GPU Nuclear

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Writer's Direct Dial Number:

March 2, 1991
C321-91-2062

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

Dear Sir:

Subject: Oyster Creek Nuclear Generating Station
Docket No. 50-219
Semiannual Radiological Effluent Release Report

Attached is a copy of the Oyster Creek Effluent Release Report for the period covering July, 1990 through December, 1990. This submittal is made in accordance with 10CFR50.36a(a)(2) and our Operating License and Technical Specifications.

If you have any questions, please do not hesitate to contact Michael Heller, Oyster Creek Licensing Engineer at 609-971-4680.

Very truly yours,

J.J. Barton
Director Oyster Creek

JJB/MH/jc
Attachment

cc: Chief
Bureau of Nuclear Engineering
NJ Department of Environmental Protection
CN 411
Trenton, New Jersey 08623

Mr. Thomas Martin, Administrator
Region 1
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

NRC Resident Inspector
Oyster Creek

IE48
1/1

OYSTER CREEK
NUCLEAR GENERATING STATION

prepared by
Radiological Engineering Dept
Oyster Creek

1990-2
SemiAnnual Effluent
Release Report

Executive Summary

The Semiannual Effluent Release Report is submitted to the United States Nuclear Regulatory Commission (NRC) every six months in accordance with the Oyster Creek Nuclear Generating Station (OCNGS) Technical Specifications (Tech Specs). It summarizes the radioactive gaseous and liquid effluents released and solid radioactive wastes shipped from the OCNGS. In addition, meteorological data are presented in joint frequency tables per atmospheric stability class.

For clarity, the report is organized into four sections. Section I itemizes gaseous releases of 407 curies of fission and activation gases, 0.112 curies of non-particulate halogens, 6.17 curies of tritium, and 0.021 curies of particulate radioactivity. There were no liquid releases for the reporting period. Tables 1, 2, 3, and 4 show that quantities of radioactive material released were well within the limits allowed by the OCNGS Tech Specs. Figure 1 shows a decreasing trend in the quantity of batch liquid releases, with the current reporting period showing the absence of liquid releases, compared to those in the past eight six-month reporting periods. Further limits for the release of radioactive effluents at OCNGS are based upon offsite exposure to members of the general public. These limits, outlined on pages 1-2, were compared to dose projections calculated using the methodology in the Offsite Dose Calculation Manual (ODCM). The results for the 1990-2 reporting period, as well as the entire year are shown in Figure 2. Note that the resultant doses from 1990-1 and 1990-2 are not additive due to the fact that the affected sector for the maximum exposed individual was not the same in each period. Section I also itemizes 4933.5 curies of radioactivity, contained in 165.07 cubic meters of waste, which was shipped offsite in 28 shipments. These shipments are similar to those of nuclear plants of comparable type, age and size. The report summarizes the fact that all effluents released were within federal regulatory requirements of the OCNGS Technical Specifications.

Section II provides a summary of Oyster Creek's meteorological data for the reporting period in tabular form. Section III provides a detailed listing of all changes made to the Offsite Dose Calculation Manual (ODCM) and the Process Control Plan (PCP) during the reporting period. One change was made to the PCP. There was one change made to the ODCM. Section IV reports any effluent monitoring instrumentation that was inoperative as per Technical Specification 3.15 for the reporting period.

Figure 1

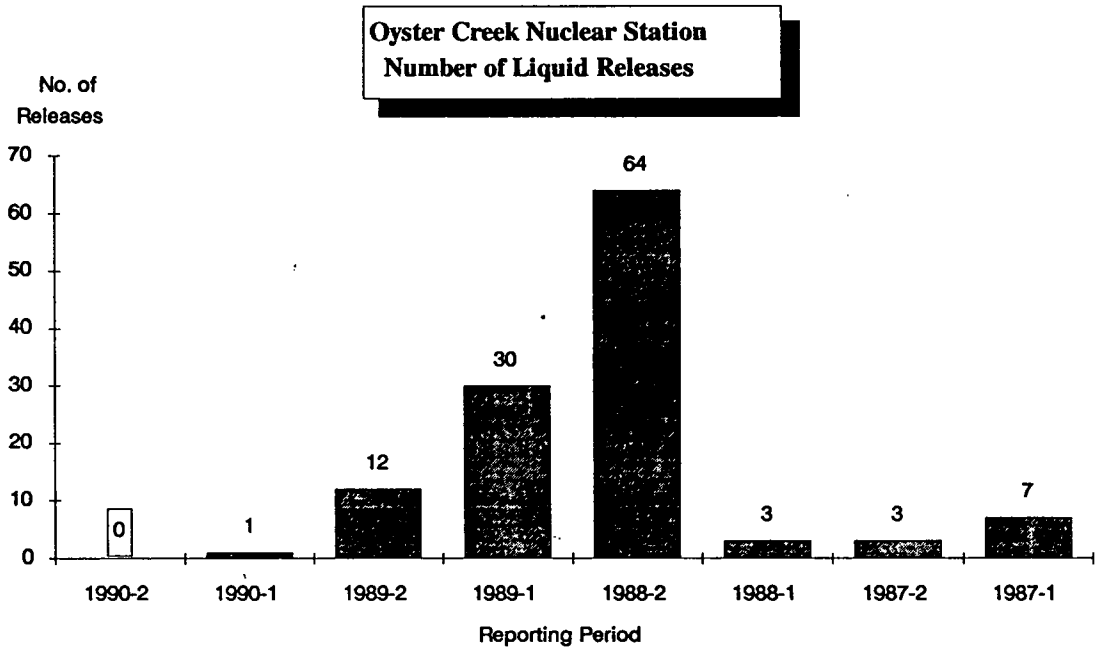

Figure 2

Maximum Offsite Exposure Due to Radionuclides In Radioactive Effluents

Tech Spec Ref.	3.6.J.1	3.6.J.1	3.6.L.1	3.6.L.1	3.6.K.1	3.6.M.2	3.6.K.1
	Liquid Dose		Air Dose (Noble Gas)		Whole	(Thyroid)	
	WB	Organ	Beta	Gamma	Body	Organ	Skin
	mrem	mrem	mrad	mrad	mrem	mrem	mrem
Jan-June Total	2.13E-05	3.34E-05	1.27E-03	1.07E-02	4.93E-03	2.95E-02	5.93E-03
Jul-Dec Total	0.00E+00	0.00E+00	1.05E-03	9.89E-03	4.43E-03	2.78E-02	5.54E-03
1990 Total*	2.13E-05	3.34E-05	2.28E-03	1.87E-02	8.74E-03	5.72E-02	1.05E-02
Tech Spec Limit	3.00E+00	1.00E+01	2.00E+01	1.00E+01	5.00E+02	1.50E+01	3.00E+03
Fraction of Annual Limit	**7.10E-06**	**3.34E-06**	**1.14E-04**	**1.87E-03**	**1.75E-05**	**3.81E-03**	**3.50E-06**

* these air doses not additive due to affected sector locations

Table of Contents

Effluent and Waste Disposal Supplemental Information

FACILITY: Oyster Creek Nuclear Generating Station
LICENSEE: Owner - Jersey Central Power and Light Company
Operator - GPU Nuclear Corporation

1.) **Regulatory Limits**

a.) Fission and Activation Gases

Technical Specification 3.6.E.1
The gross radioactivity in noble gases discharged from the main condenser air ejector shall not exceed a 0.21/E Ci/sec after the holdup line ,where E is the average gamma energy (Mev per atomic transformation).

Technical Specification 3.6.K.1
The dose equivalent rate outside of the EXCLUSION AREA due to radioactive noble gas in gaseous effluent shall not exceed 500 mrem/year to the total body or 3000 mrem/year to the skin.

Technical Specification 3.6.L.1
The air dose outside of the EXCLUSION AREA due to noble gas released in gaseous effluent shall not exceed:

5 mrad/calendar quarter due to gamma radiation,
10 mrad/calendar quarter due to beta radiation,
10 mrad/calendar year due to gamma radiation, or
20 mrad/calendar year due to beta radiation

Technical Specification 3.6.N.1
The annual dose to a MEMBER OF THE PUBLIC due to radiation and radioactive material in effluents from the OCNGS outside of the EXCLUSION AREA shall not exceed 75 mrem to his thyroid or 25 mrem to his total body or to any other organ.

b. Iodines and Particulates

Technical Specification 3.6.K.2
The dose equivalent rate outside of the EXCLUSION AREA due to H-3, I-131, I--133, and to radioactive material in particulates having half-lives of 8 days or more in gaseous effluents shall not exceed 1500 mrem/year to any body organ when the dose rate due to H-3, Sr-89, Sr-90, and alpha-emitting radionuclides is averaged over no more than 3 months and the dose rate due to other radionuclides is averaged over no more than 31 days.

Technical Specification 3.6.M.1
The dose to a MEMBER OF THE PUBLIC from iodine-131, iodine-133, and from radionuclides in particulate form having half-lives of 8 days or more in gaseous effluents, outside of the EXCLUSION AREA shall not exceed 7.5 mrem to any body organ per calendar quarter or 15 mrem to any body organ per calendar year.

c. Liquid Effluents

Technical Specification 3.6.I.1
The concentration of radioactive material, other than noble gases, in liquid effluent in the discharge canal at the Route 9 bridge shall not exceed the concentrations specified in 10 CFR Part 20, Appendix B, Table II, Column 2.

Technical Specification 3.6.I.2
The concentration of noble gases dissolved or entrained in liquid effluent in the discharge canal at the Route 9 bridge shall not exceed $2X10^{-4}$ microcuries/milliliter.

Technical Specification 3.6.J.2
The dose to a MEMBER OF THE PUBLIC due to radioactive material in liquid effluents beyond the outside of the EXCLUSION AREA shall not exceed:

1.5 mrem to the total body during any calendar quarter,
5 mrem to any body organ during any calendar quarter,
3 mrem to the total body during any calendar year, or
10 mrem to any body organ during any calendar year.

2.) **Maximum Permissible Concentrations (MPC)**

a. Fission and Activation Gases:

Appendix B, Table II, Column 2 of 10 CFR 20

b. Iodines and Particulates:

Appendix B, Table II, Column 2 of 10 CFR 20

c. Liquid Effluents:

Appendix B, Table II, Column 2 of 10 CFR 20, except for dissolved or entrained noble gases where the limit is 2×10^{-4} uCi/ml

3.) **Measurements and Approximation of Total Radioactivity**

a. Fission and Activation Gases:

1. Stack

The continuous recording of gross activity and the incorporation of isotopic data obtained from a weekly grab sample analyzed using gamma spectroscopy.

2. Augmented Offgas (AOG) Vent

The continuous recording of gross activity and the incorporation of isotopic data obtained from a weekly grab sample analyzed using gamma spectroscopy.

3. Turbine Building Stack and Feedpump Room Vent

The continuous recording of gross activity and the incorporation of isotopic data obtained from a monthly grab sample analyzed using gamma spectroscopy.

b. Iodines

1. Stack

Filters are changed twice weekly and analyzed using gamma spectroscopy.

2. AOG Vent

Filters are changed twice weekly and analyzed using gamma spectroscopy.

3. Turbine Building Stack and Feedpump Room Vent

Filters are changed twice weekly and analyzed using gamma spectroscopy.

c. Particulates

1. Stack

Filters are changed twice weekly and analyzed using a low background beta counter and gamma spectroscopy.

2. AOG Vent

Filters are changed twice weekly and analyzed using gamma spectroscopy.

3. Turbine Building Stack and Feedpump Room Vent

Filters are changed twice weekly and analyzed using gamma spectroscopy.

d. Liquid Effluents

Analysis per batch release using gamma spectrometry with a germanium detector, a low background beta counter, and a liquid scintillation counter.

Section I: Effluent Summaries: Gases, Liquids, and Solid Waste

Effluent Summaries: Gaseous Effluents

Table 1- Third Quarter Summary - Elevated

Gaseous Effluents	Nuclide	Elevated Release Curies Released
Fission and Activation Gases		
	Kr-85m	3.25E+00
	Kr-87	1.41E+01
	Kr-88	1.36E+01
	Xe-133	3.28E+01
	Xe-135	7.33E+01
	Total Released	1.37E+02
	Average Release Rate	1.72E+01 uCi/sec
	E-bar	0.7578 MeV
	Percent Tech Spec Limit	0.01%
Iodines		
	I-131	5.43E-03
	I-133	2.87E-02
	I-135	9.21E-03
	Total Released	4.33E-02
	Average Release Rate	5.45E-03 uCi/sec
Particulates		
	Sr-89	1.93E-03
	Sr-90	2.73E-06
	Tc-99m	2.36E-03
	Ba-140	1.20E-04
	Gross Alpha	7.98E-03
	Total Released	1.24E-02
	Average Release Rate	1.56E-03 uCi/sec
Tritium		
	H-3	3.24E+00
	Total Released	3.24E+00
	Average Release Rate	4.08E-01 uCi/sec

Table 2- Fourth Quarter Summary - Elevated

Gaseous Effluents	Nuclide	Elevated Release Curies Released
Fission and Activation Gases		
	Kr-87	2.43E+01
	Kr-88	2.34E+01
	Xe-133	5.65E+01
	Xe-135	1.66E+02
	Total Released	2.70E+02
	Average Release Rate	3.40E+01 uCi/sec
	E-bar	0.8712 MeV
	Percent Tech Spec Limit	0.01%
Iodines		
	I-131	7.03E-03
	I-133	4.38E-02
	I-135	1.79E-02
	Total Released	6.87E-02
	Average Release Rate	8.65E-03 uCi/sec
Particulates		
	Sr-89	2.51E-03
	Sr-90	1.94E-05
	Tc-99m	5.82E-03
	Ba-140	2.90E-04
	Gross Alpha	4.10E-06
	Total Released	8.64E-03
	Average Release Rate	1.09E-03 uCi/sec
Tritium		
	H-3	2.93E+00
	Total Released	2.93E+00
	Average Release Rate	3.69E-01 uCi/sec

Table 3- Third Quarter Summary - Ground Level

Gaseous Effluents	Nuclide	Ground Level Release Curies Released	
Fission and Activation Gases		< LLD	
	Total Released	< LLD	
	Average Release Rate	< LLD	uCi/sec
Iodines			
	I-131	5.10E-06	
	I-133	2.80E-04	
	Total Released	2.85E-04	
	Average Release Rate	3.59E-05	uCi/sec
Particulates			
	Sr-89	8.57E-05	
	Gross Alpha	4.38E-06	
	Total Released	9.01E-05	
	Average Release Rate	1.13E-05	uCi/sec
Tritium	H-3	< LLD	
	Total Released	< LLD	
	Average Release Rate	< LLD	uCi/sec

Table 4- Fourth Quarter Summary - Ground Level

Gaseous Effluents	Nuclide	Ground Level Release Curies Released
Fission and Activation Gases		< LLD
	Total Released	< LLD
	Average Release Rate	< LLD uCi/sec
Iodines		
	I-131	7.99E-06
	I-133	2.86E-05
	Total Released	3.66E-05
	Average Release Rate	4.60E-06 uCi/sec
Particulates		
	Sr-89	1.28E-05
	Sr-90	2.21E-06
	Total Released	1.50E-05
	Average Release Rate	1.89E-06 uCi/sec
Tritium		
	H-3	< LLD
	Total Released	< LLD
	Average Release Rate	< LLD uCi/sec

Solid Waste Summaries

Table 5- Solid Waste Shipped Offsite For Disposal

Waste Stream:Resins, Filters, Evaporator Bottoms

Waste Class	Cubic Feet	Cubic Meters	Curies Shipped	% Error (Curies)
A	4210.8	119.2	1.97E+02	25%
B	540.3	15.3	7.71E+01	25%
C	0.0	0.0	0.00E+00	25%
ALL	4751.1	134.6	2.74E+02	25%

Waste Stream:Dry Activated Waste

Waste Class	Cubic Feet	Cubic Meters	Curies Shipped	% Error (Curies)
A	180.1	5.1	2.29E+00	25%
B	0.0	0.0	0.00E+00	25%
C	0.0	0.0	0.00E+00	25%
ALL	180.1	5.1	2.29E+00	25%

Waste Stream:Irradiated Components

Waste Class	Cubic Feet	Cubic Meters	Curies Shipped	% Error (Curies)
A	0.0	0.0	0.00E+00	25%
B	0.0	0.0	0.00E+00	25%
C	0.0	0.0	0.00E+00	25%
ALL	0	0.0	0.00E+00	25%

Waste Stream:Other Waste

Waste Class	Cubic Feet	Cubic Meters	Curies Shipped	% Error (Curies)
A	0.0	0.0	0.00E+00	25%
B	0.0	0.0	0.00E+00	25%
C	0.0	0.0	0.00E+00	25%
ALL	0	0.0	0.00E+00	25%

Waste Stream:Sum of All Four Categories

Waste Class	Cubic Feet	Cubic Meters	Curies Shipped	% Error (Curies)
A	4390.9	124.4	1.99E+02	25%
B	540.3	15.3	7.71E+01	25%
C	0.0	0.0	0.00E+00	25%
ALL	4931.2	139.7	2.76E+02	25%

Waste Stream:SEG (Dry Activated Waste)

Waste Class	Cubic Feet	Cubic Meters	Curies Shipped	% Error (Curies)
A	899.4	25.5	2.25E+00	25%

Estimates of Major Nuclides by Waste Class and Stream
Table 6 - Waste Stream: Resins, Filters, Evaporator Bottoms

Waste Class	Nuclide Name	PerCent Abundance	Curies
A	Co-60	43.946%	8.59E+01
	Fe-55	31.054%	6.07E+01
	Mn-54	9.516%	1.86E+01
	Cs-137	8.595%	1.68E+01
	Cr-51	2.844%	5.56E+00
	Cs-134	2.190%	4.28E+00
	Co-58	1.330%	2.60E+00
	Ni-63	0.371%	7.25E-01
	Sr-90	0.056%	1.10E-01
	Pu-241	0.055%	1.08E-01
	C-14	0.029%	5.71E-02
	H-3	0.013%	2.50E-02
	Cm-242	0.001%	1.12E-03
	I-129	0.000%	0.00E+00
	I-131	0.000%	0.00E+00
	Nb-94	0.000%	0.00E+00
	Ni-59	0.000%	0.00E+00
	Tc-99	0.000%	0.00E+00

Waste Class	Nuclide Name	PerCent Abundance	Curies
B	Fe-55	46.121%	3.50E+01
	Cs-137	24.905%	1.89E+01
	Co-60	19.239%	1.46E+01
	Cs-134	5.324%	4.04E+00
	Mn-54	2.886%	2.19E+00
	Cr-51	1.057%	8.02E-01
	Ni-63	0.254%	1.93E-01
	Pu-241	0.112%	8.49E-02
	Sr-90	0.077%	5.82E-02
	H-3	0.022%	1.68E-02
	Cm-242	0.002%	1.58E-03
	C-14	0.002%	1.22E-03
	Co-58	0.000%	0.00E+00
	I-129	0.000%	0.00E+00
	I-131	0.000%	0.00E+00
	Nb-94	0.000%	0.00E+00
	Ni-59	0.000%	0.00E+00
	Tc-99	0.000%	0.00E+00

Waste Class	Nuclide Name	PerCent Abundance	Curies
ALL	Co-60	36.836%	1.00E+02
	Fe-55	35.252%	9.57E+01
	Cs-137	13.151%	3.57E+01
	Mn-54	7.625%	2.07E+01
	Cs-134	3.065%	8.32E+00
	Cr-51	2.346%	6.37E+00
	Co-58	1.216%	3.30E+00
	Ni-63	0.338%	9.18E-01
	Pu-241	0.071%	1.93E-01
	Sr-90	0.062%	1.68E-01
	C-14	0.021%	5.83E-02
	H-3	0.015%	4.18E-02
	Cm-242	0.001%	2.70E-03
	I-129	0.000%	0.00E+00
	I-131	0.000%	0.00E+00
	Nb-94	0.000%	0.00E+00
	Ni-59	0.000%	0.00E+00
	Tc-99	0.000%	0.00E+00

Table 7 - Waste Stream: Dry Activated Waste

Waste Class	Nuclide Name	PerCent Abundance	Curies
A	Fe-55	59.314%	1.36E+00
	Co-60	23.987%	5.50E-01
	Cs-137	8.505%	1.95E-01
	Mn-54	4.339%	9.95E-02
	Cs-134	2.769%	6.35E-02
	Cr-51	1.073%	2.46E-02
	H-3	0.011%	2.53E-04
	C-14	0.002%	4.78E-05
	Sr-90	0.000%	0.00E+00
	Ni-59	0.000%	0.00E+00
	Ni-63	0.000%	0.00E+00
	Nb-94	0.000%	0.00E+00
	Tc-99	0.000%	0.00E+00
	I-129	0.000%	0.00E+00
	Pu-241	0.000%	0.00E+00
	Cm-242	0.000%	0.00E+00

Waste Class	Nuclide Name	PerCent Abundance	Curies
All	Fe-55	59.314%	1.36E+00
	Co-60	23.987%	5.50E-01
	Cs-137	8.505%	1.95E-01
	Mn-54	4.339%	9.95E-02
	Cs-134	2.769%	6.35E-02
	Cr-51	1.073%	2.46E-02
	H-3	0.011%	2.53E-04
	C-14	0.002%	4.78E-05
	Sr-90	0.000%	0.00E+00
	Ni-59	0.000%	0.00E+00
	Ni-63	0.000%	0.00E+00
	Nb-94	0.000%	0.00E+00
	Tc-99	0.000%	0.00E+00
	I-129	0.000%	0.00E+00
	Pu-241	0.000%	0.00E+00
	Cm-242	0.000%	0.00E+00

Waste Stream: Dry Activated Waste (SEG)

Waste Class	Nuclide Name	PerCent Abundance	Curies
A	Fe-55	47.406%	1.05E+00
	Co-60	35.216%	7.80E-01
	Cs-137	7.224%	1.60E-01
	Mn-54	3.160%	7.00E-02
	Cs-134	1.806%	4.00E-02
	Cr-51	1.806%	4.00E-02
	Co-58	0.903%	2.00E-02
	La-140	0.903%	2.00E-02
	Ni-63	0.451%	1.00E-02
	Zn-65	0.316%	7.00E-03
	Fe-59	0.271%	6.00E-03
	Sr-89	0.226%	5.00E-03
	Pu-241	0.135%	3.00E-03
	Sr-90	0.135%	3.00E-03

Waste Class	Nuclide Name	PerCent Abundance	Curies
A	Ce-141	0.023%	5.00E-04
	Ce-144	0.009%	2.00E-04
	H-3	0.009%	2.00E-04
	Am-241	0.000%	0.00E+00
	C-14	0.000%	0.00E+00
	Cm-242	0.000%	0.00E+00
	Cm-243/44	0.000%	0.00E+00
	I-129	0.000%	0.00E+00
	Nb-94	0.000%	0.00E+00
	Ni-59	0.000%	0.00E+00
	Np-237	0.000%	0.00E+00
	Pu-238	0.000%	0.00E+00
	Pu-239/40	0.000%	0.00E+00
	Tc-99	0.000%	0.00E+00

Table 8 - Waste Stream: Sum of All Four Categories

Waste Class	Nuclide Name	PerCent Abundance	Curies
A	Co-60	43.690%	8.64E+01
	Fe-55	31.402%	6.21E+01
	Mn-54	9.456%	1.87E+01
	Cs-137	8.596%	1.70E+01
	Cr-51	2.827%	5.59E+00
	Cs-134	2.195%	4.34E+00
	Co-58	1.315%	2.60E+00
	Ni-63	0.367%	7.25E-01
	Sr-90	0.056%	1.10E-01
	Pu-241	0.055%	1.08E-01
	C-14	0.029%	5.71E-02
	H-3	0.013%	2.53E-02
	Cm-242	0.001%	1.12E-03
	Ni-59	0.000%	0.00E+00
	Nb-94	0.000%	0.00E+00
	Tc-99	0.000%	0.00E+00
	I-129	0.000%	0.00E+00
	I-131	0.000%	0.00E+00

Waste Class	Nuclide Name	PerCent Abundance	Curies
B	Fe-55	46.121%	3.50E+01
	Cs-137	24.905%	1.89E+01
	Co-60	19.239%	1.46E+01
	Cs-134	5.324%	4.04E+00
	Mn-54	2.886%	2.19E+00
	Cr-51	1.057%	8.02E-01
	Ni-63	0.254%	1.93E-01
	Pu-241	0.112%	8.49E-02
	Sr-90	0.077%	5.82E-02
	H-3	0.022%	1.68E-02
	Cm-242	0.002%	1.58E-03
	C-14	0.002%	1.22E-03
	Co-58	0.000%	0.00E+00
	I-129	0.000%	0.00E+00
	I-131	0.000%	0.00E+00
	Nb-94	0.000%	0.00E+00
	Ni-59	0.000%	0.00E+00
	Tc-99	0.000%	0.00E+00

Waste Class	Nuclide Name	PerCent Abundance	Curies
ALL	Co-60	36.841%	1.01E+02
	Fe-55	35.382%	9.70E+01
	Cs-137	13.095%	3.59E+01
	Mn-54	7.587%	2.08E+01
	Cs-134	3.057%	8.38E+00
	Cr-51	2.331%	6.39E+00
	Co-58	1.204%	3.30E+00
	Ni-63	0.335%	9.18E-01
	Pu-241	0.070%	1.93E-01
	Sr-90	0.061%	1.68E-01
	C-14	0.021%	5.83E-02
	H-3	0.015%	4.21E-02
	Cm-242	0.001%	2.70E-03
	Ni-59	0.000%	0.00E+00
	Nb-94	0.000%	0.00E+00
	Tc-99	0.000%	0.00E+00
	I-129	0.000%	0.00E+00

Table 9 - Solid Waste Disposition Summary

Number of Shipments	Mode of Transportation	Destination	
26	Truck	Barnwell, SC	
2	Truck	Oak Ridge, TN	(SEG)

SEG = Scientific Ecology Group, Inc.

Section II: Meteorological Data

Third Quarter, 1990 33-Foot Level

Hours at Each Wind Speed and Direction
Period of Record = 90070100-90093023
Stability Class: A DT/DZ
Elevation: Speed:SPD33A Direction:DIR33A Lapse:DT150

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	1	9	0	0	0	0	10
NNE	0	10	3	0	0	0	13
NE	3	17	32	0	0	0	52
ENE	0	19	31	0	0	0	50
E	1	7	6	0	0	0	14
ESE	0	12	3	0	0	0	15
SE	0	17	14	1	0	0	32
SSE	0	2	20	6	0	0	28
S	0	4	30	8	0	0	42
SSW	1	3	11	4	0	0	19
SW	0	7	11	2	0	0	20
WSW	0	16	13	5	0	0	34
W	1	19	14	0	0	0	34
WNW	0	13	24	0	0	0	37
NW	2	22	17	0	0	0	41
NNW	0	16	8	0	0	0	24
TOTAL	9	193	237	26	0	0	465

Hours of Missing Data: 18

Hours at Each Wind Speed and Direction
Period of Record = 90070100-90093023
Stability Class: C DT/DZ
Elevation: Speed:SPD33A Direction:DIR33A Lapse:DT150

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	1	1	0	0	0	0	2
NNE	0	0	0	0	0	0	0
NE	0	6	3	0	0	0	9
ENE	0	3	4	0	0	0	7
E	1	1	1	0	0	0	3
ESE	0	2	0	0	0	0	2
SE	0	2	1	0	0	0	3
SSE	0	2	1	0	0	0	3
S	0	1	7	0	0	0	8
SSW	1	3	3	1	0	0	8
SW	1	2	0	0	0	0	3
WSW	0	3	0	0	0	0	3
W	1	1	2	0	0	0	4
WNW	1	2	1	0	0	0	4
NW	0	0	1	0	0	0	1
NNW	1	2	0	0	0	0	3
TOTAL	7	31	24	1	0	0	63

Hours of Missing Data: 18

Hours at Each Wind Speed and Direction
Period of Record = 90070100-90093023
Stability Class: B DT/DZ
Elevation: Speed:SPD33A Direction:DIR33A Lapse:DT150

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	1	2	1	0	0	0	4
NNE	2	0	0	0	0	0	2
NE	0	9	4	1	0	0	14
ENE	0	7	2	0	0	0	9
E	2	3	1	0	0	0	6
ESE	0	1	2	0	0	0	3
SE	1	3	2	0	0	0	6
SSE	1	5	4	0	0	0	10
S	1	3	5	0	0	0	9
SSW	0	4	8	1	1	0	14
SW	0	3	1	0	0	0	4
WSW	1	3	2	1	0	0	7
W	1	3	4	0	0	0	8
WNW	1	7	6	0	0	0	14
NW	0	6	1	0	0	0	7
NNW	3	3	1	0	0	0	7
TOTAL	14	62	44	3	1	0	124

Hours of Missing Data: 18

Hours at Each Wind Speed and Direction
Period of Record = 90070100-90093023
Stability Class: D DT/DZ
Elevation: Speed:SPD33A Direction:DIR33A Lapse:DT150

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	3	7	0	0	0	0	10
NNE	2	15	4	0	0	0	21
NE	2	44	26	1	0	0	73
ENE	1	19	7	0	0	0	27
E	0	14	3	0	0	0	17
ESE	1	9	2	0	0	0	12
SE	0	13	4	0	0	0	17
SSE	0	21	7	0	0	0	28
S	1	12	17	2	0	0	32
SSW	3	15	23	3	0	0	44
SW	2	6	6	0	0	0	14
WSW	3	10	2	1	0	0	16
W	2	10	2	0	0	0	14
WNW	5	9	3	0	0	0	17
NW	3	14	5	0	0	0	22
NNW	2	7	4	0	0	0	13
TOTAL	30	225	115	7	0	0	377

Hours of Missing Data: 18

Third Quarter, 1990 — 33-Foot Level

Hours at Each Wind Speed and Direction
Period of Record = 90070100-90093023
Stability Class: E DT/DZ
Elevation: Speed:SPD33A Direction:DIR33A Lapse:DT150

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	8	14	0	0	0	0	22
NNE	7	13	7	0	0	0	27
NE	9	28	33	1	0	0	71
ENE	5	25	10	0	0	0	40
E	6	28	5	0	0	0	39
ESE	4	11	1	0	0	0	16
SE	1	8	0	0	0	0	9
SSE	3	16	3	0	0	0	22
S	10	25	11	2	0	0	48
SSW	10	41	14	2	0	0	67
SW	7	43	10	0	0	0	60
WSW	17	31	9	0	0	0	57
W	6	17	2	0	0	0	25
WNW	9	20	0	0	0	0	29
NW	10	13	0	0	0	0	23
NNW	11	16	0	0	0	0	27
TOTAL	123	349	105	5	0	0	582

Hours of Missing Data: 18

Hours at Each Wind Speed and Direction
Period of Record = 90070100-90093023
Stability Class: G DT/DZ
Elevation: Speed:SPD33A Direction:DIR33A Lapse:DT150

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	21	4	0	0	0	0	25
NNE	6	0	0	0	0	0	6
NE	13	2	0	0	0	0	15
ENE	5	0	0	0	0	0	5
E	8	1	0	0	0	0	9
ESE	20	0	0	0	0	0	20
SE	12	0	0	0	0	0	12
SSE	10	0	0	0	0	0	10
S	14	0	0	0	0	0	14
SSW	24	3	0	0	0	0	27
SW	21	2	0	0	0	0	23
WSW	22	11	0	0	0	0	33
W	25	7	0	0	0	0	32
WNW	18	21	0	0	0	0	39
NW	26	5	0	0	0	0	31
NNW	22	7	0	0	0	0	29
TOTAL	267	63	0	0	0	0	330

Hours of Missing Data: 18

Hours at Each Wind Speed and Direction
Period of Record = 90070100-90093023
Stability Class: F DT/DZ
Elevation: Speed:SPD33A Direction:DIR33A Lapse:DT150

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	6	3	0	0	0	0	9
NNE	8	5	0	0	0	0	13
NE	6	2	2	0	0	0	10
ENE	3	0	0	0	0	0	3
E	1	1	0	0	0	0	2
ESE	3	1	0	0	0	0	4
SE	3	0	0	0	0	0	3
SSE	2	0	0	0	0	0	2
S	7	5	0	0	0	0	12
SSW	15	20	0	0	0	0	35
SW	14	14	0	0	0	0	28
WSW	19	21	0	0	0	0	40
W	14	14	0	0	0	0	28
WNW	5	15	0	0	0	0	20
NW	12	6	0	0	0	0	18
NNW	11	11	0	0	0	0	22
TOTAL	129	118	2	0	0	0	249

Hours of Missing Data: 18

Hours at Each Wind Speed and Direction
Period of Record = 90070100-90093023
Stability Class: ALL DT/DZ
Elevation: Speed:SPD33A Direction:DIR33A Lapse:DT150

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	41	40	1	0	0	0	82
NNE	25	43	14	0	0	0	82
NE	33	108	100	3	0	0	244
ENE	14	73	54	0	0	0	141
E	19	55	16	0	0	0	90
ESE	28	36	8	0	0	0	72
SE	17	43	21	1	0	0	82
SSE	16	46	35	6	0	0	103
S	33	50	70	12	0	0	165
SSW	54	89	59	11	1	0	214
SW	45	77	28	2	0	0	152
WSW	62	95	26	7	0	0	190
W	50	71	24	0	0	0	145
WNW	39	87	34	0	0	0	160
NW	53	66	24	0	0	0	143
NNW	50	62	13	0	0	0	125
TOTAL	579	1041	527	42	1	0	2190

Hours of Missing Data: 18

Fourth Quarter, 1990 — 33-Foot Level

Hours at Each Wind Speed and Direction
Period of Record = 90100100-90123123
Stability Class: A DT/DZ
Elevation: Speed:SPD33A Direction:DIR33A Lapse:DT150

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	3	2	0	0	0	5
NNE	0	0	0	0	0	0	0
NE	0	4	2	0	0	0	6
ENE	0	7	3	0	0	0	10
E	0	4	0	0	0	0	4
ESE	0	2	0	0	0	0	2
SE	0	2	5	5	0	0	12
SSE	0	5	8	0	0	0	13
S	0	1	9	3	0	0	13
SSW	0	3	11	9	1	0	24
SW	0	3	10	1	0	0	14
WSW	0	4	8	0	0	0	12
W	0	4	7	3	0	0	14
WNW	0	1	23	18	0	0	42
NW	0	6	27	11	0	0	44
NNW	0	8	14	3	0	0	25
TOTAL	0	57	129	53	1	0	240

Hours of Missing Data: 26

Hours at Each Wind Speed and Direction
Period of Record = 90100100-90123123
Stability Class: C DT/DZ
Elevation: Speed:SPD33A Direction:DIR33A Lapse:DT150

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	2	1	0	0	0	3
NE	0	0	0	0	0	0	0
ENE	0	1	0	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	1	0	0	0	0	1
SE	0	1	0	0	0	0	1
SSE	0	0	0	0	0	0	0
S	0	1	3	2	0	0	6
SSW	0	0	3	3	0	0	6
SW	1	1	1	0	0	0	3
WSW	0	1	3	0	0	0	4
W	0	2	3	1	0	0	6
WNW	0	3	3	1	0	0	7
NW	0	5	7	1	0	0	13
NNW	1	2	2	0	0	0	5
TOTAL	2	20	26	8	0	0	56

Hours of Missing Data: 26

Hours at Each Wind Speed and Direction
Period of Record = 90100100-90123123
Stability Class: B DT/DZ
Elevation: Speed:SPD33A Direction:DIR33A Lapse:DT150

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	2	0	0	0	0	2
NNE	0	2	0	0	0	0	2
NE	0	1	1	0	0	0	2
ENE	0	3	0	0	0	0	3
E	0	0	0	0	0	0	0
ESE	0	3	0	0	0	0	3
SE	0	2	1	1	0	0	4
SSE	0	0	2	1	0	0	3
S	1	2	2	2	1	0	8
SSW	0	2	4	2	3	0	11
SW	0	4	2	1	0	0	7
WSW	0	1	5	1	0	0	7
W	0	4	4	1	0	0	9
WNW	0	3	6	3	0	0	12
NW	0	8	4	4	0	0	16
NNW	0	2	3	0	0	0	5
TOTAL	1	39	34	16	4	0	94

Hours of Missing Data: 26

Hours at Each Wind Speed and Direction
Period of Record = 90100100-90123123
Stability Class: D DT/DZ
Elevation: Speed:SPD33A Direction:DIR33A Lapse:DT150

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	3	3	6	0	0	12
NNE	0	3	2	0	0	0	5
NE	0	6	0	0	0	0	6
ENE	1	3	0	0	0	0	4
E	0	4	0	1	0	0	5
ESE	1	5	2	2	0	0	10
SE	0	5	6	0	0	0	11
SSE	1	5	7	0	0	0	13
S	0	2	5	2	2	0	11
SSW	0	5	16	5	2	0	28
SW	1	13	10	3	0	0	27
WSW	3	11	8	1	0	0	23
W	1	9	9	0	0	0	19
WNW	1	13	15	12	0	0	41
NW	0	19	23	2	0	0	44
NNW	1	2	14	1	0	0	18
TOTAL	10	108	120	35	4	0	277

Hours of Missing Data: 26

Fourth Quarter, 1990 — 33-Foot Level

Hours at Each Wind Speed and Direction
Period of Record = 90100100-90123123
Stability Class: E DT/DZ
Elevation: Speed:SPD33A Direction:DIR33A Lapse:DT150

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	1	9	7	0	0	0	17
NNE	1	6	1	0	0	0	8
NE	5	10	3	0	0	0	18
ENE	7	7	11	1	0	0	26
E	0	1	2	0	0	0	3
ESE	1	6	2	3	0	0	12
SE	3	25	16	4	1	0	49
SSE	6	21	22	2	0	0	51
S	3	21	12	2	4	1	43
SSW	0	55	52	16	0	0	123
SW	6	57	25	9	0	0	97
WSW	4	28	15	0	0	0	47
W	5	37	19	3	0	0	64
WNW	8	38	37	8	1	0	92
NW	12	44	31	4	0	0	91
NNW	1	30	23	0	0	0	54
TOTAL	63	395	278	52	6	1	795

Hours of Missing Data: 26

Hours at Each Wind Speed and Direction
Period of Record = 90100100-90123123
Stability Class: G DT/DZ
Elevation: Speed:SPD33A Direction:DIR33A Lapse:DT150

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	32	8	0	0	0	0	40
NNE	9	1	0	0	0	0	10
NE	6	3	0	0	0	0	9
ENE	3	0	0	0	0	0	3
E	2	0	0	0	0	0	2
ESE	7	0	0	0	0	0	7
SE	7	0	0	0	0	0	7
SSE	18	1	0	0	0	0	19
S	21	2	0	0	0	0	23
SSW	30	9	0	0	0	0	39
SW	28	11	0	0	0	0	39
WSW	18	10	0	0	0	0	28
W	13	38	1	0	0	0	52
WNW	13	13	1	0	0	0	27
NW	16	30	0	0	0	0	46
NNW	40	23	0	0	0	0	63
TOTAL	263	149	2	0	0	0	414

Hours of Missing Data: 26

Hours at Each Wind Speed and Direction
Period of Record = 90100100-90123123
Stability Class: F DT/DZ
Elevation: Speed:SPD33A Direction:DIR33A Lapse:DT150

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	4	2	0	0	0	0	6
NNE	1	4	0	0	0	0	5
NE	3	1	0	0	0	0	4
ENE	5	0	2	0	0	0	7
E	1	3	0	0	0	0	4
ESE	0	3	0	0	0	0	3
SE	5	3	0	0	0	0	8
SSE	4	0	0	0	0	0	4
S	5	5	0	0	0	0	10
SSW	4	13	2	1	0	0	20
SW	5	43	6	0	0	0	54
WSW	6	43	2	0	0	0	51
W	8	24	0	0	0	0	32
WNW	2	17	4	1	0	0	24
NW	17	27	5	0	0	0	49
NNW	11	13	1	0	0	0	25
TOTAL	81	201	22	2	0	0	306

Hours of Missing Data: 26

Hours at Each Wind Speed and Direction
Period of Record = 90100100-90123123
Stability Class: ALL DT/DZ
Elevation: Speed:SPD33A Direction:DIR33A Lapse:DT150

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	37	27	12	6	0	0	82
NNE	11	18	4	0	0	0	33
NE	14	25	6	0	0	0	45
ENE	16	21	16	1	0	0	54
E	3	12	2	1	0	0	18
ESE	9	20	4	5	0	0	38
SE	15	38	28	10	1	0	92
SSE	29	32	39	3	0	0	103
S	30	34	31	11	7	1	114
SSW	34	87	88	36	6	0	251
SW	41	132	54	14	0	0	241
WSW	31	98	41	2	0	0	172
W	27	118	43	8	0	0	196
WNW	24	88	89	43	1	0	245
NW	45	139	97	22	0	0	303
NNW	54	80	57	4	0	0	195
TOTAL	420	969	611	166	15	1	2182

Hours of Missing Data: 26

Third Quarter, 1990 380-foot Level

Hours at Each Wind Speed and Direction
Period of Record = 90070100-90093023
Stability Class: A DT/DZ
Elevation: Speed:SPD380A Direction:DIR380A Lapse:DT380A

Wind Direction	Wind Speed(mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	1	0	0	0	1
NNE	0	1	1	0	0	0	2
NE	0	1	4	6	1	0	12
ENE	0	1	1	3	5	0	10
E	0	0	1	2	0	0	3
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	1	0	0	0	1
S	0	0	0	1	1	0	2
SSW	0	0	1	1	0	1	3
SW	0	0	0	1	2	0	3
WSW	0	0	0	0	1	0	1
W	0	1	0	1	0	0	2
WNW	0	0	0	3	2	0	5
NW	0	1	6	4	2	0	13
NNW	0	3	1	0	0	0	4
TOTAL	0	8	17	22	14	1	62

Hours of Missing Data: 13

Hours at Each Wind Speed and Direction
Period of Record = 90070100-90093023
Stability Class: C DT/DZ
Elevation: Speed:SPD380A Direction:DIR380A Lapse:DT38

Wind Direction	Wind Speed(mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	1	3	0	0	0	4
NNE	0	3	2	2	0	0	7
NE	0	1	8	7	3	0	19
ENE	0	0	8	9	0	0	17
E	0	1	5	0	0	0	6
ESE	0	3	3	1	0	0	7
SE	0	3	3	2	0	0	8
SSE	0	0	2	7	0	0	9
S	0	0	6	13	3	1	23
SSW	1	0	2	2	0	2	7
SW	0	2	6	2	0	0	10
WSW	0	2	6	1	1	2	12
W	0	1	4	6	1	0	12
WNW	0	3	3	5	1	1	13
NW	0	1	7	5	2	0	15
NNW	0	1	5	5	0	0	11
TOTAL	1	22	73	67	11	6	180

Hours of Missing Data: 13

Hours at Each Wind Speed and Direction
Period of Record = 90070100-90093023
Stability Class: B DT/DZ
Elevation: Speed:SPD380A Direction:DIR380A Lapse:DT380A

Wind Direction	Wind Speed(mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	1	0	1	0	0	2
NNE	0	0	0	0	0	0	0
NE	0	1	1	13	1	0	16
ENE	0	1	6	7	0	0	14
E	0	0	2	1	0	0	3
ESE	0	0	0	0	0	0	0
SE	0	0	7	1	0	0	8
SSE	0	0	3	5	1	0	9
S	0	0	0	4	0	0	4
SSW	0	0	1	1	1	0	3
SW	0	0	2	3	0	0	5
WSW	0	0	5	4	2	2	13
W	0	0	7	4	1	0	12
WNW	0	0	1	7	4	0	12
NW	0	0	1	4	1	0	6
NNW	0	1	1	2	1	0	5
TOTAL	0	4	37	57	12	2	112

Hours of Missing Data: 13

Hours at Each Wind Speed and Direction
Period of Record = 90070100-90093023
Stability Class: D DT/DZ
Elevation: Speed:SPD380A Direction:DIR380A Lapse:DT38

Wind Direction	Wind Speed(mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	2	5	9	5	0	0	21
NNE	2	2	16	14	2	0	36
NE	0	6	39	47	20	17	129
ENE	0	3	18	39	11	4	75
E	2	6	21	22	4	0	55
ESE	0	7	24	7	0	0	38
SE	0	12	26	6	1	0	45
SSE	0	9	28	20	2	0	59
S	1	4	29	32	12	1	79
SSW	1	6	19	45	14	2	87
SW	2	7	6	9	4	0	28
WSW	1	11	10	3	7	2	34
W	0	8	9	12	4	0	33
WNW	1	14	7	14	6	1	43
NW	1	7	11	13	8	0	40
NNW	1	6	9	10	3	0	29
TOTAL	14	113	281	298	98	27	831

Hours of Missing Data: 13

Third Quarter, 1990 380-foot Level

Hours at Each Wind Speed and Direction
Period of Record = 90070100-90093023
Stability Class: E DT/DZ
Elevation: Speed:SPD380A Direction:DIR380A Lapse:DT380A

Wind Direction	Wind Speed(mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	2	6	11	1	0	20
NNE	2	4	11	4	0	0	21
NE	1	2	8	10	15	17	53
ENE	0	4	6	10	0	0	20
E	1	3	3	8	0	0	15
ESE	1	1	4	1	0	0	7
SE	0	3	5	1	0	0	9
SSE	0	3	6	7	0	0	16
S	0	4	12	22	2	0	40
SSW	0	2	10	51	13	0	76
SW	0	0	11	25	25	1	62
WSW	0	6	11	14	16	6	53
W	0	2	6	11	7	0	26
WNW	0	4	8	11	5	1	29
NW	0	5	3	11	3	0	22
NNW	1	3	8	12	8	0	32
TOTAL	6	48	118	209	95	25	501

Hours of Missing Data: 13

Hours at Each Wind Speed and Direction
Period of Record = 90070100-90093023
Stability Class: G DT/DZ
Elevation: Speed:SPD380A Direction:DIR380A Lapse:DT38

Wind Direction	Wind Speed(mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	1	4	1	6	8	0	20
NNE	0	1	1	1	0	0	3
NE	2	0	6	0	0	0	8
ENE	0	1	0	0	0	0	1
E	0	2	1	0	0	0	3
ESE	0	3	1	0	0	0	4
SE	0	4	1	0	0	0	5
SSE	0	4	2	0	0	0	6
S	0	2	0	3	0	0	5
SSW	1	3	5	3	0	1	1
SW	0	3	2	1	0	0	6
WSW	1	0	6	13	2	1	23
W	2	2	10	9	5	0	28
WNW	2	3	8	9	5	1	28
NW	0	7	9	5	5	2	28
NNW	1	1	5	6	5	2	20
TOTAL	10	40	58	56	30	7	201

Hours of Missing Data: 13

Hours at Each Wind Speed and Direction
Period of Record = 90070100-90093023
Stability Class: F DT/DZ
Elevation: Speed:SPD380A Direction:DIR380A Lapse:DT380A

Wind Direction	Wind Speed(mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	2	1	4	4	3	0	14
NNE	0	4	4	6	0	0	14
NE	2	0	7	0	0	0	9
ENE	2	0	2	0	0	0	4
E	1	2	2	1	0	0	6
ESE	2	3	10	1	0	0	16
SE	0	3	4	0	0	0	7
SSE	0	0	3	0	0	0	3
S	0	2	1	8	0	0	11
SSW	1	0	3	16	5	2	27
SW	0	3	4	19	10	2	38
WSW	0	2	5	22	21	4	54
W	0	2	2	26	2	0	32
WNW	0	1	2	8	11	8	30
NW	1	1	4	9	4	0	19
NNW	1	1	1	3	18	0	24
TOTAL	12	25	58	123	74	16	308

Hours of Missing Data: 13

Hours at Each Wind Speed and Direction
Period of Record = 90070100-90093023
Stability Class: ALL DT/DZ
Elevation: Speed:SPD380A Direction:DIR380A Lapse:DT38

Wind Direction	Wind Speed(mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	5	14	24	27	12	0	82
NNE	4	15	35	27	2	0	83
NE	5	11	73	83	40	34	246
ENE	2	10	41	68	16	4	141
E	4	14	35	34	4	0	91
ESE	3	17	42	10	0	0	72
SE	0	25	46	10	1	0	82
SSE	0	16	45	39	3	0	103
S	1	12	48	83	18	2	164
SSW	4	11	41	119	33	8	216
SW	2	15	31	60	41	3	152
WSW	2	21	43	57	50	17	190
W	2	16	38	69	20	0	145
WNW	3	25	29	57	34	12	160
NW	2	22	41	51	25	2	143
NNW	4	16	30	38	35	2	125
TOTAL	43	260	642	832	334	84	2195

Hours of Missing Data: 13

Fourth Quarter, 1990 — 380-Foot Level

Hours at Each Wind Speed and Direction
Period of Record = 90100100-90123123
Stability Class: A DT/DZ
Elevation: Speed:SP380A Direction:DIR380A Lapse:DT380A

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	1	0	0	1
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	1	0	0	0	1
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	1	0	0	0	1
W	0	0	0	0	0	0	0
WNW	0	0	1	0	1	0	2
NW	0	0	0	2	0	1	3
NNW	0	0	1	1	0	1	3
TOTAL	0	0	4	4	1	2	11

Hours of Missing Data: 32

Hours at Each Wind Speed and Direction
Period of Record = 90100100-90123123
Stability Class: C DT/DZ
Elevation: Speed:SP380A Direction:DIR380A Lapse:DT380

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	3	0	0	0	3
NNE	0	1	0	0	0	0	1
NE	0	0	2	0	0	0	2
ENE	0	2	4	0	0	0	6
E	0	2	1	0	0	0	3
ESE	0	1	0	0	0	0	1
SE	0	1	1	1	3	1	7
SSE	1	1	5	2	0	0	9
S	0	0	1	5	1	1	8
SSW	0	0	3	5	2	2	12
SW	0	3	2	3	1	0	9
WSW	0	0	2	4	3	0	9
W	0	0	1	5	1	3	10
WNW	0	0	3	7	4	10	24
NW	0	0	3	11	5	6	25
NNW	0	1	3	1	1	1	7
TOTAL	1	12	34	44	21	24	136

Hours of Missing Data: 32

Hours at Each Wind Speed and Direction
Period of Record = 90100100-90123123
Stability Class: B DT/DZ
Elevation: Speed:SP380A Direction:DIR380A Lapse:DT380A

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	0	0	2	0	2
NNE	0	0	0	0	0	0	0
NE	0	0	0	2	0	0	2
ENE	0	0	2	1	0	0	3
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	2	0	0	1	3
SSE	0	0	0	1	0	0	1
S	0	0	0	2	0	0	2
SSW	1	0	1	2	2	0	6
SW	0	0	0	2	0	0	2
WSW	0	0	1	1	1	0	3
W	0	0	0	2	0	0	2
WNW	0	0	0	6	1	9	16
NW	0	0	2	7	3	9	21
NNW	0	0	4	4	4	2	14
TOTAL	1	0	12	30	13	21	77

Hours of Missing Data: 32

Hours at Each Wind Speed and Direction
Period of Record = 90100100-90123123
Stability Class: D DT/DZ
Elevation: Speed:SP380A Direction:DIR380A Lapse:DT380

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	5	2	7	9	23
NNE	0	0	3	4	0	0	7
NE	0	1	7	5	3	1	17
ENE	0	3	9	0	2	3	17
E	0	1	1	2	1	2	7
ESE	0	2	7	2	1	5	17
SE	0	3	9	4	6	8	30
SSE	0	0	8	9	2	1	20
S	1	1	13	6	4	8	33
SSW	0	0	13	28	26	11	78
SW	1	3	7	20	9	7	47
WSW	0	4	8	12	13	4	41
W	0	5	14	7	17	6	49
WNW	0	4	10	15	29	33	91
NW	0	2	14	25	25	18	84
NNW	0	3	1	11	23	12	50
TOTAL	2	32	129	152	168	128	611

Hours of Missing Data: 32

Fourth Quarter, 1990 380-Foot Level

Hours at Each Wind Speed and Direction
Period of Record = 90100100-90123123
Stability Class: E DT/DZ
Elevation: Speed:SP380A Direction:DIR380A Lapse:DT380A

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	2	6	4	1	13
NNE	0	0	2	11	0	0	13
NE	0	1	4	5	3	1	14
ENE	0	1	4	5	3	8	21
E	0	1	0	3	1	1	6
ESE	0	1	0	3	6	2	12
SE	0	0	5	18	14	8	45
SSE	0	5	3	12	22	9	51
S	0	1	6	12	15	5	39
SSW	0	1	8	31	54	15	109
SW	0	2	6	36	35	20	99
WSW	1	0	5	5	14	13	38
W	0	1	7	9	35	8	60
WNW	0	1	4	11	44	16	76
NW	1	2	5	28	44	19	99
NNW	0	1	1	12	30	6	50
TOTAL	2	18	62	207	324	132	745

Hours of Missing Data: 32

Hours at Each Wind Speed and Direction
Period of Record = 90100100-90123123
Stability Class: G DT/DZ
Elevation: Speed:SP380A Direction:DIR380A Lapse:DT380

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	2	5	14	8	1	30
NNE	0	0	3	4	2	0	9
NE	0	0	4	3	0	0	7
ENE	0	0	2	0	0	0	2
E	0	0	0	0	0	0	0
ESE	0	3	2	0	0	0	5
SE	0	2	2	0	0	0	4
SSE	0	9	6	1	1	0	17
S	1	3	3	4	0	0	11
SSW	3	3	11	9	4	2	32
SW	1	5	6	12	6	5	35
WSW	1	0	2	9	9	7	28
W	2	1	1	6	22	13	45
WNW	0	2	3	4	4	2	15
NW	0	1	0	2	8	5	16
NNW	1	5	9	11	11	4	41
TOTAL	9	36	59	79	75	39	297

Hours of Missing Data: 32

Hours at Each Wind Speed and Direction
Period of Record = 90100100-90123123
Stability Class: F DT/DZ
Elevation: Speed:SP380A Direction:DIR380A Lapse:DT380A

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	0	1	2	8	0	11
NNE	0	0	2	1	0	0	3
NE	0	0	2	0	1	0	3
ENE	0	3	1	0	0	0	4
E	0	1	1	0	0	0	2
ESE	1	1	0	0	0	0	2
SE	1	1	0	0	0	0	2
SSE	1	0	3	0	1	0	5
S	2	1	5	6	5	0	19
SSW	0	0	1	0	10	1	12
SW	0	0	3	4	20	21	48
WSW	0	0	4	6	12	30	52
W	0	0	2	8	12	8	30
WNW	0	0	2	7	10	2	21
NW	0	0	2	8	28	17	55
NNW	0	0	1	5	19	5	30
TOTAL	5	7	30	47	126	84	299

Hours of Missing Data: 32

Hours at Each Wind Speed and Direction
Period of Record = 90100100-90123123
Stability Class: ALL DT/DZ
Elevation: Speed:SP380A Direction:DIR380A Lapse:DT380

Wind Direction	Wind Speed (mph) 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	2	16	24	29	11	82
NNE	0	1	10	20	2	0	33
NE	0	2	19	15	7	2	45
ENE	0	9	22	7	5	11	54
E	0	5	3	5	2	3	18
ESE	1	8	9	5	7	7	37
SE	1	7	19	23	23	18	91
SSE	2	15	25	25	26	10	103
S	4	6	29	35	25	14	113
SSW	4	4	37	75	98	31	249
SW	2	13	24	77	71	53	240
WSW	2	4	23	37	52	54	172
W	2	7	25	37	87	38	196
WNW	0	7	23	50	93	72	245
NW	1	5	26	83	113	75	303
NNW	1	10	20	45	88	31	195
TOTAL	20	105	330	563	728	430	2176

Hours of Missing Data: 32

Section III: Changes to PCP and ODCM

Change Number 1

Procedure Title:	Process Control Plan for Processing Resins Into a CNSI High Integrity Container (Procedure 352.0, Rev.11)
Effective Date:	October 31, 1990
Description of Change:	To incorporate the CNSI Rapid Dewatering System (RDS-1000) into Procedure 352.0 which will reduce the High Integrity Container dewatering time for resin from 3 cycles to 1 cycle and yet not change the final waste form requirement of less than or equal to 1% water by volume.
Radwaste Programs Manager:	A.H. Wacha

Change Number 2

Procedure Title:	Offsite Dose Calculation Manual (ODCM)
Effective Date:	August 1, 1990
Description of Change:	Mixing ratios used in the assessment of liquid effluent doses were updated using information from FSAR and historic analysis of the Barnegat Bay.
Environmental Scientist:	P.E. Schwartz

Section IV: Effluent Monitoring Instrumentation Inoperability

EFFLUENT MONITORING INSTRUMENTATION INOPERABILITY

Section 3.15 of the Technical Specifications requires that "instrumentation to monitor radioactive effluents [must be] operable when effluent is discharged or that [some] means of measuring effluent is provided." Furthermore, sections 3.15.A and 3.15.B for liquid and gaseous effluent monitoring instrumentation, respectively, state that when "less than the minimum number of ... channels are operable, ... make every reasonable effort to restore the instrument to operable status within 30 days and, if unsuccessful, explain in the next Semiannual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner."

During the reporting period, July 1, 1990 through December 31, 1990, the following effluent monitoring instrumentation inoperabilities greater than 30 days were recorded:

Failure to maintain operability of:

1. Liquid Radwaste Effluent Line Monitor (Table 3.15.1a)*
2. Reactor Building Service Water System Effluent Line Monitor (Table 3.15.1b)

Corrective Action: The corrective actions in Table 3.15.1 of the OC Technical Specifications were implemented. Daily overboard discharge samples of the Reactor Building Closed Cooling Water (RBCCW) System service water were taken and analyzed from the beginning of the reporting period since the RBCCW monitor was taken out of service.

*There were no planned releases via this pathway during this period. Therefore, per Tech Spec 4.15.1, note b, the instrumentation was not required to be operable. The deletion for the requirement of this monitor from the Technical Specifications is currently under discussion.