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DTE Energy
Detroit Edison

10 CFR 52.79

September 21, 2010
NRC3-10-0042

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 Jack M. Davis (Detroit Edison), "Request for Additional Information Letter No. 40 Related to the SRP Sections 2.4.13, 2.5.4, 3.2.1., 3.2.2 and 13.6.6 for the Fermi 3 Combined License Application," dated August 10, 2010
3) Letter from Jerry Hale (USNRC) to Jack M. Davis (Detroit Edison), "Request for Additional Information Letter No 42 Related to SRP Section 12.03-04, 14.03.03 and 02.04.13 for the Fermi 3 Combined License Application," dated September 16, 2010

Subject: Detroit Edison Company Response to NRC Request for Additional Information Letter No. 40

In Reference 2, the NRC requested additional information (RAI) to support the review of certain portions of the Fermi 3 Combined License Application (COLA). The responses to these RAIs are provided in Attachments 1 through 9 of this letter. Information contained in these responses will be incorporated into a future COLA submission as described in the RAI response.

In Reference 3, the NRC requested additional information related to SRP Section 02.04.13. The response to RAI 02.04.13-11 will be addressed in a combined response to RAI 02.04.13-12 from Reference 3 by October 18, 2010.

D095
NRO

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 21st day of September 2010.

Sincerely,

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

Attachments:
1) Response to RAI Letter No. 40 (Question No. 02.05.04-35)
2) Response to RAI Letter No. 40 (Question No. 13.06.06-1)
3) Response to RAI Letter No. 40 (Question No. 13.06.06-2)
4) Response to RAI Letter No. 40 (Question No. 03.02.01-1)
5) Response to RAI Letter No. 40 (Question No. 03.02.01-2)
6) Response to RAI Letter No. 40 (Question No. 03.02.02-1)
7) Response to RAI Letter No. 40 (Question No. 03.02.02-2)
8) Response to RAI Letter No. 40 (Question No. 03.02.02-3)

cc: Adrian Muniz, NRC Fermi 3 Project Manager
Jerry Hale, NRC Fermi 3 Project Manager
Bruce Olson, NRC Fermi 3 Environmental Project Manager
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 Dept. of Natural Resources & Environment
Radiological Protection Section (w/o Attachments)

Attachment 1
NRC3-10-0042

Response to RAI Letter No. 40
(eRAI Tracking No. 4905)

RAI Question No. 02.05.04-35

NRC RAI 02.05.04-35

ESBWR DCD information item COL 2.0-29-A requires the COL applicant to address "localized liquefaction potential under other than Seismic Category I structures" (ESBWR DCD Tier 2, Chapter 2, Table 2.0-2). However, in FSAR Section 2.5.4.8 "Liquefaction Potential", you did not provide any information about the localized liquefaction potential under other than Seismic Category I structures. Please provide this evaluation in the FSAR. If the soils under other than Seismic Category I structures are susceptible to liquefaction, please assess the potential safety implications, especially for those buildings that are adjacent to Seismic Category I structures in accordance with 10 CFR100.23.

Response

ESBWR DCD Revision 7, Section 3.7.2.8, addresses interaction between non-Category I Structures and Seismic Category I Structures for non-Category I structures that are within the scope of the DCD. The following non-Category I structures are addressed in Section 3.7.2.8 of the DCD.

- Turbine Building (DCD Section 3.7.2.8.1)
- Radwaste Building (DCD Section 3.7.2.8.2)
- Service Building (DCD Section 3.7.2.8.3)
- Ancillary Diesel Building (DCD Section 3.7.2.8.4)

Per DCD Section 3.7.2.8, all non-Category I Systems, Structures and Components (SSCs) meet at least one of the following criteria:

(1) "The collapse of any non-Category I structure, system or component does not cause the non-Category I structure, system or component to strike a Seismic Category I SSCs. SSCs in this category are classified as Seismic Category NS. Any Seismic Category NS structure postulated to fail under SSE is located at least a distance of its height above grade from Seismic Category I structures."

(2) "The collapse of any non-Category I SSCs does not impair the integrity of Seismic Category I SSCs. This is demonstrated by showing that the impact loads on the Category I structure, system or component resulting from collapse of an adjacent non-Category I structure, because of its size and mass, are either negligible or smaller than those considered in the design (e.g., loads associated with tornado, including missiles). SSCs in this category are classified as Seismic Category NS."

(3) "The non-Category I structures, systems or components are analyzed and designed to prevent their failure under SSE conditions in a manner such that the margin of safety of these structures, systems or components is equivalent to that of Seismic Category I structures, systems or components. SSCs in this category are classified as Seismic Category II, except the Radwaste Building."

As described in DCD, Section 3.7.2.8.1 through 3.7.2.8.4, the Turbine Building, Radwaste Building, Service Building and Ancillary Diesel Building are all designed to satisfy the third criteria to prevent failure under SSE conditions.

The response to RAI 03.07.02-4, submitted in Detroit Edison letter NRC3-10-0018, dated May 10, 2010, [ML101320136], discusses that DCD Section 3.7.2.8 addresses the interaction of non-Category I structures with seismic Category I structures and establishes design criteria that protect seismic Category I structures from the failure of non-Category I structures. FSAR Section 3.7.2.8 incorporates DCD Section 3.7.2.8 by reference. The first criteria of DCD Section 3.7.2.8 is satisfied if site-specific, non-Category I structures are located at least a distance of its height above grade from Seismic Category I structures. As described in the response to RAI 03.07.02-4 all site-specific non-Category I structures satisfy this requirement. The response to RAI 03.07.02-4 included a revision to FSAR Section 3.7.2.8 stating:

> "Non-Category I structures within the scope of the DCD are addressed in the DCD. Non-Category I structures outside the scope of the DCD are located at least a distance of its height above grade from Seismic Category I structures. Thus, the collapse of any site specific non-Category I structure, system, or component will not cause the non-Category I structure, system, or component to strike a Seismic Category I structure, system, or component."

Thus, site-specific non-Category I structures are precluded from impacting Seismic Category I structures by providing sufficient distance between the non-Category I structures and the Seismic Category I structures. Therefore, consistent with the stated purpose of the first criteria in DCD Section 3.7.2.8, there are no safety implications from the collapse of a site-specific non-Category I structure.

For the purposes of this discussion, potential liquefaction concerns are limited to non-Category I structures that could strike a Seismic Category I structure if the non-Category I structure were to fail during a seismic event (that is, non-Category I structures that do not satisfy the first criteria in DCD Section 3.7.2.8). FSAR Table 2.5.4-201 identifies the subsurface material at Fermi 3. As shown in Table 2.5.4-201, the subsurface materials above the bedrock (Bass Island Group) are the fill, lacustrine deposits, and glacial till. As described in FSAR Sections 2.5.4.2.1.1.1 and 2.5.4.2.1.1.2 the existing fill and lacustrine deposits are not considered suitable for foundation support for Fermi 3 and will be excavated in the Fermi 3 area. As described in FSAR Section 2.5.4.2.1.1.3 [Page 1106] regarding the glacial till:

> "The glacial till will be removed from under Seismic Category I structures. However, based on the characteristic of glacial till, it may be used to support Non-Seismic Category I structures."

As shown in FSAR Table 2.5.4-202, glacial till is classified as lean clay (USCS Classification CL) with an average fines content of 68 percent and plasticity index of 14. NRC Regulatory Guide 1.198, Section B, "Discussion," under section titled "Screening Techniques for Evaluation of Liquefaction Potential," states:

> "Cohesive soils with fines content greater than 30 percent and fines that are either (1) are classified as clays based on the Unified Soil Classification system or (2) have Plasticity Index (PI) greater than 30 percent should generally not be considered susceptible to liquefaction."

Therefore, as the glacial till has a fine content greater than 30 percent and is classified as lean clay (CL), the glacial till satisfies the criterion in Regulatory Guide 1.198 and is not considered susceptible to liquefaction.

If backfill is placed above the glacial till to the base of a foundation, it will be an engineered backfill with quality control and testing such as discussed in FSAR Section 2.5.4.5.4.2. As discussed in the response to RAI 02.05.04-20 (Attachment 29 to Detroit Edison Letter NRC3-10-0006, dated February 11, 2010 [ML100570305]) this will result in a dense to very dense consistency granular backfill, which will not be susceptible to liquefaction. This will be the same material used for backfill adjacent to Seismic Category I structures described in the markup for FSAR Section 2.5.4.8 included with the response to RAI 02.05.04-34 in Detroit Edison Letter NRC3-10-0035, dated August 6, 2010 [ML102210351]; which identifies that there is no potential for liquefaction of the engineered granular backfill.

Additional discussion will be added to the markup of FSAR Section 2.5.4.8 provided in the response to RAI 02.05.04-34 to address liquefaction under non-Category I structures.

Proposed COLA Revision

Proposed revision to the markup for FSAR Section 2.5.4.8 is shown on the attached markup. For clarity, this markup is provided on the markup previously provided with the response to RAI 02.05.04-34.

Markup of Detroit Edison COLA
(following 5 pages)

The following markup represents how Detroit Edison intends to reflect this RAI response in a future submittal of the Fermi 3 COLA. 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.

geologic mapping program includes photographic documentation of the exposed surface and documentation for significant geologic features.

The details of the quality control and quality assurance programs for foundation bedrock are addressed in the design specifications prepared during the detailed design phase of the project.

2.5.4.5.4.2 Backfill Materials and Quality Control

Backfill for the Fermi 3 may consist of concrete fill or a sound, well graded granular backfill. Engineered granular backfill to be used will have a ϕ' equal to or greater than 35 degrees when properly placed and compacted. In addition, the engineered backfill is required to meet the following criteria:

i. Product of peak ground acceleration α (in g), Poisson's ratio ν and density γ

$\alpha(0.95\nu + 0.65)\gamma$: 1220 kg/m^3 (76 lbf/ft^3) maximum

ii. Product of at-rest pressure coefficient κ_0 and density:

$\kappa_0\gamma$:750 kg/m^3 (47lbf/ft^3) minimum

iii. At-rest pressure coefficient:

κ_0: 0.36 minimum

iv. Soil density

γ: 1900 kg/m^3 (119 lbf/ft^3) minimum

The anticipated extent of lean concrete fill and granular backfill is shown on Figure 2.5.4-202, Figure 2.5.4-203, and Figure 2.5.4-204.

Concrete fill mix designs are addressed in a design specification prepared during the detailed design phase of the project. Field observation is performed to verify that approved mixes are used and test specimens are obtained that verify that specified design parameters are reached. The foundation bedrock and concrete fill provide adequately high factors of safety against bearing capacity failure under both static and seismic structural loading. Quality Control testing requirements for bedrock include visual inspection and geologic mapping.

Engineered granular backfill sources are identified and tested for engineering properties, in accordance with recommendations from Subsection 2.5.4.5.1 and other testing as required by design specifications.

Insert 1 here

Insert 1

During detailed design, the laboratory testing in Subsection 2.5.4.5.1 is implemented to establish the required density to meet design requirements of the engineered granular backfill adjacent to Category I structures. To further confirm the density selected based on the laboratory testing results meets the design requirements, a program will be implemented to test the in-place engineered granular backfill, which could consist of construction of a test pad(s). Also during detailed design, a testing program will be implemented to confirm the engineered granular backfill placed during construction meets the design requirements. For liquefaction, the program could consist of performing standard penetration tests to confirm the fill has the minimum N_{60} in Subsection 2.5.4.8.

profiles and modulus reduction and damping curves are described in Subsection 2.5.2.6.

2.5.4.8 Liquefaction Potential

This section conforms to guidelines in RG 1.198.

All Seismic Category I structures are supported within the Bass Islands dolomite or on lean concrete fill extending to the top of bedrock. Neither the bedrock nor lean concrete fill are susceptible to liquefaction. ~~Engineered granular backfill is used to fill adjacent to all Seismic Category I structures and is not susceptible to liquefaction.~~

Insert 2 here

for these soils

The existing fill, lacustrine deposits and glacial till are removed under and adjacent to all Seismic Category I structures; therefore, liquefaction analysis is not necessary.

Glacial till and/or engineered granular backfill will be used as foundation support under non-Category I structures that could strike a Seismic Category I structure if it were to fail during a seismic event. Glacial till is not susceptible to liquefaction based on it's USCS classification as lean clay (CL) and fines content greater than 30 percent (Table 2.5.4-202). As described above, engineered granular backfill is not susceptible to liquefaction.

2.5.4.9 Earthquake Design Basis

The V_S values of soils and bedrock at the site were determined through the field exploration program using geophysical testing as described in Subsection 2.5.4.2 and Subsection 2.5.4.4. Subsection 2.5.4.7 presents the dynamic response of soil and bedrock under dynamic loading conditions. The top of generic bedrock is approximately 129.5 m (425 ft) below the existing ground surface where the V_S of bedrock (Salina Group Unit B) is greater than 2804 m/s (9200 fps). A site response analysis was performed using the above information to develop the GMRS for the site as described in Subsection 2.5.2.6.

2.5.4.10 Static Stability

In this section, the analyses performed to evaluate the stability of the safety-related structures under static loading conditions are presented. Specifically, this subsection addresses three Seismic Category I structures – R/FB, CB and FWSC. This section includes analyses of foundation bearing capacity and settlement, excavation rebound, lateral earth pressures, and hydrostatic pressures.

DCD Figure 3G.1-6 and DCD Tables 2.0-1, 3.8-8, and 3.8-13 provide information on plan dimensions, embedment depths, and loads. The R/FB mat foundation has plan dimensions of 49.0 by 70.0 m (161 by 230 ft), and bears 20.0 m (65.6 ft) below the Referenced DCD reference grade (4500 mm). As discussed in Subsection 2.5.4.5, the Referenced DCD reference grade is equivalent to a site elevation of 179.6 m (589.3 ft) NAVD 88. The base of the R/FB foundation base is thus at elevation

Insert 2

For engineered granular backfill adjacent to Seismic Category I structures, liquefaction considerations only apply below the groundwater table. Section 2.4.12.5 provides the maximum historical high groundwater level of 175.6 m (576.11 ft) NAVD 88, which is approximately 4 m (13.2 ft) below the plant grade of 179.6 m (589.3 ft) NAVD 88; therefore, liquefaction is not a consideration in the upper 4 m (13.2 ft) of the engineered granular backfill. Section 2.5.4.5.4.2 discusses placement of granular backfill adjacent to Seismic Category I structures in controlled lifts with compaction. This will result in a dense to very dense consistency engineered backfill surrounding the embedded walls of Seismic Category I structures; therefore, there is also no potential for liquefaction if the engineered granular backfill below the groundwater. For confirmation, a liquefaction analysis based on the standard penetration test (SPT) is provided to demonstrate that the engineered granular backfill is not susceptible to liquefaction.

Reference 2.5.4-252, Table 12.1 shows that for dense granular soils N_{60} is between 30 and 50 blows/foot, and for very dense granular soils N_{60} is greater than 50 blows/foot. N_{60} is the numbers of blow to drive a standard split barrel sampler the last 12 inches of the SPT using a 140 pound hammer falling 30 inches, where the hammer has a 60 percent energy efficiency. To evaluate liquefaction potential of soil, $(N_1)_{60}$ is needed, where $(N_1)_{60}$ is the N_{60} value normalized to an overburden pressure of approximately 100 kPa (1 ton per square foot) (Reference 2.5.4-253). Reference 2.5.4-253 shows that for historical data, no liquefaction was observed when $(N_1)_{60}$ is greater than 30 blows/ft.

For the engineered granular backfill, the N_{60}-value is estimated to be 30 blows/foot at the ground surface, and is increased linearly to 60 blows/foot at a depth of 65 feet. Using this distribution for N_{60} and a bounding groundwater level at 2 feet below plant grade, at all engineered granular backfill depths for the full depth of the deepest Seismic Category I structure, $(N_1)_{60}$ is greater than 30 blows/foot. With the backfill placement approach and resultant $(N_1)_{60}$ greater than 30, it is concluded that the engineered granular backfill, adjacent to all Seismic Category I structures, is not susceptible to liquefaction. If $(N_1)_{60}$ of the in-place engineered granular backfill is less than 30, a more refined liquefaction analysis will be performed to confirm there is adequate resistance against liquefaction.

New FSAR References

2.5.4-252
Youd, T.L., et al., Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils, Journal of the Geotechnical and Geoenvironmental Engineering, Vol. 127, No.10, pp. 817-833, ASCE, 2001.

Attachment 2
NRC3-10-0042

Response to RAI Letter No. 40
(eRAI Tracking No. 4920)

RAI Question No. 13.06.06-1

NRC RAI 13.06.06-1

Definitions for use in Part 73 are contained in 10 CFR 73.2.. A glossary was not provided in the Fermi 3 cyber security plan. However in Section 1, Introduction, of the Fermi 3 cyber security plan, reference is made to the glossary in NEI 08-09, Revision 6. Does DTE intend to incorporate by reference the glossary in NEI 08-09 Revision 6 Appendix B?

Response

Section 2 of the Introduction to NEI 08-09, Revision 6 provides instructions for preparation of cyber security plans for submittal to the NRC, should a licensee or applicant elect to use NEI 08-09, Revision 6 as a basis for their plan. The instructions state that the Cyber Security Plan submitted to the NRC need only include Appendix A, "Cyber Security Plan Template," with the bracketed information revised with site specific information. The template references Appendix B, "Glossary," Appendix D, "Technical Security Controls," and Appendix E, "Management and Operational Controls." It is implied that these would be incorporated by reference. Changes to the standard text contained in the template or referenced appendices were to be avoided.

Revision 1 of the Cyber Security Plan submitted for Fermi 3 is based upon NEI 08-09, Revision 6. It is the intent of Detroit Edison to incorporate Appendix B of NEI 08-09, Revision 6 by reference, with one deviation. The deviation from Appendix B of NEI 08-09, Revision 6 was identified in the transmittal letter for Revision 1 of the Fermi 3 Cyber Security Plan (NRC3-10-0024 dated June 25, 2010) and was related to the definition of "Cyber Attack." The revised "Cyber Attack" definition was accepted by the NRC in a letter from Richard P. Correia (USNRC) to Christopher E. Earls (NEI) dated June 7, 2010.

Proposed COLA Revision

None.

Attachment 3
NRC3-10-0042

Response to RAI Letter No. 40
(eRAI Tracking No. 4920)

RAI Question No. 13.06.06-2

NRC RAI 13.06.06-2

Licensees are required to implement security controls to protect the digital assets within the scope of 10 CFR 73.54 from cyber attacks by 10 CFR 73.54(c)(1). In the Fermi 3 Cyber Security Plan, Section 4.2 Cyber Security Controls, states "The Technical, Operational and Management Cyber Security Controls described in Appendices D and E of NEI 08-09 Revision 6, are evaluated and dispositioned based on site specific conditions during the establishment of risk baselines, during on-going programs, and during oversight activities." Does DTE intend to incorporate by reference all the security controls in NEI 08-09 Revision 6 Appendices D and E?

Response

Section 2 of the Introduction to NEI 08-09, Revision 6 provides instructions for preparation of cyber security plans for submittal to the NRC, should a licensee or applicant elect to use NEI 08-09, Revision 6 as a basis for their plan. The instructions state that the Cyber Security Plan submitted to the NRC need only include Appendix A, "Cyber Security Plan Template," with the bracketed information revised with site specific information. The template references Appendix B, "Glossary," Appendix D, "Technical Security Controls," and Appendix E, "Management and Operational Controls." It is implied that these would be incorporated by reference. Changes to the standard text contained in the template or referenced appendices were to be avoided.

Revision 1 of the Cyber Security Plan submitted for Fermi 3 is based upon NEI 08-09, Revision 6. It is the intent of Detroit Edison to incorporate Appendix D and Appendix E of NEI 08-09, Revision 6 by reference, without deviation.

Proposed COLA Revision

None

Attachment 4
NRC3-10-0042

Response to RAI Letter No. 40
(eRAI Tracking No. 4927)

RAI Question No. 03.02.01-1

NRC RAI 03.02.01-1

FSAR Subsection 3.2 does not identify any departures or supplements relative to seismic classification identified in the ESBWR DCD and conformance with RG 1.29 Revision 4, but FSAR Table 1.9-202 identifies an exception to Revision 4, dated March 2007 and implements Revision 3 rather than Revision 4. RG 1.206 Part C.III.1 subsection C.I.1.9.1 states that, for site-specific portions of the facility design that are not included in the referenced certified design, a COL applicant should address conformance with regulatory guides in effect 6 months before the submittal date of the COL application. Explain and justify why the seismic classification of site-specific SSCs are based on RG 1.29 Revision 3 rather than the current Revision 4.

Response

ESBWR Structures, Systems and Components (SSCs), including all site-specific SSCs, for Fermi 3 have been classified in the DCD in accordance with Revision 3 of Regulatory Guides 1.29 (refer to DCD Table 3.2-1). There are no additional site-specific SSCs beyond those listed in the DCD. Therefore, FSAR Revision 2 Table 1.9-202 takes exceptions to Revision 4 of Regulatory Guides 1.29. The justification for these exceptions, as stated in FSAR Table 1.9-202, are that the requirements for the seismic classifications for systems and structures are defined by the DCD, which implements Revision 3 of Regulatory Guide 1.29.

The response to RAI 17.5-23, submitted in Detroit Edison letter NRC3-10-0036, dated September 2, 2010, provided a proposed markup to FSAR Table 1.9-202 to clarify that conformance with Revision 4 of Regulatory Guides 1.29 is limited to site specific SSCs that are outside the scope of the DCD.

Proposed COLA Revision

None. Refer to proposed COLA revision included with the response to RAI 17.5-23, submitted in Detroit Edison letter NRC3-10-0036, dated September 2, 2010.

Attachment 5
NRC3-10-0042

Response to RAI Letter No. 40
(eRAI Tracking No. 4927)

RAI Question No. 03.02.01-2

NRC RAI 03.02.01-2

DCD and COLA Section 1 identify certain site-specific SSCs that are outside the scope of the DCD and the COL applicant is expected to provide site-specific information. FSAR 3.2 identifies only limited site-specific systems. FSAR Table 1.9-203 states there are no safety-related or RTNSS SSCs not included in the DCD, but it is not clear if there are any unique plant-specific nonsafety-related SSCs that are considered important to safety and are not addressed in the DCD that are to be evaluated in the FSAR. For example, plant specific features, such as the fiberglass service water piping that appears to be considered site-specific, is not seismically classified or addressed in FSAR Section 3.2. The non-safety-related RTNSS C service water system piping is classified in the DCD as non-seismic and based on DCD 19A.8.3, RTNSS Criterion C components are not required to function in order to avoid core damage following a seismic event. However, RTNSS Criterion C SSCs are to be designed to seismic standards of the IBC and should be designed to be highly reliable. Staff is concerned that the structural integrity of buried fiberglass piping may not be as reliable as steel pipe after a seismic event and should be evaluated for seismic adequacy or the consequences of a catastrophic failure caused by a seismic event. Clarify if there are any unique site-specific SSCs outside the scope of the DCD that are not addressed in FSAR subsection 3.2.1 and are to be seismically evaluated in the COLA. If so, the applicant is requested to identify and justify the seismic classification of such SSCs.

Response

FSAR Section 3.2 incorporates DCD Table 3.2-1 by reference with two changes. One change is the identification that the site-specific plant design includes the Hydrogen Water Chemistry System (HWCS). DCD Table 3.2-1 includes the classification information for the HWCS; thus, the only detail included in the FSAR is to identify that the HWCS is included in the site-specific plant design. As shown in DCD Table 3.2-1, the HWCS is non-safety related and non-seismic. The second change is the identification that the site-specific design does not include the Zinc Injection System.

DCD Appendix 19A demonstrates that the ESBWR design adequately addresses Regulatory Treatment of Non-Safety Systems (RTNSS) issues. DCD Appendix 19A defines the criteria that are applied to the ESBWR design to determine the systems that are candidates for regulatory oversight. Based on the criteria, DCD Appendix 19A, Table 19A-2 identifies the RTNSS functions. DCD Appendix 19A Table 19A-3 identifies the structures housing the RTNSS functions identified in DCD Table 19A-2. There are no site-specific RTNSS functions or structures housing RTNSS functions outside the scope of the DCD. Additionally, there are no site-specific SSCs not in the DCD that are important to safety.

The DCD identifies SSCs as either safety-related, RTNSS, or nonsafety related. FSAR Table 1.9-203, "Conformance with the FSAR Content Guidance in Regulatory Guide 1.206," evaluates conformance with section C.III.1.3.2.1, "Seismic Classification," of Regulatory Guide 1.206. FSAR Table 1.9-203 states:

> "There are no additional safety-related or RTNSS SSCs subject to seismic classification beyond those addressed in the DCD. There are no SSCs outside the referenced certified design that are required to be designed for an OBE."

The seismic classification of RTNSS SSCs is within the scope of the DCD. Regarding RTNSS B components, DCD Section 19A.8.3 states:

> "RTNSS B components are required to function following a seismic event and they are designed to Seismic Category II, at a minimum. (Some RTNSS B structures are Seismic Category I due to safety-related equipment within)."

Regarding RTNSS C components, DCD Section 19A.8.3 states:

> "However, some RTNSS C systems are housed in Seismic Category I or II structures, and some are housed in non-seismic structures that are designed using the International Building Code – 2003 by International Code Council, Inc. (IBC-2003) to maintain structural integrity under SSE conditions. Non-seismic structures that house RTNSS Criterion C systems are seismically designed using dynamic analysis method with the SSE ground input motion equal to two-thirds of the Certified Seismic Design Spectra taken from Figures 2.0-1 and 2.0-2 adjusted as required to their bases. An Occupancy Importance Factor of 1.5, Response Modification Factor of 2 and Seismic Design Category D/Seismic Use Group III apply to these structures. RTNSS C systems and components are designed to the seismic requirements of IBC-2003 consistent with the above SSE ground motion."

As described in the supplemental response to RAI 09.02.01-3 submitted in Detroit Edison letter NRC3-10-0029, dated July 9, 2010 [ML101930518], Detroit Edison has elected not to pursue the use of fiberglass reinforced polyester piping for the Plant Service Water System (PSWS). Alternatively, Detroit Edison has selected carbon steel that meets ASTM standards for underground piping in the PSWS. Quality and seismic requirements for the underground piping for the PSWS are dictated by DCD Table 3.2-1.

Proposed COLA Revision

None.

Attachment 6
NRC3-10-0042

Response to RAI Letter No. 40
(eRAI Tracking No. 4929)

RAI Question No. 03.02.02-1

NRC RAI 03.02.02-1

FSAR Subsection 3.2 does not identify any departures or supplements relative to quality group classification identified in the ESBWR DCD and conformance with RG 1.26 Revision 4, but FSAR Table 1.9-202 identifies an exception to Revision 4, dated March 2007, and Revision 3 is implemented rather than Revision 4. RG 1.206 Part C.III.1 subsection C.I.1 .9.1 states that, for site-specific portions of the facility design that are not included in the referenced certified design, a COL applicant should address conformance with regulatory guides in effect 6 months before the submittal date of the COL application. Explain and justify why the quality group classification of any site-specific SSCs are based on RG 1.26 Revision 3 rather than the current Revision 4.

Response

ESBWR Structures, Systems and Components (SSCs), including all site-specific SSCs, for Fermi 3 have been classified in the DCD in accordance with Revision 3 of Regulatory Guides 1.26 (refer to DCD Table 3.2-1). There are no additional site-specific SSCs beyond those listed in the DCD. Therefore, FSAR Revision 2 Table 1.9-202 takes exceptions to Revision 4 of Regulatory Guides 1.26. The justification for these exceptions, as stated in FSAR Table 1.9-202, are that the requirements for the quality group classifications for systems and structures are defined by the DCD, which implements Revision 3 of Regulatory Guide 1.26.

The response to RAI 17.5-23, submitted in Detroit Edison letter NRC3-10-0036, dated September 2, 2010, provided a proposed markup to FSAR Table 1.9-202 to clarify that conformance with Revision 4 of Regulatory Guides 1.26 is limited to site specific SSCs that are outside the scope of the DCD.

Proposed COLA Revision

None. Refer to proposed COLA revision included with the response to RAI 17.5-23, submitted in Detroit Edison letter NRC3-10-0036, dated September 2, 2010.

Attachment 7
NRC3-10-0042

Response to RAI Letter No. 40
(eRAI Tracking No. 4929)

Supplemental RAI Question No. 03.02.02-2

NRC RAI 03.02.02-2

SRM dated July 21, 1993, concerning SECY-93-087 identified that the staff will review passive plant design applications using the newest codes and standards endorsed by the NRC and unapproved revisions to the codes will be reviewed on a case by case basis. RG 1.206 Part C.III identifies that COL applicants that reference a certified design do not need to include additional information on codes and standards. However, if the applicant deviates from the DCD or there are site-specific SSCs, codes and standards would be expected to be identified. Editions of various codes and standards are referenced in FSAR Table 1.9-204, but it is not clear if the list of codes and standards applies only to site-specific SSCs or if the list is a comprehensive list. For example, the ASME B31 .1 Code and supplemental standards used for the plant-specific fiberglass pressure pipe and the applicable editions are not referenced in FSAR Table 1.9-204. Clarify which editions of codes and standards apply to any site-specific SSCs, such as fiberglass piping, and if those editions are NRC endorsed or need to be reviewed on a case by case basis

Response

The industrial codes and standards which are applicable to the design and procurement of ESBWR SSCs are provided in DCD, Revision 7, Table 1.9-22. As described in FSAR Section 1.9.2, under Industrial Codes and Standards:

> "Table 1.9-204 identifies the Industrial Codes and Standards that are applicable to those portions of the Fermi 3 design that are beyond the scope of the DCD, and to the operational aspects of the facility."

Therefore, the codes and standards referenced in FSAR Table 1.9-204 apply to the portions of the Fermi 3 design beyond the scope of the DCD and to operational aspects of the facility, and are not a comprehensive list of all codes and standards applicable to Fermi 3.

As described in the supplemental response to RAI 09.02.01-3 submitted in Detroit Edison letter NRC3-10-0029, dated July 9, 2010 [ML101930518], Detroit Edison has elected not to pursue the use of fiberglass reinforced polyester piping for the Plant Service Water System (PSWS). Alternatively, Detroit Edison has selected carbon steel that meets ASTM standards for underground piping in the PSWS. As described in the response to RAI Quality and seismic requirements for the underground piping for the PSWS are dictated by DCD Table 3.2-1. The codes and standards for the underground carbon steel piping are included in DCD Table 1.9-22.

FSAR Table 1.9-202 evaluates conformance with NRC Regulatory Guides. In Table 1.9-202, the term "Conforms" means that no exception is being taken to the guidance in the regulatory positions as they apply to site-specific design information, operation aspects of the facility, or siting information in the FSAR. DCD Table 1.9-21 addresses applicability of NRC Regulatory Guides to the ESBWR.

DCD Revision 7 added a comment for Regulatory Guide 1.84 to apply Code Case N-782. The basis for including Code Case N-782 is described in Section 1.9.2 of the DCD. To ensure

consistency with the DCD regarding application of Code Case N-782, the code case is being added to FSAR Table 1.9-202 for Regulatory Guide 1.84.

Proposed COLA Revision

The attached markup for FSAR Table 1.9-202 adds Code Case N-782 to Regulatory Guide 1.84.

Markup of Detroit Edison COLA
(following 1 page)

The following markup represents how Detroit Edison intends to reflect this RAI response in a future submittal of the Fermi 3 COLA. 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.

Table 1.9-202 Conformance with Regulatory Guides (Sheet 9 of 25)

[EF3 COL 1.9-3-A]

RG Number	Title	Revision	Date	RG Position	Evaluation
1.77	Assumptions Used for Evaluating a Control Rod Ejection Accident for Pressurized Water Reactors	Rev. 0	May-74	General	Not applicable
1.78	Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release	Rev. 1	Dec-01	General	Conforms
1.79	Preoperational Testing of Emergency Core Cooling Systems for Pressurized Water Reactors	Rev. 1	Sep-75	General	Not applicable
1.81	Shared Emergency and Shutdown Electric Systems for Multi-Unit Nuclear Power Plants	Rev. 1	Jan-75	General	Not applicable
1.82	Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident	Rev. 3	Nov-03	General	Not applicable
1.83	Inservice Inspection of Pressurized Water Reactor Steam Generator Tubes	Rev. 1	Jul-75	General	Not applicable
1.84	Design, Fabrication, and Materials Code Case Acceptability, ASME Section III	Rev. 34	Oct 07	General	Conforms
1.86	Termination of Operating Licenses for Nuclear Reactors	Rev. 0	Jun-74	General	This RG is outside the scope of the FSAR.
1.87	Guidance for Construction of Class 1 Components in Elevated-Temperature Reactors (Supplement to ASME Section III Code Cases 1592, 1593, 1594, 1595, and 1596)	Rev. 1	Jun-75	General	Not applicable
1.89	Environmental Qualification of Certain Electric Equipment Important to Safety for Nuclear Power Plants	Rev. 1	Jun-84	General	Conforms. Source terms from RG 1.183 used.

Code Case N-782 is also applied as described in the Comments Section for RG 1.84 in Table 1.9-21 of the DCD.

Attachment 8
NRC3-10-0042

Response to RAI Letter No. 40
(eRAI Tracking No. 4929)

RAI Question No. 03.02.02-3

NRC RAI 03.02.02-3

General Design Criterion 1 identifies, in part, that structures systems and components important to safety shall be designed, fabricated, erected and tested to quality standards commensurate with the importance of the safety functions to be performed. Where generally recognized codes and standards are used, they shall be supplemented or modified as necessary to assure a quality product in keeping with the required safety function. RG 1.206 Part C.III subsection C.I.3.2.2 states that the COL applicant is to identify those fluid systems or portions that are important to safety and outside the scope of the certified design, as well as the applicable codes and standards for each pressure-retaining component. SRP 3.2.2 also specifically states that the staff reviews quality standards including application of the QA program and codes and standards applicability. Supplemental quality standards and QA program applicable to passive SSCs used in nonsafety-related RTNSS systems that may be important to safety are not clearly defined in subsection 3.2 of the COL application for site- specific SSCs. Clarify in FSAR 3.2 or include a pointer to another FSAR chapter to define what supplemental quality standards are applied to non-safety-related site-specific SSCs that are important to safety to ensure that all SSCs important to safety are designed, fabricated, erected, and tested to quality standards commensurate with the safety function to be performed. For example, FSAR subsection 9.2.1.5 identifies that fiberglass pressure pipe that meets ASME B31.1 and other supplemental standards will be applied, but it is not obvious which supplemental quality standards apply to site-specific SSCs, such as fiberglass piping, in either the DCD 3.2 tables or FSAR Section 3.2.

Response

FSAR Section 3.2 incorporates DCD Table 3.2-1 by reference with two changes. One change is the identification that the site-specific plant design includes the Hydrogen Water Chemistry System (HWCS). DCD Table 3.2-1 includes the classification information for the HWCS; thus, the only detail included in the FSAR is to identify that the HWCS is included in the site-specific plant design. As shown in DCD Table 3.2-1, the HWCS is non-safety related and non-seismic. The second change is the identification that the site-specific design does not include the Zinc Injection System.

The ESBWR DCD Table 3.2-1 specifies the extent to which the quality assurance requirements apply to nonsafety-related SSCs. GEH has included this information in DCD Section 3.2 and Appendix 19A. These requirements are applied to all structures, systems, and components, including those that are site-specific. In addition, FSAR Table 1.9-203 states:

> "There are no additional safety-related or RTNSS SSCs subject to seismic classification beyond those addressed in the DCD. There are no SSCs outside the referenced certified design that are required to be designed for an OBE."

There are no site specific safety related or non-safety related RTNSS systems beyond the scope of the DCD. Therefore, there is no need to define supplemental quality standards for site-specific SSCs.

As described in the supplemental response to RAI 09.02.01-3 submitted in Detroit Edison letter NRC3-10-0029, dated July 9, 2010 [ML101930518], Detroit Edison has elected not to pursue the use of fiberglass reinforced polyester piping for the Plant Service Water System (PSWS). Alternatively, Detroit Edison has selected carbon steel that meets ASTM standards for underground piping in the PSWS. Quality assurance and seismic requirements for the underground piping for the PSWS are dictated by DCD Table 3.2-1. The codes and standards for the underground carbon steel piping are included in DCD Table 1.9-22.

Proposed COLA Revision

A proposed markup is provided for FSAR Section 3.2 to clearly state that there are no site specific safety related or non-safety related RTNSS systems beyond the scope of the DCD.

Markup of Detroit Edison COLA
(following 2 pages)

The following markup represents how Detroit Edison intends to reflect this RAI response in a future submittal of the Fermi 3 COLA. 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.

Chapter 3 Design of Structures, Components, Equipment, and Systems

3.1 Conformance with NRC General Design Criteria

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

3.2 Classification of Structures, Systems and Components

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

Insert 1 Here. →

Table 3.2-1 Classification Summary

Replace the note for System P73 with the following.

STD CDI The site-specific plant design includes the HWCS. See Subsection 9.3.9 for further details.

Replace the note for System P74 with the following.

STD CDI The site-specific plant design does not include the Zinc Injection System.

3.3 Wind and Tornado Loadings

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

3.4 Water Level (Flood) Design

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

3.5 Missile Protection

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

3.5.1.5 Site Proximity Missiles (Except Aircraft)

Add the following sentence after the first sentence in the first paragraph.

Insert 1

STD CDI	Add the following sentence at the end of Section 3.2 There are no site specific safety related or non-safety related RTNSS systems beyond the scope of the DCD.