

NRR-PMDAPEm Resource

From: DiFrancesco, Nicholas
Sent: Friday, March 27, 2015 11:20 AM
To: 'Christopher.Wasik@duke-energy.com'
Subject: Inquiry RE: Oconee ESEP Report Clarifications

Mr. Wasik,

The below email was send to Mr. Hailie. Apologies if it was misdirected.

Thanks,

Nick

Sr Project Manager - Seismic Walkdowns and Re-evaluations
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From: DiFrancesco, Nicholas
Sent: Friday, March 27, 2015 11:10 AM
To: 'Haile, David (David.Haile@duke-energy.com)'
Cc: 'Keiser, Robert L (Robert.Keiser@duke-energy.com)'; Shams, Mohamed; Wyman, Stephen; Devlin-Gill, Stephanie; 'Guill, Paul F'; 'Dana.jones@duke-energy.com'; 'Robison, Greg (Greg.Robison@duke-energy.com)'
Subject: Inquiry RE: Oconee ESEP Report Clarifications

Mr. Haile,

I spoke with Mr. Keiser, and discuss at a high-level the below questions this morning. Also, appreciative of Duke's continued licensing updates to NRC in the R2.1 Seismic area.

As part of the NRC review of the Oconee Expedited Seismic Evaluation Process (ESEP) report, the staff would appreciate clarification on the following technical items:

Question 1

ESEP Report Section 5.2 states, “[in-structure response spectra] ISRS for ESEP evaluation of components located outside the SSF were estimated by scaling the ONS [Oconee Nuclear Station] design-basis SSE [Safe Shutdown Earthquake] ISRS by the RLGGM [Review Level Ground Motion] scale factor of 2.0.” However, ESEP Report Section 6.4, “Functional Capacity Screening Using [Electric Power Research Institute] EPRI NP-6041-SL,” states, “The SSE ISRS were amplified by a factor of 2.0 throughout the frequency range and were then clipped (per EPRI 1019200), using the methodology in EPRI NP-6041-SL, Appendix Q,…” It appears that raw ISRS with sharp peaks and valleys, but with peaks clipped, were used for screening. The staff expected that the “ONS design-basis SSE ISRS” used for screening would be typical broadened, enveloped ISRS used for seismic design of Category I SSCs.

Please clarify how raw ISRS and peak clipping were used in the screening process, and provide the technical basis. Additionally, provide the range of calculated clipping factors, the reference for the equation used, and an example showing representative raw ISRS and the corresponding clipped ISRS.

Question 2

ESEP Report Section 6.4 “Functional Capacity Screening Using EPRI NP-6041-SL,” states “..., and the North-South and East-West clipped peaks were averaged.” The technical basis for averaging the clipped peaks of N-S and E-W ISRS is not clear. The dynamic characteristics of the intervening structure between the ground and the location of the ISRS filters the ground motion. N-S and E-W ISRS may be significantly different in shape and spectral amplification. While averaging may be appropriate for the ground motions, which have amplitudes that are roughly equal in the two horizontal directions, it is not obvious that averaging is appropriate for ISRS.

Please provide the technical basis for the appropriateness of averaging, and also clarify how averaging was performed, including an example calculation using representative N-S and E-W clipped ISRS.

Question 3

Section 5 of the Augmented Approach Guidance (EPRI TR 3002000704) references EPRI 1019200 specifically for screening beyond 40 feet above grade level. The Oconee ESEP Report Section 6.4, “Functional Capacity Screening Using EPRI NP-6041-SL,” makes no differentiation between screening below 40 feet and screening beyond 40 feet above grade level. It appears that the licensee applied the screening guidance of EPRI 1019200 at all elevations above the basemat.

Please clarify whether, and to what extent, the screening guidance of EPRI NP-6041-SL, Table 2-4 (without the 1.5 factor) was implemented for components located less than 40 feet above grade level. Specify the lowest elevation, relative to grade level, at which screening was conducted using the 1.5 factor and the amplified, clipped SSE ISRS. If this elevation is less than 40’ above grade level, please provide the technical basis for deviation from the guidance in Section 5 of EPRI TR 30020007a04, also discuss differences in the reported HCLPF capacities if the Augmented Approach guidance is followed.

An email response should be sufficient to support the ESEP report review. A response around April 13, if practicable, would be greatly appreciated to support the planned review schedule. Please note that I plan to document the response in ADAMS.

Please let me or Steve Wyman (at 301-415-3041) know if you would like to schedule a clarification call or any have questions and concerns.

Thanks,

Nick

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Hearing Identifier: NRR_PMDA
Email Number: 2360

Mail Envelope Properties (0046140293E11F408991442DB4FE25CA020BACEF5A72)

Subject: Inquiry RE: Oconee ESEP Report Clarifications
Sent Date: 3/27/2015 11:19:50 AM
Received Date: 3/27/2015 11:19:00 AM
From: DiFrancesco, Nicholas

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Tracking Status: None

Post Office: HQCLSTR01.nrc.gov

Files	Size	Date & Time
MESSAGE	5017	3/27/2015 11:19:00 AM

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received: