

NRR-DMPSPeM Resource

From: Lyons, Sara
Sent: Wednesday, January 24, 2018 2:02 PM
To: Nevins, Kathleen J.
Subject: Beaver Valley 10 CFR 50.54(f) - NTTF 2.1 SPRA Review

Good afternoon, Kathleen,

In performing the detailed review of the subject submittal, the NRC staff has determined that additional clarification is needed. As discussed, we will organize a clarification call on January 31st from 2-3:00 PM ET. This clarification call will be held in accordance with the audit plan which was issued on July 6, 2017 ([ML17177A446](#)). The four clarification questions which we would like to discuss are included below for your reference. I am providing these questions to you in advance to help you determine the appropriate staff to support the meeting.

Please note that I am also including the previously resolved clarification question here for reference only; we are not requesting any further clarification on that point. Feel free to call or email me if you need additional information to facilitate this discussion.

Thanks,
-Sara

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Clarification Question 1 – Response Analysis for Buildings (Topic #7)

Section 3.1.1.2 of the Beaver Valley Power Station (BVPS) seismic PRA (SPRA) submittal, explains that “representative foundation elevations” were selected for site response analysis and the acceleration response spectra were mapped to structures by their foundation elevation. In this way, buildings with similar foundation elevations were assessed to the same acceleration response spectra. Section 3.1, however, does not explain how consideration of impact soil was factored into the site response mapping nor does it provide the actual mapping of building to acceleration response spectra. In order to help NRC gain a more complete understanding of this treatment, please describe the mapping between the structure foundation elevation groups, soil interaction groups, and the plant structures.

Clarification Question 2 – SOV Fragility Analysis on Risk Dominant SSCs (Topic #12)

Section 4.4.2.5 of the submittal states that for the building structures included in the fragility analysis, the fragility was calculated using the Separation of Variables (SOV) method. Section 4.4.2.16 of the submittal explains that, to remove conservatism in other SSC fragility analyses, a “Fragility Refinement Process” was used. For cases in which the level of risk was not acceptably low, refinements were made to the fragility analysis of the top CDF and LERF contributors. The refinement options included:

- Creating new groups and selecting new representative components
- Refining the seismic demand through development of computer models
- Inclusion of a higher ductility factor
- Performing a new fragility calculation using the separation of variables approach

The process of refining SSC fragility analysis and determining the resulting CDF and LERF values was repeated until acceptable CDF and LERF levels were reached. Section 5.7.1.6 and Section A.10 of the submittal reveal that in practice

use of SOV was not needed (except for building structures). It is not clear whether and to what extent the other refinement options (non-SOV refinement options) were used and what impact they had on the seismic CDF and LERF. It is also not clear what the specific bases for these refinements were or how these refinements were applied. In light of these observations:

- a) Explain whether the other refinement options cited in the submittal were used to reduce CDF and LERF and if so the impact that these refinements had on CDF and LERF.
- b) Describe how these refinements were applied and justify the basis for these refinements.
- c) Explain whether any of the refinements were non-conservative, and if so, justify using non-conservative treatments.

Clarification Question 3 – Disposition of Seismic Event PRA F&Os (Topic #14)

Appendix A of Enclosures A and B of the submittal provides the SPRA peer review F&Os and dispositions by FENOC for the SPRA submittal. For F&O 4-16 associated with PRA Standard Supporting Requirement SFR-A2, explain the basis referenced in the disposition for not evaluating the rupture fragility of the steel liner.

Clarification Question 4 – Plant Improvements (Topic #16)

The Section 6.0 (Conclusions) of Enclosure A (corresponding to Unit 1) of the submittal states that “[t]he seismic risk CDF and LERF are sufficiently low that possible improvements or modifications to the plant are not considered necessary.” This conclusion is supported, in part, by the importance measures provided in the submittal. Clarify how the importance measures were determined from the SPRA across the range of seismic hazard level bins and explain whether the results are considered realistic, conservative, or non-conservative.

Previously Resolved Clarification Question

The submittal states that the internal events and internal flooding PRA findings have been addressed, but it is not clear if the findings were closed in accordance with an NRC approved process (e.g., a focused scope peer review or an independent assessment team). If not, our process calls for the reviewers to review the findings and associated resolution. These findings and the associated resolution do not appear to be included with the submittal, but the reviewers can reference other docketed information if the associated findings are already available on the docket.

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