

ArevaEPRDCPEm Resource

From: WILLIFORD Dennis (AREVA) [Dennis.Williford@areva.com]
Sent: Wednesday, August 31, 2011 9:43 AM
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. 479 (5568_5610_5612), FSAR Ch. 6, Supplement 3
Attachments: RAI 479 Supplement 3 Response US EPR DC.pdf

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to the three questions in RAI 479 on April 7, 2011. Supplement 1 and Supplement 2 responses to RAI 479 were sent on June 14, 2011, and July 27, 2011, respectively, to revise the response schedule for the three questions.

The attached file, "RAI 479 Supplement 3 Response US EPR DC.pdf" provides technically correct and complete responses to 2 of the remaining 3 questions. Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the responses to RAI 479 Question 06.02.01-102 and Question 06.02.04-12. Please note that a portion of the U.S. EPR FSAR changes associated with these responses were included as part of Revision 3 to the U.S. EPR FSAR. These changes are not denoted by "redline-strikeout" on the enclosed markup of U.S. EPR FSAR Interim Revision 4.

The following table indicates the respective pages in the response document, "RAI 479 Supplement 3 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 479 — 06.02.01-102	2	3
RAI 479 — 06.02.04-12	4	4

The schedule for a technically correct and complete response to the remaining question is unchanged and provided below.

Question #	Response Date
RAI 479 — 06.02.04-11	September 28, 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: WELLS Russell (RS/NB)
Sent: Wednesday, July 27, 2011 7:30 PM
To: 'Tesfaye, Getachew'
Cc: ROMINE Judy (RS/NB); WILLIFORD Dennis (RS/NB); BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 479 (5568_5610_5612), FSAR Ch. 6, Supplement 2

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to the three questions in RAI 479 on April 7, 2011. Supplement 1 response to RAI 479 was sent on June 14, 2011 to revise the response schedule for the three questions.

The schedule has been has been changed as provided below:

Question #	Response Date
RAI 479 — 06.02.01-102	August 31, 2011
RAI 479 — 06.02.04-11	September 28, 2011
RAI 479 — 06.02.04-12	August 31, 2011

Sincerely,

Russ Wells for
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: RYAN Tom (RS/NB)
Sent: Tuesday, June 14, 2011 11:28 AM
To: 'Tesfaye, Getachew'
Cc: GUCWA Len (External RS/NB); BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); WILLIFORD Dennis (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 479 (5568_5610_5612), FSAR Ch. 6, Supplement 1

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to the three questions in RAI 479 on April 7, 2011.

The schedule has been has been changed as provided below:

Question #	Response Date
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RAI 479 — 06.02.01-102	July 27, 2011
RAI 479 — 06.02.04-11	July 27, 2011
RAI 479 — 06.02.04-12	July 27, 2011

Sincerely,

Tom Ryan for
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: WELLS Russell (RS/NB)
Sent: Thursday, April 07, 2011 9:23 AM
To: Tesfaye, Getachew
Cc: GUCWA Len (External RS/NB); Miernicki, Michael; 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. 479 (5568_5610_5612), FSAR Ch. 6

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 479 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 479 Response US EPR DC.pdf," that contain AREVA NP's responses to the subject questions.

Question #	Start Page	End Page
RAI 479 — 06.02.01-102	2	2
RAI 479 — 06.02.04-11	3	3
RAI 479 — 06.02.04-12	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 479 — 06.02.01-102	June 15, 2011
RAI 479 — 06.02.04-11	June 15, 2011
RAI 479 — 06.02.04-12	June 15, 2011

Sincerely,

Russ Wells

U.S. EPR Design Certification Licensing Manager

AREVA NP, Inc.

3315 Old Forest Road, P.O. Box 10935

Mail Stop OF-57

Lynchburg, VA 24506-0935

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Russell.Wells@Areva.com

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

Sent: Monday, March 07, 2011 8:29 PM

To: ZZ-DL-A-USEPR-DL

Cc: Jensen, Walton; Grady, Anne-Marie; Jackson, Christopher; McKirgan, John; Carneal, Jason; Colaccino, Joseph; ArevaEPRDCPEm Resource

Subject: U.S. EPR Design Certification Application RAI No. 479 (5568_5610_5612), FSAR Ch. 6

Attached please find the subject request for additional information (RAI). A draft of the RAI was provided to you on March 4, 2011, and on March 7, 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: 3378

Mail Envelope Properties (2FBE1051AEB2E748A0F98DF9EEE5A5D486D4CE)

Subject: Response to U.S. EPR Design Certification Application RAI No. 479
(5568_5610_5612), FSAR Ch. 6, Supplement 3
Sent Date: 8/31/2011 9:43:28 AM
Received Date: 8/31/2011 9:44:21 AM
From: WILLIFORD Dennis (AREVA)

Created By: Dennis.Williford@areva.com

Recipients:

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Tracking Status: None
"RYAN Tom (AREVA)" <Tom.Ryan@areva.com>
Tracking Status: None
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Files	Size	Date & Time
MESSAGE	6790	8/31/2011 9:44:21 AM
RAI 479 Supplement 3 Response US EPR DC.pdf		689137

Options

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

Response to
Request for Additional Information No. 479, Supplement 3

3/07/2011

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 06.02.01 - Containment Functional Design
SRP Section: 06.02.04 - Containment Isolation System

Application Section: 06.02

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

Question 06.02.01-102:

These questions relate to the discussions at the February 15 and 16 Containment Audit for US-EPR.

1. The staff observed discrepancies in the compartment volumes in various data sets submitted by AREVA. See RAI 437 Q 06.02.01-99 and RAI 466 Q 06.02.01.02-10. The staff understands that the discrepancies are the result of compartment boundaries being independently determined by different analysts. The compartment size may affect the pressures obtained in subcompartment analyses. Provide an ITAAC by which the compartment volumes used in subcompartment analyses will be verified for the as-built plant so that the results from the FSAR analyses can be concluded to be valid for the as-built plant.
2. RHR heat exchanger fouling: The staff noted that assurance is needed that the heat transfer capabilities of the RHR heat exchangers are not degraded as the plant ages to levels below those assumed in the safety analyses. Tech Spec surveillance requirements are one means to provide the required assurance. AREVA has indicated that the Chapter 5 maintenance program would be adequate. The staff requires that AREVA provide a full and complete justification that the Chapter 5 maintenance program will be sufficient to identify any heat transfer degradation within the heat exchangers below that which was assumed in the safety analyses for reactor heat removal and the containment heat removal over the life of the plant and a justification for why Tech Specs are not appropriate.

Response to Question 06.02.01-102:**Response to Part 1:**

The NRC Staff correctly identified that the control volume boundaries are different between the two primary containment models. The models developed for the subcompartment analyses are nodalized at the room level to facilitate individual analyses whereas the model developed for the bulk containment analyses grouped rooms based on flow commonality. The total containment volume has previously been shown to be nearly identical between the two models (See RAI 437, Question 06.02.01-99).

The subcompartment pressure response is primarily driven by the size and behavior of the vent paths from the break compartment to the rest of the building. The vent area for each room where the pressure response exceeded 5 psig has been assigned an ITAAC (See RAI Set 104, Question 14.03-1.a2). The vent area is significantly more sensitive to the room pressure response than the volume. As described in SRP 14.3 only the most safety significant features should be in tier 1 and have ITAAC. Therefore if an ITAAC for the room volume is not necessary.

Response to Part 2:

Surveillance Requirement (SR) 3.5.2.8 and associated Bases will be added to the Technical Specifications in U.S. EPR FSAR Tier 2, Chapter 16. SR 3.5.2.8 will provide for periodic verification of the heat removal capability of the Low Head Safety Injection (LHSI) system heat exchangers.

FSAR Impact:

1. The U.S. EPR FSAR will not be changed as a result of this question.
2. U.S. EPR FSAR Tier 2, Chapter 16, Section 3.5.2 and associated Bases will be revised as described in the response and indicated on the enclosed markup. Please note that a portion of the U.S. EPR FSAR Changes associated with this response were included as part of Revision 3 to the U.S. EPR FSAR. These changes are not denoted by "redline-strikeout" on the enclosed markup of U.S. EPR FSAR Interim Revision 4.

Question 06.02.04-12:

OPEN ITEM

In FSAR Tier 2, Table 6.2.4-1, all containment penetrations are given and described. The dedicated penetration 60BQ064 is included. However, the size (36") in diameter should be added to the Table. This information was provided in the applicant's response to RAI 181, Question 19-271, but not included in Table 6.2.4-1. Please add the diameter of the dedicated penetration to Table 6.2.4-1.

Response to Question 06.02.04-12:

The size (36") of dedicated penetration no. 60BQ064 will be added to U.S. EPR FSAR, Tier 2, Table 6.2.4-1.

FSAR Impact:

U.S. EPR FSAR, Tier 2, Table 6.2.4-1 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

Table 6.2.4-1—Containment Penetration, Isolation Valve, and Actuator Data
Sheet 17 of 22

Penetration No.	GDC Req.	System Name	Fluid	Line Size (in)	Essent System	Potent Bypass Path	Valve Number	Valve Location	LLRT	Valve Type and Operator	Primary Actuation	Secondary Actuation	Normal Position	Shut-down Position	Post Accident Position	Power Failure Position	Cont. Isolation Signal	Valve Closure Time	Power Source
11BQ023	57	NSS for SG BD	water	0.375	no	no	QUC11 AA011	inside	C	globe/ MOV	PS	RM	open	close	close	as-is	stage 1	≤ 15 sec	34BRA
11BQ023	57	NSS for SG BD	water	0.375	no	no	QUC11 AA001	outside	C	globe/ MOV	PS	RM	open	close	close	as-is	stage 1	≤ 15 sec	31BNB03
12BQ024	57	NSS for SG BD	water	0.375	no	no	QUC12 AA011	inside	C	globe/ MOV	PS	RM	open	close	close	as-is	stage 1	≤ 15 sec	34BRA
12BQ024	57	NSS for SG BD	water	0.375	no	no	QUC12 AA001	outside	C	globe/ MOV	PS	RM	open	close	close	as-is	stage 1	≤ 15 sec	31BNB03
13BQ025	57	NSS for SG BD	water	0.375	no	no	QUC13 AA011	inside	C	globe/ MOV	PS	RM	open	close	close	as-is	stage 1	≤ 15 sec	31BRA
13BQ025	57	NSS for SG BD	water	0.375	no	no	QUC13 AA001	outside	C	globe/ MOV	PS	RM	open	close	close	as-is	stage 1	≤ 15 sec	34BNB03
14BQ026	57	NSS for SG BD	water	0.375	no	no	QUC14 AA011	inside	C	globe/ MOV	PS	RM	open	close	close	as-is	stage 1	≤ 15 sec	31BRA
14BQ026	57	NSS for SG BD	water	0.375	no	no	QUC14 AA001	outside	C	globe/ MOV	PS	RM	open	close	close	as-is	stage 1	≤ 15 sec	34BNB03
10BQ030	56/57	CADS to IA	air	2.0	no	no	SCB01 AA002	inside	C	globe/ MOV	PS	RM	open	open	close	as-is	stage 1	≤ 15 sec	31BRA
10BQ030	56/57	CADS to IA	air	2.0	no	no	SCB01 AA001	outside	C	globe/ MOV	PS	RM	open	open	close	as-is	stage 1	≤ 15 sec	34BNB03
01BQ031	56/57	CADS to SA	air	2.0	no	no	SCB02 AA002	inside	C	globe/ manual	n/a	n/a	close	open	close	n/a	admin close	n/a	n/a
01BQ031	56/57	CADS to SA	air	2.0	no	no	SCB02 AA001	outside	C	globe/ manual	n/a	n/a	close	open	close	n/a	admin close	n/a	n/a
30BQ033	56/57	FWDS inside NI	water	8.0	no	no	SGB30 AA032	inside	C	gate/ MOV	PS	RM	close	open	close	as-is	stage 1	≤ 40 sec	31BRA
30BQ033	56/57	FWDS inside NI	water	8.0	no	no	SGB30 AA031	outside	C	gate/ MOV	PS	RM	close	open	close	as-is	stage 1	≤ 40 sec	34BNB03
60BQ064	n/a	Mech. Spare (Dedicated Penetration)	air	8.0 36.0	n/a	n/a	n/a	n/a	no	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

06.02.04-12

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify each ECCS manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.5.2.2	Verify ECCS piping is full of water.	31 days
SR 3.5.2.3	Verify each ECCS pump's developed head at the test flow point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.5.2.4	Verify each ECCS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	24 months
SR 3.5.2.5	Verify each ECCS pump starts automatically on an actual or simulated actuation signal.	24 months
SR 3.5.2.6	Verify, by visual inspection, each ECCS train suction inlet from the In-Containment Refueling Water Storage Tank is not restricted by debris and the suction inlet trash racks and screens show no evidence of structural distress or abnormal corrosion.	24 months
SR 3.5.2.7	Verify that the flow split for hot leg injection is $\geq 75\%$ of LHSI flow.	24 months
SR 3.5.2.8	Verify that the containment heat removal capability <u>of the LHSI heat exchangers</u> is sufficient to maintain post-accident conditions within design limits.	24 months on a STAGGERED TEST BASIS

06.02.01-102(2)



BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.2.7

This Surveillance verifies that the LHSI flow split between the hot leg and the cold leg when in the hot leg injection mode remains consistent with analysis assumptions. The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage.

06.02.01-102(2)



SR 3.5.2.8

Verifying the containment heat removal capability provides assurance that the containment heat removal systems are capable of maintaining containment temperature below design limits following an accident. This test verifies the heat removal capability of the Low Head Safety Injection (LHSI) heat exchangers. The Frequency of 24 months on a STAGGERED TEST BASIS for each LHSI heat exchanger was developed considering the known reliability of closed cycle heat exchangers and other testing performed at shorter intervals that is intended to identify the possible loss of heat removal capability.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 35.
 2. 10 CFR 50.46.
 3. FSAR Section 6.2.
 4. FSAR Chapter 15.
 5. NRC Memorandum to V. Stello, Jr., from R.L. Baer, "Recommended Interim Revisions to LCOs for ECCS Components," December 1, 1975.
 6. ASME Code for Operation and Maintenance of Nuclear Power Plants.
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