From:	Carolyn Lauron
To:	Andrew Brenner
Cc:	Greg Cranston; Manny Sayoc
Subject:	NRC Staff response to Question re: Seismic Probabilistic Risk Assessment for a Construction Permit Application (Project 99902049)
Date:	Thursday, August 10, 2023 8:06:00 AM

Hi Andrew –

Please find the NRC staff response to the SMR (Holtec) question regarding the subject topic.
If you have questions or need more information, please let us know.

Thanks,
Carolyn

Background:
SMR-160 understands that we will need a full seismic PRA, but we would like to clarify with the NRC staff when the full seismic PRA is required in the Part 50 process, and whether a seismic margins analysis (SMA) is adequate at the time of CPA submittal.

- DNRL-ISG-2022-01, Safety Review of Light-Water Power Reactor Construction Permit Applications
  We did not see any language related to seismic PRA in this ISG.

- NUREG-0800 SRP 19.0, PROBABILISTIC RISK ASSESSMENT AND SEVERE ACCIDENT EVALUATION FOR NEW REACTORS
  We found the following statements:
  "The technical changes incorporated in Revision 3, dated September 2014 include:
  (1) incorporation of guidance previously contained in Interim Staff Guidance (ISG) DC/COL-ISG-003 (ADAMS Accession No. ML081430087) concerning the review of PRA information and severe accident assessments submitted to support DC and COL applications,
  (2) incorporation of guidance previously contained in ISG DC/COL-ISG-020 (ADAMS Accession No. ML100491233) concerning review of information from PRA-based seismic margin analyses submitted in support of DC and COL applications…"

  "The scope of a DC review is limited to the design-specific aspects within the scope of the design certification. The design-specific PRA developed during the DC stage may not identify site specific information (e.g., local hazards, switchyard, and offsite grid configuration, and ultimate heat sink) and may not explicitly model all aspects of the design (e.g., balance of plant). A seismic PRA cannot be performed without a site-specific probabilistic seismic hazard analysis (PSHA) and as-built information. Consequently, a PRA-based seismic margin analysis (SMA) is acceptable."
  We did not find language specific to a construction permit application and seismic PRA.

Question:
Is our thinking above, correct? Could the staff elaborate on the expectations for an SMA or

a full seismic PRA in a CPA submittal?

NRC Staff Response:

A PRA-based SMA is considered acceptable for a CP application. NUREG-0800, SRP 19.0, and the incorporated ISGs, DC/COL-ISG-003 and DC/COL-ISG-020 provide guidance related to the PRA-based SMA for a DC and COL applicant. (References 1, 2, and 3) These guidance documents are broadly applicable to a PRA-based SMA conducted for a CP. A PRA-based SMA for a CP application is expected to account for the availability of site-specific information in a CP application.

The site-specific response spectra should be determined in accordance with the requirements for site characteristics described in NUREG-0800, SRP 2.0, and for seismic design described in NUREG-0800, SRP 3.0. (References 4 and 5)

If the applicant chooses to perform a PRA-based SMA at the CP stage, a seismic PRA is expected in support of the operating license application.

The NRC staff is currently developing guidance to address the content of a CP application for information on PRA, risk insights, and severe accident analysis. The staff has engaged external stakeholders in two public meetings on this initiative.

References:

1. U.S. NRC, NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 19.0, "Probabilistic Risk Assessment and Severe Accident Evaluation for New Reactors," Final Revision 3, December 2015. https://www.nrc.gov/docs/ML1508/ML15089A068.pdf
2. U.S. NRC, Interim Staff Guidance, DC/COL-ISG-003, "Interim Staff Guidance Probabilistic Risk Assessment Information to Support Design Certification and Combined License Applications." https://www.nrc.gov/docs/ML0814/ML081430675.pdf This interim staff guidance was incorporated into Revision 3 to Section 19.0 of NUREG-0800 dated December 2015. This ISG was closed on May 17, 2019 (84 FR 22523).
3. U.S. NRC, Interim Staff Guidance, DC/COL-ISG-020, "Interim Staff Guidance on Implementation of a Probabilistic Risk Assessment-Based Seismic Margin Analysis for New Reactors," issued March 22, 2010. https://www.nrc.gov/docs/ML1004/ML100491233.pdf
4. U.S. NRC, NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Chapter 2, "Site Characteristics and Site Parameters." https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0800/ch2/index.html
5. U.S. NRC, NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Chapter 3, "Design of Structures, Components, Equipment, and Systems." https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0800/ch3/index.html