ArevaEPRDCPEm Resource

From: WELLS Russell (AREVA) [Russell.Wells@areva.com]
Sent: Friday, July 29, 2011 5:57 PM
To: Tesfaye, Getachew
Cc: WILLIFORD Dennis (AREVA); ROMINE Judy (AREVA); LENTZ Tony (EXTERNAL AREVA); BENNETT Kathy (AREVA); DELANO Karen (AREVA); RYAN Tom (AREVA)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 27 (Part 1 of 3)
Attachments: RAI 376 Supplement 27 Response US EPR DC_Part 1 of 3.pdf

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplements 18 and 19 on March 18, 2011 and April 19, 2011, respectively. On May 2, 2011, AREVA NP submitted Supplement 20, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplement 21 on May 20, 2011. On June 9, 2011, AREVA NP submitted Supplement 22, to provide a final response to Question 03.08.05-25. On June 27, 2011, AREVA NP submitted Supplement 23 to provide a revised INTERIM response for Question 03.08.05-28. On July 7, 2011, AREVA NP submitted Supplement 24 to provide an INTERIM response for Question 03.08.05-31. On July 20, 2011, AREVA NP submitted Supplement 24 to provide a revised INTERIM response for Question 03.08.05-31. On July 20, 2011, AREVA NP submitted Supplement 25 to provide a revised INTERIM response for Question 03.08.05-31. On July 22, 2011, AREVA NP submitted Supplement 25 to provide a AREVA NP submitted Supplement 26 to provide a revised INTERIM response to Question 03.08.05-31.

The attached file, "RAI 376 Supplement 27 Response US EPR DC (Part 1 of 3).pdf" provides the technically correct and revised INTERIM response to Question 03.08.05-28. 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 376 Question 03.08.05-28. The remaining parts will be provided in subsequent e-mails.

The following table indicates the page in the response document, "RAI 376 Supplement 27 Response US EPR DC (Part 1 of 3).pdf" that contains AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 376 — 03.08.05-28	2	50

The schedule for the final response to Question 03.08.05-28 and Question 03.08.05-31 remains unchanged. The schedule for technically correct and complete responses to the remaining questions is provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-28	October 25, 2010 (Actual) **July 29, 2011 (Actual)**	October 10, 2011
RAI 376-03.08.05-31	October 25, 2010 July 22, 2011 (Actual)	November 30, 2011

Sincerely,

Russ Wells ***for***
Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WELLS Russell (RS/NB)
Sent: Friday, July 22, 2011 1:03 PM
To: Tesfaye, Getachew
Cc: WILLIFORD Dennis (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 26 (Part 2 of 2)

Getachew
Attached is part 2 of 2 for the response of RAI No. 376, FSAR Ch 3, Supplement 26.

Russ Wells ***for***
Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WELLS Russell (RS/NB)
Sent: Friday, July 22, 2011 1:01 PM
To: 'Tesfaye, Getachew'
Cc: WILLIFORD Dennis (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 26 (Part 1 of 2)

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplements 18 and 19 on March 18, 2011 and April 19, 2011, respectively. On May 2, 2011, AREVA NP submitted Supplement 20, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplement 21 on May 20, 2011. On June 9, 2011, AREVA NP submitted Supplement 22, to provide a final response to Question 03.08.05-25. On June 27, 2011, AREVA NP submitted Supplement 23 to provide a revised INTERIM response for Question 03.08.05-28. On July 7, 2011, AREVA NP submitted Supplement 24 to provide an INTERIM response for Question 03.08.05-31. On July 20, 2011, AREVA NP submitted Supplement 24 to provide a revised INTERIM response for Question 03.08.05-31.

The attached file, "RAI 376 Supplement 26 Response US EPR DC – PUBLIC (Part 1 of 2).pdf" and the file "RAI 376 Supplement 26 Response US EPR DC - PUBLIC (Part 2 of 2).pdf" in a subsequent email provide a technically correct revised INTERIM response to Question 03.08.05-31 to correct an editorial error on FSAR mark-up page 2.1-5 (on U.S. EPR FSAR Tier 2, Table 2.1-1 (the value showed u = .36, instead of u > and = to .36).

Appended to these files are the affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 376 Question 03.08.05-31. Because the response 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 will be provided in a separate email.

The following table indicates the pages in the response document, "RAI 376 Supplement 26 Response US EPR DC - PUBLIC (Part 1 of 2).pdf" and the file "RAI 376 Supplement 26 Response US EPR DC - PUBLIC (Part 2 of 2).pdf" that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 376 — 03.08.05-31	2	4

The schedule for the final responses to the remaining questions is unchanged as provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-28	October 25, 2010 (Actual) June 27, 2011 (Actual)	October 10, 2011
RAI 376-03.08.05-31	October 25, 2010 (Actual) **July 22, 2011 (Actual)**	November 30, 2011

Sincerely,

Russ Wells for
Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Wednesday, July 20, 2011 10:27 AM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); Miernicki, Michael
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 25 (Part 1 of 2)

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplements 18 and 19 on March 18, 2011 and April 19, 2011, respectively. On May 2, 2011, AREVA NP submitted Supplement 20, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplement 21 on May 20, 2011. On June 9, 2011, AREVA NP submitted Supplement 22, to provide a final response to Question 03.08.05-25. On June 27, 2011, AREVA NP

submitted Supplement 23 to provide a revised INTERIM response for Question 03.08.05-28. On July 7, 2011, AREVA NP submitted Supplement 24 to provide an INTERIM response for Question 03.08.05-31.

The attached file, "RAI 376 Supplement 25 Response US EPR DC – PUBLIC (Part 1 of 2).pdf" and the file "RAI 376 Supplement 25 Response US EPR DC - PUBLIC (Part 2 of 2).pdf" in a subsequent email provide a technically correct revised INTERIM response to Question 03.08.05-31. Appended to these files are the affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 376 Question 03.08.05-31. Because the response 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 will be provided in a separate email.

The following table indicates the pages in the response document, "RAI 376 Supplement 25 Response US EPR DC - PUBLIC (Part 1 of 2).pdf" and the file "RAI 376 Supplement 25 Response US EPR DC - PUBLIC (Part 2 of 2).pdf" that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 376 — 03.08.05-31	2	4

The schedule for the final responses to the remaining questions is unchanged as provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-28	October 25, 2010 (Actual) June 27, 2011 (Actual)	October 10, 2011
RAI 376-03.08.05-31	October 25, 2010 (Actual) **July 20, 2011 (Actual)**	November 30, 2011

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Thursday, July 07, 2011 1:49 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); Miernicki, Michael
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 24

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed.

AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplements 18 and 19 on March 18, 2011 and April 19, 2011, respectively. On May 2, 2011, AREVA NP submitted Supplement 20, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplement 21 on May 20, 2011. On June 9, 2011, AREVA NP submitted Supplement 22, to provide a final response to Question 03.08.05-25. On June 27, 2011, AREVA NP submitted Supplement 23 to provide a revised INTERIM response for Question 03.08.05-28.

The attached file, "RAI 376 Supplement 24 Response US EPR DC - PUBLIC (Part 1 of 2).pdf" and the file "RAI 376 Supplement 24 Response US EPR DC - PUBLIC (Part 2 of 2).pdf" in a subsequent email provides a technically correct INTERIM response to Question 03.08.05-31. Appended to these files are the affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 376 Question 03.08.05-31. Because the response 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 will be provided in a separate email.

The following table indicates the page in the response document, "RAI 376 Supplement 24 Response US EPR DC - PUBLIC (Part 1 of 2).pdf" and the file "RAI 376 Supplement 24 Response US EPR DC - PUBLIC (Part 2 of 2).pdf" that contains AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 376 — 03.08.05-31	2	4

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

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-28	October 25, 2010 (Actual) June 27, 2011 (Actual)	October 10, 2011
RAI 376-03.08.05-31	October 25, 2010 **July 7, 2011 (Actual)**	November 30, 2011

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Monday, June 27, 2011 4:47 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); CORNELL Veronica (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 23

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplements 18 and 19 on March 18, 2011 and April 19, 2011, respectively. On May 2, 2011, AREVA NP submitted Supplement 20, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplement 21 on May 20, 2011. On June 9, 2011, AREVA NP submitted Supplement 22 to provide a final response to Question 03.08.05-25.

The attached file, “RAI 376 Supplement 23 Response US EPR DC - INTERIM.pdf (Part 1 of 2).pdf” and the file “RAI 376 Supplement 23 Response US EPR DC - INTERIM.pdf (Part 2 of 2).pdf” in a subsequent email, provide a technically correct INTERIM response to Question 03.08.05-28, as committed. Appended to the file “RAI 376 Supplement 23 Response US EPR DC - INTERIM.pdf (Part 2 of 2).pdf” are the affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 376 Question 03.08.05-28.

The following table indicates the respective pages in the response document, “RAI 376 Supplement 23 Response US EPR DC - INTERIM.pdf (Part 1 of 2).pdf” and “RAI 376 Supplement 23 Response US EPR DC - INTERIM.pdf (Part 2 of 2).pdf” that contain AREVA NP’s INTERIM response to Question 03.08.05-28.

Question #	Start Page	End Page
RAI 376 — 03.08.05-28	2	50

The schedule for the final response to Question 03.08.05-28 and Question 03.08.05-31 is being revised. The schedule for technically correct and complete responses to the remaining questions is provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-28	October 25, 2010 (Actual) **June 27, 2011 (Actual)**	**October 10, 2011**
RAI 376-03.08.05-31	October 25, 2010	**November 30, 2011**

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Thursday, June 09, 2011 12:46 PM
To: 'Tesfaye, Getachew'
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); CORNELL Veronica (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 22

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplements 18 and 19 on March 18, 2011 and April 19, 2011, respectively. On May 2, 2011, AREVA NP submitted Supplement 20, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplement 21 on May 20, 2011.

The attached file, "RAI 376 Supplement 22 Response US EPR DC.pdf" provides a technically correct and complete FINAL response to Question 03.08.05-25. 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 376 Question 03.08.05-25.

The following table indicates the pages in the response document, "RAI 376 Supplement 22 Response US EPR DC.pdf" that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 376 — 03.08.05-25	2	5

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

Question #	Interim Response Date	Response Date
RAI 376—03.08.05-28	October 25, 2010 (Actual)	July 8, 2011
RAI 376—03.08.05-31	October 25, 2010 (Actual)	July 8, 2011

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Friday, May 20, 2011 5:19 PM
To: 'Tesfaye, Getachew'
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); CORNELL Veronica (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 21

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted

Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplements 18 and 19 on March 18, 2011 and April 19, 2011, respectively. On May 2, 2011, AREVA NP submitted Supplement 20 to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31.

The schedule for Question 03.08.05-25 is being revised. The schedule for the remaining questions is unchanged.

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

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-25	August 27, 2010 (Actual)	**July 8, 2011**
RAI 376-03.08.05-28	October 25, 2010 (Actual)	July 8, 2011
RAI 376-03.08.05-31	October 25, 2010 (Actual)	July 8, 2011

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WELLS Russell (RS/NB)
Sent: Monday, May 02, 2011 10:30 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. 376, FSAR Ch. 3, Supplement 20

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for

Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted a revised schedule for Question 03.08.05-25 in Supplements 18 and 19 on March 18, 2011 and April 19, 2011, respectively.

Due to changes in the schedule for FSAR Sections 3.7 and 3.8 as discussed with NRC, the schedule for Questions 03.08.05-28 and 03.08.05-31 is being revised. The schedule for the remaining question is unchanged.

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

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-25	August 27, 2010 (Actual)	May 26, 2011
RAI 376-03.08.05-28	October 25, 2010 (Actual)	**July 8, 2011**
RAI 376-03.08.05-31	October 25, 2010 (Actual)	**July 8, 2011**

Sincerely,

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

From: WELLS Russell (RS/NB)
Sent: Tuesday, April 19, 2011 7:39 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. 376, FSAR Ch. 3, Supplement 19

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response

to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31. AREVA NP submitted Supplement 18 on March 18, 2011, to provide a revised schedule for Question 03.08.05-25.

The schedule for Question 03.08.05-25 is being revised to allow AREVA NP additional time to address NRC comments. The schedule for the remaining questions is unchanged.

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

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-25	August 27, 2010 (Actual)	**May 26, 2011**
RAI 376-03.08.05-28	October 25, 2010 (Actual)	May 4, 2011
RAI 376-03.08.05-31	October 25, 2010 (Actual)	May 26, 2011

Sincerely,

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

From: WELLS Russell (RS/NB)
Sent: Friday, March 18, 2011 4:43 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. 376, FSAR Ch. 3, Supplement 18

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010,

to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29. On February 11, 2011, AREVA NP submitted Supplement 17, to provide a revised schedule for Question 03.08.05-28 and Question 03.08.05-31.

The schedule for Question 03.08.05-25 is being revised to allow AREVA NP additional time to interact with the NRC. The schedule for the remaining questions is unchanged.

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

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-25	August 27, 2010 (Actual)	**April 21, 2011**
RAI 376-03.08.05-28	October 25, 2010 (Actual)	May 4, 2011
RAI 376-03.08.05-31	October 25, 2010 (Actual)	May 26, 2011

Sincerely,

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

From: BRYAN Martin (External RS/NB)
Sent: Friday, February 11, 2011 2:51 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. 376, FSAR Ch. 3, Supplement 17

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to

provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30. AREVA NP submitted Supplement 16 on February 8, 2011, to provide a revised schedule for Question 03.08.05-25 and FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29.

The schedule for Question 03.08.05-28 and Question 03.08.05-31 has changed. The schedule for the remaining question is unchanged.

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

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-25	August 27, 2010 (Actual)	March 30, 2011
RAI 376-03.08.05-28	October 25, 2010 (Actual)	May 4, 2011
RAI 376-03.08.05-31	October 25, 2010 (Actual)	May 26, 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

From: BRYAN Martin (External RS/NB)
Sent: Tuesday, February 08, 2011 5:23 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. 376, FSAR Ch. 3, Supplement 16

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM

responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 25, 2010, to provide a revised schedule for Question 03.08.05-29. On November 22, 2011, AREVA NP submitted Supplement 15 to provide FINAL responses to Questions 03.08.05-27 and 03.08.05-30.

The attached file, "RAI 376 Supplement 16 Response US EPR DC.pdf" provides technically correct and complete FINAL responses to Questions 03.08.05-24, 03.08.05-26 and 03.08.05-29, as committed.

The following table indicates the respective pages in the response document, RAI 376 Supplement 16 Response US EPR DC.pdf," that contains AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 376 – 03.08.05-24	2	5
RAI 376 – 03.08.05-26	6	6
RAI 376 – 03.08.05-29	7	7

The schedule for Question 03.08.05-25 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 technically correct and complete responses to the remaining questions is provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-25	August 27, 2010 (Actual)	March 30, 2011
RAI 376-03.08.05-28	October 25, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-31	October 25, 2010 (Actual)	February 17, 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

From: BRYAN Martin (External RS/NB)
Sent: Monday, November 22, 2010 7:33 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. 376, FSAR Ch. 3, Supplement 15

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010,

to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31. AREVA NP submitted Supplement 14 on October 27, 2010, to provide a revised schedule for Question 03.08.05-29.

The attached file, "RAI 376 Supplement 15 Response US EPR DC.pdf" provides technically correct and complete FINAL responses to Questions 03.08.05-27 and 03.08.05-30, as committed.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 376 Question 03.08.05-27.

The following table indicates the respective pages in the response document, RAI 376 Supplement 15 Response US EPR DC.pdf," that contains AREVA NP's response to the subject questions. Please note that the similar table for RAI 376 Supplement 13 listed the RAI question as 354 when it should have been 376. The schedule for the remaining questions is unchanged.

Question #	Start Page	End Page
RAI 376 - 03.08.05-27	2	4
RAI 376 - 03.08.05-30	5	5

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

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-24	July 15, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-25	August 27, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-29	August 27, 2010 (Actual)	February 28, 2011
RAI 376-03.08.05-31	October 25, 2010 (Actual)	February 17, 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

From: BRYAN Martin (External RS/NB)
Sent: Wednesday, October 27, 2010 1:24 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. 376, FSAR Ch. 3, Supplement 14

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively. On October 25, 2010, AREVA NP submitted Supplement 13 to provide INTERIM responses for Questions 03.08.05-28 and 03.08.05-31.

The schedule for Question 03.08.05-29 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 technically correct and complete responses to the remaining questions is provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-24	July 15, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-25	August 27, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-29	August 27, 2010 (Actual)	February 28, 2011
RAI 376-03.08.05-30	N/A	November 22, 2010
RAI 376-03.08.05-31	October 25, 2010 (Actual)	February 17, 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

From: BRYAN Martin (External RS/NB)
Sent: Monday, October 25, 2010 4:37 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. 376, FSAR Ch. 3, Supplement 13

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted a revised schedule for the final response to question 03.08.05-30 in Supplements 11 and 12 on September 15, 2010 and October 7, 2010, respectively.

The attached file, "RAI 376 Supplement 13 Response US EPR DC-INTERIM.pdf" provides a technically correct and complete INTERIM response to Questions 03.08.05-28 and 03.08.05-31, as committed.

The following table indicates the respective pages in the response document, RAI 376 Supplement 13 Response US EPR DC - INTERIM.pdf," that contains AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 354 - 03.08.05-28	2	10
RAI 354 - 03.08.05-31	11	12

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

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-24	July 15, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-25	August 27, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-29	August 27, 2010 (Actual)	October 29, 2010
RAI 376-03.08.05-30	N/A	November 22, 2010
RAI 376-03.08.05-31	October 25, 2010 (Actual)	February 17, 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

From: BRYAN Martin (External RS/NB)
Sent: Thursday, October 07, 2010 2:50 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. 376, FSAR Ch. 3, Supplement 12

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29. AREVA NP submitted Supplement 11 on September 15, 2010, to provide a revised schedule for the final response to question 03.08.05-30

The schedule for Question 03.08.05-30 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 technically correct and complete responses to the remaining questions is provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-24	July 15, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-25	August 27, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010	February 17, 2011
RAI 376-03.08.05-29	August 27, 2010 (Actual)	October 29, 2010
RAI 376-03.08.05-30	N/A	**November 22, 2010**
RAI 376-03.08.05-31	October 25, 2010	February 17, 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

From: BRYAN Martin (External RS/NB)
Sent: Wednesday, September 15, 2010 9:21 AM
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. 376, FSAR Ch. 3, Supplement 11

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25. On August 27, 2010, AREVA NP submitted Supplement 10 to provide INTERIM responses for Questions 03.08.05-25 and 03.08.05-29.

The schedule for Question 03.08.05-30 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 technically correct and complete responses to the remaining 8 questions is unchanged and provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-24	July 15, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-25	August 27, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010	February 17, 2011
RAI 376-03.08.05-29	August 27, 2010 (Actual)	October 29, 2010
RAI 376-03.08.05-30	N/A	October 14, 2010
RAI 376-03.08.05-31	October 25, 2010	February 17, 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

From: BRYAN Martin (External RS/NB)
Sent: Friday, August 27, 2010 4:58 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. 376, FSAR Ch. 3, Supplement 10-INTERIM

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to

provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29. AREVA NP submitted Supplement 9 on August 16, 2010, to provide INTERIM responses for Questions 03.08.05-26 and 03.08.05-27 and a revised schedule for INTERIM response to question 03.08.05-25.

The attached file, "RAI 376 Supplement 10 Response US EPR DC- INTERIM.pdf" provides a technically correct and complete INTERIM response to 2 of the remaining 8 questions, as committed.

The following table indicates the respective pages in the response document, "RAI 376 Supplement 10 Response US EPR DC- INTERIM.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 376 — 03.08.05-25	2	3
RAI 376 — 03.08.05-29	4	5

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

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-24	July 15, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-25	August 27, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010	February 17, 2011
RAI 376-03.08.05-29	August 27, 2010 (Actual)	October 29, 2010
RAI 376-03.08.05-30	N/A	September 16, 2010
RAI 376-03.08.05-31	October 25, 2010	February 17, 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

From: BRYAN Martin (External RS/NB)
Sent: Monday, August 16, 2010 12:34 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. 376, FSAR Ch. 3, Supplement 9

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to

provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed. AREVA NP submitted Supplement 8 on August 9, 2010, to provide a revised schedule for INTERIM response to question 03.08.05-29.

The schedule for INTERIM response to Question 03.08.05-25 is revised to allow AREVA NP additional time to prepare the response. The FINAL response date for Question 03.08.05-25 has not changed. The FINAL response date for Question 03.08.05-30 is being changed to account for the interaction with NRC being scheduled at a later date than the existing FINAL response date.

The attached file, "RAI 376 Supplement 9 Response - INTERIM.pdf" provides a technically correct and complete INTERIM response to 2 of the remaining 8 questions, as committed.

The following table indicates the respective pages in the response document, "RAI 376 Supplement 9 Response - INTERIM.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 376 — 03.08.05-26	2	2
RAI 376 — 03.08.05-27	3	5

The schedule for technically correct and complete responses to the remaining 8 questions is changed and provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-24	July 15, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-25	**September 8, 2010**	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010 (Actual)	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010	February 17, 2011
RAI 376-03.08.05-29	August 27, 2010	October 29, 2010
RAI 376-03.08.05-30	N/A	**September 16, 2010**
RAI 376-03.08.05-31	October 25, 2010	February 17, 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

From: BRYAN Martin (EXT)
Sent: Monday, August 09, 2010 5:45 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); CORNELL Veronica (EXT)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 8

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed. AREVA NP submitted Supplement 7 on July 29, 2010, to provide a FINAL response to 2 of the remaining 10 question, as committed.

The schedule for INTERIM response to Question 03.08.05-29 is revised to allow AREVA NP additional time to prepare the interim response. The final response date for Question 03.08.05-29 has not changed.

The schedule for technically correct and complete responses to the remaining 8 questions is unchanged and provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-24	July 15, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-25	August 16, 2010	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010	February 17, 2011
RAI 376-03.08.05-29	August 27, 2010	October 29, 2010
RAI 376-03.08.05-30	N/A	August 16, 2010
RAI 376-03.08.05-31	October 25, 2010	February 17, 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

From: BRYAN Martin (EXT)
Sent: Thursday, July 29, 2010 7:56 PM
To: 'Tesfaye, 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. 376, FSAR Ch. 3, Supplement 7

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010 to provide an INTERIM response to question 03.08.05-24. AREVA NP submitted Supplement 6 on July 26, 2010, to provide a FINAL response to 3 of the remaining 13 question, as committed.

The attached file, “RAI 376 Supplement 7 FINAL Response US EPR DC.pdf” provides technically correct and complete responses to 2 of the remaining 10 questions, as committed.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 376 Questions 03.08.01-48 and 03.08.03-24.

The following table indicates the respective pages in the response document, RAI 376 Supplement 7 Response US EPR DC.pdf,” that contain AREVA NP’s response to the subject questions.

Question #	Start Page	End Page
RAI 376 — 03.08.01-48	2	3
RAI 376 — 03.08.03-24	4	8

The schedule for technically correct and complete responses to the remaining 8 questions is unchanged and provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.05-24	July 15, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-25	August 16, 2010	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010	February 17, 2011
RAI 376-03.08.05-29	August 9, 2010	October 29, 2010
RAI 376-03.08.05-30	N/A	August 16, 2010
RAI 376-03.08.05-31	October 25, 2010	February 17, 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

From: BRYAN Martin (EXT)
Sent: Monday, July 26, 2010 4:00 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. 376, FSAR Ch. 3, Supplement 6

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted a revised schedule for the remaining 13 questions in Supplements 2 and 3 on June 8, 2010, and June 24, 2010, respectively. AREVA NP submitted Supplement 4 on July 13, 2010, to provide a revised schedule for question 03.08.05-30. AREVA NP submitted Supplement 5 on July 15, 2010, an INTERIM response to question 03.08.05-24.

The attached file, "RAI 376 Supplement 6 Response U.S. EPR DC.pdf" provides a technically correct and complete FINAL response to 3 of the remaining 13 questions, as committed. The schedule for the remaining 10 questions is unchanged.

The following table indicates the respective pages in the response document, "RAI 376 Supplement 6 Response U.S. EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 376 — 03.08.01-47	2	3
RAI 376 — 03.08.03-21	4	5
RAI 376 — 03.08.03-22	6	7

The schedule for technically correct and complete responses to the remaining 13 questions is provided below.

Question #	Interim Response Date	Response Date
RAI 376-03.08.01-48	N/A	July 29, 2010
RAI 376-03.08.03-24	N/A	July 29, 2010
RAI 376-03.08.05-24	July 15, 2010 (Actual)	February 17, 2011
RAI 376-03.08.05-25	August 16, 2010	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010	February 17, 2011
RAI 376-03.08.05-29	August 9, 2010	October 29, 2010
RAI 376-03.08.05-30	N/A	August 16, 2010
RAI 376-03.08.05-31	October 25, 2010	February 17, 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

From: BRYAN Martin (EXT)
Sent: Thursday, July 15, 2010 7:13 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. 376, FSAR Ch. 3, Supplement 5 - Interim

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to RAI No. 376 on April 26, 2010. AREVA NP submitted Supplement 1 to the response on May 20, 2010 to address 1 of the remaining 14 questions. AREVA NP submitted Supplement 2 to the response on June 8, 2010, to change the schedule for responding to Question 03.08.05-30. AREVA NP submitted Supplement 3 to the response on June 24,

2010, to provide a changed schedule 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. AREVA NP submitted Supplement 4 on July 13, 2010 to provide a revised schedule for question 03.08.05-30. The attached file, "RAI 376 Question 03.08.05-24 Response - INTERIM.pdf" provides a technically correct and complete INTERIM response to 1 of the remaining 13 questions, as committed.

The following table indicates the respective pages in the response document, "RAI 376 Question 03.08.05-24 Response - INTERIM.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 376 — 03.08.05-24	2	5

The schedule for technically correct and complete FINAL responses to the remaining 13 questions is unchanged and provided below:

Question #	Interim Response Date	Response Date
RAI 376-03.08.01-47	N/A	August 17, 2010
RAI 376-03.08.01-48	N/A	July 29, 2010
RAI 376-03.08.03-21	N/A	July 26, 2010
RAI 376-03.08.03-22	N/A	July 26, 2010
RAI 376-03.08.03-24	N/A	July 29, 2010
RAI 376-03.08.05-24	July 15, 2010 **Actual**	February 17, 2011
RAI 376-03.08.05-25	August 16, 2010	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010	February 17, 2011
RAI 376-03.08.05-29	August 9, 2010	October 29, 2010
RAI 376-03.08.05-30	N/A	August 16, 2010
RAI 376-03.08.05-31	October 25, 2010	February 17, 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

From: BRYAN Martin (EXT)
Sent: Tuesday, July 13, 2010 6:08 PM
To: 'Tesfaye, 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. 376, FSAR Ch. 3, Supplement 4

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted Supplement 2 to the response on June 8, 2010, to provide a schedule for the remaining 13 questions, which were affected by the work underway to address NRC comments from the April 26, 2010, audit. AREVA NP submitted RAI No. 376 Supplement 3 on June 24, 2010, to reflect the revised RAI response schedule as a result of the civil/structural re-planning activities.

RAI 376 Supplement 4 revises the schedule for the response to Question 03.08.05-30 to allow time to interact with the NRC on the draft response. The schedule for the remaining 12 questions is unchanged.

The schedule for technically correct and complete responses to the remaining 13 questions is provided below.

Question #	Interim Response Date	Response Date
RAI 376-03.08.01-47	N/A	August 17, 2010
RAI 376-03.08.01-48	N/A	July 29, 2010
RAI 376-03.08.03-21	N/A	July 26, 2010
RAI 376-03.08.03-22	N/A	July 26, 2010
RAI 376-03.08.03-24	N/A	July 29, 2010
RAI 376-03.08.05-24	July 15, 2010	February 17, 2011
RAI 376-03.08.05-25	August 16, 2010	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010	February 17, 2011
RAI 376-03.08.05-29	August 9, 2010	October 29, 2010
RAI 376-03.08.05-30	N/A	August 16, 2010
RAI 376-03.08.05-31	October 25, 2010	February 17, 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

From: BRYAN Martin (EXT)
Sent: Thursday, June 24, 2010 11:56 AM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); RYAN Tom (AREVA NP INC); VAN NOY Mark (EXT); CORNELL Veronica (EXT); GARDNER George Darrell (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 3

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions. AREVA NP submitted Supplement 2 to the response on June 8, 2010, to provide a schedule for the remaining 13 questions, which were 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 has been changed. The schedule for 03.08.05-30 remains unchanged.

Prior to submittal of the final RAI response, AREVA NP will provide an interim RAI response that includes:

(1) a description of the technical work (e.g., methodology)
(2) U.S. EPR FSAR revised pages, as applicable

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

Question #	Interim Response Date	Response Date
RAI 376-03.08.01-47	N/A	August 17, 2010
RAI 376-03.08.01-48	N/A	July 29, 2010
RAI 376-03.08.03-21	N/A	July 26, 2010
RAI 376-03.08.03-22	N/A	July 26, 2010
RAI 376-03.08.03-24	N/A	July 29, 2010
RAI 376-03.08.05-24	July 15, 2010	February 17, 2011
RAI 376-03.08.05-25	August 16, 2010	February 8, 2011
RAI 376-03.08.05-26	August 16, 2010	February 8, 2011
RAI 376-03.08.05-27	August 16, 2010	February 8, 2011
RAI 376-03.08.05-28	October 25, 2010	February 17, 2011
RAI 376-03.08.05-29	August 9, 2010	October 29, 2010
RAI 376-03.08.05-30	N/A	July 14, 2010
RAI 376-03.08.05-31	October 25, 2010	February 17, 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

From: BRYAN Martin (EXT)
Sent: Tuesday, June 08, 2010 3:32 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. 376, FSAR Ch. 3, Supplement 2

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI 376 on April 26, 2010. RAI 376 Supplement 1 provided a technically correct and complete response to 1 of 14 questions.

The schedule for the response to Question 03.08.05-30 has been changed. The final schedule for this question as well as the remaining questions below will be evaluated based on the information that will be presented at the June 9, 2010, public meeting and subsequent NRC feedback.

Question #	Response Date
RAI 376-03.08.01-47	July 14, 2010
RAI 376-03.08.01-48	August 3, 2010
RAI 376-03.08.03-21	June 24, 2010
RAI 376-03.08.03-22	June 24, 2010
RAI 376-03.08.03-24	August 3, 2010
RAI 376-03.08.05-24	August 3, 2010
RAI 376-03.08.05-25	August 3, 2010
RAI 376-03.08.05-26	August 3, 2010
RAI 376-03.08.05-27	July 14, 2010
RAI 376-03.08.05-28	August 3, 2010
RAI 376-03.08.05-29	August 3, 2010
RAI 376-03.08.05-30	July 14, 2010
RAI 376-03.08.05-31	August 3, 2010

Sincerely,

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From: BRYAN Martin (EXT)
Sent: Thursday, May 20, 2010 4:24 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. 376, FSAR Ch. 3, Supplement 1

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to RAI No. 376 on April 26, 2010. The attached file, "RAI 376 Supplement 1 Response US EPR DC.pdf," provides technically correct and complete responses to 1 of the remaining 14 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 376 Question 03.08.03-23.

The response to one question, 03.08.05-30, cannot be provided at this time due to its dependence on path-to-closure related work-planning currently being rescheduled and reviewed by the NRC.

The following table indicates the respective pages in the response document, "RAI 376 Supplement 1 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page

RAI 376-03.08.03-23	2	2

A complete answer is not provided for 13 of the 14 questions. The schedule for a technically correct and complete response to these questions has been changed and is provided below.

Question #	Response Date
RAI 376-03.08.01-47	July 14, 2010
RAI 376-03.08.01-48	August 3, 2010
RAI 376-03.08.03-21	June 24, 2010
RAI 376-03.08.03-22	June 24, 2010
RAI 376-03.08.03-24	August 3, 2010
RAI 376-03.08.05-24	August 3, 2010
RAI 376-03.08.05-25	August 3, 2010
RAI 376-03.08.05-26	August 3, 2010
RAI 376-03.08.05-27	July 14, 2010
RAI 376-03.08.05-28	August 3, 2010
RAI 376-03.08.05-29	August 3, 2010
RAI 376-03.08.05-30	June 10, 2010
RAI 376-03.08.05-31	August 3, 2010

Sincerely,

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From: BRYAN Martin (EXT)
Sent: Monday, April 26, 2010 12:49 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); RYAN Tom (AREVA NP INC); VAN NOY Mark (EXT)
Subject: Response to U.S. EPR Design Certification Application RAI No. 376 (4355,4367,4377), FSAR Ch. 3

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 376 Response US EPR DC.pdf" provides a schedule since a technically correct and complete response to the 14 questions is not provided.

The following table indicates the respective pages in the response document, "RAI 376 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 376-03.08.01-47	2	2
RAI 376-03.08.01-48	3	4
RAI 376-03.08.03-21	5	6
RAI 376-03.08.03-22	7	7
RAI 376-03.08.03-23	8	8

RAI 376-03.08.03-24	9	10
RAI 376-03.08.05-24	11	12
RAI 376-03.08.05-25	13	13
RAI 376-03.08.05-26	14	14
RAI 376-03.08.05-27	15	16
RAI 376-03.08.05-28	17	19
RAI 376-03.08.05-29	20	20
RAI 376-03.08.05-30	21	21
RAI 376-03.08.05-31	22	22

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

Question #	Response Date
RAI 376-03.08.01-47	July 14, 2010
RAI 376-03.08.01-48	August 3, 2010
RAI 376-03.08.03-21	June 24, 2010
RAI 376-03.08.03-22	June 24, 2010
RAI 376-03.08.03-23	May 20, 2010
RAI 376-03.08.03-24	August 3, 2010
RAI 376-03.08.05-24	August 3, 2010
RAI 376-03.08.05-25	August 3, 2010
RAI 376-03.08.05-26	August 3, 2010
RAI 376-03.08.05-27	July 14, 2010
RAI 376-03.08.05-28	August 3, 2010
RAI 376-03.08.05-29	August 3, 2010
RAI 376-03.08.05-30	May 20, 2010
RAI 376-03.08.05-31	August 3, 2010

Sincerely,
Martin (Marty) C. Bryan
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AREVA NP Inc.
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From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Thursday, March 25, 2010 2:13 PM
To: ZZ-DL-A-USEPR-DL
Cc: Xu, Jim; Hawkins, Kimberly; Miernicki, Michael; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 376 (4355,4367,4377), FSAR Ch. 3

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on March 11, 2010, and on March 24, 2010, you informed us that the RAI is clear and no further clarification is needed. As a result, no change is made to the draft RAI. The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs. For any RAIs that cannot be answered within 30 days, it is expected that a date for receipt of this information will be provided to the staff within the 30 day period so that the staff can assess how this information will impact the published schedule.

Thanks,
Getachew Tesfaye
Sr. Project Manager
NRO/DNRL/NARP
(301) 415-3361

Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 3295

Mail Envelope Properties (1F1CC1BBDC66B842A46CAC03D6B1CD4104ACAFB9)

Subject: Response to U.S. EPR Design Certification Application RAI No. 376, FSAR Ch. 3, Supplement 27 (Part 1 of 3)
Sent Date: 7/29/2011 5:56:30 PM
Received Date: 7/29/2011 5:56:53 PM
From: WELLS Russell (AREVA)

Created By: Russell.Wells@areva.com

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"WILLIFORD Dennis (AREVA)" <Dennis.Williford@areva.com>
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Tracking Status: None
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Files	**Size**	**Date & Time**
MESSAGE	95007	7/29/2011 5:56:53 PM
RAI 376 Supplement 27 Response US EPR DC_Part 1 of 3.pdf	4624090	

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

Response to

Request for Additional Information No. 376, Supplement 27

3/25/2010

U.S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 03.08.01 - Concrete Containment
SRP Section: 03.08.03 - Concrete and Steel Internal Structures of Steel or Concrete Containments
SRP Section: 03.08.05 - Foundations
Application Section: 3.8

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

Question 03.08.05-28:

Follow-up to RAI 155, Question 03.08.05-8

The response to this RAI indicates that a new FEM SSI analysis of the NI Common Basemat Structure has been performed using fully embedded conditions to address sliding and overturning issues as well as to determine dynamic soil bearing pressures. This new analysis models the tendon gallery as a shear key. In light of this new information, several items in the original RAI (related to the "second model" as described in FSAR Section 3.8.5.4 Revision 0) are no longer applicable. Nevertheless, the staff finds that portions of the original RAI are still relevant and require further clarification as discussed below. This clarification is necessary to determine if the foundation design meets the acceptance criteria in SRP 3.8.5.II.

1. The responses to Items 1 through 3 of this RAI indicate that the "second model" in question has been superseded by a new analysis methodology and the second model is no longer applicable. To resolve Items 1 through 3 of this RAI, provide a detailed description of the new FEM SSI analysis methodology, including a figure showing the relevant details of the computer model, and a description of the computer code used to perform the analysis, and all relevant analysis assumptions. This information should be included in FSAR Section 3.8.5.

2. The response to Item 4 of the RAI indicates that "the static coefficient of friction at the soil-concrete interface is based upon the angle of internal friction and on a roughened contact surface." It adds that a coefficient of friction of 0.5 (representing saturated conditions) and 0.7 (representing dry conditions) are used in the new analysis methodology. To resolve Item 4 of this RAI, the staff requests the following information:

(a) The issue of potential sliding at the various interfaces (i.e., basemat-upper mudmat, upper mudmat-membrane, membrane-lower mudmat, lower mudmat-soil) is explicitly identified in SRP 3.8.5.II.4 as an area of staff review; however, this issue has not been addressed. Explain how it is assured (e.g., COL action items) that the coefficients of friction at these various interfaces are higher than those listed in the RAI response. This information should be included in FSAR Section 3.8.5 and other relevant sections of the FSAR.

(b) The coefficient of friction of 0.5 assumed in the new analysis for saturated conditions is lower than indicated in FSAR Sections 2.5.4 and 3.8.5 and in other RAI responses (e.g., RAI 3.8.5-4), and is therefore more conservative. This new information should be incorporated to the relevant sections of the FSAR.

(c) The RAI response explicitly mentions that static coefficients of friction are used in the new analysis. To justify this assumption, confirm that the new analysis findings demonstrate that no sliding of the structure occurs for any soil cases considered in the design certification. Otherwise, as mentioned in the original RAI, dynamic coefficients of friction need to be used (typically having lower values). Information regarding this issue should be provided in conjunction with the response to the follow-up to RAI 3.8.5-4 Item 3. The staff notes that if the coefficients of friction are overestimated then the corresponding factors of safety against sliding could also be overestimated, and it would not be possible to determine if the foundation design meets the acceptance criteria in SRP 3.8.5.II.

3. The response to Item 5 of the RAI indicates that the "second model" in question has been superseded by a new analysis methodology and is no longer applicable. The new analysis uses

an embedded FEM SSI model with the tendon gallery as a shear key. To resolve Item 5 of this RAI, and since the new analysis uses an embedded FEM SSI model, explain the methodology used to determine the dynamic lateral pressure loads at the interface between the soil and the exterior foundation walls, tendon gallery walls, and vertical edges of the NI Common Basemat Structure. This explanation should include a comparison to the lateral pressure loads used in the design of these vertical elements as well as a comparison to the full passive pressures that can be developed in the soil, for all soil cases referenced in the design certification. This information is needed to determine if the foundation design related to soil pressures is in accordance with the criteria in SRP 3.8.5.II.4. Information regarding this issue should be provided in conjunction with the response to the follow-up to RAI 3.8.5-4 Item 5.

4. The response to Item 7 of the RAI indicates that the “second model” in question has been superseded by a new analysis methodology and is no longer applicable. The markup to FSAR Section 3.8.5.4.2 (paragraph 11) included with the RAI response further indicates that the new analysis considers excitation by the three EUR seismic transients (CSDRS) for soil cases 2sn4u, 4u, and 5a corresponding to soft, medium and hard soils. To resolve Item 7 of this RAI, provide the technical justification for not considering in the new analysis the other soil cases referenced in the design certification.

5. The response to Item 8 of the RAI indicates that the “second model” in question has been superseded by a new analysis methodology and is no longer applicable. The new analysis uses an embedded FEM SSI model, with the tendon gallery as a shear key, to address sliding and overturning issues. The response adds that instantaneous demand-to-capacity ratios to determine sliding and overturning factors of safety are generated by time history methods. Finally, the minimum factors of safety against sliding and overturning are listed as 1.16 and 1.78 respectively, which are in conformance with the required factors of safety given in FSAR Table 3.8-11. To resolve Item 8 of this RAI, and to ensure that stability evaluations and calculation of soil pressures are performed in accordance with the criteria in SRP 3.8.5.II, the staff requests the following information:

(a) Provide a detailed description of the methodology used to determine the minimum factors of safety against sliding and overturning “generated by time history methods” from the FEM SSI model. This description should provide numerical results for the three soil cases analyzed and also be included in FSAR Section 3.8.5.

(b) Since the RAI response indicates that the FEM SSI model used in the new analysis assumes linear behavior with a coefficient of friction of 0.5 to 0.7, explain how sliding can be included in the analysis and how is the issue of potential uplift of the NI foundation basemat addressed.

(c) The markup to FSAR Section 3.8.5.4.2 (paragraphs 1 and 9) included with the RAI response indicates that the embedded FEM SSI model is also used to calculate dynamic soil bearing pressures. Confirm that this is the case and provide representative calculation results for all soil cases referenced in the design certification. In addition, there appears to be some inconsistency in the values of the maximum soil bearing pressures listed in the FSAR. The markup to FSAR Section 3.8.5.4.1 (paragraph 8) indicates the maximum static bearing pressure is 34,560 psf, whereas the markup to FSAR Section 3.8.5.5.1 (paragraph 2) lists the maximum static and dynamic bearing pressures as 22,000 psf and 26,000 psf respectively. This inconsistency should be clarified.

(d) The RAI response indicates that the tendon gallery is modeled as a shear key to resist seismic induced shear forces. However, the markup to FSAR Section 3.8.5.1.1 (paragraph 2) included with the RAI response states: “No credit is taken in the design for the tendon gallery transmitting vertical loads into the soil, and the connection of the tendon gallery to the NI Common Basemat Structure foundation basement allows for differential movement between the concrete structures. However, the tendon gallery acts as a shear key and transfers lateral loads into the basemat.” Clarify this statement. In particular, explain how the connection of the tendon gallery to the NI basement allows for differential movement and, simultaneously, transfers seismic induced shear loads. Information regarding this issue should be provided in conjunction with the response to the follow-up to RAI 3.8.5-2.

(e) The RAI response does not mention if the results of the new analysis are utilized in the concrete design of the NI foundation basemat, for load cases involving seismic loads. If this is not the case and the static FE model of the NI Common Basemat Structure (with soil springs as described in FSAR Section 3.8.5.4.2) is used in the design, then confirm that comparative studies have been performed to show that the equivalent-static seismic analysis results (e.g. soil bearing pressures and internal forces and moments in the basemat) are in agreement with the results of the new FEM SSI analysis. Information regarding this issue should be provided in conjunction with the response to the follow-up to RAIs 3.8.5-5 Item 1 and 3.8.5-6, for all soil cases referenced in the design certification.

6. Since a new FEM model and analyses are being performed as discussed in this RAI, and other changes in the analysis methods (e.g., a new FEM used in the SSI analyses, revised set of soil cases) are being implemented, as noted during the meeting with AREVA on December 14 and 15, 2009, AREVA is requested to reconcile this and the other applicable RAIs regarding these changes.

Response to Question 03.08.05-28:

Item 1

A detailed description of the embedded 3D finite element model (FEM) soil-structure interaction (SSI) analysis methodology, including analysis assumptions, is included in the revised U.S. EPR FSAR Tier 2, Sections 3.7.1 and 3.7.2 as a result of the Response to RAI 320, Question 03.07.02-63. The Nuclear Island (NI) Common Basemat Structures FEM figures and computer program description, used for the SSI analysis, are also included in the Response to RAI 320, Question 03.07.02-63. MTR/SASSI, which is an enhanced version of the computer program SASSI, is used to perform the SSI analysis. A description of the NI stability analysis is provided in the Response to RAI 371, Question 03.07.02-69.

Item 2

a) The minimum coefficient of friction acting on foundation basemats and near surface foundations for Seismic Category I Structures is 0.5. The coefficient of friction is specified in U. S. EPR FSAR Tier 2, Section 2.5.4.2 and Table 2.1-1. The Response to RAI 384 Question 03.04.02-13 addresses the interfaces between basemat and soil. Existing COL Item 2.0-1 specifies that a COL applicant that references the U.S. EPR design certification will compare the characteristics of its proposed site to the site parameters in U. S. EPR FSAR Tier 2, Table 2.1-1. U.S. EPR FSAR Tier 2, Section 3.8.5 includes a cross-reference to U. S. EPR FSAR Tier 2, Section 2.5.4.2.

b) See the Response to Item 2a.

c) Static coefficient of friction of 0.5 is used to verify that the factors of safety against sliding are satisfied. U. S. EPR FSAR Tier 2, Table 3.8-12, and Appendix 3.E.1will be revised to include the NI minimum calculated factors of safety against sliding and overturning. The SSI calculation shows that the embedded NI movement is rotational.

Item 3

The dynamic soil pressures on the NI basemat, sidewalls and shear key were calculated from the dynamic soil reaction force output at the SSI nodes. The time history of total dynamic soil reaction forces at SSI nodes were calculated by algebraically summing the corresponding co-directional forces obtained from separate analysis of the three direction of input motion. The dynamic soil reaction force time histories were transformed to local coordinates of each component, specifically basemat, sidewalls, and shear key. The reaction forces in local coordinates of each component consisted of the out-of-plane normal force, in-plane horizontal shear force, and in-plane vertical shear force. Dynamic soil forces were applied at each node. For nodes located at the juncture of several components, the forces were divided equally between the adjoining components.

Wall pressures calculated from the SSI analysis, elastic solution by Wood, and required for sliding stability are considered in the design of embedded walls. Each soil case is analyzed, dynamically and statically, and design loads and controlling loads for each wall used for design. U.S. EPR FSAR Tier 2, Section 3.8.5.4.1 will be revised to clarify the application of lateral wall pressures. The results from the basemat analysis using ANSYS model with static soil springs are used to develop design loads for the foundation mat. For additional details, see the Response to Question 5e of this RAI. For a comparison of soil pressure loads on the embedded walls, see Attachment 1 to this response.

Item 4

The original NI stability analysis considered soil cases 2sn4ue, 4ue, and 5ae. The new NI stability analysis is based on an embedded 3D FEM. The analysis results are for the eight soil cases provided in U.S. EPR FSAR Tier 2, Table 3.7.1-6. U.S. EPR FSAR Tier 2, Section 3.8.5.4.2 will be revised to include a reference to U.S. EPR FSAR Tier 2, Table 3.7.1-6.

Item 5

a) The stability analysis methodology is provided in the Response to RAI 371, Question 03.07.02-69.

b) Factors of safety against sliding and overturning are calculated as described in response to RAI 371, Question 03.07.02-69. The effect of uplift on the stability check is also described in the Response to RAI 371, Question 03.07.02-69. Analysis and results are for a minimum coefficient of friction of 0.5.

c) The dynamic bearing pressure demands are determined from the embedded FEM SSI model. The dynamic foundation bearing pressure methodology is described in the Response to RAI 371, Question 03.07.02-69. The maximum static and dynamic bearing pressure demands for the NI structures will be clarified in U.S. EPR FSAR Tier 1, Table

5.0-1 and U.S. EPR FSAR Tier 2, Section 3.8.5.4.1, Section 3.8.5.5.1, and Table 2.1-1. U.S. EPR FSAR Tier 2, Sections 3.8.5.4.1, and 3.8.5.5.1 will be revised to reflect that the maximum bearing demands are uniform across the site for the NI structures. The calculated static and dynamic bearing pressures for the NI structures will be provided in U.S. EPR FSAR Tier 2, Appendix 3.E.1 in the final response to this question.

In addition, the following clarifications will be made in U.S. EPR FSAR Tier 2:

- Table 1.8-2, COL Item 2.5-4 - bearing capacity safety factor requirements.
- Section 2.5.4.10.1 - dynamic bearing pressure and required safety factor.
- Sections 2.5.4.10.3 and 3.8.5.4.1 - bearing pressure demand.
- Table 3.8-17, Item 5.F - bearing pressure demand.

d) The tendon gallery is integrally cast with the NI basemat, acts as a shear key, and transmits vertical and lateral loads. The statement regarding differential movement was deleted from Revision 2 of U.S. EPR FSAR Tier 2, Section 3.8.5.1.1. In addition, U.S. EPR FSAR Tier 2, Section 3.8.5.1.1 will be revised to provide clarification and new dimensions of the shear key.

e) An ANSYS 3D FEM basemat model was developed to generate static and dynamic loadings for design of the NI foundation basemat. The soil surrounding the basemat is represented by soil springs. Local uplift conditions are accounted for in the basemat model as contact elements at the spring-node interface locations. The NI foundation basemat design is based on results from the ANSYS 3D FEM basemat model. The ANSYS 3D FEM basemat model results were compared to the SASSI FEM model results and are compatible. Critical soil cases in the dynamic analysis (SASSI) are investigated in the foundation evaluations.

Item 6

The ANSYS 3D FEM basemat model, including SSI analyses and eight soil cases, were reconciled in the Response to RAI 320, Question 03.07.02-63.

Previously submitted RAI responses impacted by RAI 320 will be submitted concurrent with the final Response to RAI 320, Question 03.07.02-63. Several of these responses are not complete. A schedule for each open response will be developed.

FSAR Impact:

U.S. EPR FSAR Tier 1, Table 5.0-1 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR FSAR Tier 2, Table 1.8-2; Table 2.1-1; Sections 2.5.4.10.1, 2.5.4.10.3, 3.8.5.1, 3.8.5.4, and 3.8.5.5.1; Table 3.8-12; Table 3.8-17 and Appendix 3E.1 will be revised as described in the response and indicated on the enclosed markup.

ATTACHMENT 1
COMPARISON OF APPLIED SOIL PRESSURE WITH SOIL PRESSURE IN STABILITY ANALYSIS

1. Cracked Concrete Model

The coefficients of passive soil pressure, K_p, in Table 03.08.05-28-1 are developed using the time history of horizontal displacement of the sidewalls in the global embedded NI seismic stability, specifically the cracked concrete model. Passive soil pressures for design of the embedded NI building walls are scaled up from the SASSI analysis such that the maximum pressure on each wall is, at least equal to the passive earth pressure of K_p=3. For soil case 4ue, a uniform lateral soil pressure of 43.5 psi (300kPa) for the wall provides a factor of safety against sliding of at least 1.1. K_p for soil case 5ae is not established because the NI is fully embedded in hard rock in this soil case, and the superstructure static model constrains the lateral movements of the walls below grade.

The fixed base analyses for the Superstructure have the nodes of the bottom surface of the basemat fully constrained in the X, Y, and Z directions. For soil case 5ae which represents hard rock (shear wave velocity 13,124ft/sec), additionally constraints are applied to the X and Y directions on walls where there is contact with the excavation. The additional constraints are shown in Figure 03.08.05-28-1. Since 5ae is a hard rock, subgrade walls in contact with the excavation are constrained from lateral movement.

The boundary conditions for 5ae prevent both outward (towards the rock) and inward (away from the rock) movement. Inward movement is only expected to occur under hydrostatic or seismic (on the side of the building opposite of the earthquake direction) loading. This will be considered in local design. The design for the below grade portions of the affected walls will be the same as the above grade portions.

Since the additional constraints for case 5ae place no constraint on vertical movement, axial loads are properly delivered to the basemat and the global overturning moment is unaffected.

The SASSI Dynamic model for 5ae does not constrain the lateral walls as in the Static Superstructure model. The SASSI Dynamic Model includes a soil representation for the hard rock case of 5ae.

Comparison of the total applied soil pressure in the superstructure static analysis and the passive soil pressure developed from the stability analysis results for various soil conditions are shown in Figures 03.08.05-28-2 through 03.08.05-28-31. The total soil pressure is a combination of static soil pressures with surcharge load and seismic passive soil pressures.

The passive soil pressure in the stability analysis is enveloped by the soil pressures applied in the superstructure static analysis for each soil case. For illustration only, the design pressure upper and lower bounds from each soil case are plotted against the stability analysis maximum soil pressure for each soil case as shown in Figures 03.08.05-28-32 through 03.08.05-28-41. The design pressures from each soil case are applied to the respective soil cases in the static analyses and the governing cases are designed accordingly. The upper and lower bound curves are not applied to the model and are not used for design, but are for comparison only. Both the boundary and maximum soil pressure in Figures 03.08.05-28-32 through

03.08.05-28-41 are the maximum and minimum values of the soil cases at the elevation considered, and are an envelope of all soil cases.

The applied soil pressure is also compared to the Wood's soil pressure (with surcharge) for each soil case. This is also shown in Figures 03.08.05-28-2 through 03.08.05-28-31.

2. Uncracked Concrete Model

The coefficients of passive soil pressure, K_p, in Table 03.08.05-28-2 are developed using the time history of horizontal displacement of the side walls in the global embedded NI seismic stability (uncracked concrete model). The passive soil pressures for design of the embedded NI building walls are scaled up from the SASSI analysis such that the maximum pressure on each wall is, at least equal to the passive earth pressure of K_p=3. For soil case 4ue, a uniform lateral soil pressure of 43.5 psi (300kPa) was determined to provide a factor of safety against sliding of 1.1. K_p for soil case 5ae is not established because the NI is fully embedded in hard rock in this soil case, and the superstructure static model constrains the lateral movements of the walls below grade (see Figure 03.08.05-28-1 and discussion in Section 1 of this Attachment).

The comparison of total applied soil pressure in the superstructure static analysis and the passive soil pressure developed from the stability analysis results for various soil conditions are shown in Figures 03.08.05-28-43 through 03.08.05-28-72. The total soil pressure is a combination of static soil pressures with surcharge load and seismic passive soil pressures.

The passive soil pressures in the stability analysis are enveloped by the soil pressures applied in the superstructure static analysis for each soil case. For illustration only, the design pressure upper and lower bounds from each soil case are plotted against the stability analysis maximum soil pressure of each soil case (see Figures 03.08.05-28-73 through 03.08.05-28-82). The design pressures from each soil case are applied to the respective soil cases in the static analyses, and the governing cases are designed accordingly. The upper and lower bound curves are not applied to the model and are not used for design, but are for comparison only. Both the boundary and maximum soil pressures in Figures 03.08.05-28-73 through 03.08.05-28-82 are the maximum and minimum values of the soil cases at the elevation considered, and are an envelope of all soil cases

The applied soil pressure is also compared to the Wood's soil pressure (with surcharge) for each soil case. This is also shown in Figures 03.08.05-28-43 through 03.08.05-28-72.

Table 03.08.05-28-1—Maximum K_p Values (Cracked Concrete Case)[1, 2, 3]

Soil Case						
1n2ue	**1n5ae**	**2sn4ue**	**hfbe**	**hflb**	**hfub**	**4ue**
2.13	1.29	2.7	0.71	0.73	0.77	Uniform Pressure of 43.5psi (300kPa)

Notes:

1. See Figure 03.08.05-28-42 for wall numbering.
2. Soil case 5ae (hard rock) not established - superstructure static model constrains the lateral movements of below grade walls.
3. Soil cases hfbe, hflb and hfub are the same as soil cases BBBE, BBLB and BBUB, respectively.

Table 03.08.05-28-2—Maximum K_p Values (Uncracked Concrete Case)[1, 2, 3]

			Soil Case					
Building	**Wall No.**	**1n2ue**	**1n5ae**	**2sn4ue**	**hfbe**	**hflb**	**hfub**	**4ue**
Fuel Building	**2,4,5**	2.1	0.9	2.4	0.75	0.65	0.7	Uniform Pressure of 43.5 psi (300kPa)
Safeguard Building 1	**3,4,6,8**	2.15	1.25	2.75	0.7	0.7	0.7	
Safeguard Building 2/3	**7,8,10**	2.1	1.05	2.4	0.7	0.65	0.7	
Safeguard Building 4	**11**	2.15	1.3	2.7	0.7	0.7	0.65	

Notes:

1. See Figure 03.08.05-28-42 for wall numbering.
2. Soil case 5ae (hard rock) not established - superstructure static model constrains the lateral movements of below grade walls.
3. Soil cases hfbe, hflb and hfub are the same as soil cases BBBE, BBLB and BBUB, respectively.

Figure 03.08.05-28-1— Additional Constraints for Soil Case 5ae

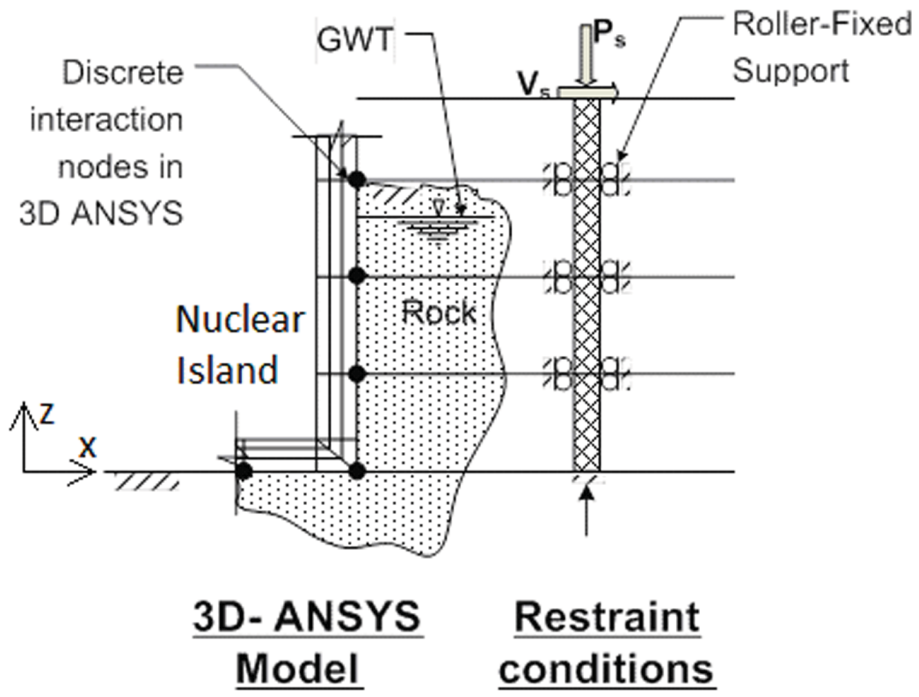

Figure 03.08.05-28-2—Wall 2 - Soil 1n2ue and 1n5ae (Cracked Concrete)

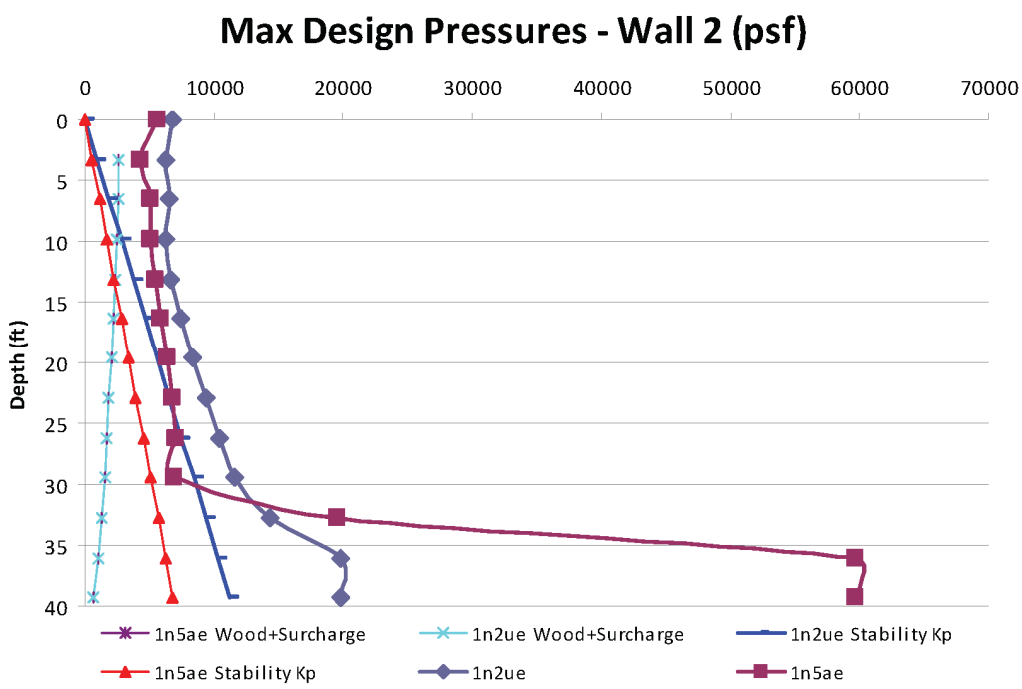

Figure 03.08.05-28-3—Wall 2 - Soil 2sn4ue, 4ue and hfbe (Cracked Concrete)

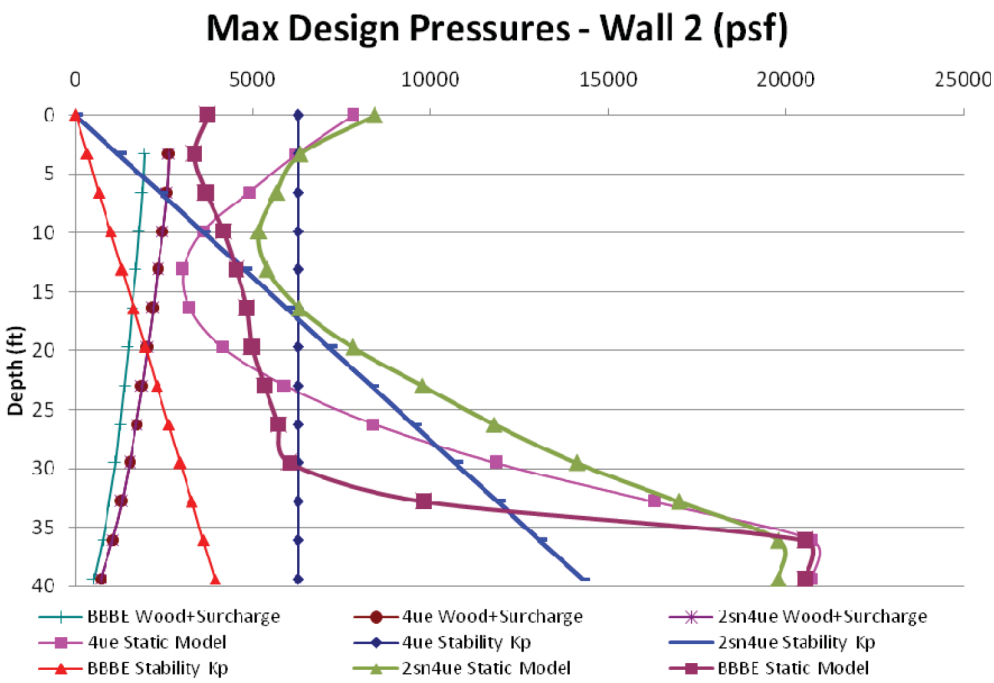

Figure 03.08.05-28-4—Wall 2 - Soil hflb and hfub (Cracked Concrete)

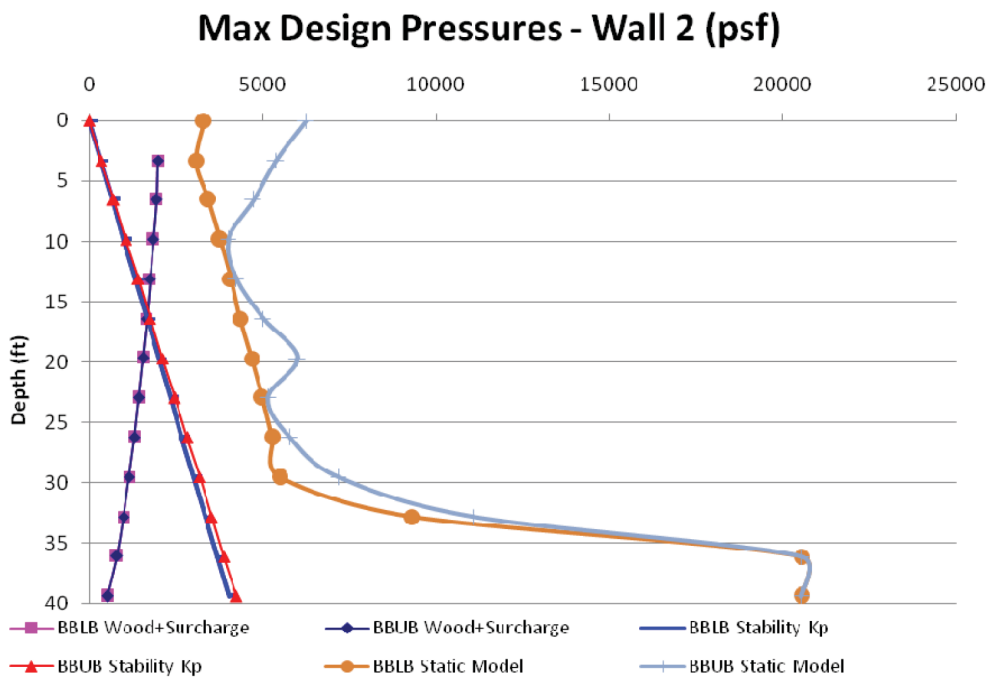

Figure 03.08.05-28-5—Wall 3 - Soil 1n2ue and 1n5ae (Cracked Concrete)

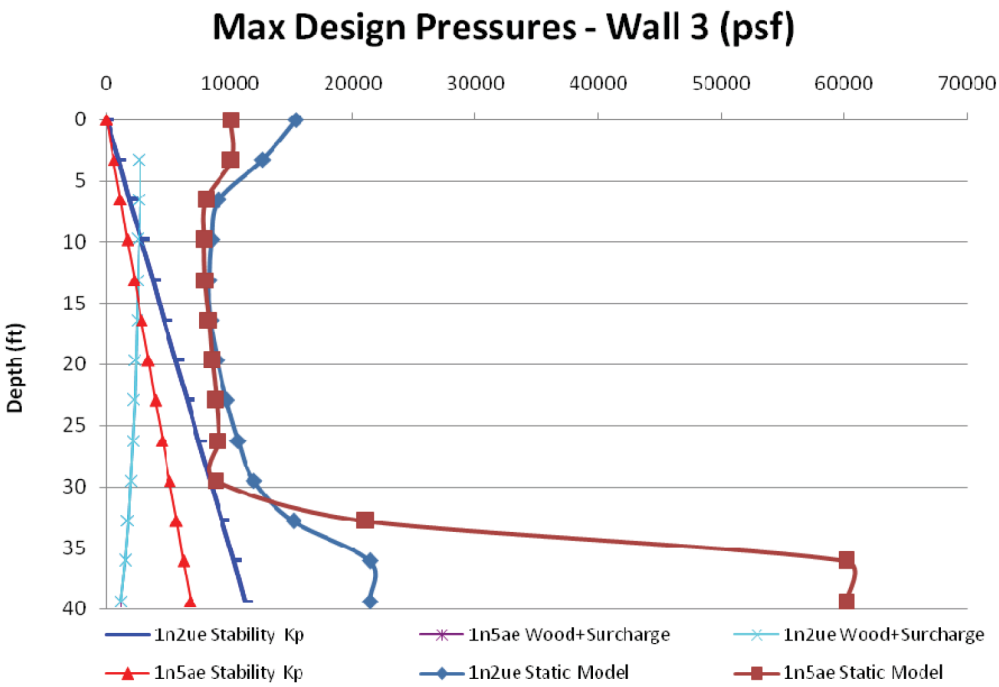

Figure 03.08.05-28-6—Wall 3 - Soil 2sn4ue, 4ue and hfbe (Cracked Concrete)

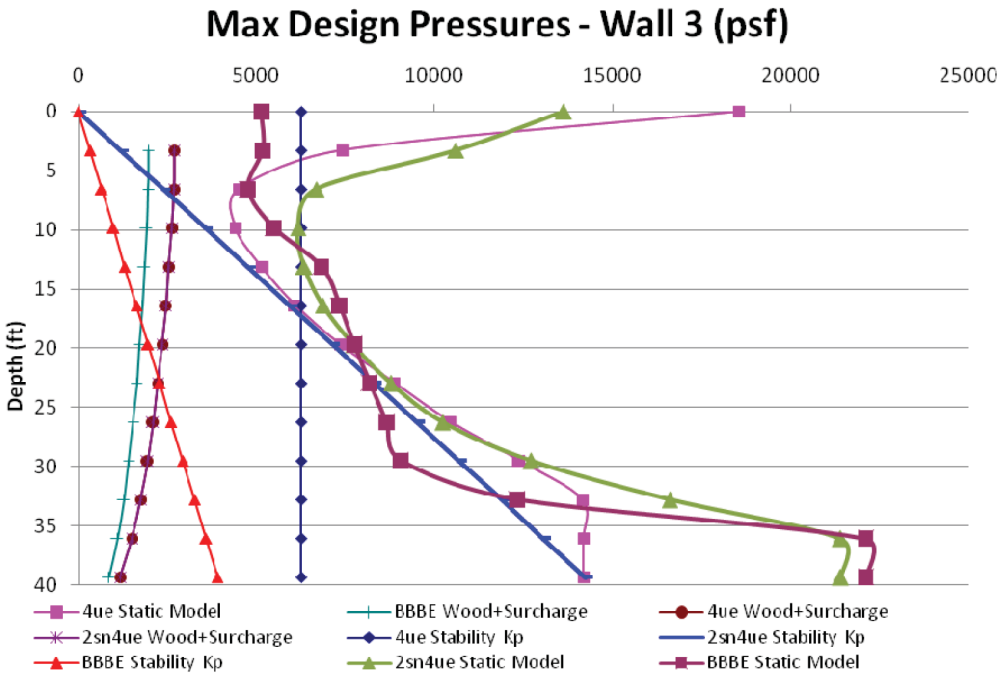

Figure 03.08.05-28-7—Wall 3 - Soil hflb and hfub (Cracked Concrete)

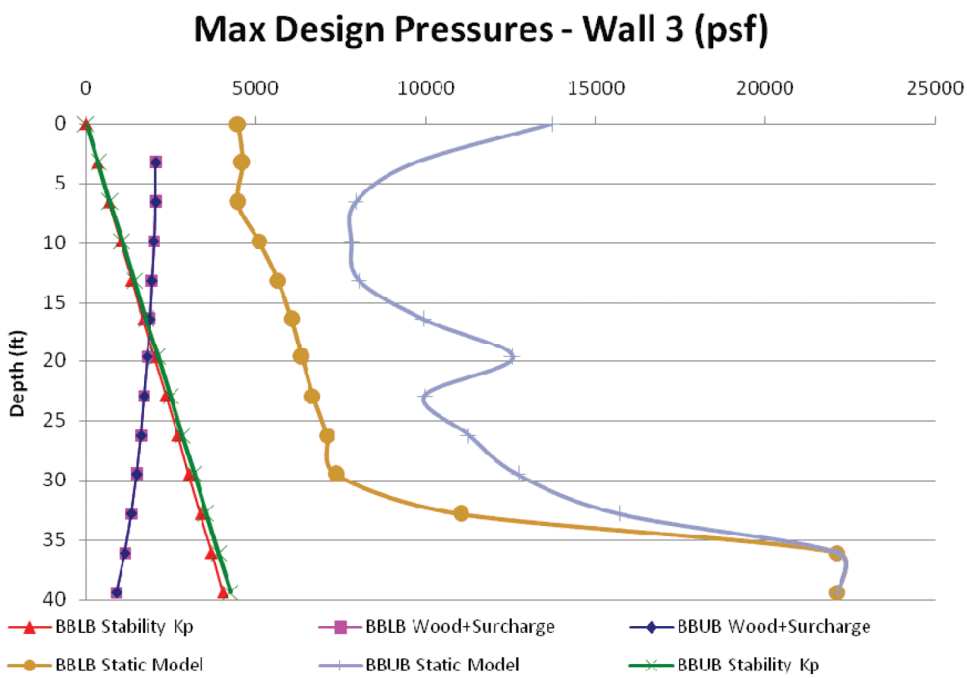

Figure 03.08.05-28-8—Wall 4 - Soil 1n2ue and 1n5ae (Cracked Concrete)

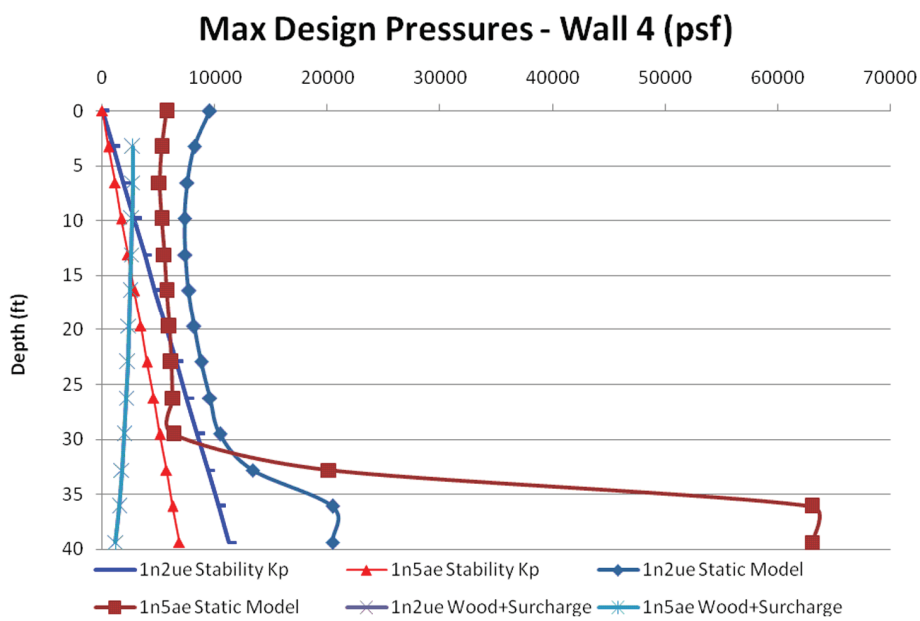

Figure 03.08.05-28-9—Wall 4 - Soil 2sn4ue, 4ue and hfbe (Cracked Concrete)

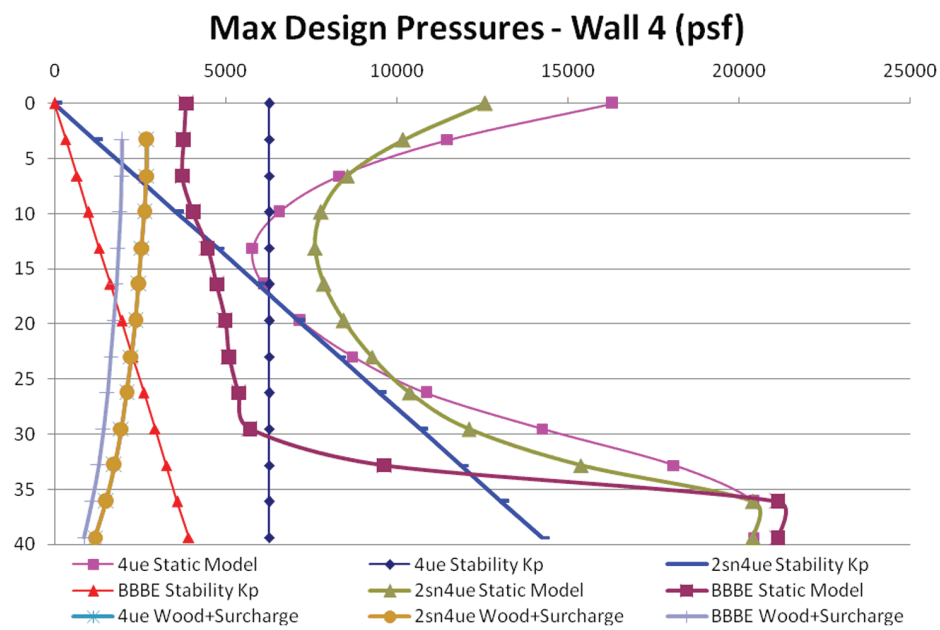

Figure 03.08.05-28-10—Wall 4 - Soil hflb and hfub (Cracked Concrete)

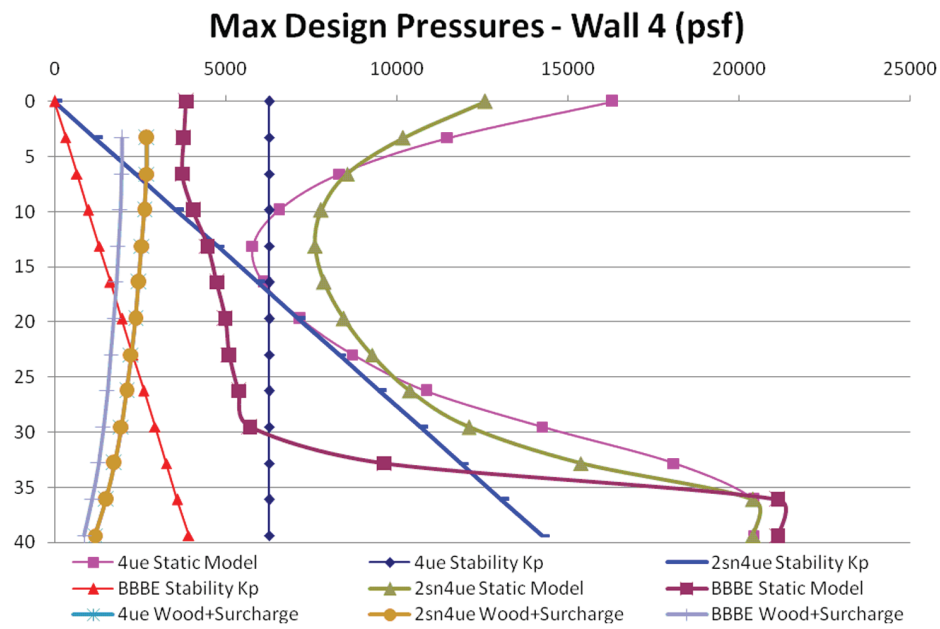

Figure 03.08.05-28-11—Wall 5 - Soil 1n2ue and 1n5ae (Cracked Concrete)

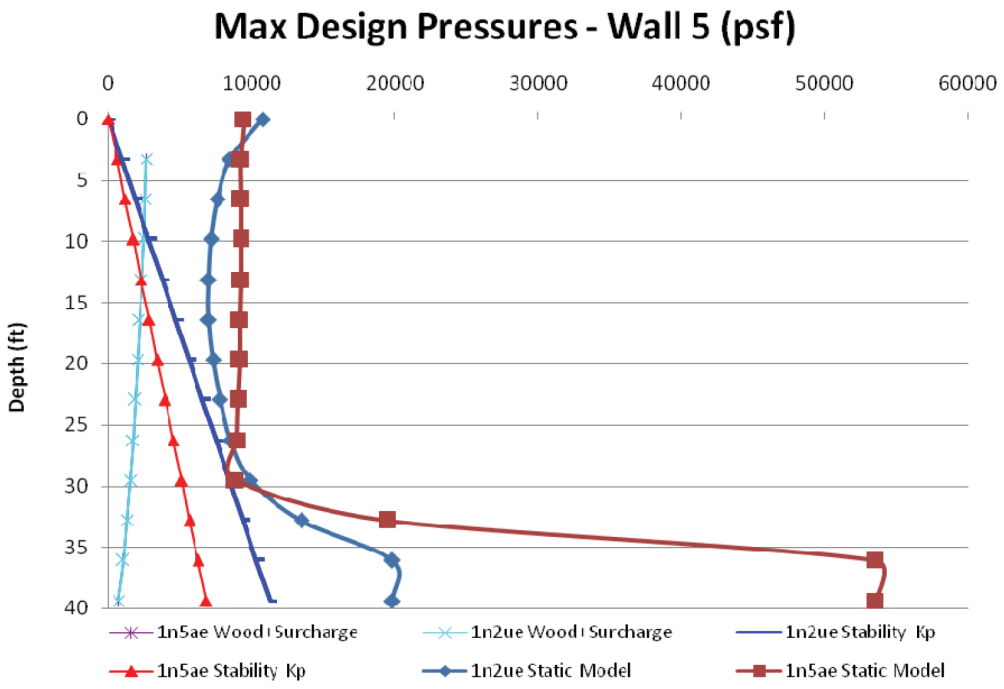

Figure 03.08.05-28-12—Wall 5 - Soil 2sn4ue, 4ue and hfbe (Cracked Concrete)

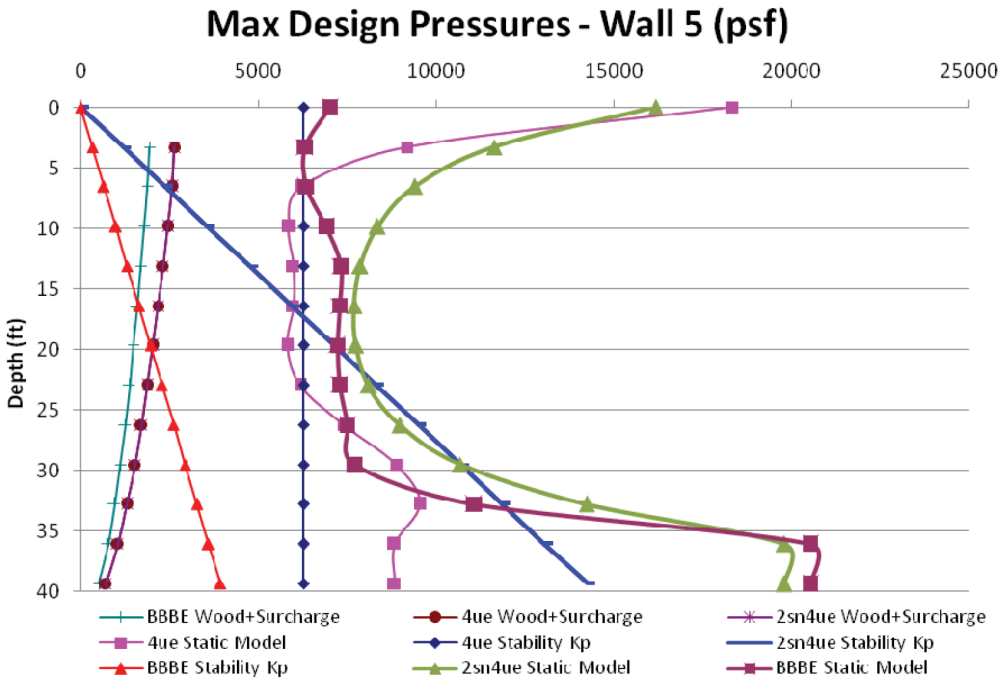

Figure 03.08.05-28-13—Wall 5 - Soil hflb and hfub (Cracked Concrete)

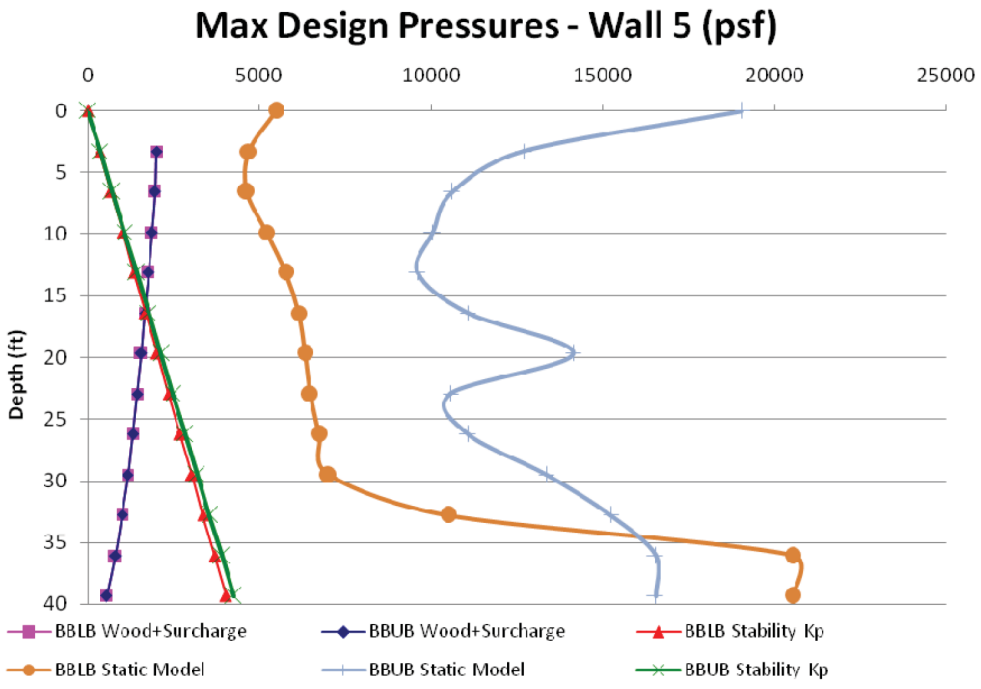

Figure 03.08.05-28-14—Wall 6 - Soil 1n2ue and 1n5ae (Cracked Concrete)

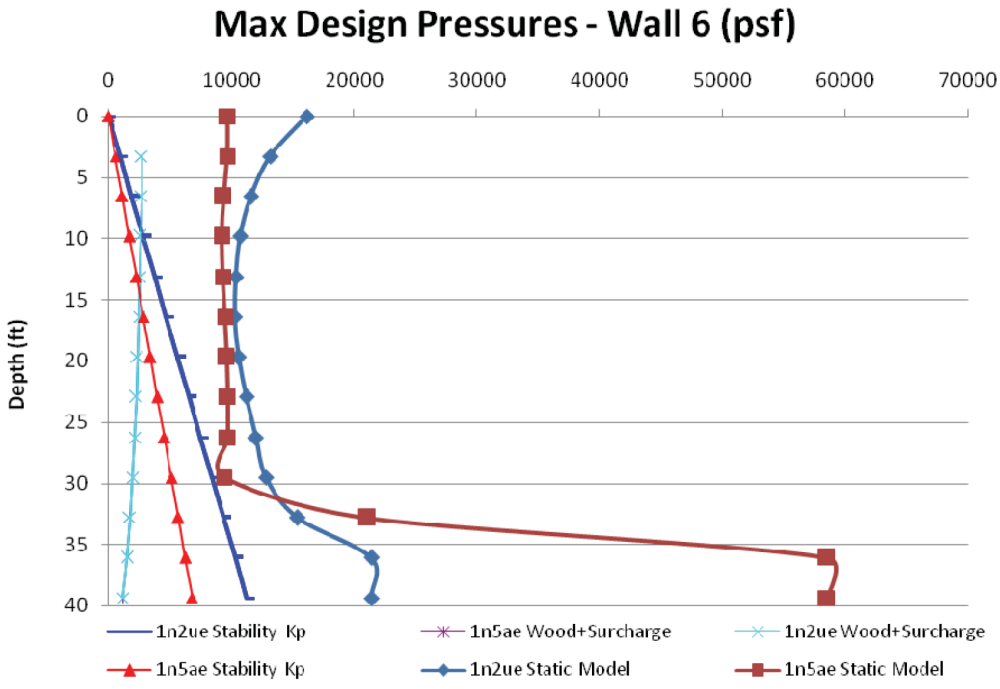

Figure 03.08.05-28-15—Wall 6 - Soil 2sn4ue, 4ue and hfbe (Cracked Concrete)

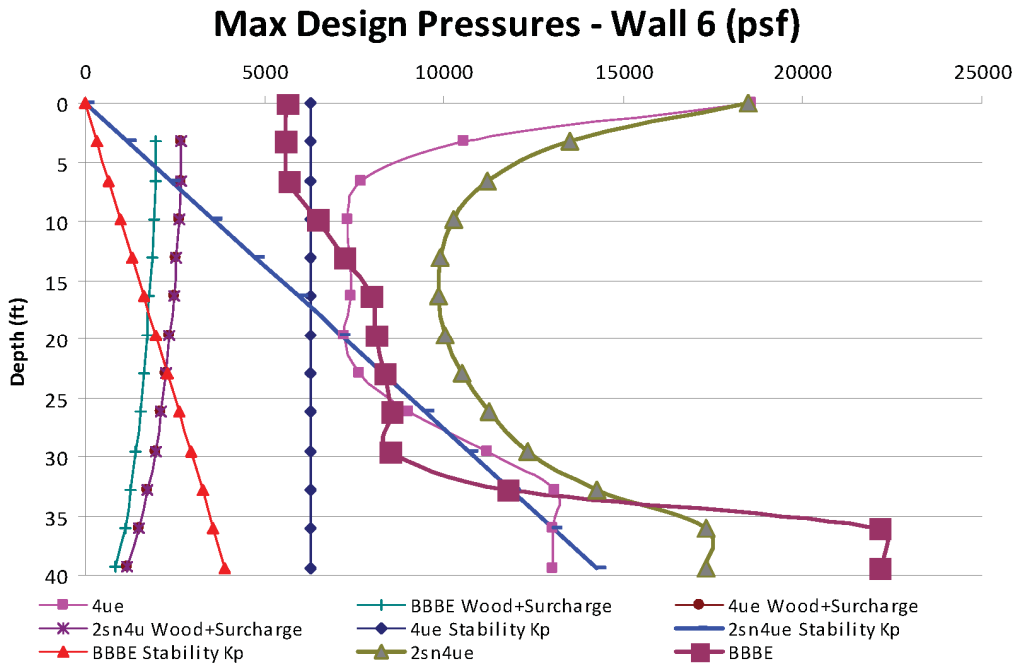

Figure 03.08.05-28-16—Wall 6 - Soil hflb and hfub (Cracked Concrete)

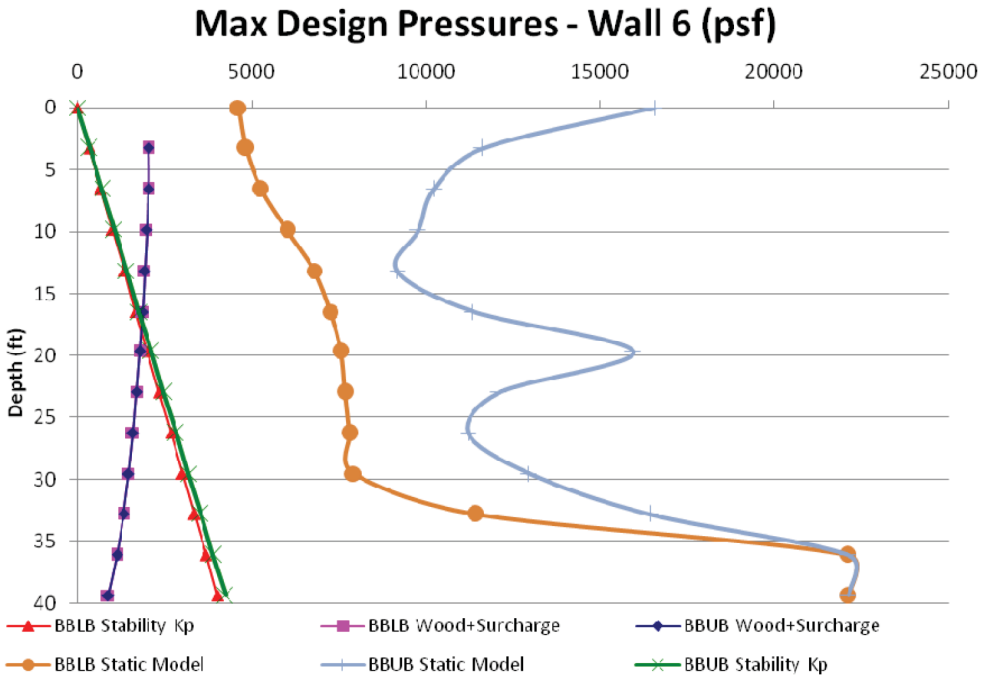

Figure 03.08.05-28-17—Wall 7 - Soil 1n2ue and 1n5ae (Cracked Concrete)

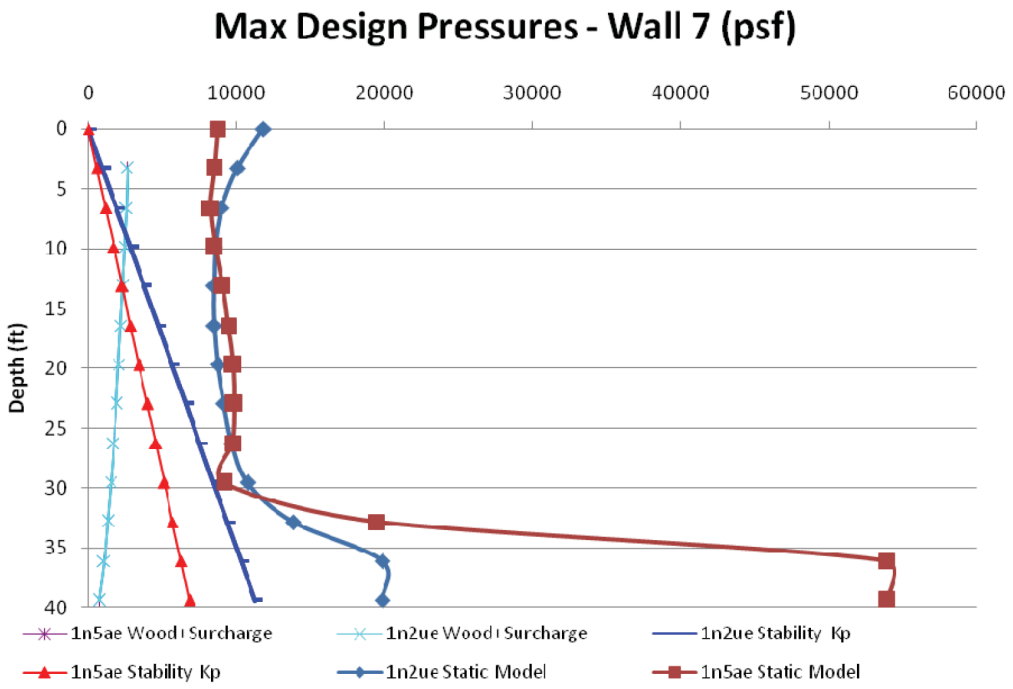

Figure 03.08.05-28-18—Wall 7 - Soil 2sn4ue, 4ue and hfbe (Cracked Concrete)

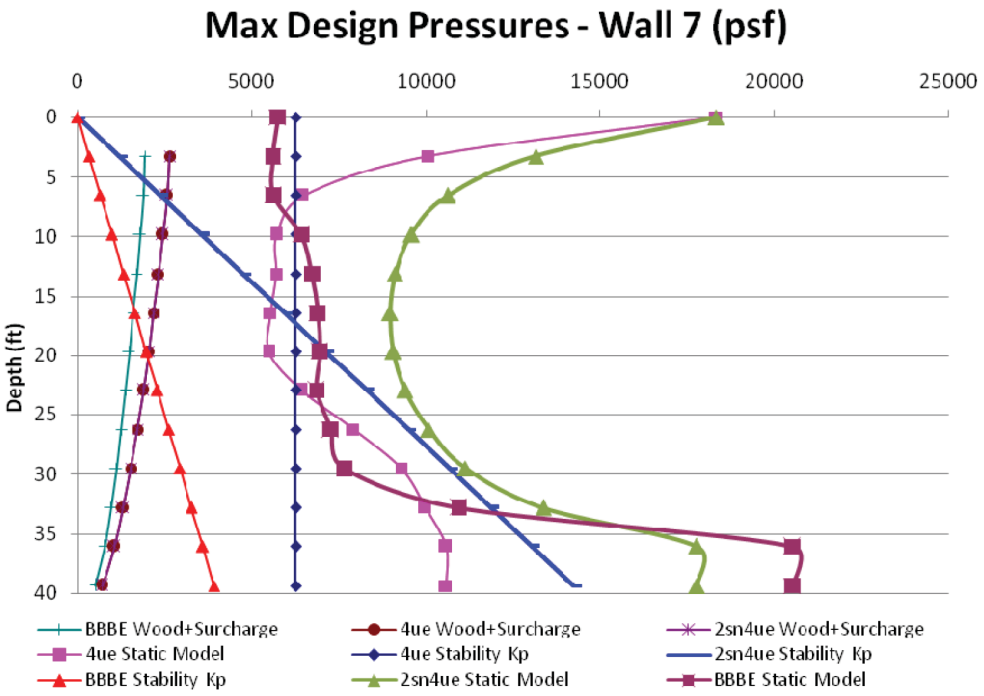

Figure 03.08.05-28-19—Wall 7 - Soil hflb and hfub (Cracked Concrete)

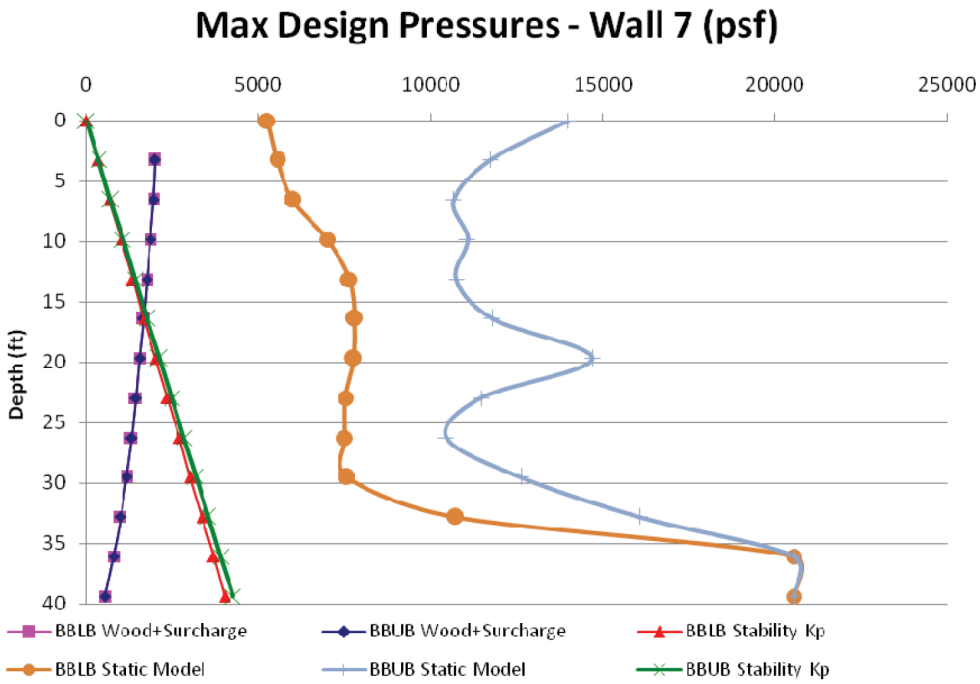

Figure 03.08.05-28-20—Wall 8 - Soil 1n2ue and 1n5ae (Cracked Concrete)

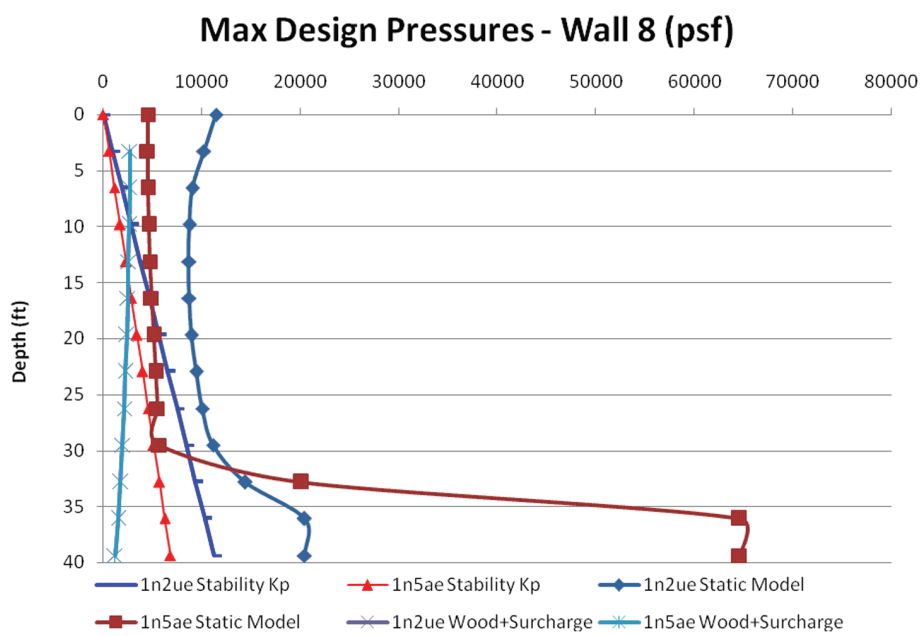

Figure 03.08.05-28-21—Wall 8 - Soil 2sn4ue, 4ue and hfbe (Cracked Concrete)

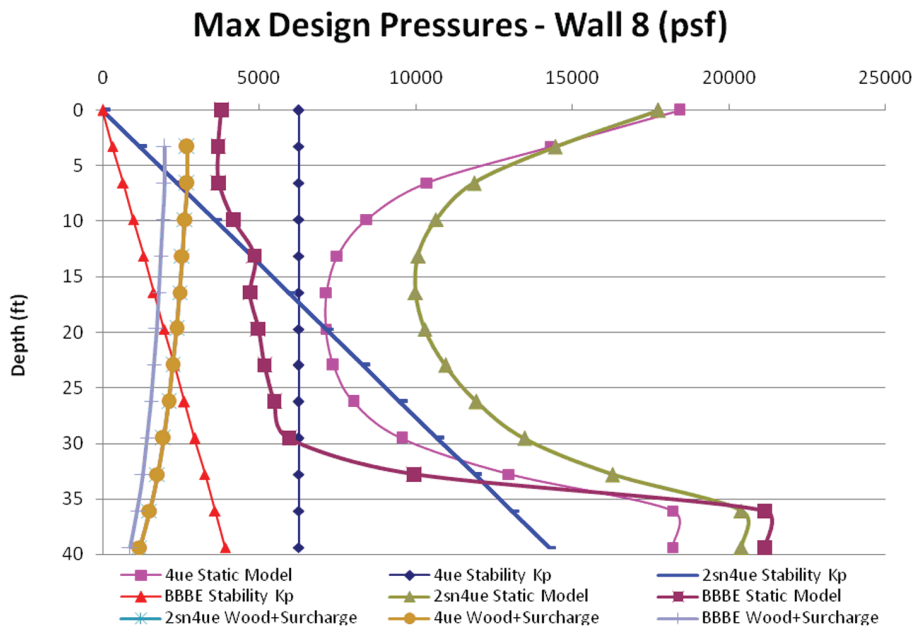
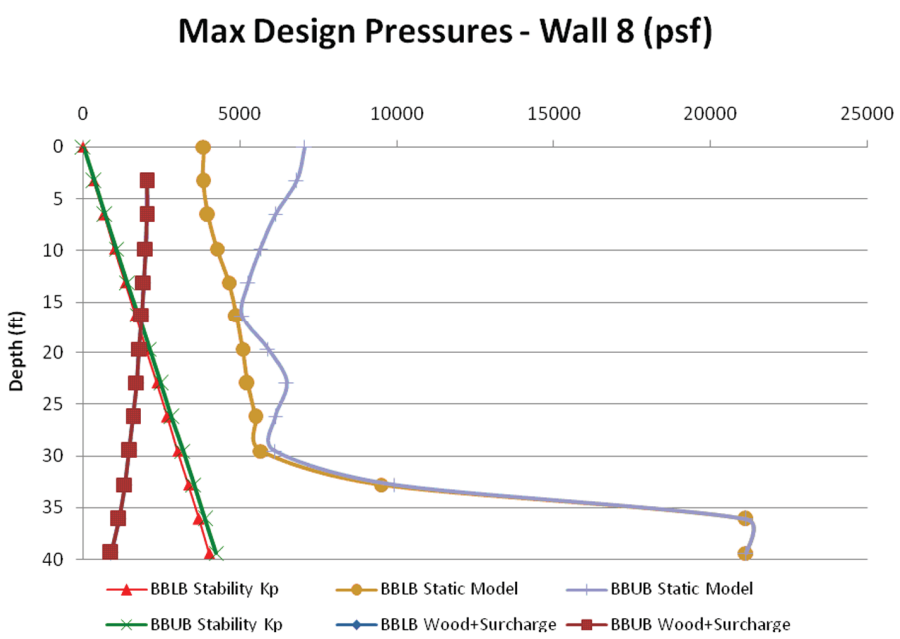
Figure 03.08.05-28-22—Wall 8 - Soil hflb and hfub (Cracked Concrete)