

ArevaEPRDCPEm Resource

From: WILLIFORD Dennis (AREVA) [Dennis.Williford@areva.com]
Sent: Friday, September 30, 2011 4:14 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (AREVA); DELANO Karen (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA); WELLS Russell (AREVA)
Subject: Response to U.S. EPR Design Certification Application RAI No. 467, FSAR Ch. 3, Supplement 11
Attachments: RAI 467 Supplement 11 Response US EPR DC.pdf

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for the 14 questions of RAI No. 467 on February 24, 2011. AREVA NP submitted Supplement 1 on April 1, 2011 to provide technically correct and complete responses to 4 of the remaining 14 questions. AREVA NP submitted Supplement 2 on April 15, 2011, Supplement 3 on May 27, 2011, and Supplement 4 on June 22, 2011, to provide a revised schedule for 9 of the 10 remaining questions. AREVA NP submitted Supplement 5 on July 7, 2011, which provided a technically correct and complete response to 1 of the remaining 10 questions. AREVA NP submitted Supplement 6 on July 27, 2011 to provide a revised schedule for the remaining 9 questions. AREVA NP submitted Supplement 7 on July 29, 2011, which provided a technically correct and complete final responses to 3 of the remaining 9 questions. AREVA NP submitted Supplement 8 on August 3, 2011, which provided a technically correct and complete final response to 1 of the 6 remaining questions. AREVA NP submitted Supplement 9 on August 5, 2011, which provided a technically correct and complete final response to 2 of the remaining 5 questions. AREVA NP submitted Supplement 10 on September 9, 2011 to provide a revised schedule for the remaining 3 questions.

The attached file, "RAI 467 Supplement 11 Response US EPR DC.pdf" provides a technically correct and complete FINAL response to 1 of the remaining 3 questions, as committed. Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 467 Question 03.09.02-160.

The following table indicates the respective pages in the response document, "RAI 467 Supplement 11 Response US EPR DC.pdf" that contain AREVA NP's final response to the subject question.

Question #	Start Page	End Page
RAI 467 — 03.09.02-160	2	2

The schedule for technically correct and complete final responses to the remaining 2 questions is unchanged as provided below.

Question #	Response Date
RAI 467 — 03.06.03-28	October 9, 2011
RAI 467 — 03.09.02-161	October 9, 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

From: WILLIFORD Dennis (RS/NB)
Sent: Friday, September 09, 2011 1:02 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); WELLS Russell (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 467, FSAR Ch. 3, Supplement 10

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for the 14 questions of RAI No. 467 on February 24, 2011. AREVA NP submitted Supplement 1 on April 1, 2011 to provide technically correct and complete responses to 4 of the remaining 14 questions. AREVA NP submitted Supplement 2 on April 15, 2011, Supplement 3 on May 27, 2011, and Supplement 4 on June 22, 2011, to provide a revised schedule for 9 of the 10 remaining questions. AREVA NP submitted RAI 467 Supplement 5 on July 7, 2011, which provided a technically correct and complete response to 1 of the remaining 10 questions. AREVA NP submitted RAI 467 Supplement 6 on July 27, 2011, which provided a revised schedule for the remaining 9 questions. AREVA NP submitted RAI 467 Supplement 7 on July 29, 2011, which provided a technically correct and complete final responses to 3 of the remaining 9 questions. AREVA NP submitted RAI 467 Supplement 8 on August 3, 2011, which provided a technically correct and complete final response to 1 of the 6 remaining questions. AREVA NP submitted RAI 467 Supplement 9 on August 5, 2011, which provided a technically correct and complete final response to 2 of the remaining 5 questions, as committed.

The schedule for the remaining 3 questions has been revised as shown below.

Question #	Response Date
RAI 467 — 03.06.03-28	October 9, 2011
RAI 467 — 03.09.02-160	October 9, 2011
RAI 467 — 03.09.02-161	October 9, 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: Friday, August 05, 2011 10:37 AM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); WELLS Russell (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 467, FSAR Ch. 3, Supplement 9

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for the 14 questions of RAI No. 467 on February 24, 2011. AREVA NP submitted Supplement 1 on April 1, 2011 to provide technically correct and complete responses to

4 of the remaining 14 questions. AREVA NP submitted Supplement 2 on April 15, 2011, Supplement 3 on May 27, 2011, and Supplement 4 on June 22, 2011, to provide a revised schedule for 9 of the 10 remaining questions. AREVA NP submitted RAI 467 Supplement 5 on July 7, 2011, which provided a technically correct and complete response to 1 of the remaining 10 questions. AREVA NP submitted RAI 467 Supplement 6 on July 27, 2011, which provided a revised schedule for the remaining 9 questions. AREVA NP submitted RAI 467 Supplement 7 on July 29, 2011, which provided a technically correct and complete final responses to 3 of the remaining 9 questions. AREVA NP submitted RAI 467 Supplement 8 on August 3, 2011, which provided a technically correct and complete final response to 1 of the 6 remaining questions. The attached file, "RAI 467 Supplement 9 Response US EPR DC.pdf" provides technically correct and complete FINAL responses to 2 of the remaining 5 questions, as committed.

The following table indicates the respective pages in the response document, "RAI 467 Supplement 9 Response US EPR DC.pdf" that contain AREVA NP's final response to the subject questions.

Question #	Start Page	End Page
RAI 467 — 03.09.02-157	2	4
RAI 467 — 03.09.02-165	5	5

The schedule for technically correct and complete final responses to the remaining 3 questions is unchanged as provided below.

Question #	Response Date
RAI 467 — 03.06.03-28	September 15, 2011
RAI 467 — 03.09.02-160	September 9, 2011
RAI 467 — 03.09.02-161	September 9, 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, August 03, 2011 12:38 PM
To: 'Tesfaye, Getachew'
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); WELLS Russell (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 467, FSAR Ch. 3, Supplement 8

Getachew,

AREVA NP Inc. letter NRC:11:084 dated August 2, 2011 provides a technically correct and complete final response to 1 of the 6 remaining questions in RAI 467. AREVA NP considers some of the material contained in the response to be proprietary information. As required by 10 CFR 2.390(b), an affidavit is provided to support the withholding of the proprietary information from public disclosure. Proprietary and non-proprietary versions of the enclosure to this letter are provided separately.

The following table indicates the respective pages in the enclosed response that contain AREVA NP's final response to the subject question.

Question #	Start Page	End Page
RAI 467 — 03.09.02-163	2	5

The schedule for a technically correct and complete final response to Question 03.06.03-28 has been revised as shown below in bold. The schedule for technically correct and complete final responses to the remaining questions is unchanged as provided below.

Question #	Response Date
RAI 467 — 03.06.03-28	September 15, 2011
RAI 467 — 03.09.02-157	September 9, 2011
RAI 467 — 03.09.02-160	September 9, 2011
RAI 467 — 03.09.02-161	September 9, 2011
RAI 467 — 03.09.02-165	September 9, 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: Friday, July 29, 2011 2:45 PM

To: Tesfaye, Getachew

Cc: WILLIFORD Dennis (RS/NB); ROMINE Judy (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. 467, FSAR Ch. 3, Supplement 7

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for the 14 questions of RAI No. 467 on February 24, 2011. AREVA NP submitted Supplement 1 on April 1, 2011 to provide technically correct and complete responses to 4 of the remaining 14 questions. AREVA NP submitted Supplement 2 on April 15, 2011, Supplement 3 on May 27, 2011, and Supplement 4 on June 22, 2011, to provide a revised schedule for 9 of the 10 remaining questions. AREVA NP submitted RAI 467 Supplement 5 on July 7, 2011, which provided a technically correct and complete response to 1 of the remaining 10 questions. AREVA NP submitted RAI 467 Supplement 6 on July 27, 2011, which provided a revised schedule for the remaining 9 questions. The attached file, "RAI 467 Supplement 7 Response US EPR DC.pdf" provides technically correct and complete FINAL responses to 3 of the remaining 9 questions, as committed.

The following table indicates the respective pages in the response document, "RAI 467 Supplement 7 Response US EPR DC.pdf" that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 467 — 03.09.02-155	2	3
RAI 467 — 03.09.02-156	4	4
RAI 467 — 03.09.02-162	5	6

The schedule for technically correct and complete FINAL responses to the remaining 6 questions is unchanged as provided below.

Question #	Response Date
RAI 467 — 03.06.03-28	August 15, 2011
RAI 467 — 03.09.02-157	September 9, 2011
RAI 467 — 03.09.02-160	September 9, 2011
RAI 467 — 03.09.02-161	September 9, 2011
RAI 467 — 03.09.02-163	September 9, 2011
RAI 467 — 03.09.02-165	September 9, 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: WELLS Russell (RS/NB)
Sent: Wednesday, July 27, 2011 10:23 AM
To: 'Tesyfaye, Getachew'
Cc: WILLIFORD Dennis (RS/NB); ROMINE Judy (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. 467, FSAR Ch. 3, Supplement 6

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for the 14 questions of RAI No. 467 on February 24, 2011. AREVA NP submitted Supplement 1 on April 1, 2011 to provide technically correct and complete responses to 4 of the remaining 14 questions. AREVA NP submitted Supplement 2 on April 15, 2011, Supplement 3 on May 27, 2011, and Supplement 4 on June 22, 2011, to provide a revised schedule for 9 of the 10 remaining questions. AREVA NP submitted RAI 467 Supplement 5 on July 7, 2011, which provided a technically correct and complete response to 1 of the remaining 10 questions.

The schedule for technically correct and complete responses to the remaining 9 questions has been changed as provided below.

Question #	Response Date
RAI 467 — 03.06.03-28	August 15, 2011
RAI 467 — 03.09.02-155	September 9, 2011
RAI 467 — 03.09.02-156	September 9, 2011
RAI 467 — 03.09.02-157	September 9, 2011
RAI 467 — 03.09.02-160	September 9, 2011
RAI 467 — 03.09.02-161	September 9, 2011
RAI 467 — 03.09.02-162	September 9, 2011
RAI 467 — 03.09.02-163	September 9, 2011
RAI 467 — 03.09.02-165	September 9, 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: WILLIFORD Dennis (RS/NB)
Sent: Thursday, July 07, 2011 11:35 AM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); WELLS Russell (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 467, FSAR Ch. 3, Supplement 5

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for the 14 questions of RAI No. 467 on February 24, 2011. AREVA NP submitted Supplement 1 on April 1, 2011 to provide technically correct and complete responses to 4 of the remaining 14 questions. AREVA NP submitted Supplement 2 on April 15, 2011, Supplement 3 on May 27, 2011, and Supplement 4 on June 22, 2011, to provide a revised schedule for 9 of the 10 remaining questions.

The attached file, "RAI 467 Supplement 5 Response US EPR DC.pdf" provides a technically correct and complete response to 1 of the remaining 10 questions.

The following table indicates the respective pages in the response document, "RAI 467 Supplement 5 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 467 — 03.09.02-167	2	2

The schedule for technically correct and complete responses to the remaining 9 questions is unchanged as provided below.

Question #	Response Date
RAI 467 — 03.06.03-28	August 15, 2011
RAI 467 — 03.09.02-155	July 27, 2011
RAI 467 — 03.09.02-156	July 27, 2011
RAI 467 — 03.09.02-157	July 27, 2011
RAI 467 — 03.09.02-160	July 27, 2011
RAI 467 — 03.09.02-161	July 27, 2011
RAI 467 — 03.09.02-162	July 27, 2011
RAI 467 — 03.09.02-163	July 27, 2011
RAI 467 — 03.09.02-165	July 27, 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 22, 2011 12:57 PM
To: 'Tefaye, Getachew'
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); WELLS Russell (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 467, FSAR Ch. 3, Supplement 4

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for the 14 questions of RAI No. 467 on February 24, 2011. AREVA NP submitted Supplement 1 on April 1, 2011 to provide technically correct and complete responses to 4 of the remaining 14 questions. AREVA NP submitted Supplement 2 on April 15, 2011 and Supplement 3 on May 27, 2011, to provide a revised schedule for 9 of the 10 remaining questions

The schedule for 9 of the 10 questions, shown in bold below, has been changed. The schedule for the remaining question is unchanged. The schedule for technically correct and complete responses to the remaining questions is provided below.

Question #	Response Date
RAI 467 — 03.06.03-28	August 15, 2011
RAI 467 — 03.09.02-155	July 27, 2011
RAI 467 — 03.09.02-156	July 27, 2011
RAI 467 — 03.09.02-157	July 27, 2011
RAI 467 — 03.09.02-160	July 27, 2011
RAI 467 — 03.09.02-161	July 27, 2011
RAI 467 — 03.09.02-162	July 27, 2011
RAI 467 — 03.09.02-163	July 27, 2011
RAI 467 — 03.09.02-165	July 27, 2011
RAI 467 — 03.09.02-167	July 27, 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: Friday, May 27, 2011 11:11 AM
To: Tefaye, Getachew
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); WELLS Russell (RS/NB); CORNELL Veronica (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 467, FSAR Ch. 3, Supplement 3

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for the 14 questions of RAI No. 467 on February 24, 2011. AREVA NP submitted Supplement 1 on April 1, 2011 to provide technically correct and complete responses to 4 of the remaining 14 questions. AREVA NP submitted Supplement 2 on April 15, 2011 to provide a revised schedule for 9 of the 10 remaining questions

The schedule for 9 of the 10 questions, shown in bold below, has been changed. The schedule for the remaining question is unchanged. The schedule for technically correct and complete responses to the remaining questions is provided below.

Question #	Response Date
RAI 467 — 03.06.03-28	August 15, 2011
RAI 467 — 03.09.02-155	June 27, 2011
RAI 467 — 03.09.02-156	June 27, 2011
RAI 467 — 03.09.02-157	June 27, 2011
RAI 467 — 03.09.02-160	June 27, 2011
RAI 467 — 03.09.02-161	June 27, 2011
RAI 467 — 03.09.02-162	June 27, 2011
RAI 467 — 03.09.02-163	June 27, 2011
RAI 467 — 03.09.02-165	June 27, 2011
RAI 467 — 03.09.02-167	June 27, 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: Friday, April 15, 2011 4:15 PM
To: Tesfaye, Getachew
Cc: 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. 467, FSAR Ch. 3, Supplement 2

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for the 14 questions of RAI No. 467 on February 24, 2011. AREVA NP submitted Supplement 1 on April 1, 2011 to provide technically correct and complete responses to 4 of the remaining 14 questions.

To allow additional time to interact with NRC staff, the schedule for technically correct and complete responses to 9 of the 10 has been changed and is provided below. The schedule for a technically correct and complete response to the remaining question is unchanged and is provided below:

Question #	Response Date
RAI 467 — 03.06.03-28	August 15, 2011

RAI 467 — 03.09.02-155	May 27, 2011
RAI 467 — 03.09.02-156	May 27, 2011
RAI 467 — 03.09.02-157	May 27, 2011
RAI 467 — 03.09.02-160	May 27, 2011
RAI 467 — 03.09.02-161	May 27, 2011
RAI 467 — 03.09.02-162	May 27, 2011
RAI 467 — 03.09.02-163	May 27, 2011
RAI 467 — 03.09.02-165	May 27, 2011
RAI 467 — 03.09.02-167	May 27, 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

Phone: 434-832-3884 (work)

434-942-6375 (cell)

Fax: 434-382-3884

Russell.Wells@Areva.com

From: WELLS Russell (RS/NB)

Sent: Friday, April 01, 2011 1:24 PM

To: 'Tesfaye, Getachew'

Cc: 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. 467, FSAR Ch. 3, Supplement 1

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for the 14 questions of RAI No. 467 on February 24, 2011. The attached file, "RAI 467 Supplement 1 Response US EPR DC.pdf" provides technically correct and complete responses to 4 of the remaining 14 questions, as committed.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 467 Questions 03.09.02-158, 03.09.02-159, and 03.09.02-164.

The following table indicates the respective pages in the response document, "RAI 467 Supplement 1 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 467 — 03.09.02-158	6	6
RAI 467 — 03.09.02-159	7	7
RAI 467 — 03.09.02-164	12	12
RAI 467 — 03.09.02-166	14	14

The schedule for technically correct and complete responses to the remaining questions is unchanged and is provided below:

Question #	Response Date
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RAI 467 — 03.06.03-28	August 15, 2011
RAI 467 — 03.09.02-155	April 28, 2011
RAI 467 — 03.09.02-156	April 28, 2011
RAI 467 — 03.09.02-157	April 28, 2011
RAI 467 — 03.09.02-160	April 28, 2011
RAI 467 — 03.09.02-161	April 28, 2011
RAI 467 — 03.09.02-162	April 28, 2011
RAI 467 — 03.09.02-163	April 28, 2011
RAI 467 — 03.09.02-165	April 28, 2011
RAI 467 — 03.09.02-167	April 28, 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

Phone: 434-832-3884 (work)

434-942-6375 (cell)

Fax: 434-382-3884

[*Russell.Wells@Areva.com*](mailto:Russell.Wells@Areva.com)

From: WELLS Russell (RS/NB)

Sent: Thursday, February 24, 2011 2:08 PM

To: 'Tefaye, Getachew'

Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); BRYAN Martin (External RS/NB)

Subject: Response to U.S. EPR Design Certification Application RAI No. 467, FSAR Ch. 3

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 467 Response US EPR DC.pdf" provides a schedule for a technically correct and complete response to the 14 questions.

The following table indicates the respective pages in the response document, "RAI 467 Response US EPR DC.pdf" that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 467 — 03.06.03-28	2	2
RAI 467 — 03.09.02-155	3	3
RAI 467 — 03.09.02-156	4	4
RAI 467 — 03.09.02-157	5	5
RAI 467 — 03.09.02-158	6	6
RAI 467 — 03.09.02-159	7	7
RAI 467 — 03.09.02-160	8	8
RAI 467 — 03.09.02-161	9	9
RAI 467 — 03.09.02-162	10	10

RAI 467 — 03.09.02-163	11	11
RAI 467 — 03.09.02-164	12	12
RAI 467 — 03.09.02-165	13	13
RAI 467 — 03.09.02-166	14	14
RAI 467 — 03.09.02-167	15	15

A complete answer is not provided for the 14 questions. The schedule for a technically correct and complete response to these questions is provided below.

Question #	Response Date
RAI 467 — 03.06.03-28	August 15, 2011
RAI 467 — 03.09.02-155	April 28, 2011
RAI 467 — 03.09.02-156	April 28, 2011
RAI 467 — 03.09.02-157	April 28, 2011
RAI 467 — 03.09.02-158	April 28, 2011
RAI 467 — 03.09.02-159	April 28, 2011
RAI 467 — 03.09.02-160	April 28, 2011
RAI 467 — 03.09.02-161	April 28, 2011
RAI 467 — 03.09.02-162	April 28, 2011
RAI 467 — 03.09.02-163	April 28, 2011
RAI 467 — 03.09.02-164	April 28, 2011
RAI 467 — 03.09.02-165	April 28, 2011
RAI 467 — 03.09.02-166	April 28, 2011
RAI 467 — 03.09.02-167	April 28, 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
 Phone: 434-832-3884 (work)
 434-942-6375 (cell)
 Fax: 434-382-3884
Russell.Wells@Areva.com

From: Tesfaye, Getachew [<mailto:Getachew.Tesfaye@nrc.gov>]
Sent: Wednesday, January 26, 2011 3:34 PM
To: ZZ-DL-A-USEPR-DL
Cc: Reichelt, Eric; Terao, David; Wong, Yuken; Dixon-Herrity, Jennifer; Miernicki, Michael; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 467 (5333, 5344), FSAR Ch. 3

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on January 6, 2011, and discussed with your staff on January 20 and 24, 2011. No change is made to the draft RAI as a result of those discussions. 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: 3445

Mail Envelope Properties (2FBE1051AEB2E748A0F98DF9EEE5A5D48E8954)

Subject: Response to U.S. EPR Design Certification Application RAI No. 467, FSAR Ch. 3, Supplement 11
Sent Date: 9/30/2011 4:13:41 PM
Received Date: 9/30/2011 4:14:24 PM
From: WILLIFORD Dennis (AREVA)

Created By: Dennis.Williford@areva.com

Recipients:

"BENNETT Kathy (AREVA)" <Kathy.Bennett@areva.com>

Tracking Status: None

"DELANO Karen (AREVA)" <Karen.Delano@areva.com>

Tracking Status: None

"ROMINE Judy (AREVA)" <Judy.Romine@areva.com>

Tracking Status: None

"RYAN Tom (AREVA)" <Tom.Ryan@areva.com>

Tracking Status: None

"WELLS Russell (AREVA)" <Russell.Wells@areva.com>

Tracking Status: None

"Tsfaye, Getachew" <Getachew.Tsfaye@nrc.gov>

Tracking Status: None

Post Office: auscharm02.adom.ad.corp

Files	Size	Date & Time
MESSAGE	26173	9/30/2011 4:14:24 PM
RAI 467 Supplement 11 Response US EPR DC.pdf		467176

Options

Priority: Standard

Return Notification: No

Reply Requested: No

Sensitivity: Normal

Expiration Date:

Recipients Received:

Response to

**Request for Additional Information No. 467 (5333, 5344)
Supplement 11**

1/26/2011

U.S. EPR Standard Design Certification

AREVA NP Inc.

Docket No. 52-020

SRP Section: 03.06.03 - Leak-Before-Break Evaluation Procedures

**SRP Section: 03.09.02 - Dynamic Testing and Analysis of Systems Structures and
Components**

Application Section: FSAR Chapter 3

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

**QUESTIONS for Engineering Mechanics Branch 2 (ESBWR/ABWR Projects)
(EMB2)**

Question 03.09.02-160:

The applicant states the following in the FSAR, Appendix 3C.1.3 paragraph:

The initial conditions (pressures, enthalpies, and flow) for the RPV internals are calculated by spreadsheet using data obtained from an analysis of the RPV internal flow paths to assess bypass flows and pressure drops inside the RPV.

The applicant is requested to provide details of the methods used in the spreadsheet to verify the technical soundness of the method used as recommended by the NRC SRP 3.9.2.5.III.

Response to Question 03.09.02-160:

The reactor pressure vessel (RPV) hydraulic model is a more detailed version of the reactor coolant system (RCS) four-loop hydraulic model as explained in U.S. EPR FSAR Tier 2, Section 3C.1.3. The RPV model has been refined to add more control volumes and flow paths to the RPV lower head, core, downcomers, upper head, and upper plenum regions. The initial pressure and enthalpy values for the added control volumes and flow rates for the added flow paths are calculated using pressure loss and conservation of mass and energy equations from the CRAFT2 theoretical manual and the existing values from the RCS hydraulic model as a starting point.

The hydraulic modeling and analyses are performed in accordance with the methodology described in Topical Report BAW-10132P-A (U.S. EPR FSAR Tier 2, Appendix 3C, Reference 4). The spreadsheets provided in U.S. EPR FSAR Tier 2, Section 3C.1.3, are used to perform iterative calculations for the numerous control volumes and flow paths in the model in order to determine the initial control volume pressures and enthalpies. The only calculations performed using the spreadsheets are those used to determine steady-state pressures, temperatures, and flow rates in the RCS. This data is used to initialize the CRAFT RCS thermal-hydraulic model, which is used for all pipe rupture analyses. The calculations performed using spreadsheets do not incorporate a different methodology than the one described in BAW-10132P-A. U.S. EPR FSAR Tier 2, Section 3C.1.3 will be revised to include additional information regarding the use of spreadsheets.

FSAR Impact:

U.S. EPR FSAR Tier 2, Section 3C.1.3, will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

break opening area versus time relationships are determined as indicated in Section 3C.1.1.

In addition to the inputs described above, heat transfer into the secondary side from the primary side during steady state conditions is represented in the model. The heat into the system is calculated as the product of the enthalpy and flow rate in the tube bundle flow paths as obtained from the steady state thermal performance analysis of the SG.

The initial conditions for the SG secondary side (pressures, enthalpies, flow, and steam quality) are determined from data taken from an analysis performed to evaluate the SG thermal performance.

3C.1.3 Reactor Pressure Vessel Isolated Hydraulic Model

The CRAFT2 model of the RPV consists of a series of control volumes and flow paths which represent the hydraulic features of the RPV.

Loads on the RPV internals due to system internal pressure waves that occur after postulated primary side breaks are determined through hydraulics analysis of the RCS primary side using the hydraulic analysis code, CRAFT2. The CRAFT2 model used is the same model used for the hydraulics analysis of the primary side of the RCS (see Section 3C.1.1), except that additional control volumes and flow paths are added to the representation of the RPV internals. This refinement of the model is necessary to obtain accurate differential pressures across key structural components within the RPV internals, such as the upper and lower core plates and the upper internals support structure. Accordingly, the number of control volumes, and related flow paths, in the RPV downcomer, heavy reflector and active core regions of the RPV internals model are increased beyond the number considered in the RCS four loop hydraulic model described in Section 3C.1.1. Figure 3C-3—RPV Isolated Hydraulic Model depicts the RPV isolated hydraulic model.

Recoverable pressure losses through the various RPV flow paths that are added as part of model refinement are calculated by spreadsheet based on geometry obtained from RPV internals and core support structure drawings and on pressures and temperatures obtained from steady state analysis of the RCS four loop hydraulics model.

Unrecoverable pressure losses are taken directly from steady state hydraulics analysis of the core that is performed in support of core design and from steady state hydraulics analysis of the RPV internal flow paths to assess bypass flows and pressure drops inside the RPV. The spreadsheets are used to perform calculations to determine steady-state pressures, temperatures, and flow rates in the RCS. This data is used to initialize the CRAFT2 thermal-hydraulic model, which is used for RCS loop pipe rupture loading analyses.

RAI 467,
Q. 03.09.02-160