Constellation Energy
Nine Mile Point Nuclear Station

P.O. Box 63
Lycoming, NY 13093

May 1, 2009

U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

ATTENTION: Document Control Desk

SUBJECT: Nine Mile Point Nuclear Station
Unit No. 2; Docket No. 50-410

Radioactive Effluent Release Report, January – December 2008

In accordance with 10 CFR 50.36a and the Nine Mile Point Unit 2 (NMP2) Technical Specifications, enclosed is the Radioactive Effluent Release Report for the period January through December 2008.

Included in this report is a summary of gaseous and liquid effluents, and solid waste released from the station during the reporting period (Attachments 1-6), a summary of revisions to the Offsite Dose Calculation Manual (ODCM) and the Radwaste Process Control Program during the reporting period (Attachments 7 and 8), and an explanation as to the cause and corrective actions regarding the inoperability of any station liquid and/or gaseous effluent monitoring instrumentation greater than 30 days (Attachment 9). Attachments 10 and 11 provide a summary and assessment of radiation doses to members of the public within and outside the site boundary, respectively, from liquid and gaseous effluents as well as direct radiation in accordance with 40 CFR 190. Attachment 12 is a copy of Revision 31 of the ODCM. Attachment 13 is a copy of Revision 07 of the PCP. Attachment 14 includes updated 2007 Radioactive Effluent Release Report Attachments 2 and 3 that correct a units error.

The format used for the effluent data is outlined in Appendix B of Regulatory Guide 1.21, Revision 1. Dose assessments were made in accordance with the NMP2 ODCM. During the reporting period from January through December 2008, NMP2 did not exceed any 10 CFR 20, 10 CFR 50, Technical Specification, or ODCM limits for gaseous or liquid effluents.

Should you have questions regarding the information in this submittal, please contact me at (315) 349-5219.

Very truly yours,

Terry F. Syrell
Director Licensing

TFS/KES

Enclosure: Radioactive Effluent Release Report, January – December 2008

IE48
NRR

cc: S. J. Collins, NRC Region I Administrator
R.V. Guzman, NRC Project Manager
J. Furia, NRC
Senior NRC Resident Inspector

ENCLOSURE

NINE MILE POINT NUCLEAR STATION, UNIT 2

RADIOACTIVE EFFLUENT RELEASE REPORT

January – December 2008

Nine Mile Point Nuclear Station, LLC
May 1, 2009

NINE MILE POINT NUCLEAR STATION - UNIT 2

RADIOACTIVE EFFLUENT RELEASE REPORT

January – December 2008

Constellation Energy®

Nine Mile Point Nuclear Station

NINE MILE POINT NUCLEAR STATION - UNIT 2

RADIOACTIVE EFFLUENT RELEASE REPORT

JANUARY – DECEMBER 2008

SUPPLEMENTAL INFORMATION

Facility: Nine Mile Point Unit #2 **Licensee: Nine Mile Point Nuclear Station, LLC**

1. TECHNICAL SPECIFICATION/ODCM 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 from noble gases released in gaseous effluents from Nine Mile Point Unit 2 to areas at or beyond the site boundary shall be limited during any calendar quarter to less than or equal to 5 mrad 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 mrad 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 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 2 to areas at or 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. Improved Technical Specifications (ITS) limits the concentration of radioactive material released in the liquid effluents to unrestricted areas to ten times the concentrations specified in 10CFR20.1001-20.2402, 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 2 to unrestricted areas shall be limited during any calendar quarter to less than or equal to 1.5 mrem to the whole 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 whole 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) of an isokinetic sample stream.

B) IODINES

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

C) PARTICULATES

Activity released from the main stack and the combined Radwaste/Reactor Building vent 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) LIQUID EFFLUENTS

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

F) SOLID EFFLUENTS

Isotopic contents of waste shipments are determined by gamma spectroscopy analyses 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 _____ Unit 2 X Reporting Period January - December 2008

Liquid Effluents:

ODCM Required MEC = 10 x 10CFR20.1001 - 20.2402, Appendix B, Table 2, Column 2

Average MEC - µCi/ml (Qtr. 1) =	NO RELEASES	Average MEC - µCi/ml (Qtr. 3) =	NO RELEASES
Average MEC - µCi/ml (Qtr. 2) =	1.59E-02	Average MEC - µCi/ml (Qtr. 4) =	1.00E-02

Average Energy (Fission and Activation gases - MEV):

Qtr. 1:	$\bar{E}\gamma$ =	9.34E-01	$\bar{E}\beta$ =	3.06E-01
Qtr. 2:	$\bar{E}\gamma$ =	9.21E-01	$\bar{E}\beta$ =	3.67E-01
Qtr. 3:	$\bar{E}\gamma$ =	8.92E-01	$\bar{E}\beta$ =	2.91E-01
Qtr. 4:	$\bar{E}\gamma$ =	7.80E-01	$\bar{E}\beta$ =	7.49E-01

Liquid:

Number of Batch Releases	16
Total Time Period for Batch Releases (hrs)	3.91E+01
Maximum Time Period for a Batch Release (hrs)	3.38E+00
Average Time Period for a Batch Release (hrs)	2.44E+00
Minimum Time Period for a Batch Release (hrs)	1.66E-02

	1st	2nd	3rd	4th
Total volume of water used to dilute the liquid during the release period (L)	No Releases	1.26E+08	No Releases	1.36E+07

	1st	2nd	3rd	4th
Total volume of water available to dilute the liquid effluent during the report period (L)	1.17E+10	1.15E+10	1.36E+10	1.32E+10

Gaseous(Emergency Condenser Vent) "Not applicable for Unit 2"

Number of Batch Releases	N/A
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	N/A

Gaseous (Primary Containment Purge)

Number of Batch Releases	14
Total Time Period for Batch Releases (hrs)	3.40E+02
Maximum Time Period for a Batch Release (hrs)	6.67E+01
Average Time Period for a Batch Release (hrs)	2.43E+01
Minimum Time Period for a Batch Release (hrs)	1.58E+00

ATTACHMENT 1
SUMMARY DATA

Unit 1 _____ Unit 2 X Reporting Period January - December 2008

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

ATTACHMENT 2

Unit 1 _____ Unit 2 X Reporting Period January - December 2008

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	1.71E+02	2.71E+01	3.83E+01	1.23E+02	5.00E+01
2. Average Release Rate	µCi/sec	2.18E+01	3.44E+00	4.81E+00	1.55E+01	
B. Iodines						
1. Total Iodine - 131	Ci	1.57E-03	2.12E-03	3.45E-04	1.56E-04	3.00E+01
2. Average Release Rate for Period	µCi/sec	2.00E-04	2.70E-04	4.08E-05	2.15E-05	
C. Particulates						
1. Particulates with half-lives>8days	Ci	3.80E-04	1.61E-03	9.21E-05	2.69E-04	3.00E+01
2. Average Release Rate for Period	µCi/sec	7.16E-05	2.46E-04	1.50E-05	3.78E-05	
3. Gross alpha radioactivity	Ci	0.00E+00	0.00E+00	0.00E+00	7.07E-08	2.50E+01
D. Tritium						
1. Total release	Ci	3.96E+01	1.50E+01	2.11E+01	1.57E+01	5.00E+01
2. Average Release Rate for Period	µCi/sec	5.05E+00	1.91E+00	2.49E+00	2.17E+00	
E. Percent of Tech. Spec. Limits Fission and Activation Gases						
Percent of Quarterly Gamma Air Dose Limit (5 mR)	%	3.78E-01	5.80E-02	8.42E-02	2.24E-01	
Percent of Quarterly Beta Air Dose Limit (10 mrad)	%	7.80E-03	1.10E-03	3.08E-03	1.21E-02	
Percent of Annual Gamma Air Dose Limit to Date (10 mR)	%	1.89E-01	2.18E-01	2.61E-01	3.73E-01	
Percent of Annual Beta Air Dose Limit to Date (20 mrad)	%	3.90E-03	4.46E-03	6.00E-03	1.21E-02	
Percent of Whole Body Dose Rate Limit (500 mrem/yr)	%	1.47E-02	2.26E-03	3.24E-03	8.59E-03	
Percent of Skin Dose Rate Limit (3000 mrem/yr)	%	2.89E-03	4.42E-04	6.48E-04	1.79E-03	
Tritium, Iodines, and Particulates (with half-lives greater than 8 days)						
Percent of Quarterly Dose Limit (7.5 mrem)	%	4.05E-01	5.05E-01	9.12E-02	4.61E-02	
Percent of Annual Dose Limit to Date (15 mrem)	%	2.04E-01	4.58E-01	5.04E-01	5.27E-01	
Percent of Organ Dose Limit (1500 mrem/yr	%	8.15E-03	1.02E-02	1.82E-03	9.17E-04	

ATTACHMENT 3

Unit 1 _____ Unit 2 X Reporting Period January - December 2008

GASEOUS EFFLUENTS - ELEVATED RELEASE

Nuclides Released		Continuous Mode (2) 1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Fission Gases (1)					
Argon-41	Ci	1.35E-01	**	**	**
Krypton-85	Ci	**	**	**	**
Krypton-85m	Ci	5.20E+01	1.16E+01	1.80E+01	1.82E+01
Krypton-87	Ci	4.13E+00	6.11E-01	**	2.14E+00
Krypton-88	Ci	7.36E+01	8.88E+00	1.56E+01	2.55E+01
Xenon-127	Ci	**	**	**	**
Xenon-131m	Ci	**	**	**	**
Xenon-133	Ci	3.28E+01	7.06E-01	2.07E+00	5.12E+00
Xenon-133m	Ci	8.78E-03	**	**	**
Xenon-135	Ci	1.61E+00	5.46E-01	1.30E-01	2.86E+00
Xenon-135m	Ci	3.36E+00	6.06E-01	**	6.63E+00
Xenon-137	Ci	4.76E-02	**	**	3.44E+01
Xenon-138	Ci	2.54E-01	4.09E+00	**	2.62E+01
Iodines (1)					
Iodine-131	Ci	1.45E-03	1.91E-03	6.60E-05	7.35E-05
Iodine-133	Ci	1.12E-02	9.84E-05	4.00E-04	5.64E-04
Iodine-135	Ci	**	**	**	**
Particulates (1)					
Chromium-51	Ci	**	**	**	**
Manganese-54	Ci	**	1.89E-05	**	**
Iron-55	Ci	7.69E-05	2.04E-04	**	6.50E-05
Iron-59	Ci	**	**	**	**
Cobalt-58	Ci	**	**	**	**
Cobalt-60	Ci	**	**	**	**
Neodymium-147	Ci	**	**	**	**
Zinc-65	Ci	**	**	**	**
Strontium-89	Ci	**	2.37E-05	**	1.22E-05
Stronium-90	Ci	**	**	**	**
Niobium-95	Ci	**	**	**	**
Zirconium-95	Ci	1.30E-05	**	**	**
Molybdenum-99	Ci	**	**	**	**
Cesium-134	Ci	**	**	**	**
Cesium-136	Ci	**	**	**	**
Cesium-137	Ci	**	**	**	2.20E-06
Barium-140	Ci	**	**	**	**
Lanthanum-140	Ci	**	**	**	**
Cerium-141	Ci	**	**	**	**
Cerium-144	Ci	**	**	**	**
Tritium (1)	Ci	1.25E+01	8.77E+00	1.49E+01	1.02E+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 and gross alpha, 1.00E-12 µCi/ml for required Iodines, 1.00E-11 µCi/ml for Sr-89/90 and 1.00E-06 µCi/ml for Tritium, as required by the ODCM, has been verified.

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

ATTACHMENT 4

Unit 1 _____ Unit 2 X Reporting Period January - December 2008

GASEOUS EFFLUENTS - GROUND LEVEL RELEASES

Nuclides Released		Continuous Mode (2) 1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
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	6.25E-01	**	7.17E-01	1.10E+00
Xenon-133m	Ci	**	**	**	**
Xenon-135	Ci	4.03E-01	**	5.52E-01	7.63E-01
Xenon-135m	Ci	2.12E+00	**	1.16E+00	**
Xenon-137	Ci	**	**	**	**
Xenon-138	Ci	**	**	**	**
Iodines (1)					
Iodine-131	Ci	1.21E-04	2.08E-04	2.79E-04	8.22E-05
Iodine-133	Ci	8.18E-04	6.79E-04	7.08E-04	1.81E-03
Iodine-135	Ci	**	**	**	**
Particulates (1)					
Chromium-51	Ci	**	**	**	**
Manganese-54	Ci	4.48E-05	1.95E-04	**	**
Iron-55	Ci	4.17E-05	1.04E-03	7.28E-05	1.90E-04
Iron-59	Ci	**	3.41E-05	**	**
Cobalt-58	Ci	**	**	**	**
Cobalt-60	Ci	2.36E-05	9.33E-05	1.93E-05	**
Neodymium-147	Ci	**	**	**	**
Zinc-65	Ci	**	**	**	**
Stronium-89	Ci	1.80E-04	**	**	**
Stronium-90	Ci	**	**	**	**
Niobium-95	Ci	**	**	**	**
Zirconium-95	Ci	**	**	**	**
Molybdenum-99	Ci	**	1.08E-05	9.69E-06	**
Cesium-134	Ci	**	**	**	**
Cesium-136	Ci	**	**	**	**
Cesium-137	Ci	**	**	**	**
Barium-140	Ci	**	**	**	**
Lanthanum-140	Ci	**	**	**	**
Cerium-141	Ci	**	**	**	**
Cerium-144	Ci	**	**	**	**
Tritium	Ci	2.71E+01	6.26E+00	6.15E+00	5.55E+00

(1) Concentrations less than the lower limit of detection of the counting system used are indicated with a double asterisk. A lower limit of detection of 1.00E-04 µCi/ml for required noble gases, 1.00E-11 µCi/ml for required particulates and gross alpha, 1.00E-12 µCi/ml for required Iodines, 1.00E-11 µCi/ml for Sr-89/90 and 1.00E-06 µCi/ml for Tritium, as required by the ODCM, has been verified.
(2) There were no batch releases from this path during the reporting period.

ATTACHMENT 5

Unit 1 _____ Unit 2 X Reporting Period January - December 2008

LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES (1)

		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Est. Total Error, %
A. Fission & Activation Products						
1. Total Release (not including Tritium, gases, alpha)	Ci	No Releases	3.07E-03	No Releases	**	5.00E+01
2. Average diluted concentration during reporting period	µCi/ml	No Releases	2.68E-10	No Releases	**	
B. Tritium						
1.Total release	Ci	No Releases	7.26E+00	No Releases	1.54E-04	5.00E+01
2. Average diluted concentration during the reporting period	µCi/ml	No Releases	6.33E-07	No Releases	1.16E-11	
C. Dissolved and Entrained Gases						
1. Total release	Ci	No Releases	**	No Releases	**	5.00E+01
2. Average diluted concentration during the reporting period	µCi/ml	No Releases	**	No Releases	**	
D. Gross Alpha Radioactivity						
1. Total release	Ci	No Releases	**	No Releases	**	5.00E+01
E. Volumes						
1. Prior to Dilution	Liters	No Releases	9.77E+05	No Releases	1.51E+04	5.00E+01
2. Volume of dilution water used during release period	Liters	No Releases	1.26E+08	No Releases	1.36E+07	5.00E+01
3. Volume of dilution water available during reporting period	Liters	1.17E+10	1.15E+10	1.36E+10	1.32E+10	5.00E+01
F. Percent of Tech. Spec. Limits						
Percent of Quarterly Whole Body Dose Limit (1.5 mrem)	%	No Releases	1.69E-02	No Releases	1.06E-07	
Percent of Annual Whole Body Dose Limit to Date (3 mrem)	%	No Releases	8.46E-03	No Releases	8.46E-03	
Percent of Quarterly Organ Dose Limit (5 mrem)	%	No Releases	2.72E-02	No Releases	3.17E-08	
Percent of Annual Organ Dose Limit to Date (10 mrem)	%	No Releases	1.36E-02	No Releases	1.36E-02	
Percent of 10CFR20 Concentration Limit (2), (3)	%	No Releases	6.76E-03	No Releases	1.16E-07	
Percent of Dissolved or Entrained Noble Gas Limit (2.00E-04 µCi/ml)	%	No Releases	**	No Releases	**	

(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 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 required by the Off-Site Dose Calculation Manual (ODCM), have been verified.

(2) The percent of 10CFR20 concentration limit is based on the average concentration during the quarter.

(3) Improved Technical Specifications limit the concentration of radioactive material released in the liquid effluents to unrestricted areas to ten times the concentrations specified in 10CFR20.1001 - 20.2402, Appendix B, Table 2, Column 2. Maximum Effluent Concentrations (MEC) numerically equal to ten times the 10CFR20.1001 - 20.2402 concentrations were adopted to evaluate liquid effluents.

ATTACHMENT 5

Unit 1 _____ Unit 2 X Reporting Period January - December 2008

LIQUID EFFLUENTS RELEASED

Nuclides Released		Batch Mode (1),(2) 1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Nuclides Released					
Strontium-89	Ci	**	**	**	**
Strontium-90	Ci	**	**	**	**
Cesium-134	Ci	**	**	**	**
Cesium-137	Ci	**	**	**	**
Iodine-131	Ci	**	**	**	**
Cobalt-58	Ci	**	2.00E-05	**	**
Cobalt-60	Ci	**	1.30E-03	**	**
Iron-59	Ci	**	1.11E-04	**	**
Zinc-65	Ci	**	**	**	**
Manganese-54	Ci	**	1.31E-03	**	**
Chromium-51	Ci	**	2.99E-04	**	**
Zirconium-95	Ci	**	**	**	**
Niobium-95	Ci	**	**	**	**
Molybdenum-99	Ci	**	**	**	**
Technetium-99m	Ci	**	**	**	**
Barium-140	Ci	**	**	**	**
Lanthanum-140	Ci	**	**	**	**
Cerium-141	Ci	**	3.29E-05	**	**
Tungsten-187	Ci	**	**	**	**
Arsenic-76	Ci	**	**	**	**
Iodine-133	Ci	**	**	**	**
Iron-55	Ci	**	**	**	**
Neptunium-239	Ci	**	**	**	**
Silver-110m	Ci	**	**	**	**
Gold-199	Ci	**	**	**	**
Cerium-144	Ci	**	**	**	**
Cesium-136	Ci	**	**	**	**
Copper-64	Ci	**	**	**	**
Dissolved or Entrained Gases	Ci	**	**	**	**
Tritium (3),(4)	Ci	**	7.26E+00	**	1.54E-04

(1) No continuous mode release occurred during the report period as indicated by effluent sampling.

(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 ODCM, has been verified.

(3) 2nd Quarter tritium activity includes the 4/2/08 contribution of 1.71E-02 Ci from one post-analysis discharge via the service water discharge pathway for Closed Cooling Primary cross-tie to Spent Fuel Pool Cooling heat exchanger.

(4) 4th Quarter tritium activity reflects the contribution from four tanks of water collected from the Circulating Water Pump bay pits and discharged via the service water discharge pathway following analysis.

ATTACHMENT 6

Unit 1 _____ Unit 2 X Reporting Period January - December 2008

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A1. TYPE	Volume (m^3) Class			Activity (1) (Ci) Class		
	A	B	C	A	B	C
a.1 Spent Resins (Dewatered)	5.63E+01	0.00E+00	0.00E+00	2.57E+02	0.00E+00	0.00E+00
a.2 Filter Sludge	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
a.3 Concentrated Waste	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Totals	5.63E+01	0.00E+00	0.00E+00	2.57E+02	0.00E+00	0.00E+00
b.1 Dry, compressible waste	5.89E+02	0.00E+00	0.00E+00	1.72E+00	0.00E+00	0.00E+00
b.2 Dry, non-compressible waste (contaminated equipment)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Totals	5.89E+02	0.00E+00	0.00E+00	1.72E+00	0.00E+00	0.00E+00
c. Irradiated Components, Control Rods	0.00E+00	0.00E+00	1.52E-01	0.00E+00	0.00E+00	1.89E+04
d. Other (to vendor for processing)						
d.1 Dry Active Waste (compactible) High Rad Trash	5.37E+01	0.00E+00	0.00E+00	2.11E+01	0.00E+00	0.00E+00

(1) The estimated total error is 5.00E+01%

ATTACHMENT 6

Unit 1	Unit 2 X	Reporting Period January - December 2008

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A1. TYPE	Container	Package	Solidification Agent
a.1 Spent Resin (Dewatered)	Poly Liner	General Design	None
a.2 Filter Sludge	N/A	N/A	N/A
a.3 Concentrated Waste	N/A	N/A	N/A
b.1 Dry, Compressible waste	Metal Box	General Design	None
b.2 Dry, non-compressible waste (Contaminated Equipment)	N/A	N/A	N/A
c. Irradiated Components, Control Rods	Steel Liner	Type B	None
d. Other (to vendor for processing)			
d.1 Dry Active Waste (Compactible) (High Rad Trash)	Steel Liner / Metal Box	General Design	None

ATTACHMENT 6

Unit 1	Unit 2 X	Reporting Period January - December 2008

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A2. ESTIMATE OF MAJOR NUCLIDE COMPOSITION (BY TYPE OF WASTE)

a. Spent Resins, Filter Sludges, Concentrated Waste

Nuclide	Percent
Fe-55	75.4
Co-60	12.9
Mn-54	7.1
Zn-65	3.4
H-3, Cr-51, Fe-59, Co-58, Ni-63, Nb-95, Se-124, Cs-134, Cs-137, La-140	1.2

b. Dry, compressible waste, dry, non-compressible waste (contaminated equipment)

Nuclide	Percent
Fe-55	80.6
Co-60	15.1
Mn-54	3.4
Fe-59, Ni-63, Zn-65, Sb-125, Cs-137, Ce-144	0.9

c. Irradiated Components, Control Rods

Nuclide	Percent
Co-60	58.9
Fe-55	36.1
Ni-63	4.4
H-3, C-14, Cr-51, Mn-54, Fe-59, Co-58, Ni-59, Zn-65, Sr-90, Zr-95, Nb-94, Mo-93, Tc-99, Ag-110m, I-129, Cs-134, Cs-137	0.6

d. Other (To Vendor for Processing)

1. Dry Active Waste (Compactible) (High Rad Trash)

Nuclide	Percent
Fe-55	65.7
Co-60	29.0
Mn-54	3.0
H-3, C-14, Fe-59, Co-58, Ni-59, Ni-63, Zn-65, Sr-90, Tc-99, Ag-110m, Sb-125, Cs-134, Cs-137, Ce-144, Pu-238, Pu-239, Pu-241, Am-241, Cm-242, Cm-243	2.3

ATTACHMENT 6

Unit 1 _____ Unit 2 X Reporting Period January - December 2008

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A3. SOLID WASTE DISPOSITION

Number of Shipments	Mode of Transportation	Destination
1	Hittman Transport	Barnwell Disposal Facility
15	Hittman Transport	Duratek Services, Inc.
3	Hittman Transport	Studsvik Processing Facility - Memphis
1	Studsvik Logistics	Studsvik Processing Facility - Memphis
13	Hittman Transport	Studsvik Processing Facility - Erwin

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

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

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

Sewage wastes shipped to a treatment facility for processing and burial, if any, are reported in the Nine Mile Point Nuclear Station's Unit No. 1 Radioactive Effluent Release Report.

ATTACHMENT 7

Unit 1 _____ Unit 2 X Reporting Period January - December 2008

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

The Unit 2 Off-Site Dose Calculation Manual (ODCM) was revised during the reporting period to incorporate plant modifications (addition of iron prefilters, replacement of GEMS stack and vent effluent monitors), include more accurate environmental monitoring program sample locations based on GPS data, add clarifications and enhancements, and correct typos.

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 31 is attached and a summary of the changes presented to and approved by the Plant Operations Review Committee on November 20, 2008 is provided below. The summary also includes the justification for the change.

REVISION 31

Page #	New/Amended Section #	Description of Change	Reason For Change
I 1.0-3	1.0	Format alignment error	Correct typo
I 1.0-4	Figure D 1.0-1	Electonically generated figure	Enhancement
I 3.2-2	Table D 3.2.1-1	Reformatted for clarity	Enhancement
I 3.2-3	Table D 3.2.1-1	Footnote (d); replaced "isotopic" with "radiation"	Plant modification; replacement of stack and vent monitors
I 4.2-1 & I 4.4-2	Section D 4.2	Replaced "SORC" with "PORC"	Title change
II 9	Section 1.3	Added text to use estimates until actual results are obtained.	Clarification
II 13 & II 14	Sections 2.1.2, 2.1.2.1 & 2.1.2.2	Revised text to describe new stack and vent replacement monitors	Plant modification; replacement of stack and vent monitors
II 16	Section 2.2	Added text to use estimates until actual results are obtained.	Clarification
II 20	Section 2.3	Added text to use estimates until actual results are obtained.	Clarification
II 58	Table D 3-21	Nd-147, Vegetation, Teen, Total Body dose factor	Correct typo
II 62 to 65	Table D 5.1	Updated location distances and azimuths using GPS data	Enhancement
II 90	Regenerant Waste System Figure	Added input from Iron Prefilter	Plant modification
II 104	Gaseous Radiation Monitoring Figure	Deleted the word "isotopic"	Plant modification; replacement of stack and vent monitors
II 105	Block Diagram Typical Gaseous	Deleted figure	Plant modification; replacement of stack and vent monitors
II 107, II 108 & II 109	Figures D 5.1-1, & D 5.1-2	Electonically generated figure	Enhancement

ATTACHMENT 8

Unit 1 _____ Unit 2 X Reporting Period January - December 2008

SUMMARY OF CHANGES TO THE PROCESS CONTROL PROGRAM (PCP)

The Unit 2 Radwaste Process Control Program (RPCP) Revision 07 was implemented in June 2008. The Revision reflects the implementation of a condensate "prefilter" filtration system upstream of the deep bed condensate demineralizers and an associated change in the use, operation and naming of the Evaporator Bottoms Tank and Pump. The affect on the RPCP is the addition of a new generation source (the Iron Prefilter System) for both Liquid and Solid waste. The RPCP changes do not reduce the overall conformance of a solidified waste product to existing criteria for solid waste. A copy of the RPCP, Revision 07 is attached and a summary of the changes presented to and approved by the Plant Operations Review Committee on June 18, 2008 is provided below. The summary also includes the justification for the change.

REVISION 07

Page #	New/Amended Section #	Description of Change	Reason For Change
Page 1	Section 2.1	Changes text from "The Plant Manager" to "The Plant General Manager".	Change to reflect the current organizational titles.
Page 1	Section 2.1.2	The text at the end of the sentence that had indicated "in accordance with the Quality Assurance program" is deleted.	Eliminates guidance that is otherwise controlled under separate programs.
Page 1	Section 2.2	Changes text from "The Managers of Operations" to "The Manager of Operations".	Grammatical correction.
Page 2	Section 3.1.2	Changed the specified equipment name from "Evaporator Bottoms Tank" to "Condensate Filtration System Phase Separator".	The modification for implemenetation of the condensate "prefilter" filtration system changed the use, operation and specified name of the Evaporator Bottoms Tank and Pump.
Page 2	Section 3.1.2 (a)	Replaced information regarding the Evaporator Bottoms Tank with new information identifying that the Condensate Filtration System Phase Separator tank may be decanted to the Floor Drain Collector System.	The modification for implementation of the condensate "prefilter" filtration system changed the use, operation and specified name of the Evaporator Bottoms Tank and Pump. The tank is now designated as the Condensate Filtration System Phase Separator Tank and remains 2LWS-TK10.
Page 2	Section 3.1.2 (b)	Identifies that the contents of the Condensate Filtration System Phase Separator Tank may be recirculated or transferred to a liner in the Radwaste Truck Bay for further offsite processing.	The Evaporator Bottoms Tank (2LWS-TK10) has been re-named as the Condensate Filtration System Phase Separator Tank (2LWS-TK10) and is now being used to process the insoluble waste generated by the new condensate "prefilter" system.
Page 9	Section 3.4 (a)	Replaced Evaporator Bottoms Tank (TK10) with Condensate Prefilter/Phase Separator Tank (TK10) designation for isolation when preparing to process waste.	The Evaporator Bottoms Tank (2LWS-TK10) has been re-named as the Condensate Filtration System Phase Separator Tank (2LWS-TK10) and is now being used to process the insoluble waste generated by the new condensate "prefilter" system.
Page 9	Section 3.4 (b)	Replaced Evaporator Bottoms Tank (TK10) with Condensate Prefilter/Phase Separator Tank (TK10) designation for recirculation to ensure homogenous mixture for sampling.	The ability to process insoluble impurities removed from the condensate process stream by the prefilters requires a collection tank for settling out of the solids. The pre-existing Concentrated Waste Tank now serves this function and was effectively integrated into the overall design as an efficiency in the design process.

ATTACHMENT 8

Unit 1 _____ Unit 2 ___X___ Reporting Period January - December 2008

SUMMARY OF CHANGES TO THE PROCESS CONTROL PROGRAM (PCP) (continued)

The Unit 2 Radwaste Process Control Program (RPCP) Revision 07 was implemented in June 2008. The Revision reflects the implementation of a condensate "prefilter" filtration system upstream of the deep bed condensate demineralizers and an associated change in the use, operation and naming of the Evaporator Bottoms Tank and Pump. The affect on the RPCP is the addition of a new generation source (the Iron Prefilter System) for both Liquid and Solid waste. The RPCP changes do not reduce the overall conformance of a solidified waste product to existing criteria for solid waste. A copy of the RPCP, Revision 07 is attached and a summary of the changes presented to and approved by the Plant Operations Review Committee on June 18, 2008 is provided below. The summary also includes the justification for the change.

pped to a treatment facility for processing and burial, if any, are reported in the Nine Mile Point Nuclear Station's Unit No. 1 Radioactive Effl

Page #	New/Amended Section #	Description of Change	Reason For Change
Page 10	NOTE for Section 3.6	Replaced the position title from "The Manager, Nuclear QA Operations" to "The Director of Quality and Performance Assessment".	Change to reflect the current organizational titles.
Page 10	Section 3.6.1 (b)	The step text ", under the cognizance of the SRAB," is deleted.	Eliminates guidance that is otherwise controlled under separate programs.
Page 11	Section 3.6.2 (b.3)	Change from "Meet the applicable requirements of QATR-1, Quality Assurance Program Topical Report for Nine Mile Point Nuclear Station Operations, Section 17.0, Quality Assurance Records, NIP-TQS-01, Qualification and Certification, and NIP-RMG-01, Identification, Maintenance, Storage and Transfer of Nuclear Division Records" to "Meet the applicable requirements of the Quality Assurance Topical Report Section B.15 Records, CNG-TR-1.01-1000 Conduct of Training and CNG-PR-3.01-1000 Records Management" for the administration and control of training records.	Updated to reflect the current Quality Assurance Topical Report section reference and administrative procedure references for control of training records.
Page 11	Section 3.6.4 (b)	Change from "Station Operations Review Committee" to "Plant Operations Review Committee."	Updated to reflect the current title of the Plant Operations Review Committee.
Page 11	Section 3.6.5	Change from "The Supervisor of Radwaste" to "The Supervisor Radioactive Materials Processing."	Updated to reflect the current organizational title and responsibilities.
Page 13	Section 5.1.1	Change the reference from "QATR-1, Quality Assurance Program Topical Report for Nine Mile Point Nuclear Station Operations, Section 17.0, Quality Assurance Records", to "Quality Assurance Topical Report Section B.15 Records."	Updated reference to reflect the current Quality Assurance Topical Report.

ATTACHMENT 8

Unit 1 _____ Unit 2 X Reporting Period January - December 2008

SUMMARY OF CHANGES TO THE PROCESS CONTROL PROGRAM (PCP) (continued)

The Unit 2 Radwaste Process Control Program (RPCP) Revision 07 was implemented in June 2008. The Revision reflects the implementation of a condensate "prefilter" filtration system upstream of the deep bed condensate demineralizers and an associated change in the use, operation and naming of the Evaporator Bottoms Tank and Pump. The affect on the RPCP is the addition of a new generation source (the Iron Prefilter System) for both Liquid and Solid waste. The RPCP changes do not reduce the overall conformance of a solidified waste product to existing criteria for solid waste. A copy of the RPCP, Revision 07 is attached and a summary of the changes presented to and approved by the Plant Operations Review Committee on June 18, 2008 is provided below. The summary also includes the justification for the change.

REVISION 07

Page #	New/Amended Section #	Description of Change	Reason For Change
Page 14	Section 5.3.11	New supplemental reference added for DCP N2-05-064, Condensate Filtration Radwaste Processing.	The new supplemental reference identifies the design change under which modification to repurpose and rename the Evaporator Bottoms Tank and Pump was made.
Page 15	Attachment 1	*Edited the contained program reference* from "Quality Assurance Procedures (QAPs)" to Quality Assurance Procedures (CNG-QL Series)."	*Updated to reflect the current procedure series title designation.*
Page 16	Attachment 2, Section 3.0	Inserted a new Section 3.0 (with sub-sections 3.1, 3.2 and 3.3) for the solid waste source from the condensate filtration system. Renumber the remainder of Attachment 2 as appropriate.	The modification for implementation of the condensate filtration "prefilter" system creates a new generation source for both Liquid and Solid waste. The filtration system removes iron particulates from the BWR condensate process stream. The associated filters are periodically backwashed. The bachwash is collected in a receiving tank and the iron ladened waste is pumped to a phase separator tank where flocculent is added to assist in separation. The resultant sludge is pumped to a liner for offsite processing. The Condensate Prefilter elements are treated as solid Radwaste at the end of there useful life. Elements are shipped offsite for vendor processing.
Page 17 and Page 18	Attachment 2	The Waste Evaporator and Regenerant Evaporator solid waste sources identifed as Section 10.0 and 11.0, respectively in Attachment 2 of the previous Revision 6 have been deleted. Renumber the remainder of Attachment 2 as appropriate.	The Waste Evaporator and Regenerant Evaporator are not being utilized to concentrate solids from the waste stream and future use is not anticipated.

ATTACHMENT 9

Unit 1 _____ Unit 2 X Reporting Period January - December 2008

SUMMARY OF INOPERABLE MONITORS

Monitor	Dates of Inoperability	Cause and Corrective Actions
Liquid Radwaste Effluent Line Radioactivity Monitor, 2LWS-CAB206	May 27, 2008 @ 15:30 and continuing	The monthly functional test frequency was exceeded. The monitor is not required to be operable if no discharge is in progress. Discharge isolation manual valves 2LWS-V420 and 2LWS-V422 are locked closed, therefore no inadvertent discharge can occur. The monitor remains inoperable until a liquid waste discharge is needed.
Stack Gaseous Effluent Monitoring System (GEMS), 2RMS-CAB170 and 2RMS-RAK170. a) Noble Gas Activity Monitor b) Iodine Sampler c) Particulate Sampler d) Flow-Rate Monitor e) Sample Flow Rate Monitor	a) April 16, 2008 through December 31, 2008. b, c, d, e) April 21, 2008 through December 31, 2008	The Stack GEMS became inoperable due to an unidentified failure. Prior to the identification of the failure, the system was removed from service for replacement with a new design. Required compensatory actions remained in effect for the balance of 2008. The new system was made functional on February 3, 2009.
Radwaste/Reactor Building Vent Effluent Monitoring System (GEMS), 2RMS-CAB180 and 2RMS-RAK180. a) Noble Gas Activity Monitor b) Iodine Sampler c) Particulate Sampler d) Flow-Rate Monitor e) Sample Flow Rate Monitor	a) April 16, 2008 through December 31,2008 b, c, d, e) April 21, 2008 through December 31, 2008	The Vent GEMS became inoperable due to an unidentified failure. Prior to the identification of the failure, the system was removed from service for replacement with a new design. Required compensatory actions remained in effect for the balance of 2008. The new system was made functional on February 3, 2009.

Attachment 10

Unit 1 _____ Unit 2 ___X___ Reporting Period January – December 2008

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 2 (NMP2) liquid and gaseous effluents has been conducted for the period January through December 2008.

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 2008 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 NMP2 stack and 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 NMP2 Stack and Vent.
- Direct radiation pathway; dose resulting from the operation of NMP2, Nine Mile Point Unit 1 (NMP1) 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 Unit 2 Offsite Dose Calculation Manual (NMP2 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 2008 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 = 1.57 E-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 Annual Dose.

Attachment 10

Unit 1 _____ Unit 2 ___X___ Reporting Period January – December 2008

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 NMP2 ODCM, as adapted from Regulatory Guide 1.109. The total whole body dose and organ dose received by the hypothetical maximum exposed fisherman during 2008 is calculated using the following input parameters for gaseous effluents released from both the NMP2 Stack and Vent for the time period exposure is received:

NMP 2 Stack:

Variable	Fisherman *
X/Q (s/m³)	9.60E-07
Inhalation dose factor	Table E-7 Regulatory Guide 1.109
Annual air intake m³/year) (adult)	8000
Fractional portion of the year (hours)	0.0356
H-3 (pCi/sec)	1.43 E+06
Mn-54 (pCi/sec)	8.02 E-01
Fe-55 (pCi/sec)	1.14 E+01
Sr-89 (pCi/sec)	1.18 E+00
Cs-137 (pCi/sec)	9.34 E-02
I-131 (pCi/sec)	8.70 E+01
I-133 (pCi/sec)	4.50 E+01

NMP2 Vent:

Variable	Fisherman *
X/Q (s/m³)	2.80E-06
Inhalation dose factor	Table E-7 Regulatory Guide 1.109
Annual air intake (m³/year) (adult)	8000
Fractional portion of the year (hours)	0.0356
H-3 (pCi/sec)	7.62 E+05
Mn-54 (pCi/sec)	8.27 E+00
Fe-55 (pCi/sec)	5.53 E+01
Fe-59 (pCi/sec)	1.45 E+00
Co-60 (pCi/sec)	4.78 E+00
Mo-99 (pCi/sec)	8.70 E-01
I-131 (pCi/sec)	2.42 E+01
I-133 (pCi/sec)	1.35 E+02

- 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 Annual Dose.

Attachment 10

Unit 1 _____ Unit 2 ___X___ Reporting Period January – December 2008

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 NMP2 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 2008 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)	1.53 E-03
Exposure time (hours)	312

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

Dose Received By A Hypothetical Maximum Exposed Member Of The Public Inside the Site Boundary During 2008

The following is a summary of the dose received by a hypothetical maximum exposed fisherman from Liquid and Gaseous effluents released from NMP2 during 2008:

Table 1 Exposure Pathway Annual Dose

Exposure Pathway	Dose Type	Fisherman (mRem)
External Ground	Whole Body	2.47 E-03
	Skin of Whole Body	2.88 E-03
Inhalation	Whole Body	1.58 E-04
	Maximum Organ	Thyroid: 2.55 E-04
Direct Radiation	Whole Body	0.48

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

Table 2 Annual Dose Summary

Total Annual Dose for 2008	Fisherman (mRem)
Total Whole Body	4.83 E-01
Skin of Whole Body	2.88 E--03
Maximum Organ	Thyroid: 2.55 E-04

Attachment 11

Unit 1 _____ Unit 2 ___X___ Reporting Period January – December 2008

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 2008 for comparison against the 40CFR190 annual dose limits.

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

40CFR190 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 NMP2, NMP1 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 NMP2 Off-site Dose Calculation Manual (NMP2 ODCM) as adapted from Regulatory Guide 1.109. The dose for 2008 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 2008; therefore no dose was received by the whole body and organs of the likely most exposed Member of the Public during 2008.

Shoreline Sediment

Dose received from shoreline sediment is based on the methodology in the NMP2 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.

Attachment 11

Unit 1 _____ Unit 2 ___X___ Reporting Period January – December 2008

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

Shoreline Sediment continued:

No radionuclides were detected in shoreline sediment samples collected and analyzed during 2008; therefore no dose was received by the whole body and organs of the likely most exposed Member of the Public during 2008.

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 NMP2 ODCM, NMP1 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 2008 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 2008, 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 2008

Exposure Pathway	Dose Type	Dose (mRem)
Fish Consumption	Total Whole Body	No Dose
	Total Maximum Organ	No Dose
Shoreline Sediment	Total Whole Body	No Dose
	Total Skin of Whole Body	No Dose
Gaseous Effluents	Total Whole Body	8.18 E-03
	Total Maximum Organ	Thyroid: 1.08 E-01
Direct Radiation	Total Whole Body	0.48

Based on these values the maximum total annual dose potentially received by the most likely exposed member of the public during 2008 is as follows:

- Total Whole Body: 4.92 E-01 mRem
- Total Skin of Whole Body: 4.90E-03 mRem
- Maximum Organ: Thyroid: 1.08 E-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: 0.108 mRem) and the maximum whole body dose (0.492 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.

ATTACHMENT 12
OFF-SITE DOSE CALCULATION MANUAL (ODCM)

Constellation Energy
Nine Mile Point Nuclear Station

NINE MILE POINT NUCLEAR STATION

NINE MILE POINT UNIT 2

OFF-SITE DOSE CALCULATION MANUAL (ODCM)

REVISION 31

APPROVALS	SIGNATURES	DATE
Prepared by:	G. R. Stinson Principle Chemist	8/7/08
Reviewed by:	C. L. Widay Supervisor – Chemistry Support	8/8/08
Concurred by:	M. R. Faivus General Supervisor Chemistry	8-15-08

G. J. Laughlin	Manager Engineering Services	8-29-08
S. L. Belcher	for S Belcher Plant General Manager	12.4.08

SUMMARY OF REVISIONS

Revision 31 (Effective December 2008)

PAGE	*DATE*
I 3.3-13,14	August 2000
I 3.3-6	November 2000
I 4.0-1	November 2000
II 2-10,26,33-36,66,67,75,80	November 2000
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INTRODUCTION

The OFFSITE DOSE CALCULATION MANUAL (ODCM) is a supporting document of the Technical Specifications Section 5.5.1. The previous Limiting Conditions for Operation that were contained in the Radiological Effluent Technical Specifications are now transferred to the ODCM as Radiological Effluent Controls. The ODCM contains two parts: Radiological Effluent Controls, Part I; and Calculational Methodologies, Part II. Radiological Effluent Controls, Part 1, includes the following: (1) The Radioactive Effluent Controls and Radiological Environmental Monitoring Programs required by Technical Specification 5.5.1 and (2) descriptions of the information that should be included in the Annual Radiological Environmental Operating and Radioactive Effluent Release Reports required by Technical Specifications 5.6.2 and 5.6.3. Calculational Methodologies, Part II, describes the methodology and parameters to be used in the calculation of liquid and gaseous effluent monitoring instrumentation alarm/trip setpoints and the calculation of offsite doses due to radioactive liquid and gaseous effluents. The ODCM also contains a list and graphical description of the specific sample locations for the radiological environmental monitoring program, and liquid and gaseous radwaste treatment system configurations.

The ODCM follows the methodology and models suggested by NUREG-0133 and Regulatory Guide 1.109, Revision 1. Simplifying assumptions have been applied in this manual where applicable to provide a more workable document for implementing the Radiological Effluent Control requirements; this simplified approach will result in a more conservative dose evaluation for determining compliance with regulatory requirements.

The ODCM will be maintained for use as a reference and training document of accepted methodologies and calculations. Changes to the calculation methods or parameters will be incorporated into the ODCM to assure that the ODCM represents the present methodology in all applicable areas. Any changes to the ODCM will be implemented in accordance with Section 5.5.1 of the Technical Specifications.

PART I - RADIOLOGICAL EFFLUENT CONTROLS

PART I - RADIOLOGICAL EFFLUENT CONTROLS

SECTION 1.0 DEFINITIONS

1.0 DEFINITIONS

----------NOTE----------
Technical Specifications defined terms and the following additional defined terms appear in capitalized type and are applicable throughout these specifications and bases.

TERM	DEFINITION
FUNCTIONAL (FUNCTIONALITY)	FUNCTIONALITY is an attribute of Structures, Systems, or Components (SSCs) that is not controlled by Technical Specifications. An SSC shall be functional or have functionality when it is capable of performing its specified function as set forth in the Current Licensing Basis (CLB). FUNCTIONALITY does not apply to specified safety functions, but does apply to the ability of non-Technical Specifications SSCs to perform specified support functions.
GASEOUS RADWASTE TREATMENT SYSTEM	A GASEOUS RADWASTE TREATMENT SYSTEM shall be any system designed and installed to reduce radioactive gaseous effluents by collecting offgases from the main condenser evacuation system and providing for delay or holdup for the purpose of reducing the total radioactivity prior to release to the environment.
MEMBER(S) OF THE PUBLIC	MEMBER(S) OF THE PUBLIC shall include all persons who are not occupationally associated with the Nine Mile Point Nuclear Station and James A. FitzPatrick Nuclear Power Plant. This category does not include employees of owners and operators of the Nine Mile Point Nuclear Station and James A. Fitzpatrick Nuclear Power Plant, their contractors or vendors. Also excluded from this category are persons who enter the site to service equipment or to make deliveries. This category does include persons who use portions of the site for recreational, occupational, or other purposes not associated with Nine Mile Point Nuclear Station and James A. FitzPatrick Nuclear Power Plant.
MILK SAMPLING LOCATION	A MILK SAMPLING LOCATION is a location where 10 or more head of milk animals are available for collection of milk samples.

(continued)

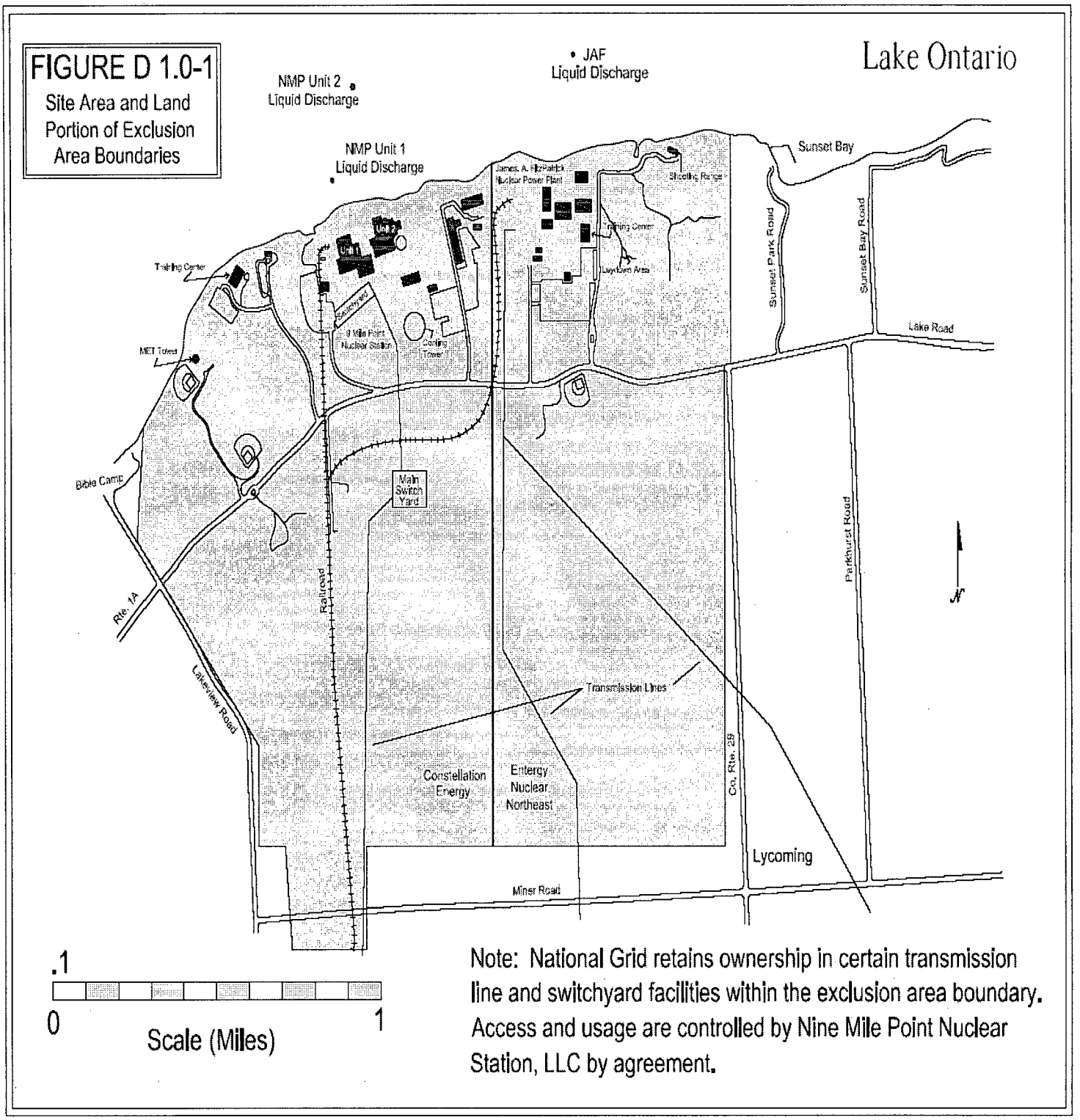
1.0 DEFINITIONS (continued)

TERM	DEFINITION
OFFSITE DOSE CALCULATION MANUAL	The OFFSITE DOSE CALCULATION MANUAL (ODCM) shall contain the current methodology and parameters used in the calculation of offsite doses that result from radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring Alarm/Trip Setpoints, and in the conduct of the environmental radiological monitoring program. The ODCM shall also contain: (1) the Radioactive Effluent Controls and Radiological Environmental Monitoring Program required by Specification 5.5.1 of Technical Specifications and, (2) descriptions of the information that should be included in the Annual Radiological Environmental Operating and Radioactive Effluent Release Reports required by Technical Specifications 5.6.2 and 5.6.3.
PURGE – PURGING	PURGE and PURGING shall be the controlled process of discharging air or gas from a confinement to maintain temperature, pressure, concentration, or other operating condition, in such a manner that replacement air or gas is required to purify the confinement.
REPORTABLE EVENT	A REPORTABLE EVENT shall be any of those conditions specified in 10 CFR 50.73.
SITE BOUNDARY	The SITE BOUNDARY shall be that line around the Nine Mile Point Nuclear Station beyond which the land is not owned, leased or otherwise controlled by the owners and operators of Nine Mile Point Nuclear Station and James A. Fitzpatrick Nuclear Power Plant. See Figure D 1.0-1.
SOURCE CHECK	A SOURCE CHECK shall be the qualitative assessment of channel response when the channel sensor is exposed to a source of increased radioactivity.
UNRESTRICTED AREA	An UNRESTRICTED AREA shall be any area at or beyond the SITE BOUNDARY, access to which is not controlled by the owners and operators of Nine Mile Point Nuclear Station and James A. Fitzpatrick Nuclear Power Plant for purposes of protection of individuals from exposure to radiation and radioactive materials, or any area within the SITE BOUNDARY used for residential quarters or for industrial, commercial, institutional, and/or recreational purposes.

(continued)

1.0 DEFINITIONS (continued)

TERM	DEFINITION
VENTILATION EXHAUST TREATMENT SYSTEM	A VENTILATION EXHAUST TREATMENT SYSTEM shall be any system designed and installed to reduce gaseous radioiodine or radioactive material in particulate form in effluents by passing ventilation or vent exhaust gases through charcoal adsorbers and/or HEPA filters for the purpose of removing iodines or particulates from the gaseous exhaust stream prior to the release to the environment (such a system is not considered to have any effect on noble gas effluents). Engineered safety features (ESF) atmospheric cleanup systems are not considered to be VENTILATION EXHAUST TREATMENT SYSTEM components.
VENTING	VENTING shall be the controlled process of discharging air or gas from a confinement to maintain temperature, pressure, concentration, or other operating condition, in such a manner that replacement air or gas is not provided or required during VENTING. Vent, used in system names, does not imply a VENTING process.



Note: National Grid retains ownership in certain transmission line and switchyard facilities within the exclusion area boundary. Access and usage are controlled by Nine Mile Point Nuclear Station, LLC by agreement.

PART I - RADIOLOGICAL EFFLUENT CONTROLS

SECTION 3.0 APPLICABILITY

3.0 APPLICABILITY

The Offsite Dose Calculation Manual (ODCM) Specifications are contained in Section 3.0 of Part I. They contain operational requirements, Surveillance Requirements, and reporting requirements. Additionally, the Required Actions and associated Completion Times for degraded Conditions are specified. The format is consistent with the Technical Specifications (Appendix A to the NMP2 Operating License).

The rules of usage for the ODCM Specification are the same as those for the Technical Specifications. These rules are found in Technical Specifications Sections 1.2, "Logical Connectors," 1.3, "Completion Times," and 1.4, "Frequency."

The ODCM Specifications are subject to Technical Specifications Section 3.0, "Limiting Condition for Operation (LCO) Applicability and Surveillance Requirement (SR) Applicability," with the following exceptions:

1. LCO 3.0.6, regarding support/supported system ACTIONS is not applicable to ODCM Specifications.

2. LCO 3.0.7, regarding allowances to change specified Technical Specifications is not applicable to ODCM Specifications.

3. Section 3.0 requirements are not required when so stated in notes within individual specifications.

D 3.1 RADIOACTIVE LIQUID EFFLUENTS

D 3.1.1 Liquid Effluents Concentration

DLCO 3.1.1 The concentration of radioactive material released in liquid effluents to UNRESTRICTED AREAS (Figure D 1.0-1) shall be limited to:

a. Ten times the concentration specified in 10 CFR Part 20, Appendix B, Table 2, Column 2 for radionuclides other than dissolved or entrained noble gases; and

b. 2×10^{-4} μCi/ml total activity concentration for dissolved or entrained noble gases.

APPLICABILITY: At all times.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Concentration of radioactive material released in liquid effluents to UNRESTRICTED AREAS exceeds limits.	A.1 Initiate action to restore concentration to within limits.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
DSR 3.1.1.1	Perform radioactive liquid waste sampling and activity analysis.	In accordance with Table D 3.1.1-1
DSR 3.1.1.2	Verify the results of the DSR 3.1.1.1 analyses to assure that the concentrations at the point of release are maintained within the limits of DLCO 3.1.1.	In accordance with Table D 3.1.1-1

Table D 3.1.1-1 (Page 1 of 2)
Radioactive Liquid Waste Sampling and Analysis

LIQUID RELEASE TYPE	SAMPLE TYPE	SAMPLE FREQUENCY	ANALYSIS FREQUENCY	SAMPLE ANALYSIS	SAMPLE LOWER LIMIT OF DETECTION (LLD) (a)
1. Batch Waste Release Tanks (b) a. 2LWS-TK4A b. 2LWS-TK4B c. 2LWS-TK5A d. 2LWS-TK5B	Grab Sample	Each Batch (g)	Each Batch (g)	Principal Gamma Emitters (c)	5×10^{-7} µCi/ml
				I-131	1×10^{-6} µCi/ml
	Grab Sample	One batch/31 days (g)	31 days	Dissolved and Entrained Gases (gamma emitters)	1×10^{-5} µCi/ml
	Proportional Composite of grab samples (d)	Each batch (g)	31 days	H-3	1×10^{-5} µCi/ml
				Gross Alpha	1×10^{-7} µCi/ml
	Proportional Composite of grab samples (d)	Each batch (g)	92 days	Sr-89	5×10^{-8} µCi/ml
				Sr-90	5×10^{-8} µCi/ml
				Fe-55	1×10^{-6} µCi/ml
2. Continuous Releases a. Service Water Effluent A b. Service Water Effluent B c. Cooling Tower Blowdown	Grab Sample	31 days (e)	31 days (e)	Principal Gamma Emitters (c)	5×10^{-7} µCi/ml
	Grab Sample	31 days (e)	31 days (e)	I-131	1×10^{-6} µCi/ml
	Grab Sample	31 days (e)	31 days (e)	Dissolved and Entrained Gases (gamma emitters)	1×10^{-5} µCi/ml
	Grab Sample	31 days (e)	31 days (e)	H-3	1×10^{-5} µCi/ml
	Grab Sample	31 days (e)	31 days (e)	Gross Alpha	1×10^{-7} µCi/ml
	Grab Sample	92 days (e)	92 days (e)	Sr-89	5×10^{-8} µCi/ml
	Grab Sample	92 days (e)	92 days (e)	Sr-90	5×10^{-8} µCi/ml
	Grab Sample	92 days (e)	92 days (e)	Fe-55	1×10^{-6} µCi/ml
3. Continuous Release Auxiliary Boiler Pump Seal and Sample Cooling Discharge (Service Water)	Grab Sample	31 days (f)	31 days (f)	Principal Gamma Emitters (c)	5×10^{-7} µCi/ml
	Grab Sample	92 days (f)	92 days (f)	H-3	1×10^{-5} µCi/ml

Table D 3.1.1-1 (Page 2 of 2)
Radioactive Liquid Waste Sampling and Analysis

(a) The LLD is defined as the smallest concentration of radioactive material in a sample that will yield a net count, above system background, that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system, which may include radiochemical separation:

$$LLD = \frac{(4.66)(S_b)}{(E)(V)(2.22x10^6)(Y)e^{-\lambda\Delta t}}$$

where:

LLD	=	The before-the-fact lower limit of detection (μCi per unit mass or volume),
S_b	=	The standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (counts per minute),
E	=	The counting efficiency (counts per disintegration),
V	=	The sample size (units of mass or volume),
2.22×10^6	=	The number of disintegrations per minute per μCi,
Y	=	The fractional radiochemical yield, when applicable,
λ	=	The radioactive decay constant for the particular radionuclide (sec^{-1}), and
Δt	=	The elapsed time between the midpoint of sample collection and the time of counting (seconds).

Typical values of E, V, Y, and Δt should be used in the calculation.

It should be recognized that the LLD is defined as a before-the-fact limit representing the capability of a measurement system and not as an after-the-fact limit for a particular measurement.

(b) A batch release is the discharge of liquid wastes of a discrete volume. Prior to sampling for analyses, each batch shall be isolated, and then thoroughly mixed by the method described in Part II, Section 1.4 to assure representative sampling

(c) The principal gamma emitters for which the LLD applies include the following radionuclides: Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, and Ce-141. Ce-144 shall also be measured, but with an LLD of 5×10^6 μCi/ml. This list does not mean that only these nuclides are to be considered. Other gamma peaks that are identifiable, together with those of the above nuclides, shall also be analyzed and reported in the Radioactive Effluent Release Report pursuant to Technical Specification 5.6.3 in the format outlined in RG 1.21, Appendix B, Revision 1, June 1974.

(d) A composite sample is one in which the quantity of liquid sampled is proportional to the quantity of liquid waste discharged and in which the method of sampling employed results in a specimen that is representative of the liquids released.

(e) If the alarm setpoint of the effluent monitor is exceeded, the frequency of sampling shall be increased to daily until the condition no longer exists. Frequency of analysis shall be increased to daily for principal gamma emitters and an incident composite for H-3, gross alpha, Sr-89, Sr-90, and Fe-55.

(f) If the alarm setpoint of Service Water Effluent Monitor A and/or B is exceeded, the frequency of sampling shall be increased to daily until the condition no longer exists. Frequency of analysis shall be increased to daily for principal gamma emitters and an incident composite for H-3, gross alpha, Sr-89, Sr-90, and Fe-55.

(g) Complete prior to each release.

D 3.1 RADIOACTIVE LIQUID EFFLUENTS

D 3.1.2 Liquid Effluents Dose

DLCO 3.1.2 The dose or dose commitment to a MEMBER OF THE PUBLIC from radioactive materials released in liquid effluents from each unit to UNRESTRICTED AREAS (Figure D 1.0-1) shall be limited to:

a. ≤ 1.5 mrem to the whole body and ≤ 5 mrem to any organ during any calendar quarter; and

b. ≤ 3 mrem to the whole body and ≤ 10 mrem to any organ during any calendar year.

APPLICABILITY: At all times.

ACTIONS

----------NOTES----------

1. LCO 3.0.3 is not applicable.
2. LCO 3.0.4 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Calculated dose to a MEMBER OF THE PUBLIC from the release of radioactive materials in liquid effluents to UNRESTRICTED AREAS exceeds limits.	A.1 Prepare and submit to the NRC, pursuant to D 4.1.1, a Special Report that (1) Identifies the cause(s) for exceeding the limit(s) and (2) Defines the corrective actions that have been taken to reduce the releases and the proposed corrective actions to be taken to assure that subsequent releases will be in compliance with DLCO 3.1.2.	30 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Calculated dose to a MEMBER OF THE PUBLIC from the release of radioactive materials in liquid effluents exceeds 2 times the limits.	B.1 Calculate the annual dose to a MEMBER OF THE PUBLIC which includes contributions from direct radiation from the units (including outside storage tanks, etc.).	Immediately
	AND	
	B.2 Verify that the limits of DLCO 3.4 have not been exceeded.	Immediately
C. Required Action B.2 and Associated Completion time not met.	C.1 Prepare and submit to the NRC, pursuant to D 4.1.1, a Special Report, as defined in 10 CFR 20.2203 (a)(4), of Required Action A.1 shall also include the following: (1) The corrective action(s) to be taken to prevent recurrence of exceeding the limits of DLCO 3.4 and the schedule for achieving conformance, (2) An analysis that estimates the dose to a MEMBER OF THE PUBLIC from uranium fuel cycle sources, including all effluent pathways and direct radiation, for the calendar year that includes the release(s), and (3) Describes the levels of radiation and concentrations of radioactive material involved and the cause of the exposure levels or concentrations.	30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
DSR 3.1.2.1	Determine cumulative dose contributions from liquid effluents for the current calendar quarter and the current calendar year.	31 days

D 3.1 RADIOACTIVE LIQUID EFFLUENTS

D 3.1.3 Liquid Radwaste Treatment System

DLCO 3.1.3 The liquid radwaste treatment system shall be FUNCTIONAL.

APPLICABILITY: At all times.

ACTIONS

----------NOTES----------

1. LCO 3.0.3 is not applicable.
2. LCO 3.0.4 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Radioactive liquid waste being discharged without treatment. AND Projected doses due to the liquid effluent, from the unit, to UNRESTRICTED AREAS would exceed 0.06 mrem to the whole body or 0.2 mrem to any organ in a 31 day period. AND Any portion of the liquid radwaste treatment system not in operation.	A.1 Prepare and submit to the NRC, pursuant to D 4.1.1, a Special Report that includes: (1) An explanation of why liquid radwaste was being discharged without treatment, identification of any nonfunctional equipment or subsystems, and the reason for the nonfunctionality, (2) Action(s) taken to restore the nonfunctional equipment to FUNCTIONAL status, and (3) Summary description of action(s) taken to prevent a recurrence.	30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
DSR 3.1.3.1	----------NOTE---------- Only required to be met when liquid radwaste treatment systems are not being fully utilized. ----------	
	Project the doses due to liquid effluents from each unit to UNRESTRICTED AREAS.	31 days

D 3.2 RADIOACTIVE GASEOUS EFFLUENTS

D 3.2.1 Gaseous Effluents Dose Rate

DLCO 3.2.1 The dose rate from radioactive materials released in gaseous effluents from the site to areas at or beyond the SITE BOUNDARY (Figure D 1.0-1) shall be limited to:

a. For noble gases, ≤ 500 mrem/yr to the whole body and ≤ 3000 mrem/yr to the skin and

b. For I-131, I-133, H-3 and all radionuclides in particulate form with half-lives > 8 days, ≤ 1500 mrem/yr to any organ.

APPLICABILITY: At all times.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The dose rate(s) at or beyond the SITE BOUNDARY due to radioactive gaseous effluents exceeds limits.	A.1 Restore the release rate to within the limit.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
DSR 3.2.1.1	The dose rate from noble gases in gaseous effluents shall be determined to be within the limits of DLCO 3.2.1.a.	In accordance with Table D 3.2.1-1
DSR 3.2.1.2	The dose rate from I-131, I-133, H-3 and all radionuclides in particulate form with half-lives > 8 days in gaseous effluents shall be determined to be within the limits of DLCO 3.2.1.b.	In accordance with Table D 3.2.1-1

Table D 3.2.1-1 (Page 1 of 2)
Radioactive Gaseous Waste Sampling and Analysis

GASEOUS RELEASE TYPE	SAMPLE TYPE	SAMPLE FREQUENCY	ANALYSIS FREQUENCY	SAMPLE ANALYSIS	SAMPLE LOWER LIMIT OF DETECTION (LLD) (a)
1. Containment (b)	Grab Sample	Each Purge	(h)	Principal Gamma Emitters (c)	1×10^{-4} µCi/ml
			Each Purge	H-3 (oxide)	1×10^{-6} µCi/ml
			Each Purge	Principal Gamma Emitters (c)	1×10^{-4} µCi/ml
2. Main Stack, Radwaste/Reactor Building Vent	Grab Sample	31 days (d)	31 days (d)	Principal Gamma Emitters (c)	1×10^{-4} µCi/ml
	Grab Sample	31 days (e)	31 days (e)	H-3 (oxide)	1×10^{-6} µCi/ml
	Charcoal Sample	Continuous (f)	7 days (g)	I-131	1×10^{-12} µCi/ml
	Particulate Sample	Continuous (f)	7 days (g)	Principal Gamma Emitters (c)	1×10^{-11} µCi/ml
				Gross Alpha	1×10^{-11} µCi/ml
	Composite Particulate Sample	Continuous (f)	92 days	Sr-89	1×10^{-11} µCi/ml
				Sr-90	1×10^{-11} µCi/ml

See the notes on the next page.

Table D 3.2.1-1 (Page 2 of 2)
Radioactive Gaseous Waste Sampling and Analysis

(a) The LLD is defined as the smallest concentration of radioactive material in a sample that will yield a net count, above system background, that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system, which may include radiochemical separation:

$$LLD = \frac{(4.66)(S_b)}{(E)(V)(2.22x10^6)(Y)e^{-\lambda\Delta t}}$$

where:

LLD	=	The before-the-fact lower limit of detection (μCi per unit mass or volume),
S_b	=	The standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (counts per minute),
E	=	The counting efficiency (counts per disintegration),
V	=	The sample size (units of mass or volume),
2.22×10^6	=	The number of disintegrations per minute per μCi,
Y	=	The fractional radiochemical yield, when applicable,
λ	=	The radioactive decay constant for the particular radionuclide (sec^{-1}), and
Δt	=	The elapsed time between the midpoint of sample collection and the time of counting (seconds).

Typical values of E, V, Y, and Δt should be used in the calculation.

It should be recognized that the LLD is defined as a before-the-fact limit representing the capability of a measurement system and not as an after-the-fact limit for a particular measurement.

(b) Sample and analysis before PURGE is used to determine permissible PURGE rates. Sample and analysis during actual PURGE is used for offsite dose calculations.

(c) The principal gamma emitters for which the LLD applies include the following radionuclides: Kr-87, Kr-88, Xe-133, Xe-133m, Xe-135, and Xe-138 in noble gas releases and Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, I-131, Cs-134, Cs-137, Ce-141 and Ce-144 in iodine and particulate releases. This list does not mean that only these nuclides are to be considered. Other gamma peaks that are identifiable, together with those of the above nuclides, shall also be analyzed and reported in the Radioactive Effluent Release Report pursuant to Technical Specification 5.6.3 in the format outlined in RG 1.21, Appendix B, Revision 1, June 1974.

(d) If the main stack or reactor/radwaste building radiation monitor is not FUNCTIONAL, sampling and analysis shall also be performed following shutdown, startup, or when there is an alarm on the offgas pretreatment monitor.

(e) H-3 grab samples shall be taken once every 7 days from the reactor/radwaste ventilation system when fuel is offloaded until stable H-3 release levels can be demonstrated.

(f) The ratio of the sample flow rate to the sampled stream flow rate shall be known for the time period covered by each dose or dose rate calculation made in accordance with DLCO 3.2.1.b and DLCO 3.2.3.

(g) When the release rate of the main stack or reactor/radwaste building vent exceeds its alarm setpoint, the iodine and particulate device shall be removed and analyzed to determine the changes in iodine and particulate release rates. The analysis shall be done once per 24 hours until the release no longer exceeds the alarm setpoint. When samples collected for 24 hours are analyzed, the corresponding LLDs may be increased by a factor of 10.

(h) Complete prior to each release.

D 3.2 RADIOACTIVE GASEOUS EFFLUENTS

D 3.2.2 Gaseous Effluents Noble Gas Dose

DLCO 3.2.2 The air dose from noble gases released in gaseous effluents from each unit to areas at or beyond the SITE BOUNDARY (Figure D 1.0-1) shall be limited to:

a. During any calendar quarter: ≤ 5 mrad for gamma radiation and ≤ 10 mrad for beta radiation and

b. During any calendar year: ≤ 10 mrad for gamma radiation and ≤ 20 mrad for beta radiation.

APPLICABILITY: At all times.

ACTIONS

----------NOTES----------

1. LCO 3.0.3 is not applicable.
2. LCO 3.0.4 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The air dose at or beyond the SITE BOUNDARY due to noble gases released in gaseous effluents exceeds limits.	A.1 Prepare and submit to the NRC, pursuant to D 4.1.1, a Special Report that (1) Identifies the cause(s) for exceeding the limit(s) and (2) Defines the corrective actions that have been taken to reduce the releases and the proposed corrective actions to be taken to assure that subsequent releases will be in compliance with DLCO 3.2.2.	30 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Calculated dose to a MEMBER OF THE PUBLIC from the release of radioactive materials in gaseous effluents due to noble gases exceeds 2 times the limits.	B.1 Calculate the annual dose to a MEMBER OF THE PUBLIC which includes contributions from direct radiation from the units (including outside storage tanks, etc.).	Immediately
	AND	
	B.2 Verify that the limits of DLCO 3.4 have not been exceeded.	Immediately
C. Required Action B.2 and Associated Completion time not met.	C.1 Special Report, as defined in 10 CFR 20.2203 (a)(4), of Required Action A.1 shall also include the following: (1) The corrective action(s) to be taken to prevent recurrence of exceeding the limits of DLCO 3.4 and the schedule for achieving conformance, (2) An analysis that estimates the dose to a MEMBER OF THE PUBLIC from uranium fuel cycle sources, including all effluent pathways and direct radiation, for the calendar year that includes the release(s), and (3) Describes the levels of radiation and concentrations of radioactive material involved and the cause of the exposure levels or concentrations.	30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
DSR 3.2.2.1	Determine cumulative dose contributions for the current calendar quarter and current calendar year.	31 days

D 3.2 RADIOACTIVE GASEOUS EFFLUENTS

D 3.2.3 Gaseous Effluents Dose – I-131, I-133, H-3 and Radioactive Material in Particulate Form

DLCO 3.2.3 The dose to a MEMBER OF THE PUBLIC from I-131, I-133, H-3, and all radioactive material in particulate form with half-lives > 8 days in gaseous effluents released, from each unit, to areas at or beyond the SITE BOUNDARY (Figure D 1.0-1) shall be limited to:

a. During any calendar quarter: ≤ 7.5 mrem to any organ and

b. During any calendar year: ≤ 15 mrem to any organ.

APPLICABILITY: At all times.

ACTIONS

----------NOTES----------

1. LCO 3.0.3 is not applicable.
2. LCO 3.0.4 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The dose from I-131, I-133, H-3 and radioactive material in particulate form with half-lives > 8 days released in gaseous effluents at or beyond the SITE BOUNDARY exceeds limits.	A.1 Prepare and submit to the NRC, pursuant to D 4.1.1, a Special Report that (1) Identifies the cause(s) for exceeding the limit(s) and (2) Defines the corrective actions that have been taken to reduce the releases and the proposed corrective actions to be taken to assure that subsequent releases will be in compliance with DLCO 3.2.3.	30 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Calculated dose to a MEMBER OF THE PUBLIC from the release of radioactive materials in gaseous effluents exceeds 2 times the limits.	B.1 Calculate the annual dose to a MEMBER OF THE PUBLIC which includes contributions from direct radiation from the units (including outside storage tanks, etc.).	Immediately
	AND	
	B.2 Verify that the limits of DLCO 3.4 have not been exceeded.	Immediately
C. Required Action B.2 and Associated Completion time not met.	C.1 Special Report, as defined in 10 CFR 20.2203 (a)(4), of Required Action A.1 shall also include the following: (1)The corrective action(s) to be taken to prevent recurrence of exceeding the limits of DLCO 3.4 and the schedule for achieving conformance, (2)An analysis that estimates the dose to a MEMBER OF THE PUBLIC from uranium fuel cycle sources, including all effluent pathways and direct radiation, for the calendar year that includes the release(s), and (3)Describes the levels of radiation and concentrations of radioactive material involved and the cause of the exposure levels or concentrations.	30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
DSR 3.2.3.1	Determine cumulative dose contributions for the current calendar quarter and current calendar year for I-131, I-133, H-3 and radioactive material in particulate form with half-lives > 8 days.	31 days

D 3.2 RADIOACTIVE GASEOUS EFFLUENTS

D 3.2.4 Gaseous Radwaste Treatment System

DLCO 3.2.4 The GASEOUS RADWASTE TREATMENT SYSTEM shall be in operation.

APPLICABILITY: Whenever the main condenser air ejector system is in operation.

ACTIONS

---------- NOTE ----------
LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The gaseous radwaste from the main condenser air ejector system is being discharged without treatment.	A.1 Restore treatment of gaseous radwaste effluent.	7 days
B. Required Action and associated Completion Time not met.	B.1 Prepare and submit to the NRC, pursuant to D 4.1.1, a Special Report that includes the following: (1) Identification of any nonfunctional equipment or subsystems and the reason for the nonfunctionality, (2) Action(s) taken to restore the nonfunctional equipment to FUNCTIONAL status, and (3) Summary description of action(s) taken to prevent a recurrence.	30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
DSR 3.2.4.1	Check the readings of the relevant instruments to ensure that the GASEOUS RADWASTE TREATMENT SYSTEM is functioning.	12 hours

D 3.2 RADIOACTIVE GASEOUS EFFLUENTS

D 3.2.5 Ventilation Exhaust Treatment System

DLCO 3.2.5 The VENTILATION EXHAUST TREATMENT SYSTEM shall be FUNCTIONAL.

APPLICABILITY: At all times.

ACTIONS

----------NOTES----------

1. LCO 3.0.3 is not applicable.
2. LCO 3.0.4 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The radioactive gaseous waste is being discharged without treatment. AND Projected doses in 31 days from iodine and particulate releases, from each unit, to areas at or beyond the SITE BOUNDARY (see Figure D 1.0-1) would exceed 0.3 mrem to any organ of a MEMBER OF THE PUBLIC.	A.1 Prepare and submit to the NRC, pursuant to D 4.1.1, a Special Report that includes the following: (1) Identification of any nonfunctional equipment or subsystems and the reason for the nonfunctionality, (2) Action(s) taken to restore the nonfunctional equipment to FUNCTIONAL status, and (3) Summary description of action(s) taken to prevent a recurrence.	30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
DSR 3.2.5.1	----------NOTE---------- Only required to be met when the VENTILATION EXHAUST TREATMENT SYSTEM is not being fully utilized. ---------- Project the doses from iodine and particulate releases from each unit to areas at or beyond the SITE BOUNDARY.	31 days

D 3.2 RADIOACTIVE GASEOUS EFFLUENTS

D 3.2.6 Venting or Purging

DLCO 3.2.6 VENTING or PURGING of the drywell and/or suppression chamber shall be through the standby gas treatment system.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

----------NOTES----------

1. LCO 3.0.3 is not applicable.

2. LCO 3.0.4 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. VENTING or PURGING of the drywell and/or suppression chamber not through the standby gas treatment system.	A.1 Suspend all VENTING and PURGING of the drywell and/or suppression chamber.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
DSR 3.2.6.1	The drywell and/or suppression chamber shall be determined to be aligned for VENTING or PURGING through the standby gas treatment system.	Within 4 hours before start of VENTING or PURGING AND 12 hours thereafter during VENTING or PURGING

D 3.3 INSTRUMENTATION

D 3.3.1 Radioactive Liquid Effluent Monitoring Instrumentation

DLCO 3.3.1 The radioactive liquid effluent monitoring instrumentation channels shown in Table D 3.3.1-1 shall be FUNCTIONAL with:

a. The minimum FUNCTIONAL channel(s) in service.

b. The alarm/trip setpoints set to ensure that the limits of DLCO 3.1.1 are not exceeded.

APPLICABILITY: According to Table D 3.3.1-1.

ACTIONS

----------NOTES----------

1. LCO 3.0.3 is not applicable.
2. Separate condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Liquid effluent monitoring instrumentation channel alarm/trip setpoint less conservative than required.	A.1 Suspend the release of radioactive liquid effluents monitored by the affected channel.	Immediately
	OR	
	A.2 Declare the channel nonfunctional.	Immediately
	OR	
	A.3 Change the setpoint so it is acceptably conservative.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or more required channels nonfunctional.	B.1 Enter the Condition referenced in Table D 3.3.1-1 for the channel. AND B.2 Restore nonfunctional channel(s) to FUNCTIONAL status.	Immediately 30 days
C. As required by Required Action B.1 and referenced in Table D 3.3.1-1.	C.1 Analyze at least 2 independent samples in accordance with Table D 3.1.1-1. AND C.2 ----------NOTE---------- Verification Action will be performed by at least 2 separate technically qualified members of the facility staff. ---------- Independently verify the release rate calculations and discharge line valving.	Prior to initiating a release Prior to initiating a release
D. As required by Required Action B.1 and referenced in Table D 3.3.1-1.	D.1 Collect and analyze grab samples for radioactivity at a limit of detection of at least 5×10^{-7} μCi/ml.	12 hours AND Once per 12 hours thereafter

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. As required by Required Action B.1 and referenced in Table D 3.3.1-1.	E.1 ----------NOTE---------- Pump performance curves generated in place may be used to estimate flow. ---------- Estimate the flow rate during actual releases.	4 hours AND Once per 4 hours thereafter
F. As required by Required Action B.1 and referenced in Table D 3.3.1-1.	F.1 Estimate tank liquid level.	Immediately AND During liquid additions to the tank
G. Required Action B.2 and associated Completion Time not met.	G.1 Explain in the next Radioactive Effluent Release Report why the nonfunctionality was not corrected in a timely manner.	In accordance with Radioactive Effluent Release Report
H. Required Action and associated Completion Time for Condition C, D, or E not met.	H.1 Suspend liquid effluent releases monitored by the nonfunctional channel(s).	Immediately
I. Required Action and associated Completion Time for Condition F not met.	I.1 Suspend liquid additions to the tank monitored by the nonfunctional channel(s).	Immediately

SURVEILLANCE REQUIREMENTS

----------NOTE----------
Refer to Table D 3.3.1-1 to determine which DSRs apply for each function.

SURVEILLANCE		FREQUENCY
DSR 3.3.1.1	Perform CHANNEL CHECK.	24 hours
DSR 3.3.1.2	Perform CHANNEL CHECK by verifying indication of flow during periods of release.	24 hours on any day on which continuous, periodic, or batch releases are made
DSR 3.3.1.3	Perform SOURCE CHECK.	Prior to release
DSR 3.3.1.4	Perform SOURCE CHECK.	31 days
DSR 3.3.1.5	Perform CHANNEL FUNCTIONAL TEST. The CHANNEL FUNCTIONAL TEST shall also demonstrate that automatic isolation of this pathway and control room alarm annunciation occurs if the instrument indicates measured levels above the alarm/trip setpoint; and control room alarm annunciation occurs for instrument indication levels measured above the alarm setpoint, circuit failure, instrument indicating a downscale failure, or instrument controls not set in operate mode.	31 days
DSR 3.3.1.6	Perform CHANNEL FUNCTIONAL TEST.	92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
DSR 3.3.1.7	Perform CHANNEL FUNCTIONAL TEST. The CHANNEL FUNCTIONAL TEST shall also demonstrate control room alarm annunciation occurs for instrument indication levels measured above the alarm setpoint, circuit failure, instrument indicating a downscale failure, or instrument controls not set in operate mode.	184 days
DSR 3.3.1.8	Perform CHANNEL CALIBRATION. The initial CHANNEL CALIBRATION shall be performed using one or more of the reference standards certified by the National Institute of Standards and Technology (NIST), standards that are traceable to NIST standards, or using actual samples of liquid effluents that have been analyzed on a system that has been calibrated with NIST traceable sources. These standards shall permit calibrating the system over its intended range of energy and measurement. For subsequent CHANNEL CALIBRATION, sources that have been related to the initial calibration may be used.	18 months
DSR 3.3.1.9	Perform CHANNEL CALIBRATION.	18 months

Table D 3.3.1-1 (page 1 of 1)
Radioactive Liquid Effluent Monitoring Instrumentation

INSTRUMENT	APPLICABILITY OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER INSTRUMENT	CONDITIONS REFERENCED FROM REQUIRED ACTION B.1	SURVEILLANCE REQUIREMENTS
1. Radioactivity Monitors Providing Alarm and Automatic Termination of Release				
Liquid Radwaste Effluent Line	(a)	1	C	DSR 3.3.1.1 DSR 3.3.1.3 DSR 3.3.1.5 DSR 3.3.1.8
2. Radioactivity Monitors Providing Alarm but not Providing Automatic Termination of Release				
a. Service Water Effluent Line A	(a)	1	D	DSR 3.3.1.1 DSR 3.3.1.4 DSR 3.3.1.7 DSR 3.3.1.8
b. Service Water Effluent Line B	(a)	1	D	DSR 3.3.1.1 DSR 3.3.1.4 DSR 3.3.1.7 DSR 3.3.1.8
c. Cooling Tower Blowdown Line	(a)	1	D	DSR 3.3.1.1 DSR 3.3.1.4 DSR 3.3.1.7 DSR 3.3.1.8
3. Flow Rate Measurement Devices				
a. Liquid Radwaste Effluent Line	(a)	1	E	DSR 3.3.1.2 DSR 3.3.1.6 DSR 3.3.1.9
b. Service Water Effluent Line A	(a)	1	E	DSR 3.3.1.2 DSR 3.3.1.6 DSR 3.3.1.9
c. Service Water Effluent Line B	(a)	1	E	DSR 3.3.1.2 DSR 3.3.1.6 DSR 3.3.1.9
d. Cooling Tower Blowdown Line	(a)	1	E	DSR 3.3.1.2 DSR 3.3.1.6 DSR 3.3.1.9
4. Tank Level Indicating Devices (c)	(b)	1	F	DSR 3.3.1.1 DSR 3.3.1.6 DSR 3.3.1.9

(a) During releases via this pathway.
(b) During liquid addition to the associated tank.
(c) Tanks included in this DLCO are those outdoor tanks that are not surrounded by liners, dikes, or walls capable of holding the tank contents and do not have tank overflows and surrounding area drains connected to the liquid radwaste treatment system, such as temporary tanks.

D 3.3 INSTRUMENTATION

D 3.3.2 Radioactive Gaseous Effluent Monitoring Instrumentation

DLCO 3.3.2 The radioactive gaseous effluent monitoring instrumentation channels shown in Table D 3.3.2-1 shall be FUNCTIONAL with:

a. The minimum FUNCTIONAL channel(s) in service.

b. The alarm/trip setpoints of Offgas Noble Gas Activity Monitor set to ensure that the limit of Technical Specification LCO 3.7.4 is not exceeded.

c. The alarm/trip setpoints of Radwaste/Reactor Building Vent Effluent Noble Gas Activity Monitor and Main Stack Effluent Noble Gas Activity Monitor set to ensure that the limits of DLCO 3.2.1 are not exceeded.

APPLICABILITY: According to Table D 3.3.2-1.

ACTIONS

----------NOTES----------

1. LCO 3.0.3 is not applicable.
2. Separate condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Gaseous effluent monitoring instrumentation channel alarm/trip setpoint less conservative than required.	A.1 Suspend the release of radioactive gaseous effluents monitored by the affected channel.	Immediately
	OR	
	A.2 Declare the channel nonfunctional.	Immediately
	OR	
	A.3 Change the setpoint so it is acceptably conservative.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or more channels nonfunctional.	B.1 Enter the Condition referenced in Table D 3.3.2-1 for the channel.	Immediately
	AND	
	B.2 Restore nonfunctional channel(s) to FUNCTIONAL status.	30 days
C. As required by Required Action B.1 and referenced in Table D 3.3.2-1.	C.1 Place the nonfunctional channel in the tripped condition.	12 hours
	OR	
	C.2.1 Take grab samples.	12 hours AND Once per 12 hours thereafter
	AND	
	C.2.2 Analyze samples for gross activity.	24 hours from time of sampling completion

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. As required by Required Action B.1 and referenced in Table D 3.3.2-1.	D.1 Estimate the flow rate for the nonfunctional channel(s).	4 hours AND Once per 4 hours thereafter
E. As required by Required Action B.1 and referenced in Table D 3.3.2-1.	E.1 Continuously collect samples using auxiliary sampling equipment as required in Table D 3.2.1-1.	8 hours
F. As required by Required Action B.1 and referenced in Table D 3.3.2-1.	F.1.1 Take grab samples.	12 hours AND Once per 12 hours thereafter
	AND	
	F.1.2 Analyze samples for gross activity with a radioactivity limit of detection of at least 1×10^{-4} µCi/ml.	24 hours from time of sampling completion
	AND	
	F.2.1 Restore the nonfunctional channel(s) to FUNCTIONAL status.	72 hours
	OR	
	F.2.2 Through a CR, determine: (1) The cause(s) of the nonfunctional. (2) The actions to be taken and the schedule for restoring the system to FUNCTIONAL status.	14 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. Required Action B.2 and associated Completion Time not met.	G.1 Explain in the next Radioactive Effluent Release Report why the nonfunctionality was not corrected in a timely manner.	In accordance with Radioactive Effluent Release Report frequency
H Required Action and associated Completion Time for Condition C, D, E or F.1 not met.	H.1 Suspend gaseous effluent releases monitored by the nonfunctional channel(s).	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
DSR 3.3.2.1	Perform CHANNEL CHECK.	24 hours
DSR 3.3.2.2	Perform CHANNEL CHECK.	7 days
DSR 3.3.2.3	Perform SOURCE CHECK.	31 days
DSR 3.3.2.4	Perform CHANNEL FUNCTIONAL TEST. The CHANNEL FUNCTIONAL TEST shall also demonstrate the automatic isolation capability of this pathway and that control room alarm annunciation occurs if the instrument indicates measured levels above the alarm/trip setpoint (each channel will be tested independently so as to not initiate isolation during operation); and control room alarm annunciation occurs for instrument indication levels measured above the alarm setpoint, circuit failure, instrument indicating a downscale failure, and instrument controls not set in operate mode.	31 days
DSR 3.3.2.5	Perform CHANNEL FUNCTIONAL TEST.	92 days
DSR 3.3.2.6	Perform CHANNEL FUNCTIONAL TEST. The CHANNEL FUNCTIONAL TEST shall also demonstrate control room alarm annunciation occurs for instrument indication levels measured above the alarm setpoint, circuit failure, instrument indicating a downscale failure, and instrument controls not set in operate mode.	92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
DSR 3.3.2.7	Perform CHANNEL CALIBRATION. The initial CHANNEL CALIBRATION shall be performed using one or more of the reference standards certified by the National Institute of Standards and Technology (NIST) or using standards that have been obtained from suppliers that participate in measurement assurance activities with NIST, or using actual samples of gaseous effluents that have been analyzed on a system that has been calibrated with NIST traceable sources. These standards shall permit calibrating the system over its intended range of energy and measurement. For subsequent CHANNEL CALIBRATION, sources that have been related to the initial calibration may be used. The CHANNEL CALIBRATION shall also demonstrate that automatic isolation of this pathway occurs when the instrument channels indicate measured levels above the Trip Setpoint.	24 months
DSR 3.3.2.8	Perform CHANNEL CALIBRATION.	18 months
DSR 3.3.2.9	Perform CHANNEL CALIBRATION. The initial CHANNEL CALIBRATION shall be performed using one or more of the reference standards certified by the National Institute of Standards and Technology (NIST) or using standards that have been obtained from suppliers that participate in measurement assurance activities with NIST, or using actual samples of gaseous effluents that have been analyzed on a system that has been calibrated with NIST traceable sources. These standards shall permit calibrating the system over its intended range of energy and measurement. For subsequent CHANNEL CALIBRATION, sources that have been related to the initial calibration may be used.	18 months
DSR 3.3.2.10	Perform CHANNEL CALIBRATION.	24 months

Table D 3.3.2-1 (page 1 of 2)
Radioactive Gaseous Effluent Monitoring Instrumentation

INSTRUMENT	APPLICABILITY OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER INSTRUMENT	CONDITIONS REFERENCED FROM REQUIRED ACTION B.1	SURVEILLANCE REQUIREMENTS
1. Offgas System				
a. Noble Gas Activity Monitor – Providing Alarm and Automatic Termination of Release	(a)	2	C	DSR 3.3.2.1 DSR 3.3.2.4 DSR 3.3.2.7
b. System Flow-Rate Measuring Device	(a)	1	D	DSR 3.3.2.1 DSR 3.3.2.5 DSR 3.3.2.10
c. Sample Flow-Rate Measuring Device	(a)	2	D	DSR 3.3.2.1 DSR 3.3.2.5 DSR 3.3.2.10
2. Radwaste/Reactor Building Vent Effluent System				
a. Noble Gas Activity Monitor (c)	(b)	1	F	DSR 3.3.2.1 DSR 3.3.2.3 DSR 3.3.2.6 DSR 3.3.2.9
b. Iodine Sampler	(b)	1	E	DSR 3.3.2.2
c. Particulate Sampler	(b)	1	E	DSR 3.3.2.2
d. Flow-Rate Monitor	(b)	1	D	DSR 3.3.2.1 DSR 3.3.2.5 DSR 3.3.2.8
e. Sample Flow-Rate Monitor	(b)	1	D	DSR 3.3.2.1 DSR 3.3.2.5 DSR 3.3.2.8

(continued)

(a) During offgas system operation.

(b) At all times.

(c) Includes high range noble gas monitoring capability.

Table D 3.3.2-1 (page 2 of 2)
Radioactive Gaseous Effluent Monitoring Instrumentation

INSTRUMENT	APPLICABILITY OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER INSTRUMENT	CONDITIONS REFERENCED FROM REQUIRED ACTION B.1	SURVEILLANCE REQUIREMENTS
3. Main Stack Effluent				
a. Noble Gas Activity Monitor (c)	(b)	1	F	DSR 3.3.2.1 DSR 3.3.2.3 DSR 3.3.2.6 DSR 3.3.2.9
b. Iodine Sampler	(b)	1	E	DSR 3.3.2.2
c. Particulate Sampler	(b)	1	E	DSR 3.3.2.2
d. Flow-Rate Monitor	(b)	1	D	DSR 3.3.2.1 DSR 3.3.2.5 DSR 3.3.2.8
e. Sample Flow-Rate Monitor	(b)	1	D	DSR 3.3.2.1 DSR 3.3.2.5 DSR 3.3.2.8

(b) At all times.

(c) Includes high range noble gas monitoring capability.

D 3.4 RADIOACTIVE EFFLUENTS TOTAL DOSE

D 3.4 Radioactive Effluents Total Dose

DLCO 3.4 The annual (calendar year) dose or dose commitment to any MEMBER OF THE PUBLIC due to releases of radioactivity and to radiation from uranium fuel cycle sources shall be limited to ≤ 25 mrem to the whole body or any organ, except the thyroid, which shall be limited to ≤ 75 mrem.

APPLICABILITY: At all times.

ACTIONS

----------NOTES----------

1. LCO 3.0.3 is not applicable.
2. LCO 3.0.4 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Estimated dose or dose commitment due to direct radiation and the release of radioactive materials in liquid or gaseous effluents exceeds the limits.	A.1 Verify the condition resulting in doses exceeding these limits has been corrected.	Immediately
B. Required Action and associated Completion Time not met.	B.1 ----------NOTE---------- This is the Special Report required by D 3.1.2, D 3.2.2, or D 3.2.3 supplemented with the following. ---------- Submit a Special Report, pursuant to D 4.1.1, including a request for a variance in accordance with the provisions of 40 CFR 190. This submission is considered a timely request, and a variance is granted until staff action on the request is complete.	30 days

D 3.5 RADIOLOGICAL ENVIRONMENTAL MONITORING

D 3.5.1 Monitoring Program

DLCO 3.5.1 The Radiological Environmental Monitoring Program shall be conducted as specified in Table D 3.5.1-1.

APPLICABILITY: At all times.

ACTIONS

----------NOTES----------
1. LCO 3.0.3 is not applicable.
2. LCO 3.0.4 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Radiological Environmental Monitoring Program not conducted as specified in Table D 3.5.1-1.	A.1 Prepare and submit to the NRC in the Annual Radiological Environmental Operating Report, a description of the reasons for not conducting the program as required and the plans for preventing a recurrence.	In accordance with the Annual Radiological Environmental Operating Report frequency
B. Level of radioactivity in an environmental sampling medium at a specified location exceeds the reporting levels of Table D 3.5.1-2 when averaged over any calendar quarter. OR	B.1 ----------NOTES---------- 1. Only applicable if the radioactivity/radionuclides are the result of plant effluents. 2. For radionuclides other than those in Table D 3.5.1-2, this report shall indicate the methodology and parameters used to estimate the potential annual dose to a MEMBER OF THE PUBLIC. ----------	

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
More than one of the radionuclides in Table D 3.5.1-2 are detected in the environmental sampling medium and Concentration 1 / reporting level 1 + concentration 2 / reporting level 2 + ... ≥ 1.0. OR Radionuclides other than those in Table D 3.5.1-2 are detected in an environmental sampling medium at a specified location which are the result of plant effluents and the potential annual dose to a MEMBER OF THE PUBLIC from all radionuclides is ≥ the calendar year limits of D 3.1.2, D 3.2.2 or D 3.2.3.	Prepare and submit to the NRC, pursuant to D 4.1.1, a Special Report that (1) Identifies the cause(s) for exceeding the limit(s) and (2) Defines the corrective actions to be taken to reduce radioactive effluents so that the potential annual dose to a MEMBER OF THE PUBLIC is less than the calendar year limits of D 3.1.2, D 3.2.2, or D 3.2.3.	30 days
	OR	
	B.2 ----------NOTES---------- 1. Only applicable if the radioactivity/radionuclides are not the result of plant effluents. 2. For radionuclides other than those in Table D 3.5.1-2, this report shall indicate the methodology and parameters used to estimate the potential annual dose to a MEMBER OF THE PUBLIC. ---------- Report and describe the condition in the Annual Radiological Environmental Operating Report.	In accordance with the Annual Radiological Environmental Operating Report frequency

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Milk or fresh leafy vegetation samples unavailable from one or more of the sample locations required by Table D 3.5.1-1.	C.1 Identify specific locations for obtaining replacement samples and add them to the Radiological Environmental Monitoring Program.	30 days
	AND	
	C.2 Delete the specific locations from which samples were unavailable from the Radiological Environmental Monitoring Program.	30 days
	AND	
	C.3 Pursuant to Technical Specification 5.6.3, submit in the next Radioactive Effluent Release Report documentation for a change in the ODCM reflecting the new location(s) with supporting information identifying the cause of the unavailability of samples and justifying the selection of the new location(s) for obtaining samples.	In accordance with the Radioactive Effluent Release Report
D. Environmental samples required in Table D 3.5.1-1 are unobtainable due to sampling equipment malfunctions.	D.1 Ensure all efforts are made to complete corrective action(s).	Prior to the end of the next sampling period
	AND	
	D.2 Report all deviations from the sampling schedule in the Annual Radiological Environmental Operating Report.	In accordance with the Annual Radiological Environmental Operating Report

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Samples required by Table D 3.5.1-1 not obtained in the media of choice, at the most desired location, or at the most desired time.	E.1 Choose suitable alternative media and locations for the pathway in question.	30 days
	AND	
	E.2 Make appropriate substitutions in the Radiological Environmental Monitoring Program.	30 days
	AND	
	E.3 Submit in the next Radioactive Effluent Release Report documentation for a change in the ODCM reflecting the new location(s) with supporting information identifying the cause of the unavailability of samples for that pathway and justifying the selection of the new location(s) for obtaining samples.	In accordance with the Radioactive Effluent Release Report

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
DSR 3.5.1.1	Collect and analyze radiological environmental monitoring samples pursuant to the requirements of Table D 3.5.1-1 and the detection capabilities required by Table D 3.5.1-3.	In accordance with Table D 3.5.1-1

Table D 3.5.1-1 (page 1 of 4)
Radiological Environmental Monitoring Program

EXPOSURE PATHWAY AND/OR SAMPLE	NUMBER OF SAMPLES STATIONS	SAMPLE LOCATIONS (a)	SAMPLING AND COLLECTION FREQUENCY	TYPE AND FREQUENCY OF ANALYSIS
1. Direct Radiation	32 routine monitoring stations (b)	(1) An inner ring of stations, one in each meteorological sector in the general area of the SITE BOUNDARY (2) An outer ring of stations, one in each land base meteorological sector in the 4 to 5 mile (c) range from the site (3) The balance of the stations should be placed in special interest areas such as population centers, nearby residences, schools, and in one or two areas to serve as control stations (d)	Once per 3 months	Gamma dose: once per 3 months
2. Airborne Radioiodine and Particulates	5 locations	(1) 3 samples from offsite locations close to the site boundary (within 1 mile) in different sectors (e) (2) 1 sample from the vicinity of an established year-round community (e) (3) 1 sample from a control location, at least 10 miles distant and in a least prevalent wind direction (d)	Continuous sampler operation with sample collection weekly or more frequently if required by dust loading	Radioiodine canister: Analyze weekly for I-131 Particulate sampler: (1) Analyze for gross beta radioactivity ≥ 24 hours following filter change (f). (2) Perform gamma isotopic analysis on each sample (g) in which gross beta activity is > 10 times the previous yearly mean of control samples. (3) Gamma isotopic analysis of composite sample (g) (by location) once per 3 months
3. Waterborne				
a. Surface	1 sample	Upstream (d) (h)	Composite sample over a one month period (i)	(1) Gamma isotopic analysis of each sample (g) once per month (2) H-3 analysis of each composite sample and once per 3 months
	1 sample	Site's downstream cooling water intake (h)		
b. Ground	As required	From one or two sources if likely to be affected (j)	Grab sample once per 3 months	(3) Gamma isotopic analysis of each sample (g) once per 3 months (4) H-3 analysis of each sample once per 3 months

(continued)

Table D 3.5.1-1 (page 2 of 4)
Radiological Environmental Monitoring Program

EXPOSURE PATHWAY AND/OR SAMPLE	NUMBER OF SAMPLES	SAMPLE LOCATIONS (a)	SAMPLING AND COLLECTION FREQUENCY	TYPE AND FREQUENCY OF ANALYSIS
3. Waterborne (continued)				
c. Drinking	1 sample of each	One to three of the nearest water supplies that could be affected by its discharge (k)	When I-131 analysis is performed, a composite sample over a two week period (i); otherwise, a composite sample monthly	(1) I-131 analysis on each composite sample when the dose calculated for the consumption of the water is greater than 1 mrem/yr (l) (2) Gross beta and gamma isotopic analyses of each composite sample (g) monthly (3) H-3 analysis of each composite sample once per 3 months
d. Sediment from Shoreline	1 sample	From a downstream area with existing or potential recreational value	Twice per year	Gamma isotopic analysis of each sample (g)
4. Ingestion				
a. Milk	(1) 3 samples from MILK SAMPLING LOCATIONS	In 3 locations within 3.5 miles (e)	Twice per month, April through December (m)	(1) Gamma isotopic (g) and I-131 analysis of each sample twice per month April through December
	(2) If there are none, then 1 sample from MILK SAMPLING LOCATIONS	In each of 3 areas 3.5-5.0 miles distant (e)		(2) Gamma isotopic (g) and I-131 analysis of each sample once per month January through March if required
	(3) 1 sample from a MILK SAMPLING LOCATION	At a control location 9-20 miles distant and in a least prevalent wind direction (d)		
b. Fish	(1) 1 sample each of 2 commercially or recreationally important species (n)	In the vicinity of a plant discharge area	Twice per year	Gamma isotopic analysis of each sample (g) on edible portions twice per year
	(2) 1 sample of the same species	In areas not influenced by station discharge (d)		

(continued)

Table D 3.5.1-1 (page 3 of 4)
Radiological Environmental Monitoring Program

EXPOSURE PATHWAY AND/OR SAMPLE	NUMBER OF SAMPLES	SAMPLE LOCATIONS (a)	SAMPLING AND COLLECTION FREQUENCY	TYPE AND FREQUENCY OF ANALYSIS
4. Ingestion (continued)				
c. Food Products	(1) 1 sample of each principal class of food products	Any area that is irrigated by water in which liquid plant wastes have been discharged (o)	At time of harvest (p)	Gamma isotopic (g) and I-131 analysis of each sample of edible portions
	(2) Samples of 3 different kinds of broad leaf vegetation (such as vegetables)	Grown nearest to each of 2 different offsite locations (e)	Once per year during the harvest season-	
	(3) 1 sample of each of the similar broad leaf vegetation.	Grown at least 9.3 miles distant in a least prevalent wind direction	Once per year during the harvest season	

Table D 3.5.1-1 (page 4 of 4)
Radiological Environmental Monitoring Program

(a) Specific parameters of distance and direction sector from the centerline of one reactor, and additional descriptions where pertinent, shall be provided for each and every sample location in Table D 3.5.1-1. Refer to NUREG-0133, "Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants," October 1978, and to Radiological Assessment Branch Technical Position on Environmental Monitoring, Revision 1, November 1979. Deviations are permitted from the required sampling schedule if specimens are unobtainable because of such circumstances as hazardous conditions, seasonal unavailability (which includes theft and uncooperative residents), or malfunction of automatic sampling equipment.

(b) One or more instruments, such as a pressurized ion chamber, for measuring and recording dose rate continuously may be used in place of, or in addition to integrating dosimeters. Each of the 32 routine monitoring stations shall be equipped with 2 or more dosimeters or with 1 instrument for measuring and recording dose rate continuously. For the purpose of this table, a thermoluminescent dosimeter (TLD) is considered to be one phosphor; 2 or more phosphors in a packet are considered as 2 or more dosimeters. Film badges shall not be used as dosimeters for measuring direct radiation.

(c) At this distance, 8 windrose sectors (W, WNW, NW, NNW, N, NNE, NE, and ENE) are over Lake Ontario.

(d) The purpose of these samples is to obtain background information. If it is not practical to establish control locations in accordance with the distance and wind direction criteria, other sites, which provide valid background data, may be substituted.

(e) Having the highest calculated annual site average ground-level D/Q based on all site licensed reactors.

(f) Airborne particulate sample filters shall be analyzed for gross beta activity 24 hours or more after sampling to allow for radon and thoron daughter decay.

(g) Gamma isotopic analysis means the identification and quantification of gamma–emitting radionuclides that may be attributable to the effluents from the facility.

(h) The upstream sample shall be taken at a distance beyond significant influence of the discharge. The downstream sample shall be taken in an area beyond but near the mixing zone.

(i) In this program, representative composite sample aliquots shall be collected at time intervals that are very short (e.g., hourly) relative to the compositing period (e.g., monthly) in order to assure obtaining a representative sample.

(j) Groundwater samples shall be taken when this source is tapped for drinking or irrigation purposes in areas where the hydraulic gradient or recharge properties are suitable for contamination.

(k) Drinking water samples shall be taken only when drinking water is a dose pathway.

(l) Analysis for I-131 may be accomplished by Ge-Li analysis provided that the lower limit of detection (LLD) for I-131 in water samples found on Table D 3.5.1-2 can be met. Doses shall be calculated for the maximum organ and age group.

(m) Samples will be collected January through March if I-131 is detected in November and December of the preceding year.

(n) In the event 2 commercially or recreationally important species are not available, after 3 attempts of collection, then 2 samples of one species or other species not necessarily commercially or recreationally important may be utilized.

(o) Applicable only to major irrigation projects within 9 miles of the site in the general downcurrent direction.

(p) If harvest occurs more than once/year, sampling shall be performed during each discrete harvest. If harvest occurs continuously, sampling shall be taken monthly. Attention should be paid to including samples of tuberous and root food products.

Table D 3.5.1-2 (page 1 of 1)
Reporting Levels for Radioactivity in Environmental Samples

RADIONUCLIDE ANALYSIS	WATER (pCi/L)	AIRBORNE PARTIUCLATE OR GASES (pCi/m^3)	FISH (pCi/kg, wet)	MILK (pCi/L)	FOOD PRODUCTS (pCi/kg, wet)
H-3	20,000 (a)				
Mn-54	1,000		30,000		
Fe-59	400		10,000		
Co-58	1,000		30,000		
Co-60	300		10,000		
Zn-65	300		20,000		
Zr-95	400				
Nb-95	400				
I-131	2 (b)	0.9		3	100
Cs-134	30	10	1,000	60	1,000
Cs-137	50	20	2,000	70	2,000
Ba-140	200			300	
La-140	200			300	

(a) For drinking water samples. This is a 40 CFR 141 value. If no drinking water pathway exists, a value of 30,000 pCi/L may be used.

(b) If no drinking water pathway exists, a value of 20 pCi/L may be used.

Table D 3.5.1-3 (page 1 of 2)
Detection Capabilities for Environmental Sample Analysis [a] [b]

	LOWER LIMIT OF DETECTION (LLD)[c]					
RADIONUCLIDE ANALYSIS	WATER (pCi/L)	AIRBORNE PARTIUCLATE OR GASES (pCi/m^3)	FISH (pCi/kg, wet)	MILK (pCi/L)	FOOD PRODUCTS (pCi/kg, wet)	SEDIMENT (pCi/kg, dry)
Gross Beta	4	0.01				
H-3	2,000 [d]					
Mn-54	15		130			
Fe-59	30		260			
Co-58	15		130			
Co-60	15		130			
Zn-65	30		260			
Zr-95	15					
Nb-95	15					
I-131	1 [e]	0.07		1	60	
Cs-134	15	0.05	130	15	60	150
Cs-137	18	0.06	150	18	80	180
Ba-140	15			15		
La-140	15			15		

See the notes on the next page

Table 3.5.1-3 (page 2 of 2)
Detection Capabilities for Environmental Sample Analysis [(a) (b)]

(a) This list does not mean that only these nuclides are tobe considered. Other peaks that are identifiable, together with those of the above nuclides, shall also be analyzed and reported in the Annual Radiological Environmental Operating Report.

(b) Required detection capabilities for thermoluminescent dosimetersused for environmental measurements are given in ANSI N-545, Section 4.3 1975. Allowable exceptions to ANSI N-545, Section 4.3 are contained in the ODCM.

(c) The LLD is defined as the smallest concentration of radioactive material in a sample that will yield a net count, above system background, that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system, which may include radiochemical separation:

$$LLD = \frac{(4.66)(S_b)}{(E)(V)(2.22)(Y)e^{-\lambda\Delta t}}$$

where:

LLD	=	The before-the-fact lower limit of detection (pCi per unit mass or volume),
S_b	=	The standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (counts per minute),
E	=	The counting efficiency (counts per disintegration),
V	=	The sample size (units of mass or volume),
2.22	=	The number of disintegrations per minute per pCi,
Y	=	The fractional radiochemical yield, when applicable,
λ	=	The radioactive decay constant for the particular radionuclide (sec^{-1}), and
Δt	=	The elapsed time between environmental collection or end of the sample collection period, and the time of counting (seconds).

Typical values of E, V, Y, and Δt should be used in the calculation.

It should be recognized that the LLD is defined as a beforethe-fact limit representing the capability of a measurement system and not as an after-the-fact limit for a particular measurement. Analyses shall be performed in such a manner that the stated LLDs will be achieved under routine conditions. Occasionally background fluctuations, unavoidable small sample sizes, the presence of interfering nuclides, or other uncontrollable circumstances may render these LLDs unachievable. In such cases, the contributing factors shall be identified and described in the Annual Radiological Environmental Operating Report.

(d) If no drinking water pathway exists, a value of 3,000 pCi/L may be used.

(e) If no drinking water pathway exists, a value of 15 pCi/L may be used.

D 3.5 RADIOLOGICAL ENVIRONMENTAL MONITORING

D 3.5.2 Land Use Census

DLCO 3.5.2 A land use census shall:

a. Be conducted,

b. Identify within a distance of 5 miles the location in each of the 16 meteorological sectors of the nearest milk animal and the nearest residence, and the nearest garden (broad leaf vegetation sampling controlled by Table D 3.5.1-1, part 5.c may be performed in lieu of the garden census) of > 500 ft^2 producing broad leaf vegetation, and

c. For elevated releases, identify within a distance of 3 miles the locations in each of the 16 meteorological sectors of all milk animals and all gardens (broad leaf vegetation sampling controlled by Table D 3.5.1-1, part 5.c may be performed in lieu of the garden census) > 500 ft^2 producing broad leaf vegetation.

APPLICABILITY: At all times.

ACTIONS

----------NOTES----------

1. LCO 3.0.3 is not applicable.
2. LCO 3.0.4 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Land use census identifies location(s) that yields a calculated dose, dose commitment, or D/Q value > than the values currently being calculated in DSR 3.2.3.1.	A.1 Identify the new location(s) in the next Radioactive Effluent Release Report.	In accordance with the Radioactive Effluent Release Report

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Land use census identifies location(s) that yields a calculated dose, dose commitment, or D/Q value (via the same exposure pathway) 50% > than at a location from which samples are currently being obtained in accordance with Table D 3.5.1-1.	B.1 Add the new location(s) to the Radiological Environmental Monitoring Program.	30 days
	AND	
	B.2 Delete the sampling location(s), excluding the control station location, having the lowest calculated dose, dose commitment(s) or D/Q value, via the same exposure pathway, from the Radiological Environmental Monitoring Program.	After October 31 of the year in which the land use census was conducted
	AND	
	B.3 Submit in the next Radioactive Effluent Release Report documentation for a change in the ODCM including revised figure(s) and table(s) for the ODCM reflecting the new location(s) with information supporting the change in sampling locations.	In accordance with the Radioactive Effluent Release Report

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
DSR 3.5.2.1	Conduct the land use census during the growing season using that information that will provide the best results, such as by a door-to-door survey, aerial survey, or by consulting local agriculture authorities.	366 days
DSR 3.5.2.2	Report the results of the land use census in the Annual Radiological Environmental Operating Report.	In accordance with the Annual Radiological Environmental Operating Report

D 3.5 RADIOLOGICAL ENVIRONMENTAL MONITORING

D 3.5.3 Interlaboratory Comparison Program

DLCO 3.5.3 The Interlaboratory Comparison Program shall be described in the ODCM.

AND

Analyses shall be performed on all radioactive materials, supplied as part of an Interlaboratory Comparison Program that has been approved by the NRC, that correspond to samples required by Table D 3.5.1-1. Participation in this program shall include media for which environmental samples are routinely collected and for which intercomparison samples are available.

APPLICABILITY: At all times.

ACTIONS

---------- NOTES ----------

1. LCO 3.0.3 is not applicable.

2. LCO 3.0.4 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Analyses not performed as required.	A.1 Report the corrective actions taken to prevent a recurrence to the NRC in the Annual Radiological Environmental Operating Report.	In accordance with the Annual Radiological Environmental Operating Report

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
DSR 3.5.3.1	Report a summary of the results obtained as part of the Interlaboratory Comparison Program in the Annual Radiological Environmental Operating Report.	In accordance with the Annual Radiological Environmental Operating Report

PART I - RADIOLOGICAL EFFLUENT CONTROLS

BASES

B 3.1 RADIOACTIVE LIQUID EFFLUENTS

B 3.1.1 Liquid Effluents Concentration

BASES

This is provided to ensure that the concentration of radioactive materials released in liquid waste effluents to UNRESTRICTED AREAS will be less than ten times the concentration levels specified in 10 CFR 20, Appendix B, Table 2, Column 2. This limitation provides additional assurance that the levels of radioactive materials in bodies of water in UNRESTRICTED AREAS will result in exposures within: (1) the Section II.A design objectives of Appendix I to 10 CFR 50, to a MEMBER OF THE PUBLIC and (2) the levels required by 10 CFR 20.1301(e) to the population. The concentration limit for dissolved or entrained noble gases is based upon the assumption that Xe-135 is the controlling radioisotope and its effluent concentration in air (submersion) was converted to an equivalent concentration in water using the methods described in International Commission on Radiological Protection (ICRP) Publication 2.

This applies to the release of radioactive materials in liquid effluents from all units at the site.

The required detection capabilities for radioactive materials in liquid waste samples are tabulated in terms of the lower limits of detection (LLDs). Detailed discussion of the LLD, and other detection limits can be found in L. A. Currie, "Lower Limit of Detection: Definition and Elaboration of a Proposed Position for Radiological Effluent and Environmental Measurements," NUREG/CR-4007 (September 1984), and in the HASL Procedures Manual, HASL-300 (revised annually).

B 3.1 RADIOACTIVE LIQUID EFFLUENTS

B 3.1.2 Liquid Effluents Dose

BASES

This is provided to implement the requirements of Sections II.A, III.A, and IV.A of Appendix I to 10 CFR 50. This implements the guides set forth in Section II.A of Appendix I. The ACTION statements provide the required operating flexibility and at the same time implement the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive materials in liquid effluents to UNRESTRICTED AREAS will be kept as low as is reasonably achievable. Also, for fresh water sites with drinking water supplies that can be potentially affected by plant operations, there is reasonable assurance that the operation of the facility will not result in radionuclide concentrations in the potable drinking water that are in excess of the requirements of 40 CFR 141. For sites containing up to four reactors, it is highly unlikely that the resultant dose to a MEMBER OF THE PUBLIC will exceed the dose limits of 40 CFR 190 if the individual reactors remain within twice the dose design objectives of Appendix I, and if direct radiation doses from the units including outside storage tanks, etc., are kept small. The Special Report will describe a course of action that should result in the limitation of the annual dose to a MEMBER OF THE PUBLIC to within the 40 CFR 190 limits. For the purposes of the Special Report, it may be assumed that the dose commitment to the MEMBERS OF THE PUBLIC from other uranium fuel cycle sources is negligible, with the exception that dose contributions from other nuclear fuel cycle facilities at the same site or within a radius of 5 miles must be considered. The dose calculation methodology and parameters implement the requirements in Section III.A of Appendix I that conformance with the guides of Appendix I be shown by Calculational procedures based on models and data, so that the actual exposure of a MEMBER OF THE PUBLIC through appropriate pathways is unlikely to be substantially underestimated. The equations specified for calculating the doses that result from actual release rates of radioactive material in liquid effluents are consistent with the methodology provided in RG 1.109, "Calculation of Annual Doses To Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," Revision 1, October 1977 and R.G. 1.113, "Estimating Aquatic Dispersion of Effluents from Accidental and Routine Reactor Releases for the Purpose of Implementing Appendix I," April 1977. This applies to the release of radioactive materials in liquid effluents from each unit at the site. For units with shared radwaste treatment systems, the liquid effluents from the shared system are to be proportioned among the units sharing that system.

B 3.1 RADIOACTIVE LIQUID EFFLUENTS

B 3.1.3 Liquid Radwaste Treatment System

BASES

The installed liquid radwaste treatment system shall be considered FUNCTIONAL by meeting DLCO 3.1.1 and DLCO 3.1.2. The FUNCTIONALITY of the liquid radwaste treatment system ensures that this system will be available for use whenever liquid effluents require treatment before release to the environment. The requirement that the appropriate portions of this system be used when specified provides assurance that the releases of radioactive materials in liquid effluents will be kept as low as is reasonably achievable. This implements the requirements of 10 CFR 50.36a, GDC 60 of Appendix A to 10 CFR 50 and the design objective given in Section II.D of Appendix I to 10 CFR 50. The specified limits governing the use of appropriate portions of the liquid radwaste treatment system were specified as a suitable fraction of the dose design objectives set forth in Section II.A of Appendix I to 10 CFR 50 for liquid effluents. This applies to the release of radioactive materials in liquid effluents from each unit at the site. For units with shared radwaste treatment systems, the liquid effluents from the shared system are to be proportioned among the units sharing that system.

B 3.2 RADIOACTIVE GASEOUS EFFLUENTS

B 3.2.1 Gaseous Effluents Dose Rate

BASES

This is provided to ensure that the dose rate at any time at and beyond the SITE BOUNDARY from gaseous effluents from all units on the site will be within the annual dose limits of 10 CFR 20 to UNRESTRICTED AREAS.

The annual dose limits are the doses associated with the concentrations of 10 CFR 20, Appendix B, Table 2, Column 1. These limits provide reasonable assurance that radioactive material discharged in gaseous effluents will not result in the exposure of a MEMBER OF THE PUBLIC in an UNRESTRICTED AREA, either within or outside the SITE BOUNDARY, to annual average concentrations exceeding the limits specified in Appendix B, Table 2 of 10 CFR 20 or as governed by 10 CFR 20.1302(c). For MEMBERS OF THE PUBLIC who may at times be within the SITE BOUNDARY, the occupancy of that MEMBER OF THE PUBLIC will usually be sufficiently low to compensate for any increase in the atmospheric diffusion factor above that for the SITE BOUNDARY. Examples of calculations for such MEMBERS OF THE PUBLIC, with the appropriate occupancy factors, shall be given in Part II. The specified release rate limits restrict, at all times, the corresponding gamma and beta dose rates above background to a MEMBER OF THE PUBLIC at or beyond the SITE BOUNDARY to less than or equal to 500 mrem/year to the whole body or to less than or equal to 3000 mrem/year to the skin. These release rate limits also restrict, at all times, the corresponding thyroid dose rate above background to a child via the inhalation pathway to less than or equal to 1500 mrem/year. This applies to the release of radioactive materials in gaseous effluents from all units at the site.

The required detection capabilities for radioactive materials in gaseous waste samples are tabulated in terms of the lower limits of detection (LLDs). Detailed discussion of the LLD, and other detection limits can be found in L. A. Currie, "Lower Limit of Detection: Definition and Elaboration of a Proposed Position for Radiological Effluent and Environments Measurements," NUREG/CR-4007 (September 1984), and in the HASL Procedures Manual, HASL-300 (revised annually).

B 3.2 RADIOACTIVE GASEOUS EFFLUENTS

B 3.2.2 Gaseous Effluents Noble Gas Dose

BASES

This is provided to implement the requirements of Section II.B, III.A, and IV.A of Appendix I to 10 CFR 50. The DLCO implements the guides set forth in Section II.B of Appendix I. The REQUIRED ACTIONS provide the required operating flexibility and, at the same time, implement the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive material in gaseous effluents to UNRESTRICTED AREAS will be kept as low as is reasonably achievable. The Surveillance Requirements implement the requirements in Section III.A of Appendix I that conformance with the guidelines of Appendix I be shown by calculational procedures based on models and data so that the actual exposure of a MEMBER OF THE PUBLIC through appropriate pathways is unlikely to be substantially underestimated. For sites containing up to four reactors, it is highly unlikely that the resultant dose to a MEMBER OF THE PUBLIC will exceed the dose limits of 40 CFR 190 if the individual reactors remain within twice the dose design objectives of Appendix I, and if direct radiation doses from the units including outside storage tanks, etc., are kept small. The Special Report will describe a course of action that should result in the limitation of the annual dose to a MEMBER OF THE PUBLIC to within the 40 CFR 190 limits. For the purposes of the Special Report, it may be assumed that the dose commitment to the MEMBER OF THE PUBLIC from other uranium fuel cycle sources is negligible, with the exception that dose contributions from other nuclear fuel cycle facilities at the same site or within a radius of 5 miles must be considered. The dose calculation methodology and parameters for calculating the doses from the actual release rates of radioactive noble in gaseous effluents are consistent with the methodology provided in RG 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," Revision 1, October 1977, and RG 1.111, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water Cooled Reactors," Revision 1," July 1977. The ODCM equations provided for determining the air doses at or beyond the SITE BOUNDARY are based upon real-time meteorological conditions or the historical average atmospheric conditions. This applies to the release of radioactive material in gaseous effluents from each unit at the site.

B 3.2 RADIOACTIVE GASEOUS EFFLUENTS

B 3.2.3 Gaseous Effluents Dose – Iodine-131, Iodine-133, Tritium, and Radioactive Material In Particulate Form

BASES

This is provided to implement the requirements of Sections II.C, III.A, and IV.A of Appendix I to 10 CFR 50. The DLCO implements the guides set forth in Section II.C of Appendix I. The REQUIRED ACTIONS provide the required operating flexibility and at the same time implement the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive materials in gaseous effluents to UNRESTRICTED AREAS will be kept as low as is reasonably achievable. The calculational methods specified in the Surveillance Requirements implement the requirements in Section III.A of Appendix I that conformance with the guides of Appendix I be shown by calculational procedures based on models and data, so that the actual exposure of a MEMBER OF THE PUBLIC through appropriate pathways is unlikely to be substantially underestimated. . For sites containing up to four reactors, it is highly unlikely that the resultant dose to a MEMBER OF THE PUBLIC will exceed the dose limits of 40 CFR 190 if the individual reactors remain within twice the dose design objectives of Appendix I, and if direct radiation doses from the units including outside storage tanks, etc., are kept small. The Special Report will describe a course of action that should result in the limitation of the annual dose to a MEMBER OF THE PUBLIC to within the 40 CFR 190 limits. For the purposes of the Special Report, it may be assumed that the dose commitment to the MEMBER OF THE PUBLIC from other uranium fuel cycle sources is negligible, with the exception that dose contributions from other nuclear fuel cycle facilities at the same site or within a radius of 5 miles must be considered. The calculational methodology and parameters for calculating the doses from the actual release rates of the subject materials are consistent with the methodology provided in RG 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I, " Revision 1, October 1977, and RG 1.111, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors," Revision 1, July 1977. These equations also provide for determining the actual doses based upon the historical average atmospheric conditions. The release rate DLCO for iodine-131, iodine-133, tritium, and radioactive material in particulate form with half-lives greater than 8 days are dependent upon the existing radionuclide pathways to man, in the areas at or beyond the SITE BOUNDARY. The pathways that were examined in the development of these calculations were: (1) individual inhalation of airborne radioactive material, (2) deposition of radioactive material onto green leafy vegetation

B 3.2.3 Gaseous Effluents Dose – Iodine-131, Iodine-133, Tritium, and Radioactive Material In Particulate Form (continued)

with subsequent consumption by man, (3) deposition onto grassy areas where milk-producing animals and meat-producing animals graze (human consumption of the milk and meat is assumed), and (4) deposition on the ground with subsequent exposure to man. This applies to the release of radioactive materials in gaseous effluents from each unit at the site. For units with shared radwaste treatment systems, the gaseous effluents from the shared system are proportioned among the units sharing that system.

B 3.2 RADIOACTIVE GASEOUS EFFLUENTS

B 3.2.4 Gaseous Radwaste Treatment System

BASES

The FUNCTIONALITY of the GASEOUS RADWASTE TREATMENT SYSTEM ensures that the system will be available for use whenever gaseous effluents require treatment before release to the environment. The requirement that the appropriate portions of this system be used, when specified, provides reasonable assurance that the releases of radioactive materials in gaseous effluents will be kept as low as is reasonably achievable. This implements the requirements of 10 CFR 50.36a, GDC 60 of Appendix A to 10 CFR 50, and the design objectives given in Section II.D of Appendix I to 10 CFR 50. Limits governing the use of appropriate portions of the system were specified as a suitable fraction of the dose design objectives set forth in Sections II.B and II.C of Appendix I to 10 CFR 50, for gaseous effluents. This applies to the release of radioactive materials in gaseous effluents from each unit at the site. For units with shared radwaste treatment systems, the gaseous effluents from the shared system are proportional among the units sharing that system.

B 3.2 RADIOACTIVE GASEOUS EFFLUENTS

B 3.2.5 Ventilation Exhaust Treatment System

BASES

The FUNCTIONALITY of the VENTILATION EXHAUST TREATMENT SYSTEM ensures that the system will be available for use whenever gaseous effluents require treatment before release to the environment. The requirement that the appropriate portions of this system be used, when specified, provides reasonable assurance that the releases of radioactive materials in gaseous effluents will be kept as low as is reasonably achievable. This implements the requirements of 10 CFR 50.36a, GDC 60 of Appendix A to 10 CFR 50, and the design objectives given in Section II.D of Appendix I to 10 CFR 50. Limits governing the use of appropriate portions of the system were specified as a suitable fraction of the dose design objectives set forth in Sections II.B and II.C of Appendix I to 10 CFR 50, for gaseous effluents. This applies to the release of radioactive materials in gaseous effluents from each unit at the site. For units with shared radwaste treatment systems, the gaseous effluents from the shared system are proportional among the units sharing that system.

The appropriate components, which affect iodine or particulate release, to be FUNCTIONAL are:

1) HEPA Filter – Radwaste Decon Area
2) HEPA Filter – Radwaste Equipment Area
3) HEPA Filter – Radwaste General Area

Whenever one of these filters is not FUNCTIONAL, iodine and particulate dose projections will be made for 31-day intervals starting with filter nonfunctionality, and continuing as long as the filter remains nonfunctional, in accordance with DSR 3.2.5.1.

B 3.2 RADIOACTIVE GASEOUS EFFLUENTS

B 3.2.6 Venting or Purging

BASES

This provides reasonable assurance that releases from drywell and/or suppression chamber purging operations will not exceed the annual dose limits of 10 CFR 20 for unrestricted areas.

B 3.3 INSTRUMENTATION

B 3.3.1 Radioactive Liquid Effluent Monitoring Instrumentation

BASES

The radioactive liquid effluent instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in liquid effluents during actual or potential releases of liquid effluents. The alarm/trip setpoints for these instruments shall be calculated and adjusted in accordance with the methodology and parameters in Part II to ensure that the alarm/trip will occur before exceeding ten times the limits of 10 CFR 20. The FUNCTIONALITY and use of this instrumentation is consistent with the requirements of GDC 60, 63, and 64 of Appendix A to 10 CFR 50. The purpose of tank level indicating devices is to assure the detection and control of leaks that if not controlled could potentially result in the transport of radioactive materials to UNRESTRICTED AREAS.

Tanks included are those outdoor tanks that are not surrounded by liners, dikes, or walls capable of holding the tank contents and do not have tank overflows and surrounding area drains connected to the liquid radwaste treatment system, such as temporary tanks.

B 3.3 INSTRUMENTATION

B 3.3.2 Radioactive Gaseous Effluent Monitoring Instrumentation

BASES

The radioactive gaseous effluent instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in gaseous effluents during actual or potential releases of gaseous effluents. The alarm/trip setpoints for these instruments shall be calculated and adjusted in accordance with the methodology and parameters in Part II to ensure that the alarm/trip will occur before exceeding the limits of 10 CFR 20. Although the Offgas System Noble Gas Activity Monitor is listed in Table D 3.3.2-1, "Radioactive Gaseous Effluent Monitoring Instrumentation", these monitors are actually located upstream of the Main Stack noble gas activity monitor and are not effluent monitors. They were included in Table D 3.3.2-1 in accordance with NUREG-0473. As such, Offgas System Noble Gas Activity Monitor alarm and trip setpoints are not based on 10CFR20. The offgas system noble gas monitor alert setpoint is set at 1.5 times nominal full power background to assure compliance with ITS SR 3.7.4.1 which requires offgas sampling be performed within four hours of a 50% increase in offgas monitoring readings, and to support MSLRM trip removal. The offgas system noble gas monitor trip setpoint is based on the 10CFR100 limits for the limiting design basis gaseous waste system accident which is the offgas system rupture. The range of the noble gas channels of the main stack and radwaste/reactor building vent effluent monitors is sufficiently large to envelope both normal and accident levels of noble gas activity. The capabilities of these instruments are consistent with the recommendations of Regulatory Guide 1.97, "Instrumentation for Light Water Cooled Nuclear Power Plants to Assess Plant Conditions During and Following an Accident," December 1980 and NUREG-0737, "Clarification of the TMI Action Plan Requirements," November 1980. This instrumentation also includes provisions for monitoring and controlling the concentrations of potentially explosive gas mixtures in the offgas system. The FUNCTIONALITY and use of this instrumentation is consistent with the requirements of GDC 60, 63, and 64 of Appendix A to 10 CFR 50.

B 3.4 RADIOACTIVE EFFLUENTS TOTAL DOSE

BASES

This is provided to meet the dose limitations of 40 CFR 190 that have been incorporated into 10 CFR 20 by 46 FR 18525. This requires the preparation and submittal of a Special Report whenever the calculated doses from releases of radioactivity and from radiation from uranium fuel cycle sources exceed 25 mrem to the whole body or any organ, except the thyroid (which shall be limited to less than or equal to 75 mrem). If the dose to any MEMBER OF THE PUBLIC is estimated to exceed the requirements of 40 CFR 190, the Special Report with a request for a variance (provided the release conditions resulting in violation of 40 CFR 190 have not already been corrected), in accordance with the provisions of 40 CFR 190.11 and 10 CFR 20.405c, is considered to be a timely request and fulfills the requirements of 40 CFR 190 until NRC staff action is completed. The variance only relates to the limits of 40 CFR 190, and does not apply in any way to the other requirements for dose limitation of 10 CFR 20, as addressed in 3.1.1 and 3.2.1. An individual is not considered a MEMBER OF THE PUBLIC during any period in which the individual is engaged in carrying out any operation that is part of the nuclear fuel cycle.

B 3.5 RADIOLOGICAL ENVIRONMENTAL MONITORING

B 3.5.1 Monitoring Program

BASES

The Radiological Environmental Monitoring Program provides representative measurements of radiation and of radioactive materials in those exposure pathways and for those radionuclides that lead to the highest potential radiation exposure of MEMBERS OF THE PUBLIC resulting from the plant operation. This monitoring program implements Section IV.B.2 of Appendix I to 10 CFR 50 and thereby supplements the Radiological Effluent Monitoring Program by verifying that the measurable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of the effluent measurements and the modeling of the environmental exposure pathways. Guidance for this monitoring program is provided by the Radiological Assessment Branch Technical Position on Environmental Monitoring, Revision 1, November 1979. Program changes may be initiated based on operational experience.

The required detection capabilities for environmental sample analyses are tabulated in terms of the lower limits of detection (LLDs). The LLDs required by Table D 3.5.1-3 are considered optimum for routine environmental measurements in industrial laboratories. It should be recognized that the LLD is defined as a before-the-fact limit representing the capability of a measurement system and not as an after-the-fact limit for a particular measurement.

Detailed discussion of the LLD, and other detection limits, can be found in L. A. Currie, "Lower Limit of Detection: Definition and Elaboration of a Proposed Position for Radiological Effluent and Environmental Measurements," NUREG/CR-4007 (September 1984), and in the HASL Procedures Manual, HASL-300 (revised annually).

B 3.5 RADIOLOGICAL ENVIRONMENTAL MONITORING

B 3.5.2 Land Use Census

BASES

This is provided to ensure that changes in the use of areas at or beyond the SITE BOUNDARY are identified and that modifications to the Radiological Environmental Monitoring Program are made if required by the results of this census. The best information, such as from a door-to-door survey, from an aerial survey, or from consulting with local agricultural authorities, shall be used. This census satisfies the requirements of Section IV.B.3 of Appendix I to 10 CFR 50. Restricting the census to gardens of greater than 500 square feet provides assurance that significant exposure pathways via leafy vegetables will be identified and monitored since a garden of this size is the minimum required to produce the quantity (26 kg/year) of leafy vegetables assumed in RG 1.109 for consumption by a child. To determine this minimum garden size, the following assumptions were made: (1) 20% of the garden was used for growing broad leaf vegetation (i.e., similar to lettuce and cabbage) and (2) the vegetation yield was 2 kg/m^2.

A MILK SAMPLING LOCATION, as defined in Section 1.0, requires that at least 10 milking cows are present at a designated milk sample location. It has been found from past experience, and as a result of conferring with local farmers, that a minimum of 10 milking cows is necessary to guarantee an adequate supply of milk twice a month for analytical purposes. Locations with fewer than 10 milking cows are usually utilized for breeding purposes, eliminating a stable supply of milk for samples as a result of suckling calves and periods when the adult animals are dry. Elevated releases are defined in RG 1.111, Revision 1, July 1977.

B 3.5 RADIOLOGICAL ENVIRONMENTAL MONITORING

B 3.5.3 Interlaboratory Comparison Program

BASES

The requirement for participation in an approved Interlaboratory Comparison Program is provided to ensure that independent checks on the precision and accuracy of the measurements of radioactive materials in environmental sample matrices are performed as part of the quality assurance program for environmental monitoring in order to demonstrate that the results are valid for the purposes of Section IV.B.2 of Appendix I to 10 CFR 50.

PART I - RADIOLOGICAL EFFLUENT CONTROLS

SECTION 4.0 ADMINISTRATIVE CONTROLS

4.0 ADMINISTRATIVE CONTROLS

The ODCM Specifications are subject to Technical Specifications Section 5.5.4, "Radioactive Effluent Controls Program," Section 5.6.2, "Annual Radiological Environmental Operating Report," Section 5.6.3, "Radioactive Effluent Release Report," and Section 5.5.1, "Offsite Dose Calculation Manual."

D 4.1 REPORTING REQUIREMENTS

D 4.1.1 Special Reports

Special Reports shall be submitted in accordance with 10 CFR 50.4 within the time period specified for each report.

D 4.1.2 Annual Radiological Environmental Operating Reports

In addition to the requirements of Technical Specification 5.6.2 the report shall also include the following:

A summary description of the Radiological Environmental Monitoring Program; at least two legible maps, one shall cover stations near the SITE BOUNDARY and the second shall include the more distant stations, covering all sample locations keyed to a table giving distances and directions from the centerline of one reactor; the results of license participation in the Interlaboratory Comparison Program, required by Control D 3.5.3; discussion of all deviations from the Sampling Schedule of Table D 3.5.1-1; and discussion of all analysis in which the LLD required by Table D 3.5.1-3 was not achievable.

D 4.1.3 Radioactive Effluent Release Report

The Radiological Effluent Release Report described in Technical Specification section 5.6.3 shall include:

- An annual summary of hourly meteorological data collected over the previous year. This annual summary may be either in the form of an hour-by-hour listing on magnetic tape of wind speed, wind direction, atmospheric stability, and precipitation (if measured), or in the form of joint frequency distribution of wind speed, wind direction, and atmospheric stability. In lieu of submission with the Radiological Effluent Release Report, the licensee has the option of retaining this summary of required meteorological data on site in a file that shall be provided to the NRC upon request.
- An assessment of radiation doses from the radioactive liquid and gaseous effluents released from the unit during the previous year.

(Continued)

D 4.1.3 Radioactive Effluent Release Report (continued)

- As assessment of radiation doses from the radioactive liquid and gaseous effluents to MEMBERS OF THE PUBLIC from their activities inside the SITE BOUNDARY during the report period. All assumptions used in making these assessments, i.e., specific activity, exposure time, and location shall be included in these reports. The assessment of radiation doses shall be performed in accordance with the methodology and parameters in Part II.
- As assessment of doses to the likely most exposed MEMBER OF THE PUBLIC from reactor releases and other nearby uranium fuel cycle sources, including doses from primary effluent pathways and direct radiation, for the previous calendar year to show conformance with 40 CFR 190, "Environmental Radiation Protection Standards for Nuclear Power Operation." Acceptable methods for calculating the dose contribution from liquid and gaseous effluents are given in Part II.
- A list of unplanned releases from the site to UNRESTRICTED AREAS of radioactive materials in gaseous and liquid effluents made during the reporting period.
- Any changes made during the reporting period to the PROCESS CONTROL PROGRAM and to the OFFSITE DOSE CALCULATION MANUAL (ODCM).
- Any major changes to liquid, gaseous, or solid radwaste treatment systems pursuant to D 4.2.
- A listing of new locations for dose calculations and/or environmental monitoring identified by the land use census pursuant to Control D 3.5.2.
- An explanation of why the nonfunctionality of liquid or gaseous effluent monitoring instrumentation was not corrected within the time specified in Controls D 3.3.1 and D 3.3.2.
- Description of events leading to liquid holdup tanks exceeding the limits of TRM 3.7.7.

D 4.2 MAJOR CHANGES TO LIQUID, GASEOUS, AND SOLID RADWASTE TREATMENT SYSTEM

----------NOTE----------
Licensees may choose to submit this information as part of the annual FSAR update.

Licensee-initiated major changes to the radwaste treatment systems (liquid, gaseous, and solid):

a. Shall be reported to the Commission in the Radioactive Effluent Release report for the period in which the evaluation was reviewed by the PORC. The discussion of each change shall contain:

   1. A summary of the evaluation that led to the determination that the change could be made in accordance with 10 CFR 50.59.

   2. Sufficient detailed information to totally support the reason for the change without benefit of additional or supplemental information;

   3. A detailed description of the equipment, components, and processes involved and the interfaces with other plant systems;

   4. An evaluation of the change, which shows the predicted releases of radioactive materials in liquid and gaseous effluents and/or quantity of solid waste that differ from those previously predicted in the license application and amendments thereto;

   5. An evaluation of the change, which shows the expected maximum exposures to a MEMBER OF THE PUBLIC in the UNRESTRICTED AREA and to the general population that differ from those previously estimated in the license application and amendments thereto;

   6. A comparison of the predicted releases of radioactive materials, in liquid and gaseous effluents and in solid waste, to the actual releases for the period that precedes the time when the change is to be made;

   7. An estimate of the exposure to plant operating personnel as a result of the change; and

(Continued)

D 4.2 MAJOR CHANGES TO LIQUID, GASEOUS, AND SOLID RADWASTE TREATMENT SYSTEM (continued)

8. Documentation of the fact that the change was reviewed and found acceptable by the PORC.

b. Shall become effective upon review and acceptance by the PORC.

ATTACHMENT 13
RADWASTE PROCESS CONTROL PROGRAM (RPCP)

NINE MILE POINT NUCLEAR STATION UNIT 2

UNIT 2 RADWASTE PROCESS CONTROL PROGRAM

REVISION 07

TECHNICAL SPECIFICATION REQUIRED

Approved by: S. L. Belcher Plant General Manager 6/26/08 Date

CONTROLLED

THIS IS A FULL REVISION

Effective Date: 6/26/2008

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1.0 PURPOSE

1.1 To describe the methods for processing, packaging and transportation of low-level radioactive waste and provide assurance of complete stabilization of various radioactive "wet wastes" in accordance with applicable NRC regulations and guidelines.

1.2 To satisfy the Nuclear Regulatory Commission's Low-Level Waste and Uranium Recovery Projects Branch (WMLU) requirement and establish process parameters within which the vendor supplied Rapid Dewatering System must be operated to meet current disposal criteria at low-level waste disposal facilities.

NOTE: Conformance with WMLU requirements provides assurance that the requirements identified in 10CFR61, Subpart D, Technical Requirements for Land Disposal Facilities and Final Waste Classification are satisfied.

2.0 RESPONSIBILITIES

2.1 **The Plant General Manager** is responsible for:

2.1.1 Ensuring the Unit 2 Radwaste Process Control Program provides for the health and safety of the general public as it applies to Radwaste Management.

2.1.2 Reviewing and approving changes to the Unit 2 Radwaste Process Control Program.

2.2 **The Manager of Operations** is responsible for the content and maintenance of this procedure.

2.3 **The Supervisor Radioactive Materials Processing** is responsible for overall implementation of the Radwaste Process Control Program.

2.4 **Operators** are responsible to process and package wastes in accordance with applicable Waste Handling Procedures.

3.0 PROGRAM

3.1 System Description

3.1.1 General

a. The Solid Waste Management System (SWMS) is implemented by the procedures identified in the Unit 2 Radwaste Process Control Program Implementing Procedures (Attachment 1). SWMS describes the collection volume reduction, dewatering, or solidification and packaging of wet and dry types of radioactive waste in preparation for shipment off-site for further processing or disposal at a licensed processing or burial site. The processing and storage methods used for interim storage are consistent with the present waste form stability requirements.

3.1.1 (Cont)

b. Types of solid waste sources are identified in Solid Waste Sources (Attachment 2).

c. The Solid Waste Management System accommodates dry solid trash which is either compacted with a trash compactor (when physically possible) or sent offsite for separation and processing.

NOTE: When required, Unit 2 will use the services of a vendor to solidify, dewater, separate, recover, or incinerate waste.

d. Bead resins, powdered resins and charcoal are dewatered using a Dewatering System in vendor certified polyethylene containers or High Integrity Containers (HIC) if going for burial.

e. Bead resins powdered resins, and charcoal, are sent to a vendor for volume reduction using vendor approved containers.

f. Concentrated wastes are processed offsite by an Approved vendor.

3.1.2 Condensate Filtration System Phase Separator

a. The Condensate Filtration System Phase Separator tank may be decanted to the Floor Drain Collector System.

b. Contents of the tank may be recirculated, or transferred to a liner in the Radwaste Truck bay for further offsite processing.

3.1.3 Waste Sludge Tank

a. The waste sludge tank is supplied with waste from the following sources:

1. Radwaste filters

2. The Thermex System

3. Spent Resin Tank

b. The waste sludge tank has the ability for decantation. A decant pump takes a suction off the sludge tank and discharges to the spent resin tank. The tank can also be gravity decanted manually to the floor drains.

3.1.3 (Cont)

c. Contents of the waste sludge tank are transferred by one of two redundant waste sludge pumps, to the Radwaste Truck bay for dewatering by an approved vendor using dewatering System or cement solidification.

3.1.4 Ventilation System

The Radwaste Building Ventilation System (HVW) provides filtered, conditioned outside air to various areas of the Radwaste Building and exhausts the air to the atmosphere through the Reactor Building Ventilation. The HVW system maintains the building at a pressure below atmospheric to help prevent any unmonitored air leakage to the environment.

3.1.5 Liners

a. Dewatering System is compatible with vendor supplied dewatering waste containers.

b. These containers and their dewatering internals are designed to ensure uniform dewatering of waste slurries. They are fabricated and inspected in accordance with a vendor approved Quality Assurance Program and are compatible with the waste they are designed to contain.

c. Selection of liner type will be determined by waste classification requirements.

3.1.6 Crane

a. Liner movements normally are completed using a radio controlled remote operated crane. Linear movements may be completed using the pendent controller.

b. When liners stored in the Radwaste Building storage area are to be shipped, they are loaded using the crane for transportation to a processing or burial facility.

3.2 Radioactive Waste Dewatering System

3.2.1 Dewatering System

a. The dewatering system is a self-contained, free-standing portable system for dewatering radioactive spent resins and filter sludge's in a variety of liners to meet current disposal criteria at low-level waste disposal facilities. The system is comprised of:

3.2.1.a (Cont)

1. A plant connection skid

2. A container fillhead, complete with interconnecting hoses and cables

3. A dewatering skid

4. A control panel

5. A waste container.

b. The radioactive waste slurry is transferred by waste transfer pumps to the Dewatering System.

c. The water removed from the radioactive waste is pumped from the waste liner by a dewatering pump through a media-specific filtering device and returned to a plant floor drain.

d. Fill operation is controlled remotely and viewed with a video monitor on the control panel. A remote level-control system detects and monitors waste level in the liner and provides overfill protection. An independent level control system in the fillhead provides redundant overfill protection.

e. Upon completion of dewatering, warm air between 180-195 deg. F is recirculated through the liner and moisture separator until water content of the waste is within the low-level burial site Acceptance Criteria.

NOTE: The limiting factor on air temperature recirculated through the liner is based on maximum allowable temperature of a HIC. The maximum measured acceptable temperature is 200 deg. F.

f. The type of media which can be dewatered by the Dewatering System is divided into two categories:

1. Granular media which includes bead resin, charcoal, and zeolites

2. Filter precoat media which includes ecodex, powdex, ecosorb, ecocoat, and diatomateous earth.

g. All discharge air is passed through HEPA filtration units contained within the Dewatering Skid before passing to permanent plant ventilation.

3.2.2 Acceptance Criteria

Acceptance Criteria for process completion is established by a minimum dewatering time and a maximum water collection rate. The resultant waste form meets the requirements of 10 CFR 61 "Licensing Requirements for Land Disposal of Radioactive Waste" and NRC Branch Technical Position on Waste Form (May, 1983 Rev 0).

a. Bead Resin Type Liners

1. The dewatering pump has run for one hour or until unable to maintain 16" vacuum, after the final waste transfer.

2. The Dewatering System has been run for a minimum of four hours.

3. The moisture separator sight glass level does not increase more than 1/2 inch during a thirty minute period.

b. Precoat Media Type Liners

1. The dewatering pump has run, for one hour or until unable to maintain 22" vacuum after final waste transfer.

2. The Dewatering System has been run for a minimum of eleven hours.

3. The moisture separator sight glass level does not increase more than 1 inch during a thirty minute period.

3.2.3 Plant Connection Skid

The plant connection skid consists of the following:

a. A remotely operated waste inlet control valve to regulate influent to the liner. This valve is interlocked to close on High Level, High High Level (mechanical float inside fillhead), and decreasing air pressure or loss of electrical power.

b. A diaphragm pump with connections to the fillhead for gross initial dewatering.

c. Manifold for air and water supplies to control valves and to flush components.

3.2.4 Fillhead

a. Camera and light provides remote visual observation of the container level during the resin transfer and dewatering.

b. Connections on the underside of the fillhead connect to break away fittings to facilitate remote removal from the container for ALARA.

c. The external connections on the fillhead are camlock, with the exception of the waste inlet.

d. A float switch inside the fillhead provides redundant liner level detection.The float switch provides automatic closure of the waste isolation valve on high high level.

3.2.5 Dewatering Skid

The Dewatering Skid consists of a vacuum pump, moisture separator, air conditioning unit, and piping interface to the plant connection stand. Pressures and temperatures are monitored at various points on this component to safeguard mechanical operations. A HEPA filter is installed downstream of the safety relief and manual bypass valves.

3.2.6 Control Panel

A control panel containing electrical and pneumatic controls to allow remote operation of all components and monitoring of individual parameters. A video monitor of the liner is provided as well as temperature and pressure indications of primary components. Audible and visual alarms to indicate off-normal conditions are also found on the control panel.

3.2.7 Waste Containers

a. Waste Containers used for dewatering satisfy stability requirements.

1. Polyethylene container may be used as the disposal package for NRC Class "A" waste.

2. Polyethylene container may also be used for NRC Class "B" and "C" waste, but enhanced structural stability is required for burial at the Barnwell site.

NOTE: The enhanced structural stability required for 10CFR61.56 and the State of South Carolinas accomplished by the use of DHEC approved concrete overpack structures at the Barnwell burial site.

b. Each Waste Container is accompanied by a certificate of compliance.

3.2.7 (Cont)

c. Dewatering procedures will be based on an NRC approved vendor process control program or Topical Report and are part of Dewatering System Procedures.

d. No polyethylene container is stored in direct sunlight for a period greater than one year.

e. Waste containers used to transport concentrated waste are Compatible with the type of waste they are designed to contain.

f. Containers are protected from overfill by a level detection system. FAVA is the manufacturer's designation for a level detection system which is installed in the liner with a remote readout display on the control panel. Four probes inserted at different levels in the liner work on the conduction principle to determine the level of waste in the container.

3.2.8 Operators

Operators shall ensure proper equipment is available before beginning radwaste processing. Operators may process wastes when the following equipment is operable:

a. Closed circuit television system stations

b. Radwaste Building Ventilation

c. Radwaste Building Floor Drain System

d. Radwaste Building CNS System

e. Service Air System

3.2.9 Vendor Operators

All operations of the Dewatering System shall be performed by technicians/operators that have successfully completed the Vendor training program. The technician/operator shall have practical experience and certification on the Dewatering System. The technician/operator is subjected to recertification every two years.

3.2.10 Quality Assurance

Vendor approved Quality Assurance Program, and Vendor QA Procedures, shall be employed to control the design, fabrication, inspection, testing, operation, and record keeping for the Dewatering System.

3.2.11 Records

The Vendor maintains records of the design, fabrication and testing of each Dewatering System. The setup and operation of the system is maintained in accordance with vendor supplied procedures.

3.3 Disposition of other Radioactive Material

3.3.1 Contaminated Fluids

a. Contaminated fluids are stored in containers at designated areas within the plant.

b. A vendor with an approved process control program acceptable at the selected processing or burial site is used to dispose of contaminated fluids.

c. A vendor may also be used to incinerate oils.

3.3.2 Temporary Radwaste Processing

a. Vendors are NRC approved and have demonstrated a commitment to 10CFR61, Subpart D, Technical Requirements for Land Disposal Facilities and Final Waste Classification and Waste Form Technical Position Papers stability requirements.

b. Vendors have completed Class B and C waste testing or have provided a schedule of completion.

c. Vendors have approved procedures to process Class A waste (Dewatering, Evaporation, and Solidification).

d. Vendor procedures are Reviewed and approved in accordance with NIP-PRO-03, Preparation and Review of Technical Procedures.

3.3.3 Dry Active Waste (DAW)

a. The proper and safe steps are performed to collect and prepare low specific activity (LSA) DAW in accordance with N2-WHP-12, Solid Dry Waste Collection and Compaction and N2-WHP-4, Waste Transfer Procedure.

b. DAW is examined for liquids or items that would compromise the integrity of the package or violate the burial site license and/or criteria before compacting. These liquids or items are removed or separated.

3.3.3 (Cont)

c. DAW is shipped in containers meeting the transport requirements of 49CFR173.427, Transport Requirements for Low Specific Activity (LSA) Radioactive Materials, and any additional vendor requirements, if specified.

d. Waste precluded from disposal in LSA boxes or drums due to radiation limits is disposed of in liners in accordance with WHPs, Waste Handling Procedures.

3.4 Sampling

a. The Condensate Prefilter/ Phase Separator Tank (TK10), the Waste Sludge Tank (TK8), and the Spent Resin Tank (TK7) are isolated from further input when preparing to process waste and a batch number is assigned.

b. The Condensate Prefilter/Phase Separator Tank (TK10) and the Spent Resin Tank (TK7) are recirculated to ensure a homogeneous mixture.

c. The Waste Sludge Tank (TK8) is agitated to ensure a homogeneous mixture.

d. A sample is obtained from the tank(s) to be processed in accordance with N2-WHP-4, Waste Transfer Procedure.

e. The sample from the tank(s) to be processed is analyzed by Chemistry and the sample data sheet form in N2-CSP-WSS-@406, Dewatered Waste Surveillance at Unit 2, is completed.

3.5 Waste Classification

a. The Unit 2 Radwaste Process Control Program, procedure assures that wastes determined acceptable for near surface disposal are properly classified.

b. Waste classification is performed consistent with the guidance provided in the Branch Technical Position pertaining to Waste Classification and is based upon the concentration of certain radionuclide's in the waste form as given in 10CFR61.55, Waste Classification, and 10CFR61.56, Waste Characteristics.

NOTE: The methods used and the frequency for determining the radionuclide concentration of the final waste form are conducted in accordance with N2-CSP-WSS-@406, Dewatered Waste Surveillance at Unit 2.

c. Classification of waste is performed in accordance with S-WHP-03, Classification and Shipment of Radioactive Material, using the RADMAN computer code or S-WHP-04, Classification and Shipment of Radioactive Material, using the RAMSHP computer program.

3.6 Administrative Controls

NOTE: The Director of Quality and Performance Assessment has the authority to stop work when significant conditions adverse to quality exist and require corrective action.

3.6.1 Quality Assurance (QA) procedures and the Nuclear QA Program require:

a. Ongoing review, monitoring, and audit functions.

b. Performance of audits of the Process Control Program and implementing procedures for processing and packaging of radioactive waste at least once every 24 months.

c. Compliance with the waste classification and characterization requirements of 10CFR61.55, Waste Classification and 10CFR61.56, Waste Characteristics.

d. Quality Assurance Inspectors performing radwaste inspections have documented training in Department of Transportation and NRC radwaste regulatory requirements.

e. Quality Assurance review of vendor programs to ensure compliance with 10CFR71, Packaging and Transportation of Radioactive Materials, Quality Assurance requirements.

3.6.2 Training Procedures and Training Programs require:

a. Operator qualification by completion of the Operations Unit 2 Plant Training Program including:

1. On-the-job training in conjunction with classroom instruction to ensure each operator demonstrates an acceptable level of skill and familiarity associated with radwaste controls and operational procedures.

2. Continuing Training in accordance with approved training procedures.

b. Training records to:

1. Be maintained for audit and inspection purposes.

2. Be considered permanent records.

3.6.2.b (Cont)

3. Meet the applicable requirements of the Quality Assurance Topical Report Section B.15 Records, CNG-TR-1.01-1000 Conduct of Training and CNG-PR-3.01-1000 Records Management.

3.6.3 Documentation Control and Record Retention

a. Station management shall evaluate QA program audits of waste classification records to satisfy the requirements of 10CFR20.2006.d, Transfer for Disposal and Manifests.

b. Personnel shall process changes to operating procedures in accordance with NIP-PRO series.

c. Site Records Management shall maintain waste management records in accordance with the appropriate administrative procedures.

3.6.4 Licensee-initiated changes to the Unit 2 Radwaste Process Control Program:

a. Are submitted to the Commission in the Radioactive Effluent Release Report for the period in which the change(s) was made, and contain the information required by USAR Section 11.4.7, Process Control Program.

b. Become effective upon review and acceptance by the Plant Operations Review Committee.

3.6.5 The Supervisor Radioactive Materials Processing shall ensure:

a. Shipping manifests are completed and tracked to satisfy the requirements of 10CFR20, Transfer for Disposal and Manifests, in accordance with Waste Handling Procedures.

b. Temporary storage of solid radioactive material awaiting shipment in an area other than a designated area is done in accordance with GAP-INV-02, Control of Material Storage Areas.

3.6.6 Solid Radioactive Wastes Specification

a. Technical Requirements Manual (TRM) Specification 3.11.1 contains the requirement to solidify or dewater wastes to meet shipping, transportation and disposal site requirements. Required actions and completion times associated with failure to meet the requirements are also contained in TRM 3.11.1.

b. TRM 3.11.1 is a part of the Process Control Program and is therefore subject to the same controls and change processes as the PCP.

4.0 DEFINITIONS

4.1 Class "A" Waste

Waste usually segregated from other waste classes at the disposal site. The physical form and characteristics shall meet the minimum requirements of 10CFR61.56, Waste Characteristics.

4.2 Class "B" Waste

Waste meeting more rigorous waste form requirements to ensure stability after disposal. Class B waste form shall meet both the minimum and stability requirements of 10CFR61.56, Waste Characteristics.

4.3 Class "C" Waste

Waste meeting Class B standards and requiring additional measures at the disposal facility to prevent inadvertent intrusion.

4.4 Homogeneous

Of the same kind or nature; essentially alike. Most waste streams are considered homogeneous for purposes of waste classification.

4.5 Batch

An isolated quantity of feed waste to be processed having essentially constant physical and chemical characteristics.

4.6 Dewatered Waste

Refers to waste that has been processed by means other than solidification, encapsulation, or absorption to meet the free standing liquid requirements of 10 CFR 61.56 (a)(3) and (b)(2).

4.7 Concentrated Waste

Liquid waste that has a high level of dissolved and/or particulate solid content.

4.8 Dried Waste

Solid waste that has been processed by evaporation to dryness.

5.0 REFERENCES

5.1 Licensee Documentation

5.1.1 Quality Assurance Topical Report, Section B.15 Records

5.1.2 Unit 2 Technical Specifications Section 5.6.3, Radioactive Effluent Release Report

5.1.3 Nuclear Quality Assurance Program

5.1.4 Unit 2 Updated Safety Analysis Report Section 11.4.7, Process Control Program

5.1.5 Unit 2 Technical Requirements Manual Specification 3.11.1, Solid Radioactive Wastes

5.2 Standards, Regulations, and Codes

5.2.1 ANSI/ANS 55.1, 1979, American National Standard for Solid Radioactive Waste Processing System for Light Water Cooled Reactor Plants

5.2.2 10CFR20.2006.d, Transfer for Disposal and Manifest

5.2.3 10CFR20 App G, Requirements for Transfers of Low Level Radioactive Waste intended for Disposal at Licensed Land Disposal Facilities and Manifests

5.2.4 10CFR61, Subpart D, Technical Requirements for Land Disposal Facilities and Final Waste Classification and Waste Form Technical Position Papers

5.2.5 10CFR61.55, Waste Classification

5.2.6 10CFR61.56, Waste Characteristics

5.2.7 10CFR71, Packaging and Transportation of Radioactive Material

5.2.8 49CFR173.1.b, Transportation

5.2.9 49CFR173.427, Transport Requirements for Low Specific Activity (LSA) Radioactive Materials

5.2.10 NUREG-0123, Standard Radiological Effluent Technical Specifications for Boiling Water Reactors

5.2.11 NUREG-0800,

a. Section 11.2, Standard Review Plan for Liquid Waste Management Systems

b. Section 11.4, Standard Review Plan for Solid Waste Management Systems

5.2.12 Resource Conservation and Recovery Act (RCRA) of 1976 (Ref: Corporate Guide to Hazardous Waste Disposal and Spill Reporting)

5.2.13 Regulatory Guide 1.143, Rev. 0, Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light Water Cooled Nuclear Power Plants

5.3 Supplemental References

5.3.1 South Carolina Department of Health and Environmental Control, Radioactive Material License 097, as amended

5.3.2 State of Washington Radioactive Material License No. WN-I019-2, as amended

5.3.3 NRC Special Nuclear Material License No. 12-13536-02, as amended, for Barnwell, SC

5.3.4 NRC Special Nuclear Material License No. 16-19204-01, as amended, for Richland, WA

5.3.5 Nuclear Regulatory Commission Branch Technical Position on Waste Classification and Waste Form, May 1983

5.3.6 CNSI Proprietary Topical Report
No. RDS-25506-01-NP-A, Rev. 1- March 1988.
Appendix A, B, C, D and Material Safety Data Sheets

5.3.7 SE 92-049, Interim On-Site Storage of Low Level Radioactive Waste (LLRW) in the Radwaste Solidification and Storage Building (RSSB) at Unit 1.

5.3.8 SE 92-061, Upgrade Radwaste 245′ Elevation Storage, at Unit 2.

5.3.9 N2-WHP-25, Thermex Operating Procedure

5.3.10 Safety Evaluation 94-074, Installation of the Thermex System

5.3.11 DCP N2-05-064, Condensate Filtration Radwaste Processing

ATTACHMENT 1: UNIT 2 RADWASTE PROCESS CONTROL PROGRAM REFERENCE AND IMPLEMENTING PROCEDURES

Waste Handling Procedures (WHPs)

Radiation Protection Procedures (S-RPIPs)

Chemistry Procedures (CSPs)

Quality Assurance Procedures (CNG-QL Series)

Operating Procedures (OPs)

Generation Administrative Procedures (GAP/APs)

Nuclear Division Interfacing Procedures (NIPs)

1.0 RADWASTE FILTERS

1.1 Mechanical radwaste filters filter particulates (backwash material) from the waste collector subsystem.

1.2 When a filter reaches a pre-determined differential pressure, the filter media is backwashed into the backwash tank, which is then pumped to the spent resin tank, Regen Waste Tanks, or to a liner in the Radwaste Truckbay.

2.0 RADWASTE DEMINERALIZERS

2.1 The radwaste demineralizers are loaded with an ionic exchange media for processing water from the waste collector tanks.

2.2 When determined the resin can no longer be used, the depleted resin is pumped to the spent resin tank.

3.0 CONDENSATE FILTRATION SYSTEM

3.1 The Condensate filtration system removes iron particulates to extend Condensate demineralizer bed life.

3.2 The filters are periodically backwashed and the iron laden waste is sent to a backwash receiving tank. The waste is then pumped to a phase separator tank where a flocculent is added turning the iron into sludge. This sludge is then pumped to a liner for offsite processing.

3.3 The Condensate Prefilter Elements are treated as solid Radwaste at the end of their useful life. Filter Elements are shipped offsite for vendor processing.

4.0 CONDENSATE DEMINERALIZER

4.1 The condensate demineralizers remove soluble and insoluble impurities from the condensate water to maintain reactor feedwater purity.

4.2 After it is determined these resins can no longer be used, the depleted resins are pumped to the Radwaste Demineralizer or Spent Resin Tank.

5.0 THERMEX SYSTEM

5.1 Concentrated waste will be pumped to a Regen Waste Tank for further concentration by an evaporator, stored in a temporary liner for offsite processing, or pumped to the Spent Resin Tank.

5.2 Exhausted resin and charcoal are sluiced to the Waste Sludge Tank. This waste may be transferred to the Spent Resin Tank, mixed to a homogenous mixture, and then transferred to a liner in the truckbay for dewatering, or transferred to a liner in the Radwaste Truckbay.

5.3 Exhausted reverse osmosis membranes and filters will be processed as DAW.

6.0 SPENT FUEL POOL PHASE SEPARATOR

This tank receives the exhausted powdered filter media (resins) from the Spent Fuel Pool Cleanup System which is subsequently pumped directly to a liner in the Radwaste Truckbay for processing.

7.0 RWCU PHASE SEPARATOR

These separator tanks receive exhausted powdered filter media (resins) from the water cleanup system which is subsequently pumped directly to a liner in the Radwaste Truckbay for processing.

8.0 CONTAMINATED FLUIDS

Fluids from sources within Unit 2 that become contaminated is either stored in containers (to be solidified by a vendor with an approved procedure) or shipped off-site for incineration.

9.0 COMPACTIBLE SOLIDS

Compactable low level trash is either processed and compacted in a hydraulically operated box compactor, or shipped off-site for vendor separation and processing.

10.0 FILTERS AND MISCELLANEOUS ITEMS

Solid items with high dose rates are handled on a case-by-case basis, being disposed of by methods acceptable to the burial site or shipped off-site for vendor recovery or disposal.

11.0 SPENT RESIN TANK

11.1 Exhausted resin from the condensate demineralizer and the Radwaste demineralizer are sluiced to the Spent Resin Tank. Exhausted resin from the RWCU phase separator(s), the Spent Fuel Pool phase separator and the Radwaste Filter Backwash Tanks may be sluiced to the Spent Resin Tank.

11.2 Bleed water from the Thermex System may be pumped to the Spent Resin Tank.

11.3 The waste from the Spent Resin Tank is pumped to the Waste Sludge Tank for processing by the Dewatering System in the Radwaste Truckbay.

ATTACHMENT 14

Unit 1		Unit 2	X	Reporting Period	January - December 2008

ATTACHMENT 14

Includes Attachment 2 and Attachment 3, Revision 1
updates to the Nine Mile Point Nuclear Station Unit 2
2007 Radioactive Effluent Release Report
that correct a units error.

ATTACHMENT 14

Unit 1 _____ Unit 2 X Reporting Period January - December 2007

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	2.26E+00	4.38E+00	2.00E+02	2.06E+02	5.00E+01
2. Average Release Rate	µCi/sec	2.90E-01	5.58E-01	2.52E+01	2.58E+01	
B. Iodines						
1. Total Iodine - 131	Ci	4.68E-06	3.83E-06	5.76E-04	1.10E-03	3.00E+01
2. Average Release Rate for Period	µCi/sec	5.96E-07	4.87E-07	6.79E-05	1.51E-04	
C. Particulates						
1. Particulates with half-lives>8	Ci	~~5.27E+00~~ 2.42E-04	4.33E-04	2.33E-04	1.30E-03	3.00E+01
2. Average Release Rate for Period	µCi/sec	~~6.71E-01~~ 3.08E-05	5.51E-05	2.75E-05	1.79E-04	
3. Gross alpha radioactivity	Ci	3.98E-08	**	**	**	2.50E+01
D. Tritium						
1. Total release	Ci	3.32E+01	2.62E+01	4.01E+01	3.89E+01	5.00E+01
2. Average Release Rate for Period	µCi/sec	4.23E+00	3.33E+00	4.73E+00	5.36E+00	
E. Percent of Tech. Spec. Limits						
Fission and Activation Gases						
Percent of Quarterly Gamma Air Dose Limit (5 mR)	%	6.50E-03	1.18E-02	3.92E-01	4.26E-01	
Percent of Quarterly Beta Air Dose Limit (10 mrad)	%	9.65E-05	1.62E-04	7.40E-03	1.13E-02	
Percent of Annual Gamma Air Dose Limit to Date (10 mR)	%	3.25E-03	9.13E-03	2.07E-01	4.21E-01	
Percent of Annual Beta Air Dose Limit to Date (20 mrad)	%	4.83E-05	1.30E-04	3.83E-03	9.50E-03	
Percent of Whole Body Dose Rate Limit (500 mrem/yr)	%	2.55E-04	4.57E-04	1.51E-02	1.64E-02	
Percent of Skin Dose Rate Limit (3000 mrem/yr)	%	4.97E-05	8.92E-05	2.96E-03	3.22E-03	
Tritium, Iodines, and Particulates (with						
Percent of Quarterly Dose Limit (7.5 mrem)	%	7.95E-03	6.95E-03	1.03E-02	1.33E-02	
Percent of Annual Dose Limit to Date (15 mrem)	%	4.01E-03	7.51E-03	1.27E-02	1.94E-02	
Percent of Organ Dose Limit (1500 mrem/yr)	%	1.82E-04	1.56E-04	2.83E-03	6.38E-03	

ATTACHMENT 14

Unit 1 _____ Unit 2 X Reporting Period January - December 2007

GASEOUS EFFLUENTS - ELEVATED RELEASE

Continuous Mode (2)

Nuclides Released		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Fission Gases (1)					
Argon-41	Ci	2.48E-01	5.16E-01	1.49E-01	1.70E-01
Krypton-85	Ci	9.44E-03	**	1.17E-02	**
Krypton-85m	Ci	6.56E-01	1.78E+00	3.70E+01	5.29E+01
Krypton-87	Ci	6.98E-03	**	1.41E+01	1.14E+01
Krypton-88	Ci	1.13E+00	2.09E+00	7.71E+01	7.86E+01
Xenon-127	Ci	**	**	**	**
Xenon-131m	Ci	**	**	**	**
Xenon-133	Ci	**	**	7.12E+01	4.22E+01
Xenon-133m	Ci	**	**	**	**
Xenon-135	Ci	2.41E-02	**	1.03E-01	5.33E+00
Xenon-135m	Ci	4.23E-02	**	**	3.07E+00
Xenon-137	Ci	6.18E-02	**	**	3.99E+00
Xenon-138	Ci	8.46E-02	**	**	4.43E+00
Iodines (1)					
Iodine-131	Ci	1.98E-06	2.88E-06	3.56E-04	7.65E-04
Iodine-133	Ci	**	**	1.40E-03	6.59E-03
Iodine-135	Ci	**	**	**	**
Particulates (1)					
Chromium-51	Ci	**	**	**	**
Manganese-54	Ci	**	**	**	**
Iron-55	Ci	**	**	1.32E-05	3.18E-04
Iron-59	Ci	**	**	**	**
Cobalt-58	Ci	**	**	**	**
Cobalt-60	Ci	~~5.27E+00~~ 5.27E-06	**	7.77E-06	**
Neodymium-147	Ci	**	**	**	**
Zirconium-95	Ci	**	**	**	**
Zinc-65	Ci	**	**	**	**
Strontium-89	Ci	**	**	3.59E-05	1.10E-04
Stronium-90	Ci	**	**	**	**
Niobium-95	Ci	**	**	**	**
Molybdenum-99	Ci	**	**	**	**
Cesium-134	Ci	**	**	**	**
Cesium-136	Ci	**	**	**	**
Cesium-137	Ci	**	**	**	**
Barium-140	Ci	**	**	**	**
Lanthanum-140	Ci	**	**	**	**
Cerium-141	Ci	**	**	**	**
Cerium-144	Ci	**	**	**	**
Tritium (1)	Ci	2.09E+01	1.69E+01	2.35E+01	1.63E+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 and gross alpha, 1.00E-12 µCi/ml for required Iodines, 1.00E-11 µCi/ml for Sr-89/90 and 1.00E-06 µCi/ml for Tritium, as required by the ODCM, has been verified.

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