ArevaEPRDCPEm Resource

From: WILLIFORD Dennis (AREVA) [Dennis.Williford@areva.com]
Sent: Monday, December 12, 2011 4:04 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (AREVA); DELANO Karen (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA); GUCWA Len (EXTERNAL AREVA)
Subject: Response to U.S. EPR Design Certification Application RAI No. 524 (6181), FSAR Ch. 6
Attachments: RAI 524 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 524 Response US EPR DC.pdf," provides a schedule since a technically correct and complete response to the one question cannot be provided at this time.

The following table indicates the respective pages in the response document, "RAI 524 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 524 — 06.02.02-127	2	2

A preliminary schedule for a technically correct and complete response to the one question is provided below. This schedule is being reevaluated and a new supplement with a revised schedule for this question will be transmitted by January 31, 2012.

Question #	Response Date
RAI 524 — 06.02.02-127	January 31, 2012

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
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From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Friday, November 11, 2011 7:34 AM
To: ZZ-DL-A-USEPR-DL
Cc: Ashley, Clinton; McKirgan, John; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 524 (6181), FSAR Ch. 6

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on November 4, 2011, and discussed with your staff on November 9, 2011. No change is made to the draft RAI as a result of that discussion. 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: 3639

Mail Envelope Properties (2FBE1051AEB2E748A0F98DF9EEE5A5D4A027CD)

Subject: Response to U.S. EPR Design Certification Application RAI No. 524 (6181), FSAR Ch. 6
Sent Date: 12/12/2011 4:03:56 PM
Received Date: 12/12/2011 4:03:59 PM
From: WILLIFORD Dennis (AREVA)

Created By: Dennis.Williford@areva.com

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Files	**Size**	**Date & Time**
MESSAGE	2293	12/12/2011 4:03:59 PM
RAI 524 Response US EPR DC.pdf	61621	

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

Response to

Request for Additional Information No. 524

11/11/2011

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 06.02.02 - Containment Heat Removal Systems
Application Section: 6.3

QUESTIONS for Containment and Ventilation Branch 1 (AP1000/EPR Projects)
(SPCV)

Question 06.02.02-127:

Follow-up to RAI-457, Question 06.02.02-81

Regarding risk and credit for containment accident pressure in ECCS pump NPSH analyses:

The U.S. EPR design credited containment accident pressure in evaluating the net positive suction head (NPSH) for pumps that perform emergency core cooling and containment heat removal functions under design basis accident conditions.

SRP 6.2.2 states that "if containment accident pressure is credited in determining available NPSH, an evaluation of the contribution to plant risk from inadequate containment pressure should be made."

AREVA's response to Question 6.2.2-81 presented a result summary for seven LOCA and loss of cooling scenarios. AREVA concluded that the IRWST temperature remained below 212F (100C) for all cases, therefore containment accident pressure (CAP) was not credited in the probabilistic risk assessment (PRA) model to support operation of the safety injection pumps. As part of the staff's review effort, the staff has requested and received the Modular Accident Analysis Program (MAAP) analysis, developed to support the PRA that was used to reach this conclusion and conducted an audit.

During the audit, AREVA stated that they did not account for uncertainty in the MAAP IRWST temperature results. It was also discovered during the audit that some safety equipment was not running that would be expected to operate in these scenarios. For example, the MHSI pumps were set to not run for some low margin cases, i.e. IRWST peak temperature was roughly one degree Celsius below saturation, although two or more MHSI pumps would be expected to operate under design basis or realistic scenarios. AREVA agreed that running MHSI pumps would add heat to the IRWST and could impact the IRWST temperature (no heat exchanger in the MHSI train). The staff considers this to be an unrealistic and non-conservative assumption. In addition, AREVA limited the analysis to one LHSI train (pump and HX). This is more restrictive than the design basis requirements.

Because AREVA's analysis has low margin (approximately one degree Celsius), did not account for uncertainty and had non-conservative assumptions regarding injection pump operation, it is not evident to the staff that the modeling approach selected by AREVA to assess risk, based upon MAAP analysis of IRWST temperature remaining below 212F (100C) during an accident response, is sufficient to conclude that CAP credit is not needed to support operation of the safety injection pumps.

Therefore, the staff requests that AREVA perform a risk assessment and provide results, informed by the discussion above, to the staff for review. The risk assessment should address all plant accident conditions where CAP is credited for reliable operation of the ECCS and containment heat removal system pumps and discuss the bases (e.g., results of thermal-hydraulic analyses) for determining whether CAP credit is needed.

Response to Question 06.02.02-127:

A response to this question will be provided by January 31, 2012.