

ArevaEPRDCPEm Resource

From: Pederson Ronda M (AREVA NP INC) [Ronda.Pederson@areva.com]
Sent: Thursday, August 20, 2009 1:35 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); VAN NOY Mark (EXT)
Subject: Response to U.S. EPR Design Certification Application RAI No. 264, FSARCh. 3
Attachments: RAI 264 Response US EPR DC.pdf

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 264 Response US EPR DC.pdf" provides a technically correct and complete response to the 1 question.

Appended to this file is the affected page of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which supports the response to RAI 264 Question 03.07.03-35.

The following table indicates the respective page in the response document, "RAI 264 Response US EPR DC.pdf," that contains AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 264 — 03.07.03-35	2	2

This concludes the formal AREVA NP response to RAI 264, and there are no questions from this RAI for which AREVA NP has not provided responses.

Sincerely,

Ronda Pederson

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Licensing Manager, U.S. EPR Design Certification

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From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Friday, July 24, 2009 4:31 PM
To: ZZ-DL-A-USEPR-DL
Cc: Chakravorty, Manas; Miernicki, Michael; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 264 (3304), FSARCh. 3

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on July 17, 2009, and on July 24, 2009, you informed us that the RAI is clear and no further clarification is needed. As a result, no change is made to the draft RAI. The schedule we have established for review of your

application assumes technically correct and complete responses within 30 days of receipt of RAIs. For any RAIs that cannot be answered within 30 days, it is expected that a date for receipt of this information will be provided to the staff within the 30 day period so that the staff can assess how this information will impact the published schedule.

Thanks,
Getachew Tesfaye
Sr. Project Manager
NRO/DNRL/NARP
(301) 415-3361

Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 743

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Subject: Response to U.S. EPR Design Certification Application RAI No. 264, FSARCh. 3
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Response to

Request for Additional Information No. 264 (3304), Revision 0

7/24/2009

U. S. EPR Standard Design Certification

AREVA NP Inc.

Docket No. 52-020

SRP Section: 03.07.03 - Seismic Subsystem Analysis

Application Section: 03.07.03

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

Question 03.07.03-35:**Follow-Up RAI to Question 03.07.03-31:**

In its response to Question 03.07.03-31, the applicant states that Section 5.4 of Topical Report ANP-10264NP-A, "U.S. EPR Piping Analysis and Pipe Support Design" describes Seismic Category I piping to non-Category I piping interface design requirements. The section of the topical report that actually covers the design requirements of the Seismic Category I piping to non-Category I piping interface is Section 5.5 (Seismic/Non-Seismic Interface Boundaries) in which it describes how the requirements of Section 5.4 are applied to the Seismic Category I piping to non-Category I piping interface. The applicant is requested to correct the referenced section from Section 5.4 to Section 5.5 in its response.

The markup of the FSAR states that in cases where the first seismic restraint cannot be an anchor, a series of restraints may be utilized to isolate the seismic response of the non-seismic subsystem for the seismic subsystem. It goes on to state that this isolation zone must include *four* seismic restraints in each of the three orthogonal directions beyond the Seismic Category I subsystem boundary and include at least one change in direction. This is consistent with Section 5.4.3.1 (Overlap Region Methodology) of the topical report. However, in Section 5.5 of the topical report it states that isolation of dynamic effects is provided by *four* seismic restraints in each of three orthogonal directions beyond the Seismic Category I subsystem boundary, but does not include the requirement that there be at least one change in direction. The applicant is requested to clarify which requirement applies and to explain why there is a difference in criteria between Section 5.4 and Section 5.5 of the topical report.

Response to Question 03.07.03-35:

The correct reference for the AREVA response to RAI Question 03.07.03-31 is Section 5.5 of Topical Report ANP-10264NP-A "U.S. EPR Piping Analysis and Support Design."

As discussed in ANP-10264NP-A Section 5.5, the model boundary at a non-seismic to seismic interface may consist of several isolation methods including methods similar to those shown in ANP-10264NP-A Section 5.4 with the additional considerations described in Section 5.5. Since non-seismic piping beyond the model boundary may not be designed to seismic requirements, Section 5.5 requires that a plastic moment be applied at the last support in three orthogonal directions.

Although not explicitly repeated in ANP-10264NP-A Section 5.5, the change in direction described by Section 5.4 is implicitly required by the description in Section 5.5 due the fact that using four restraints in each orthogonal direction requires a change in direction since four axial restraints on a run of pipe is not an acceptable design philosophy.

FSAR Impact:

U.S. EPR FSAR Tier 2, Section 3.7.3.8 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

necessary. An interaction evaluation may be performed to demonstrate that the interaction does not prevent the Seismic Category I distribution subsystem from performing its safety-related function.

For non-seismic subsystems attached to seismic subsystems, the dynamic effects of the non-seismic subsystem are accounted for in the modeling of the seismic subsystem. The attached non-seismic subsystem, classified as Seismic Category II, is designed to preclude the effect of causing failure of the seismic subsystem during a seismic event. Section 3.7.3.3 describes decoupling criteria used to determine if the flexibility of the non-seismic subsystem is included in the subsystem model.

Seismic Category I subsystem design requirements extend to the first seismic restraint beyond the system boundary with non-seismic subsystems.

If the first seismic restraint beyond the Seismic Category I subsystem boundary is an anchor restraining the Category I subsystem in all six degrees of freedom, the analysis model includes only the Category I subsystem up to the anchor, which is designed to accept loads from both the Category I subsystem and the non-seismic subsystem.

If the first seismic restraint cannot be an anchor, the non-seismic subsystem and supports beyond this location that affect the Seismic Category I subsystem dynamic analysis are classified Seismic Category II and included in the model. Boundary conditions of the model at the seismic to non-seismic interface are described in Section 5.5 of Reference 1.

3.7.3.8.1 Isolation of Seismic and Non-Seismic Systems

Isolation of seismic and non-seismic subsystems is provided by either geographical separation or by the use of physical barriers. Isolation minimizes the interaction effects that must be considered for the seismic systems and minimizes the number of non-seismic subsystems requiring more rigorous analysis.

Several routing considerations are used to isolate seismic and non-seismic subsystems. When possible, non-seismic SSC are not routed in rooms containing safety-related SSC. Non-seismic SSC that can not be completely separated from seismic SSC must be shown to have no interaction with the seismic systems based on separation distance or an intermediate barrier, or be classified as Seismic Category II. To the extent possible, non-seismic systems are not routed close to any safety-related components.

3.7.3.8.2 Interaction Evaluation

Non-seismic SSC may be located in the vicinity of safety-related SSC without being qualified as Seismic Category II, provided an impact evaluation is performed to verify that no possible adverse impacts occur. In this evaluation, the non-seismic components are assumed to fall or overturn as a result of a seismic event. Any safety-