PMFermiCOLPEm Resource

From: Govan, Tekia
Sent: Friday, December 28, 2012 11:19 AM
To: 'Michael K Brandon'; 'Ryan C Pratt'
Cc: FermiCOL Resource
Subject: DRAFT RAIs
Attachments: RAI_6975.doc; RAI_6976.doc

Mike/Ryan:

Please find attached the draft RAIs developed by the NRC staff in order continue their review of the Fermi 3 RCOL application in the areas of Soil Structure Interaction and Fukushima Recommendation 2.1. We have posted a public teleconference to discuss these RAIs on Thursday, January 10, 2013.

Thanks
Tekia

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RAI_6975.doc	19834	
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Request for Additional Information

Issue Date:
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

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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.

Request for Additional Information

Issue Date:
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

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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.