

PMFermiCOLNPem Resource

From: Hinson, Charles
Sent: Monday, August 01, 2011 4:19 PM
To: Roy Karimi; FermiCOL Resource
Subject: FW: Fermi- Courtesy Copy of Open Item Letter #1 (supplement response to Chapters 11 and 12 concerns)
Attachments: NRC3-11-0029.pdf

From: Anand, Raj
Sent: Monday, August 01, 2011 3:57 PM
To: Cicotte, George; Hinson, Charles
Subject: Fermi- Courtesy Copy of Open Item Letter #1 (supplement response to Chapters 11 and 12 concerns)

Hi George/Charlie,
I am forwarding you Fermi supplemental response to Chapters 11 and 12 concerns. Fermi will respond to our issue concerning condensate polishing system by the end of this week.
Thanks,
Raj

From: Nicholas A Latzy [<mailto:latzyn@dteenergy.com>]
Sent: Monday, August 01, 2011 3:24 PM
To: Eudy, Michael; Anand, Raj; Hale, Jerry; Muniz, Adrian
Subject: Courtesy Copy of Open Item Letter #1

Here is a courtesy copy of Open Item Letter #1. This letter contains 3 of the 4 responses to the requested information from the July 14 Open Item call. The 4th and final response will be delivered no later than 8/8/2011.

If you have any questions, please feel free to contact me.

Thank you
Nicholas A. Latzy
Supervisor - Engineering
Nuclear Development - DTE Energy
(313)-235-3370

Hearing Identifier: Fermi_COL_NonPublic
Email Number: 1457

Mail Envelope Properties (CC56DD79EC73A545B9890C3C629E307DA841EE084D)

Subject: FW: Fermi- Courtesy Copy of Open Item Letter #1 (supplement response to Chapters 11 and 12 concerns)
Sent Date: 8/1/2011 4:19:25 PM
Received Date: 8/1/2011 4:19:26 PM
From: Hinson, Charles

Created By: Charles.Hinson@nrc.gov

Recipients:
"Roy Karimi" <rxk@eri-world.com>
Tracking Status: None
"FermiCOL Resource" <FermiCOL.Resource@nrc.gov>
Tracking Status: None

Post Office: HQCLSTR01.nrc.gov

Files	Size	Date & Time
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NRC3-11-0029.pdf	556383	

Options
Priority: Standard
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Reply Requested: No
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Expiration Date:
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10 CFR 52.79

August 1, 2011
NRC3-11-0029

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

- References:
- 1) Fermi 3
Docket No. 52-033
 - 2) Letter from Jerry R. Hale (USNRC) to Jack M. Davis (Detroit Edison), "Request for Additional Information Letter No. 18 Related to the SRP Sections 8.2, 9.2.1, 10.4.5, 11.4, 12.2, 12.3-12.4, and 14.2 for the Fermi 3 Combined License Application," dated December 1, 2009
 - 3) Letter from Jerry Hale (USNRC) to Jack M. Davis (Detroit Edison), "Request for Additional Information Letter No. 42 Related to the SRP Section 12.03-04, 14.03.03 and 02.04.13 for the Fermi 3 Combined License Application," dated September 16, 2010
 - 4) Letter from Raj Anand (USNRC) to Jack M. Davis (Detroit Edison), "Request for Additional Information Letter No. 57 Related to the SRP Chapter 11 for the Fermi 3 Combined License Application," dated May 27, 2011
 - 5) Letter from Peter W. Smith (DTE Energy) to USNRC, "Detroit Edison Company Response to NRC Request for Additional Information Letters No. 18 and Supplemental Response to Letter No. 15," NRC3-10-0001, dated January 29, 2010
 - 6) Letter from Peter W. Smith (DTE Energy) to USNRC, "Detroit Edison Company Response to NRC Requests for Additional Information (RAI) Letter No. 42 and RAI 02.04.13-11 of Letter No. 40," NRC3-10-0046, dated October 19, 2010
 - 7) Letter from Peter W. Smith (DTE Energy) to USNRC, "Detroit Edison Company Response to NRC Request for Additional Information Letter Nos. 57 and 58, and Supplemental Response to NRC Request for Additional Information Letter No. 4," NRC3-11-0018, dated June 17, 2011

Subject: Detroit Edison Company Supplemental Responses to NRC Request for Additional Information Letter Nos. 18, 42, and 57

In References 2, 3, and 4, the NRC requested additional information to support the review of certain portions of the Fermi 3 Combined License Application (COLA). Responses to those

Requests for Additional Information (RAIs) were provided in References 5 through 7. Attachments 1 through 3 of this letter provide supplemental responses to portions of References 5 through 7 as discussed in the attachments.

If you have any questions, or need additional information, please contact me at (313) 235-3341.

I state under penalty of perjury that the foregoing is true and correct. Executed on the 1st day of August 2011.

Sincerely,



Peter W. Smith, Director
Nuclear Development – Licensing and Engineering
Detroit Edison Company

Attachments: 1) Supplemental Response to RAI Letter No. 18, RAI Question No. 12.02-5
2) Supplemental Response to RAI Letter No. 42, RAI Question No. 12.03-12.04-6
3) Supplemental Response to RAI Letter No. 57, RAI Question No. 11.04-4

cc: Adrian Muniz, NRC Fermi 3 Project Manager
Raj Anand, NRC Fermi 3 Project Manager
Jerry Hale, NRC Fermi 3 Project Manager
Michael Eudy, NRC Fermi 3 Project Manager (w/o attachments)
Bruce Olson, NRC Fermi 3 Environmental Project Manager (w/o attachments)
Fermi 2 Resident Inspector (w/o attachments)
NRC Region III Regional Administrator (w/o attachments)
NRC Region II Regional Administrator (w/o attachments)
Supervisor, Electric Operators, Michigan Public Service Commission (w/o attachments)
Michigan Department of Natural Resources and Environment
Radiological Protection Section (w/o attachments)

**Attachment 1
NRC3-11-0029**

**Supplemental Response to RAI Letter No. 18
(eRAI Tracking No. 4037)**

RAI Question No. 12.02-5

NRC RAI 12.02-5

Question 1:

FSAR Subsection 12.2.2.2 presents compliance with 10 CFR 50 Appendix I, 10 CFR 20 Appendix B, and 10 CFR 20.1301 and 20.1302 based on the airborne release quantities in ESBWR DCD Revision 5 Table 12.2-16, "Annual Airborne Releases for Offsite Dose Evaluations (MBq)." ESBWR DCD Revision 6 presented revised annual airborne releases, showing higher release quantities of iodine isotopes. This change requires reevaluation of offsite doses presented in FSAR Subsection 12.2.2.2. Accordingly, provide an updated offsite dose evaluation and demonstrate compliance with the applicable regulations.

Question 2:

FSAR Subsection 12.2.2.4 presents compliance with 10 CFR 50 Appendix I, 10 CFR 20 Appendix B, and 10 CFR 20.1301 and 20.1302 based on liquid effluent release quantities in ESBWR DCD Revision 5 Table 12.2-19b, "Average Annual Liquid Releases." ESBWR DCD Revision 6, presented revised annual liquid effluent releases. This change requires reevaluation of offsite doses presented in FSAR Subsection 12.2.2.4. Accordingly, provide an updated offsite liquid effluent dose evaluations and demonstrate compliance with the applicable regulations.

Supplemental Response

Detroit Edison provided a response to NRC RAI 12.02-5 (eRAI Tracking No. 4307) within Detroit Edison letter NRC3-10-0001, dated January 29, 2010 (ML1000331450), which contained COLA markups to incorporate ESBWR DCD Revision 6. As discussed in a conference call with the NRC on July 14, 2011, this attachment provides supplemental information to update FSAR Table 12.2-19bR to be consistent with the initial response to RAI 12.02-5. The FSAR Table 12.2-19bR update, shown on the attached markups, does not impact any further analyses presented in the Fermi 3 COLA. The attached markups represent current ESBWR DCD revision details.

Proposed COLA Revision

See attached update of FSAR Table 12.2-19bR.

Markup of Detroit Edison COLA
(following 5 pages)

The following markup represents how Detroit Edison intends to reflect this RAI response in the next submittal of the Fermi 3 COLA. However, the same COLA content may be impacted by other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be different than presented here.

Table 12.2-19bR Comparison of Annual Liquid Release Concentrations with 10 CFR 20 Limit (Sheet 1 of 3)

[EF3 COL
12.2-3-A]

Nuclide	Fermi 3 Annual Release		Fermi 3 Concentration		Fermi 2 + 3 Concentration		10 CFR 20 Concentration Limit		Fermi 2 + 3 Fraction of 10 CFR 20 Limit
	MBq/yr	Ci/yr	Bq/ml	µCi/ml	µCi/ml	µCi/ml	µCi/ml	µCi/ml	
1-131	1.55E+02	4.19E-03	6.4E-06	1.73E-10	2.09E-10	2.09E-10	1.00E-06	2.09E-04	
1-132	3.03E+01	8.18E-04	1.25E-06	3.38E-11	2.19E-10	2.19E-10	1.00E-04	2.19E-06	
1-133	7.77E+02	2.10E-02	3.21E-05	8.68E-10	1.29E-09	1.29E-09	7.00E-06	1.84E-04	
1-134	1.48E+00	4.00E-05	6.12E-08	1.65E-12	1.20E-10	1.20E-10	4.00E-04	3.00E-07	
1-135	2.00E+02	5.40E-03	8.27E-06	2.23E-10	5.30E-10	5.30E-10	3.00E-05	1.77E-05	
H-3	5.18E+05	1.40E+01	2.14E-02	5.78E-07	1.01E-06	1.01E-06	1.00E-03	1.01E-03	
Na-24	1.89E+02	5.10E-03	7.82E-06	2.11E-10	2.85E-10	2.85E-10	5.00E-05	5.70E-06	
P-32	1.55E+01	4.19E-04			1	1.91E-11	9.00E-06	2.12E-06	
Cr-51	4.81E+02	1.30E-02			5.37E-10	5.93E-10	5.00E-04	1.19E-06	
Mn-54	5.92E+00	1.60E-04	2.45E-07	6.61E-12	7.25E-12	7.25E-12	3.00E-05	2.42E-07	
Mn-56	4.81E+01	1.30E-03	1.99E-06	5.37E-11	2.16E-10	2.16E-10	7.00E-05	3.08E-06	
Fe-55	8.51E+01	2.30E-03	3.52E-06	9.50E-11	1.04E-10	1.04E-10	1.00E-04	1.04E-06	
Fe-59	2.59E+00	6.99E-05	1.07E-07	2.89E-12	3.21E-12	3.21E-12	1.00E-05	3.21E-07	
Co-58	1.63E+01	4.40E-04	6.74E-07	1.82E-11	2.00E-11	2.00E-11	2.00E-05	9.99E-07	
Co-60	3.33E+01	8.99E-04	1.38E-06	3.72E-11	4.09E-11	4.09E-11	3.00E-06	1.36E-05	
Cu-64	4.81E+02	1.30E-02	1.99E-05	5.37E-10	7.51E-10	7.51E-10	2.00E-04	3.76E-06	
Zn-65	1.67E+01	4.51E-04	6.91E-07	1.86E-11	2.04E-11	2.04E-11	5.00E-06	4.08E-06	
Zn-69m	3.40E+01	9.18E-04	1.41E-06	3.80E-11	5.26E-11	5.26E-11	6.00E-05	8.77E-07	

Replace with Insert 1

Table 12.2-19bR Comparison of Annual Liquid Release Concentrations with 10 CFR 20 Limit (Sheet 2 of 3)

[EF3 COL
12.2-3-A]

Nuclide	Fermi 3 Annual Release		Fermi 3 Concentration		Fermi 2 + 3 Concentration		10 CFR 20 Concentration Limit		Fermi 2 + 3 Fraction of 10 CFR 20 Limit
	MBq/yr	Ci/yr	Bq/ml	µCi/ml	µCi/ml	µCi/ml	µCi/ml	µCi/ml	
Br-83	3.33E+00	8.99E-05	1.38E-07	3.72E-12	2.30E-11	2.30E-11	9.00E-04	2.56E-08	
Sr-89	8.14E+00	2.20E-04	3.37E-07	9.09E-12	1.01E-11	1.01E-11	8.00E-06	1.26E-06	
Sr-90	7.40E-01	2.00E-05	3.06E-08	8.26E-13	8.26E-13	8.26E-13	5.00E-07	1.65E-06	
Sr-91	4.44E+01	1.20E-03	1.84E-06	4.96E-11	7.58E-11	7.58E-11	2.00E-05	3.79E-06	
Y-91	5.18E+00	1.40E-04	2.14E-07	5.78E-12	6.11E-12	6.11E-12	8.00E-06	7.63E-07	
Sr-92	1.07E+01	2.89E-04	4.43E-07	1.19E-11	4.56E-11	4.56E-11	4.00E-05	1.14E-06	
Y-92	4.07E+01	1.10E-03	1.68E-06	4.55E-11	9.02E-11	9.02E-11	4.00E-05	2.25E-06	
Y-93	4.44E+01	1.20E-03	1.84E-06	4.96E-11	7.64E-11	7.64E-11	2.00E-05	3.82E-06	
Zr-95	7.40E-01	2.00E-05	3.06E-08	8.26E-13	8.26E-13	8.26E-13	2.00E-05	4.13E-08	
Nb-95	7.40E-01	2.00E-05	3.06E-08	8.26E-13	8.26E-13	8.26E-13	3.00E-05	2.75E-08	
Mo-99	1.11E+02	3.00E-03	4.59E-06	1.24E-10	1.41E-10	1.41E-10	2.00E-05	7.07E-06	
Tc-99m	2.04E+02	5.51E-03	8.44E-06	2.28E-10	3.43E-10	3.43E-10	1.00E-03	3.43E-07	
Ru-103	1.48E+00	4.00E-05	6.12E-08	1.65E-12	1.81E-12	1.81E-12	3.00E-05	6.05E-08	
Ru-105	6.29E+00	1.70E-04	2.60E-07	7.02E-12	1.64E-11	1.64E-11	7.00E-05	2.34E-07	
Te-129m	3.33E+00	8.99E-05	1.38E-07	3.72E-12	4.04E-12	4.04E-12	7.00E-06	5.77E-07	
Te-131m	3.70E+00	9.99E-05	1.53E-07	4.13E-12	4.94E-12	4.94E-12	8.00E-06	6.17E-07	
Te-132	7.40E-01	2.00E-05	3.06E-08	8.26E-13	8.26E-13	8.26E-13	9.00E-06	9.18E-08	
Cs-134	2.52E+01	6.80E-04	1.04E-06	2.81E-11	3.10E-11	3.10E-11	9.00E-07	3.45E-05	

Table 12.2-19bR Comparison of Annual Liquid Release Concentrations with 10 CFR 20 Limit (Sheet 3 of 3)

[EF3 COL
12.2-3-A]

Nuclide	Fermi 3 Annual Release		Fermi 3 Concentration		Fermi 2 + 3 Concentration		10 CFR 20 Concentration Limit		Fermi 2 + 3 Fraction of 10 CFR 20 Limit
	MBq/yr	Ci/yr	Bq/ml	µCi/ml	µCi/ml	µCi/ml	µCi/ml	µCi/ml	
Cs-136	1.52E+01	4.10E-04	6.29E-07	1.70E-11	2.44E-11	2.44E-11	6.00E-06	4.06E-06	
Cs-137	6.66E+01	1.80E-03	2.75E-06	7.44E-11	7.61E-11	7.61E-11	1.00E-06	7.61E-05	
Ba-139	1.48E+00	4.00E-05	6.12E-08	1.65E-12	2.00E-11	2.00E-11	2.00E-04	9.99E-08	
Ba-140	3.03E+01	8.18E-04	1.25E-06	3.38E-11	3.75E-11	3.75E-11	8.00E-06	4.69E-06	
Ce-141	2.59E+00	6.99E-05	1.07E-07	2.89E-12	3.21E-12	3.21E-12	3.00E-05	1.07E-07	
La-142	1.11E+00	3.00E-05	4.59E-08	1.24E-12	1.28E-11	1.28E-11	1.00E-04	1.28E-07	
Ce-143	1.11E+00	3.00E-05	4.59E-08	1.24E-12	1.40E-12	1.40E-12	2.00E-05	7.00E-08	
Pr-143	3.33E+00	8.99E-05	1.38E-07	3.72E-12	4.04E-12	4.04E-12	2.00E-05	2.02E-07	
W-187	8.88E+00	2.40E-04	3.67E-07	9.92E-12	1.23E-11	1.23E-11	3.00E-05	4.11E-07	
Np-239	4.07E+02	1.10E-02	1.68E-05	4.55E-10	5.16E-10	5.16E-10	2.00E-05	2.58E-05	
Total (w/H-3)	5.22E+05	1.41E+01	2.16E-02	5.83E-07	1.02E-06	1.02E-06		1.63E-03	
Total (w/oH-3)	3.62E+03	9.79E-02	1.50E-04	4.05E-09	6.06E-09	6.06E-09		6.21E-04	

Insert 1 - Replacement for Table 12.2-19bR

Nuclide	Fermi 3 Annual Release		Fermi 3 Concentration		Fermi 2 + 3 Concentration		10 CFR 20 Concentration Limit		Fermi 2 + 3 Fraction of 10 CFR 20 Limit
	MBq/yr	Ci/yr	Bq/ml	µCi/ml	µCi/ml	µCi/ml	µCi/ml	µCi/ml	
I-131	2.29E+02	6.19E-03	9.47E-06	2.56E-10	2.92E-10	2.92E-10	1.00E-06	1.00E-06	2.92E-04
I-132	3.44E+01	9.30E-04	1.42E-06	3.85E-11	2.23E-10	2.23E-10	1.00E-04	1.00E-04	2.23E-06
I-133	1.11E+03	3.00E-02	4.59E-05	1.24E-09	1.66E-09	1.66E-09	7.00E-06	7.00E-06	2.37E-04
I-134	1.48E+00	4.00E-05	6.12E-08	1.65E-12	1.20E-10	1.20E-10	4.00E-04	4.00E-04	3.00E-07
I-135	2.63E+02	7.11E-03	1.09E-05	2.94E-10	6.00E-10	6.00E-10	3.00E-05	3.00E-05	2.00E-05
H-3	5.18E+05	1.40E+01	2.14E-02	5.79E-07	1.01E-06	1.01E-06	1.00E-03	1.00E-03	1.01E-03
Na-24	1.55E+02	4.19E-03	6.41E-06	1.73E-10	2.47E-10	2.47E-10	5.00E-05	5.00E-05	4.95E-06
P-32	1.30E+01	3.51E-04	5.38E-07	1.45E-11	1.63E-11	1.63E-11	9.00E-06	9.00E-06	1.81E-06
Cr-51	4.07E+02	1.10E-02	1.68E-05	4.55E-10	5.10E-10	5.10E-10	5.00E-04	5.00E-04	1.02E-06
Mn-54	4.81E+00	1.30E-04	1.99E-07	5.38E-12	6.02E-12	6.02E-12	3.00E-05	3.00E-05	2.01E-07
Mn-56	3.70E+01	1.00E-03	1.53E-06	4.14E-11	2.04E-10	2.04E-10	7.00E-05	7.00E-05	2.91E-06
Fe-55	7.03E+01	1.90E-03	2.91E-06	7.86E-11	8.79E-11	8.79E-11	1.00E-04	1.00E-04	8.79E-07
Fe-59	2.22E+00	6.00E-05	9.18E-08	2.48E-12	2.80E-12	2.80E-12	1.00E-05	1.00E-05	2.80E-07
Co-58	1.37E+01	3.70E-04	5.67E-07	1.53E-11	1.71E-11	1.71E-11	2.00E-05	2.00E-05	8.54E-07
Co-60	2.78E+01	7.51E-04	1.15E-06	3.11E-11	3.48E-11	3.48E-11	3.00E-06	3.00E-06	1.16E-05
Cu-64	3.70E+02	1.00E-02	1.53E-05	4.14E-10	6.28E-10	6.28E-10	2.00E-04	2.00E-04	3.14E-06
Zn-65	1.37E+01	3.70E-04	5.67E-07	1.53E-11	1.71E-11	1.71E-11	5.00E-06	5.00E-06	3.42E-06
Zn-69m	2.78E+01	7.51E-04	1.15E-06	3.11E-11	4.57E-11	4.57E-11	6.00E-05	6.00E-05	7.62E-07
Br-83	3.70E+00	1.00E-04	1.53E-07	4.14E-12	2.34E-11	2.34E-11	9.00E-04	9.00E-04	2.60E-08
Sr-89	7.03E+00	1.90E-04	2.91E-07	7.86E-12	8.82E-12	8.82E-12	8.00E-06	8.00E-06	1.10E-06
Sr-90	3.70E-01	1.00E-05	1.53E-08	4.14E-13	4.14E-13	4.14E-13	5.00E-07	5.00E-07	8.27E-07
Sr-91	3.52E+01	9.51E-04	1.46E-06	3.93E-11	6.56E-11	6.56E-11	2.00E-05	2.00E-05	3.28E-06
Y-91	4.44E+00	1.20E-04	1.84E-07	4.96E-12	5.28E-12	5.28E-12	8.00E-06	8.00E-06	6.61E-07
Sr-92	8.51E+00	2.30E-04	3.52E-07	9.51E-12	4.31E-11	4.31E-11	4.00E-05	4.00E-05	1.08E-06
Y-92	3.22E+01	8.70E-04	1.33E-06	3.60E-11	8.07E-11	8.07E-11	4.00E-05	4.00E-05	2.02E-06
Y-93	3.70E+01	1.00E-03	1.53E-06	4.14E-11	6.82E-11	6.82E-11	2.00E-05	2.00E-05	3.41E-06
Zr-95	3.70E-01	1.00E-05	1.53E-08	4.14E-13	4.14E-13	4.14E-13	2.00E-05	2.00E-05	2.07E-08
Nb-95	3.70E-01	1.00E-05	1.53E-08	4.14E-13	4.14E-13	4.14E-13	3.00E-05	3.00E-05	1.38E-08

Nuclide	Fermi 3 Annual Release		Fermi 3 Concentration		Fermi 2 + 3 Concentration		10 CFR 20 Concentration Limit		Fermi 2 + 3 Fraction of 10 CFR 20 Limit
	MBq/yr	Ci/yr	Bq/ml	µCi/ml	µCi/ml	µCi/ml	µCi/ml		
Mo-99	9.25E+01	2.50E-03	3.83E-06	1.03E-10	1.21E-10	1.21E-10	2.00E-05	2.00E-05	6.05E-06
Tc-99m	1.70E+02	4.59E-03	7.03E-06	1.90E-10	3.05E-10	3.05E-10	1.00E-03	1.00E-03	3.05E-07
Ru-103	1.48E+00	4.00E-05	6.12E-08	1.65E-12	1.82E-12	1.82E-12	3.00E-05	3.00E-05	6.05E-08
Ru-105	4.81E+00	1.30E-04	1.99E-07	5.38E-12	1.47E-11	1.47E-11	7.00E-05	7.00E-05	2.10E-07
Te-129m	2.59E+00	7.00E-05	1.07E-07	2.90E-12	3.22E-12	3.22E-12	7.00E-06	7.00E-06	4.60E-07
Te-131m	2.96E+00	8.00E-05	1.22E-07	3.31E-12	4.11E-12	4.11E-12	8.00E-06	8.00E-06	5.14E-07
Te-132	3.70E-01	1.00E-05	1.53E-08	4.14E-13	4.14E-13	4.14E-13	9.00E-06	9.00E-06	4.60E-08
Cs-134	2.11E+01	5.70E-04	8.73E-07	2.36E-11	2.65E-11	2.65E-11	9.00E-07	9.00E-07	2.94E-05
Cs-136	1.30E+01	3.51E-04	5.38E-07	1.45E-11	2.19E-11	2.19E-11	6.00E-06	6.00E-06	3.66E-06
Cs-137	5.55E+01	1.50E-03	2.30E-06	6.20E-11	6.38E-11	6.38E-11	1.00E-06	1.00E-06	6.38E-05
Ba-139	1.11E+00	3.00E-05	4.59E-08	1.24E-12	1.96E-11	1.96E-11	2.00E-04	2.00E-04	9.79E-08
Ba-140	2.55E+01	6.89E-04	1.05E-06	2.85E-11	3.22E-11	3.22E-11	8.00E-06	8.00E-06	4.03E-06
Ce-141	2.22E+00	6.00E-05	9.18E-08	2.48E-12	2.80E-12	2.80E-12	3.00E-05	3.00E-05	9.34E-08
La-142	7.40E-01	2.00E-05	3.06E-08	8.27E-13	1.24E-11	1.24E-11	1.00E-04	1.00E-04	1.24E-07
Ce-143	1.11E+00	3.00E-05	4.59E-08	1.24E-12	1.40E-12	1.40E-12	2.00E-05	2.00E-05	7.01E-08
Pr-143	2.59E+00	7.00E-05	1.07E-07	2.90E-12	3.22E-12	3.22E-12	2.00E-05	2.00E-05	1.61E-07
W-187	7.40E+00	2.00E-04	3.06E-07	8.27E-12	1.07E-11	1.07E-11	3.00E-05	3.00E-05	3.56E-07
Np-239	3.44E+02	9.30E-03	1.42E-05	3.85E-10	4.46E-10	4.46E-10	2.00E-05	2.00E-05	2.23E-05
Total (w/ H-3)	5.22E+05	1.41E+01	2.16E-02	5.83E-07	1.02E-06	1.02E-06			1.74E-03
Total (w/o H-3)	3.66E+03	9.89E-02	1.51E-04	4.09E-09	6.10E-09	6.10E-09			7.28E-04

**Attachment 2
NRC3-11-0029**

**Supplemental Response to RAI Letter No. 42
(eRAI Tracking No. 4882)**

RAI Question No. 12.03-12.04-6

NRC RAI 12.03-12.04-6

Subsection 12.3.1.5.1 of the ESBWR DCD Tier 2, Revision 6, states that the piping for the following SSCs will contain segments that will have to be run underground; 1) Condensate Storage Tank (CST) and CST Retention Area Drain, 2) Radwaste Effluent Discharge Pipeline, 3) Cooling Tower Blowdown Line, and 4) Hot Machine Shop Drain. This section of the DCD goes on to state that these lines will be kept as short and direct as possible. RG 4.21 states that applicants covered by 10 CFR 20.1406 should strive to minimize leaks and spills, provide containment in areas where such leaks might occur, and provide for detection that supports timely assessment and appropriate response. Fermi FSAR Subsection 12.3.1.5 provides supplemental information to address STD COL 12.3-4-A (which states that the COL Applicant will address the operational and post-construction objectives of RG 4.21). However, Fermi FSAR Subsection 12.3.1.5 does not include a description of site-specific provisions to minimize the potential for unmonitored and uncontrolled releases to the environment from underground piping.

In order to address objectives of RG 4.21 with respect to the monitoring of underground piping at Fermi, FSAR Subsection 12.3.1.5 should be modified to:

- 1. Include a listing of the SSCs at Fermi which will have piping segments which will be run underground.*
- 2. Include a description of the features associated with the underground piping for each of these SSCs to minimize contamination in accordance with the guidance provided in RG 4.21 and the requirements of 10 CFR 20.1406.*
- 3. Include a description of the monitoring program associated with the piping for each of these SSCs that will ensure that the potential for unmonitored, uncontrolled releases of radioactivity to the environment from these pipes will be minimized.*
- 4. Include a description of the portion of the discharge line that runs from the cooling tower blowdown to the point of release into the environment beyond the owner-controlled area or EAB. Include a description of the monitoring program associated with this portion of the discharge piping that will ensure that the potential for unmonitored, uncontrolled releases of radioactivity to the environment will be minimized.*
- 5. Incorporate by reference NEI Template 08-08A, which addresses the guidance provided in RG 4.21 and the requirements of 10 CFR 20.1406. NEI 08-08A states that the COL applicant will establish an on-site ground water monitoring program to ensure timely detection of inadvertent radiological releases to the ground water. Identify areas of the site to be specifically considered in this groundwater monitoring program.*

Supplemental Response

Detroit Edison provided a response to NRC RAI 12.03-12.04-6 (eRAI Tracking No. 4882) within Detroit Edison letter NRC3-10-0046, dated October 19, 2010 (ML102940218), which included

discussion of buried piping segments at the Fermi 3 site. As discussed in a conference call with NRC staff on July 14, 2011, further information to support this discussion is provided here as a supplement to that response. As shown in the attached markups, further detail is included in FSAR Section 11.2.3.2, "Radioactive Releases," to describe design and monitoring details for the portion of the blowdown line from the Circulating Water System that could receive Liquid Waste Management System (LWMS) discharge.

As discussed in FSAR Section 12.2.2.4, "Liquid Doses Offsite," the LWMS is designed with the capacity to recycle 100% of liquid radwaste and Detroit Edison intends to operate Fermi 3 with zero liquid effluents. LWMS discharge capabilities are not expected to be utilized during normal operation. The Circulating Water System blowdown line is not expected to contain radioactive effluents during normal plant operations, which limits the potential for chronic radioactive effluent leakage in the blowdown line. The attached markups provide FSAR Section 11.2.3.2 updates to outfall and effluent discharge piping descriptions and monitoring requirements.

Proposed COLA Revision

FSAR Section 11.2.3.2 updates to outfall piping descriptions.

Markup of Detroit Edison COLA
(following 3 pages)

The following markup represents how Detroit Edison intends to reflect this RAI response in the next submittal of the Fermi 3 COLA. However, the same COLA content may be impacted by other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be different than presented here.

release, these comprise <0.001% of the total annual release; therefore this augment will have little affect and is not a cost benefit augment.

Of the three augments which fall below the \$1000 per person-rem threshold value, none of these is cost-beneficial.

Note that the ESBWR Radwaste LWMS is designed to monitor and process all radioactive liquid streams and to provide water management for those streams. Under normal conditions, the water management is not expected to result in any routine release of radioactive effluents in the liquid discharges.

11.2.2.3 Detailed System Component Description

11.2.2.3.3 Processing Systems

Replace the first two paragraphs with the following.

STD COL 11.2-1-A

Specific equipment connection configuration and plant sampling procedures are used to implement the guidance in Inspection and Enforcement (IE) Bulletin 80-10 (DCD Reference 11.2-10). The non-radioactive systems, which are connected to radioactive or potentially radioactive portions of process LWMS, are protected from contamination with an arrangement of double check valves in each line. The configuration of each line is also equipped with a tell-tale connection, which permits periodic checks to confirm the integrity of the line and its check valve arrangement. Plant procedures describe sampling of non-radioactive systems that could become contaminated by cross-connection with systems that contain radioactive material. In accordance with the guidance in RG 1.109, exposure pathways that may arise due to unique conditions are considered for incorporation into the plant-specific ODCM if they are likely to contribute significantly to the total dose.

STD COL 11.2-2-A

[Section 12.3](#) discusses how ESBWR design features and procedures for operation will minimize contamination of the facility and environment, facilitate decommissioning, and minimize the generation of radioactive wastes, in compliance with 10 CFR 20.1406. [Section 13.5](#) describes the requirement for procedures for operation of radioactive waste processing system. Operating procedures for LWMS process systems required by

[Section 12.3](#), [Section 12.4](#), [Section 12.5](#), and [Section 13.5](#) address the requirements of 10 CFR 20.1406.

Insert #1 Here



11.2.6 COL Information

STD COL 11.2-1-A

11.2-1-A Implementation of IE Bulletin 80-10

This COL item is addressed in [Subsection 11.2.2.3](#).

STD COL 11.2-2-A

11.2-2-A Implementation of Part 20.1406

This COL item is addressed in [Subsection 11.2.2.3](#).

11.2.7 References

11.2-201 OMB Circular A-94, "Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs," October 29, 1992, Office of Management and Budget.

Insert #2 Here



11.3 Gaseous Waste Management System

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

11.3.1 Design Basis

Add the following at the end of this section.

EF3 SUP 11.3-1

Regulatory Guide 1.110 was used as the basis for a cost benefit evaluation to assess gaseous radwaste system augments. The overall principle behind Regulatory Guide 1.110 is to determine when it is economically feasible to implement an augmented system to reduce radiation exposure to the public further below the regulatory threshold. The regulatory guidance specifies that an augmented system should be implemented if the cumulative dose to a population within an 80 km (50 mile) radius of the reactor site can be reduced at an annual cost of less than \$1000 per person-rem or \$1000 per person-thyroid-rem.

Only the augments applicable to the ESBWR conceptual design are considered.

Cost Benefit Analysis Determination

Appendix A of Regulatory Guide 1.110 states that augments with a Total Annual Cost (TAC) lower than the reduced dose multiplied by \$1000 per

Insert #1

11.2.3.2 Radioactive Releases

Add the following after the end of the first sentence of the second paragraph.

EF3 SUP 11.2-2

The radioactive releases are discharged from the circulating water system through the blowdown line which extends into Lake Erie. The blowdown line is a high density polyethylene pipe with no valves, vacuum breakers, or other inline components in the blowdown line downstream of the LWMS connection as required by DCD Subsection 12.3.1.5.1. Monitoring for leakage downstream of LWMS connection is per NEI 08-08A (Reference 11.2-202) as described in Subsection 12.3.1.5.2. This monitoring will be implemented as part of the Fermi 3 groundwater monitoring program.

Insert #2

11.2-202

Nuclear Energy Institute, Generic FSAR Template Guidance for Life Cycle Minimization of Contamination, NEI 08-08A.

**Attachment 3
NRC3-11-0029**

**Supplemental Response to RAI Letter No. 57
(eRAI Tracking No. 5633)**

RAI Question No. 11.04-4

NRC RAI 11.04-4

FSAR Section 11.4, "Solid Waste Management System [SWMS]," is incorporated by reference from the ESBWR Design Control Document (DCD), Revision 8, with Departure EF3 DEP 11.4-1. In Revision 3 of Section 11.4, Departure EF3 DEP 11.4-1 indicates changes to system component capacities for the SWMS, and includes Figures 11.4-1R and 11.4-2R, and Tables 11.4-1R and 11.4-2R. Figure 11.4-1R includes the revised system process diagram.

The proposed redesigned solid waste management system included the revised system process diagram in Figure 11.4-1R. However, the process diagram shows pumps in series in two places, with no holding tank or other equipment separating the pumps. This is shown for the:

- 1) Reactor Water Cleanup System (RWCU)/Fuel and Auxiliary Pools Cooling System (FAPCS) – the top process line, showing the high activity circulation and high activity transfer pumps, and*
- 2) Condensate Filter Backwash Drain/Equipment-Floor Drain Subsystem Filter Backwash Drain/Dewatering Fill Head – the lower process line, showing the low activity circulation and low activity transfer pumps. These pumps are shown as tandem units in parallel but the figure does not show if these pumps provide redundancy since they are lacking isolation valves.*

Additionally, the figure appears to be incomplete, in that the detail of the diagram is not sufficient for the NRC staff to fully evaluate whether the system processes are consistent with the regulatory position in Regulatory Guide 1.143 and Branch Technical Position 11-3.

It is not clear from this figure how these pumps are meant to operate, since dual pump units in series may be prone to cavitation. Please provide additional clarifications on the system operation and on the use of these pumps.

Supplemental Response

Detroit Edison provided a response to NRC RAI 11.04-4 (eRAI Tracking No. 5633) within Detroit Edison letter NRC3-11-0018, dated June 17, 2011 (ML11171A297), which included discussion of the Fermi 3 solid waste management system process flows. As discussed in a conference call with the NRC staff on July 14, 2011, further information to support this discussion is provided here as a supplement to that response, specifically Figure 11.4-1R is to be revised to depict the process descriptions in the FSAR text and in Figure 11.4-2R more comprehensively.

The block diagram represented in Figure 11.4-1R, consistent with the ESBWR DCD, represents a level of system detail to illustrate typical process flows of the Solid Waste Management System (SWMS) and is not intended to illustrate complete SWMS system capabilities. Configuration capabilities for the SWMS are shown in Figure 11.4-2R. Fermi 3 FSAR Figures 11.4-1R and 11.4-2R are currently consistent as Figure 11.4-2R shows that the system can be configured to support the flow paths depicted by Figure 11.4-1R.

As requested, FSAR Figure 11.4-1R will be revised to provide more system detail in the block diagram representation of SWMS, consistent with FSAR system descriptions and Figure 11.4-2R, as shown on the attached markups. In addition FSAR Figure 11.4-2R will be revised as shown on the attached markups.

Proposed COLA Revision

The attached markups represent an update to FSAR Figure 11.4-1R to provide further SWMS system detail, as well as an update to FSAR Figure 11.4-2R.

Markup of Detroit Edison COLA
(following 2 pages)

The following markup represents how Detroit Edison intends to reflect this RAI response in the next submittal of the Fermi 3 COLA. However, the same COLA content may be impacted by other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be different than presented here.

Solid Waste Management System Process Diagram



