

January 14, 2013

Mr. Peter W. Smith, Director
Nuclear Development
Licensing and Engineering
337 WCB
DTE Electric Company¹
One Energy Plaza
Detroit, MI 48226-1221

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 82 RELATED TO
CHAPTERS 02.05.02 and 03.07.02 FOR THE FERMI 3 COMBINED LICENSE
APPLICATION

Dear Mr. Smith:

By letter dated September 18, 2008, Detroit Edison Company (Detroit Edison) submitted for approval a combined license application pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52. The U.S. Nuclear Regulatory Commission (NRC) staff is performing a detailed review of this application to enable the staff to reach a conclusion on the safety of the proposed application.

The NRC staff has identified that additional information is needed to continue portions of the review. The staff's request for additional information (RAI) is contained in the enclosure to this letter. In order to minimize delays to the current licensing schedule, we request that you respond within 30-days of receipt of this RAI.

If changes are needed to the safety analysis report, the staff requests that the RAI response include the proposed wording changes. If you have any questions or comments concerning this matter, I can be reached at 301-415-6197 or by e-mail at tekia.govan@nrc.gov.

Sincerely,

/RA/

Tekia Govan, Project Manager
Licensing Branch 3
Division of New Reactor Licensing
Office of New Reactors

Docket No.: 052-033

eRAI Tracking No. 6975 and 6976

Enclosure: Request for Additional Information

¹ On December 21, 2012, the Detroit Edison company sent the NRC a letter indicating that, effective January 1, 2013, the name of the company would be changed to "DTE Electric Company." The legal entity will remain the same (see ML12361A437).

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Request for Additional Information

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*Approval captured electronically in the electronic RAI system.

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Request for Additional Information 82

Issue Date: 1/14/2013

Application Title: Fermi Unit 3 - Docket Number 52-033

Operating Company: Detroit Edison

Docket No. 52-033

Review Section: 03.07.02 - Seismic System Analysis

Application Section: 03.07.02

QUESTIONS

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 $G_{UB} \geq 1.5 \times G_{BE}$ or $G_{LB} \leq G_{BE} / 1.5$ 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.

Enclosure

Request for Additional Information 82

Issue Date: 1/14/2013

Application Title: Fermi Unit 3 - Docket Number 52-033

Operating Company: Detroit Edison

Docket No. 52-033

Review Section: 02.05.02 - Vibratory Ground Motion

Application Section: 2.5.2

QUESTIONS

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.