

## ArevaEPRDCPEm Resource

---

**From:** WELLS Russell (AREVA) [Russell.Wells@areva.com]  
**Sent:** Wednesday, May 04, 2011 12:48 PM  
**To:** Tesfaye, Getachew  
**Cc:** CORNELL Veronica (EXTERNAL AREVA); BENNETT Kathy (AREVA); DELANO Karen (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 23  
**Attachments:** RAI 354 Supplement 23 Response US EPR DC.pdf

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. AREVA NP submitted Supplement 1 on June 3, 2010, to provide a schedule for the remaining 21 questions. Supplement 2 was submitted on June 24, 2010, and included a revised schedule for Questions 03.08.02-11, 12, 13, 14, 15, 16; 03.08.05-22 and 03.08.05-23. AREVA NP submitted Supplement 3 on July 7, 2010, responding to 1 of the remaining 21 questions. AREVA NP submitted Supplement 4 on July 30, 2010, to provide final responses to Questions 03.06.02-32, 03.06.02-41 and 03.08.02-16 and a revised schedule for Questions 03.06.02-33 through 03.06.02-40. On August 5, 2010, AREVA NP provided a revised schedule for Questions 03.06.02-42 and 03.08.05-23 in Supplement 5. AREVA NP submitted Supplement 6 on August 31, 2010, to provide final responses to 5 of the remaining 17 questions. On September 8, 2010, AREVA NP submitted Supplement 7 to provide a revised schedule for the response to Question 03.08.05-21. On September 13, 2010, AREVA NP provided an INTERIM response to Question 03.08.05-22 in Supplement 8. In Supplement 9, AREVA NP submitted a revised schedule for Question 03.08.05-23 on October 1, 2010. AREVA NP submitted Supplement 10 on October 7, 2010 and Supplement 11 on November 1, 2010 to provide a revised schedule for the response to Question 03.08.02-13. On November 17, 2010, AREVA NP submitted Supplement 12 to provide a revised schedule for Questions 03.06.02-33 through 03.06.02-40 and 03.08.05-23. On November 22, 2010, AREVA NP submitted Supplement 13 to provide an INTERIM response to Question 03.08.05-22 and a new schedule for supplemental responses to Questions 03.08.02-11 and 03.08.02-12. In Supplement 14, AREVA NP submitted a revised schedule for Question 03.08.05-23 on January 7, 2011. In Supplement 15, AREVA NP submitted a revised schedule for Question 03.08.05-22 on January 13, 2011. On February 11, 2011, AREVA NP submitted Supplement 16 to provide a revised schedule for Questions 03.08.02-11, 03.08.02-12, 03.08.02-13, 03.08.05-22 and 03.08.05-23. On March 3, 2011, AREVA NP submitted Supplement 17 to provide a technically correct and complete FINAL response to Question 03.08.02-12 and a revised schedule for Questions 03.08.02-11 and Question 03.08.02-13. In Supplement 18, AREVA NP submitted a revised schedule for Questions 03.06.02-33 through 03.06.02-40 on March 17, 2011. On March 29, 2011, AREVA NP submitted Supplement 19 to provide revised schedules for Question 03.08.05-22 and Question 03.08.05-23. On April 18, 2011, AREVA NP submitted Supplement 20 to provide a technically correct and complete FINAL response to Question 03.08.05-22. On April 18, 2011, AREVA NP also submitted Supplement 21 to provide a technically correct and complete response to question 03.08.02-11. On April 28, 2011, in Supplement 22, AREVA NP submitted a revised schedule for Questions 03.06.02-33 through 03.06.02-40 on April 28, 2011.

The attached file, "RAI 354 Supplement 23 Response US EPR DC.pdf" provides a technically correct and complete response to Question 03.08.05-23, as committed. Appended to this file are the affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 354 Question 03.08.05-23.

The following table indicates the respective pages in the response document, "RAI 354 Supplement 23 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 354 — 03.08.05-23	2	4

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

Question #	Interim Response Date	Response Date
RAI 354 - 03.08.02-13		June 14, 2011
RAI 354 - 03.06.02-33		May 30, 2011
RAI 354 - 03.06.02-34		May 30, 2011
RAI 354 - 03.06.02-35		July 28, 2011
RAI 354 - 03.06.02-36		May 30, 2011
RAI 354 - 03.06.02-37		May 30, 2011
RAI 354 - 03.06.02-38		May 30, 2011
RAI 354 - 03.06.02-39		May 30, 2011
RAI 354 - 03.06.02-40		May 30, 2011

*Sincerely,*

*Russ Wells*

*U.S. EPR Design Certification Licensing Manager*

*AREVA NP, Inc.*

*3315 Old Forest Road, P.O. Box 10935*

*Mail Stop OF-57*

*Lynchburg, VA 24506-0935*

*Phone: 434-832-3884 (work)*

*434-942-6375 (cell)*

*Fax: 434-382-3884*

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

---

**From:** WELLS Russell (RS/NB)

**Sent:** Thursday, April 28, 2011 3:18 PM

**To:** 'Tesfaye, Getachew'

**Cc:** CORNELL Veronica (External RS/NB); BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 22

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. AREVA NP submitted Supplement 1 on June 3, 2010, to provide a schedule for the remaining 21 questions. Supplement 2 was submitted on June 24, 2010, and included a revised schedule for Questions 03.08.02-11, 12, 13, 14, 15, 16; 03.08.05-22 and 03.08.05-23. AREVA NP submitted Supplement 3 on July 7, 2010, responding to 1 of the remaining 21 questions. AREVA NP submitted Supplement 4 on July 30, 2010, to provide final responses to Questions 03.06.02-32, 03.06.02-41 and 03.08.02-16 and a revised schedule for Questions 03.06.02-33 through 03.06.02-40. On August 5, 2010, AREVA NP provided a revised schedule for Questions 03.06.02-42 and 03.08.05-23 in Supplement 5. AREVA NP submitted Supplement 6 on August 31, 2010, to provide final responses to 5 of the remaining 17 questions. On September 8, 2010, AREVA NP submitted Supplement 7 to provide a revised schedule for the response to Question 03.08.05-21. On September 13, 2010, AREVA NP provided an INTERIM response to Question 03.08.05-22 in Supplement 8. In Supplement 9, AREVA NP submitted a revised schedule for Question 03.08.05-23 on October 1, 2010. AREVA NP submitted Supplement 10 on October 7, 2010 and Supplement 11 on November 1, 2010 to provide a revised schedule for the response to Question 03.08.02-

13. On November 17, 2010, AREVA NP submitted Supplement 12 to provide a revised schedule for Questions 03.06.02-33 through 03.06.02-40 and 03.08.05-23. On November 22, 2010, AREVA NP submitted Supplement 13 to provide an INTERIM response to Question 03.08.05-22 and a new schedule for supplemental responses to Questions 03.08.02-11 and 03.08.02-12. In Supplement 14, AREVA NP submitted a revised schedule for Question 03.08.05-23 on January 7, 2011. In Supplement 15, AREVA NP submitted a revised schedule for Question 03.08.05-22 on January 13, 2011. On February 11, 2011, AREVA NP submitted Supplement 16 to provide a revised schedule for Questions 03.08.02-11, 03.08.02-12, 03.08.02-13, 03.08.05-22 and 03.08.05-23. On March 3, 2011, AREVA NP submitted Supplement 17 to provide a technically correct and complete FINAL response to Question 03.08.02-12 and a revised schedule for Questions 03.08.02-11 and Question 03.08.02-13. In Supplement 18, AREVA NP submitted a revised schedule for Questions 03.06.02-33 through 03.06.02-40 on March 17, 2011. On March 29, 2011, AREVA NP submitted Supplement 19 to provide revised schedules for Question 03.08.05-22 and Question 03.08.05-23. On April 18, 2011, AREVA NP submitted Supplement 20 to provide a technically correct and complete FINAL response to Question 03.08.05-22. On April 18, 2011, AREVA NP also submitted Supplement 21 to provide a technically correct and complete response to question 03.08.02-11.

The schedule for the response to questions 03.06.02-33 through 03.06.02-40 is being revised to allow AREVA NP additional time to address NRC comments. The schedule for the technically correct and complete responses to the remaining questions is unchanged and provided below.

<b>Question #</b>	<b>Interim Response Date</b>	<b>Response Date</b>
RAI 354 - 03.08.02-13		June 14, 2011
RAI 354 - 03.08.05-23		May 10, 2011
RAI 354 - 03.06.02-33		<b>May 30, 2011</b>
RAI 354 - 03.06.02-34		<b>May 30, 2011</b>
RAI 354 - 03.06.02-35		<b>July 28, 2011</b>
RAI 354 - 03.06.02-36		<b>May 30, 2011</b>
RAI 354 - 03.06.02-37		<b>May 30, 2011</b>
RAI 354 - 03.06.02-38		<b>May 30, 2011</b>
RAI 354 - 03.06.02-39		<b>May 30, 2011</b>
RAI 354 - 03.06.02-40		<b>May 30, 2011</b>

*Sincerely,*

*Russ Wells*

*U.S. EPR Design Certification Licensing Manager*

*AREVA NP, Inc.*

*3315 Old Forest Road, P.O. Box 10935*

*Mail Stop OF-57*

*Lynchburg, VA 24506-0935*

*Phone: 434-832-3884 (work)*

*434-942-6375 (cell)*

*Fax: 434-382-3884*

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

---

**From:** WELLS Russell (RS/NB)

**Sent:** Monday, April 18, 2011 10:04 AM

**To:** Tesfaye, Getachew

**Cc:** CORNELL Veronica (External RS/NB); BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 21

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. AREVA NP submitted Supplement 1 on June 3, 2010, to provide a schedule for the remaining 21 questions. Supplement 2 was submitted on June 24, 2010, and included a revised schedule for Questions 03.08.02-11, 12, 13, 14, 15, 16; 03.08.05-22 and 03.08.05-23. AREVA NP submitted Supplement 3 on July 7, 2010, responding to 1 of the remaining 21 questions. AREVA NP submitted Supplement 4 on July 30, 2010, to provide final responses to Questions 03.06.02-32, 03.06.02-41 and 03.08.02-16 and a revised schedule for Questions 03.06.02-33 through 03.06.02-40. On August 5, 2010, AREVA NP provided a revised schedule for Questions 03.06.02-42 and 03.08.05-23 in Supplement 5. AREVA NP submitted Supplement 6 on August 31, 2010, to provide final responses to 5 of the remaining 17 questions. On September 8, 2010, AREVA NP submitted Supplement 7 to provide a revised schedule for the response to Question 03.08.05-21. On September 13, 2010, AREVA NP provided an INTERIM response to Question 03.08.05-22 in Supplement 8. In Supplement 9, AREVA NP submitted a revised schedule for Question 03.08.05-23 on October 1, 2010. AREVA NP submitted Supplement 10 on October 7, 2010 and Supplement 11 on November 1, 2010 to provide a revised schedule for the response to Question 03.08.02-13. On November 17, 2010, AREVA NP submitted Supplement 12 to provide a revised schedule for Questions 03.06.02-33 through 03.06.02-40 and 03.08.05-23. On November 22, 2010, AREVA NP submitted Supplement 13 to provide an INTERIM response to Question 03.08.05-22 and a new schedule for supplemental responses to Questions 03.08.02-11 and 03.08.02-12. In Supplement 14, AREVA NP submitted a revised schedule for Question 03.08.05-23 on January 7, 2011. In Supplement 15, AREVA NP submitted a revised schedule for Question 03.08.05-22 on January 13, 2011. On February 11, 2011, AREVA NP submitted Supplement 16 to provide a revised schedule for Questions 03.08.02-11, 03.08.02-12, 03.08.02-13, 03.08.05-22 and 03.08.05-23. On March 3, 2011, AREVA NP submitted Supplement 17 to provide a technically correct and complete FINAL response to Question 03.08.02-12 and a revised schedule for Questions 03.08.02-11 and Question 03.08.02-13. In Supplement 18, AREVA NP submitted a revised schedule for Questions 03.06.02-33 through 03.06.02-40 on March 17, 2011. On March 29, 2011, AREVA NP submitted Supplement 19 to provide revised schedules for Question 03.08.05-22 and Question 03.08.05-23. On April 18, 2011, AREVA NP submitted Supplement 20 to provide a technically correct and complete FINAL response to Question 03.08.05-22.

The attached file, "RAI 354 Supplement 21 Response US EPR DC - PUBLIC.pdf" provides a technically correct and complete response to question 03.08.02-11, as committed. 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 email and attached file do not contain any security-related information. An unredacted security-related version is provided under separate email.

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 354 Question 03.08.02-11.

The following table indicates the respective pages in the response document, "RAI 354 Supplement 21 Response US EPR DC - PUBLIC.pdf," that contain AREVA NP's response to the subject question.

<b>Question #</b>	<b>Start Page</b>	<b>End Page</b>
RAI 354 — 03.08.02-11	2	5

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

Question #	Interim Response Date	Response Date
RAI 354 - 03.08.02-13		June 14, 2011
RAI 354 - 03.08.05-23		May 10, 2011
RAI 354 - 03.06.02-33		April 29, 2011
RAI 354 - 03.06.02-34		April 29, 2011
RAI 354 - 03.06.02-35		April 29, 2011
RAI 354 - 03.06.02-36		April 29, 2011
RAI 354 - 03.06.02-37		April 29, 2011
RAI 354 - 03.06.02-38		April 29, 2011
RAI 354 - 03.06.02-39		April 29, 2011
RAI 354 - 03.06.02-40		April 29, 2011

*Sincerely,*

*Russ Wells*

*U.S. EPR Design Certification Licensing Manager*

**AREVA NP, Inc.**

3315 Old Forest Road, P.O. Box 10935

Mail Stop OF-57

Lynchburg, VA 24506-0935

Phone: 434-832-3884 (work)

434-942-6375 (cell)

Fax: 434-382-3884

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

---

**From:** WELLS Russell (RS/NB)

**Sent:** Monday, April 18, 2011 9:55 AM

**To:** 'Tesfaye, Getachew'

**Cc:** CORNELL Veronica (External RS/NB); BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 20 (Part 3 of 3)

Getachew

Attached is part 3 of 3 for a response of RAI No. 354, FSAR Ch 3, Supplement 20

*Sincerely,*

*Russ Wells*

*U.S. EPR Design Certification Licensing Manager*

**AREVA NP, Inc.**

3315 Old Forest Road, P.O. Box 10935

Mail Stop OF-57

Lynchburg, VA 24506-0935

Phone: 434-832-3884 (work)

434-942-6375 (cell)

Fax: 434-382-3884

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

---

**From:** WELLS Russell (RS/NB)  
**Sent:** Monday, April 18, 2011 9:54 AM  
**To:** 'Tesfaye, Getachew'  
**Cc:** CORNELL Veronica (External RS/NB); BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 20 (Part 2 of 3)

Getachew

Attached is part 2 of 3 for a response of RAI No. 354, FSAR Ch 3, Supplement 20

*Sincerely,*

*Russ Wells*  
*U.S. EPR Design Certification Licensing Manager*  
**AREVA NP, Inc.**  
*3315 Old Forest Road, P.O. Box 10935*  
*Mail Stop OF-57*  
*Lynchburg, VA 24506-0935*  
*Phone: 434-832-3884 (work)*  
*434-942-6375 (cell)*  
*Fax: 434-382-3884*  
[Russell.Wells@Areva.com](mailto:Russell.Wells@Areva.com)

---

**From:** WELLS Russell (RS/NB)  
**Sent:** Monday, April 18, 2011 9:52 AM  
**To:** 'Tesfaye, Getachew'  
**Cc:** CORNELL Veronica (External RS/NB); BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 20 (Part 1 of 3)

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. AREVA NP submitted Supplement 1 on June 3, 2010, to provide a schedule for the remaining 21 questions. Supplement 2 was submitted on June 24, 2010, and included a revised schedule for Questions 03.08.02-11, 12, 13, 14, 15, 16; 03.08.05-22 and 03.08.05-23. AREVA NP submitted Supplement 3 on July 7, 2010, responding to 1 of the remaining 21 questions. AREVA NP submitted Supplement 4 on July 30, 2010, to provide final responses to Questions 03.06.02-32, 03.06.02-41 and 03.08.02-16 and a revised schedule for Questions 03.06.02-33 through 03.06.02-40. On August 5, 2010, AREVA NP provided a revised schedule for Questions 03.06.02-42 and 03.08.05-23 in Supplement 5. AREVA NP submitted Supplement 6 on August 31, 2010, to provide final responses to 5 of the remaining 17 questions. On September 8, 2010, AREVA NP submitted Supplement 7 to provide a revised schedule for the response to Question 03.08.05-21. On September 13, 2010, AREVA NP provided an INTERIM response to Question 03.08.05-22 in Supplement 8. In Supplement 9, AREVA NP submitted a revised schedule for Question 03.08.05-23 on October 1, 2010. AREVA NP submitted Supplement 10 on October 7, 2010 and Supplement 11 on November 1, 2010 to provide a revised schedule for the response to Question 03.08.02-13. On November 17, 2010, AREVA NP submitted Supplement 12 to provide a revised schedule for Questions 03.06.02-33 through 03.06.02-40 and 03.08.05-23. On November 22, 2010, AREVA NP submitted Supplement 13 to provide an INTERIM response to Question 03.08.05-22 and a new schedule for supplemental responses to Questions 03.08.02-11 and 03.08.02-12. In Supplement 14, AREVA NP submitted a revised schedule for Question 03.08.05-23 on January 7, 2011. In Supplement 15, AREVA NP submitted a revised schedule for Question 03.08.05-22 on January 13, 2011. On February 11, 2011, AREVA NP submitted Supplement 16 to provide a revised schedule for Questions 03.08.02-11, 03.08.02-12, 03.08.02-13, 03.08.05-22 and 03.08.05-

23. On March 3, 2011, AREVA NP submitted Supplement 17 to provide a technically correct and complete FINAL response to Question 03.08.02-12 and a revised schedule for Questions 03.08.02-11 and Question 03.08.02-13. In Supplement 18, AREVA NP submitted a revised schedule for Questions 03.06.02-33 through 03.06.02-40 on March 17, 2011. On March 29, 2011, AREVA NP submitted Supplement 19 to provide revised schedules for Question 03.08.05-22 and Question 03.08.05-23.

The attached file, "RAI 354 Supplement 20 Response US EPR DC (1 of 3).pdf" provides a technically correct and complete response to question 03.08.05-22, as committed. Due to file size, the remaining parts will be provided in subsequent e-mails.

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 354 Question 03.08.05-22.

The following table indicates the respective pages in the response document, "RAI 354 Supplement 20 Response US EPR DC (1 of 3).pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 354 — 03.08.05-22	2	9

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

Question #	Interim Response Date	Response Date
RAI 354 - 03.08.02-11		April 28, 2011
RAI 354 - 03.08.02-13		June 14, 2011
RAI 354 - 03.08.05-23		May 10, 2011
RAI 354 - 03.06.02-33		April 29, 2011
RAI 354 - 03.06.02-34		April 29, 2011
RAI 354 - 03.06.02-35		April 29, 2011
RAI 354 - 03.06.02-36		April 29, 2011
RAI 354 - 03.06.02-37		April 29, 2011
RAI 354 - 03.06.02-38		April 29, 2011
RAI 354 - 03.06.02-39		April 29, 2011
RAI 354 - 03.06.02-40		April 29, 2011

*Sincerely,*

*Russ Wells*

*U.S. EPR Design Certification Licensing Manager*

**AREVA NP, Inc.**

*3315 Old Forest Road, P.O. Box 10935*

*Mail Stop OF-57*

*Lynchburg, VA 24506-0935*

*Phone: 434-832-3884 (work)*

*434-942-6375 (cell)*

*Fax: 434-382-3884*

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

---

**From:** WELLS Russell (RS/NB)

**Sent:** Tuesday, March 29, 2011 10:11 AM

**To:** 'Tesfaye, Getachew'

**Cc:** CORNELL Veronica (External RS/NB); BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 19

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. AREVA NP submitted Supplement 1 on June 3, 2010, to provide a schedule for the remaining 21 questions. Supplement 2 was submitted on June 24, 2010, and included a revised schedule for Questions 03.08.02-11, 12, 13, 14, 15, 16; 03.08.05-22 and 03.08.05-23. AREVA NP submitted Supplement 3 on July 7, 2010, responding to 1 of the remaining 21 questions. AREVA NP submitted Supplement 4 on July 30, 2010, to provide final responses to Questions 03.06.02-32, 03.06.02-41 and 03.08.02-16 and a revised schedule for Questions 03.06.02-33 through 03.06.02-40. On August 5, 2010, AREVA NP provided a revised schedule for Questions 03.06.02-42 and 03.08.05-23 in Supplement 5. AREVA NP submitted Supplement 6 on August 31, 2010, to provide final responses to 5 of the remaining 17 questions. On September 8, 2010, AREVA NP submitted Supplement 7 to provide a revised schedule for the response to Question 03.08.05-21. On September 13, 2010, AREVA NP provided an INTERIM response to Question 03.08.05-22 in Supplement 8. In Supplement 9, AREVA NP submitted a revised schedule for Question 03.08.05-23 on October 1, 2010. AREVA NP submitted Supplement 10 on October 7, 2010 and Supplement 11 on November 1, 2010 to provide a revised schedule for the response to Question 03.08.02-13. On November 17, 2010, AREVA NP submitted Supplement 12 to provide a revised schedule for Questions 03.06.02-33 through 03.06.02-40 and 03.08.05-23. On November 22, 2010, AREVA NP submitted Supplement 13 to provide an INTERIM response to Question 03.08.05-22 and a new schedule for supplemental responses to Questions 03.08.02-11 and 03.08.02-12. In Supplement 14, AREVA NP submitted a revised schedule for Question 03.08.05-23 on January 7, 2011. In Supplement 15, AREVA NP submitted a revised schedule for Question 03.08.05-22 on January 13, 2011. On February 11, 2011, AREVA NP submitted Supplement 16 to provide a revised schedule for Questions 03.08.02-11, 03.08.02-12, 03.08.02-13, 03.08.05-22 and 03.08.05-23. On March 3, 2011, AREVA NP submitted Supplement 17 to provide a technically correct and complete FINAL response to Question 03.08.02-12 and a revised schedule for Questions 03.08.02-11 and Question 03.08.02-13. In Supplement 18, AREVA NP submitted a revised schedule for Questions 03.06.02-33 through 03.06.02-40 on March 17, 2011.

The schedule for Question 03.08.05-22 is being revised to allow AREVA NP additional time to interact with the NRC. In addition, Question 03.08.05-23 is being revised to allow AREVA NP additional time to address NRC audit comments. The schedule for the remaining questions is unchanged.

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

<b>Question #</b>	<b>Interim Response Date</b>	<b>Response Date</b>
RAI 354 - 03.08.02-11		April 28, 2011
RAI 354 - 03.08.02-13		June 14, 2011
RAI 354 - 03.08.05-22	September 15, 2010 (Actual September 13, 2010 ) November 22, 2010 (Actual)	<b>May 10, 2011</b>
RAI 354 - 03.08.05-23		<b>May 10, 2011</b>
RAI 354 - 03.06.02-33		April 29, 2011
RAI 354 - 03.06.02-34		April 29, 2011
RAI 354 - 03.06.02-35		April 29, 2011
RAI 354 - 03.06.02-36		April 29, 2011
RAI 354 - 03.06.02-37		April 29, 2011
RAI 354 - 03.06.02-38		April 29, 2011
RAI 354 - 03.06.02-39		April 29, 2011
RAI 354 - 03.06.02-40		April 29, 2011



*Sincerely,*

*Russ Wells*

*U.S. EPR Design Certification Licensing Manager*

**AREVA NP, Inc.**

*3315 Old Forest Road, P.O. Box 10935*

*Mail Stop OF-57*

*Lynchburg, VA 24506-0935*

*Phone: 434-832-3884 (work)*

*434-942-6375 (cell)*

*Fax: 434-382-3884*

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

---

**From:** WELLS Russell (RS/NB)

**Sent:** Thursday, March 17, 2011 4:46 PM

**To:** 'Tesfaye, Getachew'

**Cc:** BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); CORNELL Veronica (External RS/NB)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 18

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. AREVA NP submitted Supplement 1 on June 3, 2010, to provide a schedule for the remaining 21 questions. Supplement 2 was submitted on June 24, 2010, and included a revised schedule for Questions 03.08.02-11, 12, 13, 14, 15, 16; 03.08.05-22 and 03.08.05-23. AREVA NP submitted Supplement 3 on July 7, 2010, responding to 1 of the remaining 21 questions. AREVA NP submitted Supplement 4 on July 30, 2010, to provide final responses to Questions 03.06.02-32, 03.06.02-41 and 03.08.02-16 and a revised schedule for Questions 03.06.02-33 through 03.06.02-40. On August 5, 2010, AREVA NP provided a revised schedule for Questions 03.06.02-42 and 03.08.05-23 in Supplement 5. AREVA NP submitted Supplement 6 on August 31, 2010, to provide final responses to 5 of the remaining 17 questions. On September 8, 2010, AREVA NP submitted Supplement 7 to provide a revised schedule for the response to Question 03.08.05-21. On September 13, 2010, AREVA NP provided an INTERIM response to Question 03.08.05-22 in Supplement 8. In Supplement 9, AREVA NP submitted a revised schedule for Question 03.08.05-23 on October 1, 2010. AREVA NP submitted Supplement 10 on October 7, 2010 and Supplement 11 on November 1, 2010 to provide a revised schedule for the response to Question 03.08.02-13. On November 17, 2010, AREVA NP submitted Supplement 12 to provide a revised schedule for Questions 03.06.02-33 through 03.06.02-40 and 03.08.05-23. On November 22, 2010, AREVA NP submitted Supplement 13 to provide an INTERIM response to Question 03.08.05-22 and a new schedule for supplemental responses to Questions 03.08.02-11 and 03.08.02-12. In Supplement 14, AREVA NP submitted a revised schedule for Question 03.08.05-23 on January 7, 2011. In Supplement 15, AREVA NP submitted a revised schedule for Question 03.08.05-22 on January 13, 2011. On February 11, 2011, AREVA NP submitted Supplement 16 to provide a revised schedule for Questions 03.08.02-11, 03.08.02-12, 03.08.02-13, 03.08.05-22 and 03.08.05-23. On March 3, 2011, AREVA NP submitted Supplement 17 to provide a technically correct and complete FINAL response to Question 03.08.02-12 and a revised schedule for Questions 03.08.02-11 and Question 03.08.02-13.

The schedule for Questions 03.06.02-33 through 03.06.02-40 has been revised In order to allow time for interaction with the NRC. The schedule for the remaining questions is unchanged.

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

Question #	Interim Response Date	Response Date
RAI 354 - 03.08.02-11		April 28, 2011

Question #	Interim Response Date	Response Date
RAI 354 - 03.08.02-13		June 14, 2011
RAI 354 - 03.08.05-22	September 15, 2010 (Actual September 13, 2010 ) November 22, 2010 (Actual)	March 31, 2011
RAI 354 - 03.08.05-23		March 31, 2011
RAI 354 - 03.06.02-33		<b>April 29, 2011</b>
RAI 354 - 03.06.02-34		<b>April 29, 2011</b>
RAI 354 - 03.06.02-35		<b>April 29, 2011</b>
RAI 354 - 03.06.02-36		<b>April 29, 2011</b>
RAI 354 - 03.06.02-37		<b>April 29, 2011</b>
RAI 354 - 03.06.02-38		<b>April 29, 2011</b>
RAI 354 - 03.06.02-39		<b>April 29, 2011</b>
RAI 354 - 03.06.02-40		<b>April 29, 2011</b>

*Sincerely,*

*Russ Wells*

*U.S. EPR Design Certification Licensing Manager*

*AREVA NP, Inc.*

*3315 Old Forest Road, P.O. Box 10935*

*Mail Stop OF-57*

*Lynchburg, VA 24506-0935*

*Phone: 434-832-3884 (work)*

*434-942-6375 (cell)*

*Fax: 434-382-3884*

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

---

**From:** WELLS Russell (RS/NB)

**Sent:** Thursday, March 03, 2011 6:10 PM

**To:** 'Tefaye, Getachew'

**Cc:** BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); CORNELL Veronica (External RS/NB)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 17

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. AREVA NP submitted Supplement 1 on June 3, 2010, to provide a schedule for the remaining 21 questions. Supplement 2 was submitted on June 24, 2010, and included a revised schedule for Questions 03.08.02-11, 12, 13, 14, 15, 16; 03.08.05-22 and 03.08.05-23. AREVA NP submitted Supplement 3 on July 7, 2010, responding to 1 of the remaining 21 questions. AREVA NP submitted Supplement 4 on July 30, 2010, to provide final responses to Questions 03.06.02-32, 03.06.02-41 and 03.08.02-16 and a revised schedule for Questions 03.06.02-33 through 03.06.02-40. On August 5, 2010, AREVA NP provided a revised schedule for Questions 03.06.02-42 and 03.08.05-23 in Supplement 5. AREVA NP submitted Supplement 6 on August 31, 2010, to provide final responses to 5 of the remaining 17 questions. On September 8, 2010, AREVA NP submitted Supplement 7 to provide a revised schedule for the response to Question 03.08.05-21. On September 13, 2010, AREVA NP provided an INTERIM response to Question 03.08.05-22 in Supplement 8. In Supplement 9, AREVA NP submitted a revised schedule for Question 03.08.05-23 on October 1, 2010. AREVA NP submitted Supplement 10 on October 7, 2010 and Supplement 11 on November 1, 2010 to provide a revised schedule for the response to Question 03.08.02-13. On November 17, 2010, AREVA NP submitted Supplement 12 to provide a revised schedule for Questions 03.06.02-33 through 03.06.02-40 and 03.08.05-23. On November 22, 2010, AREVA NP submitted Supplement

13 to provide an INTERIM response to Question 03.08.05-22 and a new schedule for supplemental responses to Questions 03.08.02-11 and 03.08.02-12. In Supplement 14, AREVA NP submitted a revised schedule for Question 03.08.05-23 on January 7, 2011. In Supplement 15, AREVA NP submitted a revised schedule for Question 03.08.05-22 on January 13, 2011. On February 11, 2011, AREVA NP submitted Supplement 16 to provide a revised schedule for Questions 03.08.02-11, 03.08.02-12, 03.08.02-13, 03.08.05-22 and 03.08.05-23.

The attached file, "RAI 354 Supplement 17 Response US EPR DC.pdf" provides a technically correct and complete FINAL response to the Question 03.08.02-12, as committed.

The following table indicates the page in the response document, "RAI 354 Supplement 17 Response US EPR DC.pdf" that contains AREVA NP's response to the subject question.

<b>Question #</b>	<b>Start Page</b>	<b>End Page</b>
RAI 354 – 03.08.02-12	2	3

The schedule for Question 03.08.02-11 and Question 03.08.02-13 is being revised to allow AREVA NP additional time to address NRC audit comments. The schedule for the remaining question is unchanged.

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

<b>Question #</b>	<b>Interim Response Date</b>	<b>Response Date</b>
RAI 354 - 03.08.02-11		<b>April 28, 2011</b>
RAI 354 - 03.08.02-13		<b>June 14, 2011</b>
RAI 354 - 03.08.05-22	September 15, 2010 (Actual September 13, 2010 ) November 22, 2010 (Actual)	March 31, 2011
RAI 354 - 03.08.05-23		March 31, 2011
RAI 354 - 03.06.02-33		March 31, 2011
RAI 354 - 03.06.02-34		March 31, 2011
RAI 354 - 03.06.02-35		March 31, 2011
RAI 354 - 03.06.02-36		March 31, 2011
RAI 354 - 03.06.02-37		March 31, 2011
RAI 354 - 03.06.02-38		March 31, 2011
RAI 354 - 03.06.02-39		March 31, 2011
RAI 354 - 03.06.02-40		March 31, 2011

*Sincerely,*

*Russ Wells*

*U.S. EPR Design Certification Licensing Manager*

*AREVA NP, Inc.*

*3315 Old Forest Road, P.O. Box 10935*

*Mail Stop OF-57*

*Lynchburg, VA 24506-0935*

*Phone: 434-832-3884 (work)*

*434-942-6375 (cell)*

*Fax: 434-382-3884*

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

**From:** BRYAN Martin (External RS/NB)

**Sent:** Friday, February 11, 2011 1:20 PM

**To:** 'Tesfaye, Getachew'

**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); CORNELL Veronica (External RS/NB)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 16

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. AREVA NP submitted Supplement 1 on June 3, 2010, to provide a schedule for the remaining 21 questions. Supplement 2 was submitted on June 24, 2010, and included a revised schedule for Questions 03.08.02-11, 12, 13, 14, 15, 16; 03.08.05-22 and 03.08.05-23. AREVA NP submitted Supplement 3 on July 7, 2010, responding to 1 of the remaining 21 questions. AREVA NP submitted Supplement 4 on July 30, 2010, to provide final responses to Questions 03.06.02-32, 03.06.02-41 and 03.08.02-16 and a revised schedule for Questions 03.06.02-33 through 03.06.02-40. On August 5, 2010, AREVA NP provided a revised schedule for Questions 03.06.02-42 and 03.08.05-23 in Supplement 5. AREVA NP submitted Supplement 6 on August 31, 2010, to provide final responses to 5 of the remaining 17 questions. On September 8, 2010, AREVA NP submitted Supplement 7 to provide a revised schedule for the response to Question 03.08.05-21. On September 13, 2010, AREVA NP provided an INTERIM response to Question 03.08.05-22 in Supplement 8. In Supplement 9, AREVA NP submitted a revised schedule for Question 03.08.05-23 on October 1, 2010. AREVA NP submitted Supplement 10 on October 7, 2010 and Supplement 11 on November 1, 2010 to provide a revised schedule for the response to Question 03.08.02-13. On November 17, 2010, AREVA NP submitted Supplement 12 to provide a revised schedule for Questions 03.06.02-33 through 03.06.02-40 and 03.08.05-23. On November 22, 2010, AREVA NP submitted Supplement 13 to provide an INTERIM response to Question 03.08.05-22 and a new schedule for supplemental responses to Questions 03.08.02-11 and 03.08.02-12. In Supplement 14, AREVA NP submitted a revised schedule for Question 03.08.05-23 on January 7, 2011. In Supplement 15, AREVA NP submitted a revised schedule for Question 03.08.05-22 on January 13, 2011.

The schedule for Questions 03.08.02-11, 03.08.02-12, 03.08.02-13, and 03.08.05-22 has changed. The schedule for Question 03.08.05-23 is being revised to allow AREVA NP additional time to address NRC comments. The schedule for the remaining questions is unchanged.

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

<b>Question #</b>	<b>Interim Response Date</b>	<b>Response Date</b>
RAI 354 - 03.08.02-11		March 4, 2011
RAI 354 - 03.08.02-12		March 4, 2011
RAI 354 - 03.08.02-13		March 4, 2011
RAI 354 - 03.08.05-22	September 15, 2010 (Actual September 13, 2010 ) November 22, 2010 (Actual)	March 31, 2011
RAI 354 - 03.08.05-23		March 31, 2011
RAI 354 - 03.06.02-33		March 31, 2011
RAI 354 - 03.06.02-34		March 31, 2011
RAI 354 - 03.06.02-35		March 31, 2011
RAI 354 - 03.06.02-36		March 31, 2011
RAI 354 - 03.06.02-37		March 31, 2011
RAI 354 - 03.06.02-38		March 31, 2011
RAI 354 - 03.06.02-39		March 31, 2011
RAI 354 - 03.06.02-40		March 31, 2011

Sincerely,

Martin (Marty) C. Bryan  
 U.S. EPR Design Certification Licensing Manager  
 AREVA NP Inc.  
 Tel: (434) 832-3016  
 702 561-3528 cell  
[Martin.Bryan.ext@areva.com](mailto:Martin.Bryan.ext@areva.com)

**From:** BRYAN Martin (External RS/NB)  
**Sent:** Thursday, January 13, 2011 5:34 PM  
**To:** 'Tesfaye, Getachew'  
**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); CORNELL Veronica (External RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 15

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. AREVA NP submitted Supplement 1 on June 3, 2010, to provide a schedule for the remaining 21 questions. Supplement 2 was submitted on June 24, 2010, and included a revised schedule for Questions 03.08.02-11, 12, 13, 14, 15, 16; 03.08.05-22 and 03.08.05-23. AREVA NP submitted Supplement 3 on July 7, 2010, responding to 1 of the remaining 21 questions. AREVA NP submitted Supplement 4 on July 30, 2010, to provide final responses to Questions 03.06.02-32, 03.06.02-41 and 03.08.02-16 and a revised schedule for Questions 03.06.02-33 through 03.06.02-40. On August 5, 2010, AREVA NP provided a revised schedule for Questions 03.06.02-42 and 03.08.05-23 in Supplement 5. AREVA NP submitted Supplement 6 on August 31, 2010, to provide final responses to 5 of the remaining 17 questions. On September 8, 2010, AREVA NP submitted Supplement 7 to provide a revised schedule for the response to Question 03.08.05-21. On September 13, 2010, AREVA NP provided an INTERIM response to Question 03.08.05-22 in Supplement 8. In Supplement 9, AREVA NP submitted a revised schedule for Question 03.08.05-23 on October 1, 2010. AREVA NP submitted Supplement 10 on October 7, 2010 and Supplement 11 on November 1, 2010 to provide a revised schedule for the response to Question 03.08.02-13. On November 17, 2010, AREVA NP submitted Supplement 12 to provide a revised schedule for Questions 03.06.02-33 through 03.06.02-40 and 03.08.05-23. On November 22, 2010, AREVA NP submitted Supplement 13 to provide an INTERIM response to Question 03.08.05-22 and a new schedule for supplemental responses to Questions 03.08.02-11 and 03.08.02-12. In Supplement 9, AREVA NP submitted a revised schedule for Question 03.08.05-23 on January 7, 2011.

The schedule for Question 03.08.05-22 is being revised to allow AREVA NP additional time for to address NRC feedback. The schedule for the remaining questions is unchanged.

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

Question #	Interim Response Date	Response Date
RAI 354 - 03.08.02-11		February 15, 2011
RAI 354 - 03.08.02-12		February 15, 2011
RAI 354 - 03.08.02-13		February 15, 2011
RAI 354 - 03.08.05-22	September 15, 2010 (Actual September 13, 2010 ) November 22, 2010	March 17, 2011
RAI 354 - 03.08.05-23		February 15, 2011
RAI 354 - 03.06.02-33		March 31, 2011
RAI 354 - 03.06.02-34		March 31, 2011
RAI 354 - 03.06.02-35		March 31, 2011
RAI 354 - 03.06.02-36		March 31, 2011

Question #	Interim Response Date	Response Date
RAI 354 - 03.06.02-37		March 31, 2011
RAI 354 - 03.06.02-38		March 31, 2011
RAI 354 - 03.06.02-39		March 31, 2011
RAI 354 - 03.06.02-40		March 31, 2011

Sincerely,

Martin (Marty) C. Bryan  
U.S. EPR Design Certification Licensing Manager  
AREVA NP Inc.  
Tel: (434) 832-3016  
702 561-3528 cell  
[Martin.Bryan.ext@areva.com](mailto:Martin.Bryan.ext@areva.com)

---

**From:** BRYAN Martin (External RS/NB)  
**Sent:** Friday, January 07, 2011 2:57 PM  
**To:** Tesfaye, Getachew  
**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); CORNELL Veronica (External RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 14

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. AREVA NP submitted Supplement 1 on June 3, 2010, to provide a schedule for the remaining 21 questions. Supplement 2 was submitted on June 24, 2010, and included a revised schedule for Questions 03.08.02-11, 12, 13, 14, 15, 16; 03.08.05-22 and 03.08.05-23. AREVA NP submitted Supplement 3 on July 7, 2010, responding to 1 of the remaining 21 questions. AREVA NP submitted Supplement 4 on July 30, 2010, to provide final responses to Questions 03.06.02-32, 03.06.02-41 and 03.08.02-16 and a revised schedule for Questions 03.06.02-33 through 03.06.02-40. On August 5, 2010, AREVA NP provided a revised schedule for Questions 03.06.02-42 and 03.08.05-23 in Supplement 5. AREVA NP submitted Supplement 6 on August 31, 2010, to provide final responses to 5 of the remaining 17 questions. On September 8, 2010, AREVA NP submitted Supplement 7 to provide a revised schedule for the response to Question 03.08.05-21. On September 13, 2010, AREVA NP provided an INTERIM response to Question 03.08.05-22 in Supplement 8. In Supplement 9, AREVA NP submitted a revised schedule for Question 03.08.05-23 on October 1, 2010. AREVA NP submitted Supplement 10 on October 7, 2010 and Supplement 11 on November 1, 2010 to provide a revised schedule for the response to Question 03.08.02-13. On November 17, 2010, AREVA NP submitted Supplement 12 to provide a revised schedule for Questions 03.06.02-33 through 03.06.02-40 and 03.08.05-23. On November 22, 2010, AREVA NP submitted Supplement 13 to provide an INTERIM response to Question 03.08.05-22 and a new schedule for supplemental responses to Questions 03.08.02-11 and 03.08.02-12.

The schedule for Question 03.08.05-23 is being revised to allow additional time for AREVA NP to interact with the NRC. The schedule for the remaining questions is unchanged. Please note that in Supplement 13 the information for Questions 03.06.02-33 through 40 was inadvertently not included in the table, but it has been now been added back.

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

Question #	Interim Response Date	Response Date
RAI 354 - 03.08.02-11		February 15, 2011
RAI 354 - 03.08.02-12		February 15, 2011
RAI 354 - 03.08.02-13		February 15, 2011
RAI 354 - 03.08.05-22	September 15, 2010 (Actual September 13, 2010 ) November 22, 2010	January 13, 2011
RAI 354 - 03.08.05-23		February 15, 2011
RAI 354 - 03.06.02-33		March 31, 2011
RAI 354 - 03.06.02-34		March 31, 2011
RAI 354 - 03.06.02-35		March 31, 2011
RAI 354 - 03.06.02-36		March 31, 2011
RAI 354 - 03.06.02-37		March 31, 2011
RAI 354 - 03.06.02-38		March 31, 2011
RAI 354 - 03.06.02-39		March 31, 2011
RAI 354 - 03.06.02-40		March 31, 2011

Sincerely,

Martin (Marty) C. Bryan  
U.S. EPR Design Certification Licensing Manager  
AREVA NP Inc.  
Tel: (434) 832-3016  
702 561-3528 cell  
[Martin.Bryan.ext@areva.com](mailto:Martin.Bryan.ext@areva.com)

---

**From:** BRYAN Martin (External RS/NB)  
**Sent:** Monday, November 22, 2010 7:40 PM  
**To:** 'Tefaye, Getachew'  
**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); CORNELL Veronica (External RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 13

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. AREVA NP submitted Supplement 1 on June 3, 2010, to provide a schedule for the remaining 21 questions. Supplement 2 was submitted on June 24, 2010, and included a revised schedule for Questions 03.08.02-11, 12, 13, 14, 15, 16; 03.08.05-22 and 03.08.05-23. AREVA NP submitted Supplement 3 on July 7, 2010, responding to 1 of the remaining 21 questions. AREVA NP submitted Supplement 4 on July 30, 2010, to provide final responses to Questions 03.06.02-32, 03.06.02-41 and 03.08.02-16 and a revised schedule for Questions 03.06.02-33 through 03.06.02-40. On August 5, 2010, AREVA NP provided a revised schedule for Questions 03.06.02-42 and 03.08.05-23 in Supplement 5. AREVA NP submitted Supplement 6 on August 31, 2010, to provide final responses to 5 of the remaining 17 questions. On September 8, 2010, AREVA NP submitted Supplement 7 to provide a revised schedule for the response to Question 03.08.05-21. On September 13, 2010, AREVA NP provided an INTERIM response to Question 03.08.05-22 in Supplement 8. In Supplement 9, AREVA NP submitted a revised schedule for Question 03.08.05-23 on October 1, 2010. AREVA NP submitted Supplement 10 on October 7, 2010 and Supplement 11 on November 1, 2010 to provide a revised schedule for the response to Question 03.08.02-

13. On November 17, 2010, AREVA NP submitted Supplement 12 to provide a revised schedule for Questions 03.06.02-33 through 03.06.02-40 and 03.08.05-23.

The attached file, "RAI 354 Supplement 13 Response US EPR DC-INTERIM.pdf" provides a technically correct and complete INTERIM response to question 03.08.05-22, as committed.

Appended to this file are the affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which supports the response to RAI 354 Supplement 13 question 03.08.05-22.

The following table indicates the respective pages in the response document, "RAI 354 Supplement 13 Response US EPR DC-INTERIM.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 354 — 03.08.05-22	2	11

A new schedule for supplemental responses to Questions 03.08.02-11 and 03.08.02-12 is added. The supplemental responses will address open items identified during the NRC October 28-29, 2010, containment appurtenances audit. The schedule for the remaining questions is unchanged.

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

Question #	Interim Response Date	Response Date
RAI 354 - 03.08.02-11		February 15, 2011
RAI 354 - 03.08.02-12		February 15, 2011
RAI 354 - 03.08.02-13		February 15, 2011
RAI 354 - 03.08.05-22	September 15, 2010 (Actual) September 13, 2010 ) November 22, 2010 (Actual)	January 13, 2011

Sincerely,

Martin (Marty) C. Bryan  
U.S. EPR Design Certification Licensing Manager  
AREVA NP Inc.  
Tel: (434) 832-3016  
702 561-3528 cell  
[Martin.Bryan.ext@areva.com](mailto:Martin.Bryan.ext@areva.com)

---

**From:** BRYAN Martin (External RS/NB)  
**Sent:** Wednesday, November 17, 2010 11:35 AM  
**To:** 'Tesfaye, Getachew'  
**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); WELLS Russell (RS/NB); 'Miernicki, Michael'  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 12

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. AREVA NP submitted Supplement 1 on June 3, 2010, to provide a schedule for the remaining 21 questions. Supplement 2 was submitted on June 24, 2010, and included a revised schedule for Questions 03.08.02-11, 12, 13, 14, 15, 16;



03.08.05-22 and 03.08.05-23. AREVA NP submitted Supplement 3 on July 7, 2010, responding to 1 of the remaining 21 questions. AREVA NP submitted Supplement 4 on July 30, 2010, to provide final responses to Questions 03.06.02-32, 03.06.02-41 and 03.08.02-16 and a revised schedule for Questions 03.06.02-33 through 03.06.02-40. On August 5, 2010, AREVA NP provided a revised schedule for Questions 03.06.02-42 and 03.08.05-23 in Supplement 5. AREVA NP submitted Supplement 6 on August 31, 2010, to provide final responses to 5 of the remaining 17 questions. On September 8, 2010, AREVA NP submitted Supplement 7 to provide a revised schedule for the response to Question 03.08.05-21. On September 13, 2010, AREVA NP provided an INTERIM response to Question 03.08.05-22 in Supplement 8. In Supplement 9, AREVA NP submitted a revised schedule for Question 03.08.05-23 on October 1, 2010. AREVA NP submitted Supplement 10 on October 7, 2010 and Supplement 11 on November 1, 2010 to provide a revised schedule for the response to Question 03.08.02-13.

A meeting with NRC regarding Questions 03.06.02-33 through 03.06.02-40 was held on November 1, 2010. As a result of that meeting the schedule for the final response to Questions 03.06.02-33 through 03.06.02-40 is being revised to allow additional time for AREVA NP to address NRC comments. Additionally, AREVA plans to prepare a technical report to be submitted with the final response to reflect the information on jet impingement that has been provided to NRC in the RAI responses and the meeting on November 1, 2010. The schedule for Question 03.08.05-23 is also being revised to allow additional time for AREVA NP to interact with the NRC. The schedule for the remaining questions is unchanged.

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

<b>Question #</b>	<b>Interim Response Date</b>	<b>Response Date</b>
RAI 354 - 03.08.02-13		February 15, 2011
RAI 354 - 03.08.05-22	September 15, 2010 (Actual September 13, 2010 ) November 22, 2010	January 13, 2011
RAI 354 - 03.08.05-23		January 7, 2011
RAI 354 - 03.06.02-33		March 31, 2011
RAI 354 - 03.06.02-34		March 31, 2011
RAI 354 - 03.06.02-35		March 31, 2011
RAI 354 - 03.06.02-36		March 31, 2011
RAI 354 - 03.06.02-37		March 31, 2011
RAI 354 - 03.06.02-38		March 31, 2011
RAI 354 - 03.06.02-39		March 31, 2011
RAI 354 - 03.06.02-40		March 31, 2011

Sincerely,

Martin (Marty) C. Bryan  
 U.S. EPR Design Certification Licensing Manager  
 AREVA NP Inc.  
 Tel: (434) 832-3016  
 702 561-3528 cell  
[Martin.Bryan.ext@areva.com](mailto:Martin.Bryan.ext@areva.com)

**From:** BRYAN Martin (External RS/NB)  
**Sent:** Monday, November 01, 2010 5:39 PM  
**To:** 'Tesfaye, Getachew'  
**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); CORNELL Veronica (External RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 11

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. AREVA NP submitted Supplement 1 on June 3, 2010, to provide a schedule for the remaining 21 questions. Supplement 2 was submitted on June 24, 2010, and included a revised schedule for Questions 03.08.02-11, 12, 13, 14, 15, 16; 03.08.05-22 and 03.08.05-23. AREVA NP submitted Supplement 3 on July 7, 2010, responding to 1 of the remaining 21 questions. AREVA NP submitted Supplement 4 on July 30, 2010, to provide final responses to Questions 03.06.02-32, 03.06.02-41 and 03.08.02-16 and a revised schedule for Questions 03.06.02-33 through 03.06.02-40. On August 5, 2010, AREVA NP provided a revised schedule for Questions 03.06.02-42 and 03.08.05-23 in Supplement 5. AREVA NP submitted Supplement 6 on August 31, 2010, to provide final responses to 5 of the remaining 17 questions. On September 8, 2010, AREVA NP submitted Supplement 7 to provide a revised schedule for the response to Question 03.08.05-21. On September 13, 2010, AREVA NP provided an INTERIM response to Question 03.08.05-22 in Supplement 8. In Supplement 9, AREVA NP submitted a revised schedule for Question 03.08.05-23 on October 1, 2010. AREVA NP submitted Supplement 10 on October 7, 2010, to provide a revised schedule for the response to Question 03.08.02-13.

The schedule for Question 03.08.02-13 is being revised to allow additional time for AREVA NP to address NRC comments. The schedule for the remaining questions is unchanged.

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

Question #	Interim Response Date	Response Date
RAI 354 - 03.08.02-13		February 15, 2011
RAI 354 - 03.08.05-22	September 15, 2010 (Actual September 13, 2010 ) November 22, 2010	January 13, 2011
RAI 354 - 03.08.05-23		November 18, 2010
RAI 354 - 03.06.02-33		November 18, 2010
RAI 354 - 03.06.02-34		November 18, 2010
RAI 354 - 03.06.02-35		November 18, 2010
RAI 354 - 03.06.02-36		November 18, 2010
RAI 354 - 03.06.02-37		November 18, 2010
RAI 354 - 03.06.02-38		November 18, 2010
RAI 354 - 03.06.02-39		November 18, 2010
RAI 354 - 03.06.02-40		November 18, 2010

Sincerely,

Martin (Marty) C. Bryan  
 U.S. EPR Design Certification Licensing Manager  
 AREVA NP Inc.  
 Tel: (434) 832-3016  
 702 561-3528 cell  
[Martin.Bryan.ext@areva.com](mailto:Martin.Bryan.ext@areva.com)

**From:** BRYAN Martin (External RS/NB)  
**Sent:** Thursday, October 07, 2010 2:41 PM  
**To:** 'Tefsaye, Getachew'  
**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); CORNELL Veronica (External RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 10

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. AREVA NP submitted Supplement 1 on June 3, 2010, to provide a schedule for the remaining 21 questions. Supplement 2 was submitted on June 24, 2010, and included a revised schedule for Questions 03.08.02-11, 12, 13, 14, 15, 16; 03.08.05-22 and 03.08.05-23. AREVA NP submitted Supplement 3 on July 7, 2010, responding to 1 of the remaining 21 questions. AREVA NP submitted Supplement 4 on July 30, 2010, to provide final responses to Questions 03.06.02-32, 03.06.02-41 and 03.08.02-16 and a revised schedule for Questions 03.06.02-33 through 03.06.02-40. On August 5, 2010, AREVA NP provided a revised schedule for Questions 03.06.02-42 and 03.08.05-23 in Supplement 5. AREVA NP submitted Supplement 6 on August 31, 2010, to provide final responses to 5 of the remaining 17 questions. On September 8, 2010, AREVA NP submitted Supplement 7 to provide a revised schedule for the response to Question 03.08.05-21. On September 13, 2010, AREVA NP provided an INTERIM response to Question 03.08.05-22 in Supplement 8. In Supplement 9, AREVA NP submitted a revised schedule for Question 03.08.05-23 on October 1, 2010.

The attached file, "RAI 354 Supplement 10 Response US EPR DC.pdf" provides a technically correct and complete FINAL response to Question 03.08.05-21, as committed. The following table indicates the respective pages in the response document, "RAI 354 Supplement 10 Response US EPR DC.pdf," that contains AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 354 - 03.08.05-21	2	3

The schedule for a revised INTERIM response to Question 03.08.05-22 is added to provide the NRC additional information on AREVA NP's settlement approach. The schedule for the remaining questions is unchanged.

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

Question #	Interim Response Date	Response Date
RAI 354 - 03.08.02-13		November 1, 2010
RAI 354 - 03.08.05-22	September 15, 2010 (Actual September 13, 2010 ) <b>November 22, 2010</b>	January 13, 2011
RAI 354 - 03.08.05-23		November 18, 2010
RAI 354 - 03.06.02-33		November 18, 2010
RAI 354 - 03.06.02-34		November 18, 2010
RAI 354 - 03.06.02-35		November 18, 2010
RAI 354 - 03.06.02-36		November 18, 2010
RAI 354 - 03.06.02-37		November 18, 2010
RAI 354 - 03.06.02-38		November 18, 2010
RAI 354 - 03.06.02-39		November 18, 2010
RAI 354 - 03.06.02-40		November 18, 2010

Sincerely,

Martin (Marty) C. Bryan  
U.S. EPR Design Certification Licensing Manager  
AREVA NP Inc.  
Tel: (434) 832-3016  
702 561-3528 cell  
[Martin.Bryan.ext@areva.com](mailto:Martin.Bryan.ext@areva.com)

---

**From:** BRYAN Martin (External RS/NB)  
**Sent:** Friday, October 01, 2010 2:31 PM  
**To:** 'Tesfaye, Getachew'  
**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); CORNELL Veronica (External RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 9

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. AREVA NP submitted Supplement 1 on June 3, 2010, to provide a schedule for the remaining 21 questions. Supplement 2 was submitted on June 24, 2010, and included a revised schedule for Questions 03.08.02-11, 12, 13, 14, 15, 16; 03.08.05-22 and 03.08.05-23. AREVA NP submitted Supplement 3 on July 7, 2010, responding to 1 of the remaining 21 questions. AREVA NP submitted Supplement 4 on July 30, 2010, to provide final responses to Questions 03.06.02-32, 03.06.02-41 and 03.08.02-16 and a revised schedule for Questions 03.06.02-33 through 03.06.02-40. On August 5, 2010, AREVA NP provided a revised schedule for Questions 03.06.02-42 and 03.08.05-23 in Supplement 5. AREVA NP submitted Supplement 6 on August 31, 2010, to provide final responses to 5 of the remaining 17 questions. On September 8, 2010, AREVA NP submitted Supplement 7 to provide a revised schedule for the response to Question 03.08.05-21. On September 13, 2010, AREVA NP provided an INTERIM response to Question 03.08.05-22 in Supplement 8.

The schedule for Question 03.08.05-23 is being revised to allow additional time for AREVA NP to interact with the NRC. The schedule for the remaining questions is unchanged.

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

Question #	Interim Response Date	Response Date
RAI 354 - 03.08.02-13		November 1, 2010
RAI 354 - 03.08.05-21		October 7, 2010
RAI 354 - 03.08.05-22	September 15, 2010 (Actual September 13, 2010 )	January 13, 2011
RAI 354 - 03.08.05-23		November 18, 2010
RAI 354 - 03.06.02-33		November 18, 2010
RAI 354 - 03.06.02-34		November 18, 2010
RAI 354 - 03.06.02-35		November 18, 2010
RAI 354 - 03.06.02-36		November 18, 2010
RAI 354 - 03.06.02-37		November 18, 2010
RAI 354 - 03.06.02-38		November 18, 2010
RAI 354 - 03.06.02-39		November 18, 2010
RAI 354 - 03.06.02-40		November 18, 2010

Sincerely,

Martin (Marty) C. Bryan  
U.S. EPR Design Certification Licensing Manager  
AREVA NP Inc.

**From:** BRYAN Martin (External RS/NB)  
**Sent:** Monday, September 13, 2010 5:09 PM  
**To:** 'Tsfaye, Getachew'  
**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); CORNELL Veronica (External RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 8

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. AREVA NP submitted Supplement 1 on June 3, 2010, to provide a schedule for the remaining 21 questions. Supplement 2 was submitted on June 24, 2010, and included a revised schedule for Questions 03.08.02-11, 12, 13, 14, 15, 16; 03.08.05-22 and 03.08.05-23. AREVA NP submitted Supplement 3 on July 7, 2010, responding to 1 of the remaining 21 questions. AREVA NP submitted Supplement 4 on July 30, 2010, to provide final responses to Questions 03.06.02-32, 03.06.02-41 and 03.08.02-16 and a revised schedule for Questions 03.06.02-33 through 03.06.02-40. On August 5, 2010, AREVA NP provided a revised schedule for Questions 03.06.02-42 and 03.08.05-23 in Supplement 5. AREVA NP submitted Supplement 6 on August 31, 2010, to provide final responses to 5 of the remaining 17 questions. On September 8, 2010, AREVA NP submitted Supplement 7 to provide a revised schedule for the response to Question 03.08.05-21.

AREVA NP recently notified the NRC of its intent to submit an INTERIM response to Question 03.08.05-22. The attached file, "RAI 354 Supplement 8 Response US EPR DC-INTERIM.pdf" provides a technically correct and complete INTERIM response to Question 03.08.05-22, as committed. The schedule for the remaining questions is unchanged.

The following table indicates the respective pages in the response document, RAI 354 Supplement 8 Response US EPR DC - INTERIM.pdf," that contains AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 354 - 03.08.05-22	2	3

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

Question #	Interim Response Date	Response Date
RAI 354 - 03.08.02-13		November 1, 2010
RAI 354 - 03.08.05-21		October 7, 2010
RAI 354 - 03.08.05-22	September 15, 2010 (Actual September 13, 2010 )	January 13, 2011
RAI 354 - 03.08.05-23		October 1, 2010
RAI 354 - 03.06.02-33		November 18, 2010
RAI 354 - 03.06.02-34		November 18, 2010
RAI 354 - 03.06.02-35		November 18, 2010
RAI 354 - 03.06.02-36		November 18, 2010
RAI 354 - 03.06.02-37		November 18, 2010
RAI 354 - 03.06.02-38		November 18, 2010
RAI 354 - 03.06.02-39		November 18, 2010
RAI 354 - 03.06.02-40		November 18, 2010

Sincerely,

Martin (Marty) C. Bryan  
U.S. EPR Design Certification Licensing Manager  
AREVA NP Inc.  
Tel: (434) 832-3016  
702 561-3528 cell  
[Martin.Bryan.ext@areva.com](mailto:Martin.Bryan.ext@areva.com)

---

**From:** BRYAN Martin (External RS/NB)  
**Sent:** Wednesday, September 08, 2010 6:09 PM  
**To:** Tesfaye, Getachew  
**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); 'Miernicki, Michael'; CORNELL Veronica (External RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 7

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. AREVA NP submitted Supplement 1 on June 3, 2010, to provide a schedule for the remaining 21 questions. Supplement 2 was submitted on June 24, 2010, and included a revised schedule for Questions 03.08.02-11, 12, 13, 14, 15, 16; 03.08.05-22 and 03.08.05-23. AREVA NP submitted Supplement 3 on July 7, 2010, responding to 1 of the remaining 21 questions. AREVA NP submitted Supplement 4 on July 30, 2010, to provide final responses to Questions 03.06.02-32, 03.06.02-41 and 03.08.02-16 and a revised schedule for Questions 03.06.02-33 through 03.06.02-40. On August 5, 2010 AREVA NP provided a revised schedule for Questions 03.06.02-42 and 03.08.05-23 in Supplement 5. On August 31, 2010, AREVA NP submitted final responses to 5 of the remaining 17 questions.

The schedule for Question 03.08.05-21 is being revised to allow additional time for AREVA NP to interact with the NRC on the draft response. The schedule for the remaining questions is unchanged.

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

<b>Question #</b>	<b>Response Date</b>
RAI 354 - 03.08.02-13	November 1, 2010
RAI 354 - 03.08.05-21	<b>October 7, 2010</b>
RAI 354 - 03.08.05-22	January 13, 2011
RAI 354 - 03.08.05-23	October 1, 2010
RAI 354 - 03.06.02-33	November 18, 2010
RAI 354 - 03.06.02-34	November 18, 2010
RAI 354 - 03.06.02-35	November 18, 2010
RAI 354 - 03.06.02-36	November 18, 2010
RAI 354 - 03.06.02-37	November 18, 2010
RAI 354 - 03.06.02-38	November 18, 2010
RAI 354 - 03.06.02-39	November 18, 2010
RAI 354 - 03.06.02-40	November 18, 2010

Sincerely,

Martin (Marty) C. Bryan

U.S. EPR Design Certification Licensing Manager  
AREVA NP Inc.  
Tel: (434) 832-3016  
702 561-3528 cell  
[Martin.Bryan.ext@areva.com](mailto:Martin.Bryan.ext@areva.com)

---

**From:** BRYAN Martin (External RS/NB)  
**Sent:** Tuesday, August 31, 2010 4:28 PM  
**To:** 'Tesfaye, Getachew'  
**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); CORNELL Veronica (External RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 6

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. AREVA NP submitted Supplement 1 on June 3, 2010, to provide a schedule for the remaining 21 questions. Supplement 2 was submitted on June 24, 2010, and included a revised schedule for Questions 03.08.02-11, 12, 13, 14, 15, 16; 03.08.05-22 and 03.08.05-23. AREVA NP submitted Supplement 3 on July 7, 2010, responding to 1 of the remaining 21 questions. AREVA NP submitted Supplement 4 on July 30, 2010, to provide final responses to Questions 03.06.02-32, 03.06.02-41 and 03.08.02-16 and a revised schedule for Questions 03.06.02-33 through 03.06.02-40. On August 5, 2010 AREVA NP provided a revised schedule for Questions 03.06.02-42 and 03.08.05-23 in Supplement 5.

The attached file, "RAI 354 Supplement 6 Response US EPR DC.pdf" provides technically correct and complete FINAL responses to Questions 03.06.02-42 and 03.08.02-11 to 03.08.02-15, as committed. 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 email and attached file do not contain any security-related information. An unredacted security-related version is provided under separate email.

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 354 Supplement 6.

The schedule for Question 03.08.02-13 is being revised to allow additional time for AREVA NP to address NRC comments. The schedule for the remaining questions is unchanged.

The following table indicates the respective pages in the response document, RAI 354 Supplement 6 Response US EPR DC.pdf," that contains AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 354 - 03.08.02-11	2	4
RAI 354 - 03.08.02-12	5	6
RAI 354 - 03.08.02-14	7	8
RAI 354 - 03.08.02-15	9	10
RAI 354 - 03.06.02-42	11	12

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

Question #	Response Date
RAI 354 - 03.08.02-13	November 1, 2010
RAI 354 - 03.08.05-21	September 8, 2010
RAI 354 - 03.08.05-22	January 13, 2011
RAI 354 - 03.08.05-23	October 1, 2010

Question #	Response Date
RAI 354 - 03.06.02-33	November 18, 2010
RAI 354 - 03.06.02-34	November 18, 2010
RAI 354 - 03.06.02-35	November 18, 2010
RAI 354 - 03.06.02-36	November 18, 2010
RAI 354 - 03.06.02-37	November 18, 2010
RAI 354 - 03.06.02-38	November 18, 2010
RAI 354 - 03.06.02-39	November 18, 2010
RAI 354 - 03.06.02-40	November 18, 2010

Sincerely,

Martin (Marty) C. Bryan  
U.S. EPR Design Certification Licensing Manager  
AREVA NP Inc.  
Tel: (434) 832-3016  
702 561-3528 cell  
[Martin.Bryan.ext@areva.com](mailto:Martin.Bryan.ext@areva.com)

---

**From:** BRYAN Martin (EXT)  
**Sent:** Thursday, August 05, 2010 6:23 PM  
**To:** 'Tefaye, Getachew'  
**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); CORNELL Veronica (EXT); WELLS Russell (RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 5

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. AREVA NP submitted Supplement 1 on June 3, 2010, to provide a schedule for the remaining 21 questions. Supplement 2 was submitted on June 24, 2010, and included a revised schedule for Questions 03.08.02-11, 12, 13, 14, 15, 16; 03.08.05-22 and 03.08.05-23. AREVA NP submitted Supplement 3 on July 7, 2010, responding to 1 of the remaining 21 questions. AREVA NP submitted Supplement 4 on July 30, 2010, to provide final responses to Questions 03.06.02-32, 03.06.02-41 and 03.08.02-16 and a revised schedule for Questions 03.06.02-33 through 03.06.02-40.

The schedule for Questions 03.06.02-42 and 03.08.05-23 is being revised to allow additional time for AREVA NP to address NRC comments. The schedule for the remaining 15 questions is unchanged.

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

Question #	Response Date
RAI 354 - 03.08.02-11	August 31, 2010
RAI 354 - 03.08.02-12	August 31, 2010
RAI 354 - 03.08.02-13	August 31, 2010
RAI 354 - 03.08.02-14	August 31, 2010
RAI 354 - 03.08.02-15	August 31, 2010
RAI 354 - 03.08.05-21	September 8, 2010
RAI 354 - 03.08.05-22	January 13, 2011
RAI 354 - 03.08.05-23	<b>October 1, 2010</b>
RAI 354 - 03.06.02-33	November 18, 2010
RAI 354 - 03.06.02-34	November 18, 2010



Question #	Response Date
RAI 354 - 03.06.02-35	November 18, 2010
RAI 354 - 03.06.02-36	November 18, 2010
RAI 354 - 03.06.02-37	November 18, 2010
RAI 354 - 03.06.02-38	November 18, 2010
RAI 354 - 03.06.02-39	November 18, 2010
RAI 354 - 03.06.02-40	November 18, 2010
RAI 354 - 03.06.02-42	<b>August 31, 2010</b>

Sincerely,

Martin (Marty) C. Bryan  
U.S. EPR Design Certification Licensing Manager  
AREVA NP Inc.  
Tel: (434) 832-3016  
702 561-3528 cell  
[Martin.Bryan.ext@areva.com](mailto:Martin.Bryan.ext@areva.com)

---

**From:** BRYAN Martin (EXT)  
**Sent:** Thursday, July 29, 2010 7:40 PM  
**To:** 'Tesyfaye, Getachew'  
**Cc:** DELANO Karen V (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); ROMINE Judy (AREVA NP INC); CORNELL Veronica (EXT)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 4

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. AREVA NP submitted Supplement 1 on June 3, 2010, to provide a schedule for the remaining 21 questions. Supplement 2 was submitted on June 24, 2010, and included a revised schedule for Questions 03.08.02-11, 12, 13, 14, 15, 16; 03.08.05-22 and 03.08.05-23. AREVA NP submitted Supplement 3 on July 7, 2010, responding to 1 of the remaining 21 questions.

The attached file, "RAI 354 Supplement 4 Response U.S. EPR DC.pdf" provides technically correct and complete responses to Questions 03.06.02-32, 03.06.02-41, and 03.08.02-16. 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 email and attached file do not contain any security-related information. An unredacted security-related version is provided under separate email.

The schedules for Questions 03.06.02-33 through 03.06.02-40 are being revised to allow additional time for AREVA NP to address NRC comments. The schedule for the remaining 9 questions is unchanged.

The following table indicates the respective pages in the response document, "RAI 354 Supplement 4 Response U.S. EPR DC," that contain the AREVA NP response to the subject questions.

Question #	Start Page	End Page
RAI 354 - 03.06.02-32	2	3
RAI 354 - 03.06.02-41	4	6
RAI 354 - 03.08.02-16	7	7

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

Question #	Response Date
RAI 354 - 03.08.02-11	August 31, 2010
RAI 354 - 03.08.02-12	August 31, 2010
RAI 354 - 03.08.02-13	August 31, 2010
RAI 354 - 03.08.02-14	August 31, 2010
RAI 354 - 03.08.02-15	August 31, 2010
RAI 354 - 03.08.05-21	September 8, 2010
RAI 354 - 03.08.05-22	January 13, 2011
RAI 354 - 03.08.05-23	August 10, 2010
RAI 354 - 03.06.02-33	November 18, 2010
RAI 354 - 03.06.02-34	November 18, 2010
RAI 354 - 03.06.02-35	November 18, 2010
RAI 354 - 03.06.02-36	November 18, 2010
RAI 354 - 03.06.02-37	November 18, 2010
RAI 354 - 03.06.02-38	November 18, 2010
RAI 354 - 03.06.02-39	November 18, 2010
RAI 354 - 03.06.02-40	November 18, 2010
RAI 354 - 03.06.02-42	August 5, 2010

Sincerely,

Martin (Marty) C. Bryan  
U.S. EPR Design Certification Licensing Manager  
AREVA NP Inc.  
Tel: (434) 832-3016  
702 561-3528 cell  
[Martin.Bryan.ext@areva.com](mailto:Martin.Bryan.ext@areva.com)

---

**From:** BRYAN Martin (EXT)  
**Sent:** Wednesday, July 07, 2010 5:27 PM  
**To:** 'Tefaye, Getachew'  
**Cc:** DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); CORNELL Veronica (EXT); VAN NOY Mark (EXT)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 3

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. AREVA NP submitted Supplement 1 on June 3, 2010, to provide a schedule for the remaining 21 questions.

On June 9, 2010, AREVA NP submitted draft Supplement 2 responses to questions 03.08.05-20, 03.08.05-21, 03.06.02-32, 03.06.02-41 and 03.06.02-42. Supplement 2 was submitted on June 24, 2010, and included a revised schedule to reflect the civil/structural re-planning activities and time allowance to interact with the NRC on the responses for 03.08.02-11, 12, 13, 14, 15, 16; 03.08.05-22 and 03.08.05-23.

The attached file, "RAI 354 Response U.S. EPR DC.pdf" provides a technically correct and complete response to Question 03.08.05-20.

The schedule for Question 03.08.05-21 is being revised to accommodate development of a revised response and to allow time to interact with the NRC on the response. The schedule for Questions 03.06.02-32, 03.06.02-41 and 03.06.02-42 is also being revised to provide additional time to interact with the NRC on the responses. The schedule for the remaining 16 questions is unchanged.

The following table indicates the respective pages in the response document, "RAI 354 Response U.S. EPR DC," that contain the AREVA NP response to the subject questions.

Question #	Start Page	End Page
RAI 354 — 03.08.05-20	2	3

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

Question #	Response Date
RAI 354 - 03.08.02-11	August 31, 2010
RAI 354 - 03.08.02-12	August 31, 2010
RAI 354 - 03.08.02-13	August 31, 2010
RAI 354 - 03.08.02-14	August 31, 2010
RAI 354 - 03.08.02-15	August 31, 2010
RAI 354 - 03.08.02-16	August 10, 2010
RAI 354 - 03.08.05-21	September 8, 2010
RAI 354 - 03.08.05-22	January 13, 2011
RAI 354 - 03.08.05-23	August 10, 2010
RAI 354 - 03.06.02-32	August 5, 2010
RAI 354 - 03.06.02-33	July 30, 2010
RAI 354 - 03.06.02-34	July 30, 2010
RAI 354 - 03.06.02-35	July 30, 2010
RAI 354 - 03.06.02-36	July 30, 2010
RAI 354 - 03.06.02-37	July 30, 2010
RAI 354 - 03.06.02-38	July 30, 2010
RAI 354 - 03.06.02-39	July 30, 2010
RAI 354 - 03.06.02-40	July 30, 2010
RAI 354 - 03.06.02-41	August 5, 2010
RAI 354 - 03.06.02-42	August 5, 2010

Sincerely,

Martin (Marty) C. Bryan  
 U.S. EPR Design Certification Licensing Manager  
 AREVA NP Inc.  
 Tel: (434) 832-3016  
 702 561-3528 cell  
[Martin.Bryan.ext@areva.com](mailto:Martin.Bryan.ext@areva.com)

---

**From:** BRYAN Martin (EXT)  
**Sent:** Thursday, June 24, 2010 12:29 PM  
**To:** 'Tesfaye, Getachew'  
**Cc:** ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); CORNELL Veronica (EXT); VAN NOY Mark

(EXT); RYAN Tom (AREVA NP INC); GARDNER George Darrell (AREVA NP INC); DELANO Karen V (AREVA NP INC)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 2

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. AREVA NP submitted Supplement 1 to the response on June 3, 2010, to provide a schedule for the remaining 21 questions, one of which was affected by the work underway to address NRC comments from the April 26, 2010, audit.

Based upon the civil/structural re-planning activities and revised RAI response schedule presented to the NRC during the June 9, 2010, Public Meeting, and to allow time to interact with the NRC on the responses, the schedule for questions 03.08.02-11, 12, 13, 14, 15, 16, 03.08.05-22 and 03.08.05-23 has been changed. The schedule for the remaining 13 questions remains unchanged.

The revised schedule for the technically correct and complete response to these questions is provided below.

Question #	Response Date
RAI 354 - 03.08.02-11	August 31
RAI 354 - 03.08.02-12	August 31
RAI 354 - 03.08.02-13	August 31
RAI 354 - 03.08.02-14	August 31
RAI 354 - 03.08.02-15	August 31
RAI 354 - 03.08.02-16	August 10, 2010
RAI 354 - 03.08.05-20	July 7, 2010
RAI 354 - 03.08.05-21	July 7, 2010
RAI 354 - 03.08.05-22	January 13, 2011
RAI 354 - 03.08.05-23	August 10, 2010
RAI 354 - 03.06.02-32	July 7, 2010
RAI 354 - 03.06.02-33	July 30, 2010
RAI 354 - 03.06.02-34	July 30, 2010
RAI 354 - 03.06.02-35	July 30, 2010
RAI 354 - 03.06.02-36	July 30, 2010
RAI 354 - 03.06.02-37	July 30, 2010
RAI 354 - 03.06.02-38	July 30, 2010
RAI 354 - 03.06.02-39	July 30, 2010
RAI 354 - 03.06.02-40	July 30, 2010
RAI 354 - 03.06.02-41	July 7, 2010
RAI 354 - 03.06.02-42	July 7, 2010

Sincerely,

Martin (Marty) C. Bryan  
U.S. EPR Design Certification Licensing Manager  
AREVA NP Inc.  
Tel: (434) 832-3016  
702 561-3528 cell  
[Martin.Bryan.ext@areva.com](mailto:Martin.Bryan.ext@areva.com)

---

**From:** BRYAN Martin (EXT)  
**Sent:** Thursday, June 03, 2010 6:39 PM  
**To:** 'Tesfaye, Getachew'  
**Cc:** DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); VAN NOY Mark (EXT); CORNELL Veronica (EXT)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 1

Getachew,

AREVA NP Inc. (AREVA NP) provided a response to 1 of the 22 questions of RAI No. 354 on April 15, 2010, and a schedule for the remaining 21 questions. The schedule for questions 03.08.02-11 through 15 is not being changed by this supplement. To allow time to interact with the NRC, the schedule for 16 questions is being changed. The date provided below for question 03.08.05-22 will be revised based on the information that will be presented at the June 9, 2010 public meeting and subsequent NRC feedback.

Question #	Response Date
RAI 354 - 03.08.02-11	July 30, 2010
RAI 354 - 03.08.02-12	July 30, 2010
RAI 354 - 03.08.02-13	July 30, 2010
RAI 354 - 03.08.02-14	July 30, 2010
RAI 354 - 03.08.02-15	July 30, 2010
RAI 354 - 03.08.02-16	July 30, 2010
RAI 354 - 03.08.05-20	July 7, 2010
RAI 354 - 03.08.05-21	July 7, 2010
RAI 354 - 03.08.05-22	July 30, 2010
RAI 354 - 03.08.05-23	July 30, 2010
RAI 354 - 03.06.02-32	July 7, 2010
RAI 354 - 03.06.02-33	July 30, 2010
RAI 354 - 03.06.02-34	July 30, 2010
RAI 354 - 03.06.02-35	July 30, 2010
RAI 354 - 03.06.02-36	July 30, 2010
RAI 354 - 03.06.02-37	July 30, 2010
RAI 354 - 03.06.02-38	July 30, 2010
RAI 354 - 03.06.02-39	July 30, 2010
RAI 354 - 03.06.02-40	July 30, 2010
RAI 354 - 03.06.02-41	July 7, 2010
RAI 354 - 03.06.02-42	July 7, 2010

Sincerely,

Martin (Marty) C. Bryan  
U.S. EPR Design Certification Licensing Manager  
AREVA NP Inc.  
Tel: (434) 832-3016  
702 561-3528 cell  
[Martin.Bryan.ext@areva.com](mailto:Martin.Bryan.ext@areva.com)

**From:** BRYAN Martin (EXT)

**Sent:** Thursday, April 15, 2010 5:46 PM

**To:** 'Tesfaye, Getachew'

**Cc:** DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); VAN NOY Mark (EXT)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 354 Response US EPR DC.pdf" provides technically correct and complete responses to 1 of the 22 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 354 Question 03.08.05-19.

The following table indicates the respective pages in the response document, "RAI 354 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 354 - 03.08.02-11	2	2
RAI 354 - 03.08.02-12	3	3
RAI 354 - 03.08.02-13	4	4
RAI 354 - 03.08.02-14	5	5
RAI 354 - 03.08.02-15	6	6
RAI 354 - 03.08.02-16	7	7
RAI 354 - 03.08.05-19	8	8
RAI 354 - 03.08.05-20	9	9
RAI 354 - 03.08.05-21	10	10
RAI 354 - 03.08.05-22	11	11
RAI 354 - 03.08.05-23	12	12
RAI 354 - 03.06.02-32	13	13
RAI 354 - 03.06.02-33	14	14
RAI 354 - 03.06.02-34	15	15
RAI 354 - 03.06.02-35	16	16
RAI 354 - 03.06.02-36	17	17
RAI 354 - 03.06.02-37	18	18
RAI 354 - 03.06.02-38	19	19
RAI 354 - 03.06.02-39	20	20
RAI 354 - 03.06.02-40	21	21
RAI 354 - 03.06.02-41	22	22
RAI 354 - 03.06.02-42	23	24

A complete answer is not provided for 21 of the 22 questions. The schedule for a technically correct and complete response to these questions is provided below.

<b>Question #</b>	<b>Response Date</b>
RAI 354 - 03.08.02-11	July 30, 2010
RAI 354 - 03.08.02-12	July 30, 2010
RAI 354 - 03.08.02-13	July 30, 2010
RAI 354 - 03.08.02-14	July 30, 2010
RAI 354 - 03.08.02-15	July 30, 2010

RAI 354 - 03.08.02-16	June 3, 2010
RAI 354 - 03.08.05-20	June 3, 2010
RAI 354 - 03.08.05-21	June 3, 2010
RAI 354 - 03.08.05-22	June 3, 2010
RAI 354 - 03.08.05-23	June 3, 2010
RAI 354 - 03.06.02-32	June 3, 2010
RAI 354 - 03.06.02-33	June 3, 2010
RAI 354 - 03.06.02-34	June 3, 2010
RAI 354 - 03.06.02-35	June 3, 2010
RAI 354 - 03.06.02-36	June 3, 2010
RAI 354 - 03.06.02-37	June 3, 2010
RAI 354 - 03.06.02-38	June 3, 2010
RAI 354 - 03.06.02-39	June 3, 2010
RAI 354 - 03.06.02-40	June 3, 2010
RAI 354 - 03.06.02-41	June 3, 2010
RAI 354 - 03.06.02-42	June 3, 2010

Sincerely,

Martin (Marty) C. Bryan  
Licensing Advisory Engineer  
AREVA NP Inc.  
Tel: (434) 832-3016  
[Martin.Bryan.ext@areva.com](mailto:Martin.Bryan.ext@areva.com)

---

**From:** Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]  
**Sent:** Tuesday, March 16, 2010 12:29 PM  
**To:** ZZ-DL-A-USEPR-DL  
**Cc:** Xu, Jim; Hawkins, Kimberly; Ng, Ching; Dixon-Herrity, Jennifer; Miernicki, Michael; Patel, Jay; Colaccino, Joseph; ArevaEPRDCPEm Resource  
**Subject:** U.S. EPR Design Certification Application RAI No. 354 (4106,4107,4220), FSAR Ch. 3

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on January 8, 2010, and discussed with your staff on February 25, 2010. Drat RAI Questions 03.08.05-23 was 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. 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:** 2925

**Mail Envelope Properties** (1F1CC1BBDC66B842A46CAC03D6B1CD410452FF3C)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 354, FSAR Ch. 3, Supplement 23  
**Sent Date:** 5/4/2011 12:48:24 PM  
**Received Date:** 5/4/2011 12:48:43 PM  
**From:** WELLS Russell (AREVA)

**Created By:** Russell.Wells@areva.com

**Recipients:**

"CORNELL Veronica (EXTERNAL AREVA)" <Veronica.Cornell.ext@areva.com>

Tracking Status: None

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

Tracking Status: None

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

Tracking Status: None

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

Tracking Status: None

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

Tracking Status: None

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

Tracking Status: None

**Post Office:** AUSLYNCMX02.adom.ad.corp

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	87173	5/4/2011 12:48:43 PM
RAI 354 Supplement 23 Response US EPR DC.pdf		146847

**Options**

**Priority:** Standard

**Return Notification:** No

**Reply Requested:** No

**Sensitivity:** Normal

**Expiration Date:**

**Recipients Received:**



**Response to**

**Request for Additional Information No. 354,  
Supplement 23**

**3/16/2010**

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

**AREVA NP Inc.**

**Docket No. 52-020**

**SRP Section: 03.08.02 - Steel Containment**

**SRP Section: 03.08.05 - Foundations**

**SRP Section: 03.06.02 - Determination of Rupture Locations and Dynamic Effects  
Associated with the Postulated Rupture of Piping**

**Application Section: FSAR Ch 3**

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

**Question 03.08.05-23****(Follow-up to RAI 155, Supplement 4, Question 03.08.05-16)**

The RAI response identified the sections in the FSAR that describe the soil properties used in many of the various seismic analyses and designs of Seismic Category I structures. From the review of this information, it is not clear whether all of the key soil parameters have been included in these FSAR sections. In addition, the staff notes that the information contained in FSAR Tier 1, Table 5.0-1 "Site Parameters" and FSAR Tier 2, Table 2.1-1 "Site Design Envelope," is not complete. Some of the soil parameters that are not included are the soil friction angle, the 3.0" global differential settlement criteria referred to in the response to RAI 3.8.5-15, and other key parameters that were relied upon in the design of the foundation walls and evaluations for foundation stability associated with FSAR Section 3.8. Therefore, to meet 10 CFR 52.47 (a) (1), AREVA is requested to ensure that FSAR Tier 1, Table 5.0-1 "Site Parameters" and FSAR Tier 2, Table 2.1-1, include the key soil parameters (e.g., soil angle of internal friction, global settlement criteria, properties used for soil backfill, and soil bearing capacity criteria with a factor of safety appropriate for the design load combinations for all seismic Category I structures) which were postulated in the analyses and design of the Seismic Category I structures and foundations.

**Response to Question 03.08.05-23**

U.S. EPR FSAR Tier 2, Table 2.1-1, Section 2.5.4.2, Section 2.5.4.3, and Table 3.8.1-17 will be revised to include the minimum and maximum soil angle of internal friction and the soil density values used in the analysis and design of Seismic Category I structures and foundations. The maximum soil angle of internal friction is included so that the lateral passive wall pressure will not exceed the design capacity of the below grade walls. Values higher than the maximum soil angle of internal friction may be evaluated on a site-specific basis to demonstrate the design of Seismic Category I below grade walls. U.S. EPR FSAR Tier 1, Table 5.0-1 will be revised to include the minimum soil angle of internal friction.

Table 03.08.05-23-1 shows the variation of soil density with depth for the dynamic analyses. The soil density variation with depth is currently reflected in U.S. EPR FSAR Tier 2, Tables 3.7.1-6, 3.7.1-8, 3.7.1-9, and 3.7.2-9. U.S. EPR FSAR Tier 2, Tables 3.7.1-6, 3.7.1-8, and 3.7.1-9 show the shear wave velocity and depth of soil layers used in the soil structure interaction (SSI) analysis of the Nuclear Island (NI), Emergency Power Generating Building (EPGB), and Essential Service Water Building (ESWB), respectively. U.S. EPR FSAR Tier 2, Table 3.7.2-9 provides the soil properties associated with different shear wave velocities, including the soil density. U.S. EPR FSAR Tier 2, Table 2.1-1 will be revised to specify the soil density values used in the dynamic analyses.

The static and dynamic soil bearing pressure values will be provided in the Response to RAI 376, Question 03.08.05-28 (NI) and RAI 376, Question 03.08.05-31 (EPGB and ESWB).

The global settlement between adjacent structures is a function of the design of the umbilicals between structures. The design of umbilicals is not in the scope of the design certification, and global settlement is not included in the U.S. EPR FSAR as a key soil parameter.

**FSAR Impact:**

U.S. EPR FSAR Tier 1, Table 5.0-1 and Tier 2, Table 2.1-1, Sections 2.5.4.2, 2.5.4.3, and Table 3.8-17 will be revised as described in the above response and indicated on the enclosed markup.

**Table 03.08.05-23-1—Variation of Density with Depth for Dynamic Analyses**

<b>Soil Case No.</b>	<b>Depth</b>	<b>Dry Density</b>
4ue	Half-space	120 pcf
5ae	Half-space	156 pcf
1n5ae	0 ft. to 38 ft.	110 pcf
	Below 38 ft.	156 pcf
1n2ue	0 ft. to 38 ft.	110 pcf
	Below 38 ft.	110 pcf
2sn4ue	0 ft. to 87 ft.	110 pcf
	Below 87 ft.	120 pcf
hfub	0 ft. to 38 ft.	126 pcf
	Below 38 ft.	170 pcf
hflb	0 ft. to 38 ft.	140 pcf
	Below 38 ft.	170 pcf
hfbe	0 ft. to 38 ft.	140 pcf
	Below 38 ft.	170 pcf

# U.S. EPR Final Safety Analysis Report Markups

**Table 5.0-1—Site Parameters for the U.S. EPR Design  
(3 Sheets)**

	The 1% exceedance (seasonal basis) <sup>(3)</sup> minimum ambient temperature is -10°F.
<b>Wind</b>	
<b>Parameter</b>	<b>Value(s)</b>
Maximum Speed (Other than Tornado)	The normal maximum wind speed is 145 mph.
<b>Tornado</b>	
<b>Parameter</b>	<b>Value(s)</b>
Tornado (maximum speed, pressure drop, radius of maximum rotational speed, rate of pressure drop, missile spectra)	Maximum tornado wind speed of 230 mph. Maximum rotational speed of 184 mph. Maximum tornado pressure drop of 1.2 pounds per square inch at 0.5 psi per second. Radius of maximum rotational speed is 150 ft.
<b>Soil</b>	
<b>Parameter</b>	<b>Value(s)</b>
Soil properties:	
<u>Minimum angle of internal friction (in situ and backfill)</u>	<u>26.6 degrees<sup>(4)</sup></u> ← <span style="border: 1px solid red; padding: 2px;">03.08.05-23</span>
Minimum shear wave velocity	Minimum shear wave velocity (low strain best estimate average value at bottom of basemat) of 1000 feet per second.
Minimum static bearing capacity	<del>Minimum Maximum static bearing capacity demand is of 22,000 lb/ft<sup>2</sup> in localized areas at the bottom of the Nuclear Island, EPGB, and ESWB basemats and 15,000 lb/ft<sup>2</sup> on is the average across the total area of the bottom of for the Nuclear Island, EPGB, and ESWB- basemats.</del> <u>The ultimate static bearing capacity divided by 3.0 is greater than or equal to the maximum static bearing demand.</u>
Minimum dynamic bearing capacity	<del>Minimum static bearing capacity of 3,800 lbs/ft<sup>2</sup> in localized areas at the bottom of the EPGB basemat and 2,700 lbs/ft<sup>2</sup> on average across total area at the bottom of the EPGB basemat.</del> <del>Minimum static bearing capacity of 17,800 lbs/ft<sup>2</sup> in localized areas at the bottom of the ESWB basemat and 5,500 lbs/ft<sup>2</sup> on average across total area at the bottom of the ESWB basemat.</del> <del>Minimum Maximum dynamic bearing demand is capacity of 35,000 26,000-lb/ft<sup>2</sup> at the bottom-toe of the Nuclear Island, EPGB, and ESWB basemats.</del> <u>The ultimate dynamic bearing capacity divided by 2.0 is greater than or equal to the maximum dynamic bearing demand.</u> <del>Minimum dynamic bearing capacity of 10,800 lbs/ft<sup>2</sup> at the bottom of the EPGB basemat.</del>

**Table 5.0-1—Site Parameters for the U.S. EPR Design  
(3 Sheets)**

Atmospheric Dispersion Factors ( $\chi/Q$ )	
Parameter	Value(s)
Meteorological Dispersion (values at Exclusion Area Boundary, and Low Population Zone at appropriate time intervals for short and long term)	Atmospheric dispersion factors – $\chi/Q$ (sec/m <sup>3</sup> )
	– Exclusion Area Boundary
	0 - 2 hours                    ≤ 1.00E-03
	– Low Population Zone
	0 – 2 hours                    ≤ 1.75E-04
	2 – 8 hours                    ≤ 1.35E-04
	8 – 24 hours                 ≤ 1.00E-04
1 – 4 days                    ≤ 5.40E-05	
4 – 30 days                  ≤ 2.20E-05	

1. The effect of the extreme liquid winter precipitation event on roof loads is negligible due to the lack of parapets. ~~The maximum 48-hour PMWP liquid of 32 inches is based on data obtained from National Oceanic and Atmospheric Administration Hydrometeorological Report No. 53 “Seasonal Variation of 10-square-mile Probable Maximum Precipitation Estimates, United States East of the 105th Meridian” for the three winter months—December through February. However, the effect of rainfall events on roof loads is negligible, due to the lack of parapets.~~
2. By definition, 0% percent exceedance temperature values exclude peaks of temperatures that last less than two hours. The 0% percent exceedance values are based on conservative estimates of 100 year return period values and historic extreme values, whichever is bounding.
3. For maximum values, data from the summer months of June, July, and August are used. For minimum values, data from the winter months of December, January, and February are used.

4. Minimum angle of internal friction is associated with the soil’s ability to develop the minimum coefficient of static friction.

03.08.05-23

Table 2.1-1—U.S. EPR Site Design Envelope  
Sheet 3 of 7

U.S. EPR Site Design Envelope	
Maximum <del>Differential</del> Settlement (across the basemat)	
<del>Differential Settlement</del> <del>Tilt Settlement</del>	Figure 3.8-124 through Figure 3.8-136 1/2 inch in 50 feet in any direction
Slope Failure Potential	No slope failure potential is considered in the design of safety-related SSC for U.S. EPR design certification. <span style="border: 1px solid red; padding: 2px;">03.08.05-23</span>
<del>Angle of Internal Friction (in situ and backfill)</del>	26.6 degrees (minimum) (See Note 8) <span style="border: 1px solid red; padding: 2px;">30 degrees (maximum) (See Note 9)</span>
<del>Soil Density (<math>\gamma</math>) (in situ and backfill)</del>	<span style="border: 1px solid red; padding: 2px;">110 lb/ft<sup>3</sup> ≤ <math>\gamma</math> ≤ 134 lb/ft<sup>3</sup></span> (See Note 7) ← <span style="border: 1px solid red; padding: 2px;">03.08.05-23</span>
Maximum Ground Water	3.3 ft below grade
Minimum Coefficient of Static Friction (representative of all interfaces between basemat and soil) (representative of soil-basemat interface)	0.75
<b>Inventory of Radionuclides Which Could Potentially Seep Into the Groundwater</b>	
See Table 2.1-2—Bounding Values for Component Radionuclide Inventory	
<b>Flood Level (Refer to Section 2.4)</b>	
Maximum Flood (or Tsunami)	1 ft below grade
<b>Wind (Refer to Section 3.3)</b>	
Maximum Speed (Other than Tornado)	145 mph (Based on 3-second gust at 33 ft above ground level and factored for 50-yr mean recurrence interval)



2. ~~Deleted COL applicant to determine wet bulb temperature correction factor to account for potential interference and recirculation effects. (Refer to COL Item 2.0-1 in Table 1-8-2—U.S. EPR Combined License Information Items).~~
3. By definition, zero percent exceedance temperature values exclude peaks of temperatures less than two hours in duration. The zero percent exceedance temperature values are based on conservative estimates of 100-year return period values and historic extreme values, whichever is bounding.
4. For maximum values, data from the summer months or June, July, and August are used. For minimum values, data from the winter months of December, January, and February are used.
5. ~~Deleted COL applicant to confirm potential UHS cooling tower interference effects on safety-related air intakes do not result in air intake inlet conditions that exceed the site design envelope ambient air conditions (refer to COL Item 2.0-1 in Table 1-8-2—U.S. EPR Combined License Information Items).~~
6. The atmospheric dispersion parameters for the equipment hatch and depressurization shaft releases are bounded by the parameters for the releases via the Safeguard Building canopy.
7. Soil densities provided in this table are associated with the structural design of basemats and walls below grade. Soil densities used in dynamic soil structure interaction analyses are defined in terms of the value of the shear wave velocity in Table 3.7.2-9. The shear wave velocity layers and depths are defined in Table 3.7.1-6, Table 3.7.1-8 and Table 3.7.1-9.
8. Minimum angle of internal friction is associated with the soil's ability to develop the minimum coefficient of static friction.
9. Maximum angle of internal friction is associated with the passive soil pressure coefficient so that soil pressure acting on walls below grade does not exceed capacity. If the maximum angle of internal friction is higher than 30 degrees, a site-specific analysis will be performed using the site-specific soil parameters and site-specific SSE to demonstrate that the capacity of the below grade walls is not exceeded.



03.08.05-23

**2.5.3 Surface Faulting**

No surface faulting is considered to be present under foundations for Seismic Category I structures in the U.S. EPR (GDC 2).

A COL applicant that references the U.S. EPR design certification will investigate site-specific surface and subsurface geologic, seismic, geophysical, and geotechnical aspects within 25 miles around the site and evaluate any impact to the design. The COL applicant will demonstrate that no capable faults exist at the site in accordance with the requirements of 10 CFR 100.23 and of 10 CFR 50, Appendix S. If non-capable surface faulting is present under foundations for safety-related structures, the COL applicant will demonstrate that the faults have no significant impact on the structural integrity of safety-related structures, systems, or components.

**2.5.4 Stability of Subsurface Materials and Foundations**

The stability of subsurface materials under the ~~and~~ foundations for Seismic Category I structures is demonstrated in Section 3.8.5 for the U.S. EPR ~~10-generic~~ soil profiles described in Section 3.7.1 and Section 3.7.2. As described in Section 3.8.5, lateral soil pressure loads under saturated conditions are considered for the design of below-grade walls. Soil loads are based on the parameters described in Section 2.5.4.2.

A COL applicant that references the U.S. EPR design certification will present site-specific information about the properties and stability of soils and rocks that may affect the nuclear power plant facilities under both static and dynamic conditions, including the vibratory ground motions associated with the CSDRS and the site-specific SSE.

**2.5.4.1 Geologic Features**

Geologic features are site specific and will be addressed by the COL applicant.

**2.5.4.2 Properties of Subsurface Materials**

The following soil properties are used for design of U.S. EPR Seismic Category I structures.

- Soil density:
  - Saturated soil = 134 lb/ft<sup>3</sup>.
  - Moist soil = 128 lb/ft<sup>3</sup>.
  - Dry soil = 110 lb/ft<sup>3</sup>.

03.08.05-23



- Angle of internal friction = ~~35~~26.6 degrees minimum, 30 degrees maximum.

- ~~Coefficient of friction acting on foundation basemats and near surface foundations for Seismic Category I structures – 0.7.~~ Coefficient of friction for all interfaces between the foundation basemat and soil for Seismic Category I structures is 0.5 minimum.

For a cohesionless soil site, the soil below and adjacent to the safety-related foundation basemat will have a minimum friction angle ~~in excess of 35~~26.6 degrees. For a cohesive soil site, the soil will have an undrained strength equivalent to or exceeding a drained strength of 35~~26.6~~ degrees (yielding a friction coefficient greater than or equal to 0.75).

03.08.05-23

The backfill soil adjacent to any safety-related structure will have a maximum angle of internal friction of 30 degrees to limit passive pressure developed on the below grade exterior walls. If the maximum angle of internal friction is higher than 30 degrees, a site-specific analysis will be performed using the site-specific soil parameters and site-specific SSE to demonstrate that the capacity of the below grade walls is not exceeded.

Section 2.5.4.5 discusses the use of mud mats under the foundation basemats to facilitate construction. When used, the governing friction value at the interface zone is determined by a thin soil layer (soil-on-soil) under the mud mat. As indicated above, the underlying soil (expected to be compacted backfill or lean concrete) will have a friction angle greater than ~~35~~26.6 degrees. Typical values of friction coefficient between concrete and dry soil and rock are in the range of approximately 0.75. Due to the interlock of concrete with soil as the concrete is placed, the friction between the mud mat and underlying soil media is generally higher than the friction resistance of soil-on-soil so that continuity of load transfer across the interface is maintained. Waterproofing systems are addressed in Section 3.4.2.

Earthquake induced soil pressures for the design of the U.S. EPR are developed in accordance with Section 3.5.3 of ASCE 4-98 (Reference 2). Maximum ground water and maximum flood elevations used for determining lateral soil loads for the U.S. EPR are as specified in Table 2.1-1.

A COL applicant that references the U.S. EPR design certification will reconcile the site-specific soil and backfill properties with those used for design of U.S. EPR Seismic Category I structures and foundations described in Section 3.8.

### 2.5.4.3 Foundation Interfaces

Foundation interfaces with underlying materials are site specific and will be addressed by the COL applicant. The COL applicant will confirm that the site soils and backfill material have (1) minimum sliding coefficient of friction of equal to at least 0.75, (2) adequate shear strength to provide adequate static and dynamic bearing capacity, (3) adequate elastic and consolidation properties to satisfy the limits on settlement described in Section 2.5.4.10.2, ~~and~~(4) adequate dynamic properties (i.e., shear wave

velocity and strain-dependent modulus-reduction and hysteretic damping properties). and (5) properties so that the earthquake design loading on the below grade walls is not exceeded (i.e., the site-specific angle of internal friction, unit soil weight, and seismic wall movements do not cause design limits of the walls to be exceeded because of the passive lateral earth pressure on the walls to support the Seismic Category I structures of the U.S. EPR under earthquake loading.

↑  
03.08.05-23

**2.5.4.4 Geophysical Surveys**

Geophysical surveys are site specific and will be addressed by the COL applicant.

**2.5.4.5 Excavations and Backfill**

Excavations and backfill are site-specific and will be addressed by the COL applicant. Additional backfill requirements are identified in Section 3.8.5.4. Mud mats may be provided under foundations for ease of construction. Mud mats may be designed as structural plain concrete elements on a site-specific basis in accordance with ACI 318 (Reference 3).

**2.5.4.6 Ground Water Conditions**

Ground water conditions are described in Section 2.4 and provided in Table 2.1-1 for the U.S. EPR. Ground water conditions are considered in the structural design of the U.S. EPR, as described in Section 3.8. However, groundwater conditions are not explicitly considered in the SSI analyses described in Section 3.7.1 and Section 3.7.2.

The COL applicant will address site-specific ground water conditions.


**2.5.4.7 Response of Soil and Rock to Dynamic Loading**

Section 2.5.2 notes that the design of the U.S. EPR is based on the assumption that the shear wave velocities assumed for the ~~10 generic~~ soil profiles described in Section 3.7.1.3 are strain-compatible properties. For SSI analysis for the U.S. EPR, assumed relationships to depict the strain-dependent modulus-reduction and hysteretic damping properties are not explicitly considered. The COL applicant will address site-specific response of soil and rock to dynamic loading, including the determination of strain-dependent modulus-reduction and hysteretic damping properties.

**2.5.4.8 Liquefaction Potential**

The design of the U.S. EPR assumes that the plant is not founded on liquefiable materials (GDC 2).

Table 3.8-17—Design Report Cross-Reference Table  
Sheet 3 of 5

		U.S. EPR FSAR Sections			
SRP Section 3.8.4, Appendix C		Concrete Containment (Section 3.8.1)	Steel Containment (Section 3.8.2) & Internal Structures (Section 3.8.3)	Other Seismic Category I Structures (Section 3.8.4)	Foundations (Section 3.8.5)
4. Prestressing Stage	A. Type of System	Section 3.8.1.1.2	N/A	N/A	N/A
	B. Description of Tendons	Sections 3.8.1.1.2, 3.8.1.6.3	N/A	N/A	N/A
	C. Description of Surcharge	Table 3.8-5	N/A	N/A	N/A
	D. Tendons and Sheeting Layout	Section 3.8.1.1.2, 3.8.1.6.3, Figures 3.8-18 and 3.8-19	N/A	N/A	N/A
	E. Dome Prestressing	Section 3.8.1.1.2	N/A	N/A	N/A
5. Foundation Media	A. General Description	Section 2.5, 3.7.1.3, Table 3.7.2-9			
	B. Unit Weight	Section 2.5.4.2; Table 2.1-1; Table 3.7.2-9			
	C. Shear Modulus	Table 3.7.2-9 			
	D. Angle of Internal Friction	Section 2.5.4.2, Table 2.1-1			
	E. Cohesion	Section 2.5.4.2			
	F. Bearing Capacity	Section 2.5.4.10.1, Table 2.1-1			
6. Special Considerations	None	None	None	None	None