NINE MILE POINT NUCLEAR STATION - UNIT 1

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

JULY - DECEMBER 1996

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR STATION - UNIT 1

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

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SUPPLEMENTAL INFORMATION

Facility: **Nine Mile Point Unit #1** **Licensee:** **Niagara Mohawk Power Corporation**

1. TECHNICAL SPECIFICATION LIMITS

A) FISSION AND ACTIVATION GASES

1. The dose rate limit of noble gases from the site to areas at and beyond the site boundary shall be less than or equal to 500 mrem/year to the total body and less than or equal to 3000 mrem/year to the skin.

2. The air dose due to noble gases released in gaseous effluents from the Nine Mile Point 1 Station to areas at and beyond the site boundary shall be limited during any calendar quarter to less than or equal to 5 milliroentgen for gamma radiation and less than or equal to 10 mrad for beta radiation and during any calendar year to less than or equal to 10 milliroentgen for gamma radiation and less than or equal to 20 mrad for beta radiation.

B&C) TRITIUM, IODINES AND PARTICULATES, HALF LIVES > 8 DAYS

1. The dose rate limit of Iodine-131, Iodine-133, Tritium and all radionuclides in particulate form with half-lives greater than eight days, released to the environs as part of the gaseous effluents from the site, shall be less than or equal to 1500 mrem/year to any organ.

2. The dose to a member of the public from Iodine-131, Iodine-133, Tritium and all radionuclides in particulate form with half lives greater than eight days as part of gaseous effluents released from the Nine Mile Point 1 Station to areas at and beyond the site boundary shall be limited during any calendar quarter to less than or equal to 7.5 mrem to any organ and, during any calendar year to less than or equal to 15 mrem to any organ.

D) LIQUID EFFLUENTS

1. The concentration of radioactive material released in liquid effluents to unrestricted areas shall be limited to the concentrations specified in 10 CFR Part 20, Appendix B, Table II, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to 2E-04 microcuries/ml total activity.

2. The dose or dose commitment to a member of the public from radioactive materials in liquid effluents released from Nine Mile Point Unit 1 to unrestricted areas shall be limited during any calendar quarter to less than or equal to 1.5 mrem to the total body and to less than or equal to 5 mrem to any organ, and during any calendar year to less than or equal to 3 mrem to the total body and to less than or equal to 10 mrem to any organ.

2. MEASUREMENTS AND APPROXIMATIONS OF TOTAL RADIOACTIVITY

Described below are the methods used to measure or approximate the total radioactivity and radionuclide composition in effluents.

A) FISSION AND ACTIVATION GASES

Noble gas effluent activity is determined by on-line gamma spectroscopic monitoring (intrinsic germanium crystal) or gross activity monitoring (calibrated against gamma isotopic analysis of a 4.0L Marinelli grab sample) of an isokinetic stack sample stream.

B) IODINES

Iodine effluent activity is determined by gamma spectroscopic analysis (at least weekly) of charcoal cartridges sampled from an isokinetic stack sample stream.

C) PARTICULATES

Activity released from the main stack is determined by gamma spectroscopic analysis (at least weekly) of particulate filters sampled from an isokinetic sample stream.

For emergency condenser vent releases, effluent curie quantities are estimated based on the isotopic distribution in the Condensate Storage Tank water and the Emergency Condenser shell water. Actual isotopic concentrations are found via gamma spectroscopy. Initial release rates of Sr-89, Sr-90 and Fe-55 are estimated by applying scaling factors to release rates of gamma emitters. For emergency condenser vent releases, the activity of Tritium released during normal operation or during batch releases is conservatively estimated by multiplying recent condensate storage tank H-3 activity by assumed steaming rates out the vents.

D) TRITIUM

Tritium effluent activity is measured by liquid scintillation or gas proportional counting of monthly samples taken with an air sparging/water trap apparatus.

E) LIQUID EFFLUENTS

Isotopic contents of liquid effluents are determined by isotopic analysis of a representative sample of each batch and composite analysis of non-gamma emitters.

F) SOLID EFFLUENTS

Isotopic contents of waste shipments are determined by gamma spectroscopy analysis of a representative sample of each batch. Scaling factors established from primary composite sample analyses conducted off-site are applied, where appropriate, to find estimated concentration of non-gamma emitters. For low activity trash shipments, curie content is estimated by dose rate measurement and application of appropriate scaling factors.

ATTACHMENT 1
Summary Data

Unit 1 X Unit 2 __ Reporting Period July - December 1996

Liquid Effluents:

10CFR20, Appendix B, Table II, Column 2

Average MPC - uCi/ml (Qtr. 3) = N/A
Average MPC - uCi/ml (Qtr. 4) = N/A

Average Energy (Fission and Activation gases - Mev):

Qtr. 3 : $\bar{E}\gamma$ = N/A $\bar{E}\beta$ = N/A

Qtr. 4 : $\bar{E}\gamma$ = 2.47E - 01 $\bar{E}\beta$ = 3.17E - 01

Liquid: There were no liquid releases during the reporting period.

Number of batch releases	: 0
Total time period for batch releases (hrs)	: N/A
Maximum time period for a batch release (hrs)	: N/A
Average time period for a batch release (hrs)	: N/A
Minimum time period for a batch release (hrs)	: N/A
Total volume of water used to dilute the liquid effluent during release period (L)	: N/A
Total volume of water used to dilute the liquid effluent during reporting period (L)	: 2.72E+11

Gaseous (Emergency Condenser Vent): There were no releases from the operation of the emergency condenser vent.

Number of batch releases	: 0
Total time period for batch releases (hrs)	: N/A
Maximum time period for a batch release (hrs)	: N/A
Average time period for a batch release (hrs)	: N/A
Minimum time period for a batch release (hrs)	: N/A

Gaseous (Primary Containment Purge):

Number of batch releases	: 2
Total time period for batch releases (hrs)	: 1.00E+01
Maximum time period for a batch release (hrs)	: 5.00E+00
Average time period for a batch release (hrs)	: 5.00E+00
Minimum time period for a batch release (hrs)	: 5.00E+00

ATTACHMENT 1
Summary Data

Unit 1 X Unit 2 __	Reporting Period July - December 1996
Abnormal Releases: There were no abnormal releases during the reporting period.	
A. Liquids:	
Number of releases	0
Total activity released	N/A Ci
B. Gaseous:	
Number of releases	0
Total activity released	N/A Ci

ATTACHMENT 2

Unit 1 X Unit 2 __ Reporting Period July - December 1996

GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES, ELEVATED AND GROUND LEVEL

			3rd QUARTER	4th QUARTER	EST. TOTAL ERROR, %
A.	Fission & Activation gases[1]				
	1. Total release	Ci	**	8.74E - 01	5.00E + 01
	2. Average release rate	µCi/sec	**	1.10E - 01	
B.	Iodines				
	1. Total iodine-131	Ci	1.21E - 04	1.34E - 04	3.00E + 01
	2. Average release rate for period	µCi/sec	1.54E - 05	1.69E - 05	
C.	Particulates[2]				
	1. Particulates with half-lives >8 days	Ci	4.99E - 05	1.31E + 03	3.00E + 01
	2. Average release rate for period	µCi/sec	6.35E - 06	1.65E - 04	
	3. Gross alpha radioactivity	Ci	7.11E - 05	4.60E - 05	2.50E + 01
D.	Tritium[2]				
	1. Total release	Ci	8.61E + 00	3.28E + 01	5.00E + 01
	2. Average release rate for period	µCi/sec	1.10E + 00	4.13E + 00	
E.	Percent of Tech. Spec. Limits				
	Fission and Activation Gases[1]				
	Percent of Quarterly Gamma Air Dose Limit (5 mR)	%	**	4.00E - 03	
	Percent of Quarterly Beta Air Dose Limit (10 mrad)	%	**	1.63E - 03	
	Percent of Annual Gamma Air Dose Limit to Date (10 mR)	%	4.54E - 04	2.45E - 03	
	Percent of Annual Beta Air Dose Limit to Date (20 mrad)	%	1.86E - 04	1.00E - 03	
	Percent of Whole Body Dose Rate Limit (500 mrem/yr)	%	**	1.05E - 04	
	Percent of Skin Dose Rate Limit (3000 mrem/yr)	%	**	3.70E - 05	
	Tritium, Iodines, and Particulates[2] (with half-lives greater than 8 days)				
	Percent of Quarterly Dose Limit (7.5 mrem)	%	9.06E - 02	5.97E - 01	
	Percent of Annual Dose Limit (15 mrem)	%	1.61E - 01	5.56E - 01	
	Percent of Organ Dose Rate Limit (1500 mrem/yr)	%	1.82E - 03	1.19E - 02	

[1] Concentrations less than the lower limit of detection of the counting system used are indicated with a double asterisk. A lower limit of detection of 1.00E-04 µCi/ml for required noble gases, 1.00E-11 µCi/ml for required particulates, 1.00E-12 µCi/ml for required Iodines, and 1.00E-06 µCi/ml for Tritium, as required by Technical Specifications, has been verified.

[2] Tritium, Iron-55, and Strontium results for the fourth quarter were not received from the off-site vendor at the time of this report. These numbers include estimates, and actual numbers will be provided in the next Semi-Annual Report.

ATTACHMENT 3

Unit 1 X Unit 2 __ Reporting Period July - December 1996

GASEOUS EFFLUENTS - ELEVATED RELEASE

Nuclides Released		CONTINUOUS MODE[3] 3rd QUARTER	CONTINUOUS MODE[3] 4th QUARTER
1. Fission Gases[1]			
Argon-41	Ci	**	**
Krypton-85	Ci	**	**
Krypton-85m	Ci	**	**
Krypton-87	Ci	**	**
Krypton-88	Ci	**	**
Xenon-127	Ci	**	**
Xenon-133	Ci	**	**
Xenon-133m	Ci	**	**
Xenon-135	Ci	**	8.74E - 01
Xenon-135m	Ci	**	**
Xenon-137	Ci	**	**
Xenon-138	Ci	**	**
2. Iodines[1]			
Iodine-131	Ci	1.21E - 04	1.34E - 04
Iodine-133	Ci	5.84E - 04	1.86E - 03
Iodine-135	Ci	**	**
3. Particulates[1,2]			
Strontium-89	Ci	9.54E - 06	6.52E - 04
Strontium-90	Ci	**	8.03E - 05
Cesium 134	Ci	**	**
Cesium-137	Ci	9.12E - 06	1.77E - 05
Cobalt-60	Ci	2.96E - 05	1.86E - 04
Cobalt-58	Ci	**	**
Manganese-54	Ci	**	**
Barium-Lanthanum-140	Ci	**	**
Antimony-125	Ci	**	**
Niobium-95	Ci	**	**
Cerium-141	Ci	**	**
Cerium-144	Ci	**	**
Iron-59	Ci	**	**
Cesium-136	Ci	**	**
Chromium-51	Ci	**	**
Zinc-65	Ci	**	**
Iron-55	Ci	**	3.61E - 04
Molybdenum-99	Ci	**	**
4. Tritium[2]	Ci	2.19E+00	2.33E+01

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1 Concentrations less than the lower limit of detection of the counting system used are indicated with a double asterisk. A lower limit of detection of 1.00E-04 μCi/ml for required noble gases, 1.00E-11 μCi/ml for required particulates, 1.00E-12 μCi/ml for required Iodines, and 1.00E-06 μCi/ml for Tritium, as required by Technical Specifications, has been verified.

2 Tritium, Iron-55, and Strontium results for the fourth quarter were not received from the off-site vendor at the time of this report. These numbers include estimates and actual numbers will be included in the next Semi-Annual Report.

3 Contributions from purges are included.

ATTACHMENT 4

Unit 1 X Unit 2 __ Reporting Period July - December 1996

GASEOUS EFFLUENTS - GROUND LEVEL RELEASES

There were no releases via the emergency condenser vent operation. Only leakage from the vents results in an assumed release based on the concentrations in the condensate storage tanks and condenser shell.

			CONTINUOUS MODE		BATCH MODE There were no batch releases during the reporting period.	
			3rd QUARTER	4th QUARTER	3rd QUARTER	4th QUARTER
1.	Fission Gases[1]					
	Argon-41	Ci	**	**		
	Krypton-85	Ci	**	**		
	Krypton-85m	Ci	**	**		
	Krypton-87	Ci	**	**		
	Krypton-88	Ci	**	**		
	Xenon-133	Ci	**	**		
	Xenon-133m	Ci	**	**		
	Xenon-135	Ci	**	5.83E - 06		
	Xenon-135m	Ci	**	**		
	Xenon-137	Ci	**	**		
	Xenon-138	Ci	**	**		
	Xenon-127	Ci	**	**		
2.	Iodines[1]					
	Iodine-131	Ci	**	**		
	Iodine-133	Ci	**	2.86E - 08		
	Iodine-135	Ci	**	**		
3.	Particulates[1,2]					
	Strontium-89	Ci	**	4.08E - 07		
	Strontium-90	Ci	**	5.11E - 08		
	Cesium-134	Ci	**	**		
	Cesium-137	Ci	2.88E - 08	2.25E - 08		
	Cobalt-60	Ci	1.65E - 06	2.86E - 06		
	Cobalt-58	Ci	**	3.99E - 07		
	Manganese-54	Ci	**	1.17E - 06		
	Barium-Lanthanum-140	Ci	**	**		
	Antimony-125	Ci	**	**		
	Niobium-95	Ci	**	**		
	Cerium-141	Ci	**	**		
	Cerium-144	Ci	**	3.84E - 08		
	Iron-59	Ci	**	8.87E - 07		
	Cesium-136	Ci	**	**		
	Chromium-51	Ci	**	5.99E - 07		
	Zinc-65	Ci	**	**		
	Iron-55	Ci	**	2.41E - 06		
	Molybdenum-99	Ci	**	**		
4.	Tritium[2]	Ci	6.42E + 00	9.53E + 00		

[1] Concentrations less than the lower limit of detection of the counting system used are indicated with a double asterisk. A lower limit of detection of 1.00E-04 μCi/ml for required noble gases, 1.00E-11 μCi/ml for required particulates, 1.00E-12 μCi/ml for required Iodines, and 1.00E-06 μCi/ml for Tritium, as required by Technical Specifications, has been verified.

[2] Tritium, Iron-55, and Strontium results for the fourth quarter were not received from the off-site vendor at the time of this report. These numbers include estimates, and actual numbers will be included in the next Semi-Annual Report.

Unit 1 X Unit 2 __ Reporting Period July - December 1996

LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES [1]

			3rd QUARTER	4th QUARTER	EST. TOTAL ERROR, %
A.	Fission & Activation Products				
	1. Total release (not including Tritium, gases, alpha)	Ci	No Releases	No Releases	5.00E+01
	2. Average diluted concentration during reporting period	µCi/ml	No Releases	No Releases	
B.	Tritium				
	1. Total release	Ci	No Releases	No Releases	5.00E+01
	2. Average diluted concentration during reporting period	µCi/ml	No Releases	No Releases	
C.	Dissolved and Entrained Gases				
	1. Total release	Ci	No Releases	No Releases	5.00E+01
	2. Average diluted concentration during reporting period	µCi/ml	No Releases	No Releases	
D.	Gross Alpha Radioactivity				
	1. Total release	Ci	No Releases	No Releases	5.00E+01
E.	Volumes				
	1. Prior to dilution	Liters	No Releases	No Releases	5.00E+01
	2. Volume of dilution water used during release period	Liters	No Releases	No Releases	5.00E+01
	3. Volume of dilution water available during reporting period	Liters	1.39E+11	1.33E+11	5.00E+01
F.	Percent of Technical Specification Limits				
	Percent of Quarterly Whole Body Dose Limit (1.5 mrem)	%	No Releases	No Releases	
	Percent of Quarterly Organ Dose Limit (5 mrem)	%	No Releases	No Releases	
	Percent of Annual Whole Body Dose Limit to Date (3 mrem)	%	No Releases	No Releases	
	Percent of Annual Organ Dose Limit to Date (10 mrem)	%	No Releases	No Releases	
	Percent of 10CFR20 Concentration Limit	%	No Releases	No Releases	
	Percent of Dissolved or Entrained Noble Gas Limit (2.00E-04 µCi/ml)	%	No Releases	No Releases	

[1] On April 30, 1996 the actual drain path for a hard piped steam trap drain, off of the steam supply to the nitrogen vaporizing unit, was found to be routed to the station's warm water discharge channel. Station drawings erroneously showed the drain path going to the station floor drain system. The drain path was subsequently changed to match the drawings so that now the system drains to a sump where it can be directed to radwaste. The work was completed on July 30, 1996. The nitrogen vaporizing system was not operated subsequent to the April 30, 1996 discovery until after the drain line was re-routed to radwaste.

However, it is possible that during the operation of the nitrogen vaporizing system in the past, the steam drain trap contained contamination. The source of the possible contamination, mainly tritium, is from the condensate storage tank feedwater supply to the electric boiler which provides the steam to the nitrogen vaporizing unit. A similar configuration existed in 1988 where possible contamination, from the same steam supply to the vaporizing unit, drained to the discharge channel via the nitrogen vaporizing unit overflow line. A conservative analysis was performed in 1988 and the results showed that the activity concentration in the overflow was less than 1 total MPC fraction. Also, due to the limited run time of the nitrogen vaporizing unit, the calculated total activity discharged per drywell inertion was shown to be approximately 1/60th the activity discharged for a radwaste discharge tank. Nine Mile Point Unit 1 is designed with a once through cooling system which typically discharges approximately 280,000 gpm of cooling water via the warm water discharge channel. This dilution water would reduce the total MPC fraction in the warm water discharge channel to approximately less than 3E-05 based on discharge rate equal to the boiler steam supply rating. This drain path was previously changed to direct the overflow to the plant processing systems.

The calculation performed in 1988 conservatively used the rated boiler output which bounds the worst case release rate for the April 30, 1996 found configuration for the steam trap drain line. Additionally, a review of the recent (February 8, 1995 - September 8, 1996) condensate storage tank water isotopic results reveals activity concentrations that are less than 1 total MPC fraction. Furthermore, the results of an environmental monitoring and sampling program on the warm water discharge channel supports the conclusion of the calculation. There has been no anomalous activity detected as a result of this monitoring.

Unit 1 X Unit 2 __ Reporting Period July - December 1996

LIQUID EFFLUENTS RELEASED

Nuclides Released		BATCH MODE[1] 3rd QUARTER	4th QUARTER
Strontium-89	Ci	No Releases	No Releases
Strontium-90	Ci	No Releases	No Releases
Cesium-134	Ci	No Releases	No Releases
Cesium-137	Ci	No Releases	No Releases
Iodine-131	Ci	No Releases	No Releases
Cobalt-58	Ci	No Releases	No Releases
Cobalt-60	Ci	No Releases	No Releases
Iron-59	Ci	No Releases	No Releases
Zinc-65	Ci	No Releases	No Releases
Manganese-54	Ci	No Releases	No Releases
Chromium-51	Ci	No Releases	No Releases
Zirconium-Niobium-95	Ci	No Releases	No Releases
Molybdenum-99	Ci	No Releases	No Releases
Technetium-99m	Ci	No Releases	No Releases
Barium-Lanthanum-140	Ci	No Releases	No Releases
Cerium-141	Ci	No Releases	No Releases
Tungsten-187	Ci	No Releases	No Releases
Arsenic-76	Ci	No Releases	No Releases
Iodine-133	Ci	No Releases	No Releases
Iron-55	Ci	No Releases	No Releases
Neptunium-239	Ci	No Releases	No Releases
Praseodymium-144	Ci	No Releases	No Releases
Iodine-135	Ci	No Releases	No Releases
Dissolved or Entrained Gases	Ci	No Releases	No Releases
Tritium	Ci	No Releases	No Releases

[1] No continuous mode release occurred during the report period.

Unit 1 X Unit 2 __ Reporting Period July - December 1996

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS:

A.1 TYPE	Volume (m^3) Class			Activity[1] (Ci) Class		
	A	B	C	A	B	C
1. Spent Resin[2]						
	3.41E+00	3.41E+00	0	4.69E+01	6.57E+01	0
Filter Sludge	0	0	0	0	0	0
Concentrated Waste Evaporator Bottoms	0	0	0	0	0	0
Total	0	0	0	0	0	0
2. Dry Compressible Waste, Dry Non-Compressible Waste (Contaminated Equipment)						
	0	0	0	0	0	0
3. Irradiated Components						
	0	0	0	0	0	0
4. Other: Incinerator Ash						
	1.10E+01	0	0	3.26E-02	0	0

[1] The estimated total error is 5.00E+01%.

[2] There were 5 Unit 1 steel encased high integrity containers of waste Class A bead resin placed in interim storage at Nine Mile Point during the reporting period. The total activity, decay corrected to January 1, 1997, was 1.26E+02 curies and the volume was 2.81E+01m^3.

Unit 1 X Unit 2 __ Reporting Period July - December 1996

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A.1 TYPE	Container	Package	Solidification Agent
1. Spent Resin (Dewatered)	Poly Hic	Type A	None
	Poly Hic	Type A	None
Filter Sludge	N/A	N/A	N/A
Concentrated Waste	N/A	N/A	N/A
2. Dry Compressible Waste, Dry Non-Compressible Waste (Contaminated Equipment)	N/A	N/A	N/A
3. Irradiated Components	N/A	N/A	N/A
4. Other: Incinerator Ash	Metal Box	STP*	None

*STP = Strong Tight Package

Unit 1 X Unit 2 __ Reporting Period July - December 1996

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A.2 ESTIMATE OF MAJOR NUCLIDE COMPOSITION (BY TYPE OF WASTE)

a. **Spent Resins, Filter Sludges, Concentrated Waste:**

Nuclide	Percent
(1) Co-60	8.09E+01
(2) Mn-54	7.65E+00
(3) Ni-63	5.15E+00
(4) Cs-137	3.33E+00
(5) Cs-134	1.95E+00
(6) Other	1.02E+00

b. **Dry Compressible Waste, Dry Non-Compressible Waste (Contaminated Equipment):** There were no shipments.

Nuclide	Percent

c. **Irradiated Components:** There were no shipments.

Nuclide	Percent

d. **Other:** Incinerator Ash

Nuclide	Percent
(1) Co-60	7.18E+01
(2) Cs-137	1.70E+01
(3) Mn-54	7.76E+00
(4) Fe-55	2.19E+00
(5) Other	1.25E+00

Unit 1 X Unit 2 ___ Reporting Period July - December 1996

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A.3. SOLID WASTE DISPOSITION

Number of Shipments	Mode of Transportation	Destination
3	Truck	Barnwell, SC

B. IRRADIATED FUEL SHIPMENTS (DISPOSITION): There were no shipments.

Number of Shipments	Mode of Transportation	Destination
0	N/A	N/A

Unit 1 X Unit 2 __ Reporting Period July - December 1996

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

C. SOLID WASTE SHIPPED OFF-SITE TO VENDORS FOR PROCESSING AND SUBSEQUENT BURIAL

Below is a summary of NMP-1 radwaste buried by vendor facilities during July - December 1996. These totals were reported separately from "10CFR61 Solid Waste Shipped for Burial" since (a) waste classification and burial was performed by the vendors, and (b) Technical Specification 6.9.1 requires reporting of "information for each class of solid waste (as defined by 10CFR61) shipped off-site during the reporting period." The following data represents the actual shipments made from the off-site vendors of our radwaste (e.g., non-compacted trash and high conductivity waste water), that was processed and commingled prior to burial.

C.1. TYPE OF WASTE - noncompacted trash and high conductivity waste water processed by vendor facilities prior to burial at Barnwell, SC

Burial Volume (m^3)	Activity (Ci)	Est. Total Error, %
7.78E+00	4.20E-01	5.00+01

C.2. ESTIMATE OF MAJOR NUCLIDE COMPOSITION

Nuclide	Percent
(1) Co-60	6.92E+01
(2) Mn-54	1.78E+01
(3) Fe-55	5.59E+00
(4) Cs-137	3.09E+00
(5) Ni-63	2.05E+00
(6) Other	2.27E+00

C.3. SOLID WASTE DISPOSITION[1]

Number of Shipments	Mode of Transportation	Destination
16	Truck	Barnwell, SC

[1] NOTE: During the report period 4 shipments of NMP-1 radwaste were sent to offsite processors. This material will be processed by the vendor and can be commingled with other licensees' waste for burial. However, the vendor performs an analysis of each shipment to determine the volume and activity buried under each utilities' license, and prepares a separate report for each licensee. This information is provided in the Semi-Annual Radioactive Effluent Release Report for the period in which the material is buried.

Unit 1 X Unit 2 ___ Reporting Period July - December 1996

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

D. SEWAGE WASTES SHIPPED TO A TREATMENT FACILITY FOR PROCESSING AND BURIAL

There were no shipments of sewage sludge with detectable quantities of plant-related nuclides from NMP to the treatment facility during the reporting period.

ATTACHMENT 7

Unit 1 X Unit 2 __	Reporting Period July - December 1996
SUMMARY OF CHANGES TO THE OFF-SITE DOSE CALCULATION MANUAL	
There were no changes to the Unit 1 Off-Site Dose Calculation Ma. al during the reporting period.	

ATTACHMENT 8

Unit 1 X Unit 2 ___	Reporting Period July - December 1996
SUMMARY OF CHANGES TO THE PROCESS CONTROL PROGRAM	
There were no changes to the Unit 1 Process Control Program during the reporting period.	

ATTACHMENT 9

Unit 1 X Unit 2 ___	Reporting Period July - December 1996
SUMMARY OF INOPERABLE MONITORS	
There were no inoperable monitors for a period greater than 30 days during the reporting period.	

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1996)
NINE MILE POINT NUCLEAR STATION UNIT 1
DOSES TO MEMBERS OF THE PUBLIC DUE TO THEIR ACTIVITIES
INSIDE THE SITE BOUNDARY

JANUARY - DECEMBER 1996

Doses to members of the public (as defined by the Technical Specifications) from the operation of the NMP1 facility as a result of activity inside the site boundary are based on activities at the Energy Center. This facility is open to the public and offers educational information, summer picnicking activities and fishing. Any possible doses received by a member of the public by utilizing the private road that transverses the east and west site boundaries are not considered here since it takes a matter of minutes to travel the distance.

The activity at the Energy Center that is used for the dose analysis is fishing because it is the most time consuming. Although there is no specific survey information available, many of the same individuals have been observed to return again and again because of the access to salmonid and lake trout populations. Dose pathways considered for this activity include direct radiation, inhalation and external ground (shoreline sediment or soil) doses. Other pathways, such as ingestion pathways, are not considered because they are either not applicable, insignificant, or are considered as part of the evaluation of the total dose to a member of the public located off-site. Releases from the NMP1 stack and emergency condenser vents were evaluated for the inhalation pathway.

The direct radiation pathway is evaluated in accordance with the methodology found in the Off-Site Dose Calculation Manual (ODCM). This pathway considers three components: direct radiation from the generating facilities, direct radiation from any possible overhead plume and direct radiation from plume submersion. The direct radiation pathway is evaluated by the use of high sensitivity environmental TLD's. Since any significant fishing activity near the Energy Center occurs between April through December, environmental TLD data for the approximate period April 1 - December 31, 1996 were considered. Data from two environmental TLD's from the approximate area where the fishing occurs were compared to control environmental TLD locations for the same time period. The average fishing area TLD dose rate was 7.2E-03 mRem per hour for the period. The average control TLD dose rate was 6.1E-03 mRem per hour for the period (approximate second, third and fourth calendar quarters of the year). The average increase in dose as a result of fishing in this area at a conservative frequency of eight hours per week for thirty-nine weeks is 3.4E-01 mRem from direct radiation for the period in question. The majority of the dose from this pathway is from the NMP1 facility because of it's proximity to the fishing area. A small portion may be due to the NMP2 facility.

The inhalation dose pathway is evaluated by utilizing the inhalation equations in the ODCM, as adapted from the Regulatory Guide 1.109. The equation basically gives a total inhalation dose in mRem for the time period in question (April - December). The total dose equals the sum, for all applicable radionuclides, of the NMP1 stack and emergency condenser vent release concentrations, times the average NMP1 stack and emergency condenser vent flowrate, times the applicable five-year average calculated X/Q, times the inhalation dose factors from Regulatory Guide 1.109, Table E-7, times the Regulatory Guide 1.109 annual air intake, times the fractional portion of the year in question. In order to be slightly conservative, no radiological decay is assumed.

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1996)
NINE MILE POINT NUCLEAR STATION UNIT 1
DOSES TO MEMBERS OF THE PUBLIC DUE TO THEIR ACTIVITIES
INSIDE THE SITE BOUNDARY

JANUARY - DECEMBER 1996

The 1996 calculation utilized the following information:

NMP1 Stack:

- Unit 1 average stack flowrate = 1.08E+02 m^3/sec
- X/Q value = 8.9 E - 06 (annual NWN sector, historical average)
- Inhalation dose factor = Table E-7 of Regulatory Guide 1.109
- Annual air intake = 8000 m^3 per year (adult)
- Fractional portion of the year = 0.0356 (312 hours)
- Co-60 = 9.87E - 02 pCi/m^3
- Fe-55 = 1.34E - 01 pCi/m^3
- Sr-89 = 2.54E - 01 pCi/m^3
- Sr-90 = 2.97E - 02 pCi/m^3
- H-3 = 1.07E+04 pCi/m^3
- 1-131 = 1.49E - 03 pCi/m^3
- 1-133 = 1.12E+00 pCi/m^3
- Cs-137 = 1.13E - 02 pCi/m^3
- Mn-54 = 2.68E - 03 pCi/m^3

Emergency Condenser Vent:

- Average Vent Flowrate = 4.42E - 04 m^3/sec
- X/Q value = 6.63E - 06 (conservative ground level value)
- Inhalation dose factor = Table E-7 of Regulatory Guide 1.109
- Annual air intake = 8000 m^3 per year (adult)
- Fractional portion of the year = 0.0356 (312 hours)
- Sr-89 = 3.87E+01 pCi/m^3
- Sr-90 = 4.87E+00 pCi/m^3
- Cs-137 = 5.72+00 pCi/m^3
- Co-60 = 6.90E+02 pCi/m^3
- Mn-54 = 1.11E+02 pCi/m^3
- Fe-55 = 2.29E+02 pCi/m^3
- H-3 = 2.09E+09 pCi/m^3
- Cr-51 = 5.70E+00 pCi/m^3
- I-133 = 2.71E+00 pCi/m^3
- Co-58 = 3.80E+01 pCi/m^3
- Fe-59 = 8.43E+01 pCi/m^3
- Ce-144 = 3.63E+00 pCi/m^3

The inhalation dose to a member of the public from NMP-1 as a result of activities inside the site boundary 8.84E-04 mRem to the thyroid (maximum organ dose) and 7.43-04 mRem to the whole body.

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1996)
NINE MILE POINT NUCLEAR STATION UNIT 1
DOSES TO MEMBERS OF THE PUBLIC DUE TO THEIR ACTIVITIES
INSIDE THE SITE BOUNDARY

JANUARY - DECEMBER 1996

The dose from standing on the shoreline while fishing is based on the methodology in the ODCM, as adapted from Regulatory Guide 1.109. During 1996, it was noted that fishing was performed from the shoreline on many occasions although waders were also utilized. In order to be conservative, it is assumed that the maximum exposed individual fished from the shoreline at all times. The use of waders, of course, would result in a dose of zero from this pathway. The shoreline sediment doses are not taken into consideration by environmental TLD data.

The ODCM equation basically gives the total dose to the whole body and skin from the sum of all plant-related radionuclides detected in shoreline sediment samples. The plant-related radionuclide concentration is adjusted for background sample results, as applicable. The equation, therefore, yields the whole body and skin dose by multiplying the radionuclide concentration adjusted for any background data (as applicable), times a usage factor, times the sediment or soil density in grams per square meter (to a depth of one centimeter), times the applicable shore width factor, times the regulatory guide dose factor, times the fractional portion of the year over which the dose is applicable. In order to be conservative and to simplify the equation, no radiological decay is assumed since the applicable radionuclides are usually long lived.

The calculation utilized the following information:

- Usage factor = 312 hours

- Density in grams per square meter = 40,000

- Shore width factor = 0.3

- Whole body and skin dose factor for each radionuclide = Regulatory Guide 1.109, Table E-6

- Fractional portion of the year = 1 (used average radionuclide concentration over total time period)

- Average Cs-137 concentration = 0.291 pCi/g

- Average Co-60 concentration = 0.031 pCi/g

The total whole body and skin dose from standing on the shoreline to fish is 6.6E-03 mRem whole body and 7.6E-03 mRem skin dose for the period.

Doses to members of the public relative to activities inside the site boundary from aquatic pathways other than ground dose from shoreline sediment/soil are not applicable.

In summary, the total dose to a member of the public as a result of activities inside the site boundary from the direct radiation, inhalation and shoreline dose pathways is 3.5E-01 mRem to the whole body and 8.8E-04 mRem to the maximum exposed internal organ (thyroid). The dose to the skin of an adult is 7.6E-03 mRem. These doses are generally a result of the operation of NMP1. However, a portion of these doses for the direct radiation pathway may be attributable to the NMP2 facility.

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1996)
NINE MILE POINT NUCLEAR STATION UNIT 1
RADIATION DOSES TO THE LIKELY MOST EXPOSED MEMBER OF THE PUBLIC OUTSIDE THE SITE BOUNDARY

JANUARY - DECEMBER 1996

Radiation doses to the likely most exposed member of the public outside of the site boundary are evaluated relative to 40CFR190 requirements. The dose limits of 40CFR190 are 25 mRem (whole body or organ) per calendar year and 75 mRem (thyroid) per calendar year. The intent of 40CFR190 also requires that the effluents of NMP1 as well as other nearby uranium fuel cycle facilities be considered. In this case, the effluents of NMP1, NMP2 and the James A. FitzPatrick (JAF) facilities must be considered.

Doses to the likely most exposed member of the public as a result of effluents from the site can be evaluated by using calculated dose modeling based on the accepted methodologies of the facilities' Off-Site Dose Calculation Manuals (ODCM's) or may, in some cases, be calculated from the analysis results of actual environmental samples. Acceptable methods for calculating doses from environmental samples are also found in the facilities' ODCM's. These methods are based on Regulatory Guide 1.109 methodology.

Dose calculations from actual environmental samples are, at times, difficult to perform for some pathways. Some pathway doses should be estimated using calculational dose modeling. These pathways include noble gas air dose, inhalation dose, etc. Other pathway doses may be calculated directly from environmental sample concentrations using Regulatory Guide 1.109 methodology.

Since the effluents from the generating facilities are low, the resultant gaseous and liquid effluent doses are anticipated to be low. In view of this, doses can be based on calculated data. Doses are not based on actual environmental data for 1996 with the exception of doses from direct radiation, fish consumption and shoreline sediment. In addition, in order to be conservative and for the sake of simplicity, it is assumed in the dose calculations that the likely most exposed member of the public is positioned in the maximum receptor location for each pathway at the same time. This approach is utilized because the doses are very low and the computations are greatly simplified.

The following pathways are considered:

1. The inhalation dose is calculated at the critical residence because of the high occupancy factor. In order to be conservative, the maximum whole body and organ dose assumes no correction for residing inside a residence.

2. The milk ingestion dose is calculated utilizing the maximum milk cow location. As noted previously, in order to be conservative and for the sake of simplicity, the likely most exposed member of the public is assumed to be at all critical receptors at one time. In this case, the member of the public at the critical residence is assumed to consume milk from the critical milk location.

3. The maximum dose from the milk ingestion pathway as a result of consuming goat's milk is based on the same criteria established for item "2", above (ingestion of cow's milk).

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1996)
NINE MILE POINT NUCLEAR STATION UNIT 1
RADIATION DOSES TO THE LIKELY MOST EXPOSED MEMBER OF THE PUBLIC
OUTSIDE THE SITE BOUNDARY

JANUARY - DECEMBER 1996

4. The maximum dose associated from consuming meat is based on the critical meat animal. The likely most exposed member at the critical residence is assumed to consume meat from the critical meat animal location.

5. The maximum site dose associated with the consumption of vegetables is calculated from the critical vegetable garden location. An noted previously, the likely most exposed member of the public is assumed to be located at the critical residence and is assumed to consume vegetables from the critical garden location.

6. The dose, as a result of direct gamma radiation from the site, encompasses doses from direct "shine" from the generating facilities, direct radiation from any overhead gaseous plumes, plume submersion and from ground deposition. This total dose is measured by environmental TLD. The critical location is based on the closest year-round residence from the generating facilities as well as the closest residence in the critical downwind sector in order to evaluate both direct radiation from the generating facilities and gaseous plumes as determined by the local meteorology. During 1996, the closest residence and the critical downwind residence are at the same location.

   The measured average dose for 1996 at the critical residence was 56.8 mRem. The average control dose was 53.6 mRem. The average dose at the critical residence is slightly greater than the average control location dose. The net increase in dose is due to the differences between doses from naturally occurring radionuclides in the soil and rock at the different locations and due to the standard deviation in TLD measurements. This difference in dose rate can be demonstrated by observing the 1996 average dose for an environmental TLD located near the critical residence TLD, but approximately 700 feet closer to the generating facilities. The annual average dose for this TLD location was 56.0 mRem. The dose for this location is lower than the critical residence location even though they are close to one another and even though the TLD location with the lowest dose is closer to the generating facilities.

7. The dose, as a result of fish consumption, is considered as part of the aquatic pathway. The dose for 1996 is calculated from actual results of the analysis of environmental fish samples. For the sake of being conservative, the average plant-related radionuclide concentrations were utilized from fish samples taken near the site discharge points. Only Cs-137 was detected during 1996. Adjusting the average concentration of Cs-137 in indicator samples by subtracting the average concentration of Cs-137 in control samples resulted in a value of zero. Therefore, no dose was calculated and was assumed to be zero for this pathway.

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT 1996
NINE MILE POINT NUCLEAR STATION UNIT 1
RADIATION DOSES TO THE LIKELY MOST EXPOSED MEMBER OF THE PUBLIC OUTSIDE THE SITE BOUNDARY

JANUARY - DECEMBER 1996

8. The shoreline sediment pathway is considered relative to recreational activities. The dose due to recreational activities from shoreline sediment is based on the methodology in the ODCM as adapted from Regulatory Guide 1.109. The ODCM gives the total dose to the whole body and skin from the sum of plant-related radionuclides detected in actual shoreline sediment samples. The plant-related radionuclide concentration is adjusted for background sample results, as applicable. The total whole body and skin dose from shoreline recreational activities are 5.3E-04 mRem whole body and 6.1E-04 mRem skin dose for the period.

9. In summary, the maximum dose to the most likely exposed member of the public is 8.24E-02 mRem to the thyroid (maximum organ dose) and 7.22E-02 mRem to the whole body. It should be noted that the maximum organ dose and maximum whole body doses are based on the sum of the maximum doses observed for all three facilities regardless of age group. This results in some conservatism. The maximum organ and whole body doses were a result of gaseous effluents. Doses as a result of liquid effluents were secondary. The total whole body and skin dose from shoreline recreational activities are 5.3E-04 mRem whole body and 6.1E-04 mRem skin dose for the period. The direct radiation dose to the critical residence from the generating facilities was insignificant or zero. The dose to an individual as a result of fish consumption was also zero. These maximum total doses are a result of operations at the Nine Mile Point Unit 1, Nine Mile Point Unit 2 and the James A. Fitzpatrick facilities. The maximum organ dose and whole body dose are below the 40CFR190 criteria of 25 mRem per calendar year to the maximum exposed organ or the whole body, and below 75 mRem per calendar year to the thyroid.

ENCLOSURE 1

Update of Actual Data for the Second Quarter 1996

Unit 1 X Unit 2 __ Reporting Period January - June 1996

UPDATE OF RELEASE AND DOSE DATA FOR GASEOUS (ELEVATED AND GROUND LEVEL) AND LIQUID EFFLUENTS

Update of data using actual results from the off-site vendors for Strontium, Tritium, and Iron-55 for the second quarter 1996.

Nuclide[1]	GASEOUS 2nd QUARTER 1996 Activity (Ci)	LIQUID 2nd QUARTER 1996 Activity (Ci)
Sr-89	2.30E - 05	No Releases
Sr-90	**	No Releases
H-3	9.27E + 00	No Releases
Fe-55	**	No Releases

			GASEOUS	LIQUID
Particulates				
	1. Particulates with half-lives >8 days	Ci	8.23E - 05	N/A
	2. Average release rate for period	µCi/sec	1.05E - 05	N/A
Tritium	1. Total release	Ci	9.27E + 00	N/A
	2. Average release rate for period	µCi/sec (gaseous) µCi/ml (liquid)	1.18E + 00	N/A

Tritium, Iodines, and Particulates (with half-lives greater than 8 days)		GASEOUS	LIQUID
1. Percent of Quarterly[2] Dose Limit	%	1.15E - 01 (Quarterly)	N/A (Quarterly)
2. Percent of Annual[2] Dose Limit to Date	%	1.15E - 01 (Annual)	N/A (Annual)
3. Percent of Organ - Dose Rate Limit (Gaseous)(Quarterly) - Dose Limit (Liquid) (Annual & Quarterly)	%	2.31E - 03 (Quarterly) N/A (Annual)	N/A (Quarterly) N/A (Annual)
4. Percent of 10CFR20 Concentration Limit (Liquid)	%	N/A	N/A
5. Percent of Dissolved or Entrained Noble Gas (Liquid)	%	N/A	N/A

[1] Concentrations less than the lower limit of detection, as required by Technical Specifications are indicated with a double asterisk.

[2] The dose is to the maximally exposed organ for gaseous effluents.