NUCLEAR ENERGY INSTITUTE

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Mr. James E. Lyons
Director, New Reactor Licensing Project Office
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: Resolution of Generic Topic ESP-13 (Seismic Evaluations)

PROJECT 689

Dear Mr. Lyons:

In public meetings on June 13, July 16, October 16, 2002, and March 5, 2003, we discussed generic topic ESP-13, which concerns seismic evaluation information to be submitted as part of an early site permit (ESP) application. In addition, on September 4, 2002, the Nuclear Energy Institute (NEI) submitted information related to ESP seismic demonstration activities. Our ESP-13 discussions focused on the methods to be utilized in preparing the seismic evaluations.

In accordance with the protocol established for documenting resolution of generic ESP issues, we request that, by reply to this letter, the NRC confirm the understandings and expectations that resulted from our discussions as identified below. To promote timely resolution of generic issues and continued progress toward submittal of ESP applications in 2003, we request that NRC respond within 30 days.

Understandings and Expectations

1. Pursuant to 10 CFR 100.23(c), the ESP applicant will investigate and identify the geological, seismological, and engineering characteristics of a site and its environs to permit evaluation of the site, to support evaluation of the Safe Shutdown Earthquake (SSE) ground motion, and to support future engineering solutions to actual or potential geologic and seismic effects at the site.

2. Pursuant to 10 CFR 100.23(d), the ESP applicant will identify site-specific geologic and seismic siting factors including a determination of the SSE ground motion for the site, the potential for surface tectonic and nontectonic deformations, and the design bases for seismically induced floods and water waves

3. Regulatory Guide 1.132 provides the principal current NRC guidance for conducting geotechnical characterization of the site. The ESP applicant may utilize existing geotechnical data from previously considered applications if its continued validity is confirmed or it is updated.

    - The extent of ESP applicant exploration and evaluation will be sufficient to address siting concerns. Additional exploration and evaluations may be necessary for COL applications to support specific design considerations.

4. Regulatory Guide 1.138 provides the principal current NRC guidance for conducting laboratory testing necessary to determine the properties of subsurface materials of the site.

5. Pursuant to 10 CFR 100.23(d)(1), a probabilistic seismic hazard analysis (PSHA) or suitable sensitivity analyses are acceptable ways to address the uncertainties in the determination of the design basis ground motion for a site. Regulatory Guide 1.165 provides the principal current NRC guidance for determining safe shutdown earthquake ground motion. Additional guidance on acceptable approaches for assessing hazard consistent ground motions at a site is contained in NUREG/CR-6728 and NUREG/CR-6769.

    - Existing Electric Power Research Institute (EPRI) seismic sources and source parameters provide an acceptable starting basis for assessing design basis ground motion for a site in Central and Eastern United States (CEUS).

    - An up-to-date site-specific geological, seismological, and geophysical investigation must be performed. Existing site-specific geological, seismological, and geophysical data from previously considered applications may be utilized if confirmed or updated.

    - The existing EPRI PSHA will be acceptable if new data evaluated pursuant to Regulatory Guide 1.165, Appendix E.3, does not substantially increase the existing hazard.

    - Design basis ground motion is determined for free-field conditions at the ground surface, as computed for a rock site and modified for site-specific soil effects.

    - The median 1E-5 annual frequency hazard is acceptable for determining design basis ground motion at a site.

    - An ESP applicant may determine the appropriate operating basis earthquake (OBE) level but doing so is not required for ESP application

6. In updating the seismic hazard information base, the ESP applicant will utilize Regulatory Positions C.1 and C.2 of RG 1.165.

    - The ESP applicant will utilize the guidance in Appendix D of RG 1.165 for the types of data needed.

    - The ESP applicant will focus on data and interpretations since the previous EPRI PSHA (circa 1990).

    - The ESP applicant will utilize published literature, available PSHA studies for important facilities, and discussions with active researchers in the region as primary data sources.

    - The ESP applicants will conduct more detailed investigations of newly identified features where warranted.

7. In performing the PSHA and determining the controlling earthquakes for a site, the ESP applicant will utilize the multi-tiered approach identified in Regulatory Position C.3 of RG 1.165.

    - Assess the applicability of the EPRI PSHA results to the site using a three-step procedure as outlined in Appendix E.3 of RG 1.165.

    - Step 1 – Assess the impact of post-EPRI data on characterization of seismic sources.

    - Step 2 – If Step 1 identifies differences from the EPRI database which may substantially affect the hazard, perform PSHA sensitivity analyses to assess the impact. If not, use existing EPRI results for rock ground motion.

    - Step 3 – If Step 2 identifies a substantial increase in the hazard, update the PSHA. If not, use existing rock ground motion for the site.

    - NOTE – An updated ground motion attenuation assessment may be used in the performance of Step 2 and Step 3.

    - Obtain median 1E-5 annual exceedance frequency ground motions on rock from either existing EPRI PSHA results or from updated PSHA results.

    - Identify controlling earthquakes using the procedure given in Appendix C of RG 1.165

8. In determining the SSE spectra, the ESP applicant will utilize the procedures identified in Regulatory Position C.4 of RG 1.165

    - Define appropriate rock spectrum using spectral shape appropriate for CEUS (e.g., from NUREG/CR-6728).

    - Assess dynamic response properties for the site using results of geotechnical investigations.

    - Perform site response analyses using procedures to develop free-field surface motions (e.g., NUREG/CR-6728 & NUREG/CR-6769).

    - Develop appropriate smooth SSE free-field spectra.

9. To reduce the earthquake ground response spectra in the high-frequency region, the ESP applicant may utilize the methods in EPRI topical report TR-102470, *Analysis of High-Frequency Seismic Effects*, which demonstrates that such motions are not damaging.

Enclosed for your use is an updated list and status of generic ESP topics that have been identified for discussion during the pre-application period.

We look forward to your confirmation of the understandings and expectations described above related to ESP-16. If you have any questions concerning this request, please contact Russ Bell (rjb@nei.org or 202-739-8087).

Sincerely,

R. Simard

Ron Simard

Enclosure

cc: Ronaldo V. Jenkins, NRC/NRR
NRC Document Control Desk

Enclosure

Status of Generic ESP Interactions/Topics – April 2003

ESP Topic	NEI Resolution Letter	NRC Response	Status/Remarks (Concerns highlighted)
1. ESP application form & content and ESP review guidance	*Later		• Industry comments on ESP Review Standard (RS-002) provided 3/31 • More time to be provided for late sections on QA, Security, and Dose Consequence Analyses (available in April) • * ESP-1 resolution letter to follow RS-002 review/comment/revision process
2. ESP inspection guidance	Post-IMC-2501		• IMC-2501 to be conformed to resolution of ESP-3 (QA) • IMC-2501 and ESP inspection procedures to be completed to support June submittals
2a. Pre-application interactions (voluntary nature, plans for local public mtgs & review fee structure)	11/26	1/10	Resolved
3. QA requirements for ESP information	12/20	2/3	• Follow-up questions discussed on Mar. 5 • Continuing concern about NRC expectations for Appendix B-equivalent controls • Comments due 6/13 on RS-002 Section 17.1.1
4. Nominal NRC review timeline	Target April		• NRC discussed ESP review timeline on 1/29 • Industry may propose ways to reduce overall time to ESP
5. Mechanism for documenting resolution of ESP issues	9/10	11/5	• Resolved • NRC provided supplemental response on 4/17
6. Use of plant parameters envelope (PPE) approach	12/20	2/5	Resolved
7. Guidance for satisfying §52.17(a)(1) requirements	a. 12/20 b. 4/10	2/5	• Supplemental resolution letter addresses continuing concern about nature of dose analyses to be provided by pilot applicants • NRC revised Section 15 of RS-002 based on March 5 discussions; comments due 6/13 • NEI to continue to pursue more optimal resolution (i.e., sole focus for ESP on Chi/Q) via RS-002 and other means
8. Fuel cycle and transportation impacts (Tables S-3 & S-4)	Target April		• Industry preparing resolution letter based on March 26 discussion w/NRC
9. Criteria for assuring control of the site by the ESP holder	Target April		Resolution Pending
10. Use of License Renewal GEIS for ESP	2/6	4/1	Evaluating NRC response
11. Criteria for determining ESP duration (10-20 years)	12/20	2/5	Resolved
12. NEPA consideration of severe accident issues (SAMAs and impacts)	a. 12/20 b. Target April	2/12	• Follow-up letter planned based on March 26 discussion w/NRC to clarify treatment in ESPAs of severe accident impacts
13. Guidance for ESP seismic evaluations	4/25		Resolution pending

ESP Topic	NEI Resolution Letter	NRC Response	Status/Remarks (Concerns highlighted)
14. Applicability of Federal requirements concerning environmental justice	*None		• Commission action pending in response to Dec. 20 NEI letter • No ESP-specific discussion of EJ or ESP-14 resolution letter necessary*
15. Appropriate level of detail for site redress plans	11/26	1/16	Resolved
16. Guidance for ESP approval of emergency plans	4/7		Resolution pending
17. Petition to eliminate duplicative NRC review of valid existing site/facility information	*None		• Commission action pending on petition PRM-52-1 • No ESP-specific discussion or ESP-17 resolution letter necessary*
18. Petition to eliminate reviews for alternate sites, sources and need for power	*None		• Supplemental industry comments on PRM-52-2 provided on Dec. 18 • Staff recommendation and Commission action pending • No ESP-specific discussion or ESP-18 resolution letter necessary*
18a Alternative site reviews	12/20	3/7	• Evaluating NRC response • Further input provided in 3/31 comments on RS-002
18x Need for alternative energy source evaluation and review	*None		• NEI commented on RS-002 (3/31) that that ESPAs need not address alt. sources
19. Addressing effects of potential new units at an existing site	Target April		Resolution pending
20. Practical use of existing site/facility information	11/26	12/18	Resolved
21. Understanding the interface of ESP with the COL process.	COLTF Item*		• Purpose is clarity of expectations regarding reference to an ESP by a COL applicant • Analogous to "COL Items" identified as part of the design certifications • Issue to be transferred to COLTF *
22. Form and content of an ESP	Target April		• NEI draft included as enclosure with 12/20 ESP-6 letter • Updated version to be provided via ESP-22 letter; NRC response to provide comments