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U.S. Nuclear Regulatory Commission
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Docket Nos.	50-245
	50-336
	50-423
License Nos.	DPR-21
	DPR-65
	NPF-49

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNITS 1, 2, AND 3
ERRATA TO THE 2012 RADIOACTIVE
EFFLUENT RELEASE REPORT

In accordance with 10 CFR 50.36a, this letter transmits the errata to the annual Radioactive Effluent Release Report (RERR) for the period January 2012 through December 2012. The report met the provisions of Section 5.7.3 of the Millstone Power Station Unit 1 Permanently Defueled Technical Specifications (PDTS), and Sections 6.9.1.6b and 6.9.1.4 of the Millstone Power Station Units 2 and 3 Technical Specifications, respectively. The RERR contains information regarding airborne, liquid, and solid radioactivity released from Millstone Power Station, including the off-site dose from airborne and liquid effluents.

Attachment 1 transmits the errata and corrigenda to the 2012 RERR. It contains six replacement pages to the 2012 RERR. These pages should be replaced with the same numbered page in the current copy of the report.

If you have any questions or require additional information, please contact Mr. William D. Bartron at (860) 444 4301.

Sincerely,

L. J. Armstromg
Director, Nuclear Station Safety and Licensing

Attachment:

1 Errata to the 2012 Radioactive Effluents Release Report

IE48
FSME20

Commitments made in this letter:

1. None.

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ATTACHMENT 1

ERRATA TO THE 2012 RADIOACTIVE EFFLUENTS RELEASE REPORT

MILLSTONE POWER STATION UNITS 1, 2, AND 3
DOMINION NUCLEAR CONNECTICUT, INC. (DNC)

Errata to 2012 Millstone Radioactive Effluents Release Report

A) Instructions:

Replace each of the following pages with the same numbered page in the current copy of the report. Pages to be replaced include Pages 7, 10, 17, 20, 24 and 26.

B) Explanation of revisions

Section 1.2.3 and Tables 1-3, 2.2-A1, 2.2-A4, 2.3-A1 and 2.3-A3 of the 2012 Radioactive Effluents Release Report are resubmitted. A new first paragraph is added to Section 1.2.3 to discuss the C-14 dose and to explain why airborne doses in 2012 were lower than prior years. Revisions to the tables were made to correct the following errors:

1) In Table 1-3, the Total Off-Site Dose from Millstone Station was revised for Direct Shine and totals with and without C-14. This was a transcription error on the entry for Direct Shine dose.
2) In Tables 2.2-A1 and 2.2-A4, the total activity of Fission & Activation Gases were revised for all four quarters because the activity for Ar-41 was not included in each quarter. The annual total activity for Fission & Activation Gases was correct and did not need revision.
3) In Table 2.2-A1, the total activity of Iodines/Halogens were revised for the third and fourth quarters because the activity for Br-82 was not included for those quarters.
4) In Table 2.3-A1, the total activity of Tritium was revised for the third and fourth quarter because of a transcription error.
5) In Tables 2.3-A1 and 2.3-A3, the particulates in 3rd quarter were revised because activity for Sc-46 was not included.

Beginning with this report (2012), doses are reported with and without dose from C-14.

To determine compliance with 10 CFR 50, Appendix I (Reference 7), the maximum individual whole body and organ doses include all applicable external pathways (i.e., plume and ground exposure) as well as the internal pathways (inhalation and ingestion).

1.2.2 Liquid Effluents

OpenEMS performs calculations for the following pathways: fish, shellfish, shoreline activity, swimming, and boating. Doses are calculated for the whole body, skin, thyroid, and maximum organ (GI, bone, liver, kidney, and lung).

1.2.3 Analysis of Results

There are two general changes in doses from airborne effluents shown in Table 1-1 compared to doses given in prior years. This year, for the first time, the increment in dose due to C-14 is shown. This was done because of the significance of the dose from C-14. The second change is a significant reduction in airborne dose compared to previous years. This reduction is due to using more accurate meteorological parameters for elevated releases from the Millstone Stack. In prior years, doses due to releases from the Millstone Stack were calculated using rooftop meteorology which gave conservatively higher doses.

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Table 1-3 provides a quantitative dose comparison with the limits specified in the REMODCM. The data indicates that the total whole body and organ doses to the maximum offsite individual from Millstone Power Station including all sources of the fuel cycle are well within the limits of 40 CFR 190 (Reference 8). On-site radioactive waste and spent fuel storage during this year was within storage criteria and the maximum dose to a member of the public was approximately 0.18 mrem/yr. The doses from airborne and liquid effluents were added to the estimated dose from on-site radioactive waste storage to show compliance compared to 40 CFR 190.

The Offsite Dose Comparison, Table 1-4, provides a perspective on the maximum offsite individual dose received from Millstone Power Station with the natural background radiation dose received by the average Connecticut resident. The total dose to the maximum individual received from Millstone Power Station is small (< 0.1%) in comparison to the dose received from natural background radiation.

Table 1-3
2012 Off-Site Dose Comparison to Limits
Millstone Units 1, 2, 3

Airborne Effluents Dose (without C-14)

	Whole Body (mrem)	Thyroid (mrem)	Max Organ* (mrem)	Skin (mrem)	Beta Air (mrad)	Gamma Air (mrad)
Unit 1	5.31E-05	5.31E-05	5.31E-05	4.08E-05	0.00E+00	0.00E+00
Unit 2	3.14E-03	1.20E-02	3.15E-03	2.09E-03	8.72E-05	4.18E-05
Unit 3	1.24E-02	1.24E-02	1.67E-02	7.69E-03	1.85E-05	1.92E-06
Millstone Station	**1.56E-02**	**2.44E-02**	**1.99E-02**	**9.81E-03**	**1.06E-04**	**4.38E-05**
10CFR50 App I Limits	*5*	*15*	*15*	*15*	*20*	*10*

Airborne Effluents Dose (with C-14)

	Whole Body (mrem)	Thyroid (mrem)	Max Organ* (mrem)	Skin (mrem)	Beta Air (mrad)	Gamma Air (mrad)
Unit 1	5.31E-05	5.31E-05	5.31E-05	4.08E-05	0.00E+00	0.00E+00
Unit 2	5.34E-02	6.24E-02	2.52E-01	2.09E-03	8.72E-05	4.18E-05
Unit 3	1.36E-02	1.36E-02	1.67E-02	7.69E-03	1.85E-05	1.92E-06
Millstone Station	**6.71E-02**	**7.60E-02**	**2.69E-01**	**9.81E-03**	**1.06E-04**	**4.38E-05**
10CFR50 App I Limits	*5*	*15*	*15*	*15*	*20*	*10*

Liquid Effluents Dose

	Whole Body (mrem)	Thyroid (mrem)	Max Organ* (mrem)
Unit 1	1.66E-05	3.69E-06	5.13E-05
Unit 2	1.28E-03	2.47E-04	1.72E-02
Unit 3	9.10E-04	5.64E-04	3.23E-03
Millstone Station	**2.21E-03**	**8.14E-04**	**2.04E-02**
10CFR50 App I Limits	*3*	*10*	*10*

Total Off-Site Dose from Millstone Station

	Whole Body (mrem)	Thyroid (mrem)	Max Organ * (mrem)
Airborne without C-14	1.56E-02	2.44E-02	1.99E-02
Airborne with C-14	6.71E-02	7.60E-02	2.69E-01
Liquid	2.21E-03	8.14E-04	2.04E-02
Direct Shine **	1.80E-01	1.80E-01	1.80E-01
Total without C-14	**1.98E-01**	**2.05E-01**	**2.20E-01**
Total with C-14	**2.49E-01**	**2.57E-01**	**4.70E-01**
40CFR190 Limits	*25*	*75*	*25*

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* Maximum of the following organs (not including Thyroid): Bone, GI-LLI, Kidney, Liver, Lung

** Direct shine is radiation exposure from onsite storage of radwaste and spent fuel

Table 2.2-A1

Millstone Unit 2

Airborne Effluents - Release Summary

	Units	2012 1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total	
A. Fission & Activation Gases							
1. Total Activity Released	Ci	4.57E-01	1.72E-01	2.03E-01	4.80E-01	1.31E+00	10/07/2013
2. Average Period Release Rate	uCi/sec	5.81E-02	2.19E-02	2.55E-02	6.04E-02	4.15E-02	
B. Iodines / Halogens							
1. Total Activity Released	Ci	6.88E-05	2.71E-04	2.32E-04	3.09E-04	8.81E-04	10/07/2013
2. Average Period Release Rate	uCi/sec	8.75E-06	3.45E-05	2.92E-05	3.89E-05	2.79E-05	
C. Particulates							
1. Total Activity Released	Ci	3.18E-07	-	-	3.04E-06	3.36E-06	
2. Average Period Release Rate	uCi/sec	4.04E-08	-	-	3.83E-07	1.06E-07	
D. Gross Alpha							
1. Total Activity Released	Ci	-	-	-	-	-	
E. Tritium							
1. Total Activity Released	Ci	1.18E+00	7.77E+00	2.19E+00	5.59E+00	1.67E+01	
2. Average Period Release Rate	uCi/sec	1.50E-01	9.88E-01	2.75E-01	7.03E-01	5.29E-01	
F. C-14							
1. Total Activity Released**	Ci	2.10E+00	2.10E+00	2.10E+00	2.10E+00	8.40E+00	
2. Average Period Release Rate	uCi/sec	2.70E-01	2.67E-01	2.64E-01	2.64E-01	2.66E-01	

"-" denotes less than Minimum Detectable Activity (MDA)

**Calculated value per "Estimation of Carbon-14 in Nuclear Power Plant Gaseous Effluents" EPRI Final Report, 12/2010.

Table 2.2-A4

Millstone Unit 2

Airborne Effluents - Elevated Batch
Containment Vents and Purges, Waste Gas Decay Tanks Discharges
Release Point - Millstone Site Stack

Nuclides Released	Units	2012 1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Gases						
Ar-41	Ci	4.51E-02	4.84E-02	4.29E-02	2.14E-02	1.58E-01
Kr-85	Ci	2.86E-01	6.01E-02	2.82E-02	3.47E-01	7.21E-01
Kr-85m	Ci	8.53E-06	-	-	-	8.53E-06
Xe-131m	Ci	6.20E-04	1.64E-04	-	-	7.84E-04
Xe-133	Ci	1.19E-01	6.19E-02	3.64E-02	2.92E-03	2.20E-01
Xe-133m	Ci	1.38E-03	4.49E-05	-	-	1.42E-03
Xe-135	Ci	4.82E-03	1.38E-03	1.31E-03	2.46E-04	7.76E-03
Other γ Emitters	Ci	-	-	-	-	-
Total Activity	Ci	4.57E-01	1.72E-01	1.09E-01	3.72E-01	1.11E+00
B. Iodines / Halogens						
I-131	Ci	-	-	-	-	-
I-133	Ci	-	-	-	-	-
Other γ Emitters	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	
C. Particulates						
γ Emitters	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
D. Gross Alpha						
Gross Alpha	Ci	na	na	na	na	na
E. Tritium						
H-3	Ci	2.46E-01	3.60E-01	1.43E-01	1.42E-02	7.63E-01

"-" denotes less than Minimum Detectable Activity (MDA)
"na" denotes not required to be analyzed

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Table 2.3-A1

Millstone Unit 3

Airborne Effluents - Release Summary

	Units	2012 1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Gases						
1. Total Activity Released	Ci	2.44E-01	4.06E-01	2.32E-01	1.64E-01	1.05E+00
2. Average Period Release Rate	uCi/sec	3.10E-02	5.16E-02	2.92E-02	2.06E-02	3.31E-02
B. Iodines / Halogens						
1. Total Activity Released	Ci	1.29E-06	8.35E-07	9.12E-07	7.89E-07	3.83E-06
2. Average Period Release Rate	uCi/sec	1.64E-07	1.06E-07	1.15E-07	9.93E-08	1.21E-07
C. Particulates						
1. Total Activity Released	Ci	4.54E-11	1.56E-11	5.63E-08	1.42E-11	5.64E-08
2. Average Period Release Rate	uCi/sec	5.77E-12	1.99E-12	7.08E-09	1.79E-12	1.78E-09
D. Gross Alpha						
1. Total Activity Released	Ci	-	-	-	-	-
E. Tritium						
1. Total Activity Released	Ci	2.08E+01	1.95E+01	6.91E+00	9.87E+00	5.71E+01
2. Average Period Release Rate	uCi/sec	2.65E+00	2.48E+00	8.69E-01	1.24E+00	1.81E+00
F. C-14						
1. Total Activity Released**	Ci	3.10E+00	3.10E+00	3.10E+00	3.10E+00	1.24E+01
2. Average Period Release Rate	uCi/sec	3.99E-01	3.94E-01	3.90E-01	3.90E-01	3.93E-01

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"-" denotes less than Minimum Detectable Activity (MDA)

**Calculated value per "Estimation of Carbon-14 in Nuclear Power Plant Gaseous Effluents" EPRI Final Report, 12/2010.

Table 2.3-A3

Millstone Unit 3

Airborne Effluents - Ground Continuous

ESF Building Ventilation, Reactor Water Storage Tank (RWST)

Release Point - ESF Building Vent, RWST Vent

Nuclides Released	Units	2012 1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Gases						
γ Emitters	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
B. Iodines / Halogens						
I-131	Ci	-	-	-	-	-
I-133	Ci	-	-	-	-	-
Other γ Emitters	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
C. Particulates						
Sc-46	Ci	-	-	5.63E-08	-	5.63E-08
Cr-51	Ci	5.27E-12	1.18E-12	5.90E-13	2.56E-13	7.30E-12
Mn-54	Ci	2.45E-12	9.90E-13	1.22E-12	1.29E-12	5.95E-12
Fe-59	Ci	1.60E-12	4.60E-13	3.30E-13	2.14E-13	2.60E-12
Co-58	Ci	2.52E-11	8.50E-12	7.90E-12	6.10E-12	4.77E-11
Co-60	Ci	4.18E-12	1.77E-12	2.34E-12	2.63E-12	1.09E-11
Zr-95	Ci	6.25E-13	2.06E-13	1.82E-13	1.37E-13	1.15E-12
Nb-95	Ci	4.97E-13	1.27E-13	7.90E-14	4.28E-14	7.46E-13
Sb-125	Ci	2.40E-12	1.02E-12	1.34E-12	1.48E-12	6.24E-12
Cs-134	Ci	1.46E-12	6.10E-13	8.10E-13	8.90E-13	3.77E-12
Cs-137	Ci	1.72E-12	7.50E-13	1.00E-12	1.15E-12	4.62E-12
Other γ Emitters	Ci	-	-	-	-	-
Total Activity	Ci	4.54E-11	1.56E-11	5.63E-08	1.42E-11	5.64E-08
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-
E. Tritium						
H-3	Ci	1.24E-04	7.50E-05	1.01E-04	9.90E-05	3.99E-04

10/07/2013

10/07/2013

"-" denotes less than Minimum Detectable Activity (MDA)