GPU NUCLEAR

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March 2, 1999
1940-99-20118

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Dear Sir:

Subject: Oyster Creek Nuclear Generating Station
Docket No. 50-219
1998 Effluent Release Report

Attached is a copy of the Oyster Creek Annual Radioactive Effluent Release Report for the period covering January through December 31, 1998. This submittal is made in accordance with 10 CFR 50.36(a)(2) and our Operating License and Technical Specifications.

If you should have any questions or require further information, please contact Ms. Brenda DeMerchant, OC Licensing Engineer, at 609-971-4642.

Very truly yours,

Michael B Roche

Michael B. Roche
Vice President & Director
Oyster Creek

MBR/BDeM/gl

Enclosure

cc: Administrator, Region I
NRC Project Manager
NRC Sr. Resident Inspector
Chief, Bureau of Nuclear Engrg., NJ Dept. of Env. Protection

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EXECUTIVE SUMMARY

Oyster Creek Nuclear Station
Effluent and Off Site Dose Report
January 1, 1998 through December 31, 1998

This report summarizes the radioactive liquid and gaseous releases (effluents) from Oyster Creek and the calculated maximum hypothetical radiation exposure to the public resulting from these releases. This report covers the period of operation from January 1, 1998 through December 31,1998.

Radiological releases from the plant are monitored by installed plant radiation monitors which survey the plant stack for gaseous releases to the atmosphere and outfall pipes for liquid discharges to the cooling water discharge canal. These monitors and associated sample analyses provide a means to accurately determine the type and quantities of radioactive materials being released to the environment.

Utilizing gaseous effluent data, the maximum hypothetical dose to any individual in the vicinity of the plant is calculated. Similarly, liquid effluent data are used to calculate a maximum hypothetical dose to an individual from liquid effluents for any shoreline exposure. Doses to the public from consumption of shellfish and fish withdrawn from the canal are also calculated.

Calculations of the maximum hypothetical dose to an individual from liquid and gaseous effluents are performed using a mathematical model which is based on the methods defined by the U.S. Nuclear Regulatory Commission.

The maximum hypothetical doses are conservative overestimates of the actual off site doses which are likely to occur. For example, the dose does not take into consideration the removal of radioactive material from the salt water by precipitation of insoluble salts, absorption onto sediment, or biological removal.

Regarding solid, low level radioactive waste, Oyster Creek made 33 shipments totaling approximately 15,600 cu. ft. This material went to either licensed burial or to a waste processor for volume reduction. The SEG Rapid Dewatering System is currently being used in lieu of solidification for dewatering resins and filter sludge.

Liquid discharges made during 1998 consisted of 0.011 curies of tritium from flushing of the fire service system and 1-5 sump overboard discharges.

Airborne discharges made during this same time period consisted of 306.62 curies of tritium, 0.00234 curies of particulates, 0.0086 curies of Iodines, and 8.297 curies of noble gases.

The maximum hypothetical calculated organ dose to any individual due to gaseous effluents was about 0.022 millirem to the thyroid. The maximum hypothetical calculated whole body dose to any individual due to gaseous effluents was 0.017 mrem.

The maximum hypothetical calculated organ dose to any individual due to liquid effluents was about 0.00000009 mrem to the liver. The maximum hypothetical calculated whole body dose to any individual due to liquid effluents was 0.00000009 mrem.

The total maximum hypothetical whole body dose of 0.017 mrem received by any individual from effluents from the Oyster Creek Nuclear Station for the reporting period is about 17,500 times lower than the dose the average individual in the Oyster Creek area received from natural background radiation including that from radon (300 mrem) during the same time period. Natural background radiation dose averages about 100 millirem whole body per year in the central New Jersey area. In addition, the average equivalent dose to the whole body from naturally occurring radon is about 200 millirem per year.

The maximum dose which could be received by a hypothetical individual from any effluent stream is about 0.3 percent of the annual guidelines established by the Nuclear Regulatory Commission.

Maximum Offsite Dose Due to Radionuclides in Effluents January -December 1998

ODCM	4.6.1.1.4.A Liquid Dose WB mrem	4.6.1.1.4.A Organ mrem	4.6.1.1.6.A Air Dose Beta mrem	4.6.1.1.6.A (GAS) Gamma mrem	4.6.1.1.7.A (Thyroid) Organ mrem	4.6.1.1.8.A (Liver) Organ mrem	4.6.1.1.8.A Whole Body mrem	4.6.1.1.8.A (Thyroid) Organ mrem
1998 Total	8.6E-08	8.6E-08	4.00E-05	8.67E-05	2.2E-2	1.7E-02	1.71E-02	2.18E-02
ODCM Limit	3	10	20	10	15	25	25	75
Fraction of Annual Limit	3.6E-8	1.1E-8	5.5E-7	1.5E-5	2.1E-3	1.1E-3	1.1E-3	4.1E-4

OYSTER CREEK NUCLEAR GENERATING STATION

LIQUID EFFLUENT RELEASES

Oyster Creek Nuclear Generating Station Policy is to strive for a zero liquid discharge of radioactive material. However, in 1998, 21,250 gallons of slightly contaminated water were released from flushing the fire service system and 1-5 sump overboard discharges.

OFFSITE DOSE CALCULATION MANUAL

During the calendar year, a revision to the ODCM involved updates to the Radiological Environmental Monitoring Program (REMP), the addition of several documents to the "Reference" section, revision of specific air dispersion factors (X/Q) and numerous non-substantive changes. The number of annual samples and media in the REMP program were reduced. Specific air dispersion factors noted in the document's body were changed to match the values found in the appendices.

EFFLUENT MONITORS OUT OF SERVICE GREATER THAN 30 DAYS:

The following effluent monitors were out of service for more than thirty days:

- AOG Ventilation Monitor: 01/08/98 to 03/15/98; due to flow indicator problems and engineering changes
- Service Water Discharge Monitor; 03/10/98 to 07/12/98; failed functional testing due to a bad pump
- Overboard Discharge Monitor; 03/10/98 to 04/17/98; due to recorder problems

CHANGES TO THE PROCESS CONTROL PLAN:

There were no changes to the PCP in 1998.

Effluent and Waste Disposal Supplemental Information

FACILITY

Oyster Creek Nuclear Generating Station

LICENSEE

Owner: GPU, Inc.

Operator: GPU Nuclear

1.) **Regulatory Limits**

a. Fission and Activation Gases

Technical Specification 3.6.E
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).

ODCM 4.6.1.1.5.A
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. A value of 100 millirem total body is used due to the January 1, 1994 revision of 10 CFR 20.

ODCM 4.6.1.1.6.A
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

ODCM 4.6.1.1.8.A
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

ODCM 4.6.1.1.5.B
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.

ODCM 4.6.1.1.7.A
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

ODCM 4.6.1.1.3.A
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.

ODCM 4.6.1.1.3.B
The concentration of noble gases dissolved or entrained in liquid effluent in the discharge canal at the Route 9 bridge shall not exceed 2×10^{-4} microcuries/milliliter.

ODCM 4.6.1.1.4.A
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. **Derived Air Concentrations (DAC)**

a. Fission and Activation Gases:

Appendix B, Table II, Column 1 of 10 CFR 20

b. Iodines and Particulates:

Appendix B. Table II, Column 1 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 monthly 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 weekly and analyzed using gamma spectroscopy.

2 AOG Vent

Filters are changed weekly and analyzed using gamma spectroscopy.

3. Turbine Building Stack and Feedpump Room Vent

   Filters are changed weekly and analyzed using gamma spectroscopy.

c. Particulates

1. Stack

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

2. AOG Vent

   Filters are changed weekly and analyzed using gamma spectroscopy.

3. Turbine Building Stack and Feedpump Room Vent

   Filters are changed 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.

OYSTER CREEK NUCLEAR GENERATING STATION
FIRST QUARTER 1998
GASEOUS EFFLUENT ELEVATED RELEASES

For Period: 1- 1-98 0: 0 To 3-31-98 0: 0

FISSION GASES	QUANTITY (Ci)
XE135	1.57E+00

Total Fission Gases Released: 1.57E+00 Ci
Average Rate of Release: 2.05E-01 uCi/sec
Gamma E-Bar: 0.248 MeV

IODINES	QUANTITY (Ci)
I131	3.35E-04
I133	1.01E-03

Total Iodines Released: 1.34E-03 Ci
Average Rate of Release: 1.74E-04 uCi/sec

PARTICULATES	QUANTITY (Ci)
CR51	3.55E-05
MN54	1.51E-06
CO58	1.95E-05
CO60	1.67E-04
SR89	1.71E-04
SR90	7.42E-06
CS137	6.20E-06
BA140	2.90E-04

Total Particulates Released: 6.98E-04 Ci
Average Rate of Release: 9.08E-05 uCi/sec

RADIONUCLIDE	QUANTITY (Ci)
H3	6.68E+01

Avg. Rate of Release for H3: 8.68E+00 uCi/sec

OYSTER CREEK NUCLEAR GENERATING STATION
FIRST QUARTER 1998
GASEOUS EFFLUENT GROUND-LEVEL RELEASES

For Period: 1- 1-98 0: 0 To 3-31-98 0: 0

FISSION GASES	QUANTITY (Ci)
Total Fission Gases Released:	0.00E+00 Ci
Average Rate of Release:	0.00E+00 uCi/sec

IODINES	QUANTITY (Ci)
I131	5.18E-06
I133	1.84E-05
Total Iodines Released:	2.36E-05 Ci
Average Rate of Release:	3.06E-06 uCi/sec

PARTICULATES	QUANTITY (Ci)
CO58	7.41E-07
CO60	8.15E-06
GROSSA	3.83E-07
Total Particulates Released:	9.27E-06 Ci
Average Rate of Release:	1.21E-06 uCi/sec

RADIONUCLIDE	QUANTITY (Ci)
H3	4.69E+00
Avg. Rate of Release for H3:	6.10E-01 uCi/sec

OYSTER CREEK NUCLEAR GENERATING STATION
SECOND QUARTER 1998
GASEOUS EFFLUENT ELEVATED RELEASES

For Period: 4- 1-98 0: 0 To 6-30-98 0: 0

FISSION GASES	QUANTITY (Ci)
XE135	2.78E+00

Total Fission Gases Released: 2.78E+00 Ci
Average Rate of Release: 3.57E-01 uCi/sec
Gamma E-Bar: 0.248 MeV

IODINES	QUANTITY (Ci)
I131	4.50E-04
I133	1.98E-03

Total Iodines Released: 2.43E-03 Ci
Average Rate of Release: 3.12E-04 uCi/sec

PARTICULATES	QUANTITY (Ci)
CR51	1.12E-05
MN54	2.00E-05
CO58	5.16E-06
CO60	3.80E-05
SR89	4.02E-05
BA140	2.55E-04
GROSSA	1.10E-06

Total Particulates Released: 3.71E-04 Ci
Average Rate of Release: 4.77E-05 uCi/sec

RADIONUCLIDE	QUANTITY (Ci)
H3	8.74E+01

Avg. Rate of Release for H3: 1.12E+01 uCi/sec

OYSTER CREEK NUCLEAR GENERATING STATION
SECOND QUARTER 1998
GASEOUS EFFLUENT GROUND-LEVEL RELEASES

For Period: 4- 1-98 0: 0 To 6-30-98 0: 0

FISSION GASES	QUANTITY (Ci)
KR85M	3.23E-03

Total Fission Gases Released: 3.23E-03 Ci
Average Rate of Release: 4.15E-04 uCi/sec
Gamma E-Bar: 0.158 MeV

IODINES	QUANTITY (Ci)

Total Iodines Released: 0.00E+00 Ci
Average Rate of Release: 0.00E+00 uCi/sec

PARTICULATES	QUANTITY (Ci)
GROSSA	4.22E-07

Total Particulates Released: 4.22E-07 Ci
Average Rate of Release: 5.43E-08 uCi/sec

RADIONUCLIDE	QUANTITY (Ci)
H3	2.62E+00

Avg. Rate of Release for H3: 3.37E-01 uCi/sec

OYSTER CREEK NUCLEAR GENERATING STATION
THIRD QUARTER 1998
GASEOUS EFFLUENT ELEVATED RELEASES

For Period: 7- 1-98 0: 0 To 9-30-98 0: 0

FISSION GASES	QUANTITY (Ci)
XE135	3.00E+00

Total Fission Gases Released: 3.00E+00 Ci
Average Rate of Release: 3.81E-01 uCi/sec
Gamma E-Bar: 0.248 MeV

IODINES	QUANTITY (Ci)
I131	5.66E-04
I132	1.50E-04
I133	2.53E-03
I134	8.46E-07
I135	1.32E-06

Total Iodines Released: 3.25E-03 Ci
Average Rate of Release: 4.14E-04 uCi/sec

PARTICULATES	QUANTITY (Ci)
NA24	1.69E-06
CR51	2.65E-05
MN54	3.63E-05
CO58	6.47E-06
CO60	8.39E-05
SR89	2.13E-04
SR90	1.16E-06
NB95	2.11E-06
TC99M	1.44E-06
BA140	6.28E-04

Total Particulates Released: 1.00E-03 Ci
Average Rate of Release: 1.27E-04 uCi/sec

RADIONUCLIDE	QUANTITY (Ci)
H3	9.10E+01

Avg. Rate of Release for H3: 1.16E+01 uCi/sec

OYSTER CREEK NUCLEAR GENERATING STATION
THIRD QUARTER 1998
GASEOUS EFFLUENT GROUND-LEVEL RELEASES

For Period: 7- 1-98 0: 0 To 9-30-98 0: 0

FISSION GASES	QUANTITY (Ci)
Total Fission Gases Released:	0.00E+00 Ci
Average Rate of Release:	0.00E+00 uCi/sec

IODINES	QUANTITY (Ci)
I133	2.19E-06
Total Iodines Released:	2.19E-06 Ci
Average Rate of Release:	2.79E-07 uCi/sec

PARTICULATES	QUANTITY (Ci)
CS137	3.13E-07
Total Particulates Released:	3.13E-07 Ci
Average Rate of Release:	3.98E-08 uCi/sec

RADIONUCLIDE	QUANTITY (Ci)
H3	2.83E+00
Avg. Rate of Release for H3:	3.60E-01 uCi/sec

OYSTER CREEK NUCLEAR GENERATING STATION
FOURTH QUARTER 1998
GASEOUS EFFLUENT ELEVATED RELEASES

For Period: 10- 1-98 0: 0 To 12-31-98 0: 0

FISSION GASES	QUANTITY (Ci)
XE135	9.44E-01

Total Fission Gases Released: 9.44E-01 Ci
Average Rate of Release: 1.20E-01 uCi/sec
Gamma E-Bar: 0.248 MeV

IODINES	QUANTITY (Ci)
I131	1.98E-04
I133	2.03E-03

Total Iodines Released: 2.23E-03 Ci
Average Rate of Release: 2.84E-04 uCi/sec

PARTICULATES	QUANTITY (Ci)
CR51	7.18E-06
MN54	3.53E-05
CO58	1.94E-06
CO60	9.24E-05
SR89	7.80E-05
SR90	6.80E-07
BA140	3.73E-05
GROSSA	1.85E-06

Total Particulates Released: 2.55E-04 Ci
Average Rate of Release: 3.24E-05 uCi/sec

RADIONUCLIDE	QUANTITY (Ci)
H3	4.95E+01

Avg. Rate of Release for H3: 6.30E+00 uCi/sec

OYSTER CREEK NUCLEAR GENERATING STATION
FOURTH QUARTER 1998
GASEOUS EFFLUENT GROUND-LEVEL RELEASES

For Period: 10- 1-98 0: 0 To 12-31-98 0: 0

FISSION GASES	QUANTITY (Ci)
Total Fission Gases Released:	0.00E+00 Ci
Average Rate of Release:	0.00E+00 uCi/sec

IODINES	QUANTITY (Ci)
I131	2.21E-06
Total Iodines Released:	2.21E-06 Ci
Average Rate of Release:	2.81E-07 uCi/sec

PARTICULATES	QUANTITY (Ci)
SR90	3.40E-08
GROSSA	1.15E-06
Total Particulates Released:	1.19E-06 Ci
Average Rate of Release:	1.51E-07 uCi/sec

RADIONUCLIDE	QUANTITY (Ci)
H3	1.78E+00
Avg. Rate of Release for H3:	2.26E-01 uCi/sec

OYSTER CREEK NUCLEAR GENERATING STATION

BASIS OF CALCULATED DOSE OFFSITE DUE TO LIQUID EFFLUENT

Source of Effluent: All Releases
Beginning Time of Interest: 1- 1-98 0: 0
Ending Time of Interest: 12-31-98 23:59

Exposure Pathway	Mixing Ratio
SALT WATER FISH	0.3
SALT WATER SHELL FISH	0.3
DISCHARGE CANAL SHORELINE DEPOSITS	0.3
SWIMMING	0.3
BOATING	0.3

Identification Numbers of Samples Used to Compute Dose

FLSH1297	SUMP5L	SUH30398	SUH30498	SUH30598
LIQ09A98	LIQ09B98	LIQ09C98	LIQ09D98	LIQ09E98
LIQ09F98	LIQ09G98	LIQ09H98	LIQ09I98	LIQ09J98

QUANTITY OF EACH RADIONUCLIDE
IN LIQUID EFFLUENT DURING TIME OF INTEREST
(1- 1-98 0: 0 TO 12-31-98 23:59)

Nuclide	Quantity (Ci)
H3	1.1E-02

OYSTER CREEK NUCLEAR GENERATING STATION

OFFSITE DOSE DUE TO RADIOACTIVE LIQUID EFFLUENT

Source of Effluent: All Releases
Beginning Time of Interest: 1- 1-98 0: 0
Ending Time of Interest: 12-31-98 23:59

Maximum Dose to Most Exposed Organ and to Total Body in Any Age Group

Exposure Pathway	Maximum Organ Dose (mrem)	Total Body Dose (mrem)
SALT WATER FISH	6.9E-08	6.9E-08
SALT WATER SHELL FISH	1.7E-08	1.7E-08
DISCHARGE CANAL SHORELINE DEPOSITS	0.0E+00	0.0E+00
SWIMMING	0.0E+00	0.0E+00
BOATING	0.0E+00	0.0E+00
Total Computed Dose	8.6E-08	8.6E-08
Percent of Annual Limit	8.6E-07	2.9E-06
Annual Dose Limit (mrem)	1.0E+01	3.0E+00
Projected Annual Dose (mrem)	8.6E-08	8.6E-08
Age Group Receiving Maximum Dose	ADULT	ADULT
Organ Receiving Maximum Dose	LIVER	

NRC Reg. Guide 1.21 Report
Report Date 02/26/99

Solid Waste Shipped Off-site for Disposal; Reporting Period: 1/1/98 to 12/31/98

Waste Stream: Resins, Filter Media, Filters and Evaporator Bottoms

WASTE CLASS	VOLUME (ft^3)	VOLUME (m^3)	CURIES SHIPPED	PERCENT ERROR (Ci)
A	3473.8	98.31	1.28E+02	± 25
B	0	0	0	± 25
C	0	0	0	± 25
ALL	3473.8	98.31	1.28E+02	± 25

Estimates of Major Nuclides by Waste Class and Stream: Resins, Filter Media, Filters and Evaporator Bottoms (with a 1% cut off)

WASTE CLASS	NUCLIDE	PERCENT ABUNDANCE	CURIES
A; ALL	Co-60	51.914 %	6.645E+02
	Fe-55	23.978 %	3.069E+02
	Mn-54	12.063 %	1.544E+02
	Cs-137	5.864 %	7.510E+01
	Cr-51	1.018 %	1.303E+01
	Ni-63	0.741 %	9.48E+00
	H-3	0.599 %	7.67E+00
	Pu-241	0.021 %	2.688E-01
	Sr-90	0.021 %	2.688E-01
	Ni-59	0.011 %	1.408E-01
	Cm-242	0.000 %	4.097E-03
	I-129	0.000 %	0.00E+00
	Tc-99	0.000 %	0.00E+00
	C-14	0.000 %	0.00E+00
	Nb-94	0.000 %	0.00E+00

NRC Reg. Guide 1.21 Report
Report Date 02/26/99

Solid Waste Shipped Off-site for Disposal; Reporting Period: 1/1/98 to 12/31/98

Waste Stream: Hi-Rad Dry Active Waste

WASTE CLASS	VOLUME (ft^3)	VOLUME (m^3)	CURIES SHIPPED	PERCENT ERROR (Ci)
A	180.1	5.1	4.49E-01	± 25
B	0	0	0	± 25
C	0	0	0	± 25
ALL	180.1	5.1	4.49E-01	± 25

Estimates of Major Nuclides by Waste Class and Stream: Hi-Rad Dry Active Waste (with a 1% cut off)

WASTE CLASS	NUCLIDE	PERCENT ABUNDANCE	CURIES
A; ALL	Fe-55	42.762 %	1.92E-01
	Co-60	35.189 %	1.58E-01
	Cs-137	12.272 %	5.51E-02
	Mn-54	6.236 %	2.80E-02
	Ni-63	0.428 %	1.92E-03
	H-3	0.031 %	1.41E-04
	Sr-90	0.027 %	1.23E-04
	Pu-241	0.020 %	8.92E-05
	Ni-59	0.005 %	2.37E-05
	Cm-242	0.000 %	8.52E-07
	I-129	0.000 %	0.00E+00
	Tc-99	0.000 %	0.00E+00
	C-14	0.000 %	0.00E+00
	Nb-94	0.000 %	0.00E+00

NRC Reg. Guide 1.21 Report
Report Date 02/26/99

Solid Waste Shipped Off-site for Volume Reduction and Disposal; Reporting Period: 1/1/98 to 12/31/98

Waste Stream: Irradiated Components

WASTE CLASS	VOLUME (ft^3)	VOLUME (m^3)	CURIES SHIPPED	PERCENT ERROR (Ci)
A	1082.54*	30.66*	1.48E+01	± 25
B	0	0	0	± 25
C	0	0	0	± 25
ALL	1082.54*	30.66*	1.48E+01	± 25

*NOTE: Volume is of the shipping container before volume reduction by an off-site vendor.

Estimates of Major Nuclides by Waste Class and Stream: Irradiated Components
(with a 1% cut off)

WASTE CLASS	NUCLIDE	PERCENT ABUNDANCE	CURIES
A; ALL	Fe-55	40.9	6.07E+00
	Co-60	36.6	5.44E+00
	Cr-51	15.6	2.31E+00
	Ni-63	3.54	5.26E-01
	Co-58	1.21	1.79E-01
	Mn-54	1.04	1.54E-01
	Cs-137	0.56	8.28E-02
	Pu-241	0.038	5.64E-03
	Ni-59	0.0258	3.83E-03
	C-14	0.0031	4.54E-04
	Sr-90	0.0018	2.61E-04
	H-3	0.0013	1.92E-04
	Nb-94	0.0011	1.169E-06
	Cm-242	0.00	2.02E-06
	Tc-99	0.00	3.95E-07
	I-129	0.00	0.00E+00

NRC Reg. Guide 1.21 Report
Report Date 02/26/99

Solid Waste Shipped Off-site for Disposal; Reporting Period: 1/1/98 to 12/31/98

Waste Stream: Dry Active Waste Sent to an Off-site Waste Processor for Volume Reduction

WASTE CLASS	VOLUME (ft^3)	VOLUME (m^3)	CURIES SHIPPED	PERCENT ERROR (Ci)
A	10801.5	305.68	1.036	± 25
B	0	0	0	± 25
C	0	0	0	± 25
ALL	10801.5	305.68	1.036	± 25

Estimates of Major Nuclides by Waste Class and Stream: Dry Active Waste Sent to an Off-site Waste Processor for Volume Reduction (with a 1% cut off)

WASTE CLASS	NUCLIDE	PERCENT ABUNDANCE	CURIES
A; ALL	Fe-55	42.65	4.42E-01
	Co-60	34.92	3.62E-01
	Cs-137	12.14	1.26E-01
	Mn-54	6.40	6.6E-02
	Ni-63	0.42	4.4E-03
	H-3	0.03	3.11E-04
	Sr-90	0.03	3.11E-04
	Pu-241	0.02	2.07E-04
	Ni-59	0.01	1.04E-04
	Cm-242	0.00	2.09E-06
	C-14	0.00	0.00E+00
	Tc-99	0.00	0.00E+00
	I-129	0.00	0.00E+00

NRC Reg. Guide 1.21 Report
Report Date 02/26/99

Reporting Period: 1/1/98 to 12/31/98

Estimates of Major Nuclides by Waste Class and Stream: Sum of All Categories

WASTE CLASS	NUCLIDE	PERCENT ABUNDANCE	CURIES
A; ALL	Co-60	51.7	6.70E+02
	Fe-55	24.23	3.14E+02
	Mn-54	11.96	1.55E+02
	Cs-137	5.82	7.54E+01
	Cr-51	1.18	1.53E+01
	Ni-63	0.77	1.00E+01
	H-3	0.59	2.67E+00
	Pu-241	0.02	2.75E-01
	Sr-90	0.02	2.70E-01
	Ni-59	0.01	1.45E-01
	Cm-242	0.00	4.10E-03
	C-14	0.00	4.54E-04
	Nb-94	0.00	1.17E-06
	Tc-99	0.00	3.95E-07
	I-129	0.00	0.00E+00

SOLID WASTE DISPOSITION SUMMARY; PERIOD FROM 01/01/98 to 12/31/98

NUMBER OF SHIPMENTS	MODE OF TRANSPORTATION	DESTINATION
20	Truck	Barnwell, SC
6	Truck	Memphis, TN
4	Truck	Wampum, PA
3	Truck	Richland, WA

OYSTER CREEK 33 FOOT DATA
JOINT FREQUENCY TABLES
VERSION: 98.8 PRINTED 02-18-1999

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD 98010100 TO 98123123
STABILITY CLASS A

SECTOR WINDS TO	FROM	WIND SPEED 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	S	1	46	19	18	0	0	84
NNE	SSW	3	12	5	17	0	0	37
NE	SW	4	19	8	4	0	0	35
ENE	WSW	6	25	24	2	0	0	57
E	W	8	33	25	11	1	0	78
ESE	WNW	13	52	55	34	2	0	156
SE	NW	8	61	81	23	8	1	182
SSE	NNW	5	33	23	8	1	0	70
S	N	3	16	3	0	0	0	22
SSW	NNE	5	4	3	0	0	0	12
SW	NE	5	17	9	0	0	0	31
WSW	ENE	13	61	28	0	0	0	102
W	E	22	66	28	3	0	0	119
WNW	ESE	14	39	25	0	0	0	78
NW	SE	5	62	31	0	0	0	98
NNW	SSE	4	32	33	1	0	0	70
TOTAL		119	578	400	121	12	1	1231

OYSTER CREEK 33 FOOT DATA
JOINT FREQUENCY TABLES
VERSION: 98.8 PRINTED 02-18-1999

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD 98010100 TO 98123123
STABILITY CLASS B

SECTOR TO	WINDS FROM	WIND SPEED 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	S	3	16	7	4	0	0	30
NNE	SSW	3	17	4	2	0	0	26
NE	SW	4	10	4	3	0	0	21
ENE	WSW	7	16	12	1	0	0	36
E	W	4	21	21	0	0	0	46
ESE	WNW	2	20	17	7	0	0	46
SE	NW	12	21	25	6	1	0	65
SSE	NNW	1	17	14	1	0	0	33
S	N	5	6	2	0	0	0	13
SSW	NNE	7	4	1	0	0	0	12
SW	NE	8	16	4	0	0	0	28
WSW	ENE	8	16	5	0	0	0	29
W	E	8	26	3	2	0	0	39
WNW	ESE	4	8	2	0	0	0	14
NW	SE	8	19	5	0	0	0	32
NNW	SSE	3	21	11	0	0	0	35
TOTAL		87	254	137	26	1	0	505

OYSTER CREEK 33 FOOT DATA
JOINT FREQUENCY TABLES
VERSION: 98.8 PRINTED 02-18-1999

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD 98010100 TO 98123123
STABILITY CLASS C

SECTOR TO	WINDS FROM	WIND SPEED 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	S	1	13	7	3	0	0	24
NNE	SSW	1	3	3	4	0	0	11
NE	SW	3	6	0	0	0	0	9
ENE	WSW	4	6	2	0	0	0	12
E	W	4	12	4	0	0	0	20
ESE	WNW	5	12	6	3	0	0	26
SE	NW	2	10	6	3	2	0	23
SSE	NNW	2	5	6	1	0	0	14
S	N	1	9	2	0	0	0	12
SSW	NNE	4	0	0	0	0	0	4
SW	NE	4	4	1	1	0	0	10
WSW	ENE	3	4	3	0	0	0	10
W	E	3	8	1	0	0	0	12
WNW	ESE	3	6	1	0	0	0	10
NW	SE	4	12	3	0	0	0	19
NNW	SSE	5	6	5	0	0	0	16
TOTAL		49	116	50	15	2	0	232

OYSTER CREEK 33 FOOT DATA
JOINT FREQUENCY TABLES
VERSION: 98.8 PRINTED 02-18-1999

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD 98010100 TO 98123123
STABILITY CLASS D

SECTOR TO	WINDS FROM	WIND SPEED 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	S	39	87	46	13	2	1	188
NNE	SSW	30	69	43	36	3	0	181
NE	SW	25	39	15	5	1	0	85
ENE	WSW	26	39	30	2	1	0	98
E	W	26	65	32	8	0	0	131
ESE	WNW	37	56	46	18	2	0	159
SE	NW	24	98	43	19	2	0	186
SSE	NNW	32	69	29	2	0	0	132
S	N	40	38	7	0	0	0	85
SSW	NNE	35	70	29	4	0	0	138
SW	NE	40	69	68	29	2	0	208
WSW	ENE	37	45	33	31	3	0	149
W	E	32	55	35	14	1	0	137
WNW	ESE	25	49	21	2	0	0	97
NW	SE	42	70	20	3	0	0	135
NNW	SSE	43	59	14	2	2	0	120
TOTAL		533	977	511	188	19	1	2229

OYSTER CREEK 33 FOOT DATA
JOINT FREQUENCY TABLES
VERSION: 98.8 PRINTED 02-18-1999

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD 98010100 TO 98123123
STABILITY CLASS E

SECTOR TO	WINDS FROM	WIND SPEED 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	S	60	52	24	12	3	0	151
NNE	SSW	82	94	51	21	0	0	248
NE	SW	91	121	52	3	0	0	267
ENE	WSW	84	117	23	0	0	0	224
E	W	53	96	25	1	0	0	175
ESE	WNW	59	93	64	4	0	0	220
SE	NW	68	102	59	16	1	0	246
SSE	NNW	49	70	36	7	1	0	163
S	N	41	21	25	16	0	0	103
SSW	NNE	34	16	47	29	0	0	126
SW	NE	39	39	15	38	3	0	134
WSW	ENE	24	32	7	3	1	0	67
W	E	43	31	10	3	0	0	87
WNW	ESE	21	7	7	3	0	0	38
NW	SE	32	22	5	5	0	0	64
NNW	SSE	40	23	7	7	2	0	79
TOTAL		820	936	457	168	11	0	2392

OYSTER CREEK 33 FOOT DATA
JOINT FREQUENCY TABLES
VERSION: 98.8 PRINTED 02-18-1999

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD 98010100 TO 98123123
STABILITY CLASS F

SECTOR TO	WINDS FROM	WIND SPEED 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	S	19	10	0	0	0	0	29
NNE	SSW	33	27	1	0	0	0	61
NE	SW	44	29	2	0	0	0	75
ENE	WSW	70	70	2	0	0	0	142
E	W	73	64	5	0	0	0	142
ESE	WNW	63	76	6	0	0	0	145
SE	NW	69	68	6	1	0	0	144
SSE	NNW	28	34	2	0	0	0	64
S	N	10	4	0	0	0	0	14
SSW	NNE	6	1	0	0	0	0	7
SW	NE	11	3	1	0	1	0	16
WSW	ENE	6	3	0	0	0	0	9
W	E	9	0	0	0	0	0	9
WNW	ESE	2	1	0	0	0	0	3
NW	SE	10	3	0	0	0	0	13
NNW	SSE	21	4	1	0	0	0	26
TOTAL		474	397	26	1	1	0	899

OYSTER CREEK 33 FOOT DATA
JOINT FREQUENCY TABLES
VERSION: 98.8 PRINTED 02-18-1999

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD 98010100 TO 98123123
STABILITY CLASS G

SECTOR TO	WINDS FROM	WIND SPEED 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	S	28	4	0	0	0	0	32
NNE	SSW	36	2	0	0	0	0	38
NE	SW	46	16	0	0	0	0	62
ENE	WSW	225	100	0	0	0	0	325
E	W	235	80	1	0	0	0	316
ESE	WNW	158	29	0	0	0	0	187
SE	NW	119	27	0	0	0	0	146
SSE	NNW	57	9	0	0	0	0	66
S	N	15	5	1	0	0	0	21
SSW	NNE	7	1	0	0	0	0	8
SW	NE	6	0	0	0	0	0	6
WSW	ENE	7	1	0	0	0	0	8
W	E	7	1	0	0	0	0	8
WNW	ESE	5	0	0	0	0	0	5
NW	SE	12	1	0	0	0	0	13
NNW	SSE	10	4	0	0	0	0	14
TOTAL		973	280	2	0	0	0	1255

OYSTER CREEK 33 FOOT DATA
JOINT FREQUENCY TABLES
VERSION: 98.8 PRINTED 02-18-1999

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD 98010100 TO 98123123
STABILITY CLASS ALL

SECTOR TO	WINDS FROM	WIND SPEED 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	S	151	228	103	50	5	1	538
NNE	SSW	188	224	107	80	3	0	602
NE	SW	217	240	81	15	1	0	554
ENE	WSW	422	373	93	5	1	0	894
E	W	403	371	113	20	1	0	908
ESE	WNW	337	338	194	66	4	0	939
SE	NW	302	387	220	68	14	1	992
SSE	NNW	174	237	110	19	2	0	542
S	N	115	99	40	16	0	0	270
SSW	NNE	98	96	80	33	0	0	307
SW	NE	113	148	98	68	6	0	433
WSW	ENE	98	162	76	34	4	0	374
W	E	124	187	77	22	1	0	411
WNW	ESE	74	110	56	5	0	0	245
NW	SE	113	189	64	8	0	0	374
NNW	SSE	126	149	71	10	4	0	360
TOTAL		3055	3538	1583	519	46	2	8743

Hours of Missing/Invalid Data: 17

OYSTER CREEK 380 FOOT DATA
JOINT FREQUENCY TABLES
VERSION: 98.8 PRINTED 02-18-1999

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD 98010100 TO 98123123
STABILITY CLASS A

SECTOR TO	WINDS FROM	WIND SPEED 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	S	0	1	0	0	1	0	2
NNE	SSW	0	0	0	4	0	0	4
NE	SW	0	0	2	0	0	0	2
ENE	WSW	0	0	0	2	0	0	2
E	W	0	0	0	3	5	0	8
ESE	WNW	0	0	0	11	12	1	24
SE	NW	0	0	0	7	12	5	24
SSE	NNW	0	0	0	1	1	0	2
S	N	0	0	0	0	0	0	0
SSW	NNE	0	0	0	0	0	0	0
SW	NE	0	0	1	2	0	0	3
WSW	ENE	0	0	1	2	0	0	3
W	E	0	0	2	1	0	0	3
WNW	ESE	0	1	2	0	0	0	3
NW	SE	1	0	1	1	0	0	3
NNW	SSE	0	1	0	2	1	0	4
TOTAL		1	3	9	36	32	6	87

OYSTER CREEK 380 FOOT DATA
JOINT FREQUENCY TABLES
VERSION: 98.8 PRINTED 02-18-1999

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD 98010100 TO 98123123
STABILITY CLASS B

SECTOR TO	WINDS FROM	WIND SPEED 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	S	0	0	2	12	4	1	19
NNE	SSW	0	0	0	7	5	0	12
NE	SW	0	0	2	3	3	0	8
ENE	WSW	0	0	3	10	3	0	16
E	W	0	0	1	19	5	4	29
ESE	WNW	0	0	8	14	22	9	53
SE	NW	0	0	4	26	16	5	51
SSE	NNW	0	0	3	10	4	1	18
S	N	0	1	3	2	0	0	6
SSW	NNE	0	1	1	0	0	0	2
SW	NE	0	0	2	7	0	0	9
WSW	ENE	0	1	14	10	1	0	26
W	E	0	0	10	4	0	0	14
WNW	ESE	0	0	11	2	0	0	13
NW	SE	0	0	9	7	0	0	16
NNW	SSE	0	1	3	6	0	0	10
TOTAL		0	4	76	139	63	20	302

OYSTER CREEK 380 FOOT DATA
JOINT FREQUENCY TABLES
VERSION: 98.8 PRINTED 02-18-1999

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD 98010100 TO 98123123
STABILITY CLASS C

SECTOR TO	WINDS FROM	WIND SPEED 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	S	0	0	8	24	5	0	37
NNE	SSW	0	2	5	11	6	2	26
NE	SW	0	0	7	9	3	2	21
ENE	WSW	0	2	10	21	5	0	38
E	W	0	2	11	24	5	1	43
ESE	WNW	0	2	18	23	19	20	82
SE	NW	0	1	21	40	20	10	92
SSE	NNW	0	0	9	17	3	2	31
S	N	0	1	5	3	1	0	10
SSW	NNE	0	0	2	1	0	0	3
SW	NE	0	1	7	5	1	0	14
WSW	ENE	0	4	27	16	0	0	47
W	E	0	2	35	5	0	0	42
WNW	ESE	0	4	24	1	0	0	29
NW	SE	0	2	19	13	0	0	34
NNW	SSE	0	1	20	17	0	0	38
TOTAL		0	24	228	230	68	37	587

OYSTER CREEK 380 FOOT DATA
JOINT FREQUENCY TABLES
VERSION: 98.8 PRINTED 02-18-1999

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD 98010100 TO 98123123
STABILITY CLASS D

SECTOR TO	WINDS FROM	WIND SPEED 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	S	4	26	84	79	35	10	238
NNE	SSW	5	14	45	109	51	36	260
NE	SW	2	17	41	44	25	4	133
ENE	WSW	4	16	32	62	23	4	141
E	W	2	23	64	93	23	8	213
ESE	WNW	1	19	64	89	55	38	266
SE	NW	3	28	71	112	81	50	345
SSE	NNW	1	11	68	85	30	8	203
S	N	6	31	46	19	9	0	111
SSW	NNE	6	33	55	40	30	16	180
SW	NE	2	24	86	74	59	110	355
WSW	ENE	6	26	68	56	27	50	233
W	E	2	39	104	47	27	23	242
WNW	ESE	7	39	86	22	2	3	159
NW	SE	4	36	106	30	10	6	192
NNW	SSE	6	30	122	42	7	5	212
TOTAL		61	412	1142	1003	494	371	3483

OYSTER CREEK 380 FOOT DATA
JOINT FREQUENCY TABLES
VERSION: 98.8 PRINTED 02-18-1999

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD 98010100 TO 98123123
STABILITY CLASS E

SECTOR TO	WINDS FROM	WIND SPEED 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	S	2	10	38	51	13	15	129
NNE	SSW	2	7	35	125	79	36	284
NE	SW	3	7	27	91	100	48	276
ENE	WSW	1	4	21	83	72	16	197
E	W	1	6	21	70	40	6	144
ESE	WNW	1	9	19	73	104	15	221
SE	NW	1	6	23	72	94	31	227
SSE	NNW	1	9	27	78	71	10	196
S	N	4	12	27	32	18	2	95
SSW	NNE	1	14	36	11	11	22	95
SW	NE	2	10	18	36	11	30	107
WSW	ENE	1	8	17	25	6	3	60
W	E	2	6	26	21	3	8	66
WNW	ESE	3	16	26	14	2	7	68
NW	SE	6	14	18	9	3	5	55
NNW	SSE	2	10	49	16	1	12	90
TOTAL		33	148	428	807	628	266	2310

OYSTER CREEK 380 FOOT DATA
JOINT FREQUENCY TABLES
VERSION: 98.8 PRINTED 02-18-1999

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD 98010100 TO 98123123
STABILITY CLASS F

SECTOR TO	WINDS FROM	WIND SPEED 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	S	2	7	23	17	2	0	51
NNE	SSW	1	4	10	23	19	5	62
NE	SW	0	3	16	36	47	25	127
ENE	WSW	0	7	5	15	31	19	77
E	W	0	3	12	29	45	19	108
ESE	WNW	0	6	14	38	49	15	122
SE	NW	0	7	16	48	69	31	171
SSE	NNW	1	4	6	30	87	13	141
S	N	2	5	10	22	17	2	58
SSW	NNE	1	7	10	15	1	0	34
SW	NE	1	3	16	9	0	0	29
WSW	ENE	0	3	8	2	0	0	13
W	E	1	7	3	1	0	0	12
WNW	ESE	0	9	6	3	0	0	18
NW	SE	3	8	11	[illegible]	0	0	25
NNW	SSE	1	5	17	7	1	0	31
TOTAL		13	88	183	298	368	129	1079

OYSTER CREEK 380 FOOT DATA
JOINT FREQUENCY TABLES
VERSION: 98.8 PRINTED 02-18-1999

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD 98010100 TO 98123123
STABILITY CLASS G

SECTOR TO	WINDS FROM	WIND SPEED 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	S	3	10	13	14	5	0	45
NNE	SSW	2	11	8	19	4	1	45
NE	SW	2	4	9	19	8	2	44
ENE	WSW	2	9	14	19	18	6	68
E	W	4	12	19	39	29	12	115
ESE	WNW	2	11	18	47	40	22	140
SE	NW	0	2	21	51	31	7	112
SSE	NNW	1	5	11	44	27	1	89
S	N	3	10	15	15	15	0	58
SSW	NNE	1	13	9	6	3	0	32
SW	NE	3	15	15	3	1	0	37
WSW	ENE	3	5	6	1	1	0	16
W	E	1	10	11	1	0	0	23
WNW	ESE	2	17	20	1	0	0	40
NW	SE	1	9	7	1	0	0	18
NNW	SSE	3	7	7	1	0	0	18
TOTAL		33	150	203	281	182	51	900

OYSTER CREEK 380 FOOT DATA
JOINT FREQUENCY TABLES
VERSION: 98.8 PRINTED 02-18-1999

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD 98010100 TO 98123123
STABILITY CLASS ALL

SECTOR TO	WINDS FROM	WIND SPEED 1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	S	11	54	168	197	65	26	521
NNE	SSW	10	38	103	298	164	80	693
NE	SW	7	31	104	202	186	81	611
ENE	WSW	7	38	85	212	152	45	539
E	W	7	46	128	277	152	50	660
ESE	WNW	4	47	141	295	301	120	908
SE	NW	4	44	156	356	323	139	1022
SSE	NNW	4	29	124	265	223	35	680
S	N	15	60	106	93	60	4	338
SSW	NNE	9	68	113	73	45	38	346
SW	NE	8	53	145	136	72	140	554
WSW	ENE	10	47	141	112	35	53	398
W	E	6	64	191	80	30	31	402
WNW	ESE	12	86	175	43	4	10	330
NW	SE	15	69	171	64	13	11	343
NNW	SSE	12	55	218	91	10	17	403
TOTAL		141	829	2269	2794	1835	880	8748

Hours of Missing/Invalid Data: 12