



10 CFR 52.79

November 9, 2009  
NRC3-09-0039

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 Hale (USNRC) to Peter W. Smith (Detroit Edison),  
"Request for Additional Information Letter No. 7 Related to the SRP Sections  
03.07.01-1, 12.03-12.04-3, 05.03.01-1, 03.07.01-2, 03.07.02-1, 12.02-3, and  
12.02-4 for the Fermi 3 Combined License Application," dated June 23, 2009
  - 3) Letter from Jerry Hale (USNRC) to Peter W. Smith (Detroit Edison),  
"Request for Additional Information Letter No. 12 Related to the SRP Sections  
01, 9.5.4, and 14.3 for the Fermi 3 Combined License Application," dated  
September 2, 2009
  - 4) Letter from Peter W. Smith (Detroit Edison) to USNRC, "Detroit Edison  
Company Response to NRC Request for Additional Information Letter No. 7  
Related to the SRP Sections 03.07.01-1, 12.03-12.04-3, 05.03.01-1, 03.07.01-  
2, 03.07.02-1, 12.02-3, and 12.02-4 for the Fermi 3 Combined License  
Application," NRC3-09-0021 dated August 25, 2009
  - 5) Letter from Peter W. Smith (Detroit Edison) to USNRC, "Detroit Edison  
Company Response to NRC Request for Additional Information Letter No. 12  
Related to the SRP Sections 01, 9.5.4, and 14.3 for the Fermi 3 Combined  
License Application," NRC3-09-0028 dated September 29, 2009

Subject: Detroit Edison Company Supplemental Responses to NRC Request for Additional  
Information Letters No. 7 & 12

In References 2 and 3, the NRC requested additional information to support the review of certain portions of the Fermi 3 Combined License Application (COLA). Detroit Edison's responses were provided in References 4 and 5. As a result of subsequent telephone discussions with the NRC Staff, Detroit Edison is providing supplemental responses to the following three RAIs.

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- RAI Question 03.07.01-1                      Seismic Design Parameters
- RAI Question 03.07.01-2                      Seismic Design Parameters
- RAI Question 09.05.04-1                      Emergency Diesel Engine Fuel Storage

The supplemental responses are included as attachments 1 through 3 of this letter.

Information contained in these responses will be incorporated into a future COLA submission as described in the RAI response.

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 9<sup>th</sup> day of November 2009.

Sincerely,



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

- Attachments: 1) Supplemental Response to RAI Letter No. 7 (Question No. 03.07.01-1)  
2) Supplemental Response to RAI Letter No. 7 (Question No. 03.07.01-2)  
3) Supplemental Response to RAI Letter No. 12 (Question No. 09.05.04-1)

cc: Jerry Hale, NRC Fermi 3 Project Manager  
Ilka Berrios, NRC Fermi 3 Project Manager  
Bruce Olsen, NRC Fermi 3 Environmental Project Manager  
Fermi 2 Resident Inspector  
NRC Region III Regional Administrator  
NRC Region II Regional Administrator  
Supervisor, Electric Operators, Michigan Public Service Commission  
Michigan Department of Environmental Quality  
Radiological Protection and Medical Waste Section

**Attachment 1  
NRC3-09-0039**

**Supplemental Response to RAI Letter No. 7  
(eRAI Tracking No. 2651)**

**RAI Question No. 03.07.01-1**

**NRC RAI 03.07.01-1**

*10 CFR 50 Appendix S requires that the Safe Shutdown Earthquake (SSE) Ground Motion for the site be characterized by both horizontal and vertical free-field ground motion response spectra at the free ground surface. For application to engineering designs, site-specific GMRS determined at the foundation level of seismic category I structures are bounded by CSDRS. However, a site-specific SSE should be established as free-field ground motion response spectra that would be used to determine whether the plant shutdown would be required following a seismic event. The NRC staff requests that the applicant specify in FSAR Section 3.7.1 both the site-specific SSE and the corresponding OBE which would be required for operating the plant and setting up the seismic instrumentation as required in FSAR Section 3.7.4.*

**Supplemental Response**

The Fermi 3 site specific Ground Motion Response Spectra (GMRS) is shown in FSAR, Revision 1, Figure 2.5.2-288, "Fermi 3 GMRS (5% damping)." The site-specific Foundation Input Response Spectra (FIRS) for the Reactor Building / Fuel Building (RB/FB) and Control Building (CB) and for the Firewater Storage Complex (FWSC), shown in FSAR Revision 1, Figures 2.0-201 through 2.0-204, were generated consistent with the development of the GMRS. That is, these spectra were developed as free-field ground motions at the appropriate foundation elevations. The FIRS were computed as truncated soil column response (TSCSR) spectra.

Fermi 3 is designed using two sets of Certified Seismic Design Response Spectra (CSDRS) both of which fully envelope the site-specific FIRS. ESBWR DCD Tier 2, Revision 5, Figures 2.0-1 and 2.0-2, where the design spectra are referred to as SSE Design Ground Spectra at Foundation Level, provide the CSDRS for the RB/FB and CB, which envelope the site-specific RB/FB and CB FIRS, as illustrated in FSAR Revision 1, Figures 2.0-201 and 2.0-202. Note 9 of Table 2.0-1 and the note on embedment depth in Table 3.7-2 in DCD, Revision 5, identify the CSDRS for the FWSC as 1.35 \* RB/FB and CB CSDRS, which envelopes the site-specific FWSC FIRS, as illustrated in FSAR Revision 1, Figures 2.0-203 and 2.0-204.

For Fermi 3, because two CSDRS are used to design the plant, the lower CSDRS is specified as the site-specific SSE as required by 10 CFR 50 Appendix S; the two CSDRS are shown in COLA FSAR Revision 1, Figures 2.0-201 and 2.0-202.

Therefore, the site-specific SSE applicable for plant shut down purposes is as follows:

$$\text{SSE} = \text{CSDRS (COLA FSAR Revision 1, Figures 2.0-201 and 2.0-202)}$$

In accordance with ESBWR DCD, Tier 2, Revision 5, Section 3.7, the OBE will be one third of the SSE. Therefore, the OBE that will be used to determine if a plant shutdown is required are determined as follows:

$$\text{OBE} = \text{CSDRS (COLA FSAR Revision 1, Figures 2.0-201 and 2.0-202)} * 1/3$$

It is noted that the above SSE and OBE definitions will be used in conjunction with the criteria specified in DCD, Tier 2, Revision 5, Section 3.7.4.4, to determine whether a plant shutdown is required following a seismic event.

**Proposed COLA Revision**

Refer to the Proposed COLA Revision attached to NRC RAI 03.07.01-2 for the proposed COLA markup to FSAR Subsection 3.7.1.1.

**Attachment 2  
NRC3-09-0039**

**Supplemental Response to RAI Letter No. 7  
(eRAI Tracking No. 2783)**

**RAI Question No. 03.07.01-2**

**NRC RAI 03.07.01-2**

*FSAR Section 3.7.1.1, Design Ground Motion, lists a supplemental information item EF3 SUP 3.7-2, which states: 3.7.1.1.5 Site-Specific Design Ground Motion Time History EF3 SUP 3.7-2. The sitespecific earthquake ground motion time history is described in Subsection 2.5.4. The staff review appears to indicate that such information is not included in Section 2.5.4. Please identify the appropriate FSAR texts and associated figures in Section 2.5.4 that describe the site-specific earthquake ground motion time history.*

**Supplemental Response**

ESBWR DCD, Revision 5, Section 3.7.5 states:

**3.7.5 Site-Specific Information**

- (1) See Table 2.0-1 for seismology requirements of site-specific SSE ground response spectra.
- (2) See Table 2.0-1 for soil properties requirements of site-specific foundation bearing capacities, minimum shear wave velocity and liquefaction potential. For sites not meeting the soil properties requirements, a site-specific analysis is required to demonstrate that site-specific conditions are enveloped by the standardized design.

As described in FSAR Table 2.0-201, the Fermi 3 site parameters meet the above requirements of the DCD. Therefore, site-specific input acceleration time histories were not developed.

Seismic Category I structures, systems, and components, are identified in ESBWR DCD, Rev. 5, Table 3.2-1. As described in DCD Section 3.2.1, Seismic Category I structures, systems, and components are designed to withstand the appropriate seismic loads as discussed in DCD Section 3.7 in combination with other appropriate loads without loss of function or pressure integrity. There are no site specific Seismic Category I structures.

**Proposed COLA Revision**

FSAR, Section 3.7.1.1.5, will be updated to reflect that site-specific earthquake ground motion time history is not developed. A proposed mark-up is attached.

**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 Revision 2. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to 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.



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**STD SUP 3.5-1** Site-specific missile sources are addressed in Section 2.2.

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**3.5.1.6 Aircraft Hazards**

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Add the following at the end of the first paragraph.

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**STD SUP 3.5-2** Site-specific aircraft hazard analysis and the site-specific critical areas are addressed in Section 2.2.

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**3.6 Protection Against Dynamic Effects Associated with the Postulated Rupture of Piping**

This section of the referenced DCD is incorporated by reference with no departures or supplements.

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**3.7 Seismic Design**

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

**3.7.1.1 Design Ground Motion**

Insert 1 Here

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**EF3 SUP 3.7-1** 3.7.1.1.4 **Site-Specific Design Ground Motion Response Spectra**

The site-specific design Ground Motion Response Spectra (GMRS) and the FIRS are described in Subsection 2.5.2. The CSDRS are compared with the FIRS in Table 2.0-201.

Insert 2 Here

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**EF3 SUP 3.7-2** 3.7.1.1.5 **Site-Specific Design Ground Motion Time History**

~~The site-specific earthquake ground motion time history is described in Subsection 2.5.2.~~

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**3.7.1.3 Supporting Media for Seismic Category I Structures**

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Add the following at the end of the first paragraph.

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**EF3 SUP 3.7-3** Subsection 2.5.4 provides site-specific properties of subsurface materials.

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### Insert 1

Add the following at the end of this section.

#### **EF3 SUP 3.7-7**

Figures 2.0-201 and 2.0-202 provide the CSDRS, which envelope the site-specific design ground motions (the FIRS) for the RB/FB and CB. Figures 2.0-203 and 2.0-204 also provide the CSDRS, which envelope the site-specific design ground motions (the FIRS) for the FWSC. The lower of the two CSDRS is that shown on Figures 2.0-201 and 2.0-202. Therefore, the site-specific SSE applicable for plant shut down purposes is the CSDRS as shown in Figures 2.0-201 and 2.0-202.

The operating basis earthquake (OBE) is one-third of the lower of these two sets of design ground motion response spectra. That is, the OBE for the site is one-third of the CSDRS as shown in Figures 2.0-201 and 2.0-202. These SSE and OBE definitions are used in conjunction with the criteria specified in DCD Section 3.7.4.4 to determine whether a plant shutdown is required following a seismic event.

### Insert 2

As shown in Table 2.0-201, the CSDRS fully envelope the site specific FIRS, and the Fermi 3 site parameters meet the requirements of the DCD for foundation bearing capacities, minimum shear wave velocity, and liquefaction potential. Therefore, site-specific earthquake ground motion time history is not developed to match the GMRS/FIRS.

**Attachment 3  
NRC3-09-0039**

**Supplemental Response to RAI Letter No. 12  
(eRAI Tracking No. 3523)**

**RAI Question No. 09.05.04-1**

**NRC RAI 09.05.04-1**

*In response to COL Item EF3 COL 9.5.4-2-A (included twice - once for the standby diesel generators and once for the ancillary diesel generators), the Fermi 3 FSAR describes the corrosion protection provided for the underground fuel oil system piping. The description in the FSAR should also include the applicable codes and/or standards for the corrosion protection features. (Note that a similar supplemental RAI was submitted for the North Anna 3 RCOLA and Dominion submitted a response on August 3, 2009.)*

**Supplemental Response**

ASME B31.1, "Power Piping" Code, Nonmandatory Appendix IV, "Corrosion Control" for ASME B31.1, "Power Piping Systems" and American Petroleum Institute (API) Recommended Practice 1632, "Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems" will be followed as deemed applicable for corrosion protection of the underground portions of the diesel fuel oil transfer system. FSAR Section 9.5.4 will be revised to reflect these industry standards.

**Proposed COLA Revision**

FSAR Section 9.5.4 will be revised as shown on the attached markup.

**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 Revision 2. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to 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.

Insert 1 here.

Replace the third paragraph with the following.

**EF3 COL 9.5.4-2-A**

The only underground component of the SDGs fuel oil storage and transfer system is carbon steel piping. A corrosion protection system is provided for external surfaces of buried piping systems. The buried sections of the piping are provided with waterproof protective coating and an impressed current type cathodic protection to control external corrosion.

**STD COL 9.5.4-1-A**

Delete the parenthetical "(COL 9.5.4-1-A)" at the end of the last paragraph.

*Ancillary Diesel Generators*

Replace the third to last sentence in the first paragraph with the following.

**STD COL 9.5.4-1-A**

Procedures require that the quantity of diesel fuel in the ancillary diesel generator (ADG) fuel oil storage tanks is monitored on a periodic basis. The diesel fuel oil usage is tracked against planned deliveries. Regular transport replenishes the fuel oil inventory during periods of high demand and ensures continued supply in the event of adverse weather conditions. These procedures ensure sufficient diesel fuel oil inventory is available on site so that the ADGs can operate continually for seven days its calculated design load, with appropriate design margins. The procedures will be developed in accordance with the milestone and processes described in Section 13.5.

Insert 2 here

Replace the third paragraph with the following.

**EF3 COL 9.5.4-2-A**

The only underground component of the ADGs fuel oil storage and transfer system is carbon steel piping. A corrosion protection system is provided for external surfaces of buried piping systems. The buried sections of the piping are provided with waterproof protective coating and an impressed current type cathodic protection to control external corrosion.

**Insert 1**

Insert the following text where indicated

consistent with the guidance contained in ASME B31.1, Power Piping Code, Nonmandatory Appendix IV, Corrosion Control for ASME B31.1 Power Piping Systems, and American Petroleum Institute (API) Recommended Practice 1632, Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems

**Insert 2**

Insert the following text where indicated

consistent with the guidance contained in ASME B31.1, Power Piping Code, Nonmandatory Appendix IV, Corrosion Control for ASME B31.1 Power Piping Systems, and American Petroleum Institute (API) Recommended Practice 1632, Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems