

ArevaEPRDCPEm Resource

From: Tesfaye, Getachew
Sent: Wednesday, July 14, 2010 9:32 AM
To: 'usepr@areva.com'
Cc: Makar, Gregory; Terao, David; Carneal, Jason; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 401(4685), FSAR Ch. 6
Attachments: RAI_401_CIB1_4685.doc

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on May 5, 2010, and discussed with your staff on May 13, 2010. As a result of that discussion and subsequent submittal of ANP-10293, Revision 1, on May 19, 2010, all questions were modified, and Questions 06.02.02-52, -55, -57, -60, -61, -62, -64, -65, -67, -68, and -69, were intentionally deleted. On June 2, 2010, a second draft was provided to you to give you an opportunity for further discussion. On June 28, 2010, you informed us that the RAI is clear and no further clarification is needed. 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: 1684

Mail Envelope Properties (0A64B42AAA8FD4418CE1EB5240A6FED11B56BF8ABE)

Subject: U.S. EPR Design Certification Application RAI No. 401(4685), FSAR Ch. 6
Sent Date: 7/14/2010 9:31:34 AM
Received Date: 7/14/2010 9:31:35 AM
From: Tesfaye, Getachew

Created By: Getachew.Tesfaye@nrc.gov

Recipients:

"Makar, Gregory" <Gregory.Makar@nrc.gov>
Tracking Status: None
"Terao, David" <David.Terao@nrc.gov>
Tracking Status: None
"Carneal, Jason" <Jason.Carneal@nrc.gov>
Tracking Status: None
"Colaccino, Joseph" <Joseph.Colaccino@nrc.gov>
Tracking Status: None
"ArevaEPRDCPEm Resource" <ArevaEPRDCPEm.Resource@nrc.gov>
Tracking Status: None
"usepr@areva.com" <usepr@areva.com>
Tracking Status: None

Post Office: HQCLSTR02.nrc.gov

Files	Size	Date & Time
MESSAGE	1123	7/14/2010 9:31:35 AM
RAI_401_CIB1_4685.doc	39930	

Options

Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

Request for Additional Information No. 401(4685), Revision 2

7/14/2010

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 06.02.02 - Containment Heat Removal Systems
Application Section: 6.2

QUESTIONS for Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects)
(CIB1)

06.02.02-52

[Question intentionally deleted.]

06.02.02-53

In ANP-10293, Revision 1, Section D.2.3.3 states that the omission of untreated NUKON is not detrimental to the testing because the binder is not expected to react in the post-LOCA environment. Provide the basis for this expectation and a proposed revision to the report.

06.02.02-54

With respect to the concrete release rates derived in ANP-10293, Revision 1, Section D.3.3, describe how the data for pH 8 and 10 were used to predict release rates for post-LOCA water containing trisodium phosphate, which has a pH of about 7.4. Include a proposed revision to ANP-10293.

06.02.02-55

[Question intentionally deleted.]

06.02.02-56

Clarify in Section D.3.3.3 of ANP-10293 the explanation of how the data for mass release vs. time for NUKON at pH 7.0 (Figure D.3-3) was used to determine the release rates.

06.02.02-57

[Question intentionally deleted.]

06.02.02-58

In Section D.3.3.5 of ANP-10293, Revision 1, explain and justify the assumptions made regarding the release of elements from microtherm insulation. For example, the microtherm contains up to 25% Al_2O_3 according to the material safety data sheet (MSDS), and therefore the most conservative approach would be to assume 25% Al_2O_3 .

Similarly, it would be most conservative to assume the maximum (70%) amorphous silica. However, the report indicates that only granular and fibrous material is released to the sump.

06.02.02-59

Table D.3-5 of ANP-10293, Revision 1 indicates that microtherm insulation contains 25 weight percent carbon. Since there is no carbon in microtherm, according to the MSDS, discuss the basis for including carbon as part of the pretest microtherm composition in Table D.3-5. If the carbon comes from the sample mount and is not actually in microtherm, recalculate the percent by weight of each constituent and show that this increase in percent composition will not affect the amount of precipitate predicted to form.

06.02.02-60

[Question intentionally deleted.]

06.02.02-61

[Question intentionally deleted.]

06.02.02-62

[Question intentionally deleted.]

06.02.02-63

Provide the following information about detection limits for elements and values reported.

- a. Section D.3.4 of ANP-10293, Revision 1, states that calcium phosphate was believed to be distributed throughout the autoclave, but quantification was impractical. Discuss the analyses and observations that led to this conclusion.
- b. Table D.2-1 of ANP-10293, Revision 1, indicates that the aluminum and calcium detection limits are 1 ppm. However, Figure D.2-11 shows measured concentration of aluminum as less than 1 ppm and Figure D.3-6 shows the detection limit for calcium as 10 ppm. These discrepancies in actual detection limits employed for the solutions are not consistent throughout the document.

For example, Figure D.3-1 uses a value of zero for aluminum concentration. The minimum detection limit used in Figure D.3-6 should be used in the Figure D.3-1 calculation as well. In addition, on Page D-71 bottom paragraph through D-72, there is a discussion of calcium concentration measured below the detection limit, but it is not clear to the staff whether this is 10 or 1 ppm. There is also a discussion of the potential for kinetically slow precipitation for calcium phosphate. This precipitate is not kinetically controlled. It indicates that the approach to calcium precipitation in the model is conservative but does not describe what value is being used either as solution or precipitate calcium. Therefore, provide a more rigorous explanation of calcium precipitation and why the assumption made is conservative.

06.02.02-64

[Question intentionally deleted.]

06.02.02-65

[Question intentionally deleted.]

06.02.02-66

ANP-10293, Revision 1, contains tables showing elements and solids released. Please provide the following information about how the values were calculated:

- a. In Table D.3-10 (Elements and Solids Released), the temperature is less than 200°F until about 1.5 hours. Discuss whether these temperatures were used for calculating solubility leaching and aluminum corrosion rates and how this affects the conservatism of the analysis.
- b. During the blowdown phase of the RCS the pH is about 4.5, which means aluminum may corrode at a relatively fast rate for the short period of time when TSP has not yet dissolved and sprayed into the containment. Discuss whether the aluminum corrosion rate at pH 4.5 was modeled into the determination of final aluminum concentration in solution. If it was not, provide a justification or discuss your plans to provide additional calculations that show the concentration of aluminum when this lower pH value is factored into the final concentration.

06.02.02-67

[Question intentionally deleted.]

06.02.02-68

[Question intentionally deleted.]

06.02.02-69

[Question intentionally deleted.]