.6	8.9	1.2	.0	.0	.0	100.0

3 HOURS OF BAD OR MISSING DATA OR 1.7 PERCENT FOR 172 HOURS

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

SLIGHTLY UNSTABLE STABILITY CLASS C
 PERIOD OF RECORD: 01/01/83 0000 Hours - 07/01/83 0000 Hours

	WIND SPEED (m/sec)							TOTAL
	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	
N	4.0	2.3	1.7	.0	.0	.0	.0	8.0
NNE	.6	4.6	1.7	.0	.0	.0	.0	6.9
NE	1.7	3.4	.0	.0	.0	.0	.0	5.2
ENE	2.3	1.1	.0	.0	.0	.0	.0	3.4
D E	1.1	1.1	.6	.6	.0	.0	.0	3.4
I ESE	2.3	2.9	.6	.0	.0	.0	.0	5.7
R SE	1.7	4.0	.0	.6	.0	.0	.0	6.3
W E SSE	2.3	4.6	.0	.0	.0	.0	.0	6.9
I C S	2.3	1.1	.6	.0	.0	.0	.0	4.0
N T SSW	2.3	1.7	2.9	.0	.0	.0	.0	6.9
D I SW	2.3	.0	.0	.0	.0	.0	.0	2.3
O WSW	3.4	2.9	.0	.0	.0	.0	.0	6.3
N W	4.0	1.7	.0	.0	.0	.0	.0	5.7
WNW	2.3	.6	.6	.0	.0	.0	.0	3.4
NW	7.5	2.3	.0	.0	.0	.0	.0	9.8
NNW	7.5	6.3	.6	.0	.0	.0	.0	14.4
CALM	1.1							1.1
% TOTAL	48.8	40.8	9.2	1.1	.0	.0	.0	100.0

1 HOUR OF BAD OR MISSING DATA OR 0.6 PERCENT FOR 175 HOURS

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

NEUTRAL STABILITY CLASS D
 PERIOD OF RECORD: 01/01/83 0000 Hours - 07/01/83 0000 Hours

	WIND SPEED (m/sec)							TOTAL
	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	
N	3.9	7.6	1.3	.0	.0	.0	.0	12.9
NNE	3.6	3.3	.3	.0	.0	.0	.0	7.2
NE	3.3	4.6	.5	.0	.0	.0	.0	8.5
ENE	2.6	3.3	.2	.0	.1	.1	.0	6.3
D E	1.9	1.8	.3	.2	.0	.0	.0	4.1
I ESE	3.1	2.8	.3	.0	.0	.0	.0	6.2
R SE	2.5	2.2	.5	.1	.0	.0	.0	5.3
W E SSE	1.7	2.0	.1	.1	.0	.0	.0	3.9
I C S	1.6	1.4	.3	.1	.0	.0	.0	3.5
N T SSW	2.3	1.4	.8	.4	.0	.0	.1	5.1
D I SW	1.8	1.7	1.1	.2	.0	.0	.0	4.8
O WSW	2.9	1.2	1.0	.1	.0	.0	.0	5.2
N W	3.7	1.2	.9	.0	.0	.0	.0	5.8
WNW	3.4	2.1	1.2	.0	.1	.0	.0	6.9
NW	2.9	1.8	.3	.0	.0	.0	.0	5.1
NNW	4.2	3.4	.8	.0	.0	.0	.0	8.5
CALM	.8							.8
% TOTAL	46.3	42.2	9.9	1.1	.2	.1	.1	100.0

0 HOURS OF BAD OR MISSING DATA OR 0.0 PERCENT FOR 1165 HOURS

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

SLIGHTLY STABLE STABILITY CLASS E
 PERIOD OF RECORD: 01/01/83 0000 Hours - 07/01/83 0000 Hours

	WIND SPEED (m/sec)							TOTAL
	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	
N	3.5	3.8	.2	.0	.0	.0	.0	7.5
NNE	6.6	3.2	.0	.0	.0	.0	.0	9.8
NE	4.7	2.0	.0	.0	.0	.0	.0	6.7
ENE	2.1	1.4	.0	.1	.0	.0	.0	3.5
D E	2.1	4.0	.2	.0	.0	.0	.1	6.3
I ESE	3.2	5.6	.3	.1	.0	.0	.0	9.2
R SE	2.6	6.9	1.2	.1	.0	.0	.0	10.8
W E SSE	2.1	6.7	1.1	.0	.0	.0	.0	9.8
I C S	2.1	5.3	.2	.0	.0	.0	.0	7.6
N T SSW	2.0	3.0	.1	.2	.0	.0	.0	5.4
D I SW	1.4	3.0	.6	.0	.0	.0	.0	5.1
O WSW	1.2	1.7	.0	.0	.0	.0	.0	2.9
N W	1.5	1.0	.5	.0	.0	.0	.0	3.0
WNW	1.3	1.7	.1	.0	.0	.0	.0	3.1
NW	2.1	1.5	.1	.0	.0	.0	.0	3.8
NW	3.0	1.4	.1	.0	.0	.0	.0	4.5
CALM	.6							.6
% TOTAL	42.0	52.5	4.9	.5	.0	.0	.1	100.0

0 HOURS OF BAD OR MISSING DATA OR 0.0 PERCENT FOR 1258 HOURS

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

MODERATELY STABLE STABILITY CLASS F
 PERIOD OF RECORD: 01/01/83 0000 Hours - 07/01/83 0000 Hours

	WIND SPEED (m/sec)							TOTAL
	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	
N	3.5	2.5	.0	.0	.0	.0	.0	6.1
NNE	4.3	1.0	.0	.0	.0	.0	.0	5.3
NE	2.3	1.2	.0	.0	.0	.0	.0	3.5
ENE	2.7	2.3	.0	.0	.0	.0	.0	5.1
DE	5.3	6.3	.2	.0	.0	.0	.0	11.7
IESE	3.3	9.4	.2	.0	.0	.0	.0	12.9
RSE	3.9	7.0	.0	.0	.0	.0	.0	10.9
WE SSE	4.1	3.7	.2	.0	.0	.0	.0	8.0
ICS	2.5	4.1	.2	.0	.0	.0	.0	6.8
NT SSW	2.9	3.5	.0	.0	.0	.0	.0	6.4
DISW	1.6	3.1	.0	.0	.0	.0	.0	4.7
OWSW	3.5	.8	.0	.0	.0	.0	.0	4.3
NW	2.9	.8	.0	.0	.0	.0	.0	3.7
WNW	2.7	1.0	.2	.0	.0	.0	.0	3.9
NW	1.9	.6	.0	.0	.0	.0	.0	2.5
NNW	1.6	1.6	.0	.0	.0	.0	.0	3.1
CALM	.8							.8
% TOTAL	50.1	48.9	1.0	.0	.0	.0	.0	100.0

0 HOURS OF BAD OR MISSING DATA OR 0.0 PERCENT FOR 511 HOURS

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

EXTREMELY STABLE STABILITY CLASS G
 PERIOD OF RECORD: 01/01/83 0000 Hours - 07/01/83 0000 Hours

	WIND SPEED (m/sec)							TOTAL
	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	
N	8.2	1.5	.3	.0	.0	.0	.0	10.0
NNE	7.4	1.0	.3	.0	.0	.0	.0	8.7
NE	4.4	2.8	.0	.0	.0	.0	.0	7.2
ENE	3.3	1.5	.0	.0	.0	.0	.0	4.9
D E	3.8	1.8	.3	.0	.0	.0	.0	5.9
I ESE	8.7	2.3	.0	.0	.0	.0	.0	11.0
R SE	4.6	4.1	.0	.0	.0	.0	.0	8.7
W E SSE	4.1	3.1	.0	.0	.0	.0	.0	7.2
I C S	3.1	5.4	.0	.0	.0	.0	.0	8.5
N T SSW	3.3	3.8	.3	.0	.0	.0	.0	7.4
D I SW	2.6	.0	.3	.0	.0	.0	.0	2.8
O WSW	2.1	.3	.5	.0	.0	.0	.0	2.8
N W	2.1	.8	.0	.0	.0	.0	.0	2.8
WNW	2.1	.3	.0	.0	.0	.0	.0	2.3
NW	2.3	.3	.0	.0	.0	.0	.0	2.6
NNW	3.3	.5	.0	.0	.0	.0	.0	3.8
CALM	3.1							3.1
% TOTAL	68.6	29.6	1.8	.0	.0	.0	.0	100.0

0 HOURS OF BAD OR MISSING DATA OR 0.0 PERCENT FOR 389 HOURS

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

EXTREMELY UNSTABLE STABILITY CLASS A
 PERIOD OF RECORD: 01/01/83 0000 Hours - 07/01/83 0000 Hours

	WIND SPEED (m/sec)							TOTAL
	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	
N	1.5	.0	.0	.0	.0	.0	.0	1.5
NNE	1.3	.0	.0	.0	.0	.0	.0	1.3
NE	1.5	.0	.0	.0	.0	.0	.0	1.5
ENE	1.8	.0	.0	.0	.0	.0	.0	1.8
E	1.0	.0	.0	.0	.0	.0	.0	1.0
ESE	2.1	.0	.0	.0	.0	.0	.0	2.1
SE	4.4	1.8	.3	.0	.0	.0	.0	6.4
SSE	3.3	2.8	.0	.0	.0	.0	.0	6.2
CS	4.4	3.1	.0	.0	.0	.0	.0	7.4
SSW	12.6	2.6	.0	.0	.0	.0	.0	15.2
DSW	15.9	2.6	.0	.0	.0	.0	.0	18.5
WSW	7.4	.3	.0	.0	.0	.0	.0	7.7
NW	5.6	.0	.3	.0	.0	.0	.0	5.9
WNW	7.7	.3	.0	.0	.0	.0	.0	8.0
NW	6.2	1.0	.0	.0	.0	.0	.0	7.2
NNW	4.4	1.3	.0	.0	.0	.0	.0	5.6
CALM	2.6							2.6
% TOTAL	83.8	15.7	.5	.0	.0	.0	.0	100.0

0 HOURS OF BAD OR MISSING DATA OR 0.0 PERCENT FOR 389 HOURS

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

MODERATELY UNSTABLE STABILITY CLASS B
 PERIOD OF RECORD: 01/01/83 0000 Hours - 07/01/83 0000 Hours

	WIND SPEED (m/sec)							TOTAL
	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	
N	2.3	.6	.0	.0	.0	.0	.0	2.9
NNE	.6	.0	.0	.0	.0	.0	.0	.6
NE	1.2	.6	.0	.0	.0	.0	.0	1.7
ENE	1.2	.0	.0	.0	.0	.0	.0	1.2
D E	1.7	.6	.0	.0	.0	.0	.0	2.3
I ESE	1.2	.0	.0	.0	.0	.0	.0	1.2
R SE	4.1	1.2	.0	.0	.0	.0	.6	5.8
W E SSE	5.8	3.5	.0	.0	.0	.0	.0	9.3
I C S	5.2	6.4	1.2	.0	.0	.0	.0	12.8
N T SSW	6.4	1.7	.0	.0	.0	.0	.0	8.1
D I SW	7.5	1.2	.0	.0	.0	.0	.0	8.7
O WSW	4.6	.0	.0	.0	.0	.0	.0	4.6
N W	6.4	1.7	.0	.0	.0	.0	.6	8.7
WNW	9.3	.0	.0	.0	.0	.0	.0	9.3
NW	9.9	1.2	.0	.0	.0	.0	.0	11.0
NNW	6.4	2.9	.0	.0	.0	.0	.0	9.3
CALM	2.3							2.3
% TOTAL	76.2	21.5	1.2	.0	.0	.0	1.2	100.0

0 HOURS OF BAD OR MISSING DATA OR 0.0 PERCENT FOR 172 HOURS

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

SLIGHTLY UNSTABLE STABILITY CLASS C
 PERIOD OF RECORD: 01/01/83 0000 Hours - 07/01/83 0000 Hours

	WIND SPEED (m/sec)							TOTAL
	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	
N	4.6	.6	.0	.0	.0	.0	.0	5.1
NNE	1.1	1.7	.0	.0	.0	.0	.0	2.8
NE	2.8	1.7	.0	.0	.0	.0	.0	4.6
ENE	2.3	.6	.0	.0	.0	.0	.0	2.8
D E	2.3	.0	.0	.0	.0	.0	.0	2.3
I ESE	3.4	.0	.0	.0	.0	.0	.0	3.4
R SE	3.4	2.8	.0	.0	.0	.0	.0	6.3
W E SSE	2.8	2.3	.0	.0	.0	.0	.0	5.1
I C S	7.4	2.8	.0	.0	.0	.0	.0	10.3
N T SSW	5.1	1.7	.0	.0	.0	.0	.0	6.8
D I SW	4.6	.0	.0	.0	.0	.0	.0	4.6
O WSW	5.7	.0	.0	.0	.0	.0	.0	5.7
N W	4.0	.6	.0	.0	.0	.0	.0	4.6
WNW	4.0	.6	.0	.0	.0	.0	.0	4.6
NW	10.3	2.8	.0	.0	.0	.0	.0	13.1
NNW	8.6	5.1	.0	.0	.0	.0	.0	13.7
CALM	4.0							4.0
% TOTAL	76.6	23.4	.0	.0	.0	.0	.0	100.0

0 HOURS OF BAD OR MISSING DATA OR 0.0 PERCENT FOR 175 HOURS

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

NEUTRAL STABILITY CLASS D
 PERIOD OF RECORD: 01/01/83 0000 Hours - 07/01/83 0000 Hours

	WIND SPEED (m/sec)							TOTAL
	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	
N	7.9	1.5	.0	.0	.0	.0	.0	9.4
NNE	4.6	1.1	.0	.0	.0	.0	.0	5.7
NE	5.7	.9	.0	.0	.0	.0	.0	6.6
ENE	4.7	.5	.0	.0	.0	.0	.0	5.2
E	4.0	.0	.0	.0	.0	.0	.0	4.0
ESE	4.4	.2	.0	.0	.0	.0	.0	4.5
SE	5.9	1.9	.0	.0	.1	.0	.0	7.9
SSE	4.5	1.3	.4	.0	.0	.0	.0	6.3
CS	4.5	2.2	.3	.0	.0	.0	.0	6.9
SSW	3.4	.5	.0	.0	.1	.0	.0	4.0
WSW	2.9	.3	.0	.0	.0	.0	.0	3.2
WSW	5.0	.2	.0	.0	.0	.0	.0	5.1
W	3.9	.4	.1	.0	.0	.0	.0	4.4
WNW	4.5	.5	.0	.0	.0	.0	.0	5.0
NW	4.5	.9	.0	.0	.0	.0	.0	5.5
NNW	5.1	2.3	.2	.0	.0	.0	.0	7.6
CALM	8.4							8.4
% TOTAL	84.0	14.8	.9	.0	.2	.0	.0	100.0

0 HOURS OF BAD OR MISSING DATA OR 0.0 PERCENT FOR 1165 HOURS

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

SLIGHTLY STABLE STABILITY CLASS E
 PERIOD OF RECORD: 01/01/83 0000 Hours - 07/01/83 0000 Hours

	WIND SPEED (m/sec)							TOTAL
	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	
N	5.6	.0	.0	.0	.0	.0	.0	5.6
NNE	6.6	.1	.0	.0	.0	.0	.0	6.7
NE	5.6	.0	.1	.0	.0	.0	.0	5.7
ENE	5.9	.0	.0	.0	.0	.0	.0	5.9
DE	4.5	.1	.0	.0	.0	.0	.0	4.6
ESE	6.1	.3	.0	.0	.0	.0	.0	6.4
SE	9.1	.7	.0	.0	.0	.0	.0	9.8
WSE	8.6	3.0	.0	.0	.0	.0	.0	11.6
ICS	5.8	1.2	.0	.0	.0	.0	.0	7.0
NTSSW	4.4	.5	.0	.0	.0	.0	.0	5.0
DISW	2.4	.0	.0	.0	.0	.0	.0	2.4
OWSW	1.7	.0	.0	.0	.0	.0	.0	1.7
NW	2.1	.0	.0	.0	.0	.0	.0	2.1
WNW	2.8	.1	.0	.0	.0	.0	.0	2.9
NW	3.2	.0	.0	.0	.0	.0	.0	3.2
NNW	2.9	.1	.0	.0	.0	.0	.0	2.9
CALM	16.4							16.4
% TOTAL	93.6	6.3	.1	.0	.0	.0	.0	100.0

0 HOURS OF BAD OR MISSING DATA OR 0.0 PERCENT FOR 1258 HOURS

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

MODERATELY STABLE STABILITY CLASS F
 PERIOD OF RECORD: 01/01/83 0000 Hours - 07/01/83 0000 Hours

	WIND SPEED (m/sec)							TOTAL
	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	
N	2.7	.0	.0	.0	.0	.0	.0	2.7
NNE	3.7	.2	.0	.0	.0	.0	.0	3.9
NE	9.2	.0	.0	.0	.0	.0	.0	9.2
ENE	9.2	.0	.0	.0	.0	.0	.0	9.2
D E	5.9	.0	.0	.0	.0	.0	.0	5.9
I ESE	6.4	.0	.0	.0	.0	.0	.0	6.4
R SE	10.0	.0	.0	.0	.0	.0	.0	10.0
W E SSE	4.5	.2	.0	.0	.0	.0	.0	4.7
I C S	1.6	.4	.0	.0	.0	.0	.0	1.9
N T SSW	2.3	.0	.0	.0	.0	.0	.0	2.3
D I SW	1.9	.0	.0	.0	.0	.0	.0	1.9
O WSW	1.0	.0	.0	.0	.0	.0	.0	1.0
N W	.6	.0	.0	.0	.0	.0	.0	.6
WNW	.4	.0	.0	.0	.0	.0	.0	.4
NW	1.2	.0	.0	.0	.0	.0	.0	1.2
NNW	1.9	.0	.0	.0	.0	.0	.0	1.9
CALM	36.6							36.6
% TOTAL	99.2	.8	.0	.0	.0	.0	.0	100.0

0 HOURS OF BAD OR MISSING DATA OR 0.0 PERCENT FOR 511 HOURS

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

EXTREMELY STABLE STABILITY CLASS G
 PERIOD OF RECORD: 01/01/83 0000 Hours - 07/01/83 0000 Hours

	WIND SPEED (m/sec)							TOTAL
	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	
N	.8	.0	.0	.0	.0	.0	.0	.8
NNE	1.8	.3	.0	.0	.0	.0	.0	2.1
NE	5.1	.0	.0	.0	.0	.0	.0	5.1
ENE	7.2	.0	.0	.0	.0	.0	.0	7.2
D E	5.6	.3	.0	.0	.0	.0	.0	5.9
I ESE	10.3	.3	.0	.0	.0	.0	.0	10.5
R SE	6.2	.3	.0	.0	.0	.0	.0	6.4
W E SSE	.5	.0	.0	.0	.0	.0	.0	.5
I C S	.0	.0	.0	.0	.0	.0	.0	.0
N T SSW	1.0	.0	.0	.0	.0	.0	.0	1.0
D I SW	1.3	.0	.0	.0	.0	.0	.0	1.3
O WSW	.3	.0	.0	.0	.0	.0	.0	.3
N W	.5	.0	.0	.0	.0	.0	.0	.5
WNW	.5	.0	.0	.0	.0	.0	.0	.5
NW	.3	.0	.0	.0	.0	.0	.0	.3
NNW	.8	.3	.0	.0	.0	.0	.0	1.0
CALM	56.5							56.5
% TOTAL	98.7	1.3	.0	.0	.0	.0	.0	100.0

0 HOURS OF BAD OR MISSING DATA OR 0.0 PERCENT FOR 389 HOURS

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

STABILITY CLASS A - G

PERIOD OF RECORD: 01/01/83 0000 Hours - 07/01/83 0000 Hours

	WIND SPEED (m/sec)							TOTAL
	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	
N	4.1	4.3	.7	.0	.0	.0	.0	9.1
NNE	4.5	2.4	.2	.0	.0	.0	.0	7.1
NE	3.5	2.6	.1	.0	.0	.0	.0	6.3
ENE	2.3	1.9	.0	.0	.0	.0	.0	4.4
DE	2.4	3.0	.3	.1	.0	.0	.0	5.8
ESE	3.4	4.4	.3	.1	.0	.0	.0	8.2
RSE	2.8	4.5	.5	.1	.0	.0	.0	8.0
WESSE	2.4	4.1	.4	.0	.0	.0	.0	6.9
ICS	2.1	3.7	.3	.0	.0	.0	.0	6.2
NTSSW	2.5	2.6	.5	.3	.0	.0	.0	5.9
DISW	2.4	2.4	.6	.0	.0	.0	.0	5.4
OWSW	2.6	1.8	.5	.0	.0	.0	.0	4.9
NW	2.8	1.4	.5	.0	.0	.0	.0	4.7
WNW	2.8	1.6	.5	.0	.0	.0	.0	4.9
NW	3.2	1.3	.1	.0	.0	.0	.0	4.7
NNW	3.4	2.6	.4	.0	.0	.0	.0	6.4
CALM	1.3							1.0
% TOTAL	48.5	44.6	6.0	.0	.0	.0	.0	100.0

293 HOURS OF BAD OR MISSING DATA OR 6.7 PERCENT FOR 4347 HOURS

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

STABILITY CLASS A - G

PERIOD OF RECORD: 01/01/83 0000 Hours - 07/01/83 0000 Hours

	WIND SPEED (m/sec)							TOTAL
	0-2	3-5	6-8	9-11	12-14	15-17	18 AND UP	
N	4.9	.5	.0	.0	.0	.0	.0	5.4
NNE	4.2	.5	.0	.0	.0	.0	.0	4.7
NE	5.3	.4	.0	.0	.0	.0	.0	5.7
ENE	5.3	.2	.0	.0	.0	.0	.0	5.5
D E	4.1	.1	.0	.0	.0	.0	.0	4.2
I ESE	5.3	.2	.0	.0	.0	.0	.0	5.5
R SE	7.1	1.1	.0	.0	.0	.0	.0	8.3
W E SSE	5.3	1.8	.1	.0	.0	.0	.0	7.2
I C S	4.2	1.7	.1	.0	.0	.0	.0	6.1
N T SSW	4.4	.7	.0	.0	.0	.0	.0	5.2
D I SW	4.0	.4	.0	.0	.0	.0	.0	4.4
O WSW	3.2	.1	.0	.0	.0	.0	.0	3.3
N W	2.8	.2	.0	.0	.0	.0	.0	3.1
WNW	3.5	.2	.0	.0	.0	.0	.0	3.8
NW	3.9	.5	.0	.0	.0	.0	.0	4.4
NNW	3.7	1.2	.0	.0	.0	.0	.0	5.0
CALM	18.4							18.0
% TOTAL	89.6	9.8	.4	.0	.0	.0	.0	100.0

288 HOURS OF BAD OR MISSING DATA OR 6.6 PERCENT FOR 4347 HOURS

TABLE 4-A (cont'd)

PERCENT BAD DATA REPORT

PERIOD OF RECORD 01/01/83 0000 Hours - 07/01/83 0000 Hours

REPORT COVERS 4347 HOURS

<u>PARAMETER</u>	<u>HOURS</u>	<u>PERCENT</u>
50M Direction	20.0	0.46
50M Wind Speed	15.0	0.35
10M Direction	5.0	0.12
10M Wind Speed	16.0	0.37
Temperature	126.0	2.90
Dew Point	1585.0	36.00
Delta "T"	288.0	6.63
Precipitation	91.0	2.09

Table 4B

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}

Note: Footnotes indicated are listed in GGNS Technical Specifications, Table 4.11.1.1.1-1

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) (uCi/ml) ^a
A. Containment Ventilation Exhaust	M ^b Grab Sample	M ^b	Principal Gamma Emitters ^e	1x10 ⁻⁴
			H-3	1x10 ⁻⁶
B. Turbine Building Ventilation Exhaust	M ^b Grab Sample	M ^b	Principal Gamma Emitters ^e	1x10 ⁻⁴
			H-3	1x10 ⁻⁶
C. Offgas Post Treatment Exhaust, whenever there is flow	M Grab Sample	M	Principal Gamma Emitters ^e	1x10 ⁻⁴
D. (1) Radwaste Building Ventilation Exhaust	Continuous ^d	W ^c Charcoal Sample	I-131	1x10 ⁻¹²
			I-133	1x10 ⁻¹⁰
(2) Fuel Handling Area Ventilation Exhaust	Continuous ^d	W ^c Particulate Sample	Principal Gamma Emitters ^e (I-131, Others)	1x10 ⁻¹¹
(3) Containment Ventilation Exhaust	Continuous ^d	M Composite Particulate Sample	Gross Alpha	1x10 ⁻¹¹
(4) Turbine Building Ventilation Exhaust	Continuous ^d	Q Composite Particulate Sample	Sr-89, Sr-90	1x10 ⁻¹¹
	Continuous ^f	Noble Gas Monitor	Noble Gases Gross Beta or Gamma	1x10 ⁻⁶

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 39205

August 26, 1983

USNRC REGIONAL OFFICE
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NUCLEAR PRODUCTION DEPARTMENT

U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, N. W., Suite 2900
Atlanta, Georgia 30303

Attention: Mr. J. P. O'Reilly, Regional Administrator

Dear Mr. O'Reilly:

SUBJECT: Grand Gulf Nuclear Station
Unit 1
Docket No. 50-416
License No. NPF-13
File: 0292/15319
Semiannual Radioactive Effluent
Release Report
AECM-83/0513

Enclosed is Mississippi Power & Light Company's **Semiannual Radioactive Effluent Release Report** for Grand Gulf Nuclear Station for the period January 1, 1983 to June 30, 1983.

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

Yours truly,

L. F. Dale
Manager of Nuclear Services

GOS/LRM:ay

Enclosure

- cc: Mr. J. B. Richard (w/o)
- Mr. R. B. McGehee (w/o)
- Mr. T. B. Conner (w/o)
- Mr. G. B. Taylor (w/o)

Mr. Richard C. DeYoung, Director (w/a)
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

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