

ArevaEPRDCPEm Resource

From: WILLIFORD Dennis (AREVA) [Dennis.Williford@areva.com]
Sent: Thursday, September 22, 2011 4:51 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. 475 (5558, 5557), FSAR Ch. 6, Supplement 3
Attachments: RAI 475 Supplement 3 Response US EPR DC.pdf

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for technically correct and complete responses to the three questions in RAI 475 on April 7, 2011. Supplement 1 and Supplement 2 responses to RAI 475 were sent on June 29, 2011 and August 17, 2011, respectively, to revise the response schedule for the 3 questions in this RAI.

The attached file, "RAI 475 Supplement 3 Response US EPR DC.pdf," provides technically correct and complete responses to the remaining 3 questions.

The following table indicates the respective pages in the response document, "RAI 475 Supplement 3 Response US EPR DC.pdf" that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 475 — 06.02.01.01.A-1	2	2
RAI 475 — 06.02.02-86	3	3
RAI 475 — 06.02.02-87	4	4

This concludes the formal AREVA NP response to RAI 475, and there are no questions from this RAI for which AREVA NP has not provided responses.

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
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Wednesday, August 17, 2011 4:22 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); GUCWA Len (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 475 (5558, 5557), FSAR Ch. 6, Supplement 2

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for technically correct and complete responses to the three questions in RAI 475 on April 7, 2011. Supplement 1 response to RAI 475 was sent on June 29, 2011 to revise the response schedule for the 3 questions in this RAI.

The schedule for these 3 questions has been changed as provided below:

Question #	Response Date
RAI 475 — 06.02.01.01.A-1	September 22, 2011
RAI 475 — 06.02.02-86	September 22, 2011
RAI 475 — 06.02.02-87	September 22, 2011

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
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Wednesday, June 29, 2011 1:54 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); GUCWA Len (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 475 (5558, 5557), FSAR Ch. 6, Supplement 1

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for technically correct and complete responses to the three questions in RAI 475 on April 7, 2011.

The schedule for these 3 questions has been changed as provided below:

Question #	Response Date
RAI 475 — 06.02.01.01.A-1	August 24, 2011
RAI 475 — 06.02.02-86	August 24, 2011
RAI 475 — 06.02.02-87	August 24, 2011

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.

7207 IBM Drive, Mail Code CLT 2B

From: WELLS Russell (RS/NB)
Sent: Thursday, April 07, 2011 7:18 AM
To: Tesfaye, Getachew
Cc: GUCWA Len (External RS/NB); BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 475 (5558, 5557), FSAR Ch. 6

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 475 Response US EPR DC.pdf" provides a schedule since technically correct and complete responses to the 3 questions are not provided.

The following table indicates the respective pages in the response document, "RAI 475 Response US EPR DC.pdf," that contain AREVA NP's responses to the subject questions.

Question #	Start Page	End Page
RAI 475 — 06.02.01.01.A-1	2	2
RAI 475 — 06.02.02-86	3	3
RAI 475 — 06.02.02-87	4	4

A complete answer is not provided for 3 of the 3 questions. The schedule for technically correct and complete responses to these questions is provided below.

Question #	Response Date
RAI 475 — 06.02.01.01.A-1	June 29, 2011
RAI 475 — 06.02.02-86	June 29, 2011
RAI 475 — 06.02.02-87	June 29, 2011

Sincerely,

Russ Wells
U.S. EPR Design Certification Licensing Manager
AREVA NP, Inc.
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Russell.Wells@Areva.com

From: Tesfaye, Getachew [<mailto:Getachew.Tesfaye@nrc.gov>]

Sent: Monday, March 07, 2011 8:07 PM

To: ZZ-DL-A-USEPR-DL

Cc: Jensen, Walton; Ashley, Clinton; Jackson, Christopher; McKirgan, John; Carneal, Jason; Colaccino, Joseph; ArevaEPRDCPEm Resource

Subject: U.S. EPR Design Certification Application RAI No. 475 (5558, 5557), FSAR Ch. 6

Attached please find the subject request for additional information (RAI). A draft of the RAI was provided to you on February 22, 2011, and on March 4, 2011, 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: 3422

Mail Envelope Properties (2FBE1051AEB2E748A0F98DF9EEE5A5D48A854B)

Subject: Response to U.S. EPR Design Certification Application RAI No. 475 (5558, 5557), FSAR Ch. 6, Supplement 3
Sent Date: 9/22/2011 4:51:26 PM
Received Date: 9/22/2011 4:51:49 PM
From: WILLIFORD Dennis (AREVA)

Created By: Dennis.Williford@areva.com

Recipients:

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Tracking Status: None
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Files	Size	Date & Time
MESSAGE	6399	9/22/2011 4:51:49 PM
RAI 475 Supplement 3 Response US EPR DC.pdf		67492

Options

Priority: Standard

Return Notification: No

Reply Requested: No

Sensitivity: Normal

Expiration Date:

Recipients Received:

Response to

Request for Additional Information No. 475, Supplement 3

3/07/2011

U. S. EPR Standard Design Certification

AREVA NP Inc.

Docket No. 52-020

**SRP Section: 06.02.01.01.A - PWR Dry Containments, Including Subatmospheric
Containments**

SRP Section: 06.02.02 - Containment Heat Removal Systems

Application Section: 6.2

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

Question 06.02.01.01.A-1:

During an audit held at AREVA's office in Lynchburg, VA from Feb 15-16, 2011 the staff learned that the reactor cavity is isolated from the rest of the containment by design features so that steam from the break cannot reach it. If the reactor cavity volume is isolated from the rest of the containment, provide justification for including this volume in the 30 node GOTHIC model to evaluate peak containment pressure. If this volume should not be included, provide evaluations of the increase in containment pressure and temperature that would occur for design basis LOCA and MSLB events.

Response to Question 06.02.01.01.A-1:

In both the containment pressure and temperature analysis and the latest water retention analysis, it is assumed that the reactor cavity pressurizes with steam from the surrounding volumes. The effect the reactor cavity volume has on total containment pressure and temperature is negligible as the free volume of GOTHIC Node 30 is only 0.79 percent of the total containment free volume.

FSAR Impact:

The U.S. EPR FSAR will not be changed as a result of this question.

Question 06.02.02-86:

During an audit of the IRWST level calculation it was discovered that some containment areas that cannot readily return water to the IRWST (sump) were not included in the IRWST water level calculation. For example, the core spreading area and the reactor cavity were not included as areas for water hold-up. Based on the containment layout review the core spreading area connects to the containment atmosphere and can collect steam/water during an accident and this water would not be able to return to the IRWST (sump) and support NPSH. Additionally, the reactor cavity area was not evaluated to hold-up water because AREVA indicated that 'design features' exist which prevent water/steam from reaching the reactor cavity during a postulated break. A description of these design features was not provided. The NRC staff request that AREVA evaluate water hold-up from the IRWST that considers the core spreading area. In addition, the staff also requests that AREVA evaluate water hold-up from the IRWST that includes the reactor cavity area; or provide a description of the design features and justification that the design features prevent water from reaching the reactor cavity.

Response to Question 06.02.02-86:

In the latest revision of the water retention analysis, the core spreading area and the reactor cavity were added to the list of rooms retaining water that can not be returned to the IRWST. For each room, it was assumed that condensation occurs in the room and any connecting rooms above. The water then pools up on the floor, increasing in depths as the transient progresses. A full list of these rooms is found in the March 31, 2011, Response to RAI 434, Supplement 4, Question 06.02.02-72.

FSAR Impact:

The U.S. EPR FSAR will not be changed as a result of this question.

Question 06.02.02-87:

Provide justification that the break selection used in the IRWST water retention (level) calculations is the most limiting or worst case. Please explain why other breaks, such as the largest pipe at the top of the pressurizer or pressurizer surge line, will not retain more water.

Response to Question 06.02.02-87:

The latest revision of the water retention calculation analyzes four different LOCA scenarios. The first is a large break LOCA in the pump suction side of the cold leg. The other three cases are small breaks, a 9-inch break in the discharge side of the cold leg, and a 3-inch break in the hot leg. The large break was chosen because it is the most limiting for containment pressure; thus, containing the greatest amount of steam in the containment. The two small breaks were chosen to represent the range of small breaks analyzed for containment pressure and temperature. The water retention results for the 3-inch hot leg break were also applied to a pressurizer break scenario in that the RCS retained high levels of safety injection water later on in the transient.

In terms of water retention as it concerns for NPSH requirements, the most limiting case analyzed was the large break in the pump suction side of the cold leg. The limiting NPSH margin occurs early in the transient when there is a large steam mass in containment and large-break and condensation flows result in high dynamic head heights on the heavy floor and lower annular floor. Other large-break cases would behave similarly but would retain less steam in the reactor building containment.

The small-break cases yielded significantly lower retained water values than the most limiting value for the large-break case. Applying the smaller of the small-break results to the pressurizer line yielded greater water retention than the other breaks, but the margin above the required IRWST level was still greater than that of the large-break case. More water is required to be in the IRWST for the larger breaks in terms of required NPSH. After analyzing the upper and lower small-break sizes as well as a pressurizer line break scenario, it is concluded that the most limiting break size is the large break.

FSAR Impact:

The U.S. EPR FSAR will not be changed as a result of this question.