

ArevaEPRDCPEm Resource

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Sent: Friday, October 29, 2010 4:38 PM
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Subject: Draft - U.S. EPR Design Certification Application RAI No. 455(4911), FSAR Ch. 19, OPEN ITEM
Attachments: Draft RAI_455_SEB2_4911.doc

Attached please find draft RAI No. 455 regarding your application for standard design certification of the U.S. EPR. If you have any question or need clarifications regarding this RAI, please let me know as soon as possible, I will have our technical Staff available to discuss them with you.

Please also review the RAI to ensure that we have not inadvertently included proprietary information. If there are any proprietary information, please let me know within the next ten days. If I do not hear from you within the next ten days, I will assume there are none and will make the draft RAI publicly available.

Thanks,
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Request for Additional Information No. 455(4911), Revision 0

10/29/2010

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020

SRP Section: 19 - Probabilistic Risk Assessment and Severe Accident Evaluation
Application Section: FSAR Chapter 19

QUESTIONS for Structural Engineering Branch 2 (ESBWR/ABWR Projects) (SEB2)

19-341

OPEN ITEM

Follow-up to Open Item RAI No 234, Question 19-304

In 10 CFR 52.47, "Contents of applications; technical information," there is a requirement that each application for design certification (DC) must include a "description of the design-specific probabilistic risk assessment (PRA) and its results" (§ 52.47(a)(27)).

To address the seismic risk for the standard design, the staff proposed a position in SECY-93-087, which the Commission approved, as modified, in a Staff Requirements Memorandum (SRM) dated July 21, 1995, the use of a PRA-based seismic margins analysis for assessing the seismic risk for the design. As stated in the SRM, the seismic margins analysis should use a plant-level seismic margin of 1.67 times the design-basis safe shut earthquakes (SSE). To provide detailed guidance on this analysis, the staff developed Interim Staff Guidance (ISG-20), "Implementation of a Probabilistic Risk Assessment-Based Seismic Margin Analysis (SMA) for New Reactors." ISG-20 provides an implementation process acceptable to the staff for performing the PRA-based SMA and identifies the information to be included in an application needed to support the staff's review and safety findings. The staff needs this information to confirm that adequate seismic margin has been demonstrated or will be established for the standard design.

Tier 2, Chapter 19 of the Final Safety Analysis Report (FSAR) provides a description and results of the PRA-based SMA for the U.S. EPR design certification. Revision 2, of the FSAR Section 19.1.5.1.1.4 provides a description of the system and accident analysis, which includes both the full-power and lower-power shutdown modes. However, with respect to seismic initiating events, the staff noticed that only the small Loss-of-Coolant Accident (LOCA) was included in the seismic initiating events as opposed to various sizes of LOCAs as indicated in ASME/ANS RA-Sa-2009, Table 5-2.3-2(a), SPR-A1 Note (1)(b). Revise Section 19.1.5.1.1.4 of the FSAR to provide a description of the design-specific plant system and sequence analysis consistent with the guidance of ISG-20, Section 5.1.1. It is important that key assumptions utilized are highlighted such that a respective COL applicant can verify their applicability with respect to its site- and plant-specific features.

Revision 2, of the FSAR Section 19.1.5.1.1.5 provides a description of the seismic fragility analysis which, according to AREVA's response to RAI No. 234, Supplement 2,

Question 19-304, was performed using the EPR Certified Seismic Design Response Spectra (CSDRS). The staff noticed that Figure 19.1-31 of Revision 2, of the FSAR Section 19 did not include the high-frequency hard rock spectra, which were added to the CSDRS. Revise Section 19.1.5.1.1.5 of the FSAR to provide a description of the seismic fragility evaluation consistent with the guidance of ISG-20, Section 5.1.2. Given that traditional fragility calculations are performed with respect to a single spectrum shape, the FSAR description should discuss the approach utilized to determine the fragility of an SSC for multiple spectral shapes as in the EPR CSDRS. In addition, for active SSCs identified in the cutsets, the FSAR description should discuss the use of generic data for fragility of active components qualified by tests consistent with the guidance given in the 3rd paragraph of Section 5.1.2 of ISG-20. Also, revise the FSAR to include the results of the fragility evaluation in terms of the median capacity and uncertainties.

To ensure that the COL applicants are able to meet Section 52.79(a)(46) and §52.79(d)(1), revise the COL information items 19.1-6 and 19.1-7 to require: 1) COL applicants to update the DC's PRA-based SMA to address plant- and site-specific features, and 2) COL holders (licensees) to perform as-built verifications of the plant level HCLPF capacities. The COL applicants should identify plant-specific vulnerabilities and confirm the key assumptions and bases of the DC's SMA applicable to the site. If the plant-level HCLPF is less than the target value of 1.67 times the site-specific GMRS, the applicant should perform a full convolution of sequence fragility for all sequences with a potential to lead to core damage to demonstrate that the seismic risk is acceptably low for the licensed plant. ISG-20 provides guidance on this process in Section 5.1.4, and the detailed guidance for COL updating is provided in Section 5.2.

ISG-20, Section 5.4, "Position on Documentation," provides a list of information regarding the documentation in the FSAR that would be sufficient to allow the staff to confirm the acceptability of the PRA-based SMA.