

## ArevaEPRDCPEm Resource

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**From:** WILLIFORD Dennis (AREVA) [Dennis.Williford@areva.com]  
**Sent:** Tuesday, April 30, 2013 12:27 PM  
**To:** Snyder, Amy  
**Cc:** Hearn, Peter; ANDERSON Katherine (EXTERNAL AREVA); DELANO Karen (AREVA); LEIGHLITER John (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA); KOWALSKI David (AREVA)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 525 (6194, 6154), FSAR Ch. 9, Supplement 10  
**Attachments:** RAI 525 Supplement 10 Response US EPR DC.pdf  
**Importance:** High

Amy,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the eighteen questions in RAI No. 525 on January 25, 2012. Supplement 1 response was sent on February 24, 2012 to provide a revised schedule. Supplement 2 response was sent on March 16, 2012 to provide a response to Question 09.01.04-28. Supplement 3 response was sent on May 30, 2012 to provide a revised final response to Question 09.01.04-28. Supplement 4 response was sent on December 14, 2012 to provide a revised schedule for 6 of the remaining 17 questions. Supplement 5 response was sent on January 8, 2013 to provide a revised schedule for 11 of the remaining 17 questions. Supplement 6 response was sent on February 25, 2013 to provide technically correct and complete final responses to Questions 09.01.04-32 and 09.01.04-35. Supplement 7 response was sent on February 28, 2013 to provide technically correct and complete final responses to Questions 09.01.04-21 and 09.01.04-34. Supplement 8 response was also sent on February 28, 2013 to provide a revised schedule for Questions 09.01.04-23 and 09.01.04-38. Supplement 9 response was sent on March 14, 2013 to provide technically correct and complete final responses to Questions 09.01.04-23 and 09.01.04-38.

NRC staff review comments on our advanced response to Question 09.01.04-27 were received via e-mail on March 26, 2013 and clarified in a subsequent telecon on April 3, 2013. We have incorporated NRC staff comments in the final response to this question provided in this supplement. The attached file, "RAI 525 Supplement 10 Response US EPR DC.pdf" provides a technically correct and complete final response to Question 09.01.04-27.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the final response to RAI 525 Question 09.01.04-27.

The following table indicates the respective pages in the response document, "RAI 525 Supplement 10 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 525 — 09.01.04-27	2	3

The schedule for a technically correct and complete response to Question 09.01.04-29 has been revised as provided below. The response schedule for the other 9 questions has not changed.

Question #	Response Date
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RAI 525 — 09.01.04-22	May 15, 2013
RAI 525 — 09.01.04-24	May 15, 2013
RAI 525 — 09.01.04-25	May 15, 2013
RAI 525 — 09.01.04-26	May 15, 2013
RAI 525 — 09.01.04-29	<b>April 30, 2013</b>
RAI 525 — 09.01.04-30	May 15, 2013
RAI 525 — 09.01.04-31	May 24, 2013
RAI 525 — 09.01.04-33	May 24, 2013
RAI 525 — 09.01.04-36	May 24, 2013
RAI 525 — 09.01.04-37	May 24, 2013

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](mailto:Dennis.Williford@areva.com)

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**From:** WILLIFORD Dennis (RS/NB)  
**Sent:** Friday, March 29, 2013 3:45 PM  
**To:** Amy.Snyder@nrc.gov  
**Cc:** peter.hearn@nrc.gov; DELANO Karen (RS/NB); LEIGHLITER John (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); WILLS Tiffany (CORP/QP); HONMA George (EXT); KOWALSKI David (RS/NB); GUCWA Len (External RS/NB); VANCE Brian (RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 525 (6194, 6154), FSAR Ch. 9, Questions 09.01.04-27 and 09.01.04-29 - STATUS  
**Importance:** High

Amy,  
AREVA appreciates the NRC staff review comments received earlier this week on the Advanced RAI responses to Questions 09.01.04-27 and 09.01.04-29. We need and have requested a clarification telecon with NRC staff to review the comments. AREVA will provide a revised schedule for submittal of the final responses to these 2 questions after completion of the clarification telecon and evaluation of the additional comments received.

The schedule for a technically correct and complete final response to the other 9 questions remains unchanged as shown below.

<b>Question #</b>	<b>Response Date</b>
RAI 525 — 09.01.04-22	May 15, 2013
RAI 525 — 09.01.04-24	May 15, 2013
RAI 525 — 09.01.04-25	May 15, 2013
RAI 525 — 09.01.04-26	May 15, 2013
RAI 525 — 09.01.04-27	<b>TBD</b>

RAI 525 — 09.01.04-29	<b>TBD</b>
RAI 525 — 09.01.04-30	May 15, 2013
RAI 525 — 09.01.04-31	May 24, 2013
RAI 525 — 09.01.04-33	May 24, 2013
RAI 525 — 09.01.04-36	May 24, 2013
RAI 525 — 09.01.04-37	May 24, 2013

Sincerely,

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

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---

**From:** WILLIFORD Dennis (RS/NB)

**Sent:** Thursday, March 14, 2013 1:44 PM

**To:** [Amy.Snyder@nrc.gov](mailto:Amy.Snyder@nrc.gov)

**Cc:** [peter.hearn@nrc.gov](mailto:peter.hearn@nrc.gov); DELANO Karen (RS/NB); LEIGHLITER John (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); WILLS Tiffany (CORP/QP); KOWALSKI David (RS/NB)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 525 (6194, 6154), FSAR Ch. 9, Supplement 9

**Importance:** High

Amy,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the eighteen questions in RAI No. 525 on January 25, 2012. Supplement 1 response was sent on February 24, 2012 to provide a revised schedule. Supplement 2 response was sent on March 16, 2012 to provide a response to Question 09.01.04-28. Supplement 3 response was sent on May 30, 2012 to provide a revised final response to Question 09.01.04-28. Supplement 4 response was sent on December 14, 2012 to provide a revised schedule for 6 of the remaining 17 questions. Supplement 5 response was sent on January 8, 2013 to provide a revised schedule for 11 of the remaining 17 questions. Supplement 6 response was sent on February 25, 2013 to provide technically correct and complete final responses to Questions 09.01.04-32 and 09.01.04-35. Supplement 7 response was sent on February 28, 2013 to provide technically correct and complete final responses to Questions 09.01.04-21 and 09.01.04-34. Supplement 8 response was also sent on February 28, 2013 to provide a revised schedule for Questions 09.01.04-23 and 09.01.04-38.

The attached file, "RAI 525 Supplement 9 Response US EPR DC - PUBLIC.pdf," provides technically correct and complete final responses to Questions 09.01.04-23 and 09.01.04-38.

Because the response file contains security-related sensitive information that should be withheld from public disclosure in accordance with 10 CFR 2.390, a public version is provided with the security-related sensitive information redacted. This e-mail does not contain any security-related information. The unredacted SUNSI version is provided under separate e-mail.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format, which support final responses to RAI 525 Questions 09.01.04-23 and 09.01.04-38.

The following table indicates the respective pages in the response document, "RAI 525 Supplement 9 Response US EPR DC - PUBLIC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 525 — 09.01.04-23	2	3
RAI 525 — 09.01.04-38	4	7

The schedule for technically correct and complete responses to the remaining 11 questions has not changed and is provided below.

Question #	Response Date
RAI 525 — 09.01.04-22	May 15, 2013
RAI 525 — 09.01.04-24	May 15, 2013
RAI 525 — 09.01.04-25	May 15, 2013
RAI 525 — 09.01.04-26	May 15, 2013
RAI 525 — 09.01.04-27	March 29, 2013
RAI 525 — 09.01.04-29	March 29, 2013
RAI 525 — 09.01.04-30	May 15, 2013
RAI 525 — 09.01.04-31	May 24, 2013
RAI 525 — 09.01.04-33	May 24, 2013
RAI 525 — 09.01.04-36	May 24, 2013
RAI 525 — 09.01.04-37	May 24, 2013

Sincerely,

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

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---

**From:** WILLIFORD Dennis (RS/NB)  
**Sent:** Thursday, February 28, 2013 10:07 PM  
**To:** [Amy.Snyder@nrc.gov](mailto:Amy.Snyder@nrc.gov)  
**Cc:** [peter.hearn@nrc.gov](mailto:peter.hearn@nrc.gov); DELANO Karen (RS/NB); LEIGHLITER John (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); WILLS Tiffany (CORP/QP); KOWALSKI David (RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 525 (6194, 6154), FSAR Ch. 9, Supplement 8  
**Importance:** High

Amy,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the eighteen questions in RAI No. 525 on January 25, 2012. Supplement 1 response was sent on February 24, 2012 to provide a revised schedule. Supplement 2 response was sent on March 16, 2012 to provide a response to Question 09.01.04-28. Supplement 3 response was sent on May 30, 2012 to provide a revised final response to

Question 09.01.04-28. Supplement 4 response was sent on December 14, 2012 to provide a revised schedule for 6 of the remaining 17 questions. Supplement 5 response was sent on January 8, 2013 to provide a revised schedule for 11 of the remaining 17 questions. Supplement 6 response was sent on February 25, 2013 to provide technically correct and complete final responses to two questions (Questions 09.01.04-32 and 09.01.04-35). Supplement 7 response was sent on February 28, 2013 to provide technically correct and complete final responses to Questions 09.01.04-21 and 09.01.04-34.

The schedule for technically correct and complete responses to two questions (Questions 09.01.04-23 and 09.01.04-38) has been changed as provided below.

<b>Question #</b>	<b>Response Date</b>
RAI 525 — 09.01.04-22	May 15, 2013
RAI 525 — 09.01.04-23	<b>March 14, 2013</b>
RAI 525 — 09.01.04-24	May 15, 2013
RAI 525 — 09.01.04-25	May 15, 2013
RAI 525 — 09.01.04-26	May 15, 2013
RAI 525 — 09.01.04-27	March 29, 2013
RAI 525 — 09.01.04-29	March 29, 2013
RAI 525 — 09.01.04-30	May 15, 2013
RAI 525 — 09.01.04-31	May 24, 2013
RAI 525 — 09.01.04-33	May 24, 2013
RAI 525 — 09.01.04-36	May 24, 2013
RAI 525 — 09.01.04-37	May 24, 2013
RAI 525 — 09.01.04-38	<b>March 14, 2013</b>

Sincerely,

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

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---

**From:** WILLIFORD Dennis (RS/NB)

**Sent:** Thursday, February 28, 2013 1:54 PM

**To:** [Amy.Snyder@nrc.gov](mailto:Amy.Snyder@nrc.gov)

**Cc:** [peter.hearn@nrc.gov](mailto:peter.hearn@nrc.gov); DELANO Karen (RS/NB); LEIGHLITER John (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); WILLS Tiffany (CORP/QP); KOWALSKI David (RS/NB)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 525 (6194, 6154), FSAR Ch. 9, Supplement 7  
**Importance:** High

Amy,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the eighteen questions in RAI No. 525 on January 25, 2012. Supplement 1 response was sent on February 24, 2012 to provide a revised schedule. Supplement 2 response was sent on March 16, 2012 to provide a response to Question

09.01.04-28. Supplement 3 response was sent on May 30, 2012 to provide a revised final response to Question 09.01.04-28. Supplement 4 response was sent on December 14, 2012 to provide a revised schedule for 6 of the remaining 17 questions. Supplement 5 response was sent on January 8, 2013 to provide a revised schedule for 11 of the remaining 17 questions. Supplement 6 response was sent on February 25, 2013 to provide technically correct and complete final responses to two questions (Questions 09.01.04-32 and 09.01.04-35).

The attached file, "RAI 525 Supplement 7 Response US EPR DC.pdf," provides a technically correct and complete final response to two questions (Questions 09.01.04-21 and 09.01.04-34). Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the final responses to RAI 525 Questions 09.01.04-21 and 09.01.04-34.

The following table indicates the respective pages in the response document, "RAI 525 Supplement 7 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 525 — 09.01.04-21	2	3
RAI 525 — 09.01.04-34	4	5

The schedule for technically correct and complete responses to the remaining 13 questions has not changed as provided below.

Question #	Response Date
RAI 525 — 09.01.04-22	May 15, 2013
RAI 525 — 09.01.04-23	February 28, 2013
RAI 525 — 09.01.04-24	May 15, 2013
RAI 525 — 09.01.04-25	May 15, 2013
RAI 525 — 09.01.04-26	May 15, 2013
RAI 525 — 09.01.04-27	March 29, 2013
RAI 525 — 09.01.04-29	March 29, 2013
RAI 525 — 09.01.04-30	May 15, 2013
RAI 525 — 09.01.04-31	May 24, 2013
RAI 525 — 09.01.04-33	May 24, 2013
RAI 525 — 09.01.04-36	May 24, 2013
RAI 525 — 09.01.04-37	May 24, 2013
RAI 525 — 09.01.04-38	February 28, 2013

Sincerely,

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

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---

**From:** WILLIFORD Dennis (RS/NB)

**Sent:** Monday, February 25, 2013 10:11 PM

**To:** [Amy.Snyder@nrc.gov](mailto:Amy.Snyder@nrc.gov)

**Cc:** [peter.hearn@nrc.gov](mailto:peter.hearn@nrc.gov); DELANO Karen (RS/NB); LEIGHLITER John (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); WILLS Tiffany (CORP/QP); KOWALSKI David (RS/NB)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 525 (6194, 6154), FSAR Ch. 9, Supplement 6

**Importance:** High

Amy,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the eighteen questions in RAI No. 525 on January 25, 2012. Supplement 1 response was sent on February 24, 2012 to provide a revised schedule. Supplement 2 response was sent on March 16, 2012 to provide a response to Question 09.01.04-28. Supplement 3 response was sent on May 30, 2012 to provide a revised final response to Question 09.01.04-28. Supplement 4 response was sent on December 14, 2012 to provide a revised schedule for 6 of the remaining 17 questions. Supplement 5 response was sent on January 8, 2013 to provide a revised schedule for 11 of the remaining 17 questions.

The attached file, "RAI 525 Supplement 6 Response US EPR DC.pdf" provides a technically correct and complete final response to two questions (Questions 09.01.04-32 and 09.01.04-35).

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 525 Questions 09.01.04-32 and 09.01.04-35.

The following table indicates the respective pages in the response document, "RAI 525 Supplement 6 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 525 — 09.01.04-32	2	2
RAI 525 — 09.01.04-35	3	3

The schedule for a technically correct and complete response to the remaining 15 questions is unchanged as provided below.

Question #	Response Date
RAI 525 — 09.01.04-21	February 28, 2013
RAI 525 — 09.01.04-22	May 15, 2013
RAI 525 — 09.01.04-23	February 28, 2013
RAI 525 — 09.01.04-24	May 15, 2013
RAI 525 — 09.01.04-25	May 15, 2013
RAI 525 — 09.01.04-26	May 15, 2013
RAI 525 — 09.01.04-27	March 29, 2013
RAI 525 — 09.01.04-29	March 29, 2013
RAI 525 — 09.01.04-30	May 15, 2013
RAI 525 — 09.01.04-31	May 24, 2013
RAI 525 — 09.01.04-33	May 24, 2013
RAI 525 — 09.01.04-34	February 28, 2013

RAI 525 — 09.01.04-36	May 24, 2013
RAI 525 — 09.01.04-37	May 24, 2013
RAI 525 — 09.01.04-38	February 28, 2013

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  
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---

**From:** WILLIFORD Dennis (RS/NB)  
**Sent:** Tuesday, January 08, 2013 3:40 PM  
**To:** [Amy.Snyder@nrc.gov](mailto:Amy.Snyder@nrc.gov)  
**Cc:** [peter.hearn@nrc.gov](mailto:peter.hearn@nrc.gov); DELANO Karen (RS/NB); LEIGHLITER John (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); WILLS Tiffany (CORP/QP); KOWALSKI David (RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 525 (6194, 6154), FSAR Ch. 9, Supplement 5  
**Importance:** High

Amy,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the eighteen questions in RAI No. 525 on January 25, 2012. Supplement 1 response was sent on February 24, 2012 to provide a revised schedule. Supplement 2 response was sent on March 16, 2012 to provide a response to Question 09.01.04-28. Supplement 3 response was sent on May 30, 2012 to provide a revised final response to Question 09.01.04-28. Supplement 4 response was sent on December 14, 2012 to provide a revised schedule for 6 of the remaining 17 questions.

The schedule for a technically correct and complete response to 11 of the remaining 17 questions has been revised as provided below.

Question #	Response Date
RAI 525 — 09.01.04-21	February 28, 2013
RAI 525 — 09.01.04-22	<b>May 15, 2013</b>
RAI 525 — 09.01.04-23	February 28, 2013
RAI 525 — 09.01.04-24	<b>May 15, 2013</b>
RAI 525 — 09.01.04-25	<b>May 15, 2013</b>
RAI 525 — 09.01.04-26	<b>May 15, 2013</b>
RAI 525 — 09.01.04-27	<b>March 29, 2013</b>
RAI 525 — 09.01.04-29	<b>March 29, 2013</b>
RAI 525 — 09.01.04-30	<b>May 15, 2013</b>
RAI 525 — 09.01.04-31	<b>May 24, 2013</b>
RAI 525 — 09.01.04-32	February 28, 2013
RAI 525 — 09.01.04-33	<b>May 24, 2013</b>



RAI 525 — 09.01.04-34	February 28, 2013
RAI 525 — 09.01.04-35	February 28, 2013
RAI 525 — 09.01.04-36	<b>May 24, 2013</b>
RAI 525 — 09.01.04-37	<b>May 24, 2013</b>
RAI 525 — 09.01.04-38	February 28, 2013

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](mailto:Dennis.Williford@areva.com)

---

**From:** WILLIFORD Dennis (RS/NB)  
**Sent:** Friday, December 14, 2012 4:58 PM  
**To:** [Amy.Snyder@nrc.gov](mailto:Amy.Snyder@nrc.gov)  
**Cc:** BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); LEIGHLITER John (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); [peter.hearn@nrc.gov](mailto:peter.hearn@nrc.gov); KOWALSKI David (RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 525 (6194, 6154), FSAR Ch. 9, Supplement 4  
**Importance:** High

Amy,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the eighteen questions in RAI No. 525 on January 25, 2012. Supplement 1 response was sent on February 24, 2012 to provide a revised schedule. Supplement 2 response was sent on March 16, 2012 to provide a response to Question 09.01.04-28. Supplement 3 response was sent on May 30, 2012 to provide a revised final response to Question 09.01.04-28.

The schedule for a technically correct and complete response to 6 of the remaining 17 questions has been revised as provided below.

<b>Question #</b>	<b>Response Date</b>
RAI 525 — 09.01.04-21	<b>February 28, 2013</b>
RAI 525 — 09.01.04-22	June 28, 2013
RAI 525 — 09.01.04-23	<b>February 28, 2013</b>
RAI 525 — 09.01.04-24	June 28, 2013
RAI 525 — 09.01.04-25	June 28, 2013
RAI 525 — 09.01.04-26	June 28, 2013
RAI 525 — 09.01.04-27	June 28, 2013
RAI 525 — 09.01.04-29	June 28, 2013
RAI 525 — 09.01.04-30	June 28, 2013
RAI 525 — 09.01.04-31	June 28, 2013
RAI 525 — 09.01.04-32	<b>February 28, 2013</b>

RAI 525 — 09.01.04-33	June 28, 2013
RAI 525 — 09.01.04-34	<b>February 28, 2013</b>
RAI 525 — 09.01.04-35	<b>February 28, 2013</b>
RAI 525 — 09.01.04-36	June 28, 2013
RAI 525 — 09.01.04-37	June 28, 2013
RAI 525 — 09.01.04-38	<b>February 28, 2013</b>

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](mailto:Dennis.Williford@areva.com)

---

**From:** WILLIFORD Dennis (RS/NB)

**Sent:** Wednesday, May 30, 2012 11:38 AM

**To:** [Getachew.Tesfaye@nrc.gov](mailto:Getachew.Tesfaye@nrc.gov)

**Cc:** BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); KOWALSKI David (RS/NB)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 525 (6194, 6154), FSAR Ch. 9, Supplement 3

**Importance:** High

Getachew,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the eighteen questions in RAI No. 525 on January 25, 2012. Supplement 1 response to RAI No. 525 was sent on February 24, 2012 to provide a revised schedule. Supplement 2 response to RAI No. 525 was sent on March 16, 2012 to provide a complete final response to Question 09.01.04-28.

The attached file, "RAI 525 Supplement 3 Response US EPR DC.pdf" provides a technically correct and complete revised final response to Question 09.01.04-28, which supersedes in its entirety the response to this question provided in Supplement 2.

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 525 Question 09.01.04-28.

The following table indicates the respective pages in the response document, "RAI 525 Supplement 3 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 525 — 09.01.04-28	2	2

The schedule for a technically correct and complete response to the remaining 17 questions has not changed as provided below.

Question #	Response Date
RAI 525 — 09.01.04-21	June 28, 2013
RAI 525 — 09.01.04-22	June 28, 2013
RAI 525 — 09.01.04-23	June 28, 2013
RAI 525 — 09.01.04-24	June 28, 2013
RAI 525 — 09.01.04-25	June 28, 2013
RAI 525 — 09.01.04-26	June 28, 2013
RAI 525 — 09.01.04-27	June 28, 2013
RAI 525 — 09.01.04-29	June 28, 2013
RAI 525 — 09.01.04-30	June 28, 2013
RAI 525 — 09.01.04-31	June 28, 2013
RAI 525 — 09.01.04-32	June 28, 2013
RAI 525 — 09.01.04-33	June 28, 2013
RAI 525 — 09.01.04-34	June 28, 2013
RAI 525 — 09.01.04-35	June 28, 2013
RAI 525 — 09.01.04-36	June 28, 2013
RAI 525 — 09.01.04-37	June 28, 2013
RAI 525 — 09.01.04-38	June 28, 2013

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](mailto:Dennis.Williford@areva.com)

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**From:** WILLIFORD Dennis (RS/NB)  
**Sent:** Friday, March 16, 2012 3:05 PM  
**To:** [Getachew.Tesfaye@nrc.gov](mailto:Getachew.Tesfaye@nrc.gov)  
**Cc:** BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); KOWALSKI David (RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 525 (6194, 6154), FSAR Ch. 9, Supplement 2

Getachew,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the eighteen questions in RAI No. 525 on January 25, 2012. Supplement 1 response to RAI No. 525 was sent on February 24, 2012 to provide a revised schedule.

The attached file, "RAI 525 Supplement 2 Response US EPR DC.pdf" provides a technically correct and complete final response to Question 09.01.04-28.

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 525 Question 09.01.04-28.

The following table indicates the respective pages in the response document, "RAI 525 Supplement 2 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 525 — 09.01.04-28	2	2

The schedule for technically correct and complete responses to the remaining seventeen questions has not changed and is provided below.

Question #	Response Date
RAI 525 — 09.01.04-21	June 28, 2013
RAI 525 — 09.01.04-22	June 28, 2013
RAI 525 — 09.01.04-23	June 28, 2013
RAI 525 — 09.01.04-24	June 28, 2013
RAI 525 — 09.01.04-25	June 28, 2013
RAI 525 — 09.01.04-26	June 28, 2013
RAI 525 — 09.01.04-27	June 28, 2013
RAI 525 — 09.01.04-29	June 28, 2013
RAI 525 — 09.01.04-30	June 28, 2013
RAI 525 — 09.01.04-31	June 28, 2013
RAI 525 — 09.01.04-32	June 28, 2013
RAI 525 — 09.01.04-33	June 28, 2013
RAI 525 — 09.01.04-34	June 28, 2013
RAI 525 — 09.01.04-35	June 28, 2013
RAI 525 — 09.01.04-36	June 28, 2013
RAI 525 — 09.01.04-37	June 28, 2013
RAI 525 — 09.01.04-38	June 28, 2013

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](mailto:Dennis.Williford@areva.com)

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**From:** WILLIFORD Dennis (RS/NB)  
**Sent:** Friday, February 24, 2012 5:21 PM  
**To:** [Getachew.Tesfaye@nrc.gov](mailto:Getachew.Tesfaye@nrc.gov)  
**Cc:** BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); KOWALSKI David (RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 525 (6194, 6154), FSAR Ch. 9, Supplement 1

Getachew,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the eighteen questions in RAI No. 525 on January 25, 2012.

The schedule for technically correct and complete responses to the eighteen questions has been changed as provided below. This schedule was transmitted to the NRC in AREVA NP letter NRC:12:008 dated February 21, 2012.

<b>Question #</b>	<b>Response Date</b>
RAI 525 — 09.01.04-21	<b>June 28, 2013</b>
RAI 525 — 09.01.04-22	<b>June 28, 2013</b>
RAI 525 — 09.01.04-23	<b>June 28, 2013</b>
RAI 525 — 09.01.04-24	<b>June 28, 2013</b>
RAI 525 — 09.01.04-25	<b>June 28, 2013</b>
RAI 525 — 09.01.04-26	<b>June 28, 2013</b>
RAI 525 — 09.01.04-27	<b>June 28, 2013</b>
RAI 525 — 09.01.04-28	<b>June 28, 2013</b>
RAI 525 — 09.01.04-29	<b>June 28, 2013</b>
RAI 525 — 09.01.04-30	<b>June 28, 2013</b>
RAI 525 — 09.01.04-31	<b>June 28, 2013</b>
RAI 525 — 09.01.04-32	<b>June 28, 2013</b>
RAI 525 — 09.01.04-33	<b>June 28, 2013</b>
RAI 525 — 09.01.04-34	<b>June 28, 2013</b>
RAI 525 — 09.01.04-35	<b>June 28, 2013</b>
RAI 525 — 09.01.04-36	<b>June 28, 2013</b>
RAI 525 — 09.01.04-37	<b>June 28, 2013</b>
RAI 525 — 09.01.04-38	<b>June 28, 2013</b>

Sincerely,

***Dennis Williford, P.E.***

***U.S. EPR Design Certification Licensing Manager***

**AREVA NP Inc.**

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---

**From:** WILLIFORD Dennis (RS/NB)

**Sent:** Wednesday, January 25, 2012 4:06 PM

**To:** 'Tefaye, Getachew'

**Cc:** BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); KOWALSKI David (RS/NB); [Michael.Miernicki@nrc.gov](mailto:Michael.Miernicki@nrc.gov); [peter.hearn@nrc.gov](mailto:peter.hearn@nrc.gov)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 525 (6194, 6154), FSAR Ch. 9

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 525 Response US EPR DC.pdf," provides a preliminary schedule since a technically correct and complete response to these eighteen questions cannot be provided at this time.

The following table indicates the respective pages in the response document, "RAI 525 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

<b>Question #</b>	<b>Start Page</b>	<b>End Page</b>
RAI 525 — 09.01.04-21	2	2
RAI 525 — 09.01.04-22	3	3
RAI 525 — 09.01.04-23	4	4
RAI 525 — 09.01.04-24	5	5
RAI 525 — 09.01.04-25	6	6
RAI 525 — 09.01.04-26	7	7
RAI 525 — 09.01.04-27	8	8
RAI 525 — 09.01.04-28	9	9
RAI 525 — 09.01.04-29	10	10
RAI 525 — 09.01.04-30	11	11
RAI 525 — 09.01.04-31	12	12
RAI 525 — 09.01.04-32	13	13
RAI 525 — 09.01.04-33	14	14
RAI 525 — 09.01.04-34	15	15
RAI 525 — 09.01.04-35	16	16
RAI 525 — 09.01.04-36	17	17
RAI 525 — 09.01.04-37	18	18
RAI 525 — 09.01.04-38	19	19

A preliminary schedule for technically correct and complete responses to these questions is provided below. This schedule is being reevaluated and a new supplement with a revised schedule will be transmitted by February 21, 2012.

<b>Question #</b>	<b>Response Date</b>
RAI 525 — 09.01.04-21	February 21, 2012
RAI 525 — 09.01.04-22	February 21, 2012
RAI 525 — 09.01.04-23	February 21, 2012
RAI 525 — 09.01.04-24	February 21, 2012
RAI 525 — 09.01.04-25	February 21, 2012
RAI 525 — 09.01.04-26	February 21, 2012
RAI 525 — 09.01.04-27	February 21, 2012
RAI 525 — 09.01.04-28	February 21, 2012
RAI 525 — 09.01.04-29	February 21, 2012
RAI 525 — 09.01.04-30	February 21, 2012
RAI 525 — 09.01.04-31	February 21, 2012
RAI 525 — 09.01.04-32	February 21, 2012
RAI 525 — 09.01.04-33	February 21, 2012
RAI 525 — 09.01.04-34	February 21, 2012

RAI 525 — 09.01.04-35	February 21, 2012
RAI 525 — 09.01.04-36	February 21, 2012
RAI 525 — 09.01.04-37	February 21, 2012
RAI 525 — 09.01.04-38	February 21, 2012

Sincerely,

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

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Charlotte, NC 28262  
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Email: [Dennis.Williford@areva.com](mailto:Dennis.Williford@areva.com)

---

**From:** Tesfaye, Getachew [<mailto:Getachew.Tesfaye@nrc.gov>]  
**Sent:** Monday, December 19, 2011 4:19 PM  
**To:** ZZ-DL-A-USEPR-DL  
**Cc:** Curran, Gordon; McKenna, Eileen; Xu, Jim; Thomas, Brian; Hearn, Peter; Segala, John; ArevaEPRDCPEm Resource  
**Subject:** U.S. EPR Design Certification Application RAI No. 525 (6194, 6154), FSAR Ch. 9

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on November 11, 2011, and discussed with your staff on December 2, 2011. Draft RAI Questions 09.01.04-24, 09.01.04-31, and 09.01.04-33 were modified as a result of that discussion. The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs, excluding the time period of **December 24, 2011 thru January 2, 2012, to account for the holiday season** as discussed with AREVA NP Inc. For any RAIs that cannot be answered **within 40 days**, it is expected that a date for receipt of this information will be provided to the staff within the 40-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:** 4377

**Mail Envelope Properties** (554210743EFE354B8D5741BEB695E65612C8D5)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 525 (6194, 6154), FSAR Ch. 9, Supplement 10  
**Sent Date:** 4/30/2013 12:27:04 PM  
**Received Date:** 4/30/2013 12:27:24 PM  
**From:** WILLIFORD Dennis (AREVA)

**Created By:** Dennis.Williford@areva.com

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"Hearn, Peter" <Peter.Hearn@nrc.gov>

Tracking Status: None

"ANDERSON Katherine (EXTERNAL AREVA)" <katherine.anderson.ext@areva.com>

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"KOWALSKI David (AREVA)" <David.Kowalski@areva.com>

Tracking Status: None

"Snyder, Amy" <Amy.Snyder@nrc.gov>

Tracking Status: None

**Post Office:** FUSLYNCMX03.fdom.ad.corp

Files	Size	Date & Time
MESSAGE	32669	4/30/2013 12:27:24 PM
RAI 525 Supplement 10 Response US EPR DC.pdf		531198

**Options**

**Priority:** High

**Return Notification:** No

**Reply Requested:** No

**Sensitivity:** Normal

**Expiration Date:**

**Recipients Received:**



**Response to**

**Request for Additional Information No. 525(6194, 6154), Supplement 10**

**12/19/2011**

**U.S. EPR Standard Design Certification**

**AREVA NP Inc.**

**Docket No. 52-020**

**SRP Section: 09.01.04 - Light Load Handling System (Related to Refueling)**

**Application Section: 09.01.04**

**QUESTIONS for Balance of Plant Branch 1 (SBPA)**

**QUESTIONS for Structural Engineering Branch 2 (ESBWR/ABWR Projects) (SEB2)**

**Question 09.01.04-27:****OPEN ITEM**

The objective of the FHS preoperational test program was found to be appropriate since it is to demonstrate the capability of the FHS to perform. The results of the FHS test program are considered to be acceptable if the FHS perform as described in Tier 2, FSAR Section 9.1.4.

While the pre-operational tests are appropriate to address the objective of the test, the staff has a concern about when this testing will be performed. For safe operation, the staff finds that the capability of the SFCTF should be performed prior to operation of the SFCTF. Since the SFCTF is not planned for use until some duration after plant operation, the applicant is requested to clearly state what testing will be performed prior to use of the SFCTF.

**Response to Question 09.01.04-27:**

After installation of the spent fuel cask transfer facility (SFCTF), inspections and testing are performed to confirm that components are correctly installed and operable. Before each cask loading campaign, the SFCTF is tested and inspected to confirm that the electrical and mechanical components will properly function during the cask loading campaign. Testing the functionality of the SFCTF components between cask loading campaigns is not necessary. The leak tightness of the SFCTF penetration assembly and cask loading pit (CLP) is continuously monitored between cask loading campaigns. Monitoring is accomplished by several methods:

- Potential leakage through the CLP liner plate is collected and monitored by a leak chase and collection system. This system is described in U.S. EPR FSAR Tier 2, Section 9.1.2.2.2. Additional information concerning the prevention, detection and mitigation of leaks in the SFCTF is provided in the response to RAI 385, Question 09.01.04-16.
- Potential leakage past the first concentric “O” ring, which seals the penetration assembly upper cover plate, is collected and monitored by a moisture sensor. Leakage is indicated by high moisture and alarmed in the main control room. In the response to RAI 525, Question 09.01.04-22, a new table and text was added to U.S. EPR FSAR Tier 2, Section 9.1.4.5, which provides a description of the interlock and emergency stop protection associated with SFCTF equipment. As shown in U.S. EPR FSAR Tier 2, Table 9.1.4-2—SFCTF Non-Safety Related Interlocks and Emergency Stops, interlock CF 18 monitors the leak tightness of the penetration assembly upper cover plate.
- The water level in the CLP is monitored for decreasing water level, which can be indicative of leakage from the CLP. The CLP level indication is shown on U.S. EPR FSAR Tier 2, Figure 9.1.3-2—Fuel Pool Purification System.
- The water level in the Fuel Building (FB) sump is monitored. Potential leakage from the penetration assembly is collected by the FB nuclear island drain and vent system (NIDVS) and routed to the FB NIDVS sump. Refer to U.S. EPR FSAR Tier 2, Section 9.1.3.4. The FB NIDVS sump level measurement instrumentation is classified safety-related, Seismic Category I, and annunciates in the main control room. Refer to U.S. EPR FSAR Tier 2, Section 9.3.3.3.
- The penetration assembly lower cover plate is bolted and sealed by concentric “O” rings. Potential leakage past the “O” rings can be visually observed. The lower cover is

equipped with a nozzle for recovery of drip-offs. Refer to U.S. EPR FSAR Tier 2, Section 9.1.4.2.2.

In the response to RAI 385, Question 09.01.04-15, a new U.S. EPR FSAR Tier 2, Section 14.2.12.3.17 was added to the U.S. EPR FSAR to describe a pre-operational test procedure for the SFCTF. Pre-operational testing of the heavy load handling equipment is also performed in accordance with Section 7420 of ASME NOG-1-2004. The required pre-operational tests include handling sequence tests, electrical circuit tests, leak-tightness tests, and load tests. The handling sequence tests include placement of a dummy cask on the spent fuel cask transfer machine (SFCTM), removal of the biological lid, docking a dummy cask on the penetration assembly, opening the penetration assembly, undocking the dummy cask, and installation of the biological lid.

U.S. EPR FSAR Tier 2, Section 9.1.4.4, will be revised to reflect this information.

**FSAR Impact:**

U.S. EPR FSAR Tier 2, Section 9.1.4.4, will be revised as described in the response and indicated on the enclosed markups.

# U.S. EPR Final Safety Analysis Report Markups



The overflow piping and the inlet purification piping enter the top of the cask loading pit. The inlet purification piping is 4.3 ft below the normal SFP level of 62.3 ft. If the cask loading pit were to drain to elevation 58 ft, there would be 24.7 ft of water above the top of the fuel assemblies in the SFP.

The outlet purification piping and the penetration structure piping are moderate energy lines. Per BTP 3-4, a pipe crack is assumed in each of these lines. The sum of the flowrate through these lines is approximately 75 gpm. Therefore, it would take >24 hours to drain the SFP to 10 ft above the top of the fuel assemblies, assuming no make-up capacity, initial operating water level of 62.3 ft, and no operator action. However, upon a visual detection of the piping failure or through level indicators in the pool, the operator would move any fuel assemblies in transit to a safe location in the SFP or cask and close the cask loading pit swivel gate. The operator actions could be completed within 30 minutes and would terminate the loss of SFP inventory. Make-up water is available via the IRWST and the SFP purification pump, which has a make-up capacity of 400 gpm. Therefore, there is sufficient time for operator intervention with minimal impact on SFP inventory and cooling.

The FB flooding analysis postulates a 6-inch pipe failure at the bottom of the cask loading pit. The release of water from this postulated failure would be detected by the operators performing the fuel transfer, as well as by level measurements. The released water volume is defined by a time period of 30 minutes. Since the FB flooding analysis assumes a 6-inch pipe failure, it bounds the postulated cracks in the 6-inch attached piping. Refer to Section 3.4.3.5 for a description of the FB flooding analysis.

#### 9.1.4.4 Inspection and Testing Requirements

The safety-related components are located to permit preservice and inservice inspections. The FHS containment isolation function is testable. Refer to Section 14.2 (test abstracts #038 and #039) for initial plant testing of the FHS components. The performance and structural integrity of system components is demonstrated by continuous operation.

The fuel handling tools are load tested to 125 percent of the rated load prior to their initial use. Visual inspections are recommended for the fuel handling tools prior to use.

After installation of the SFCTF, inspections and testing are performed to confirm that components are correctly installed and operable. Before each cask loading campaign, the SFCTF is tested and inspected to confirm that the electrical and mechanical components will properly function during the cask loading campaign. Testing the functionality of the SFCTF components between cask loading campaigns is not necessary. However, the leak tightness of the SFCTF penetration assembly and CLP is continuously monitored between cask loading campaigns.



Pre-operational testing of the heavy load handling equipment is performed in accordance with Section 7420 of ASME NOG-1-2004. The required pre-operational tests include handling sequence tests, electrical circuit tests, leak-tightness tests and load tests. The handling sequence tests include placement of a dummy cask on the spent fuel cask transfer machine (SFCTM), removal of the biological lid, docking a dummy cask on the penetration assembly, opening the penetration assembly, undocking the dummy cask, and installation of the biological lid. Refer to Section 14.2.12.3.17 for a description of the pre-operational test of the SFCTF (Test #047).

The biological lid lifting station and the penetration upper cover hoist are load-tested to 125 percent of the rated load prior to their initial use.

Tests of the SFCTF equipment are performed before each cask loading campaign and include functional tests, overload protection tests, and leak tests. The tests include the following:

- The upper cover of the loading penetration assembly is tested for leak-tightness.
- Check of the geometry of the various components and functional clearances:
  - Straightness and alignment of the different components.
  - Position of guiding rails.
- Check of the motive parts (motors, brakes).
- Check of overload thresholds.
- Check of limit switches, overtravel switches, and speed and position sensors.

Refueling cavity ring and refueling cavity door seals will be inspected for leakage after filling the refueling cavity and before moving fuel to detect potential loss of refueling cavity water through passive barriers.

#### 9.1.4.5 Instrumentation Requirements

In general, mechanical or electrical interlocks are provided, when required, to provide reasonable assurance of the proper and safe operation of the fuel handling equipment. The intent is to prevent a situation which could endanger the operator or damage the fuel assemblies and control components. The interlocks, setpoints, rules for handling fuel assemblies, and other devices that restrict undesired or uncontrolled movement are incorporated in the design. As a minimum, the interlocks specified in Table 1 of Reference 1 will be provided.

The spent fuel machine and new fuel elevator are remotely operated from their respective control desk on the FB floor. The refueling machine is remotely operated