NINE MILE POINT NUCLEAR STATION - UNIT 1

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

JULY - DECEMBER 1997

NIAGARA MOHAWK POWER CORPORATION

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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 released in gaseous effluents 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 Nine Mile Point Unit 1 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 in gaseous effluents from the site to areas at and beyond the site boundary 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 in gaseous effluents released from Nine Mile Point Unit 1 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 and composite analysis of the filters for non-gamma emitters.

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) EMERGENCY CONDENSER VENT EFFLUENTS

The 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 and actual release rates are determined from post offsite analysis results. The activity of fission and activation gases released due to tube leaks is based on reactor steam leak rates using offgas isotopic analyses.

F) 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.

G) 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.

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Liquid Effluents:

10CFR20, Appendix B, Table II, Column 2

Average MPC - uCi/ml (Qtr. 3) = N/A
Average MPC - uCi/ml (Qtr. 4) = 2.78E-03

Average Energy (Fission and Activation gases - Mev):

Qtr. 3	: $\bar{E}\gamma$ = 9.95E-01	$\bar{E}\beta$ = 5.32E-01
Qtr. 4	: $\bar{E}\gamma$ = N/A	$\bar{E}\beta$ = N/A

Liquid:

Number of batch releases	: 0 (December 1997 Abnormal Release not Included)
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)	4th Quarter : 3.69E+03 (Abnormal Release only)
Total volume of water used to dilute the liquid effluent during reporting period (L)	4th Quarter : 2.51E+06 (Abnormal Release only)

Gaseous (Emergency Condenser Vent):

Number of batch releases	: 2
Total time period for batch releases (hrs)	: 5.83E-01
Maximum time period for a batch release (hrs)	: 3.00E-01
Average time period for a batch release (hrs)	: 2.92E-01
Minimum time period for a batch release (hrs)	: 2.83E-01

Gaseous (Primary Containment Purge):

Number of batch releases	: 2
Total time period for batch releases (hrs)	: 1.20E+01
Maximum time period for a batch release (hrs)	: 6.20E+00
Average time period for a batch release (hrs)	: 5.98E+00
Minimum time period for a batch release (hrs)	: 5.75E+00

Unit 1 X Unit 2 __		Reporting Period July - December 1997
Abnormal Releases:		
A. Liquids:		
	Number of releases	1
	Total activity released	1.32E-02 Ci
B. Gaseous:		
	Number of releases	0
	Total activity released	N/A Ci

U1 ABNORMAL RELEASE

Background

The Emergency Condenser (EC) test, N1-TSP-ECS-001, "Emergency Cooling System - Heat Removal Capability Test", is performed once every five years, in accordance with Unit 1 Technical Specifications, and when identified as a post maintenance testing requirement. Makeup water is supplied to the ECs from the condensate storage tanks (CST) which contain small quantities of radioactivity. Since condensation occurs outside the vents during testing, compensatory measures are taken to contain any water that falls to the ground on site. Samples are taken at the storm sewer run-off to determine the effectiveness of these compensatory measures.

Event

On 12/10/97, the EC test, N1-TSP-ECS-001 was performed as part of post maintenance testing following the tube bundle replacement in each of the four EC condensers. A catch containment was constructed under the two vents (one for loop #11 and one for loop #12) at ground level. The storm drains in the vicinity of the projected release pathway were also covered to contain any condensation that fell to the ground during testing. The EC test took approximately 20 minutes per loop to complete. Samples were taken at the outfall prior to, during, and after completion of the test. During the testing of #11 loop, the plume veered from the projected direction causing some condensation to enter uncovered storm drains. Prior to the test of #12 loop, these additional storm drains were covered.

Analysis

Gamma Spectrum Analysis (GSA) of samples collected from the storm sewer runoff to Lake Ontario (SPDES outfall 020) revealed radioactivity of 7.08 E-08 uCi/ml. A follow-up sample obtained approximately 3 hours after the start of the EC testing revealed no detectable activity. Conservatively using the radioactivity in the EC shells prior to the start of EC testing, an estimated total release of 1000 gallons and an estimated storm sewer flow rate of 5 gallons per minute, a calculated total body dose of 1.01 E-02 mrem and a maximum organ (bone) dose of 3.60 E-02 mrem has been determined.

ATTACHMENT 2

Unit 1 X Unit 2 _ Reporting Period July - December 1997

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	1.30E+00	**	5.00E+01
	2. Average release rate	µCi/sec	1.64E-01	**	
B.	Iodines[1]				
	1. Total Iodine-131	Ci	1.77E-05	**	3.00E+01
	2. Average release rate for period	µCi/sec	2.25E-06	**	
C.	Particulates[2]				
	1. Particulates with half-lives >8 days	Ci	1.67E-03	7.17E-04	3.00E+01
	2. Average release rate for period	µCi/sec	2.12E-04	9.01E-05	
	3. Gross alpha radioactivity	Ci	6.90E-05	1.67E-05	2.50E+01
D.	Tritium[2]				
	1. Total release	Ci	2.20E+01	2.58E+01	5.00E+01
	2. Average release rate for period	µCi/sec	2.79E+00	3.24E+00	
E.	Percent of Tech. Spec. Limits Fission and Activation Gases[1]				
	Percent of Quarterly Gamma Air Dose Limit (5 mR)	%	4.22E-02	**	
	Percent of Quarterly Beta Air Dose Limit (10 mrad)	%	1.10E-02	**	
	Percent of Annual Gamma Air Dose Limit to Date (10 mR)	%	5.26E-02	5.26E-02	
	Percent of Annual Beta Air Dose Limit to Date (20 mrad)	%	1.40E-02	1.40E-02	
	Percent of Whole Body Dose Rate Limit (500 mrem/yr)	%	1.12E-03	**	
	Percent of Skin Dose Rate Limit (3000 mrem/yr)	%	3.42E-04	**	
F.	Tritium, Iodines, and Particulates[2] (with half-lives greater than 8 days)				
	Percent of Quarterly Dose Limit (7.5 mrem)	%	2.85E-01	1.65E-01	
	Percent of Annual Dose Limit (15 mrem)	%	4.45E-01	5.05E-01	
	Percent of Organ Dose Rate Limit (1500 mrem/yr)	%	5.71E-03	3.27E-03	

[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. Actual numbers will be provided in the next Semi-Annual Report.

ATTACHMENT 3

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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	9.33E-02	**
Xenon-135m	Ci	**	**
Xenon-137	Ci	**	**
Xenon-138	Ci	**	**
2. Iodines[1]			
Iodine-131	Ci	1.77E-05	**
Iodine-133	Ci	2.53E-04	1.64E-04
Iodine-135	Ci	**	**
3. Particulates[1,2]			
Strontium-89	Ci	8.04E-06	3.00E-04
Strontium-90	Ci	**	3.75E-05
Cesium-134	Ci	**	**
Cesium-137	Ci	6.51E-06	1.11E-05
Cobalt-60	Ci	4.72E-04	1.70E-04
Cobalt-58	Ci	2.45E-04	**
Manganese-54	Ci	1.10E-04	8.88E-06
Barium-Lanthanum-140	Ci	**	**
Antimony-125	Ci	**	**
Niobium-95	Ci	**	**
Cerium-141	Ci	**	**
Cerium-144	Ci	9.17E-05	**
Iron-59	Ci	**	**
Cesium-136	Ci	**	**
Chromium-51	Ci	6.51E-04	**
Zinc-65	Ci	**	**
Iron-55	Ci	7.00E-05	1.88E-04
Molybdenum-99	Ci	**	**
Neodymium-147	Ci	1.36E-05	**
4. Tritium[2]	Ci	3.15E+00	2.19E+01

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. Actual numbers will be included in the next Semi-Annual Report.

3 Contributions from purges are included.

ATTACHMENT 4

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GASEOUS EFFLUENTS - GROUND LEVEL RELEASES

There were no batch releases during the third quarter. Emergency Condenser Vent testing was performed in December following replacement of the Emergency Condenser tube bundles. Ground level releases are determined in accordance with the Off-Site Dose Calculation Manual and Chemistry procedures.

			CONTINUOUS MODE		BATCH MODE	
			3rd QUARTER	4th QUARTER	3rd QUARTER	4th QUARTER
1.	Fission Gases[1]					
	Argon-41	Ci	4.76E-03	**	No Releases	**
	Krypton-85	Ci	**	**	No Releases	**
	Krypton-85m	Ci	6.45E-03	**	No Releases	**
	Krypton-87	Ci	3.60E-02	**	No Releases	**
	Krypton-88	Ci	2.31E-02	**	No Releases	**
	Xenon-133	Ci	3.07E-03	**	No Releases	**
	Xenon-133m	Ci	**	**	No Releases	**
	Xenon-135	Ci	3.07E-02	**	No Releases	**
	Xenon-135m	Ci	1.60E-01	**	No Releases	**
	Xenon-137	Ci	**	**	No Releases	**
	Xenon-138	Ci	9.47E-01	**	No Releases	**
	Xenon-127	Ci	**	**	No Releases	**
2.	Iodines[1]					
	Iodine-131	Ci	**	**	No Releases	**
	Iodine-133	Ci	3.71E-06	**	No Releases	**
	Iodine-135	Ci	**	**	No Releases	**
3.	Particulates[1,2]					
	Strontium-89	Ci	2.72E-08	1.00E-07	No Releases	3.06E-08
	Strontium-90	Ci	**	1.25E-08	No Releases	3.82E-09
	Cesium-134	Ci	**	**	No Releases	**
	Cesium-137	Ci	1.97E-07	**	No Releases	**
	Cobalt-60	Ci	4.26E-06	3.07E-07	No Releases	1.30E-07
	Cobalt-58	Ci	4.74E-08	**	No Releases	**
	Manganese-54	Ci	9.00E-07	1.04E-07	No Releases	1.48E-08
	Barium-Lanthanum-140	Ci	**	**	No Releases	**
	Antimony-125	Ci	**	**	No Releases	**
	Niobium-95	Ci	**	**	No Releases	**
	Cerium-141	Ci	**	**	No Releases	**
	Cerium-144	Ci	**	**	No Releases	**
	Iron-59	Ci	**	**	No Releases	**
	Cesium-136	Ci	**	**	No Releases	**
	Chromium-51	Ci	4.79E-07	**	No Releases	**
	Zinc-65	Ci	**	**	No Releases	**
	Iron-55	Ci	4.30E-07	3.07E-07	No Releases	1.30E-07
	Molybdenum-99	Ci	**	**	No Releases	**
4.	Tritium[2]	Ci	1.88E+01	3.17E+00	No Releases	6.89E-01

[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 Ci/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. Actual numbers will be included in the next Semi-Annual Report.

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LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

			3rd QUARTER	4th QUARTER[1]	EST. TOTAL ERROR, %
A.	Fission & Activation Products				
	1. Total release (not including Tritium, gases, alpha)	Ci	No Releases	3.25E-06	5.00E+01
	2. Average diluted concentration during reporting period	µCi/ml	No Releases	1.29E-09	
B.	Tritium				
	1. Total release	Ci	No Releases	1.32E-02	5.00E+01
	2. Average diluted concentration during reporting period	µCi/ml	No Releases	5.26E-06	
C.	Dissolved and Entrained Gases[2]				
	1. Total release	Ci	No Releases	**	5.00E+01
	2. Average diluted concentration during reporting period	µCi/ml	No Releases	**	
D.	Gross Alpha Radioactivity				
	1. Total release	Ci	No Releases	2.55E-08	5.00E+01
E.	Volumes				
	1. Prior to dilution	Liters	No Releases	3.79E+03	5.00E+01
	2. Volume of dilution water available during release period	Liters	No Releases	3.69E+03	5.00E+01
	3. Volume of dilution water available during reporting period for the 4th Quarter Abnormal Release:	Liters	N/A	2.51E+06	5.00E+01
	4. Volume of normal service water available during the reporting period.	Liters	1.32E+11	7.53E+10	5.00E+01
F.	Percent of Technical Specification Limits				
	Percent of Quarterly Whole Body Dose Limit (1.5 mrem)	%	No Releases	6.72E-01	
	Percent of Quarterly Organ Dose Limit (5 mrem)	%	No Releases	7.20E-01	
	Percent of Annual Whole Body Dose Limit to Date (3 mrem)	%	No Releases	3.36E-01	
	Percent of Annual Organ Dose Limit to Date (10 mrem)	%	No Releases	3.60E-01	
	Percent of 10CFR20 Concentration Limit[3]	%	No Releases	1.89E-01	
	Percent of Dissolved or Entrained Noble Gas Limit (2.00E-04 µCi/ml)	%	No Releases	**	

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1 Data reflects the December 1997 Abnormal Release of liquid to the storm drain during the Emergency Condenser (EC) test. Non-gamma emitting radionuclide activities are estimated based on scaling factors applied to EC shell gamma isotopic results, and Condensate Storage Tank activity for Tritium. There were no other batch or continuous releases during the fourth quarter 1997.

2 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 5.00E-07 µCi/ml for required gamma emitting nuclides, 1.00E-05 µCi/ml for required dissolved and entrained noble gases and tritium, 5.00E-08 µCi/ml for Sr 89/90, 1.00E-06 µCi/ml for Fe-55 and 1.00E-07 µCi/ml for gross alpha radioactivity, as required by Technical Specifications, has been verified.

3 The percent of the 10CFR20 concentration limit is based on the average concentration during the quarter.

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LIQUID EFFLUENTS RELEASED

Nuclides Released[2]		BATCH MODE[1] 3rd QUARTER	BATCH MODE[1] 4th QUARTER[3]
Strontium-89	Ci	No Releases	4.05E-07
Strontium-90	Ci	No Releases	5.07E-08
Cesium-134	Ci	No Releases	**
Cesium-137	Ci	No Releases	**
Iodine-131	Ci	No Releases	**
Cobalt-58	Ci	No Releases	**
Cobalt-60	Ci	No Releases	1.17E-06
Iron-59	Ci	No Releases	**
Zinc-65	Ci	No Releases	**
Manganese-54	Ci	No Releases	4.54E-07
Chromium-51	Ci	No Releases	**
Zirconium-Niobium-95	Ci	No Releases	**
Molybdenum-99	Ci	No Releases	**
Technetium-99m	Ci	No Releases	**
Barium-Lanthanum-140	Ci	No Releases	**
Cerium-141	Ci	No Releases	**
Tungsten-187	Ci	No Releases	**
Arsenic-76	Ci	No Releases	**
Iodine-133	Ci	No Releases	**
Iron-55	Ci	No Releases	1.17E-06
Neptunium-239	Ci	No Releases	**
Praseodymium-144	Ci	No Releases	**
Iodine-135	Ci	No Releases	**
Dissolved or Entrained Gases	Ci	No Releases	**
Tritium	Ci	No Releases	1.32E-02

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1 No continuous mode release occurred during the report period.

2 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 5.00E-07 μCi/ml for required gamma emitting nuclides, 1.00E-05 μCi/ml for required dissolved and entrained noble gases and tritium, 5.00E-08 μCi/ml for Sr 89/90, 1.00E-06 μCi/ml for Fe-55 and 1.00E-07 μCi/ml for gross alpha radioactivity, as required by Technical Specifications, has been verified.

3 Activities reflect the December 1997 Abnormal Release of liquid to the storm drain during the Emergency Condenser (EC) test. Non-gamma emitting radionuclide activities are estimated based on scaling factors applied to EC shell gamma isotopic results, and Condensate Storage Tank activity for Tritium. There were no other batch or continuous releases during the fourth quarter 1997.

Unit 1 _X_ Unit 2 __ Reporting Period July - December 1997

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS:

A.1 TYPE	Volume (m^3) Class			Activity[1] (Ci) Class		
1. Spent Resin[2]	A	B	C	A	B	C
	0	0	0	0	0	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						
	5.61E+00	0	0	2.32E-01	0	0
3. Irradiated Components						
	0	0	0	0	0	0
4. Other[3]						
	0	0	0	0	0	0

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

[2] There were three 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 was 1.05E+01 curies and the volume was 1.68E+01 m^3.

[3] There was one Unit 1 steel encased high integrity container of waste Class C powdered resin and bead resin mix placed in interim storage at Nine Mile Point during the reporting period. The total activity was 2.72E+02 curies and the volume was 5.61E+00 m^3.

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SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A.1 TYPE	Container	Package	Solidification Agent
1. Spent Resin	N/A	N/A	N/A
Filter Sludge	N/A	N/A	N/A
Concentrated Waste	N/A	N/A	N/A
2. Dry Compressible Waste (non-compacted)	Poly Hic	Type A	None
3. Irradiated Components	N/A	N/A	N/A
4. Other	N/A	N/A	N/A

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SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

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

a. Spent Resins, Filter Sludges, Concentrated Waste: There were no shipments for direct burial.

b. Dry Compressible Waste

Nuclide	Percent
(1) Co-60	6.21E+01
(2) Mn-54	2.42E+01
(3) Fe-55	7.67E+00
(4) CS-137	4.91E+00
(5) Other	1.12E+00

c. Irradiated Components: There were no shipments for direct burial.

d. Other: There were no shipments for direct burial.

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SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A.3. SOLID WASTE DISPOSITION:

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

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

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

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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 1997. 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, dry non-compressible waste and high conductivity waste water) that was processed and commingled prior to burial.

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

Burial Volume (m^3)	Activity (Ci)	Est. Total Error, %
2.05E+01	1.88E+01	5.00+01

C.2. ESTIMATE OF MAJOR NUCLIDE COMPOSITION

Nuclide	Percent
(1) Cs-137	3.46E+01
(2) Co-60	3.29E+01
(3) Fe-55	2.87E+01
(4) Mn-54	1.30E+00
(5) Other	2.50E+00

C.3. SOLID WASTE DISPOSITION[1]

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

[1] Note: During the report period ten 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.

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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

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SUMMARY OF CHANGES TO THE OFF-SITE DOSE CALCULATION MANUAL

There were no changes to the Unit 1 Off-Site Dose Calculation Manual during the reporting period.

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SUMMARY OF CHANGES TO THE PROCESS CONTROL PROGRAM

The Unit 1 Process Control Program (PCP) revision 3 was implemented in December 1997. Changes updating referenced regulations and procedures and editorial changes were made. The revision also reflects the integration of a modular (skid mounted) "Thermex" system as part of the Liquid Radwaste Treatment System. The PCP changes do not reduce the overall conformance of the solidified waste product to existing criteria for solid wastes in accordance with Technical Specifications. A copy of the PCP, revision 3 is attached and below is a summary of the changes accepted by the Station Operations Review Committee (SORC). As previously stated in the "Summary Of Changes To The Process Control Program" section of the January - June 1996 Semi-Annual Radioactive Effluent Release Report for Nine Mile Point Unit 1, any resultant changes to the PCP for the integration of the Thermex system would be made once the modification was complete. The modification was Operations accepted in August 1997. The related changes to the PCP were reviewed in advance and accepted by SORC in April 1997. Additional SORC review and acceptance was obtained in December 1997 for PCP changes updating the referenced regulations and procedures.

Old Page #	New Page #	New/Amended Section #	Change	Reason for Change
i	I	N/A	Pages 9, 10, 11, 12, and 13 were added to the "List of Effective Pages".	Additional pages were required to accommodate new information and sections.
ii	II	N/A	The Table of Contents was updated.	Updated to reflect the changed document configuration.
1	1	3.1	A new section, "System Description", has been inserted as the new section 3.1. It provides a brief overview of the Process Control Program. Subsequent sections have been re-numbered accordingly.	This is an enhancement for program clarification.
1-6	3-8	4.0-6.0	Re-numbered Sections 3.1 through 5.0.	Adjusted section numbering as a result of an insertion of a new Section 3.1.
1	3	4.1	Section labels changed from a, b, c, d, and e, to 4.1.1, 4.1.2, 4.1.3, 4.1.4, and 4.1.5, respectively.	Corrected for adherence to the applicable procedure writing guidelines.
1	3	4.1.2	The sentence, "Vendors must have QA programs that meet NRC requirements.", was removed.	Updated. NMPC is responsible for ensuring that applicable QA requirements are met as part of the approval process.
2	3	4.2.3	Changed reference from 49CFR173.425 to 49CFR173.427.	Updated to accurately reflect the pertinent regulation.
2	4	4.3.1.b	The end of the sentence was changed from, "properly.", to ,"in accordance with approved procedures.".	Editorial for clarification.
3	4	4.4.1.b	Changed from,"10CFR20.311", to, "10CFR20.2006".	Updated to accurately reflect the pertinent regulation.
3	5	4.4.1.d	Changed the word "procedure" to the plural.	Corrected an editorial error.

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Old Page #	New Page #	New/Amended Section #	Change	Reason for Change
3-4	5	4.4.2	Subsections have been revised and re-labeled. • Content of old sections b and d have been eliminated. • New sections b and d reflect the information from the old section c with the referenced regulation changed from 10CFR20.311.d.3 to 10CFR20.2006. • New section c contains the information from the old section e. The word Radwaste has been capitalized.	• Updated to reflect current QA department responsibilities for assuring effective implementation of the Process Control Program. • Reorganized for clarification. Updated to accurately reflect the pertinent regulation. • Document organization change. Corrected a grammatical error.
4	5	4.4.3.a	This section was re-worded to clarify the necessary Radwaste Operator Initial and continuing qualification requirements.	Clarification.
4	5	4.4.3.a.1	The word Radwaste is capitalized.	Corrected a grammatical error.
4	6	4.4.3.a.4	The reference to a specific training procedure is replaced with the wording, "approved training procedures".	Updated to more generally reflect the requirements.
4	6	4.4.4	The word "the" is deleted from the text.	Corrected a grammatical error.
4	6	5.1	Changed from, "49CFR171.8", and, "49CFR173.403", to, "49CFR171", and, "49CFR Sub Part I", respectively.	Updated to accurately reflect the pertinent regulations.
5	6	6.1.6	The reference was changed from, "UFSAR, Section.F., R55B", to, "UFSAR, Section 3.I, RSSB".	Typographical error was corrected.
5	7	6.2.7	Changed from, "49CFR173.425", to "49CFR173.427".	Updated to accurately reflect the pertinent regulation.
6	7	6.2.9	The sentence changes the reference for Section 6.13, to Section 6.14.	Typographical error was corrected.
6	7	6.3.6	The referenced procedure title is updated.	Editorial correction.
6	8	6.4	A reference was removed, 5.4.2, and the section was re-numbered accordingly.	The reference no longer applies.
7	9	Attachment 1 (Sheet 1)	The referenced procedure title is updated.	Editorial correction.
8	10	Attachment 1 (Sheet 2)	Changed from, "NTP-TQS-201", to, "NTP-TQS-108".	Editorial correction.
N/A	11-13	Attachment 2	Added Attachment 2, "Solid Waste Sources".	Enhancement to describe the sources of solid waste.

ATTACHMENT 9

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SUMMARY OF INOPERABLE MONITORS

Monitor	Dates of Inoperability	Cause and Corrective Action
Stack Noble Gas Activity Monitor RAM-112-07A	9/15/97 to 11/4/97	Inoperable due to random upscale spiking, concluded to be electrical noise external to monitor: Corrective Actions Included: 1. 12-hour sampling analysis of grab samples during period of concurrent inoperability with RAM-112-08A. 2. Troubleshooting of monitor system. 3. Operability determination considered upscale spiking conservative. Monitor system declared operable.
Stack Noble Gas Activity Monitor RAM-112-08A	8/10/97 to 12/6/97	Inoperable due to random downscale conditions, caused by intermittent failure of electronic components. Corrective Actions Included: 1. 12-hour sampling analysis of grab samples during period of concurrent inoperability with RAM-112-07A. 2. Refurbishment of RAM-112-08A at vendor facility. 3. Calibration and restoration of monitor system.

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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 located approximately one quarter mile west of NMP1. 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 near the shoreline adjacent to the NMP site. 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. In addition, only releases from the NMP1 stack and vent 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 Thermal Luminescent Detectors (TLDs). Since any significant fishing activity near the Energy Center occurs between April through December, environmental TLD data for the approximate period of April 1 - December 31, 1997 were considered. Data from two environmental TLDs 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 7.5E-03 mRem per hour for the period. The average control TLD dose rate was 6.7E-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 2.6E-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 its proximity to the fishing area. A small portion may be due to the NMP2 facility.

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The inhalation dose pathway is evaluated by utilizing the inhalation equation in the ODCM, as adapted from 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.

The 1997 calculation utilized the following information:

NMP1 Stack:

- Unit 1 average stack flowrate = 1.05E+02 m^3/sec
- X/Q value = 8.9E-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 = 4.42E-01 pCi/m^3
- Fe-55 = 1.53E-01 pCi/m^3
- Sr-89 = 1.34E-01 pCi/m^3
- Sr-90 = 1.59E-02 pCi/m^3
- H-3 = 1.10E+04 pCi/m^3
- I-131= 1.11E-02 pCi/m^3
- I-133 = 3.26E-01 pCi/m^3
- Cs-137 = 1.46E-02 pCi/m^3
- Mn-54 = 1.04E-01 pCi/m^3
- Cr-51 = 2.72E-01 pCi/m^3
- Nd-147 = 5.30E-03 pCi/m^3
- Ce-144 = 3.57E-02 pCi/m^3
- Nb-95 = 1.94E-03 pCi/m^3
- Co-58 = 9.73E-02 pCi/m^3

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Emergency Condenser Vent:

- Average vent flowrate = 4.07E-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 = 4.09E+01 pCi/m^3
- Sr-90 = 4.90E+00 pCi/m^3
- Cs-137 = 2.43E+01 pCi/m^3
- Co-60 = 1.73E+03 pCi/m^3
- Mn-54 = 7.84E+02 pCi/m^3
- Fe-55 = 1.47E+03 pCi/m^3
- H-3 = 3.57E+09 pCi/m^3
- Cr-51 = 3.91E+02 pCi/m^3
- I-133 = 4.98E+02 pCi/m^3
- Co-58 = 2.09E+02 pCi/m^3
- Fe-59 = 5.80E+02 pCi/m^3
- Ce-144 = 3.04E+01 pCi/m^3

The inhalation dose to a member of the public from NMP1 as a result of activities inside the site boundary is 9.7E-04 mRem to the thyroid (maximum organ dose) and 9.5E-04 mRem to the whole body.

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 1997, 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 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

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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 = 0.292 pCi/g

The total whole body and skin dose from standing on the shoreline to fish is 4.6E-03 mRem whole body and 5.4E-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 2.7E-01 mRem to the whole body and 9.7E-04 mRem to the maximum exposed internal organ (thyroid). The dose to the skin of an adult is 5.4E-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.

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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 (ODCMs) or may, in some cases, be calculated from the analysis results of actual environmental samples. Acceptable methods of calculating doses from environmental samples are also found in the facilities' ODCMs. 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 1997 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.

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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).

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. As 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 TLDs. 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 1997, the closest residence and the critical downwind residence are at the same location.

The measured average dose for 1997 at the critical residence was 55.6 mRem. The average control dose was 55.9 mRem. The dose at the critical residence can be considered representative of the background dose since the control location dose was higher. Therefore, no dose was calculated and was assumed to be zero for this pathway.

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7. The dose, as a result of fish consumption, is considered as part of the aquatic pathway. The dose for 1997 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 1997. Adjusting the average concentration of Cs-137 in indicator samples by subtracing 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.

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 6.2E-04 mRem skin dose for the period.

9. In summary, the maximum dose to the likely most exposed member of the public is 8.3E-02 mRem to the thyroid (maximum organ dose) and 7.6E-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 6.2E-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 NMP1, NMP2 and the JAF 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.

ATTACHMENT 12

Update of Emergency Condenser Vent Data for the period March 1996 through June 1997
and,
Actual Data for the Second Quarter 1997 Elevated Releases

Unit 1 X Unit 2 _ Reporting Period January - June 1997

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

Update of data using: 1) actual results from the off-site vendor for Strontium, Tritium and Iron-55 for the second quarter 1997 elevated releases and 2) data representing first and second quarter 1997 ground level releases from the Emergency Condenser vents, including steam releases from leaking tubes, based on a conservative representative month[1] and the station operating history.

			1st QUARTER	2nd QUARTER	EST. TOTAL ERROR, %
A.	Fission & Activation gases				
	1. Total release	Ci	1.02E+00	6.54E-01	5.00E+01
	2. Average release rate	µCi/sec	1.31E-01	8.32E-02	
B.	Iodines				
	1. Total Iodine-131	Ci	1.85E-04	1.06E-05	3.00E+01
	2. Average release rate for period	µCi/sec	2.48E-05	1.35E-06	
C.	Particulates				
	1. Particulates with half-lives >8 days	Ci	9.48E-04	8.59E-04	3.00E+01
	2. Average release rate for period	µCi/sec	1.28E-04	1.09E-04	
D.	Tritium				
	1. Total release	Ci	2.11E+01	1.23E+01	5.00E+01
	2. Average release rate for period	µCi/sec	2.84E+00	1.57E+00	
E.	Percent of Tech. Spec. Limits				
	Fission and Activation Gases				
	Percent of Quarterly Gamma Air Dose Limit (5 mR)	%	3.84E-02	2.46E-02	
	Percent of Quarterly Beta Air Dose Limit (10 mrad)	%	1.03E-02	6.57E-03	
	Percent of Annual Gamma Air Dose Limit to Date (10 mR)	%	1.92E-02	3.15E-02	
	Percent of Annual Beta Air Dose Limit to Date (20 mrad)	%	5.15E-03	8.45E-03	
	Percent of Whole Body Dose Rate Limit (500 mrem/yr)	%	1.05E-03	6.59E-04	
	Percent of Skin Dose Rate Limit (3000 mrem/yr)	%	3.21E-04	2.03E-04	
	Tritium, Iodines, and Particulates (with half-lives greater than 8 days)				
	Percent of Quarterly Dose Limit (7.5 mrem)	%	3.43E-01	2.55E-01	
	Percent of Annual Dose Limit (15 mrem)	%	1.73E-01	3.02E-01	
	Percent of Organ Dose Rate Limit (1500 mrem/yr)	%	7.29E-03	5.14E-03	

[1] A representative monthly ground level release for the period March 1996 through June 1997 (the identified period of Emergency Condenser (EC) leakage prior to the second half 1997) has been conservatively determined based on individual condenser shell water activities and includes steam leak rates from EC tube leaks. The data for the representative month is presented on pages 3 and 4 of this report attachment.

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UPDATE OF GASEOUS EFFLUENTS - GROUND LEVEL RELEASES

Update of data representing first and second quarter 1997 ground level releases from the Emergency Condenser vents, including steam releases from leaking tubes, based on a conservative representative month[1] and the station operating history.

			CONTINUOUS MODE		BATCH MODE	
					There were no batch releases during the reporting period	
			1st QUARTER	2nd QUARTER	1st QUARTER	2nd QUARTER
1.	Fission Gases[2]					
	Argon-41	Ci	**	**		
	Krypton-85	Ci	**	**		
	Krypton-85m	Ci	7.06E-03	4.52E-03		
	Krypton-87	Ci	2.99E-02	1.91E-02		
	Krypton-88	Ci	1.73E-02	1.11E-02		
	Xenon-133	Ci	1.34E-03	8.59E-04		
	Xenon-133m	Ci	**	**		
	Xenon-135	Ci	3.37E-02	2.16E-02		
	Xenon-135m	Ci	**	**		
	Xenon-137	Ci	**	**		
	Xenon-138	Ci	9.33E-01	5.96E-01		
	Xenon-127	Ci	**	**		
2.	Iodines[2]					
	Iodine-131	Ci	**	**		
	Iodine-133	Ci	3.67E-06	2.35E-06		
	Iodine-135	Ci	**	**		
3.	Particulates[2]					
	Strontium-89	Ci	**	**		
	Strontium-90	Ci	**	**		
	Cesium-134	Ci	**	**		
	Cesium-137	Ci	1.68E-07	1.07E-07		
	Cobalt-60	Ci	1.74E-05	1.12E-05		
	Cobalt-58	Ci	2.66E-06	1.70E-06		
	Manganese-54	Ci	8.96E-06	5.73E-06		
	Barium-Lanthanum-140	Ci	**	**		
	Antimony-125	Ci	**	**		
	Niobium-95	Ci	**	**		
	Cerium-141	Ci	**	**		
	Cerium-144	Ci	3.92E-07	2.50E-07		
	Iron-59	Ci	7.48E-06	4.78E-06		
	Cesium-136	Ci	**	**		
	Chromium-51	Ci	4.70E-06	3.00E-06		
	Zinc-65	Ci	**	**		
	Iron-55	Ci	1.69E-05	1.08E-05		
	Molybdenum-99	Ci	**	**		
4.	Tritium	Ci	1.71E+01	1.09E+01		

[1] A representative monthly ground level release for the period March 1996 through June 1997 (the identified period of Emergency Condenser (EC) leakage prior to the second half 1997) has been conservatively determined based on individual condenser shell water activities and includes steam leak rates from EC tube leaks. The data for the Representative month is presented on pages 3 and 4 of this report attachment.

[2] 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.

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GASEOUS EFFLUENTS - REPRESENTATIVE MONTH GROUND LEVEL RELEASE WITH EMERGENCY CONDENSER VENT TUBE LEAKS[1]

			Representative Month
A.	Fission & Activation gases		
	1. Total release	Ci	5.19E-01
	2. Monthly Average release rate	μCi/sec	1.94E-01
B.	Iodines[2]		
	1. Total Iodine-131	Ci	**
	2. Monthly Average release rate for period	μCi/sec	**
C.	Particulates		
	1. Particulates with half-lives >8 days	Ci	2.98E-05
	2. Monthly Average release rate for period	μCi/sec	1.11E-05
D.	Tritium		
	1. Total release	Ci	8.68E+00
	2. Monthly Average release rate for period	μCi/sec	3.24E+00
E.	Percent of Tech. Spec. Limits Fission and Activation Gases - (Ground Level Contributions Only)		
	Percent of Quarterly Gamma Air Dose Limit (5 mR)	%	1.95E-02
	Percent of Quarterly Beta Air Dose Limit (10 mrad)	%	5.22E-03
	Percent of Annual Gamma Air Dose Limit to Date (10 mR)	%	9.75E-03
	Percent of Annual Beta Air Dose Limit to Date (20 mrad)	%	2.61E-03
	Percent of Whole Body Dose Rate Limit (500 mrem/yr)	%	1.54E-03
	Percent of Skin Dose Rate Limit (3000 mrem/yr)	%	4.74E-04
	Tritium, Iodines, and Particulates (with half-lives greater than 8 days) - (Ground Level Contributions Only)		
	Percent of Quarterly Dose Limit (7.5 mrem)	%	4.06E-02
	Percent of Annual Dose Limit (15 mrem)	%	2.04E-02
	Percent of Organ Dose Rate Limit (1500 mrem/yr)	%	2.39E-03

[1] A representative monthly ground level release for the period March 1996 through June 1997 (the identified period of Emergency Condenser (EC) leakage prior to the second half 1997) has been conservatively determined based on individual condenser shell water activities and includes steam leak rates from EC tube leaks. The resultant ground dose contributions, presented in the data on this page, have been considered in conjunction with the elevated doses for the quarterly periods affected (i.e., March 1996 - June 1997) and no Technical Specification dose or dose rate limits have been exceeded.

[2] 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.

Unit 1 X Unit 2 _ Period March 1996 - June 1997

GASEOUS EFFLUENTS - REPRESENTATIVE MONTH GROUND LEVEL RELEASES WITH EMERGENCY CONDENSER TUBE LEAKS[1]

			CONTINUOUS MODE REPRESENTATIVE MONTH
1.	Fission Gases[2]		
	Argon-41	Ci	**
	Krypton-85	Ci	**
	Krypton-85m	Ci	3.59E-03
	Krypton-87	Ci	1.52E-02
	Krypton-88	Ci	8.79E-03
	Xenon-133	Ci	6.83E-04
	Xenon-133m	Ci	**
	Xenon-135	Ci	1.71E-02
	Xenon-135m	Ci	**
	Xenon-137	Ci	**
	Xenon-138	Ci	4.74E-01
	Xenon-127	Ci	**
2.	Iodines[2]		
	Iodine-131	Ci	**
	Iodine-133	Ci	1.87E-06
	Iodine-135	Ci	**
3.	Particulates[2]		
	Strontium-89	Ci	**
	Strontium-90	Ci	**
	Cesium-134	Ci	**
	Cesium-137	Ci	8.54E-08
	Cobalt-60	Ci	8.87E-06
	Cobalt-58	Ci	1.35E-06
	Manganese-54	Ci	4.55E-06
	Barium-Lanthanum-140	Ci	**
	Antimony-125	Ci	**
	Niobium-95	Ci	**
	Cerium-141	Ci	**
	Cerium-144	Ci	1.99E-07
	Iron-59	Ci	3.80E-06
	Cesium-136	Ci	**
	Chromium-51	Ci	2.39E-06
	Zinc-65	Ci	**
	Iron-55	Ci	8.57E-06
	Molybdenum-99	Ci	**
4.	Tritium	Ci	8.68E+00

[1] A representative monthly ground level release for the period March 1996 through June 1997 (the identified period of Emergency Condenser (EC) leakage prior to the second half 1997) has been conservatively determined based on individual condenser shell water activities and includes steam leak rates from EC tube leaks.

[2] 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.