

ArevaEPRDCPEm Resource

From: WILLIFORD Dennis (AREVA) [Dennis.Williford@areva.com]
Sent: Wednesday, April 04, 2012 3:58 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (AREVA); DELANO Karen (AREVA); HATHCOCK Phillip (AREVA); LEIGHLITER John (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA); MEACHAM Robert (AREVA); HUDSON Greg (AREVA)
Subject: DRAFT Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Question 07.09-71
Attachments: RAI 505 Question 07.09-71 Response US EPR DC - DRAFT.pdf

Getachew,

Attached is a revised DRAFT response for Question 07.09-71 of RAI No. 505 (FSAR Ch. 7) in advance of the May 9, 2012 final response date shown below.

Let me know if the staff has any questions or if this response can be sent as final.

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: Tuesday, April 03, 2012 3:27 PM
To: Getachew.Tesfaye@nrc.gov
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. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 13

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions. On December 15, 2011, AREVA NP provided Supplement 6 to provide a complete and final response to 6 questions. On January 10, 2012, AREVA NP provided Supplement 7 to provide a complete and final response to 2 questions. On January 19, 2012, AREVA NP provided Supplement 8 to provide a complete and final response to one question and a revised preliminary schedule for the response to Question 07.01-33. On February 9, 2012, AREVA NP provided Supplement 9 to revise the schedule for 11 questions. On February 17, 2012, AREVA NP provided

Supplement 10 to revise the schedule for 20 questions. On February 21, 2012, AREVA NP provided Supplement 11 to revise the schedule for Question 07.01-33. On March 16, 2012, AREVA NP provided Supplement 12 to provide a complete and final response to 2 of the remaining questions (07.01-41 and 07.05-10), and a revised response to 2 questions (07.08-46 and 07.09-72).

The attached file, "RAI 505 Supplement 13 Response - US EPR DC.pdf" provides a technically correct and complete response to 1 of the remaining 19 questions (07.08-47). 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 Question 07.08-47. Also appended to this file are affected pages of Technical Report ANP-10315P. The revision to this technical report will be submitted by separate letter after completion of all responses to RAI 505.

The following table indicates the respective pages in the response document, "RAI 505 Supplement 13 Response - US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 505 — 07.08-47	2	7

The schedule for a technically correct and complete response to the remaining 18 questions remains unchanged as provided below.

Question #	Response Date
RAI 505 — 07.01-33	August 30, 2013
RAI 505 — 07.01-34	May 9, 2012
RAI 505 — 07.01-35	May 30, 2012
RAI 505 — 07.01-36	May 1, 2012
RAI 505 — 07.01-37	April 17, 2012
RAI 505 — 07.01-38	May 1, 2012
RAI 505 — 07.01-39	May 22, 2012
RAI 505 — 07.01-40	May 22, 2012
RAI 505 — 07.01-44	May 9, 2012
RAI 505 — 07.01-45	May 1, 2012
RAI 505 — 07.01-46	May 1, 2012
RAI 505 — 07.01-47	May 22, 2012
RAI 505 — 07.01-48	May 9, 2012
RAI 505 — 07.01-49	May 30, 2012
RAI 505 — 07.01-50	May 30, 2012
RAI 505 — 07.01-51	May 22, 2012
RAI 505 — 07.03-38	April 17, 2012
RAI 505 — 07.09-71	May 9, 2012

Sincerely,

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

7207 IBM Drive, Mail Code CLT 2B

From: WILLIFORD Dennis (RS/NB)
Sent: Friday, March 16, 2012 12:59 PM
To: Getachew.Tesfaye@nrc.gov
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. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 12

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions. On December 15, 2011, AREVA NP provided Supplement 6 to provide a complete and final response to 6 questions. On January 10, 2012, AREVA NP provided Supplement 7 to provide a complete and final response to 2 questions. On January 19, 2012, AREVA NP provided Supplement 8 to provide a complete and final response to one question and a revised preliminary schedule for the response to Question 07.01-33. On February 9, 2012, AREVA NP provided Supplement 9 to revise the schedule for 11 questions. On February 17, 2012, AREVA NP provided Supplement 10 to revise the schedule for 20 questions. On February 21, 2012, AREVA NP provided Supplement 11 to revise the schedule for Question 07.01-33.

The attached file, "RAI 505 Supplement 12 Response - US EPR DC.pdf" provides technically correct and complete responses to 2 of the remaining 21 questions (07.01-41 and 07.05-10), and a revised response to 2 questions (07.08-46 and 07.09-72). 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 Question 07.01-41, 07.05-10, 07.08-46, and 07.09-72. Also appended to this file are affected pages of Technical Reports ANP-10304, ANP-10309P and ANP-10315P. Revisions to these Technical Reports will be submitted by separate letter after completion of all responses to RAI 505.

The following table indicates the respective pages in the response document, "RAI 505 Supplement 12 Response - US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 505 — 07.01-41	2	5
RAI 505 — 07.05-10	6	9
RAI 505 — 07.08-46	10	10
RAI 505 — 07.09-72	11	12

The schedule for a technically correct and complete response to the remaining 19 questions remains unchanged as provided below.

Question #	Response Date
RAI 505 — 07.01-33	August 30, 2013
RAI 505 — 07.01-34	May 9, 2012
RAI 505 — 07.01-35	May 30, 2012
RAI 505 — 07.01-36	May 1, 2012
RAI 505 — 07.01-37	April 17, 2012
RAI 505 — 07.01-38	May 1, 2012
RAI 505 — 07.01-39	May 22, 2012
RAI 505 — 07.01-40	May 22, 2012
RAI 505 — 07.01-44	May 9, 2012
RAI 505 — 07.01-45	May 1, 2012
RAI 505 — 07.01-46	May 1, 2012
RAI 505 — 07.01-47	May 22, 2012
RAI 505 — 07.01-48	May 9, 2012
RAI 505 — 07.01-49	May 30, 2012
RAI 505 — 07.01-50	May 30, 2012
RAI 505 — 07.01-51	May 22, 2012
RAI 505 — 07.03-38	April 17, 2012
RAI 505 — 07.08-47	May 30, 2012
RAI 505 — 07.09-71	May 9, 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
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Tuesday, February 21, 2012 9:31 PM
To: Getachew.Tesfaye@nrc.gov
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. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 11

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions. On December 15, 2011, AREVA NP provided

Supplement 6 to provide a complete and final response to 6 questions. On January 10, 2012, AREVA NP provided Supplement 7 to provide a complete and final response to 2 questions. On January 19, 2012, AREVA NP provided Supplement 8 to provide a complete and final response to one question and a revised preliminary schedule for the response to Question 07.01-33. On February 9, 2012, AREVA NP provided Supplement 9 to revise the schedule for 11 questions. On February 17, 2012, AREVA NP provided Supplement 10 to revise the schedule for 20 questions.

The schedule for a technically correct and complete response to question 07.01-33 has been changed as provided below. The response schedule for the other questions remains unchanged. This schedule was transmitted to the NRC in AREVA NP letter 12:008 dated February 21, 2012.

Question #	Response Date
RAI 505 — 07.01-33	August 30, 2013
RAI 505 — 07.01-34	May 9, 2012
RAI 505 — 07.01-35	May 30, 2012
RAI 505 — 07.01-36	May 1, 2012
RAI 505 — 07.01-37	April 17, 2012
RAI 505 — 07.01-38	May 1, 2012
RAI 505 — 07.01-39	May 22, 2012
RAI 505 — 07.01-40	May 22, 2012
RAI 505 — 07.01-41	April 17, 2012
RAI 505 — 07.01-44	May 9, 2012
RAI 505 — 07.01-45	May 1, 2012
RAI 505 — 07.01-46	May 1, 2012
RAI 505 — 07.01-47	May 22, 2012
RAI 505 — 07.01-48	May 9, 2012
RAI 505 — 07.01-49	May 30, 2012
RAI 505 — 07.01-50	May 30, 2012
RAI 505 — 07.01-51	May 22, 2012
RAI 505 — 07.03-38	April 17, 2012
RAI 505 — 07.05-10	April 17, 2012
RAI 505 — 07.08-47	May 30, 2012
RAI 505 — 07.09-71	May 9, 2012

Sincerely,

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

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Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Friday, February 17, 2012 4:09 PM
To: Getachew.Tesfaye@nrc.gov

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. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 10

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions. On December 15, 2011, AREVA NP provided Supplement 6 to provide a complete and final response to 6 questions. On January 10, 2012, AREVA NP provided Supplement 7 to provide a complete and final response to 2 questions. On January 19, 2012, AREVA NP provided Supplement 8 to provide a complete and final response to one question and a revised preliminary schedule for the response to Question 07.01-33. On February 9, 2012, AREVA NP provided Supplement 9 to revise the schedule for 11 questions.

The schedule for a technically correct and complete response to 20 of the remaining 21 questions has been changed as provided below. The response schedule to the other question remains unchanged.

Question #	Response Date
RAI 505 — 07.01-33	February 21, 2012
RAI 505 — 07.01-34	May 9, 2012
RAI 505 — 07.01-35	May 30, 2012
RAI 505 — 07.01-36	May 1, 2012
RAI 505 — 07.01-37	April 17, 2012
RAI 505 — 07.01-38	May 1, 2012
RAI 505 — 07.01-39	May 22, 2012
RAI 505 — 07.01-40	May 22, 2012
RAI 505 — 07.01-41	April 17, 2012
RAI 505 — 07.01-44	May 9, 2012
RAI 505 — 07.01-45	May 1, 2012
RAI 505 — 07.01-46	May 1, 2012
RAI 505 — 07.01-47	May 22, 2012
RAI 505 — 07.01-48	May 9, 2012
RAI 505 — 07.01-49	May 30, 2012
RAI 505 — 07.01-50	May 30, 2012
RAI 505 — 07.01-51	May 22, 2012
RAI 505 — 07.03-38	April 17, 2012
RAI 505 — 07.05-10	April 17, 2012
RAI 505 — 07.08-47	May 30, 2012
RAI 505 — 07.09-71	May 9, 2012

Sincerely,

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

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Charlotte, NC 28262

Phone: 704-805-2223

Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)

Sent: Thursday, February 09, 2012 8:15 AM

To: Getachew.Tesfaye@nrc.gov

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. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 9

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions. On December 15, 2011, AREVA NP provided Supplement 6 to provide a complete and final response to 6 questions. On January 10, 2012, AREVA NP provided Supplement 7 to provide a complete and final response to 2 questions. On January 19, 2012, AREVA NP provided Supplement 8 to provide a complete and final response to one question and a revised preliminary schedule for the response to Question 07.01-33.

The schedule for a technically correct and complete response to 11 of the remaining 21 questions has been changed as provided below. The response schedule to the other 10 questions remains unchanged.

Question #	Response Date
RAI 505 — 07.01-33	February 21, 2012
RAI 505 — 07.01-34	April 5, 2012
RAI 505 — 07.01-35	April 26, 2012
RAI 505 — 07.01-36	April 5, 2012
RAI 505 — 07.01-37	March 8, 2012
RAI 505 — 07.01-38	April 5, 2012
RAI 505 — 07.01-39	April 26, 2012
RAI 505 — 07.01-40	April 26, 2012
RAI 505 — 07.01-41	March 8, 2012
RAI 505 — 07.01-44	April 5, 2012
RAI 505 — 07.01-45	April 26, 2012
RAI 505 — 07.01-46	April 26, 2012
RAI 505 — 07.01-47	April 5, 2012

RAI 505 — 07.01-48	April 5, 2012
RAI 505 — 07.01-49	April 26, 2012
RAI 505 — 07.01-50	April 26, 2012
RAI 505 — 07.01-51	April 26, 2012
RAI 505 — 07.03-38	March 8, 2012
RAI 505 — 07.05-10	March 8, 2012
RAI 505 — 07.08-47	April 26, 2012
RAI 505 — 07.09-71	April 5, 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
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Thursday, January 19, 2012 11:19 AM
To: Getachew.Tesfaye@nrc.gov
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. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 8

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions. On December 15, 2011, AREVA NP provided Supplement 6 to provide a complete and final response to 6 questions. On January 10, 2012, AREVA NP provided Supplement 7 to provide a complete and final response to 2 questions.

The attached file, "RAI 505 Supplement 8 Response US EPR DC.pdf" provides a technically correct and complete final response to 1 of the remaining 22 questions.

The following table indicates the respective pages in the response document, "RAI 505 Supplement 8 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 505 — 07.01-42	2	2

The schedule for a technically correct and complete response to the remaining 21 questions is provided below. The preliminary schedule for the response to Question 07.01-33 has been revised and is being reevaluated and a new supplement with a revised schedule will be transmitted by February 21, 2012.

Question #	Response Date
RAI 505 — 07.01-33	February 21, 2012
RAI 505 — 07.01-34	April 5, 2012
RAI 505 — 07.01-35	April 26, 2012
RAI 505 — 07.01-36	February 9, 2012
RAI 505 — 07.01-37	March 8, 2012
RAI 505 — 07.01-38	February 9, 2012
RAI 505 — 07.01-39	February 9, 2012
RAI 505 — 07.01-40	February 9, 2012
RAI 505 — 07.01-41	February 9, 2012
RAI 505 — 07.01-44	February 9, 2012
RAI 505 — 07.01-45	April 26, 2012
RAI 505 — 07.01-46	April 26, 2012
RAI 505 — 07.01-47	February 9, 2012
RAI 505 — 07.01-48	February 9, 2012
RAI 505 — 07.01-49	February 9, 2012
RAI 505 — 07.01-50	April 26, 2012
RAI 505 — 07.01-51	February 9, 2012
RAI 505 — 07.03-38	April 26, 2012
RAI 505 — 07.05-10	March 8, 2012
RAI 505 — 07.08-47	April 26, 2012
RAI 505 — 07.09-71	April 5, 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

Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (CORP/QP)

Sent: Tuesday, January 10, 2012 5:21 PM

To: Getachew.Tesfaye@nrc.gov

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. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 7

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions. On December 15, 2011, AREVA NP provided Supplement 6 to provide a complete and final response to 6 questions.

The attached file, "RAI 505 Supplement 7 Response US EPR DC.pdf" provides technically correct and complete final responses to 2 of the remaining 24 questions. 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 505 Question 07.08-48.

The following table indicates the respective pages in the response document, "RAI 505 Supplement 7 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 505 — 07.08-44	2	3
RAI 505 — 07.08-48	4	5

The schedule for a technically correct and complete response to the remaining 22 questions has changed as provided below. The preliminary schedule for the response to Question 07.01-33 is being reevaluated and a new supplement with a revised schedule will be transmitted by January 25, 2012.

Question #	Response Date
RAI 505 — 07.01-33	January 25, 2012
RAI 505 — 07.01-34	April 5, 2012
RAI 505 — 07.01-35	April 26, 2012
RAI 505 — 07.01-36	February 9, 2012
RAI 505 — 07.01-37	March 8, 2012
RAI 505 — 07.01-38	February 9, 2012
RAI 505 — 07.01-39	February 9, 2012
RAI 505 — 07.01-40	February 9, 2012
RAI 505 — 07.01-41	February 9, 2012
RAI 505 — 07.01-42	February 9, 2012
RAI 505 — 07.01-44	February 9, 2012
RAI 505 — 07.01-45	April 26, 2012
RAI 505 — 07.01-46	April 26, 2012
RAI 505 — 07.01-47	February 9, 2012
RAI 505 — 07.01-48	February 9, 2012
RAI 505 — 07.01-49	February 9, 2012
RAI 505 — 07.01-50	April 26, 2012
RAI 505 — 07.01-51	February 9, 2012
RAI 505 — 07.03-38	April 26, 2012
RAI 505 — 07.05-10	March 8, 2012

RAI 505 — 07.08-47	April 26, 2012
RAI 505 — 07.09-71	April 5, 2012

Sincerely,

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

7207 IBM Drive, Mail Code CLT 2B
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Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Thursday, December 15, 2011 1:49 PM
To: Getachew.Tesfaye@nrc.gov
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. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 6

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions.

The attached file, "RAI 505 Supplement 6 Response US EPR DC.pdf" provides technically correct and complete responses to 6 of the remaining 30 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. Also appended to this file are affected pages of Technical Reports ANP-10304 and ANP-10309P. Revisions to these Technical Reports will be submitted by separate letter after completion of all responses to RAI 505.

The following table indicates the respective pages in the response document, "RAI 505 Supplement 6 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 505 — 07.03-37	2	3
RAI 505 — 07.04-15	4	5
RAI 505 — 07.05-11	6	6
RAI 505 — 07.08-43	7	8
RAI 505 — 07.08-45	9	10
RAI 505 — 07.08-49	11	12

The schedule for a technically correct and complete response to the remaining 24 questions remains unchanged. The preliminary schedule for the response to Question 07.01-33 is being reevaluated and a new supplement with a revised schedule will be transmitted by January 25, 2012.

Question #	Response Date
RAI 505 — 07.01-33	January 25, 2012
RAI 505 — 07.01-34	January 10, 2012
RAI 505 — 07.01-35	February 9, 2012
RAI 505 — 07.01-36	January 10, 2012
RAI 505 — 07.01-37	January 19, 2012
RAI 505 — 07.01-38	January 10, 2012
RAI 505 — 07.01-39	January 10, 2012
RAI 505 — 07.01-40	January 10, 2012
RAI 505 — 07.01-41	January 10, 2012
RAI 505 — 07.01-42	January 10, 2012
RAI 505 — 07.01-44	January 10, 2012
RAI 505 — 07.01-45	February 9, 2012
RAI 505 — 07.01-46	February 9, 2012
RAI 505 — 07.01-47	January 10, 2012
RAI 505 — 07.01-48	January 10, 2012
RAI 505 — 07.01-49	January 10, 2012
RAI 505 — 07.01-50	January 10, 2012
RAI 505 — 07.01-51	January 10, 2012
RAI 505 — 07.03-38	February 9, 2012
RAI 505 — 07.05-10	January 19, 2012
RAI 505 — 07.08-44	January 10, 2012
RAI 505 — 07.08-47	January 10, 2012
RAI 505 — 07.08-48	January 10, 2012
RAI 505 — 07.09-71	January 10, 2012

Sincerely,

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

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Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Wednesday, December 14, 2011 11:30 AM
To: Getachew.Tesfaye@nrc.gov
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. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 5

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided a revised schedule for 7 questions.

The schedule for the response to four questions (Questions 7.1-35, 7.1-45, 7.1-46, and 7.3-38) is being changed, as indicated in bold below. In addition, the preliminary schedule for the response to Question 07.01-33 has been revised as indicated. This schedule is being reevaluated and a new supplement with a revised schedule will be transmitted by January 25, 2012. The schedule for a technically correct and complete response to the remaining 25 questions remains unchanged.

Question #	Response Date
RAI 505 — 07.01-33	January 25, 2012
RAI 505 — 07.01-34	January 10, 2012
RAI 505 — 07.01-35	February 9, 2012
RAI 505 — 07.01-36	January 10, 2012
RAI 505 — 07.01-37	January 19, 2012
RAI 505 — 07.01-38	January 10, 2012
RAI 505 — 07.01-39	January 10, 2012
RAI 505 — 07.01-40	January 10, 2012
RAI 505 — 07.01-41	January 10, 2012
RAI 505 — 07.01-42	January 10, 2012
RAI 505 — 07.01-44	January 10, 2012
RAI 505 — 07.01-45	February 9, 2012
RAI 505 — 07.01-46	February 9, 2012
RAI 505 — 07.01-47	January 10, 2012
RAI 505 — 07.01-48	January 10, 2012
RAI 505 — 07.01-49	January 10, 2012
RAI 505 — 07.01-50	January 10, 2012
RAI 505 — 07.01-51	January 10, 2012
RAI 505 — 07.03-37	January 19, 2012
RAI 505 — 07.03-38	February 9, 2012
RAI 505 — 07.04-15	January 19, 2012
RAI 505 — 07.05-10	January 19, 2012
RAI 505 — 07.05-11	January 19, 2012
RAI 505 — 07.08-43	January 19, 2012
RAI 505 — 07.08-44	January 10, 2012
RAI 505 — 07.08-45	January 10, 2012
RAI 505 — 07.08-47	January 10, 2012
RAI 505 — 07.08-48	January 10, 2012
RAI 505 — 07.08-49	January 19, 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
 Email: Dennis.Williford@areva.com

From: RYAN Tom (RS/NB)
Sent: Friday, December 09, 2011 8:35 AM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); WILLIFORD Dennis (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 4

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. On October 27, 2011, and November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. On November 22, 2011, AREVA NP provided a final response to four questions.

The schedule for the response to the questions 7.1-37, 7.3-37, 7.4-15, 7.5-10, 7.5-11, 7.8-43, and 7.8-49 is being changed and indicated in bold below, the remaining 23 questions remains unchanged, as indicated below. In addition, the preliminary schedule for a response to Question 07.01-33 remains unchanged. The schedule for Question 07.01-33 is being reevaluated and a new supplement with a revised schedule will be transmitted by December 14, 2011.

Question #	Response Date
RAI 505 — 07.01-33	December 14, 2011
RAI 505 — 07.01-34	January 10, 2012
RAI 505 — 07.01-35	January 10, 2012
RAI 505 — 07.01-36	January 10, 2012
RAI 505 — 07.01-37	January 19, 2012
RAI 505 — 07.01-38	January 10, 2012
RAI 505 — 07.01-39	January 10, 2012
RAI 505 — 07.01-40	January 10, 2012
RAI 505 — 07.01-41	January 10, 2012
RAI 505 — 07.01-42	January 10, 2012
RAI 505 — 07.01-44	January 10, 2012
RAI 505 — 07.01-45	January 10, 2012
RAI 505 — 07.01-46	January 10, 2012

RAI 505 — 07.01-47	January 10, 2012
RAI 505 — 07.01-48	January 10, 2012
RAI 505 — 07.01-49	January 10, 2012
RAI 505 — 07.01-50	January 10, 2012
RAI 505 — 07.01-51	January 10, 2012
RAI 505 — 07.03-37	January 19, 2012
RAI 505 — 07.03-38	January 10, 2012
RAI 505 — 07.04-15	January 19, 2012
RAI 505 — 07.05-10	January 19, 2012
RAI 505 — 07.05-11	January 19, 2012
RAI 505 — 07.08-43	January 19, 2012
RAI 505 — 07.08-44	January 10, 2012
RAI 505 — 07.08-45	January 10, 2012
RAI 505 — 07.08-47	January 10, 2012
RAI 505 — 07.08-48	January 10, 2012
RAI 505 — 07.08-49	January 19, 2012
RAI 505 — 07.09-71	January 10, 2012

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: WILLIFORD Dennis (RS/NB)
Sent: Tuesday, November 22, 2011 2:51 PM
To: Getachew.Tesfaye@nrc.gov
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. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 3

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. On October 27, 2011, and November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33.

After discussions with NRC staff, the attached file, "RAI 505 Supplement 3 Response US EPR DC.pdf" provides technically correct and complete responses to 4 of the 34 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 505 Question 07.07-23, Question 07.08 -46 and Question 07.09.02-72.

The following table indicates the respective pages in the response document, "RAI 505 Supplement 3 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 505 — 07.01-43	2	3
RAI 505 — 07.07-23	4	4
RAI 505 — 07.08-46	5	5
RAI 505 — 07.09-72	6	7

The schedule for the response to the remaining 30 questions remains unchanged, as indicated below. In addition, the preliminary revised schedule for a response to Question 07.01-33 remains unchanged. The schedule for Question 07.01-33 is being reevaluated and a new supplement with a revised schedule will be transmitted by December 14, 2011.

Question #	Response Date
RAI 505 — 07.01-33	December 14, 2011
RAI 505 — 07.01-34	January 10, 2012
RAI 505 — 07.01-35	January 10, 2012
RAI 505 — 07.01-36	January 10, 2012
RAI 505 — 07.01-37	December 11, 2011
RAI 505 — 07.01-38	January 10, 2012
RAI 505 — 07.01-39	January 10, 2012
RAI 505 — 07.01-40	January 10, 2012
RAI 505 — 07.01-41	January 10, 2012
RAI 505 — 07.01-42	January 10, 2012
RAI 505 — 07.01-44	January 10, 2012
RAI 505 — 07.01-45	January 10, 2012
RAI 505 — 07.01-46	January 10, 2012
RAI 505 — 07.01-47	January 10, 2012
RAI 505 — 07.01-48	January 10, 2012
RAI 505 — 07.01-49	January 10, 2012
RAI 505 — 07.01-50	January 10, 2012
RAI 505 — 07.01-51	January 10, 2012
RAI 505 — 07.03-37	December 11, 2011
RAI 505 — 07.03-38	January 10, 2012
RAI 505 — 07.04-15	December 11, 2011
RAI 505 — 07.05-10	December 11, 2011
RAI 505 — 07.05-11	December 11, 2011
RAI 505 — 07.08-43	December 11, 2011
RAI 505 — 07.08-44	January 10, 2012
RAI 505 — 07.08-45	January 10, 2012
RAI 505 — 07.08-47	January 10, 2012
RAI 505 — 07.08-48	January 10, 2012
RAI 505 — 07.08-49	December 11, 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: Thursday, November 17, 2011 5:44 PM
To: Getachew.Tesfaye@nrc.gov
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. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 2

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. On October 27, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 13 questions and a preliminary revised schedule for Question 07.01-33.

The schedule for the final responses has been revised, as indicated in bold below. In addition, the preliminary revised schedule for a response to Question 07.01-33 has been revised. The schedule for Question 07.01-33 is being reevaluated and a new supplement with a revised schedule will be transmitted by December 14, 2011.

Question #	Response Date
RAI 505 — 07.01-33	December 14, 2011
RAI 505 — 07.01-34	January 10, 2012
RAI 505 — 07.01-35	January 10, 2012
RAI 505 — 07.01-36	January 10, 2012
RAI 505 — 07.01-37	December 11, 2011
RAI 505 — 07.01-38	January 10, 2012
RAI 505 — 07.01-39	January 10, 2012
RAI 505 — 07.01-40	January 10, 2012
RAI 505 — 07.01-41	January 10, 2012
RAI 505 — 07.01-42	January 10, 2012
RAI 505 — 07.01-43	December 11, 2011
RAI 505 — 07.01-44	January 10, 2012
RAI 505 — 07.01-45	January 10, 2012
RAI 505 — 07.01-46	January 10, 2012
RAI 505 — 07.01-47	January 10, 2012
RAI 505 — 07.01-48	January 10, 2012

RAI 505 — 07.01-49	January 10, 2012
RAI 505 — 07.01-50	January 10, 2012
RAI 505 — 07.01-51	January 10, 2012
RAI 505 — 07.03-37	December 11, 2011
RAI 505 — 07.03-38	January 10, 2012
RAI 505 — 07.04-15	December 11, 2011
RAI 505 — 07.05-10	December 11, 2011
RAI 505 — 07.05-11	December 11, 2011
RAI 505 — 07.07-23	December 11, 2011
RAI 505 — 07.08-43	December 11, 2011
RAI 505 — 07.08-44	January 10, 2012
RAI 505 — 07.08-45	January 10, 2012
RAI 505 — 07.08-46	December 11, 2011
RAI 505 — 07.08-47	January 10, 2012
RAI 505 — 07.08-48	January 10, 2012
RAI 505 — 07.08-49	December 11, 2011
RAI 505 — 07.09-71	January 10, 2012
RAI 505 — 07.09-72	January 10, 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
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Thursday, October 27, 2011 11:22 AM
To: Getachew.Tesfaye@nrc.gov
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. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 1

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for a technically correct and complete response to the 34 questions in RAI 505.

The schedule for the final response to Questions 07.01-38, 07.01-44, 07.01-45, 07.01-46, 07.01-47, 07.01-48, 07.01-49, 07.01-50, 07.01-51, 07.03-38, 07.08-43, 07.08-47, 07.08-48 has been revised, as indicated in bold below. In addition, a preliminary revised schedule for a technically correct and complete response to Question 07.01-33 is provided below. The schedule for Question 07.01-33 is being reevaluated and a new supplement with a revised schedule will be transmitted by November 17, 2011.

Question #	Response Date
RAI 505 — 07.01-33	November 17, 2011
RAI 505 — 07.01-34	December 8, 2011
RAI 505 — 07.01-35	November 17, 2011
RAI 505 — 07.01-36	December 8, 2011
RAI 505 — 07.01-37	December 8, 2011
RAI 505 — 07.01-38	January 10, 2012
RAI 505 — 07.01-39	December 8, 2011
RAI 505 — 07.01-40	December 8, 2011
RAI 505 — 07.01-41	November 17, 2011
RAI 505 — 07.01-42	December 20, 2011
RAI 505 — 07.01-43	November 17, 2011
RAI 505 — 07.01-44	January 10, 2012
RAI 505 — 07.01-45	January 10, 2012
RAI 505 — 07.01-46	January 10, 2012
RAI 505 — 07.01-47	January 10, 2012
RAI 505 — 07.01-48	January 10, 2012
RAI 505 — 07.01-49	January 10, 2012
RAI 505 — 07.01-50	January 10, 2012
RAI 505 — 07.01-51	January 10, 2012
RAI 505 — 07.03-37	November 17, 2011
RAI 505 — 07.03-38	January 10, 2012
RAI 505 — 07.04-15	November 17, 2011
RAI 505 — 07.05-10	November 17, 2011
RAI 505 — 07.05-11	November 17, 2011
RAI 505 — 07.07-23	November 17, 2011
RAI 505 — 07.08-43	January 10, 2012
RAI 505 — 07.08-44	December 8, 2011
RAI 505 — 07.08-45	December 8, 2011
RAI 505 — 07.08-46	December 8, 2011
RAI 505 — 07.08-47	January 10, 2012
RAI 505 — 07.08-48	January 10, 2012
RAI 505 — 07.08-49	November 17, 2011
RAI 505 — 07.09-71	December 8, 2011
RAI 505 — 07.09-72	December 8, 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: Thursday, September 29, 2011 11:04 AM

To: Getachew.Tesfaye@nrc.gov

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. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 505 Response US EPR DC.pdf," provides a schedule since a technically correct and complete response to the 34 questions cannot be provided at this time.

The following table indicates the respective pages in the response document, "RAI 505 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 505 — 07.01-33	2	2
RAI 505 — 07.01-34	3	3
RAI 505 — 07.01-35	4	4
RAI 505 — 07.01-36	5	5
RAI 505 — 07.01-37	6	6
RAI 505 — 07.01-38	7	7
RAI 505 — 07.01-39	8	8
RAI 505 — 07.01-40	9	9
RAI 505 — 07.01-41	10	10
RAI 505 — 07.01-42	11	11
RAI 505 — 07.01-43	12	12
RAI 505 — 07.01-44	13	13
RAI 505 — 07.01-45	14	14
RAI 505 — 07.01-46	15	15
RAI 505 — 07.01-47	16	16
RAI 505 — 07.01-48	17	18
RAI 505 — 07.01-49	19	19
RAI 505 — 07.01-50	20	20
RAI 505 — 07.01-51	21	22
RAI 505 — 07.03-37	23	23
RAI 505 — 07.03-38	24	24
RAI 505 — 07.04-15	25	25
RAI 505 — 07.05-10	26	26
RAI 505 — 07.05-11	27	27
RAI 505 — 07.07-23	28	28
RAI 505 — 07.08-43	29	29
RAI 505 — 07.08-44	30	30
RAI 505 — 07.08-45	31	31
RAI 505 — 07.08-46	32	32

RAI 505 — 07.08-47	33	33
RAI 505 — 07.08-48	34	34
RAI 505 — 07.08-49	35	35
RAI 505 — 07.09-71	36	36
RAI 505 — 07.09-72	37	37

A complete answer is not provided for the 34 questions. The schedule for a technically correct and complete response to these questions is provided below.

Please note that the date for the response to Question 07.01-33 is a commitment date to provide a final schedule for the response in a follow-up letter.

Question #	Response Date
RAI 505 — 07.01-33	October 27, 2011
RAI 505 — 07.01-34	December 8, 2011
RAI 505 — 07.01-35	November 17, 2011
RAI 505 — 07.01-36	December 8, 2011
RAI 505 — 07.01-37	December 8, 2011
RAI 505 — 07.01-38	December 20, 2011
RAI 505 — 07.01-39	December 8, 2011
RAI 505 — 07.01-40	December 8, 2011
RAI 505 — 07.01-41	November 17, 2011
RAI 505 — 07.01-42	December 20, 2011
RAI 505 — 07.01-43	November 17, 2011
RAI 505 — 07.01-44	December 20, 2011
RAI 505 — 07.01-45	December 20, 2011
RAI 505 — 07.01-46	December 20, 2011
RAI 505 — 07.01-47	December 8, 2011
RAI 505 — 07.01-48	December 20, 2011
RAI 505 — 07.01-49	December 20, 2011
RAI 505 — 07.01-50	December 20, 2011
RAI 505 — 07.01-51	December 20, 2011
RAI 505 — 07.03-37	November 17, 2011
RAI 505 — 07.03-38	December 20, 2011
RAI 505 — 07.04-15	November 17, 2011
RAI 505 — 07.05-10	November 17, 2011
RAI 505 — 07.05-11	November 17, 2011
RAI 505 — 07.07-23	November 17, 2011
RAI 505 — 07.08-43	December 20, 2011
RAI 505 — 07.08-44	December 8, 2011
RAI 505 — 07.08-45	December 8, 2011
RAI 505 — 07.08-46	December 8, 2011
RAI 505 — 07.08-47	December 20, 2011
RAI 505 — 07.08-48	December 20, 2011
RAI 505 — 07.08-49	November 17, 2011

RAI 505 — 07.09-71	December 8, 2011
RAI 505 — 07.09-72	December 8, 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: Tesfaye, Getachew [<mailto:Getachew.Tesfaye@nrc.gov>]
Sent: Tuesday, August 30, 2011 1:23 PM
To: ZZ-DL-A-USEPR-DL
Cc: Zhang, Deanna; Morton, Wendell; Spaulding, Deirdre; Mott, Kenneth; Truong, Tung; Zhao, Jack; Mills, Daniel; Jackson, Terry; Canova, Michael; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on August 12, 2011, and discussed with your staff on August 22 and 25, 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: 3865

Mail Envelope Properties (2FBE1051AEB2E748A0F98DF9EEE5A5D4BAFCE3)

Subject: DRAFT Response to U.S. EPR Design Certification Application RAI No. 505
(5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Question 07.09-71
Sent Date: 4/4/2012 3:58:23 PM
Received Date: 4/4/2012 3:57:05 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
"HATHCOCK Phillip (AREVA)" <Phillip.Hathcock@areva.com>
Tracking Status: None
"LEIGHLITER John (AREVA)" <John.Leighliter@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
"MEACHAM Robert (AREVA)" <Robert.Meacham@areva.com>
Tracking Status: None
"HUDSON Greg (AREVA)" <Greg.Hudson@areva.com>
Tracking Status: None
"Tesfaye, Getachew" <Getachew.Tesfaye@nrc.gov>
Tracking Status: None

Post Office: auscharm02.adom.ad.corp

Files	Size	Date & Time	
MESSAGE	48070	4/4/2012 3:57:05 PM	
RAI 505 Question 07.09-71 Response US EPR DC - DRAFT.pdf			932563

Options

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

Response to

**Request for Additional Information No. 505 (5902,5735,5869,5754,5803,5950,5744),
Revision 0**

8/30/2011

U. S. EPR Standard Design Certification

AREVA NP Inc.

Docket No. 52-020

SRP Section: 07.01 - Instrumentation and Controls - Introduction

SRP Section: 07.03 - Engineered Safety Features Systems

SRP Section: 07.04 - Safe Shutdown Systems

SRP Section: 07.05 - Information Systems Important to Safety

SRP Section: 07.07 - Control Systems

SRP Section: 07.08 - Diverse Instrumentation and Control Systems

SRP Section: 07.09 - Data Communication Systems

Application Section: FSAR Chapter 7

**QUESTIONS for Instrumentation, Controls and Electrical Engineering 1
(AP1000/EPR Projects) (ICE1)**

Question 07.09-71:**OPEN ITEM**

Explain how invalid signals are identified by safety automation system (SAS) processors and state whether the voting logic in the SAS is modified to accommodate the identified invalid signals to meet the requirements of IEEE Std. 603-1998, Clause 5.6.1.

IEEE Std. 603-1998, Clause 5.6.1, requires redundant portions of the safety system to be independent and physically separated from each other to the degree necessary to retain the capability to accomplish the safety function. The staff issued Digital Instrumentation and Controls Interim Staff Guidance 4 (D I&C ISG-04) to provide criteria for implementing interdivisional data communications. Criterion 2 in Section 1 of D I&C ISG-04 states that "The safety channel should be protected from adverse influence from outside the division of which that channel is a member..." In addition, Criterion 12 in Section 1 of D I&C ISG-04 states that, "Communication faults should not adversely affect the performance of required functions in any way..." The staff evaluated the SAS interdivisional communication functions and determined that the SAS has not adequately addressed Criteria 2 and 12. Specifically, the staff finds that the applicant has not provided sufficient detail regarding provisions in the design that prevents SAS divisions from being adversely impacted by information originating from outside the division. As such, the staff requests the applicant explain how invalid signals are identified by SAS processors and state whether the voting logic in the SAS is modified to accommodate the identified invalid signals. Incorporate this description into the U.S. EPR FSAR, Tier 2, or in documents incorporated by reference.

Response to Question 07.09-71:

The safety automation system (SAS) meets the requirements of IEEE Std. 603-1998, Clause 5.6.1, which requires redundant portions of the SAS to be independent and physically separated from each other to the degree necessary to retain the capability to accomplish the safety function.

Each division of the SAS implements redundant Control Unit (CU) pairs that operate in a master / hot standby configuration. In order to avoid delay in switching from master CU to hot standby CU, the pair of CUs receives identical input data.

The SAS switchover configuration is described in U.S. EPR FSAR Tier 2, Section 7.1.1.4.2 as provided in the Response to RAI 505, Question 7.1-36.

The SAS meets the requirements of the Digital Instrumentation and Controls Interim Staff Guidance 4, which states that signal faults should not adversely affect the performance of required safety function in any way. In case of failure of sensors, sensor maintenance, or communication failure between SAS functional units detected by the SAS; the 2 out of 4 voting logic in the CU layer is automatically modified for data signals. This allows the CU to disregard the faulty signal while retaining the ability to actuate on the basis of the remaining non-faulty signals. This automatic voting modification is accomplished using the status of the signals that are inputs to the voting function block.

The data signals within the SAS carry a value and a status. The signal status can be propagated through the software function blocks; therefore, if an input signal to a function block

has a faulty status, the output of the function block also has a faulty status. When a signal with a faulty status reaches the voting function block, the signal is disregarded through modification of the vote. This results in the output of the voting function block having a non-faulty status. A signal typically obtains a faulty status through the following mechanisms:

- During sensor maintenance, or when a sensor is suspected to be faulty, the sensor can be placed in maintenance bypass. This lockout attaches a faulty status to the sensor's signal. The lockout is a software function performed in the CU layer before any processing is performed using the signal.
- If the SAS detects a faulty sensor through range monitoring, or by monitoring the status of the signal conditioning hardware, the corresponding signal is marked with a faulty status. This monitoring is also performed in the CU layer.
- In case of a communication failure between SAS functional units, the receiving functional unit detects errors such as incorrect message length, format, or age.

This detection occurs when the functional unit retrieves the message from the associated communication module before the individual signals are extracted from the message. If a communication failure is detected, a faulty status is attached to the signals in the message before they are used in function block processing.

Single failures upstream of the CU layer that could result in an invalid signal being used in the SAS actuation are accommodated by modifying the vote in the CU layer.

Each SAS actuation function is evaluated on a case-by-case basis to determine whether the vote is modified toward actuation or no actuation. In cases where inappropriate actuation of an SAS function could challenge plant safety, the function is modified toward no actuation. Otherwise, the function is modified toward actuation. The concept of modification toward no actuation, based on the number of input signals to the voting function block that carry a faulty status, is as follows:

- 0 faulty input signals: Vote is 2/4.
- 1 faulty input signal: Vote is 2/3.
- 2 faulty input signals: Vote is 2/2.
- 3 faulty input signals: No actuation.
- 4 faulty input signals: No actuation.

Due to the SAS interdivisional communication configuration and master/hot standby configuration shown in U.S. EPR FSAR Tier 2, Figure 7.1-7 – Safety Automation System Architecture, a single faulted CU would not modify voting logic within the faulted division. The voting logic remains 2/4 in the faulted division. The voting logic in other divisions is modified to 2/3. This is described in U.S. EPR FSAR Tier 2, Table 7.1-7 – SAS FMEA Results as provided in the Response to RAI 505, Question 7.1-35.

Hardwired signals which fail within range are detected during periodic testing of the CUs. Hardwired signals with fail out of range are automatically disregarded.

FSAR Impact:

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

DRAFT