PMFermiCOLPEm Resource

From: Ryan C Pratt [prattrc@dteenergy.com]
Sent: Friday, February 08, 2013 3:58 PM
To: Govan, Tekia
Cc: Eudy, Michael; Muniz, Adrian; Michael K Brandon
Subject: 2/8/13 Fermi 3 Submittals
Attachments: NRC3-13-0006.pdf; NRC3-13-0007.pdf

Tekia,

Please find the attached courtesy copies for the following two Fermi 3 COLA submittals, dated February 8, 2013:

- NRC3-13-0006, "DTE Electric Company Response to NRC Request for Additional Information Letter No. 81"
- NRC3-13-0007, "DTE Electric Company Response to NRC Request for Additional Information Letter No. 82"

Please let me know if you have any questions.

Thanks,

Ryan Pratt
Nuclear Development - Licensing
313.235.0109

Hearing Identifier: Fermi_COL_Public
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DTE Energy

10 CFR 52.79

February 8, 2013
NRC3-13-0006

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

References: 1) Fermi 3
Docket No. 52-033
2) Letter from Michael Eudy (USNRC) to Peter W. Smith (DTE Electric), "Request for Additional Information Letter No. 81 Related to Chapter 01 for the Fermi 3 Combined License Application," dated January 14, 2013

Subject: DTE Electric Company Response to NRC Request for Additional Information Letter No. 81

In Reference 2, the NRC requested additional information to support the review of certain portions of the Fermi 3 Combined License Application (COLA). The Requests for Additional Information (RAIs) in Reference 2 are related to the tables in FSAR Chapter 1 which describe conformance with various NRC guidance and other documents.

Attachments 1 through 4 provide responses to the RAIs in RAI Letter No. 81. Attachment 5 provides the COLA markups described in Attachments 1 through 4.

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 8th day of February 2013.

Sincerely,

Peter W. Smith, Director
Nuclear Development – Licensing and Engineering
DTE Electric Company

Attachments:
1) Response to RAI Letter No. 81 (RAI 01-8)
2) Response to RAI Letter No. 81 (RAI 01-9)
3) Response to RAI Letter No. 81 (RAI 01-10)
4) Response to RAI Letter No. 81 (RAI 01-11)
5) RAI Letter No. 81 COLA Markups

cc: Adrian Muniz, NRC Fermi 3 Project Manager
Tekia Govan, NRC Fermi 3 Project Manager
Michael Eudy, NRC Fermi 3 Project Manager
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
NRC3-13-0006
(3 pages)

Response to RAI Letter No. 81
(eRAI Tracking No. 6978)

RAI Question No. 01-8

NRC RAI 01-08

The requirements of 10 CFR 52.79(a)(41) specify that COL applications for a light-water-cooled nuclear power plant should evaluate the facility against the NRC's application and review guidance in effect 6 months before the docket date of the application. The evaluation required by this section must include an identification and description of all differences in design features, analytical techniques, and procedural measures proposed for the facility and those corresponding features, techniques, and measures in the acceptance criteria in the application and review guidance. In FSAR Table 1.9-201, the applicant evaluates conformance with the Standard Review Plan (SRP) (NUREG–0800) sections and Branch Technical Positions (BTPs) guidance and acceptance criteria in effect 6 months before the COL application docket date (i.e., September 18, 2008). With respect to FSAR Table 1.9-201, the staff has noted the following inconsistencies and requests for the applicant to address these inconsistencies and to also check for any additional inconsistencies in this table and revise the FSAR accordingly:

A. *In Table 1.9-201, the applicant labels one of the evaluation outcome as "Not applicable," which means that the section/acceptance criteria does not apply to the ESBWR or Fermi 3. The staff's review noted that the applicant does not always provide clarifying statement on why a section/acceptance criterion is not applicable. It is not obvious why a specific acceptance criterion is not applicable to the ESBWR or Fermi 3. The staff's comparisons of not applicable SRP sections/acceptance criteria in Table 1.9-201 with those listed in ESBWR DCD Tier 2 Table 1.9-20 and in SRP sections (in NUREG–0800) concluded that additional clarifying statements are needed. Therefore, the staff requests for the applicant to provide clarifying statements on non applicability of the following SRP sections/acceptance criteria and BTPs:*

   - *SRP Section 2.0, SRP Acceptance Criteria II.1, and II.3*
   - *BTP 5-4*
   - *SRP Section 6.3, SRP Acceptance Criteria II.5 and II.9*
   - *SRP Section 9.5.1, SRP Acceptance Criteria II.1, II.2, II.4*
   - *SRP Section 10.3, SRP Acceptance Criterion II.4*
   - *SRP Section 13.1.2-13.1.3, SRP Acceptance Criterion II.1D*
   - *SRP Section 15.2.1-15.2.5, SRP Acceptance Criterion II.2C*
   - *SRP Section 15.2.6, SRP Acceptance Criterion II.3*
   - *SRP Section 15.2.7, SRP Acceptance Criterion II.2C*
   - *SRP Section 15.4.4-15.4.5, SRP Acceptance Criterion II.C*

B. *The staff found discrepancies in versions and/or publication dates of the following SRP sections (shown here with corrected revision numbers and dates) listed in FSAR Table 1.9-201 that were in effect 6 months before the submittal date of the application. The staff requests for the applicant to clarify these discrepancies and revise the FSAR accordingly:*

   - *SRP Section 1 Revision 1, dated November 2007*
   - *SRP Section 17.6 Revision 1, dated August 2007*
   - *SRP Section 19.2 Initial issuance, dated June 2007*

C. *The staff found that the referencing to the specific acceptance criteria in Table 1.9-201 is not always consistent. Because SRP acceptance criteria are in Section II of each SRP section, the referencing to a specific criterion should always start with "II." The staff*

requests for the applicant to correct the inconsistency in referencing acceptance criteria for SRP Sections 15.2.1-15.2.5, 15.2.7, 15.4.1, 15.4.2, 15.4.4-15.4.5, and 15.8.

Response

The following specific responses are provided:

Part A

Clarifying statements have been added to FSAR Table 1.9-201 to provide justification that the identified Standard Review Plan (SRP) sections and Branch Technical Positions (BTPs) are not applicable to Fermi 3, with the following comments (no comment is included below where the requested justification was added for the SRP section and no additional changes were made):

- SRP Section 2.0 – changed to reflect that Fermi 3 conforms to Acceptance Criteria II.1 and II.3. Changed Acceptance Criterion II.4 to not applicable and added appropriate justification.
- SRP Section 9.5.1 – these acceptance criteria refer to specific Regulatory Guides (RGs). The applicability of these RGs is addressed in Table 1.9-202 and DCD Table 1.9-21. Justification is added to FSAR Table 1.9-201 for SRP Section 9.5.1, Acceptance Criteria II.1, II.2, and II.4, referring to Table 1.9-202 in addition to DCD Table 1.9-21.
- SRP Section 13.1.2-13.1.3 - Acceptance Criterion II.1D has been changed to "conforms." This Acceptance Criterion is general in nature and Fermi 3 conforms to this criterion.
- SRP Sections 15.2.1-15.2.5, 15.2.6, and 15.2.7 - changed all Acceptance Criteria to "conforms." These criteria are all applicable.
- SRP Section 15.4.4-15.4.5 - changed all Acceptance Criteria to "not applicable." ESBWR does not have forced recirculation systems.

Part B

DTE Electric concurs that the revision number and/or date for the identified SRP sections should be updated. These changes are reflected in the attached COLA markup.

Part C

DTE Electric concurs that the SRP Acceptance Criteria for the identified SRP sections should be updated to be consistent with the numbering in the associated SRP section. In addition, similar changes are also being made to the following SRP sections: 15.1.1-15.1.4, 15.4.3, 15.4.7, 15.4.9, 15.5.1-15.5.2, 15.6.1, 15.7.3, and 15.7.9. These changes are reflected in the attached COLA markup.

Proposed COLA Revision

FSAR Chapter 1 is revised as shown in Attachment 5.

Attachment 2
NRC3-13-0006
(4 pages)

Response to RAI Letter No. 81
(eRAI Tracking No. 6978)

RAI Question No. 01-9

NRC RAI 01-09

The requirements of 10 CFR 52.79(a)(4)(i) specify that the content of a COL application must include information on the design of the facility, including its principal design criteria. In general, regulatory guides describe methods that the NRC staff considers acceptable for implementing the general design criteria (GDC) specified in Appendix A to 10 CFR Part 50. Thus, COL applicants should provide an evaluation of conformance with the guidance in NRC regulatory guides in effect 6 months before the submittal date of the COL application. In FSAR Tables 1.9-202 and 1.9-203, the applicant evaluates conformance with Division 1, 4, 5, and 8 regulatory guides in effect 6 months before the COL application docket date. With respect to FSAR Tables 1.9-202 and 1.9-203, the staff has noted the following inconsistencies and requests for the applicant to address these inconsistencies and to also check for any additional inconsistencies in these tables and revise the FSAR accordingly:

A. *The staff found that FSAR Table 1.9-202 does not include the following regulatory guides, which ESBWR DCD Tier 2 Table 1.9-21 identifies as either the COL responsibility or applicable to the ESBWR design:*

   - *RG 5.7, Revision 1, dated May 1980*
   - *RG 5.12, Revision 0, dated November 1973*
   - *RG 7.10, Revision 2, dated March 2005*

   Therefore, the staff requests for the applicant to add these regulatory guides to the list in Table 1.9-203, or justify their exclusions.

B. *The staff found discrepancies in versions and/or publication dates of the following regulatory guides (shown here with corrected revision numbers and dates) listed in FSAR Table 1.9-202 that were in effect 6 months before the submittal date of the application:*

   - *RG 1.68, Revision 3, dated March 2007*
   - *RG 1.101, Revision 5, dated Jun 2005*
   - *RG 1.145, Revision 1, dated February 1983*
   - *RG 1.169, Revision 0, dated September 1997*
   - *RG 1.178, Revision 1, dated September 2003*
   - *RG 1.186, Revision 0, dated October 2000*
   - *RG 1.193, Revision 2, dated October 2007*
   - *RG 4.15, Revision 2, dated July 2007*

   The staff requests for the applicant to correct the apparent discrepancies in the revision numbers and dates of RGs 1.68, 1.101, 1.145, 1.169, 1.178, 1.186, 1.193, and 4.15.

C. *The staff found that the reason for an RG being "Not applicable" is not uniformly explained throughout Table 1.9-202. The staff's comparisons of not applicable RGs in Table 1.9-202 with those listed in ESBWR DCD Tier 2 Table 1.9-21 found that the applicant has not provided sufficient information on why the following RGs are not applicable:*

   - *RG 1.132, Revision 2, dated October 2003*
   - *RG 1.135, Revision 0, dated September 1977*

- *RG 8.25, Revision 1, dated June 1992*

The staff requests for the applicant to provide clarifying statements on why the above RGs are not applicable.

D. *In FSAR Table 1.9-203, the applicant evaluates conformance with the FSAR content guidance in RG 1.206. The staff found that the applicant does not provide clarifying statements as to why the following regulatory positions are "Not applicable" to Fermi 3:*

- *C.III.1 / C.I.10.3.6 (6)*
- *C.III.1 / C.I.17.4.2*

The staff requests for the applicant to provide clarifying statements on why the above regulatory positions are not applicable.

Response

The following specific responses are provided:

Part A

DTE Electric concurs that RGs 5.7 and 5.12 should be included in Table 1.9-202 with a comment that these are addressed in the security plans. These changes are reflected in the attached COLA markup.

As described in FSAR Subsection 1.9.2, FSAR Table 1.9-202 evaluates conformance with Division 1, 4, 5, and 8 Regulatory Guides. This is consistent with RG 1.206, Section C.I.1.9.1. As RG 7.10 is a Division 7 Regulatory Guide, it is not evaluated in Table 1.9-202.

Part B

DTE Electric concurs that the revision number and/or date for the identified RGs should be updated. Regarding RG 1.186, Revision 0 is dated December 2000, rather than October 2000 as stated in the RAI. These changes are reflected in the attached COLA markup.

Part C

Clarifying statements have been added to FSAR Table 1.9-202 to provide justification for RGs 1.135 and 8.25. RG 1.132, Regulatory Position C.6, is determined to be applicable and Fermi 3 conforms to this position in FSAR Subsection 2.5.4. These changes are reflected in the attached COLA markup.

Part D

Clarifying statements have been added to FSAR Table 1.9-203 to provide justification that RG 1.206, Regulatory Position C.III.1/C.I.10.3.6(6) is not applicable to Fermi 3. RG 1.206, Regulatory Position C.III.1/C.1.17.4.2, is applicable to Fermi 3 and is addressed in DCD Section 17.4 and FSAR Section 17.4. These changes are reflected in the attached COLA markup.

Proposed COLA Revision

FSAR Chapter 1 is revised as shown in Attachment 5.

Attachment 3
NRC3-13-0006
(2 pages)

Response to RAI Letter No. 81
(eRAI Tracking No. 6983)

RAI Question No. 01-10

NRC RAI 01-10

The requirements of 10 CFR 52.79(a)(20) specify that a COL application must include the proposed technical resolutions for those unresolved safety issues (USIs) and medium- and high-priority generic safety issues (GSIs) that (1) are identified in the version of NUREG–0933 current on the date up to 6 months before the docket date of the application and (2) are technically relevant to the design. The applicant provides the required information in Table 1.11-201 to address items in ESBWR DCD Table 1.11-1 that require site-specific information.

The staff's review noted that in the ESBWR DCD, the last new GSI evaluated was Issue 200. In mid- and late 2006, the staff added three additional GSIs (GSI 201 through 203) but all of these were eventually dropped as GSIs and required no further evaluation. However, these GSIs are not identified and included in FSAR Table 1.11-201 as dropped issues accordingly. For completeness, the staff requests for the applicant to add these three latest GSIs to Table 1.11-201 with applicable note (that is similar to that in the ESBWR DCD), or justify their exclusions.

Response

For completeness, it is acceptable to include Generic Safety Issues (GSIs) 201, 202, and 203 in FSAR Table 1.11-201. As noted in the RAI, these GSIs have been dropped by the staff and are not applicable to Fermi 3. This is also noted in the proposed changes to Table 1.11-201. These proposed changes are reflected in the attached markup.

Proposed COLA Revision

FSAR Chapter 1 is revised as shown in Attachment 5.

Attachment 4
NRC3-13-0006
(2 pages)

Response to RAI Letter No. 81
(eRAI Tracking No. 6984)

RAI Question No. 01-11

NRC RAI 01-11

The requirements of 10 CFR 52.79(a)(37) specify that the COL application must include information to demonstrate how operating experience insights from generic letters and bulletins issued after the most recent revision of the applicable SRP and 6 months before the docket date of the application, or comparable international operating experience, have been incorporated into the plant design. In addition, RG 1.206 Regulatory Position C.I.1.9.4 states that the applicants are required to demonstrate how the operating experience insights from generic letters (GLs) and bulletins issued after the review guidance update (i.e., in or about March 2007) have been incorporated into the plant design (i.e., address those generic communications that are not incorporated in the SRP update). The applicant provides this review in Table 1C-201.

The staff's review noted that ESBWR DCD Table 1C-1 conforms to the applicable GLs up to June 2006. The staff's review of the GLs in effect 6 months before the submittal date of the Fermi 3 COL application identified GL 2007-01, "Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients," as not listed in DCD Table 1C-1 or FSAR Table 1C-201. In addition, the staff found that SER Section 8.2 evaluates the applicability of GL 2007-01 to Fermi 3. According to SER Section 8.2, the applicant has revised FSAR Section 17.6.4 to include the underground cable monitoring program regardless of the voltage. For completeness, the staff requests for the application to update Table1C-201 to add GL 2007-01 accordingly, or justify its exclusion.

Response

DTE Electric concurs that Generic Letter 2007-01 should be included in FSAR Table 1C-201. This proposed change is reflected in the attached markup.

Proposed COLA Revision

FSAR Chapter 1 is revised as shown in Attachment 5.

Attachment 5
NRC3-13-0006
(30 pages)

RAI Letter No. 81 COLA Markups

The following markup represents how DTE Electric intends to reflect this RAI response in the next submittal of the Fermi 3 COLA. However, the same COLA content may be impacted by 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.

Rev. 1 Nov-07

Table 1.9-201 Conformance with S (Sheet 1 of 48) [EF3 COL 1.9-3-A]

II.4

, COLA references the ESBWR DCD.

SRP Section	Title	Rev	Date	Specific Acceptance Criteria	Evaluation
1	Introduction and Interfaces	~~Initial Issuance~~	~~Mar-07~~	No Specific Acceptance Criteria	Conforms
2.0	Site Characteristics and Site Parameters	Initial Issuance	Mar-07	~~II.1~~, II.2, ~~II.3~~, II.5	Not applicable
				~~II.4~~	Conforms
2.1.1	Site Location and Description	Rev. 3	Mar-07	II.1, II.2	Conforms
2.1.2	Exclusion Area Authority and Control	Rev. 3	Mar-07	II.1, II.2, II.3	Conforms
2.1.3	Population Distribution	Rev. 3	Mar-07	II.1, II.2, II.3, II.4, II.5	Conforms
2.2.1 - 2.2.2	Identification of Potential Hazards in Site Vicinity	Rev. 3	Mar-07	II.1, II.2, II.3	Conforms
2.2.3	Evaluation of Potential Accidents	Rev. 3	Mar-07	II.1, II.2	Conforms
2.3.1	Regional Climatology	Rev. 3	Mar-07	II.1, II.2, II.3, II.4, II.5, II.6, II.7, II.8, II.9	Conforms
2.3.2	Local Meteorology	Rev. 3	Mar-07	II.1, II.2, II.3, II.4	Conforms
2.3.3	Onsite Meteorological Measurements Programs	Rev. 3	Mar-07	II.1, II.2, II.3	Conforms with exception of proximity of trees to meteorological tower. Impacts from trees is addressed in Subsection 2.3.3.1.6.
2.3.4	Short Term Atmospheric Dispersion Estimates for Accident Releases	Rev. 3	Mar-07	II.1, II.2, II.3, II.4, II.5, II.6	Conforms
2.3.5	Long-Term Atmospheric Dispersion Estimates for Routine Releases	Rev. 3	Mar-07	II.1, II.2, II.3, II.4, II.5, II.6	Conforms
2.4.1	Hydrologic Description	Rev. 3	Mar-07	II.1, II.2, II.3, II.4, II.5, II.6	Conforms

II.1, II.3

Table 1.9-201 Conformance with Standard Review Plan (Sheet 10 of 48) [EF3 COL 1.9-3-A]

SRP Section	Title	Rev	Date	Specific Acceptance Criteria	Evaluation
BTP 5-3	Fracture Toughness Requirements	Rev. 3	Mar-07		Conforms
BTP 5-4	Design Requirements of the Residual Heat Removal System	Rev. 3	Mar-07		Not applicable to ESBWR.
6.1.1	Engineered Safety Features Materials	Rev. 2	Mar-07	II.1, II.2, II.3, II.4	. No safety-related RHR system, the ESBWR uses a non-safety-related RWCU/SDC system.
6.1.2	Protective Coating Systems (Paints) - Organic Materials	Rev. 3	Mar-07	II.1	
6.2.1	Containment Functional Design	Rev. 3	Mar-07		Conforms
6.2.1.1.A	PWR Dry Containments, Including Subatmospheric Containments	Rev. 3	Mar-07		Not applicable to the ESBWR
6.2.1.1.B	Ice Condenser Containments	Draft Rev. 3	Jun-96		Not applicable to the ESBWR
6.2.1.1.C	Pressure-Suppression Type BWR Containments	Rev. 7	Mar-07	II.1, II.2, II.3, II.4, II.5, II.6, II.7, II.8, II.9, II.10, II.11	Conforms
6.2.1.2	Subcompartment Analysis	Rev. 3	Mar-07	II.1, II.2, II.3, II.4	Conforms
6.2.1.3	Mass and Energy Release Analysis for Postulated Loss-of-Coolant Accidents (LOCAs)	Rev. 3	Mar-07	II.1, II.2, II.3	Conforms
6.2.1.4	Mass and Energy Release Analysis for Postulated Secondary System Pipe Ruptures	Rev. 2	Mar-07		Not applicable to the ESBWR

Table 1.9-201 Conformance with Standard Review Plan (Sheet 11 of 48) [EF3 COL 1.9-3-A]

SRP Section	Title	Rev	Date	Specific Acceptance Criteria	Evaluation
6.2.1.5	Minimum Containment Pressure Analysis for Emergency Core Cooling System Performance Capability Studies	Rev. 3	Mar-07		Conforms. See DCD Table 1.9-6, and DCD Table 1.9-20, and Appendix 6C.
6.2.2	Containment Heat Removal Systems	Rev. 5	Mar-07	II.1, II.2, II.3, II.4, II.5, II.6, II.7, II.8	Conforms
6.2.3	Secondary Containment Functional Design	Rev. 3	Mar-07	II.1, II.2, II.3, II.4	Conforms. See DCD Table 1.9-20.
6.2.4	Containment Isolation System	Rev. 3	Mar-07	II.1, II.2, II.3, II.4, II.5, II.6, II.7, II.8, II.9, II.10, II.11, II.12, II.13, II.14, II.15, II.16, II.17, II.18, II.19, II.20, II.21, II.22	Conforms
6.2.5	Combustible Gas Control in Containment	Rev. 3	Mar-07	II.1, II.2, II.3, II.4, II.5, II.6, II.7, II.8, II.9	Conforms
6.2.6	Containment Leakage Testing	Rev. 3	Mar-07		Conforms
6.2.7	Fracture Prevention of Containment Pressure Boundary	Rev. 1	Mar-07	II.1, II.2	Conforms
6.3	Emergency Core Cooling System	Rev. 3	Mar-07	II.1, II.2, II.3, II.4, II.6, II.7, II.8, II.10	Conforms
				II.5, II.9	Not applicable

to ESBWR design. ESBWR does not have pumps in these safety related functions and ESBWR does not have HPCI or RCIC pumps.

Table 1.9-201 Conformance with Standard Review Plan (Sheet 23 of 48) [EF3 COL 1.9-3-A]

SRP Section	Title	Rev	Date	Specific Acceptance Criteria	Evaluation
9.4.5	Engineered Safety Feature Ventilation System	Rev. 3	Mar-07	II.1, II.2, II.3, II.4, II.5, II.6	Conforms
9.5.1	Fire Protection Program	Rev. 5	Mar-07	II.1, II.2, II.4	Not applicable. See DCD Table 1.9-21.
				II.3, II.5, II.6	Conforms
				II.7	Exception: The elements of the Fire Protection Program required to be operational prior to receipt of new fuel are those elements necessary to protect buildings storing new fuel and adjacent fire areas that could affect the fuel storage area. Other required elements of the Fire Protection Program will be fully operational prior to initial fuel loading. Refer to Section 13.4.
9.5.2	Communications Systems	Rev. 3	Mar-07	II.1, II.2, II.3, II.4, II.5, II.6, II.7, II.8, II.9, II.10, II.11, II.12, II.13, II.14	Conforms
9.5.3	Lighting Systems	Rev. 3	Mar-07	II.1, II.2, II.3, II.4	Conforms
9.5.4	Emergency Diesel Engine Fuel Oil Storage and Transfer System	Rev. 3	Mar-07		Not applicable to the ESBWR
9.5.5	Emergency Diesel Engine Cooling Water System	Rev. 3	Mar-07		Not applicable to the ESBWR
9.5.6	Emergency Diesel Engine Starting System	Rev. 3	Mar-07		Not applicable to the ESBWR
9.5.7	Emergency Diesel Engine Lubrication System	Rev. 3	Mar-07		Not applicable to the ESBWR

Table 1.9-202 and

Table 1.9-201 Conformance with Standard Review Plan (Sheet 27 of 48) [EF3 COL 1.9-3-A]

SRP Section	Title	Rev	Date	Specific Acceptance Criteria	Evaluation
10.2.3	Turbine Rotor Integrity	Rev. 2	Mar-07	II.1, II.2	Conforms
				II.3.A	Exception - DCD Section 10.2.3.5 states that, “Forgings are rough-machined with minimum stock allowance prior to heat treatment.” This statement meets the intent of the corresponding SRP Acceptance Criterion. The exception to the Acceptance Criterion is introduced with the reference to welded rotors. The GE N3R-6F52 steam turbine selected for this site utilizes integral forgings in the rotor design and fabrication. Although other manufacturers produce welded rotors, the GE N3R-6F52 rotor is not a welded rotor design and does not utilize welding to construct the base rotor. Flaws in the forging may be repaired by welding and other means, but only after heat treatment. Thus, the intent of this Acceptance Criterion is met.
				II.3.B, II.3.C, II.3.D, II.4, II.5	Conforms
10.3	Main Steam Supply System	Rev. 4	Mar-07	II.1, II.2, II.3,II.5, II.6, II.7, II.8	Conforms
				II.4	Not applicable to the ESBWR
10.3.6	Steam and Feedwater System Materials	Rev. 3	Mar-07	II.1, II.2	Conforms
10.4.1	Main Condensers	Rev. 3	Mar-07	II.1	Conforms

ESBWR is BWR design.

Table 1.9-201 Conformance with Standard Review Plan (Sheet 36 of 48) [EF3 COL 1.9-3-A]

SRP Section	Title	Rev	Date	Specific Acceptance Criteria	Evaluation
				II.1.A, II.1.B	Conforms with the following exception: Section 17.5 states, "The operational phase quality assurance program requirements will be established through the Company's commitment to ANSI/ASME NQA-1-1994 as described within this QAPD. This edition of NQA-1 contains overall quality assurance requirements equivalent to those of ANSI N18.7-1976, and the Company has included within this QAPD the required administrative controls from ANSI N18.7-1976. Therefore, the Company does not commit to compliance with the requirements of ANSI N18.7-1976/ANS-3.2."
				II.1.A.i through II.1.A.v, II.1.C, II.1.E, II.1.F, II.1.G	Conforms
				~~II.1.D~~	~~Not applicable~~
				II.1.H	Conforms. Addressed in Section 13.2.
13.2.1	Reactor Operator Requalification Program: Reactor Operator Training	Rev. 3	Mar-07	II.1.A.i	Conforms. Addressed in Section 13.1.
				II.1.A.ii, II.1.A.iii, II.1.A.v, II.1.B, II.1.D, II.1.E	Conforms

Table 1.9-201 Conformance with Standard Review Plan (Sheet 42 of 48) [EF3 COL 1.9-3-A]

SRP Section	Title	Rev	Date	Specific Acceptance Criteria	Evaluation
15.0.1	Radiological Consequence Analyses Using Alternative Source Terms	Rev. 0	Jul-00	V	Conforms
15.0.2	Review of Transient and Accident Analysis Method	Rev. 0	Dec-05	II.1, II.2, II.3, II.4, II.5, II.6	Conforms
15.0.3	Design Basis Accident Radiological Consequences of Analyses for Advanced Light Water Reactors	Initial Issuance	Mar-07		Conforms
15.1.1– 15.1.4	Decrease in Feedwater Temperature, Increase in Feedwater Flow, Increase in Steam Flow, and Inadvertent Opening of a Steam Generator Relief or Safety Valve	Rev. 2	Mar-07	II.1, II.2, II.3, II.4, II.5, ~~1, 2, 3, 4~~	Conforms
15.1.5	Steam System Piping Failures Inside and Outside of Containment (PWR)	Rev. 3	Mar-07		Not applicable to the ESBWR
15.1.5.A	Radiological Consequences of Main Steam Line Failures Outside Containment of a PWR			II.1A, II.1B, II.1C, II.1D, II.2A, II.2B, II.2C, II.2D, II.2E, II.2F, II.3A, II.3B, II.3C, II.3D	Not applicable to the ESBWR
15.2.1– 15.2.5	Loss of External Load; Turbine Trip; Loss of Condenser Vacuum; Closure of Main Steam Isolation Valve (BWR); and Steam Pressure Regulator Failure (Closed)	Rev. 2	Mar-07	~~1A, 1B, 1C, 1D, 2A, 2B, 2D, 2E, 2F, 3A, 3B, 3C, 3D~~ ~~2C~~	Conforms ~~Not applicable. This is not an event of moderate frequency.~~

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SRP Section	Title	Rev	Date	Specific Acceptance Criteria	Evaluation
15.2.6	Loss of Nonemergency AC Power to the Station Auxiliaries	Rev. 2	Mar-07	II.1, II.2, II.4, II.5, II.5B, II.5C, II.5D	Conforms
				~~II.3~~	~~Not applicable. This is not an event of moderate frequency.~~
				II.5A	Not applicable. There are no RCS loops in the ESBWR.
15.2.7	Loss of Normal Feedwater Flow	Rev. 2	Mar-07	~~1A, 1B, 1C, 1D, 2A, 2B, 2D, 2E, 2F, 3A, 3B, 3C, 3D~~	Conforms
				~~2C~~	~~Not applicable. This is not an event of moderate frequency.~~
15.2.8	Feedwater System Pipe Breaks Inside and Outside Containment (PWR)	Rev. 2	Mar-07		Not applicable to the ESBWR
15.3.1–15.3.2	Loss of Forced Reactor Coolant Flow Including Trip of Pump Motor and Flow Controller Malfunctions	Rev. 2	Mar-07		Not applicable to the ESBWR
15.3.3–15.3.4	Reactor Coolant Pump Rotor Seizure and Reactor Coolant Pump Shaft Break	Rev. 3	Mar-07		Not applicable to the ESBWR
15.4.1	Uncontrolled Control Rod Assembly Withdrawal from a Subcritical or Low Power Startup Condition	Rev. 3	Mar-07	~~1A, 1C~~	Conforms
				~~1B~~	Not applicable to the ESBWR
15.4.2	Uncontrolled Control Rod Assembly Withdrawal at Power	Rev. 3	Mar-07	~~1A, 1C~~	Conforms
				~~1B~~	Not applicable to the ESBWR
15.4.3	Control Rod Misoperation (System Malfunction or Operator Error)	Rev. 3	Mar-07	~~1, 2, 3~~	Conforms

II.3,

II.1A, II.1B, II.1C, II.1D, II.2A, II.2B, II.2C, II.2D, II.2E, II.2F, II.3A, II.3B, II.3C, II.3D

II.1A, II.1C

II.1B

II.1A, II.1C

II.1B

II.1, II.2, II.3

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SRP Section	Title	Rev	Date	Specific Acceptance Criteria	Evaluation
15.4.4 - 15.4.5	Startup of an Inactive Loop or Recirculation Loop at an Incorrect Temperature, and Flow Controller Malfunction Causing an Increase in BWR Core Flow Rate	Rev. 2	Mar-07	~~1A, 1B, 1D, 1E, 1F, 1, 2, 3, 4~~	~~Conforms~~
				~~1C~~	~~Not applicable. This is not an event of moderate frequency.~~ Not applicable, ESBWR does not have forced recirculation systems.
15.4.6	Inadvertent Decrease in Boron Concentration in the Reactor Coolant System (PWR)	Rev. 2	Mar-07		Not applicable to the ESBWR
15.4.7	Inadvertent Loading and Operation of a Fuel Assembly in an Improper Position	Rev. 2	Mar-07	~~1, 2~~	Conforms
15.4.8	Spectrum of Rod Ejection Accidents (PWR)	Rev. 3	Mar-07		Not applicable to the ESBWR
15.4.8.A	Radiological Consequences of a Control Rod Ejection Accident (PWR)				Not applicable to the ESBWR
15.4.9	Spectrum of Rod Drop Accidents (BWR)	Rev. 3	Mar-07	~~1, 2, 3~~	Conforms. Postulated events are not applicable to the ESBWR.
15.4.9.A	Radiological Consequences of Control Rod Drop Accident (BWR)	Rev 2	July 81		Conforms. Postulated control rod drop events are not applicable to the ESBWR.
15.5.1–15.5.2	Inadvertent Operation of ECCS and Chemical and Volume Control System Malfunction that Increases Reactor Coolant Inventory	Rev. 2	Mar-07	~~1, 2, 3~~	Conforms

II.1A, II.1B, II.1C, II.1D, II.1E, II.1F, II.1, II.2, II.3, II.4

II.1, II.2

II.1, II.2, II.3

II.1, II.2, II.3

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SRP Section	Title	Rev	Date	Specific Acceptance Criteria	Evaluation
15.6.1	Inadvertent Opening of a PWR Pressurizer Pressure Relief Valve or a BWR Pressure Relief Valve	Rev. 2	Mar-07	~~1, 2, 3, A, B, C, D~~ II.1, II.2, II.3, II.A, II.B, II.C, II.D	Conforms
15.6.2	Radiological Consequences of the Failure of Small Lines Carrying Primary Coolant Outside Containment	Rev. 2	Jul-81	II.1, II.2	Conforms
15.6.3	Radiological Consequences of Steam Generator Tube Failure				Not applicable to the ESBWR
15.6.4	Radiological Consequences of Main Steam Line Failure Outside Containment (BWR)	Rev. 2	Jul-81	II.1, II.2, II.3	Conforms
				II.4	Conforms. Addressed in TS 3.4.3.
15.6.5	Loss-of-Coolant Accidents Resulting From Spectrum of Postulated Piping Breaks Within the Reactor Coolant Pressure Boundary	Rev. 3	Mar-07	II.1A, II.1B, II.1C, II.1D, II.1.E, II.2, II.3	Conforms.
15.6.5.A	Radiological Consequences of a Design Basis Loss-of-Coolant Accident Including Containment Leakage Contribution	Rev 1	July 81		Not Applicable. Reference DCD Table 1.9-20.
15.6.5.B	Radiological Consequences of a Design Basis Loss-of-Coolant Accident: Leakage From Engineered Safety Feature Components Outside Containment	Rev 1	July 81		Not Applicable. Reference DCD Table 1.9-20.

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SRP Section	Title	Rev	Date	Specific Acceptance Criteria	Evaluation
15.6.5.D	Radiological Consequences of a Design Basis Loss-of-Coolant Accident: Leakage From Main Steam Isolation Valve Leakage Control System (BWR)	Rev 1	July 81	II.1, II.2	Not Applicable. Reference DCD Table 1.9-20.
15.7.3	Postulated Radioactive Releases Due to Liquid-Containing Tank Failures			~~1, 2~~	Conforms
15.7.4	Radiological Consequences of Fuel Handling Accidents	Rev. 2	Jul-81	II.1, II.2, II.3, II.4, II.5	Conforms. Radiological assumptions superseded by SRP 15.0.1.
15.7.5	Spent Fuel Cask Drop Accidents	Rev. 2	July 81	II.1, II.2, II.3, II.4, II.5	Conforms. Because a spent fuel cask drop exceeding 9.2 m (30 ft) is not postulated (DCD Section 15.4.10.1), per SRP 15.7.5 a design basis radiological analysis is not required. Therefore, the acceptance criteria do not apply even though the SRP does.
15.8	Anticipated Transients Without Scram	Rev. 2	Mar-07	II.1A ~~1A~~	Not applicable. ESBWR does not have recirculation pumps.
				II.1B, II.1C, II.1D, II.1E, II.1F ~~1B, 1C, 1D, 1E~~	Conforms
				~~1F~~	~~Conforms~~
15.9	Boiling Water Reactor Stability	Initial Issuance	Mar-07	~~1, 2, 3, 4A, 4B, 5, 6, 7, 9A, 9B, 9C, 10, 11~~	Conforms
				~~8, 9D~~	~~Conforms~~
16	Technical Specifications	Rev. 2	Mar-07	II.1, II.2, II.3, II.4A, II.4B, II.5, II.6, II.7, II.8, II.9A, II.9B, II.9C, II.9D, II.10, II.11	Conforms

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SRP Section	Title	Rev	Date	Specific Acceptance Criteria	Evaluation
16.1	Risk-informed Decision Making: Technical Specifications	Rev. 1	Mar-07		Not applicable
17.1	Quality Assurance During the Design and Construction Phases	Rev. 2	Jul-81		Not applicable. RG 1.206 refers the COL applicant to Section 17.5 for the format and content of a QA Program for design and construction of new plants.
17.2	Quality Assurance During the Operations Phase	Rev. 2	Jul-81		Not applicable. RG 1.206 refers the COL applicant to Section 17.5 for the format and content of a QA Program for design and construction of new plants.
17.3	Quality Assurance Program Description	Rev. 0	Aug-90		Not applicable. RG 1.206 refers the COL applicant to Section 17.5 for the format and content of a QA Program for design and construction of new plants.
17.4	Reliability Assurance Program (RAP)	Initial Issuance	Mar-07	II.B.1, II.B.2, II.B.3, II.B.4, II.B.5, II.B.6, II.B.7, II.B.8, II.B.9	Conforms. Addressed in DCD Section 17.4 and in Section 17.6.
17.5	Quality Assurance Program Description - Design Certification, Early Site Permit and New License Applicants	Initial Issuance	Mar-07	II.A, II.B, II.C, II.D., II.E, II.F, II.G, II.H, II.I, II.J, II.K, II.L, II.M, II.N, II.O, II.P, II.Q, II.R, II.S, II.T, II.U, II.V, II.W Option 1	Conforms
				II.W Option II	Not applicable for Fermi 3. Option I chosen.
17.6	Maintenance Rule	~~Initial Issuance~~ Rev.1	~~Mar-07~~ Aug-07	II.1, II.2	Conforms

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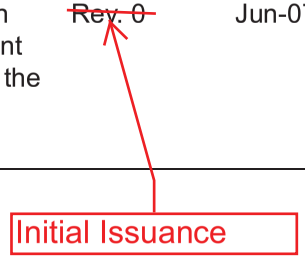
SRP Section	Title	Rev	Date	Specific Acceptance Criteria	Evaluation
18	Human Factors Engineering	Rev. 2	Mar-07	II.A	Conforms
				II.B, II.C	Not applicable. These acceptance criteria apply to changes to existing plants.
19.0	Probabilistic Risk Assessment and Severe Accident Evaluation for New Reactors	Rev. 2	Jun-07	II.1, II.2, II.3, II.4, II.5, II.6, II.7	Conforms
				II.8, II.9	Not applicable. Only applies to Westinghouse AP 600 design.
19.1	Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities	Rev. 2	Jun-07		Not applicable. There are no plans for risk-informed activities.
19.2	Review of Risk Information Used to Support Permanent Plant Specific Changes to the Licensing Basis: General Guidelines	~~Rev. 0~~	Jun-07		Not applicable. There are no plans for risk-informed applications.



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RG Number	Title	Revision	Date	RG Position	Evaluation
1.57	Design Limits and Loading Combinations for Metal Primary Reactor Containment System Components	Rev. 1	Mar-07	General	Conforms
1.59	Design Basis Floods for Nuclear Power Plants (Errata Published 7/30/80)	Rev. 2	Aug-77	General	Conforms
1.60	Design Response Spectra for Seismic Design of Nuclear Power Plants	Rev. 1	Dec-73	General	Conforms
1.61	Damping Values for Seismic Design of Nuclear Power Plants	Rev. 1	Mar-07	General	Conforms
1.62	Manual Initiation of Protective Actions	Rev. 0	Oct-73	General	Conforms
1.63	Electric Penetration Assemblies in Containment Structures for Nuclear Power Plants	Rev. 3	Feb-87	General	Conforms
1.65	Materials and Inspections for Reactor Vessel Closure Studs	Rev. 0	Oct-73	General	Conforms
1.68	Initial Test Programs for Water-Cooled Nuclear Power Plants	~~Rev. 2~~ Rev. 3	~~Aug-78~~ Mar-07	General	Conforms with the following exception: Equipment listed in Appendix A, Items 1.k(2) and 1.k(3) not included in the initial test program.
1.68.1	Preoperational and Initial Startup Testing of Feedwater and Condensate Systems for Boiling Water Reactor Power Plants	Rev. 1	Jan-77	General	Conforms
1.68.2	Initial Startup Test Program to Demonstrate Remote Shutdown Capability for Water-Cooled Nuclear Power Plants	Rev. 1	Jul-78	General	Conforms
1.68.3	Preoperational Testing of Instrument and Control Air Systems	Rev. 0	Apr-82	General	Conforms

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RG Number	Title	Revision	Date	RG Position	Evaluation
1.101	Emergency Response Planning and Preparedness for Nuclear Power Reactors	~~Rev. 3~~ Rev 5	~~Aug-05~~ Jun-05	General	Conforms except Fermi 3 Emergency Plan utilizes NEI 07-01, Rev. 0 for EALs instead of Appendix 1 of NUREG-0654/FEMA-REP-1
1.102	Flood Protection for Nuclear Power Plants	Rev. 1	Sep-76	General	Conforms
1.105	Setpoints For Safety-Related Instrumentation	Rev. 3	Dec-99	General	Conforms. Operational program implementation is described in Section 13.4
1.106	Thermal Overload Protection for Electric Motors on Motor-Operated Valves	Rev. 1	Feb-77	General	Not applicable
1.107	Qualifications for Cement Grouting for Prestressing Tendons in Containment Structures	Rev. 1	Feb-77	General	Not applicable
1.109	Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I	Rev. 1	Oct-77	General	Conforms
1.110	Cost-Benefit Analysis for Radwaste Systems for Light-Water-Cooled Nuclear Power Reactors	Rev. 0	Mar-76	General	Conforms
1.111	Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors	Rev. 1	Jul-77	General	Conforms
1.112	Calculation of Releases of Radioactive Materials in Gaseous and Liquid Effluents from Light-Water-Cooled Nuclear Power Reactors	Rev. 1	Mar-07	General	Conforms except the suggested breakdown identified in Appendix A to the RG is not used because it is not consistent with the DCD presentation of information.

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RG Number	Title	Revision	Date	RG Position	Evaluation
1.127	Inspection of Water-Control Structures Associated with Nuclear Power Plants	Rev. 1	Mar-78	General	Conforms
1.128	Installation Design and Installation of Vented Lead-Acid Storage Batteries for Nuclear Power Plants	Rev. 2	Feb-07	General	Conforms
1.129	Maintenance, Testing, and Replacement of Vented Lead-Acid Storage Batteries for Nuclear Power Plants	Rev. 2	Feb-07	General	Conforms
1.130	Service Limits and Loading Combinations for Class 1 Plate-and-Shell-Type Supports	Rev. 2	Mar-07	General	Conforms
1.131	Qualification Tests of Electric Cables, Field Splices, and Connections for Light-Water-Cooled Nuclear Power Plants	Rev. 0	Aug-77	General	Conforms
1.132	Site Investigations for Foundations of Nuclear Power Plants	Rev. 2	Oct-03	C.1, C.2, C.3, C.4.1 - C.4.2, C.4.4, C.5 - C.7	Conforms.
				C4.3.2.5	Properties of borrow materials not investigated. Cat I structures are on bedrock.
				C.4.5	Some borehole logging required reconciliation of final results
				~~C.6~~	~~Not applicable~~
1.133	Loose-Part Detection Program for the Primary System of Light Water Cooled Reactors	Rev. 1	May-81	General	Not applicable

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RG Number	Title	Revision	Date	RG Position	Evaluation
1.134	Medical Evaluation of Licensed Personnel for Nuclear Power Plants	Rev. 3	Mar-98	General	Conforms. Although RG 1.134 is not specifically identified in the FSAR, equivalent requirements for medical evaluations for licensed personnel are embedded in policies and procedures of operations and training departments.
1.135	Normal Water Level and Discharge at Nuclear Power Plants	Rev. 0	Sep-77	General	Not applicable.
1.136	Design Limits, Loading Combinations, Materials, Construction, and Testing of Concrete Containments	Rev. 3	Mar-07	General	Conforms
1.137	Fuel-Oil Systems for Standby Diesel Generators	Rev. 1	Oct-79	General	Not applicable
1.138	Laboratory Investigations of Soils and Rocks for Engineering Analysis and Design of Nuclear Power Plants	Rev. 2	Dec-03	General	Conforms
1.139	Guidance for Residual Heat Removal	Rev. 0	May-78	General	Conforms
1.140	Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Normal Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants	Rev. 2	Jun-01	General	Conforms. Operational program implementation is described in Section 13.4.
1.141	Containment Isolation Provisions for Fluid Systems	Rev. 0	Apr-78	General	Conforms
1.142	Safety-Related Concrete Structures for Nuclear Power Plants (Other Than Reactor Vessels and Containments)	Rev. 2	Nov-01	General	Conforms

Water levels are determined per SRP 2.4.1 and ANS-2.8-1992.

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[EF3 COL 1.9-3-A]

RG Number	Title	Revision	Date	RG Position	Evaluation
1.143	Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light-Water-Cooled Nuclear Power Plants	Rev. 2	Nov-01 Feb-83	General	Conforms. Operational program implementation is described in Section 13.4
1.145	Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants	Rev. 1	~~Nov-82~~	General	Conforms
1.147	Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1	Rev. 15	Oct 07	General	Conforms. Operational program implementation is described in Section 13.4.
1.148	Functional Specification for Active Valve Assemblies in Systems Important to Safety in Nuclear Power Plants	Rev. 0	Mar-81	General	Conforms
1.149	Nuclear Power Plant Simulation Facilities for Use in Operator Training and License Examinations	Rev. 3	Oct-01	General	Conforms
1.150	Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations	Rev. 1	Feb-83	General	Conforms. Operational program implementation is described in Section 13.4.
1.151	Instrument Sensing Lines	Rev. 0	Jul-83	General	Conforms. Operational program implementation is described in Section 13.4.
1.152	Criteria for Use of Computers in Safety Systems of Nuclear Power Plants	Rev. 2	Jan-06	General	Conforms. Operational program implementation is described in Section 13.4
1.153	Criteria for Safety Systems	Rev. 1	Jun-96	General	Conforms
1.154	Format and Content of Plant-Specific Pressurized Thermal Shock Safety Analysis Reports for Pressurized Water Reactors	Rev. 0	Jan-87	General	Not applicable

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[EF3 COL 1.9-3-A]

RG Number	Title	Revision	Date	RG Position	Evaluation
1.166	Pre-Earthquake Planning and Immediate Nuclear Power Plant Operator Postearthquake Actions	Rev. 0	Mar-97	General	Conforms. The seismic monitoring program, including the necessary test and operating procedures, will be implemented prior to receipt of fuel on site.
1.167	Restart of a Nuclear Power Plant Shut Down by a Seismic Event	Rev. 0	Mar-97	General	Not applicable.
1.168	Verification, Validation, Reviews, and Audits for Digital Computer Software Used in Safety Systems of Nuclear Power Plants	Rev. 1	Feb-04	General	Conforms. Procedures addressed in Section 13.5 ITAAC addressed in COLA Part 10.
1.169	Configuration Management Plans for Digital Computer Software Used in Safety Systems of Nuclear Power Plants	Rev. 0	~~Sep-87~~ Sep-97	General	Conforms. Procedures addressed in Section 13.5 ITAAC addressed in COLA Part 10.
1.170	Software Test Documentation for Digital Computer Software Used in Safety Systems of Nuclear Power Plants	Rev. 0	Sep-97	General	Conforms. Procedures addressed in Section 13.5 ITAAC addressed in COLA Part 10.
1.171	Software Unit Testing for Digital Computer Software Used in Safety Systems of Nuclear Power Plants	Rev. 0	Sep-97	General	Conforms. Procedures addressed in Section 13.5 ITAAC addressed in COLA Part 10.
1.172	Software Requirements Specifications for Digital Computer Software Used in Safety Systems of Nuclear Power Plants	Rev. 0	Sep-97	General	Conforms. Procedures addressed in Section 13.5 ITAAC addressed in COLA Part 10.
1.173	Developing Software Life Cycle Processes for Digital Computer Software Used in Safety Systems of Nuclear Power Plants	Rev. 0	Sep-97	General	Conforms. Procedures addressed in Section 13.5 ITAAC addressed in COLA Part 10.

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[EF3 COL 1.9-3-A]

RG Number	Title	Revision	Date	RG Position	Evaluation
1.174	An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis	Rev. 1	Nov-02	General	Not applicable. The approach described in this RG is not being used.
1.175	An Approach for Plant-Specific, Risk-Informed Decisionmaking: Inservice Testing	Rev. 0	Aug-98	General	Not applicable. Risk informed inservice testing is not being used.
1.177	An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications	Rev. 0 Rev. 1	Aug-98 Sep-03	General	Not applicable. Risk informed Technical Specifications are not being used.
1.178	An Approach For Plant-Specific Risk-informed Decisionmaking Inservice Inspection of Piping	~~Rev. 0~~	~~Sep-98~~	General	Not applicable. Risk informed inservice inspection is not being used.
1.179	Standard Format and Content of License Termination Plans for Nuclear Power Reactors	Rev. 0	Jan-99	General	This RG is outside the scope of the FSAR.
1.180	Guidelines for Evaluating Electromagnetic and Radio-Frequency Interference in Safety-Related Instrumentation and Control Systems	Rev. 1	Oct-03	General	Conforms. Operational program implementation is described in Section 13.4
1.181	Content of the Updated Final Safety Analysis Report in Accordance with 10 CFR 50.71(e)	Rev. 0	Sep-99	General	Conforms
1.182	Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants	Rev. 0	May-00	General	Conforms
1.183	Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors	Rev. 0	Jul-00	General	Conforms

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[EF3 COL 1.9-3-A]

RG Number	Title	Revision	Date	RG Position	Evaluation
1.184	Decommissioning of Nuclear Power Reactors	Rev. 0	Jul-00	General	Not applicable. The RG provides guidance on how to conduct decommissioning activities.
1.185	Standard Format and Content for Post-Shutdown Decommissioning Activities Report	Rev. 0	Jul-00	General	This RG is outside the scope of the FSAR.
1.186	Guidance and Examples for Identifying 10 CFR 50.2 Design Bases	Rev. 0	~~Oct-00~~ Dec-00	General	This RG is outside the scope of the FSAR.
1.187	Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments	Rev. 0	Nov-00	General	Conforms.
1.188	Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses	Rev. 1	Sep-05	General	This RG is outside the scope of the FSAR.
1.189	Fire Protection for Nuclear Power Plants	Rev. 1	Mar-07	General	Conforms with the following exception. Section C.1.1.c of the RG states that during construction, on sites with an operating unit, the superintendent of the operating plant should have overall responsibility for fire protection. However, due to physical and administrative separation of Fermi 3 from the operating unit, the onsite executive in charge of construction will have overall responsibility for Fermi 3 fire protection during construction.
1.190	Calculational and Dosimetry Methods for Determining Pressure Vessel Neutron Fluence	Rev. 0	Mar-01	General	Conforms. The reactor vessel material surveillance program is described in Subsection 5.3.1.8. Implementation of the program is described in Section 13.4

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[EF3 COL 1.9-3-A]

RG Number	Title	Revision	Date	RG Position	Evaluation
1.191	Fire Protection Program for Nuclear Power Plants During Decommissioning and Permanent Shutdown	Rev. 0	May-01	General	This RG is outside the scope of the FSAR.
1.192	Operation and Maintenance Code Case Acceptability, ASME OM Code	Rev. 0 Rev. 2	Jun-03 Oct-07	General	Conforms. Operational program implementation is described in Section 13.4
1.193	ASME Code Cases Not Approved for Use	~~Rev. 1~~	~~Aug-05~~	General	Conforms
1.194	Atmospheric Relative Concentrations for Control Room Radiological Habitability Assessments at Nuclear Power Plants	Rev. 0	Jun-03	General	Conforms
1.195	Methods and Assumptions for Evaluating Radiological Consequences of Design Basis Accidents at Light-Water Nuclear Power Reactors	Rev. 0	May-03	General	Not applicable. RG 1.183 is used.
1.196	Control Room Habitability at Light-Water Nuclear Power Reactors	Rev. 1	Jan-07	General	Conforms
1.197	Demonstrating Control Room Envelope Integrity at Nuclear Power Plant Reactors	Rev. 0	May-03	General	Conforms
1.198	Procedures and Criteria for Assessing Seismic Soil Liquefaction At Nuclear Power Plant Sites	Rev. 0	Nov-03	General	Conforms
1.199	Anchoring Components and Structural Supports in Concrete	Rev. 0	Nov-03	General	Conforms
1.200	An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities	Rev. 1	Jan-07	General	Not applicable

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[EF3 COL 1.9-3-A]

RG Number	Title	Revision	Date	RG Position	Evaluation
1.209	Guidelines for Environmental Qualification of Safety-Related Computer-Based Instrumentation and Control Systems in Nuclear Power Plants	Rev. 0	Mar-07	General	Conforms. Operational program implementation is described in Section 13.4
4.7	General Site Suitability Criteria for Nuclear Power Stations	Rev. 2	Apr-98	General	Conforms.
4.15	Quality Assurance for Radiological Monitoring Programs (Inception Through Normal Operations to License Termination) – Effluent Streams and the Environment	Rev. 2 ~~(Interim)~~	~~Mar-07~~	General	Conforms. Subsection 11.5.4.5 (NEI 07-09A) provides a description of the ODCM. The implementation milestone is provided in Section 13.4
4.21	Minimization of Contamination and Radioactive Waste Generation: Life-Cycle Planning	Rev 0	Jun-08	General	Conforms through implementation of NEI 08-08A.
5.44	Perimeter Intrusion Alarm Systems	Rev. 3	Oct-97	General	Conforms to one test option as discussed in the RG defined by a plant station procedure.
5.62	Reporting of Safeguards Events	Rev. 1	Nov-87	General	Not applicable. Reportability of Safeguards Events is in accordance with 10 CFR 73 Appendix G.
5.66	Access Authorization Program for Nuclear Power Plants	Rev. 1	Jul-09	General	Conforms
5.69	Guidance for the Application of the Radiological Sabotage Design-Basis Threat in the Design, Development, and Implementation of a Physical Security Program that meets 10 CFR 73.55 Requirements	Rev 0	Aug-07	General	Conforms
8.1	Radiation Symbol	Rev. 0	Feb-73	General	Conforms. The facility utilizes standard radiation symbols.

Jul-07

Insert 1 Here

Insert 1

5.7	Entry/Exit Control for Protected Areas, Vital Areas, and Material Access Areas	Rev. 1	May-80	General	As appropriate, addressed in the DCD and plant-specific security plans (i.e., Physical Security Plan, Training and Qualification Plan, Safeguards Contingency Plan, and Cyber Security Plan)
5.12	General Use of Locks in the Protection and Control of Facilities and Special Nuclear Materials	Rev. 0	Nov-73	General	As appropriate, addressed in the DCD and plant-specific security plans (i.e., Physical Security Plan, Training and Qualification Plan, Safeguards Contingency Plan, and Cyber Security Plan)

Table 1.9-202 Conformance with Regulatory Guides (Sheet 25 of 26)

[EF3 COL 1.9-3-A]

RG Number	Title	Revision	Date	RG Position	Evaluation
8.11	Applications of Bioassay for Uranium	Rev. 0	Jun-74	General	Not applicable. RG 8.11 has been superseded by RG 8.9, Rev 1.
8.13	Instruction Concerning Prenatal Radiation Exposure	Rev. 3	Jun-99	General	Conforms. Operational program implementation is described in Section 13.4
8.15	Acceptable Programs for Respiratory Protection	Rev. 1	Oct-99	General	Conforms. Operational program implementation is described in Section 13.4
8.19	Occupational Radiation Dose Assessment in Light-Water Reactor Power Plants – Design Stage Man-Rem Estimates	Rev. 1	Jun-79	General	Conforms
8.20	Applications of Bioassay for I-125 and I-131	Rev. 1	Sep-79	General	Exception. Per NUREG-1736, RG 8.20 is outdated. RG 8.9 is used. Operational program implementation is described in Section 13.4
8.25	Air Sampling in the Workplace	Rev. 1	Jun-92	General	Not applicable, RG does not apply to reactor licensees.
8.26	Applications of Bioassay for Fission and Activation Products	Rev. 0	Sep-80	General	Exception. Per NUREG-1736, RG 8.26 is outdated. RG 8.9 is used. Operational program implementation is described in Section 13.4
8.27	Radiation Protection Training for Personnel at Light-Water-Cooled Nuclear Power Plants	Rev. 0	Mar-81	General	Conforms. Operational program implementation is described in Section 13.4
8.28	Audible-Alarm Dosimeters	Rev. 0	Jul-81	General	Conforms. Operational program implementation is described in Section 13.4
8.29	Instruction Concerning Risks from Occupational Radiation Exposure	Rev. 1	Feb-96	General	Conforms. Operational program implementation is described in Section 13.4

Table 1.9-203 Conformance with the FSAR Content Guidance in RG 1.206 (Sheet 23 of 39) [EF3 COL 1.9-3-A]

Section	Section Title	Conformance Evaluation
C.III.1 10.3	Main Steam Supply System	Conforms. Addressed in DCD Section 10.3.
C.III.1 10.3.1 (1)	Design Bases	Conforms. Addressed in DCD Section 10.3.1.
C.III.1 10.3.1 (2)	Design Bases	Conforms. Addressed in DCD Section 10.3.
C.III.1 10.3.1 (3)	Design Bases	Conforms. Addressed in DCD Sections 10.3.2 and 10.3.3.
C.III.1 10.3.1 (4)	Design Bases	Conforms. Addressed in DCD Section 10.3.
C.III.1 10.3.1 (5)	Design Bases	Conforms. Addressed in DCD Section 10.3.
C.III.1 10.3.1 (6)	Design Bases	Conforms. Addressed in DCD Section 10.3.
C.III.1 10.3.2	Description	Conforms. Addressed in DCD Section 10.3.
C.III.1 10.3.3	Evaluation	Conforms. Addressed in DCD Section 10.3.
C.III.1 10.3.4	Inspection and Testing Requirements	Conforms. Addressed in DCD Section 10.3.4.
C.III.1 10.3.5	Water Chemistry (PWR Only)	Not applicable. Only applies to PWRs.
C.III.1 10.3.6 (1)	Steam and Feedwater System Materials	Conforms. Addressed in DCD Section 10.3.6.
C.III.1 10.3.6 (2)	Steam and Feedwater System Materials	Conforms. Addressed in DCD Sections 6.6 and 10.3.4.
C.III.1 10.3.6 (3)	Steam and Feedwater System Materials	Not applicable. DCD Section 10.3.6 states that there are no austenitic stainless steels in the steam and feedwater system piping.
C.III.1 10.3.6 (4)	Steam and Feedwater System Materials	Not Applicable. DCD Section 10.3.6 states that there are no austenitic stainless steels in the ASME Code Section III Class 1 and 2 portions of steam and feedwater piping.
C.III.1 10.3.6 (5)	Steam and Feedwater System Materials	Conforms. Addressed in DCD Section 10.3.
C.III.1 10.3.6 (6)	Steam and Feedwater System Materials	Not applicable
C.III.1 10.4 (1)	Other Features of the Steam and Power Conversion System	Conforms

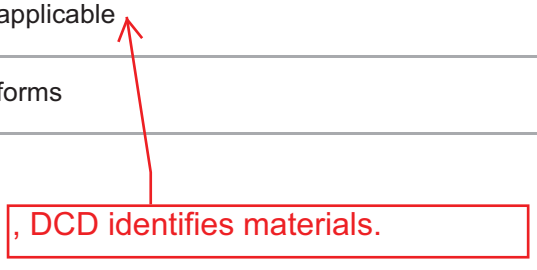

Table 1.9-203 Conformance with the FSAR Content Guidance in RG 1.206 (Sheet 35 of 39) [EF3 COL 1.9-3-A]

Section	Section Title	Conformance Evaluation
C.III.1 16.1	Technical Specifications and Bases	Conforms. Addressed in COLA Part 4. There are no deviations from the generic TS bases.
C.III.1 16.2	Content and Format of Technical Specifications and Bases	Conforms. Addressed in COLA Part 4. No plant-specific deviations from the referenced certified generic Technical Specifications or Bases are required and none are being requested (e.g., incorporation of TSTF travelers).
C.III.1 17.1	Quality Assurance and Reliability Assurance: Quality Assurance During the Design and Construction Phase	Conforms
C.III.1 17.2	Quality Assurance During the Operations Phase	Conforms
C.III.1 17.3	Quality Assurance Program Description	Conforms
C.III.1 17.4.1	New Section 17.4 in the Standard Review Plan	Conforms
C.III.1 17.4.2	Reliability Assurance Program Scope, Stages, and Goals	~~Not applicable~~ Addressed in Section 17.4 and DCD Section 17.4.
C.III.1 17.4.3	Reliability Assurance Program Implementation	Conforms. Addressed in Section 17.4 and Section 17.6.
C.III.1 17.4.4	Reliability Assurance Program Information Needed in a COL Application	Conforms. Addressed in DCD Section 17.4 and in Section 17.4, Section 17.5, and Section 17.6
C.III.1 17.5	Quality Assurance Program Guidance	See below
C.III.1 17.5.1	COL Applicant QA Program Responsibilities	Conforms
C.III.1 17.5.2	Updated SRP Section 17.5 and the QA Program Description	Criterion I requires “retaining responsibility for the quality assurance program” while C.III.1.17.5.2 goes further to require ".. and maintain control over, those portions of the QA program delegated to other organizations.” Detroit Edison retained responsibility for the QA program (see FSAR Subsection 1.4.1), this responsibility was accomplished by fully delegating the work of establishing and executing the QA program under their QA program satisfying the requirements of Appendix B to 10 CFR Part 50.
C.III.1 17.5.3	Evaluation of the QAPD Against the SRP and QAPD Submittal Guidance	Conforms

Table 1.11-201 COL Item Resolutions Related to NUREG-0933 Table II Task Action Plan Items and New Generic Issues (Sheet 2 of 2) [EF3 COL 1.11-1-A]

Action Plan Item/Issue Number	Description	Associated Location(s) Where Discussed and/or Technical Resolution
	NEW GENERIC ISSUES	
184	Endangered Species	Issue is addressed in COLA Part 3, Subsection 2.4.1.2, Subsection 2.4.2.2, Subsection 2.4.2.4 Subsection 4.3.1, Subsection 4.3.2.4, Subsection 5.3.1.2, and Subsection 5.3.3.2.
201	Small-Break LOCA and Loss of Offsite Power Scenario	Generic Issue 201 was dropped with no action required.
202	Spent Fuel Pool Leakage Limits	Generic Issue 202 was dropped with no action required.
203	Potential Safety Issues with Cranes that Lift Spent Fuel Casks	Generic Issue 203 was dropped with no action required.

Table 1C-201 Operating Experience Review Results Summary—Generic Letters

No.	Issue Date	Title	Evaluation Result or Location(s) Where Discussed
[STD COL 1C.1-1-A]			
82-39	12/22/82	Problems with the Submittals of 10 CFR 73.21 Safeguards Information Licensing Review	Not Applicable. Is an administrative communication. The site has an approved procedure for handling Safeguards Information including how to mail such information to authorized recipients.
[EF53 DEP11.4-1]			
81-38	11/10/81	Storage of Low-Level Radioactive Wastes at Power Reactor Sites	The Radwaste Building includes space for processing and storage of low level waste. Storage space is provided for at least 10 years of packaged Class B and C waste and approximately 3 months worth of packaged Class A waste. Section 11.4
07-01	02/07/07	Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients.	Applicable. Monitoring of underground cable is addressed in Subsection 17.6.4.

Table 1C-202 Operating Experience Review Results Summary—IE Bulletins

[STD COL 1C.1-2-A]

No.	Issue Date	Title	Evaluation Result or Location(s) Where Discussed
2005-02	07/18/05	Emergency Preparedness and Response Actions for Security-Based Events	COLA Part 5, Emergency Plan

DTE Energy
One Energy Plaza, Detroit, MI 48226-1279

10 CFR 52.79

February 8, 2013
NRC3-13-0007

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

References:
1) Fermi 3
Docket No. 52-033
2) Letter from Tekia Govan (USNRC) to Peter W. Smith (DTE Electric), "Request for Additional Information Letter No. 82 Related to Chapters 02.05.02 and 03.07.02 for the Fermi 3 Combined License Application," dated January 14, 2013
3) Letter from Peter W. Smith (Detroit Edison) to USNRC, "Detroit Edison Company Interim Response to NRC Request for Additional Information Letter No. 79," NRC3-12-0030, dated October 12, 2012
4) Letter from Peter W. Smith (Detroit Edison) to USNRC, "Detroit Edison Company Interim Response to NRC Request for Additional Information Letter Nos. 77 and 79," NRC3-12-0033, dated December 14, 2012

Subject: DTE Electric Company Response to NRC Request for Additional Information Letter No. 82

In Reference 2, the NRC requested additional information to support the review of certain portions of the Fermi 3 Combined License Application (COLA). Both Requests for Additional Information (RAIs) in Reference 2 are related to the shear wave velocity profiles that are described in FSAR Subsection 3.7.1.

Attachments 1 and 2 provide the responses to RAIs 03.07.02-10 and 02.05.02-20, respectively. As is noted in the RAIs, the shear wave velocity profiles are used as input to the site-specific soil-structure interaction (SSI) analyses. For this reason, the changes described in Attachments 1 and 2 will impact the proposed SSI analyses that were described in detail in Reference 3. There is no impact on the schedule for performing the SSI analyses that was provided in Reference 4 because of these changes. As described in Reference 4, markups to FSAR Subsection 3.7.1

are scheduled to be submitted by April 26, 2013, and will address the responses to RAIs 03.07.02-10 and 02.05.02-20.

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 8th day of February 2013.

Sincerely,

Peter W. Smith, Director
Nuclear Development – Licensing and Engineering
DTE Electric Company

Attachments:
1) Response to RAI Letter No. 82 (RAI 03.07.02-10)
2) Response to RAI Letter No. 82 (RAI 02.05.02-20)

cc: Adrian Muniz, NRC Fermi 3 Project Manager
Tekia Govan, 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
NRC3-13-0007
(2 pages)

Response to RAI Letter No. 82
(eRAI Tracking No. 6975)

RAI Question No. 03.07.02-10

NRC RAI 03.07.02-10

Fermi 3 FSAR Tier 2 Rev. 4 Section 3.7.1.1.4.4.3 describes the deterministic strain-iterated lower-bound (LB), best-estimate (BE), and upper-bound (UB) shear wave velocity profiles for the full soil column, which are used as input to the SSI analysis in accordance with SRP 3.7.2. These profiles are listed in FSAR Tables 3.7.1-205, 3.7.1-206, and 3.7.1-207, and shown in FSAR Figure 3.7.1-225. The FSAR indicates that UB and LB profiles were modified where necessary to maintain the minimum variation relative to the BE profile, such that GUB≥1.5 x GBE or GLB≤GBE / 1.5 is satisfied as required by SRP 3.7.2. The staff notes that the value 1.5 (corresponding to COV=50%) is applicable to subsurface site conditions that have been "well investigated" by the geotechnical investigation. Since the engineered granular backfill above the bedrock has not yet been built, the applicant is requested to provide the technical basis for using COV=50% and not considering a minimum COV=100% for the backfill portion of the LB and UB profiles.

Response

The engineered granular backfill in the lower bound (LB) and upper bound (UB) subsurface profiles will use a minimum coefficient of variation (COV) of 100 percent. The minimum COV of 50 percent will be used for the well investigated in situ bedrock units beneath the engineered granular backfill. The use of these minimum COV values satisfies the requirements of SRP 3.7.2.

The use of a minimum COV of 100 percent for the engineered granular backfill and a minimum COV of 50 percent for the in situ bedrock units beneath the engineered granular backfill will be documented in the markup of Fermi 3 FSAR Subsection 3.7.1 and a supplement to this RAI response. The markup of the Fermi 3 FSAR Subsection 3.7.1 will include the Central and Eastern United States (CEUS) Seismic Source Characterization (SSC) model from NUREG-2115 as the basis for the seismic hazard analysis and subsequent seismic analyses.

Proposed COLA Revision

The markup of FSAR Subsection 3.7.1 will be provided by April 26, 2013.

Attachment 2
NRC3-13-0007
(4 pages)

Response to RAI Letter No. 82
(eRAI Tracking No. 6976)

RAI Question No. 02.05.02-20

NRC RAI 02.05.02-20

10 CFR Part 100, Appendix A requires the determination of the static and dynamic engineering properties of the materials underlying the site, which should include properties needed to determine the behavior of the underlying material during earthquakes and the characteristics of the underlying material in transmitting earthquake-induced motions to the foundations of the plant. FSAR Section 3.7.1.1.4.1.1 describes the dynamic properties of the engineered granular backfill above the bedrock; however, in order to satisfy the requirements of 10 CFR Part 100, Appendix A, please provide the information described below.

a) *FSAR Section 3.7.1.1.4.1.1 states that the shear-wave velocity for the granular backfill is estimated based on empirical relationships for angular-grained material from Richart et al. (1970). Please provide the range of parameters (i.e., void ratio and average effective confining pressure) that were used to define the lower range (LR), intermediate range (IR) and upper range (UR) shear-wave velocity profiles and explain why they are appropriate for the backfill material to be used at the site. Furthermore, please justify the use of Richart et al. (1970) in light of more recently published empirical relationships, e.g. Menq (2003), and include a discussion of the potential applicability of the more recent relationships.*

b) *FSAR Section 3.7.1.1.4.1.1.2 states that the shear modulus reduction and damping relationships selected for the granular backfill correspond to generic sand curves from EPRI (1993). Please justify the use of the EPRI (1993) generic sand curves rather than more recently published shear modulus reduction and damping relationships, e.g. Darendeli (2001) and Menq (2003), which may be more representative of the proposed backfill material. In addition, include a discussion of the potential applicability of the more recent relationships.*

References

Darendeli, M. B. (2001), "Development of a New Family of Normalized Modulus Reduction and Material Damping Curves", Ph. D. Dissertation, University of Texas at Austin.

EPRI (1993), "Guidelines for Determining Design Basis Ground Motions," Early Site Permit Demonstration Program, Project RP3302.

Menq, F. Y. (2003), "Dynamic Properties of Sandy and Gravelly Soils", School of Civil Engineering, Ph.D. Dissertation, University of Texas at Austin.

Richart, F.E., Woods, R.D., and Hall J.R. (1970), "Vibration of Soils and Foundations," Prentice-Hall.

Response

This response provides a discussion of the approach that will be used to respond to RAI 02.05.02-20. A detailed supplemental response is scheduled to be submitted with the markup to Fermi 3 FSAR Subsection 3.7.1. Parts a) and b) of RAI 02.05.02-20 are addressed as follows:

a) *FSAR Section 3.7.1.1.4.1.1 states that the shear-wave velocity for the granular backfill is estimated based on empirical relationships for angular-grained material from Richart et al. (1970). Please provide the range of parameters (i.e., void ratio and average effective confining pressure) that were used to define the lower range (LR), intermediate range (IR) and upper range (UR) shear-wave velocity profiles and explain why they are appropriate for the backfill material to be used at the site. Furthermore, please justify the use of Richart et al. (1970) in light of more recently published empirical relationships, e.g. Menq (2003), and include a discussion of the potential applicability of the more recent relationships.*

The range of parameters used to define the engineered granular backfill lower range (LR), intermediate range (IR), and upper range (UR) shear wave velocity profiles will be documented in the supplemental response to this RAI. The range of engineered granular backfill parameters was selected to represent the possible range of properties based on the anticipated engineered granular backfill types described in Fermi 3 FSAR Subsection 2.5.4.5.1.

Both the Richart et al. (Fermi 3 FSAR Reference 3.7.1-201) and Menq (Reference 2) empirical relationships will be applied to estimate the shear wave velocities of the engineered granular backfill. The LR, IR, and UR shear wave velocities for the engineered granular backfill will be provided in the supplement to this RAI response and the markup to Fermi 3 FSAR Subsection 3.7.1 scheduled to be submitted by April 26, 2013. Additionally, the range of engineered granular backfill parameters used to apply both the Richart et al. and Menq empirical relationships will be discussed in the supplement to this RAI response.

b) *FSAR Section 3.7.1.1.4.1.1.2 states that the shear modulus reduction and damping relationships selected for the granular backfill correspond to generic sand curves from EPRI (1993). Please justify the use of the EPRI (1993) generic sand curves rather than more recently published shear modulus reduction and damping relationships, e.g. Darendeli (2001) and Menq (2003), which may be more representative of the proposed backfill material. In addition, include a discussion of the potential applicability of the more recent relationships.*

The generic EPRI (Fermi 3 FSAR Reference 2.5.2-269) modulus reduction and damping relationships for sand are suitable for generic site response studies in Eastern North America, and are intended to represent soils in the general range of gravelly sand to low plasticity silty clays or sandy clays. The EPRI (1993) generic sand curves are considered suitable for the Fermi 3 engineered granular backfill based on their intended application to gravelly sands that are similar to the proposed Fermi 3 engineered granular backfill.

The modulus reduction and damping relationships of Darendeli (Reference 1) are for different levels of plasticity, including a plasticity index of 0 for use with sand-rich materials. As stated by Darendeli in Reference 1:

> "It is important to note that soils with a wide range of plasticity are represented in this database. About half of the soils classify as fine-grained soils. Coarse-grained soils included in this study are limited to sands. Due to limitations on specimen size, gravelly soils were not tested as part of this work."

The modulus reduction and damping relationships of Menq are preferred over those of Darendeli for the Fermi 3 site because both relationships use a similar mathematical formulation, but Menq

incorporates the influence of gradation parameters based on tested samples of nonplastic sandy and gravelly soils that are anticipated to be more similar to the engineered granular backfill. The modulus reduction and damping relationships of Menq will be considered in the response of the engineered granular backfill to seismic ground motions.

The EPRI generic sand modulus reduction and damping curves produce less modulus reduction and damping than the Menq estimates; therefore, they will be applied to the UR shear wave velocity profile of the engineered granular backfill. The Menq modulus reduction and damping relationships apply to material properties similar to those used to estimate the LR shear wave velocity values; therefore, they will be applied to the LR shear wave velocity profile of the engineered granular backfill. The use of both the EPRI and Menq modulus reduction and damping relationships, along with randomization of the relationships to account for variations in the material properties, results in a wider range of modulus reduction and damping curves used to establish the LB and UB profiles.

The IR shear wave velocity values estimated for the engineered granular backfill will use an intermediate modulus reduction and damping relationship. The intermediate range modulus reduction and damping values will be developed by averaging the LR values based on Menq and the UR values based on EPRI generic sand curves.

All modulus reduction and damping curves will be randomized using standard deviations set so the randomized relationships fall within the recommended bounds provided by Silva (Fermi 3 FSAR Reference 2.5.2-287). The damping ratio curves will be limited to a maximum of 15 percent damping as recommended in Appendix E of Regulatory Guide 1.208.

References:

1. Darendeli, M. B. (2001), “Development of a New Family of Normalized Modulus Reduction and Material Damping Curves,” Ph. D. Dissertation, University of Texas at Austin.

2. Menq, F. Y. (2003), “Dynamic Properties of Sandy and Gravelly Soils,” School of Civil Engineering, Ph.D. Dissertation, University of Texas at Austin.

Proposed COLA Revision

The markup of FSAR Subsection 3.7.1 will be provided by April 26, 2013.