NINE MILE POINT NUCLEAR STATION - UNIT 1

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

January – December 2004

Constellation Energy

Nine Mile Point Nuclear Station

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ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

JANUARY - DECEMBER 2004

SUPPLEMENTAL INFORMATION

Facility: Nine Mile Point Unit #1 **Licensee: Nine Mile Point Nuclear Station, LLC**

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 or beyond the site boundary shall be less than or equal to 500 mrem/year to the whole 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 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 mrads 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 mrads 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 or 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 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 ten times the concentrations specified in 10 CFR Part 20, Appendix B, Table 2, 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 mrems to the total body and to less than or equal to 5 mrems to any organ, and during any calendar year to less than or equal to 3 mrems to the total body and to less than or equal to 10 mrems 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 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. Tritium effluent activity is measured during purge and weekly when fuel is offloaded until stable tritium release rates are demonstrated.

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 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. Tritium concentration is estimated to be the same as the most recent analysis of the Condensate Storage Tank water. 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.

G) SOLID WASTE

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 January – December 2004

Liquid Effluents:

ODCM Required MEC = 10 x 10CFR20, Appendix B, Table 2, Column 2

There were no discharges of Liquid Radwaste requiring use of MEC to determine allowable release rate.

MECs for discharges from Emergency Condenser Vents are as follows:

Average MEC - µCi/ml (Qtr. 1) = 9.91E-03 Average MEC - µCi/ml (Qtr. 3) = N/A
Average MEC - µCi/ml (Qtr. 2) = N/A verage MEC - µCi/ml (Qtr. 4) = N/A

Average Energy (Fission and Activation gases – Mev):

Qtr. 1 :	$\bar{E}_\gamma$ = 1.61E-01	$\bar{E}_\beta$ = 2.39E-01
Qtr. 2 :	$\bar{E}_\gamma$ = 2.47E-01	$\bar{E}_\beta$ = 3.17E-01
Qtr. 3 :	$\bar{E}_\gamma$ = 2.47E-01	$\bar{E}_\beta$ = 3.17E-01
Qtr. 4 :	$\bar{E}_\gamma$ = N/A	$\bar{E}_\beta$ = N/A

Liquid:	Radwaste	EC Vent
Number of batch releases	: 0	2
Total time period for batch releases (hrs)	: N/A	1.03E+00
Maximum time period for a batch release (hrs)	: N/A	5.33E-01
Average time period for a batch release (hrs)	: N/A	5.17E-01
Minimum time period for a batch release (hrs)	: N/A	5.00E-01
Total volume of water used to dilute the liquid effluent during release period (L)	: 1st 7.33E+02, 2nd N/A	3rd N/A, 4th N/A
Total volume of water available to dilute the liquid effluent during report period (L)	: 1st 1.58E+07, 2nd N/A	3rd N/A, 4th N/A

Gaseous – (There were three releases from the operation of the Emergency Condenser Vent):	
Number of batch releases	: 3
Total time period for batch releases (hrs)	: 1.10E+00
Maximum time period for a batch release (hrs)	: 5.33E-01
Average time period for a batch release (hrs)	: 3.67E-01
Minimum time period for a batch release (hrs)	: 6.67E-02

Gaseous (Primary Containment Purge):	
Number of batch releases	: 2
Total time period for batch releases (hrs)	: 1.57E+01
Maximum time period for a batch release (hrs)	: 1.03E+01
Average time period for a batch release (hrs)	: 7.86E+00
Minimum time period for a batch release (hrs)	: 5.40E+00

ATTACHMENT 1

Summary Data

Unit 1 X Unit 2 __	Reporting Period January – December 2004
Abnormal Releases:	
A. Liquids:	
Number of releases	0
Total activity released	N/A Ci
B. Gaseous:	
Number of releases	0
Total activity released	N/A Ci

Unit 1 X Unit 2 Reporting Period January – December 2004

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

			1st QUARTER	2nd QUARTER	3rd QUARTER	4th QUARTER	EST. TOTAL ERROR, %
A.	Fission & Activation gases						
	1. Total release	Ci	2.88E-03	1.37E+00	1.71E-01	0	5.00E+01
	2. Average release rate	µCi/sec	3.66E-04	1.74E-01	2.15E-02	0	
B.	Iodines						
	1. Total Iodine-131	Ci	8.82E-05	1.13E-04	1.92E-04	2.35E-04	3.00E+01
	2. Average release rate for period	µCi/sec	1.12E-05	1.44E-05	2.42E-05	2.96E-05	
C.	Particulates						
	1. Particulates with half-lives >8 days	Ci	3.95E-03	5.62E-04	4.14E-04	2.16E-03	3.00E+01
	2. Average release rate for period	µCi/sec	5.02E-04	7.15E-05	5.21E-05	2.72E-04	
	3. Gross alpha radioactivity	Ci	2.01E-05	4.78E-05	5.95E-05	4.59E-05	2.50E+01
D.	Tritium						
	1. Total release	Ci	1.33E+01	8.12E+00	1.13E+01	1.41E+01	5.00E+01
	2. Average release rate for period	µCi/sec	1.69E+00	1.03E+00	1.42E+00	1.77E+00	
E.	Percent of Tech. Spec. Limits						
	Fission and Activation Gases						
	Percent of Quarterly Gamma Air Dose Limit (5 mR)	%	8.96E-06	6.28E-04	7.82E-04	0	
	Percent of Quarterly Beta Air Dose Limit (10 mrad)	%	6.64E-06	2.57E-04	3.19E-04	0	
	Percent of Annual Gamma Air Dose Limit to Date (10 mR)	%	4.48E-06	3.14E-04	7.05E-04	7.05E-04	
	Percent of Annual Beta Air Dose Limit to Date (20 mrad)	%	3.32E-06	1.29E-03	1.45E-03	1.45E-03	
	Percent of Whole Body Dose Rate Limit (500 mrem/yr)	%	2.33E-07	1.67E-04	2.06E-05	0	
	Percent of Skin Dose Rate Limit (3000 mrem/yr)	%	1.03E-07	5.85E-05	7.21E-06	0	
	Tritium, Iodines, and Particulates (with half-lives greater than 8 days)						
	Percent of Quarterly Dose Limit (7.5 mrem)	%	1.32E-01	6.18E-02	5.75E-02	1.58E-01	
	Percent of Annual Dose Limit to Date (15 mrem)	%	6.67E-02	9.78E-02	1.42E-01	2.22E-01	
	Percent of Organ Dose Rate Limit (1500 mrem/yr)	%	2.66E-03	1.24E-03	1.14E-03	3.14E-03	

Unit 1 X Unit 2 __ Reporting Period January – December 2004

GASEOUS EFFLUENTS – ELEVATED RELEASE

Nuclides Released			CONTINUOUS MODE[2] 1st QUARTER	2nd 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-127	Ci	**	**	**	**
	Xenon-131m	Ci	**	**	**	**
	Xenon-133	Ci	**	**	**	**
	Xenon-133m	Ci	**	**	**	**
	Xenon-135	Ci	**	1.37E+00	1.71E-01	**
	Xenon-135m	Ci	**	**	**	**
	Xenon-137	Ci	**	**	**	**
	Xenon-138	Ci	**	**	**	**
2.	Iodines[1]					
	Iodine-131	Ci	8.82E-05	1.13E-04	1.92E-04	2.35E-04
	Iodine-133	Ci	1.33E-04	7.35E-06	1.77E-04	8.18E-05
	Iodine-135	Ci	**	**	**	**
3.	Particulates[1]					
	Strontium-89	Ci	**	1.34E-05	**	3.91E-05
	Strontium-90	Ci	**	**	**	**
	Cesium-134	Ci	**	**	**	**
	Cesium-137	Ci	1.57E-05	**	8.86E-06	6.66E-06
	Cobalt-60	Ci	1.93E-03	3.99E-04	3.11E-04	1.48E-03
	Cobalt-58	Ci	1.21E-04	6.04E-06	7.59E-06	3.37E-05
	Manganese-54	Ci	7.14E-04	9.25E-05	5.48E-05	2.87E-04
	Barium-Lanthanum-140	Ci	**	**	**	**
	Antimony-125	Ci	**	**	**	**
	Niobium-95	Ci	**	**	**	**
	Cerium-141	Ci	**	**	**	**
	Cerium-144	Ci	**	**	**	**
	Iron-59	Ci	6.55E-05	**	**	**
	Cesium-136	Ci	**	**	**	**
	Chromium-51	Ci	5.94E-04	5.07E-05	3.20E-05	**
	Zinc-65	Ci	**	**	**	**
	Iron-55	Ci	5.14E-04	**	**	3.16E-04
	Molybdenum-99	Ci	**	**	**	**
	Neodymium-147	Ci	**	**	**	**
4.	Tritium	Ci	7.16E+00	6.32E+00	8.35E+00	1.19E+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 ODCM, has been verified.

2 Contributions from purges are included. There were no other batch releases during the reporting period.

Unit 1 X Unit 2 _ Reporting Period January – December 2004

GASEOUS EFFLUENTS – GROUND LEVEL RELEASES

Ground level releases are determined in accordance with the Off-Site Dose Calculation Manual and Chemistry procedures.

			CONTINUOUS MODE			
			1st QUARTER	2nd 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-127	Ci	**	**	**	**
	Xenon-131m	Ci	**	**	**	**
	Xenon-133	Ci	1.43E-04	**	**	**
	Xenon-133m	Ci	**	**	**	**
	Xenon-135	Ci	1.90E-04	1.78E-05	**	**
	Xenon-135m	Ci	**	**	**	**
	Xenon-137	Ci	**	**	**	**
	Xenon-138	Ci	**	**	**	**
2.	Iodines[1]					
	Iodine-131	Ci	**	**	**	**
	Iodine-133	Ci	**	**	**	**
	Iodine-135	Ci	**	**	**	**
3.	Particulates[1]					
	Strontium-89	Ci	**	**	**	**
	Strontium-90	Ci	**	**	**	**
	Cesium-134	Ci	**	**	**	**
	Cesium-137	Ci	**	**	**	**
	Cobalt-60	Ci	**	**	**	**
	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	**	**	**	**
	Molybdenum-99	Ci	**	**	**	**
	Neodymium-147	Ci	**	**	**	**
4.	Tritium	Ci	1.75E+00	1.79E+00	2.97E+00	2.23E+00

[1] Concentrations less than the lower limit of detection of the counting system used are indicated with a double asterisk.

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GASEOUS EFFLUENTS – GROUND LEVEL RELEASES

Ground level releases are determined in accordance with the Off-Site Dose Calculation Manual and Chemistry procedures.

			BATCH MODE			
			1st QUARTER	2nd 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-127	Ci	**	**	**	**
	Xenon-131m	Ci	**	**	**	**
	Xenon-133	Ci	1.09E-03	**	**	**
	Xenon-133m	Ci	**	**	**	**
	Xenon-135	Ci	1.46E-03	**	**	**
	Xenon-135m	Ci	**	**	**	**
	Xenon-137	Ci	**	**	**	**
	Xenon-138	Ci	**	**	**	**
2.	Iodines[1]					
	Iodine-131	Ci	1.32E-08	**	**	**
	Iodine-133	Ci	1.20E-07	**	**	**
	Iodine-135	Ci	**	**	**	**
3.	Particulates[1]					
	Strontium-89	Ci	**	**	**	**
	Strontium-90	Ci	**	**	**	**
	Cesium-134	Ci	**	**	**	**
	Cesium-137	Ci	1.74E-09	**	**	**
	Cobalt-60	Ci	8.10E-08	**	**	**
	Cobalt-58	Ci	3.06E-08	**	**	**
	Manganese-54	Ci	2.58E-08	**	**	**
	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	**	**	**	**
	Molybdenum-99	Ci	**	**	**	**
	Neodymium-147	Ci	**	**	**	**
4.	Tritium	Ci	4.38E+00	**	**	**

[1] Concentrations less than the lower limit of detection of the counting system used are indicated with a double asterisk.

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LIQUID EFFLUENTS – SUMMATION OF ALL RELEASES

		1st QUARTER[1]	2nd QUARTER	3rd QUARTER	4th QUARTER	EST. TOTAL ERROR, %
A. Fission & Activation Products						
1. Total release (not including Tritium, gases, alpha)	Ci	1.84E-06	**	**	**	5.00E+01
2. Average diluted concentration during reporting period	µCi/ml	1.17E-10	**	**	**	
B. Tritium						
1. Total release	Ci	4.86E-02	**	**	**	5.00E+01
2. Average diluted concentration during reporting period	µCi/ml	3.08E-06	**	**	**	
C. Dissolved and Entrained Gases						
1. Total release	Ci	**	**	**	**	5.00E+01
2. Average diluted concentration during reporting period	µCi/ml	**	**	**	**	
D. Gross Alpha Radioactivity						
1. Total release	Ci	**	**	**	**	5.00E+01
E. Volumes[2]						
1. Prior to dilution	Liters	3.79E+03	*	**	**	5.00E+01
2. Volume of dilution water used during release period	Liters	7.33E+02	**	**	**	5.00E+01
3. Volume of dilution water available during reporting period	Liters	1.58E+07	**	**	**	5.00E+01
F. Percent of Technical Specification Limits						
Percent of Quarterly Whole Body Dose Limit (1.5 mrem)	%	2.41E-02	**	**	**	
Percent of Quarterly Organ Dose Limit (5 mrem)	%	1.42E-02	**	**	**	
Percent of Annual Whole Body Dose Limit to Date (3 mrem)	%	1.20E-02	**	**	**	
Percent of Annual Organ Dose Limit to Date (10 mrem)	%	7.09E-03	**	**	**	
Percent of 10CFR20 Concentration Limit	%	3.11E+01	**	**	**	
Percent of Dissolved or Entrained Noble Gas Limit (2.00E-04 µCi/ml)	%	0	**	**	**	

1 Liquid Batch Releases associated with Emergency Condenser operation are assumed to be discharged via storm drain in 24 hours.

2 *Dilution water volumes based on SPDES report storm drain flow estimates for EC vent releases only.*

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LIQUID EFFLUENTS RELEASED

Nuclides Released		BATCH MODE[1,2] 1st QUARTER	2nd QUARTER	3rd QUARTER	4th QUARTER
Strontium-89	Ci	**	**	**	**
Strontium-90	Ci	**	**	**	**
Cesium-134	Ci	**	**	**	**
Cesium-137	Ci	**	**	**	**
Iodine-131	Ci	**	**	**	**
Cobalt-58	Ci	5.36E-08	**	**	**
Cobalt-60	Ci	1.27E-06	**	**	**
Iron-59	Ci	**	**	**	**
Zinc-65	Ci	**	**	**	**
Manganese-54	Ci	5.15E-07	**	**	**
Chromium-51	Ci	**	**	**	**
Zirconium-Niobium-95	Ci	**	**	**	**
Molybdenum-99	Ci	**	**	**	**
Technetium-99m	Ci	**	**	**	**
Barium-Lanthanum-140	Ci	**	**	**	**
Cerium-141	Ci	**	**	**	**
Tungsten-187	Ci	**	**	**	**
Iodine-133	Ci	**	**	**	**
Iron-55	Ci	**	**	**	**
Neptunium-239	Ci	**	**	**	
Iodine-135	Ci	**	**	**	**
Dissolved or Entrained Gases	Ci	**	**	**	**
Tritium	Ci	4.86E-02	**	**	**

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1 No continuous mode release occurred during the report period as indicated by effluent sampling. Liquid Batch Releases associated with Emergency Condenser operation in January 2004 are reflected.

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 I-131 and Fe-55, and 1.00E-07 µCi/ml for gross alpha radioactivity, as identified in the Off-Site Dose Calculation Manual, has been verified.

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SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A.1 TYPE	Volume (m^3) Class			Activity[1] (Ci) Class		
	A	B	C	A	B	C
a. Spent Resins (Dewatered)	5.55E+01	0	0	3.07E+01	0	0
b. Dry Active Waste (Compactible and Non-Compactible, Contaminated Equipment)	5.13E+02	0	0	3.96E+00	0	0
c. Irradiated Components, Control Rods	0	0	0	0	0	0
d. Other: (to vendor for processing)						
1. Sewage Sediment	2.72E+01	0	0	2.21E-05	0	0
2. Torus Sediment	5.55E+00	0	0	5.36E+00	0	0

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

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SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A.1 TYPE	Container	Package	Solidification Agent
a. Spent Resins (Dewatered)	Poly Liner	General Design Type A	None
b. Dry Active Waste (Compactible and Non-Compactible, Contaminated Equipment)	Metal Box	General Design	None
c. Irradiated Components, Control Rods	N/A	N/A	N/A
d. Other: (To Vendor for Processing)			
1. Sewage Sediment	Metal Box	General Design	None
2. Torus Sediment	Poly Liner	General Design	None

Unit 1 X Unit 2 __ Reporting Period January – December 2004

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

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

a. Spent Resins (Dewatered)

Nuclide	Percent
(1) Co-60	(1) 46.4
(2) Fe-55	(2) 33.5
(3) Mn-54	(3) 13.8
(4) Cs-137	(4) 4.4
(5) Other	(5) 1.9

b. Dry Compressible Waste, Dry Non-Compressible Waste (Contaminated Equipment)

Nuclide	Percent
(1) Fe-55	(1) 76.6
(2) Co-60	(2) 17.2
(3) Mn-54	(3) 2.5
(4) Cs-137	(4) 2.2
(5) Other	(5) 1.5

c. Irradiated Components, Control Rods

Nuclide	Percent

d. Other: (to Vendor for Processing)

1. Sewage Sediment

Nuclide	Percent
(1) Co-60	(1) 79.3
(2) Mn-54	(2) 18.4
(3) Cs-137	(3) 2.3

2. Torus Sediment

Nuclide	Percent
(1) H-3	(1) 97.8
(2) C-14	(2) 1.5
(3) Other	(3) 0.7

Unit 1 X Unit 2 __ Reporting Period January – December 2004

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A.3. SOLID WASTE DISPOSITION:

Number of Shipments	Mode of Transportation	Destination
3	Truck - Hittman Transport	Duratek Services, Inc.
3	Truck - R & R Trucking	RACE, LLC
2	Truck - RACE Logistics, LLC	RACE, LLC
10	Truck - Hittman Transport	Studsvik Processing Facility, LLC

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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SUMMARY OF CHANGES TO THE OFF-SITE DOSE CALCULATION MANUAL (ODCM)

The Unit 1 Off-Site Dose Calculation Manual (ODCM) was revised during the reporting period to clarify required alarm point for the offgas noble gas radiation monitor, provide separate minimum channel operable and actions for stack noble gas high and low range monitors, require two minimum channels operable for offgas process monitor, revise table notes to specify one less and two less operable actions for stack and offgas radiation monitors, revise table D 4.6.14-2 instrument names to agree with table D 3.6.14-2, and to update BASES to delete the offgas monitor and effluent monitor historical reference and to clarify the offgas monitor and stack high range and low range functions. These changes do not affect the levels of radioactive effluent control required by 10 CFR 20.1302, 40 CFR 190, 10 CFR 50.36a, and 10 CFR 50 Appendix I, and do not adversely impact the accuracy or reliability of effluent, dose, or setpoint calculations. A copy of the ODCM, Revision 25 is attached and a summary of the changes presented to and approved by the Station Operations Review Committee on January 20, 2004 is provided below. The summary also includes the justification for the change.

Revision 25

Page #	New/Amended Section #	Description of Change	Reason for Change
I 3.1-7	D 3.6.14.b	Added a clarification that the offgas process monitor alarm setpoint is set to ensure that the Offgas Process Monitor shall meet the limits of Technical Specification 3.6.15.	This change was initiated to incorporate the resolution as determined by the corrective action program (NM-2003-2431) to the conflict between Technical Specification and ODCM indicated setpoint limits for the Offgas Noble Gas monitor. The conclusion was that incorporating offgas monitors into the effluent monitor table was only to establish consistent surveillance requirements and not for meeting dual regulatory criteria of 10CFR100 and 10CFR20.
I 3.1-8	Table D 3.6.14-2	Divided Instrument 1.a, Stack Noble Gas Monitor, into High Range and Low Range Monitors with High Range requiring two and Low Range requiring 1 Minimum Channels Operable.	This change is consistent with system design which requires 2 High Range channels to effect Purge and Vent trip and 1 Channel for Effluent Monitoring. Previous requirement for only one channel did not adequately provide for the trip function, although relevant practice has been to assure the appropriate operability.
I 3.1-9	Table D 3.6.14-2	Instrument 3, Condenser Air Ejector Monitor, changed to require 2 Minimum Channels Operable.	This change is consistent with the two-channel logic isolation logic described in NMP1 UFSAR Section VIII.C.3.1 Instrumentation Systems.
I 3.1-10	Table D 3.6.14-2	Note a. (Stack High Range Monitor) and Note g (Condenser Air Ejector Monitor) revised to provide actions for 1 less and 2 less than the Minimum Channels required. New Note I. added to provide actions for less than Minimum Required Channels for Stack Low Range Monitor.	This change provided to address addition of minimum channels operable 2 as discussed above (pages I 3.1-8 and I 3.1-9).
I 3.1-9, I 3.1-11 and I 3.1-12	Table D 3.6.14-2 and Table D 4.6.14-2	Changed instrument titles to clarify status as Process and Effluent monitors consistent with change on page I 3.1-7 above.	This change provided clarity in applicability of limits.
I B 3.1-1	Bases for DLCO 3.6.14 and DSR 4.6.14	The Bases was updated to delete the historical information on the Offgas and Emergency Condenser Vent Monitors, to add information about the Offgas Technical Specification trip point and required operability and to clarify the stack effluent monitoring and isolation functions.	These changes are provided to more accurately describe the monitoring and trip functions.

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SUMMARY OF CHANGES TO THE PROCESS CONTROL PROGRAM (PCP)

There were no changes to the Unit 1 Process Control Program (PCP) during the report period.

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SUMMARY OF INOPERABLE MONITORS

There were no inoperable monitors for a period of greater than 30 days during the reporting period.

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DOSES TO MEMBERS OF THE PUBLIC DUE TO THEIR ACTIVITIES INSIDE THE SITE BOUNDARY

Introduction

An assessment of the radiation dose potentially received by a Member of the Public due to their activities inside the site boundary from Nine Mile Point Unit 1 (NMP1) liquid and gaseous effluents has been conducted for the period January through December 2004.

This assessment considers the maximum exposed individual and the various exposure pathways resulting from liquid and gaseous effluents to identify the maximum dose received by a Member of the Public during their activities within the site boundary.

Prior to September 11, 2001, the public had access to the Energy Information Center for purposes of observing the educational displays or for picnicking and associated activities. Fishing also occurred near the shoreline adjacent to the NMP. Fishing near the shoreline adjacent to the NMP Site was the onsite activity that resulted in the potential maximum dose received by a Member of the Public. Following September 11, 2001, public access to the Energy Information Center has been restricted and fishing by Members of the Public at locations on site is also prohibited. Although fishing was not conducted during 2004 the annual dose to a hypothetical fisherman was still evaluated to provide continuity of data for the location.

Dose Pathways

Dose pathways considered for this evaluation included 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 emergency condenser vent were evaluated for the inhalation pathway. Dose due to aquatic pathways such as liquid effluents is not applicable since swimming is prohibited at the Nine Mile Point Site.

Dose to a hypothetical fisherman is received through the following pathways while standing on the shoreline fishing:

- External ground pathway; this dose is received from plant related radionuclides detected in the shoreline sediment.
- Inhalation pathway; this dose is received through inhalation of gaseous effluents released from NMP1 Stack and Emergency Condenser Vent.
- Direct radiation pathway; dose resulting from the operation of NMP1, Nine Mile Point Unit 2 (NMP2) and the James A. Fitzpatrick (JAF) Facilities.

Methodologies for Determining Dose for Applicable Pathways

External Ground (Shoreline Sediment) pathway

Dose from the external ground (shoreline sediment) is based on the methodology in the NMP1 Offsite Dose Calculation Manual (NMP1 ODCM) as adapted from Regulatory Guide 1.109. For this evaluation it is assumed that the hypothetical maximum exposed individual fished from the shoreline at all times.

The total dose received by the whole body and skin of the maximum exposed individual during 2004 was calculated using the following input parameters:

- Usage Factor = 312 hours (fishing 8 hours per week, 39 weeks per year)
- 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 = 1.85E-01 pCi/g

The total whole body and skin doses received by a hypothetical maximum exposed fisherman from the external ground pathway is presented in Table 1, Exposure Pathway Dose.

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DOSES TO MEMBERS OF THE PUBLIC DUE TO THEIR ACTIVITIES INSIDE THE SITE BOUNDARY

Inhalation Pathway

The inhalation dose pathway is evaluated by utilizing the inhalation equation in the NMP1 ODCM, as adapted from Regulatory Guide 1.109. The total whole body dose and organ dose received by the hypothetical maximum exposed fisherman during 2004 is calculated using the following input parameters for gaseous effluents released from both the NMP1 Stack and Emergency Condenser Vent for the time period exposure is received:

NMP 1 Stack:

Variable	Fisherman *
X/Q (s/m^3)	8.9E-06
Inhalation dose factor	Table E-7 Regulatory Guide 1.109
Annual air intake m^3/year (adult)	8000
Fractional portion of the year (hours)	0.0356
H-3 (pCi/Sec)	1.13E+06
Cr-51 (pCi/sec)	3.50E+00
Mn-54 (pCi/sec)	1.84E+01
Fe-55 (pCi/sec)	1.34E+01
Co-58 (pCi/sec)	2.01E+00
Co-60 (pCi/sec)	9.30E+01
Sr-89 (pCi/sec)	2.23E+00
Cs-137 (pCi/sec)	6.58E-01
I-131 (pCi/sec)	2.29E+01
I-133 (pCi/sec)	1.13E+01

NMP1 Emergency Condenser Vent:

Variable	Fisherman *
X/Q (s/m^3)	6.63E-06
Inhalation dose factor	Table E-7 Regulatory Guide 1.109
Annual air intake m^3/year (adult)	8000
Fractional portion of the year	0.0356
H-3 (pCi/sec)	2.94E+05

* The maximum exposed fisherman is assumed to be present on site during the period of April through December at a rate of 8 hours per week for 39 weeks per year equivalent to 312 hours for the year (fractional portion of the year = 0.0356). Therefore, the Average Stack and Vent flow rates and radionuclide concentrations used to determine the dose are represented by second, third and fourth quarter gaseous effluent flow and concentration values.

The total whole body dose and maximum organ dose received by the hypothetical maximum exposed fisherman is presented in Table 1, Exposure Pathway Dose.

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DOSES TO MEMBERS OF THE PUBLIC DUE TO THEIR ACTIVITIES INSIDE THE SITE BOUNDARY

Direct Radiation Pathway

The direct radiation pathway is evaluated in accordance with the methodology found in the NMP1 ODCM. This pathway considers four components: direct radiation from the generating facilities, direct radiation from any possible overhead plume, direct radiation from ground deposition and direct radiation from plume submersion. The direct radiation pathway is evaluated by the use of high sensitivity environmental Thermoluminescent Dosimeters (TLDs). Since fishing activities occur between April 1 – December 31, TLD data for the second, third, and fourth quarters of 2004 from TLDs placed in the general area where fishing once occurred were used to determine an average dose to the hypothetical maximum exposed fisherman from direct radiation. The following is a summary of the average dose rate and assumed time spent on site used to determine the total dose received:

Variable	Fisherman
Average Dose Rate (mRem/hr)	1.15E-03
Exposure time (hours)	312

Total Doses received by the hypothetical maximum exposed fisherman from direct radiation is presented in Table 1, *Exposure Pathway Dose*

Dose Received By A Hypothetical Maximum Exposed Member Of The Public Inside the Site Boundary During 2004

The following is a summary of the dose received by a hypothetical maximum exposed fisherman from Liquid and Gaseous effluents released from NMP1 during 2004:

TABLE 1 Exposure Pathway Annual Dose

Exposure Pathway	Dose Type	Fisherman (mRem)
External Ground	Whole Body	2.95E-03
	Skin of Whole Body	3.44E-03
Inhalation	Whole Body	5.40E-04
	Maximum Organ	Lung: 7.25E-04
Direct Radiation	Whole Body	0.36

Based on these values the total annual dose received by a hypothetical maximum exposed member of the public inside the site boundary is as follows:

TABLE 2 Annual Dose Summary

Total Annual Dose for 2004	Fisherman
Total Whole Body (mRem)	0.36
Skin of Whole Body (mRem)	3.44E-03
Maximum Organ (mRem)	Lung: 7.25E-04

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DOSES TO MEMBERS OF THE PUBLIC DUE TO THEIR ACTIVITIES OUTSIDE THE SITE BOUNDARY

Introduction

An assessment of radiation doses potentially received by the likely most exposed member of the public located beyond the site boundary was conducted for the period January through December 2004 for comparison against the 40 CFR 190 annual dose limits.

The intent of 40 CFR 190 requires that the effluents of Nine Mile Point Unit 1 (NMP1), as well as other nearby uranium fuel cycle facilities, be considered. In this case, the effluents of NMP1, Nine Mile Point Unit 2 (NMP2) and the James A. FitzPatrick (JAF) facilities must be considered.

40 CFR 190 requires the annual radiation dose received by members of the public in the general environment, as a result of plant operations, be limited to:

- < 25 mRem wholebody
- < 25 mRem any organ (except thyroid)
- < 75 mRem thyroid

This evaluation compares doses resulting from Liquid and Gaseous effluents and direct radiation originating from the site as a result of the operation of the NMP1, NMP2 and JAF nuclear facilities.

Dose Pathways

Dose pathways considered for this evaluation included doses resulting from liquid effluents, gaseous effluents and direct radiation from all nuclear operating facilities located on the Nine Mile Point Site.

Dose to the most likely member of the public, outside the site boundary, is received through the following pathways:

- Fish consumption pathway; this dose is received from plant radionuclides that have concentrated in fish that is consumed by a member of the public.
- Shoreline Sediment; this dose is received as a result of an individual's exposure to plant radionuclides deposited in the shoreline sediment, which is used as a recreational area.
- Deposition, Inhalation and Ingestion pathways resulting from gaseous effluents; this dose is received through exposure to gaseous effluents released from NMP1, NMP2 and JAF operating facilities.
- Direct Radiation pathway; radiation dose resulting from the operation of NMP1, NMP2 and JAF facilities.

Methodologies for Determining Dose for Applicable Pathways

Fish Consumption

Dose received as a result of fish consumption is based on the methodology specified in the NMP1 Off-site Dose Calculation Manual (NMP1 ODCM) as adapted from Regulatory Guide 1.109. The dose for 2004 is calculated from actual analysis results of environmental fish samples taken near the site discharge points. For this evaluation it is assumed that the most likely exposed member of the public consumes fish taken near the site discharge points.

No radionuclides were detected in fish samples collected and analyzed during 2004; therefore no dose was received by the whole body and organs of the likely most exposed Member of the Public during 2004.

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DOSES TO MEMBERS OF THE PUBLIC DUE TO THEIR ACTIVITIES OUTSIDE THE SITE BOUNDARY

Shoreline Sediment

Dose received from shoreline sediment is based on the methodology in the NMP1 ODCM as adapted from Regulatory Guide 1.109. For this evaluation it is assumed that the most likely exposed member of the public spends 67 hours/year along the shoreline for recreational purposes.

The total dose received by the whole body and skin of the maximum exposed individual during 2004 is calculated using the following input parameters:

- Usage Factor = 67 hours per year
- 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
- *Average Cs=137 Concentration = 0.039 pCi/g*

Dose Pathways Resulting From Gaseous Effluents

Dose received by the likely most exposed member of the public due to gaseous effluents is calculated in accordance with the methodology provided in the NMP1 ODCM, NMP2 Offsite Dose Calculation Manual, and the JAF Offsite Dose Calculation Manual. These calculations consider deposition, inhalation and ingestion pathways. The total sum of doses resulting from gaseous effluents from NMP1, NMP2 and JAF during 2004 provide a total dose to the whole body and maximum organ dose for this pathway.

Direct Radiation Pathway

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 2004, the closest residence and the critical downwind residence are at the same location.

Dose Potentially Received by the Likely Most Exposed Member of the Public Outside the Site Boundary During 2004

Exposure Pathway	Dose Type	Dose (mRem)
Fish Consumption	Total Whole Body	No Dose
	Total Maximum Organ	No Dose
Shoreline Sediment	Total Whole Body	1.32E-04
	Total Skin of Whole Body	1.54E-04
Gaseous Effluents	Total Whole Body	2.20E-02
	Total Maximum Organ	Thyroid: 1.12E-01
Direct Radiation	Total Whole Body	0.16

Based on these values the maximum total annual dose potentially received by the most likely exposed member of the public during 2004 is as follows:

- Total Whole Body 0.18 mRem
- Total Skin of Whole Body: 2.01E-02 mRem
- Maximum Organ: Thyroid: 1.12E-01 mRem

40CFR190 Evaluation

The maximum total doses presented in this attachment are the result of operations at the NMP1, NMP2 and the JAF facilities. The maximum organ dose (Thyroid: 0.112 mRem) and the maximum whole body dose (0.18 mRem) are below the 40 CFR 190 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.