ArevaEPRDCPEm Resource

From: Getachew Tesfaye
Sent: Friday, February 20, 2009 11:11 AM
To: 'usepr@areva.com'
Cc: Jim Xu; Sujit Samaddar; Michael Miernicki; Joseph Colaccino; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 190 (2205), FSAR Ch. 3
Attachments: RAI_190_SEB2_2205.doc

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on February 18, 2009, and on February 20, 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 except to correct a typographical error in the RAI numbering. The RAI no is changed from 190(2083) to 190(2205) in the email subject line and from 2205 to 190 (2205) in the attachment. 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
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Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 234

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Request for Additional Information No. 190 (2205), Revision 0

2/18/2009

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 03.08.01 - Concrete Containment
Application Section: FSAR Ch 3

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

03.08.01-28

As a result of the structural audit conducted by the NRC staff at AREVA offices, during the week of January 26, 2009, a question arose regarding the use of seismic modification factors when performing the seismic equivalent static analysis of the Nuclear Island (NI) structures. Provide an explanation why these seismic modification factors are used and how they are developed. Also, demonstrate that when using these factors, the resulting member forces (shears and moments) at selected key locations are equal to or more conservative than the corresponding member forces from the SASSI soil-structure interaction analyses. The technical basis for the use of these seismic modification factors should be described in Section 3.8 of the FSAR.

03.08.01-29

As a result of the structural audit conducted by the NRC staff at AREVA offices, during the week of January 26, 2009, a question arose regarding the separate stability analysis performed for the Reactor Building Internal Structures (RBIS). Since there is no physical connection between the RBIS and the containment liner, and no connection between the containment liner and the NI basemat, there is a need to evaluate whether uplift of the RBIS could occur under seismic loadings. The finite element model (FEM) of the RBIS used in the RBIS stability analysis restrains the base of the RBIS in the vertical direction. Since this modeling approach prevents uplift, provide technical information that demonstrates whether uplift of the RBIS could actually occur. If some uplift could occur, describe the extent of the uplift from a realistic analysis and explain how this uplift affects the design of the NI structures, including the containment liner. The evaluation for the uplift effects on the liner should demonstrate that no damage occurs to the liner resulting from potential liftoff of the liner due to bond between the RBIS base concrete and the liner, tearing of the liner at the periphery, and damage of the liner underneath the RBIS due to repetitive impact forces. Note that it would not be sufficient to simply review the vertical reaction forces at the base of the RBIS in the existing linear analysis because if tension occurs at some of the nodes, then those restraints would need to be released which makes this evaluation a nonlinear problem.

03.08.01-30

As a result of the structural audit conducted by the NRC staff at AREVA offices, during the week of January 26, 2009, a question arose regarding the finite element analysis of the Emergency Power Generating Building (EPGB). The AREVA calculation containing the development of the FEM for the EPGB contains a mesh sensitivity analysis for one of the walls which had openings. This sensitivity analysis concluded that a load factor was required to account for the need of a finer mesh representation of the wall. Explain why this mesh sensitivity analysis was only performed for one wall and not for the other walls as well.