

## ArevaEPRDCPEm Resource

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**From:** WILLIFORD Dennis (AREVA) [Dennis.Williford@areva.com]  
**Sent:** Friday, February 15, 2013 1:42 PM  
**To:** Snyder, Amy  
**Cc:** Clark, Phyllis; DELANO Karen (AREVA); LEIGHLITER John (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA); WILLS Tiffany (AREVA); NOXON David (AREVA); PEREZ Pedro (AREVA); GORDON Darryl (AREVA); MCENTIRE John (AREVA)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 273, FSAR Ch 11, Supplement 17  
**Attachments:** RAI 273 Supplement 17 Response US EPR DC.pdf

Amy,

AREVA NP Inc. (AREVA NP) provided technically correct and complete responses to 10 of the 42 questions of RAI No. 273 on October 14, 2009. Supplement 1 to RAI No. 273 was sent on November 6, 2009 which responded to 17 of the 32 remaining questions and provided partial responses to 4 of the remaining 32.

AREVA NP provided Supplement 2 on November 25, 2009 and Supplement 3 on December 8, 2009 to revise the commitment date for 11 of the remaining questions. AREVA NP provided Supplement 4 on December 10, 2009 to provide responses to 11 of the 15 remaining questions with a schedule to provide an FSAR markup for 9 of the questions. AREVA NP provided Supplement 5 on March 31, 2010 to provide a technically correct and complete response to 1 of the 4 remaining questions and provide FSAR markups for 3 of the 9 FSAR Markups. Supplement 6 to RAI No. 273 was sent on May 19, 2009 which responded to 1 of the 3 remaining questions. RAI 273 Supplement 7 sent on July 29, 2010, Supplement 8 sent on October 1, 2010, Supplement 9 sent on October 28, 2010, Supplement 10 sent on December 17, 2011, Supplement 11 on January 21, 2011 and Supplement 12 on March 3, 2011 provided a revised schedule for the remaining FSAR markups and responses. Supplement 13, sent on April 11, 2011 provided a technically correct and complete response to 2 of the 2 remaining questions and a revised schedule for the remaining 6 FSAR Markups. Supplement 14 sent on June 10, 2011, and Supplement 15 sent on August 9, 2011 provided a revised schedule for the remaining FSAR markups. Supplement 16 to RAI No. 273 was sent on August 10, 2011 to provide technically correct and complete final FSAR markups for six questions (Questions 11.05-2, 11.05-5, 11.05-7, 11.05- 8, 11.05-9, and 11.05-10).

Additional conforming changes to the U.S. EPR FSAR were identified for consistency with the FSAR changes provided in the prior response to this question in RAI 273, Supplement 16, and to address minimization of contamination required by 10CFR 20.1406. Additionally, a correction in U.S. EPR FSAR Tier 2, Table 12.3-3 was identified in discussions with NRC staff which is provided in this updated response.

The attached file, "RAI 273 Supplement 17 Response US EPR DC.pdf" provides a technically correct and complete revised final response to Questions 11.05-2 and 11.05-05.

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 273 Questions 11.05-2 and 11.05-5.

The following table indicates the respective pages in the response document, "RAI 273 Supplement 17 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 273 — 11.05-2	2	3
RAI 273 — 11.05-5	4	6

This concludes the formal AREVA NP response to RAI 273, and there are no questions from this RAI for which AREVA NP has not provided responses.

Sincerely,

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

7207 IBM Drive, Mail Code CLT 2B  
Charlotte, NC 28262  
Phone: 704-805-2223  
Email: [Dennis.Williford@areva.com](mailto:Dennis.Williford@areva.com)

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**From:** WILLIFORD Dennis (RS/NB)  
**Sent:** Wednesday, August 10, 2011 4:36 PM  
**To:** Getachew.Tesfaye@nrc.gov  
**Cc:** BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); NOXON David (RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 273, FSAR Ch 11, Supplement 16

Getachew,

AREVA NP Inc. (AREVA NP) provided technically correct and complete responses to 10 of the 42 questions of RAI No. 273 on October 14, 2009. Supplement 1 to RAI No. 273 was sent on November 6, 2009 which responded to 17 of the 32 remaining questions and provided partial responses to 4 of the remaining 32.

AREVA NP provided Supplement 2 on November 25, 2009 and Supplement 3 on December 8, 2009 to revise the commitment date for 11 of the remaining questions. AREVA NP provided Supplement 4 on December 10, 2009 to provide responses to 11 of the 15 remaining questions with a schedule to provide an FSAR markup for 9 of the questions. AREVA NP provided Supplement 5 on March 31, 2010 to provide a technically correct and complete response to 1 of the 4 remaining questions and provide FSAR markups for 3 of the 9 FSAR Markups. Supplement 6 to RAI No. 273 was sent on May 19, 2009 which responded to 1 of the 3 remaining questions. RAI 273 Supplement 7 sent on July 29, 2010, Supplement 8 sent on October 1, 2010, Supplement 9 sent on October 28, 2010, Supplement 10 sent on December 17, 2011, Supplement 11 on January 21, 2011 and Supplement 12 on March 3, 2011 provided a revised schedule for the remaining FSAR markups and responses. Supplement 13, sent on April 11, 2011 provided a technically correct and complete response to 2 of the 2 remaining questions and a revised schedule for the remaining 6 FSAR Markups. Supplement 14 sent on June 10, 2011, and Supplement 15 sent on August 9, 2011 provided a revised schedule for the remaining FSAR markups. The attached file, "RAI 273 Supplement 16 Response US EPR DC.pdf" provides technically correct and complete FINAL FSAR markups to the six remaining 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 273 Questions 11.05-2, 11.05-5, 11.05-7, 11.05- 8, 11.05-9, and 11.05-10.

The following table indicates the respective pages in the response document, "RAI 273 Supplement 16 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 273 — 11.05-2	2	3
RAI 273 — 11.05-5	4	5
RAI 273 — 11.05-7	6	6
RAI 273 — 11.05-8	7	7
RAI 273 — 11.05-9	8	9
RAI 273 — 11.05-10	10	10

This concludes the formal AREVA NP response to RAI 273, and there are no questions from this RAI for which AREVA NP has not provided responses.

Sincerely,

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

7207 IBM Drive, Mail Code CLT 2B

Charlotte, NC 28262

Phone: 704-805-2223

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

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

**Sent:** Tuesday, August 09, 2011 6:35 PM

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

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

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 273, FSAR Ch 11, Supplement 15

Getachew,

AREVA NP Inc. (AREVA NP) provided technically correct and complete responses to 10 of the 42 questions of RAI No. 273 on October 14, 2009. Supplement 1 to RAI No. 273 was sent on November 6, 2009 which responded to 17 of the 32 remaining questions and provided partial responses to 4 of the remaining 32.

AREVA NP provided Supplement 2 on November 25, 2009 and Supplement 3 on December 8, 2009 to revise the commitment date for 11 of the remaining questions. AREVA NP provided Supplement 4 on December 10, 2009 to provide responses to 11 of the 15 remaining questions with a schedule to provide an FSAR markup for 9 of the questions. AREVA NP provided Supplement 5 on March 31, 2010 to provide a technically correct and complete response to 1 of the 4 remaining questions and provide FSAR markups for 3 of the 9 FSAR Markups. Supplement 6 to RAI No. 273 was sent on May 19, 2009 which responded to 1 of the 3 remaining questions. RAI 273 Supplement 7 sent on July 29, 2010, Supplement 8 sent on October 1, 2010, Supplement 9 sent on October 28, 2010, Supplement 10 sent on December 17, 2011, Supplement 11 on January 21, 2011 and Supplement 12 on March 3, 2011 provided a revised schedule for the remaining FSAR markups and responses. Supplement 13, sent on April 11, 2011 provided a technically correct and complete response to 2 of the 2 remaining questions and a revised schedule for the remaining 6 FSAR Markups. Supplement 14 sent on June 10, 2011 provided a revised schedule for the remaining FSAR markups.

The schedule for the FSAR markups for the 6 remaining questions is being revised as provided below:

Question #	Supplement Date (providing FSAR Markup)
RAI 273 — 11.05-2	<b>August 16, 2011</b>
RAI 273 — 11.05-5	<b>August 16, 2011</b>
RAI 273 — 11.05-7	<b>August 16, 2011</b>
RAI 273 — 11.05-8	<b>August 16, 2011</b>
RAI 273 — 11.05-9	<b>August 16, 2011</b>
RAI 273 — 11.05-10	<b>August 16, 2011</b>

Sincerely,

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

7207 IBM Drive, Mail Code CLT 2B

Charlotte, NC 28262  
Phone: 704-805-2223  
Email: [Dennis.Williford@areva.com](mailto:Dennis.Williford@areva.com)

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**From:** WILLIFORD Dennis (RS/NB)  
**Sent:** Friday, June 10, 2011 7:53 AM  
**To:** 'Tesfaye, Getachew'  
**Cc:** BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); NOXON David (RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 273, FSAR Ch 11, Supplement 14

Getachew,

AREVA NP Inc. (AREVA NP) provided technically correct and complete responses to 10 of the 42 questions of RAI No. 273 on October 14, 2009. Supplement 1 to RAI No. 273 was sent on November 6, 2009 which responded to 17 of the 32 remaining questions and provided partial responses to 4 of the remaining 32.

AREVA NP provided Supplement 2 on November 25, 2009 and Supplement 3 on December 8, 2009 to revise the commitment date for 11 of the remaining questions. AREVA NP provided Supplement 4 on December 10, 2009 to provide responses to 11 of the 15 remaining questions with a schedule to provide an FSAR markup for 9 of the questions. AREVA NP provided Supplement 5 on March 31, 2010 to provide a technically correct and complete response to 1 of the 4 remaining questions and provide FSAR markups for 3 of the 9 FSAR Markups. Supplement 6 to RAI No. 273 was sent on May 19, 2010 which responded to 1 of the 3 remaining questions. RAI 273 Supplement 7 sent on July 29, 2010, Supplement 8 sent on October 1, 2010, Supplement 9 sent on October 28, 2010, Supplement 10 sent on December 17, 2011, Supplement 11 sent on January 21, 2011 and Supplement 12 sent on March 3, 2011 provided a revised schedule for the remaining FSAR markups and responses. Supplement 13 sent on April 11, 2011 provided a technically correct and complete response to the 2 remaining questions and a revised schedule for the remaining 6 FSAR Markups.

The schedule for the FSAR markups for the 6 remaining questions is being revised as provided below:

<b>Question #</b>	<b>Supplement Date (providing FSAR Markup)</b>
RAI 273 — 11.05-2	August 9, 2011
RAI 273 — 11.05-5	August 9, 2011
RAI 273 — 11.05-7	August 9, 2011
RAI 273 — 11.05-8	August 9, 2011
RAI 273 — 11.05-9	August 9, 2011
RAI 273 — 11.05-10	August 9, 2011

Sincerely,

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

7207 IBM Drive, Mail Code CLT 2B  
Charlotte, NC 28262  
Phone: 704-805-2223  
Email: [Dennis.Williford@areva.com](mailto:Dennis.Williford@areva.com)

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**From:** WELLS Russell (RS/NB)  
**Sent:** Monday, April 11, 2011 2:08 PM

**To:** 'Getachew Tesfaye'

**Cc:** Michael. Miernicki@nrc.gov ([Michael.Miernicki@nrc.gov](mailto:Michael.Miernicki@nrc.gov)); NOXON David (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. 273, FSAR Ch 11, Supplement 13

Getachew,

AREVA NP Inc. (AREVA NP) provided technically correct and complete responses to 10 of the 42 questions of RAI No. 273 on October 14, 2009. Supplement 1 to RAI No. 273 was sent on November 6, 2009 which responded to 17 of the 32 remaining questions and provided partial responses to 4 of the remaining 32.

AREVA NP provided Supplement 2 on November 25, 2009 and Supplement 3 on December 8, 2009 to revise the commitment date for 11 of the remaining questions. AREVA NP provided Supplement 4 on December 10, 2009 to provide responses to 11 of the 15 remaining questions with a schedule to provide an FSAR markup for 9 of the questions. AREVA NP provided Supplement 5 on March 31, 2010 to provide a technically correct and complete response to 1 of the 4 remaining questions and provide FSAR markups for 3 of the 9 FSAR Markups. Supplement 6 to RAI No. 273 was sent on May 19, 2009 which responded to 1 of the 3 remaining questions. RAI 273 Supplement 7 sent on July 29, 2010, Supplement 8 sent on October 1, 2010, Supplement 9 sent on October 28, 2010, Supplement 10 sent on December 17, 2011, Supplement 11 on January 21, 2011 and Supplement 12 on March 3, 2011 provided a revised schedule for the remaining FSAR markups and responses. The attached file, "RAI 273 Supplement 13 Response US EPR DC.pdf," provides a technically correct and complete response to 2 of the 2 remaining questions. A revised schedule is provided for the remaining 6 FSAR Markups.

The following table indicates the respective pages in the response document, "RAI 273 Supplement 13 Response US EPR DC.pdf," that contain AREVA NP's responses to the subject questions.

Question #	Start Page	End Page
RAI 273 — 11.02-14	2	2
RAI 273 — 11.03-12	3	3

The schedule for the FSAR markups for the 6 remaining questions is being revised to allow more time to interact with the NRC. The revised schedule for the remaining 6 FSAR markups is provided below:

Question #	Supplement Date (providing FSAR Markup)
RAI 273 — 11.05-2	June 10, 2011
RAI 273 — 11.05-5	June 10, 2011
RAI 273 — 11.05-7	June 10, 2011
RAI 273 — 11.05-8	June 10, 2011
RAI 273 — 11.05-9	June 10, 2011
RAI 273 — 11.05-10	June 10, 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)*

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**From:** WELLS Russell (RS/NB)  
**Sent:** Thursday, March 03, 2011 9:11 AM  
**To:** 'Tefaye, Getachew'  
**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); NOXON David (RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 273, FSAR Ch 11, Supplement 12

Getachew,

AREVA NP Inc. (AREVA NP) provided technically correct and complete responses to 10 of the 42 questions of RAI No. 273 on October 14, 2009. Supplement 1 to RAI No. 273 was sent on November 6, 2009 which responded to 17 of the 32 remaining questions and provided partial responses to 4 of the remaining 32.

AREVA NP provided Supplement 2 on November 25, 2009 and Supplement 3 on December 8, 2009 to revise the commitment date for 11 of the remaining questions. AREVA NP provided Supplement 4 on December 10, 2009 to provide responses to 11 of the 15 remaining questions with a schedule to provide an FSAR markup for 9 of the questions. AREVA NP provided Supplement 5 on March 31, 2010 to provide a technically correct and complete response to 1 of the 4 remaining questions and provide FSAR markups for 3 of the 9 FSAR Markups. Supplement 6 to RAI No. 273 was sent on May 19, 2009 which responded to 1 of the 3 remaining questions. RAI 273 Supplement 7 sent on July 29, 2010, Supplement 8 sent on October 1, 2010, Supplement 9 sent on October 28, 2010, Supplement 10 sent on December 17, 2011 and Supplement 11 on January 21, 2011 provided a revised schedule for the remaining FSAR markups and responses.

The schedule for the FSAR markups for the 6 remaining questions is being revised to allow more time to interact with the NRC. The revised schedule for the remaining 6 FSAR markups is provided below:

<b>Question #</b>	<b>Supplement Date (providing FSAR Markup)</b>
RAI 273 — 11.05-2	April 14, 2011
RAI 273 — 11.05-5	April 14, 2011
RAI 273 — 11.05-7	April 14, 2011
RAI 273 — 11.05-8	April 14, 2011
RAI 273 — 11.05-9	April 14, 2011
RAI 273 — 11.05-10	April 14, 2011

The schedule for a technically correct and complete response to the remaining 2 questions is being revised to allow more time to interact with the NRC. The revised schedule for the responses to the remaining 2 questions is provided below:

<b>Question #</b>	<b>Response Date</b>
RAI 273 — 11.02-14	April 14, 2011
RAI 273 — 11.03-12	April 14, 2011

*Sincerely,*

*Russ Wells*

*U.S. EPR Design Certification Licensing Manager*

*AREVA NP, Inc.*

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

Mail Stop OF-57

Lynchburg, VA 24506-0935

Phone: 434-832-3884 (work)

434-942-6375 (cell)

Fax: 434-382-3884

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

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

**Sent:** Friday, January 21, 2011 8:23 AM

**To:** 'Tesfaye, Getachew'

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

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 273, FSAR Ch 11, Supplement 11

Getachew,

AREVA NP Inc. (AREVA NP) provided technically correct and complete responses to 10 of the 42 questions of RAI No. 273 on October 14, 2009. Supplement 1 to RAI No. 273 was sent on November 6, 2009 which responded to 17 of the 32 remaining questions and provided partial responses to 4 of the remaining 32.

AREVA NP provided Supplement 2 on November 25, 2009 and Supplement 3 on December 8, 2009 to revise the commitment date for 11 of the remaining questions. AREVA NP provided Supplement 4 on December 10, 2009 to provide responses to 11 of the 15 remaining questions with a schedule to provide an FSAR markup for 9 of the questions. AREVA NP provided Supplement 5 on March 31, 2010 to provide a technically correct and complete response to 1 of the 4 remaining questions and provide FSAR markups for 3 of the 9 FSAR Markups. Supplement 6 to RAI No. 273 was sent on May 19, 2009 which responded to 1 of the 3 remaining questions. RAI 273 Supplement 7 sent on July 29, 2010, Supplement 8 sent on October 1, 2010, Supplement 9 sent on October 28, 2010 and Supplement 10 sent on December 17, 2011 provided a revised schedule for the remaining FSAR markups and responses.

The schedule for the FSAR markups for the 6 remaining questions is being revised to allow more time to interact with the NRC. The revised schedule for the remaining 6 FSAR markups is provided below:

Question #	Supplement Date (providing FSAR Markup)
RAI 273 — 11.05-2	March 3, 2011
RAI 273 — 11.05-5	March 3, 2011
RAI 273 — 11.05-7	March 3, 2011
RAI 273 — 11.05-8	March 3, 2011
RAI 273 — 11.05-9	March 3, 2011
RAI 273 — 11.05-10	March 3, 2011

The schedule for a technically correct and complete response to the remaining 2 questions is being revised to allow more time to interact with the NRC. The revised schedule for the responses to the remaining 2 questions is provided below:

Question #	Response Date
RAI 273 — 11.02-14	March 3, 2011
RAI 273 — 11.03-12	March 3, 2011

Sincerely,

Martin (Marty) C. Bryan

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

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**From:** BRYAN Martin (External RS/NB)  
**Sent:** Friday, December 17, 2010 9:51 AM  
**To:** Tesfaye, Getachew  
**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); NOXON David (RS/NB); 'Carneal, Jason'  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 273, FSAR Ch 11, Supplement 10

Getachew,

AREVA NP Inc. (AREVA NP) provided technically correct and complete responses to 10 of the 42 questions of RAI No. 273 on October 14, 2009. Supplement 1 to RAI No. 273 was sent on November 6, 2009 which responded to 17 of the 32 remaining questions and provided partial responses to 4 of the remaining 32.

AREVA NP provided Supplement 2 on November 25, 2009 and Supplement 3 on December 8, 2009 to revise the commitment date for 11 of the remaining questions. AREVA NP provided Supplement 4 on December 10, 2009 to provide responses to 11 of the 15 remaining questions with a schedule to provide an FSAR markup for 9 of the questions. AREVA NP provided Supplement 5 on March 31, 2010 to provide a technically correct and complete response to 1 of the 4 remaining questions and provide FSAR markups for 3 of the 9 FSAR Markups. Supplement 6 to RAI No. 273 was sent on May 19, 2009 which responded to 1 of the 3 remaining questions. RAI 273 Supplement 7 sent on July 29, 2010, Supplement 8 sent on October 1, 2010 and Supplement 9 sent on October 28, 2010 provided a revised schedule for the remaining FSAR markups and responses.

The schedule for the FSAR markups for the 6 remaining questions is being revised to allow more time to interact with the NRC. The revised schedule for the remaining 6 FSAR markups is provided below:

Question #	Supplement Date (providing FSAR Markup)
RAI 273 — 11.05-2	January 21, 2011
RAI 273 — 11.05-5	January 21, 2011
RAI 273 — 11.05-7	January 21, 2011
RAI 273 — 11.05-8	January 21, 2011
RAI 273 — 11.05-9	January 21, 2011
RAI 273 — 11.05-10	January 21, 2011

The schedule for a technically correct and complete response to the remaining 2 questions is being revised to allow more time to interact with the NRC. The revised schedule for the responses to the remaining 2 questions is provided below:

Question #	Response Date
RAI 273 — 11.02-14	January 21, 2011
RAI 273 — 11.03-12	January 21, 2011

Sincerely,

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



AREVA NP Inc.  
Tel: (434) 832-3016  
702 561-3528 cell  
[Martin.Bryan.ext@areva.com](mailto:Martin.Bryan.ext@areva.com)

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**From:** BRYAN Martin (External RS/NB)  
**Sent:** Thursday, October 28, 2010 2:23 PM  
**To:** 'Tesfaye, Getachew'  
**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); NOXON David (RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 273, FSAR Ch 11, Supplement 9

Getachew,

AREVA NP Inc. (AREVA NP) provided technically correct and complete responses to 10 of the 42 questions of RAI No. 273 on October 14, 2009. Supplement 1 to RAI No. 273 was sent on November 6, 2009 which responded to 17 of the 32 remaining questions and provided partial responses to 4 of the remaining 32.

AREVA NP provided Supplement 2 on November 25, 2009 and Supplement 3 on December 8, 2009 to revise the commitment date for 11 of the remaining questions. AREVA NP provided Supplement 4 on December 10, 2009 to provide responses to 11 of the 15 remaining questions with a schedule to provide an FSAR markup for 9 of the questions. AREVA NP provided Supplement 5 on March 31, 2010 to provide a technically correct and complete response to 1 of the 4 remaining questions and provide FSAR markups for 3 of the 9 FSAR Markups. Supplement 6 to RAI No. 273 was sent on May 19, 2009 which responded to 1 of the 3 remaining questions. RAI 273 Supplement 7 sent on July 29, 2010 and Supplement 8 sent on October 1, 2010 provided a revised schedule for the remaining FSAR markups and responses.

The schedule for the FSAR markups for the 6 remaining questions is being revised to allow more time to interact with the NRC. The revised schedule for the remaining 6 FSAR markups is provided below:

<b>Question #</b>	<b>Supplement Date (providing FSAR Markup)</b>
RAI 273 — 11.05-2	December 17, 2010
RAI 273 — 11.05-5	December 17, 2010
RAI 273 — 11.05-7	December 17, 2010
RAI 273 — 11.05-8	December 17, 2010
RAI 273 — 11.05-9	December 17, 2010
RAI 273 — 11.05-10	December 17, 2010

The schedule for a technically correct and complete response to the remaining 2 questions is being revised to allow more time to interact with the NRC. The revised schedule for the responses to the remaining 2 questions is provided below:

<b>Question #</b>	<b>Response Date</b>
RAI 273 — 11.02-14	December 17, 2010
RAI 273 — 11.03-12	December 17, 2010

Sincerely,

Martin (Marty) C. Bryan  
U.S. EPR Design Certification Licensing Manager  
AREVA NP Inc.  
Tel: (434) 832-3016  
702 561-3528 cell

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**From:** BRYAN Martin (External RS/NB)  
**Sent:** Friday, October 01, 2010 3:20 PM  
**To:** 'Tesfaye, Getachew'  
**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); NOXON David (RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 273, FSAR Ch 11, Supplement 8

Getachew,

AREVA NP Inc. (AREVA NP) provided technically correct and complete responses to 10 of the 42 questions of RAI No. 273 on October 14, 2009. Supplement 1 to RAI No. 273 was sent on November 6, 2009 which responded to 17 of the 32 remaining questions and provided partial responses to 4 of the remaining 32.

AREVA NP provided Supplement 2 on November 25, 2009 and Supplement 3 on December 8, 2009 to revise the commitment date for 11 of the remaining questions. AREVA NP provided Supplement 4 on December 10, 2009 to provide responses to 11 of the 15 remaining questions with a schedule to provide an FSAR markup for 9 of the questions. AREVA NP provided Supplement 5 on March 31, 2010 to provide a technically correct and complete response to 1 of the 4 remaining questions and provide FSAR markups for 3 of the 9 FSAR Markups. Supplement 6 to RAI No. 273 was sent on May 19, 2009 which responded to 1 of the 3 remaining questions. Supplement 7 to RAI 273 was sent on July 29, 2010 to provide a revised schedule for the remaining FSAR markups and responses.

The schedule for the FSAR markups for the 6 remaining questions is being revised to allow more time to interact with the NRC. The revised schedule for the remaining 6 FSAR markups is provided below:

Question #	Supplement Date (providing FSAR Markup)
RAI 273 — 11.05-2	November 1, 2010
RAI 273 — 11.05-5	November 1, 2010
RAI 273 — 11.05-7	November 1, 2010
RAI 273 — 11.05-8	November 1, 2010
RAI 273 — 11.05-9	November 1, 2010
RAI 273 — 11.05-10	November 1, 2010

The schedule for a technically correct and complete response to the remaining 2 questions is being revised to allow more time to interact with the NRC. The revised schedule for the responses to the remaining 2 questions is provided below:

Question #	Response Date
RAI 273 — 11.02-14	November 1, 2010
RAI 273 — 11.03-12	November 1, 2010

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

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**From:** BRYAN Martin (EXT)  
**Sent:** Thursday, July 29, 2010 3:45 PM

**To:** 'Tesfaye, Getachew'

**Cc:** DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); NOXON David B (AREVA NP INC)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 273, FSAR Ch 11, Supplement 7

Getachew,

AREVA NP Inc. (AREVA NP) provided technically correct and complete responses to 10 of the 42 questions of RAI No. 273 on October 14, 2009. Supplement 1 to RAI No. 273 was sent on November 6, 2009 which responded to 17 of the 32 remaining questions and provided partial responses to 4 of the remaining 32.

AREVA NP provided Supplement 2 on November 25, 2009 and Supplement 3 on December 8, 2009 to revise the commitment date for 11 of the remaining questions. AREVA NP provided Supplement 4 on December 10, 2009 to provide responses to 11 of the 15 remaining questions with a schedule to provide an FSAR markup for 9 of the questions. AREVA NP provided Supplement 5 on March 31, 2010 to provide a technically correct and complete response to 1 of the 4 remaining questions and provide FSAR markups for 3 of the 9 FSAR Markups. Supplement 6 to RAI No. 273 was sent on May 19, 2009 which responded to 1 of the 3 remaining questions.

Based on the need for more time to incorporate NRC comments, a complete FSAR markup is not provided for 6 of the questions scheduled for July 29, 2010. The revised schedule for the remaining 6 FSAR markups is provided below:

<b>Question #</b>	<b>Supplement Date (providing FSAR Markup)</b>
RAI 273 — 11.05-2	October 1, 2010
RAI 273 — 11.05-5	October 1, 2010
RAI 273 — 11.05-7	October 1, 2010
RAI 273 — 11.05-8	October 1, 2010
RAI 273 — 11.05-9	October 1, 2010
RAI 273 — 11.05-10	October 1, 2010

The schedule for a technically correct and complete response to the remaining 2 questions is being revised based on the need for more time to incorporate NRC comments. The revised schedule for the responses to the remaining 2 questions is provided below:

<b>Question #</b>	<b>Response Date</b>
RAI 273 — 11.02-14	October 1, 2010
RAI 273 — 11.03-12	October 1, 2010

Sincerely,

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

---

**From:** BRYAN Martin (EXT)

**Sent:** Wednesday, May 19, 2010 3:08 PM

**To:** Tesfaye, Getachew

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

NOXON David B (AREVA NP INC)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 273, FSAR Ch 11, Supplement 6

Getachew,

AREVA NP Inc. (AREVA NP) provided technically correct and complete responses to 10 of the 42 questions of RAI No. 273 on October 14, 2009. Supplement 1 to RAI No. 273 was sent on November 6, 2009 which responded to 17 of the 32 remaining questions and provided partial responses to 4 of the remaining 32.

AREVA NP provided Supplement 2 on November 25, 2009 and Supplement 3 on December 8, 2009 to revise the commitment date for 11 of the remaining questions. AREVA NP provided Supplement 4 on December 10, 2009 to provide responses to 11 of the 15 remaining questions with a schedule to provide an FSAR markup for 9 of the questions. AREVA NP provided Supplement 5 on March 31, 2010 to provide a technically correct and complete response to 1 of the 4 remaining questions and provide FSAR markups for 3 of the 9 FSAR Markups. The attached file, "RAI 273 Supplement 6 Response US EPR DC.pdf," provides a technically correct and complete response to 1 of the 3 remaining questions. A revised schedule is provided for the remaining 6 FSAR Markups.

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 273 Question 11.04 -15.

The following table indicates the respective pages in the response document, "RAI 273 Supplement 6 Response US EPR DC.pdf," that contain AREVA NP's responses to the subject questions.

<b>Question #</b>	<b>Start Page</b>	<b>End Page</b>
RAI 273 — 11.04-15	1	3

Based on the April 22 and 23, 2010 Chapter 11 audit, a complete FSAR markup is not provided for 6 of the questions as originally scheduled for May 19, 2010. The revised schedule for the remaining 6 FSAR markups is provided below:

<b>Question #</b>	<b>Supplement Date (providing FSAR Markup)</b>
RAI 273 — 11.05-2	July 29, 2010
RAI 273 — 11.05-5	July 29, 2010
RAI 273 — 11.05-7	July 29, 2010
RAI 273 — 11.05-8	July 29, 2010
RAI 273 — 11.05-9	July 29, 2010
RAI 273 — 11.05-10	July 29, 2010

The schedule for a technically correct and complete response to the remaining 2 questions is revised based on the April 22 and 23, 2010 Chapter 11 audit and is provided below.

<b>Question #</b>	<b>Response Date</b>
RAI 273 — 11.02-14	July 29, 2010
RAI 273 — 11.03-12	July 29, 2010

Sincerely,

Martin (Marty) C. Bryan  
U.S. EPR Design Certification Licensing Manager  
AREVA NP Inc.  
Tel: (434) 832-3016  
702 561-3528 cell

---

**From:** BRYAN Martin (EXT)  
**Sent:** Wednesday, March 31, 2010 4:36 PM  
**To:** 'Tsfaye, Getachew'  
**Cc:** DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); NOXON David B (AREVA NP INC)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 273, FSAR Ch 11, Supplement 5

Getachew,

AREVA NP Inc. (AREVA NP) provided technically correct and complete responses to 10 of the 42 questions of RAI No. 273 on October 14, 2009. Supplement 1 to RAI No. 273 was sent on November 6, 2009 which responded to 17 of the 32 remaining questions and provided partial responses to 4 of the remaining 32. AREVA NP provided Supplement 2 on November 25, 2009 and Supplement 3 on December 8, 2009 to revise the commitment date for 11 of the remaining questions. AREVA NP provided Supplement 4 on December 10, 2009 to provide response to 11 of the 15 remaining questions with a schedule to provide an FSAR markup for 9 of the questions. The attached file, "RAI 273 Supplement 5 Response US EPR DC.pdf," provides a technically correct and complete response to 1 of the 4 remaining questions and provides FSAR markups for 3 of the 9 questions.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the responses to RAI 273 Questions 11.03 -13, 11.05-01, 11.05 -04, and 11.05-6.

The following table indicates the respective pages in the response document, "RAI 273 Supplement 5 Response US EPR DC.pdf," that contain AREVA NP's responses to the subject questions.

Question #	Start Page	End Page
RAI 273 — 11.03-13	2	3
RAI 273 — 11.05-1	4	4
RAI 273 — 11.05-4	5	5
RAI 273 — 11.05-6	6	6

Based on additional time needed to update engineering source documents, a complete FSAR markup is not provided for 6 of the questions as originally scheduled for March 31, 2010. The revised schedule for the remaining 6 FSAR markups is provided below:

Question #	Supplement Date (providing FSAR Markup)
RAI 273 — 11.05-2	May 19, 2010
RAI 273 — 11.05-5	May 19, 2010
RAI 273 — 11.05-7	May 19, 2010
RAI 273 — 11.05-8	May 19, 2010
RAI 273 — 11.05-9	May 19, 2010
RAI 273 — 11.05-10	May 19, 2010

The schedule for a technically correct and complete response to the remaining 3 questions is revised based on the March 24, 2010 Chapter 11 audit and is provided below.

Question #	Response Date
RAI 273 — 11.02-14	May 19, 2010
RAI 273 — 11.03-12	May 19, 2010

Sincerely,

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

---

**From:** Pederson Ronda M (AREVA NP INC)  
**Sent:** Thursday, December 10, 2009 6:29 PM  
**To:** 'Tesyfaye, Getachew'  
**Cc:** BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); NOXON David B (AREVA NP INC); WILLIFORD Dennis C (AREVA NP INC)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 273, FSAR Ch 11, Supplement 4

Getachew,

AREVA NP Inc. (AREVA NP) provided technically correct and complete responses to 10 of the 42 questions of RAI No. 273 on October 14, 2009. Supplement 1 to RAI No. 273 was sent on November 6, 2009 which responded to 17 of the 32 remaining questions and provided partial responses to 4 of the remaining 32. Supplements 2 and Supplement 3 on revised the commitment date for 11 of the remaining questions. The attached file, "RAI 273 Supplement 4 Response US EPR DC.pdf," provides a technically correct and complete response to 11 of the 15 remaining 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 273 Questions 11.05 -06, 11.06-07, 11.05 -08, 11.06-09, 11.05 -10, 11.06-11, and 11.06-12.

A complete FSAR markup is not provided for the RAI 273 questions. As agreed by NRC staff during an FSAR Chapter 11 audit on October 7, 2009, FSAR markups may be submitted after Phase 2 completion to support Staff review to close confirmatory items. Therefore, a complete FSAR markup for the RAI 273 questions will be provided as indicated in the following table:

Question #	Supplement Date (providing FSAR Markup)
RAI 273 — 11.05-1	March 31, 2010
RAI 273 — 11.05-2	March 31, 2010
RAI 273 — 11.05-4	March 31, 2010
RAI 273 — 11.05-5	March 31, 2010
RAI 273 — 11.05-6	March 31, 2010
RAI 273 — 11.05-7	March 31, 2010
RAI 273 — 11.05-8	March 31, 2010
RAI 273 — 11.05-9	March 31, 2010
RAI 273 — 11.05-10	March 31, 2010

The following table indicates the respective pages in the response document, "RAI 273 Supplement 4 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
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RAI 273 — 11.05-1	2	2
RAI 273 — 11.05-2	3	6
RAI 273 — 11.05-4	7	8
RAI 273 — 11.05-5	9	16
RAI 273 — 11.05-6	17	19
RAI 273 — 11.05-7	20	21
RAI 273 — 11.05-8	22	23
RAI 273 — 11.05-9	24	26
RAI 273 — 11.05-10	27	27
RAI 273 — 11.05-11	28	30
RAI 273 — 11.05-12	31	31

The schedule for a technically correct and complete response to the remaining 4 questions is unchanged and provided below.

Question #	Response Date
RAI 273 — 11.02-14	March 31, 2010
RAI 273 — 11.03-12	March 31, 2010
RAI 273 — 11.03-13	March 31, 2010
RAI 273 — 11.04-15	March 31, 2010

Sincerely,

*Ronda Pederson*

[ronda.pederson@areva.com](mailto:ronda.pederson@areva.com)

Licensing Manager, U.S. EPR Design Certification

**AREVA NP Inc.**

An AREVA and Siemens company

3315 Old Forest Road

Lynchburg, VA 24506-0935

Phone: 434-832-3694

Cell: 434-841-8788

---

**From:** Pederson Ronda M (AREVA NP INC)

**Sent:** Tuesday, December 08, 2009 6:22 PM

**To:** 'Tefsaye, Getachew'

**Cc:** BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); NOXON David B (AREVA NP INC)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 273, FSAR Ch 11, Supplement 3

Getachew,

AREVA NP is unable to provide a technically correct and complete response to the 11 remaining questions for RAI 273 today, as committed, and a revised schedule for a technically correct and complete response to the remaining questions is provided below.

Question #	Response Date
RAI 273 — 11.05-1	<b>December 11, 2009</b>
RAI 273 — 11.05-2	<b>December 11, 2009</b>

RAI 273 — 11.05-4	<b>December 11, 2009</b>
RAI 273 — 11.05-5	<b>December 11, 2009</b>
RAI 273 — 11.05-6	<b>December 11, 2009</b>
RAI 273 — 11.05-7	<b>December 11, 2009</b>
RAI 273 — 11.05-8	<b>December 11, 2009</b>
RAI 273 — 11.05-9	<b>December 11, 2009</b>
RAI 273 — 11.05-10	<b>December 11, 2009</b>
RAI 273 — 11.05-11	<b>December 11, 2009</b>
RAI 273 — 11.05-12	<b>December 11, 2009</b>
RAI 273 — 11.02-14	March 31, 2010
RAI 273 — 11.03-12	March 31, 2010
RAI 273 — 11.03-13	March 31, 2010
RAI 273 — 11.04-15	March 31, 2010

Sincerely,

*Ronda Pederson*

[ronda.pederson@areva.com](mailto:ronda.pederson@areva.com)

Licensing Manager, U.S. EPR Design Certification

**AREVA NP Inc.**

An AREVA and Siemens company

3315 Old Forest Road

Lynchburg, VA 24506-0935

Phone: 434-832-3694

Cell: 434-841-8788

---

**From:** WELLS Russell D (AREVA NP INC)

**Sent:** Wednesday, November 25, 2009 2:38 PM

**To:** 'Getachew Tesfaye'; 'Michael Miernicki'

**Cc:** Pederson Ronda M (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 273, FSAR Ch 11, Supplement 2

Getachew,

AREVA NP Inc. (AREVA NP) provided technically correct and complete responses to 10 of the 42 questions of RAI No. 273 on October 14, 2009. AREVA NP submitted Supplement 1 on November 6, 2009 which provided a technically correct and complete response to 17 of the remaining questions and indicated that a response to 11 of the remaining 15 questions would be provided by November 25, 2009. However, AREVA NP is unable to provide a technically correct and complete response to 11 of the 15 remaining questions for RAI 273 as committed and a revised schedule for a technically correct and complete response to the remaining 15 questions is provided below.

<b>Question #</b>	<b>Response Date</b>
RAI 273 — 11.05-1	<b>December 8, 2009</b>
RAI 273 — 11.05-2	<b>December 8, 2009</b>
RAI 273 — 11.05-4	<b>December 8, 2009</b>
RAI 273 — 11.05-5	<b>December 8, 2009</b>
RAI 273 — 11.05-6	<b>December 8, 2009</b>
RAI 273 — 11.05-7	<b>December 8, 2009</b>
RAI 273 — 11.05-8	<b>December 8, 2009</b>
RAI 273 — 11.05-9	<b>December 8, 2009</b>



RAI 273 — 11.05-10	<b>December 8, 2009</b>
RAI 273 — 11.05-11	<b>December 8, 2009</b>
RAI 273 — 11.05-12	<b>December 8, 2009</b>
RAI 273 — 11.02-14	March 31, 2010
RAI 273 — 11.03-12	March 31, 2010
RAI 273 — 11.03-13	March 31, 2010
RAI 273 — 11.04-15	March 31, 2010

Sincerely,

(Russ Wells on behalf of)

*Ronda Pederson*

[ronda.pederson@areva.com](mailto:ronda.pederson@areva.com)

Licensing Manager, U.S. EPR Design Certification

New Plants Deployment

**AREVA NP, Inc.**

An AREVA and Siemens company

3315 Old Forest Road

Lynchburg, VA 24506-0935

Phone: 434-832-3694

Cell: 434-841-8788

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**From:** Pederson Ronda M (AREVA NP INC)

**Sent:** Friday, November 06, 2009 9:58 PM

**To:** 'Tefaye, Getachew'

**Cc:** MCINTYRE Brian (AREVA NP INC); DELANO Karen V (AREVA NP INC); SLIVA Dana (AREVA NP INC); WILLIFORD Dennis C (AREVA NP INC)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 273, FSAR Ch. 11, Supplement 1

Getachew,

AREVA NP Inc. (AREVA NP) provided technically correct and complete responses to 10 of the 42 questions of RAI No. 273 on October 14, 2009. The attached file, "RAI 273 Supplement 1 Response US EPR DC.pdf," provides a technically correct and complete response to 17 of the remaining questions and partial responses to 4 of the remaining questions.

Appended to this file are the affected pages of the U.S. EPR Final Safety Analysis Report (FSAR) in redline-strikeout format which support the response to RAI 273 Question 11.02-4, 11.02-5, 11.02-6, 11.02-7, 11.02-8, 11.02-9, 11.02-12, 11.02-13, 11.02-15, 11.03-4, 11.03-5, 11.03-8, 11.04-7, 11.04-8, 11.04-10, 11.04-14, 11.04-15, and 11.05-3.

Also included are related markups to AREVA NP's document, ANP-10292, Revision 1, "U.S. EPR Conformance with Standard Review Plan (NUREG-0800) Technical Report."

A complete FSAR markup is not provided for four of the answered questions. As agreed by NRC staff during an FSAR Chapter 11 audit on October 7, 2009, FSAR markups may be submitted after Phase 2 completion to support Staff review to close confirmatory items. Therefore, a complete FSAR markup for the four questions will be provided as indicated in the following table:

Question #	Supplement Date (providing FSAR Markup)
RAI 273 — 11.02-14	March 31, 2010
RAI 273 — 11.03-12	March 31, 2010
RAI 273 — 11.03-13	March 31, 2010

The following table indicates the respective page(s) in the response document, "RAI 273 Supplement 1 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

<b>Question #</b>	<b>Start Page</b>	<b>End Page</b>
RAI 273 — 11.02-4	2	2
RAI 273 — 11.02-5	3	4
RAI 273 — 11.02-6	5	5
RAI 273 — 11.02-7	6	6
RAI 273 — 11.02-8	7	7
RAI 273 — 11.02-9	8	9
RAI 273 — 11.02-12	10	10
RAI 273 — 11.02-13	11	11
RAI 273 — 11.02-14	12	12
RAI 273 — 11.02-15	13	14
RAI 273 — 11.03-4	15	15
RAI 273 — 11.03-5	16	16
RAI 273 — 11.03-8	17	18
RAI 273 — 11.03-12	19	19
RAI 273 — 11.03-13	20	20
RAI 273 — 11.04-7	21	22
RAI 273 — 11.04-8	23	24
RAI 273 — 11.04-10	25	25
RAI 273 — 11.04-14	26	26
RAI 273 — 11.04-15	27	27
RAI 273 — 11.05-3	28	28

A complete answer is not provided for 15 of the 42 questions. The schedule for a technically correct and complete response to these questions is provided below.

<b>Question #</b>	<b>Response Date</b>
RAI 273 — 11.02-14	March 31, 2010
RAI 273 — 11.03-12	March 31, 2010
RAI 273 — 11.03-13	March 31, 2010
RAI 273 — 11.04-15	March 31, 2010
RAI 273 — 11.05-1	November 25, 2009
RAI 273 — 11.05-2	November 25, 2009
RAI 273 — 11.05-4	November 25, 2009
RAI 273 — 11.05-5	November 25, 2009
RAI 273 — 11.05-6	November 25, 2009
RAI 273 — 11.05-7	November 25, 2009
RAI 273 — 11.05-8	November 25, 2009
RAI 273 — 11.05-9	November 25, 2009
RAI 273 — 11.05-10	November 25, 2009
RAI 273 — 11.05-11	November 25, 2009
RAI 273 — 11.05-12	November 25, 2009

Sincerely,

*Ronda Pederson*

[ronda.pederson@areva.com](mailto:ronda.pederson@areva.com)

Licensing Manager, U.S. EPR Design Certification

**AREVA NP Inc.**

An AREVA and Siemens company

3315 Old Forest Road

Lynchburg, VA 24506-0935

Phone: 434-832-3694

Cell: 434-841-8788

---

**From:** Pederson Ronda M (AREVA NP INC)

**Sent:** Wednesday, October 14, 2009 5:45 PM

**To:** 'Tefaye, Getachew'

**Cc:** BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); WILLIFORD Dennis C (AREVA NP INC)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 273, FSAR Ch. 11

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 273 Response US EPR DC.pdf" provides technically correct and complete responses to 10 of the 42 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 273, Questions 11.02-11, 11.03-7, 11.03-9, 11.03-10, 11.04-10, 11.04-11 and 11.04-12.

The following table indicates the respective pages in the response document, "RAI 273 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 273 — 11.02-4	2	2
RAI 273 — 11.02-5	3	3
RAI 273 — 11.02-6	4	4
RAI 273 — 11.02-7	5	5
RAI 273 — 11.02-8	6	6
RAI 273 — 11.02-9	7	7
RAI 273 — 11.02-10	8	8
RAI 273 — 11.02-11	9	9
RAI 273 — 11.02-12	10	10
RAI 273 — 11.02-13	11	11
RAI 273 — 11.02-14	12	12
RAI 273 — 11.02-15	13	13
RAI 273 — 11.03-4	14	14
RAI 273 — 11.03-5	15	15
RAI 273 — 11.03-6	16	16
RAI 273 — 11.03-7	17	17
RAI 273 — 11.03-8	18	18
RAI 273 — 11.03-9	19	19

RAI 273 — 11.03-10	20	21
RAI 273 — 11.03-11	22	22
RAI 273 — 11.03-12	23	23
RAI 273 — 11.03-13	24	24
RAI 273 — 11.04-7	25	25
RAI 273 — 11.04-8	26	26
RAI 273 — 11.04-10	27	28
RAI 273 — 11.04-11	29	29
RAI 273 — 11.04-12	30	30
RAI 273 — 11.04-13	31	31
RAI 273 — 11.04-14	32	32
RAI 273 — 11.04-15	33	33
RAI 273 — 11.05-1	34	34
RAI 273 — 11.05-2	35	36
RAI 273 — 11.05-3	37	37
RAI 273 — 11.05-4	38	38
RAI 273 — 11.05-5	39	40
RAI 273 — 11.05-6	41	41
RAI 273 — 11.05-7	42	42
RAI 273 — 11.05-8	43	43
RAI 273 — 11.05-9	44	44
RAI 273 — 11.05-10	45	45
RAI 273 — 11.05-11	46	47
RAI 273 — 11.05-12	48	48

A complete answer is not provided for 32 of the 42 questions. The schedule for a technically correct and complete response to these questions is provided below.

<b>Question #</b>	<b>Response Date</b>
RAI 273 — 11.02-4	November 6, 2009
RAI 273 — 11.02-5	November 6, 2009
RAI 273 — 11.02-6	November 6, 2009
RAI 273 — 11.02-7	November 6, 2009
RAI 273 — 11.02-8	November 6, 2009
RAI 273 — 11.02-9	November 6, 2009
RAI 273 — 11.02-12	November 6, 2009
RAI 273 — 11.02-13	November 6, 2009
RAI 273 — 11.02-14	November 6, 2009
RAI 273 — 11.02-15	November 6, 2009
RAI 273 — 11.03-4	November 6, 2009
RAI 273 — 11.03-5	November 6, 2009
RAI 273 — 11.03-8	November 6, 2009
RAI 273 — 11.03-12	November 6, 2009
RAI 273 — 11.03-13	November 6, 2009
RAI 273 — 11.04-7	November 6, 2009
RAI 273 — 11.04-8	November 6, 2009
RAI 273 — 11.04-10 (Part 3)	November 6, 2009
RAI 273 — 11.04-14	November 6, 2009

RAI 273 — 11.04-15	November 6, 2009
RAI 273 — 11.05-1	November 6, 2009
RAI 273 — 11.05-2	November 6, 2009
RAI 273 — 11.05-3	November 6, 2009
RAI 273 — 11.05-4	November 6, 2009
RAI 273 — 11.05-5	November 6, 2009
RAI 273 — 11.05-6	November 6, 2009
RAI 273 — 11.05-7	November 6, 2009
RAI 273 — 11.05-8	November 6, 2009
RAI 273 — 11.05-9	November 6, 2009
RAI 273 — 11.05-10	November 6, 2009
RAI 273 — 11.05-11	November 6, 2009
RAI 273 — 11.05-12	November 6, 2009

Sincerely,

*Ronda Pederson*

[ronda.pederson@areva.com](mailto:ronda.pederson@areva.com)

Licensing Manager, U.S. EPR Design Certification

**AREVA NP Inc.**

An AREVA and Siemens company

3315 Old Forest Road

Lynchburg, VA 24506-0935

Phone: 434-832-3694

Cell: 434-841-8788

---

**From:** Tesfaye, Getachew [<mailto:Getachew.Tesfaye@nrc.gov>]

**Sent:** Monday, September 14, 2009 3:12 PM

**To:** ZZ-DL-A-USEPR-DL

**Cc:** Dehmel, Jean-Claude; Frye, Timothy; Jennings, Jason; Colaccino, Joseph; ArevaEPRDCPEm Resource

**Subject:** U.S. EPR Design Certification Application RAI No. 273 (3450, 3459,3460, 3462), FSAR Ch. 11

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on August 11, 2009, and discussed with your staff on August 25, 2009. Draft RAI Question 11.04-9 was deleted, and Draft RAI Questions 11.02-4, 11.02-14, 11.03-4, 11.03-12, 11.03-13, 11.04-7, 11.04-12, 11.05-1, 11.05-4, and 11.05-5 were modified as a result of that discussion. The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs. 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:** 4222

**Mail Envelope Properties** (554210743EFE354B8D5741BEB695E6560C8822)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 273, FSAR Ch  
11, Supplement 17  
**Sent Date:** 2/15/2013 1:42:28 PM  
**Received Date:** 2/15/2013 1:42:45 PM  
**From:** WILLIFORD Dennis (AREVA)

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

**Recipients:**

"Clark, Phyllis" <Phyllis.Clark@nrc.gov>  
Tracking Status: None  
"DELANO Karen (AREVA)" <Karen.Delano@areva.com>  
Tracking Status: None  
"LEIGHLITER John (AREVA)" <John.Leighliter@areva.com>  
Tracking Status: None  
"ROMINE Judy (AREVA)" <Judy.Romine@areva.com>  
Tracking Status: None  
"RYAN Tom (AREVA)" <Tom.Ryan@areva.com>  
Tracking Status: None  
"WILLS Tiffany (AREVA)" <Tiffany.Wills@areva.com>  
Tracking Status: None  
"NOXON David (AREVA)" <David.Noxon@areva.com>  
Tracking Status: None  
"PEREZ Pedro (AREVA)" <Pedro.Perez@areva.com>  
Tracking Status: None  
"GORDON Darryl (AREVA)" <Darryl.Gordon@areva.com>  
Tracking Status: None  
"MCENTIRE John (AREVA)" <John.Mcentire@areva.com>  
Tracking Status: None  
"Snyder, Amy" <Amy.Snyder@nrc.gov>  
Tracking Status: None

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

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**Response to**

**Request for Additional Information No. 273 (3450, 3459, 3460, 3462), Revision 0,  
Supplement 17**

**9/14/2009**

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

**AREVA NP Inc.**

**Docket No. 52-020**

**SRP Section: 11.02 - Liquid Waste Management System**

**SRP Section: 11.03 - Gaseous Waste Management System**

**SRP Section: 11.04 - Solid Waste Management System**

**SRP Section: 11.05 - Process and Effluent Radiological Monitoring  
Instrumentation and Sampling Systems**

**Application Section: Chapter 11**

**QUESTIONS for Health Physics Branch (CHPB)**

**Question 11.05-2:**

In Sections 11.5.2, 11.5.3 and 11.5.4, the FSAR describes the various functions and components of PERMSS subsystems. A review of the description indicates that the information is presented inconsistently. Several components described in the text and Table 11.5-1 and Figure 11.5-1 are discussed in the text and not shown in a corresponding figure, or are not discussed in the text but shown in a figure. For example:

- 1) The descriptions do not address subsystem features to perform functional channel checks, source checks, and whether subsystems need to be brought off line to perform the surveillance and functional checks required by standard radiological effluent controls (see GL 89-01 and NUREG-1301).
- 2) The design features do not describe provisions and methods for offline radiation detectors to be purged or flushed with clean air or water, which portions of the LWMS and GWMS systems will be contaminated, and provisions to prevent the cross-contamination of purge and flush supply systems.
- 3) The design features do not describe the calibration of subsystems under different operational conditions (e.g., routine, AOOs, and accident) given expected differences in radionuclide distributions; how raw instrument output data will be converted to meaningful radiological units in determining compliance with Part 20 Appendix B and Appendix I to Part 50; calibration frequencies of process and effluent of radiation monitoring subsystems and associated sampling equipment; and the QA/QC process that will be used to verify and validate computer codes and algorithms purchased through vendors or supplied with PERM instrumentation.
- 4) Subsystem figures and diagrams do not show sampling locations for liquid and gaseous process and effluent streams, and sample conditioning for specific systems to minimize sample loss and distortion of chemical and physical compositions. Also, the relationship with FSAR Section 9.3.2 is not well established in understanding shared use of equipment and sampling functions among LWMS and GWMS subsystems.
- 5) The design features do not address requirements for the derivation of lower limits of detection for liquid and gaseous effluent monitors and detection sensitivities for liquid and gaseous process monitors.
- 6) The design features do not address the placement of isolation or diversion valves and radiation detectors on process and effluent piping/ductwork in order to ensure the timely closure of such valves upon the detection of elevated radioactivity levels in liquid and gaseous effluent streams in terminating releases and isolating process streams from further contamination.
- 7) The design features of the liquid and gaseous monitoring systems do not consider how the failure of a radiation detector or its corresponding channel is indicated in local and control room panels. For example, does a detector or channel failure result in a high or zero instrumentation reading? Are there specific warnings differentiating various types of failures, such as loss of detector only, loss of an entire channel, loss of sampling flow from a process or effluent stream?



Collectively, these observations apply to nearly all PERMSS subsystem descriptions and should be reviewed against Section 11.5 of the SRP and Regulatory Guide 1.206 and corrected accordingly in FSAR subsystem descriptions and tables and figures.

**Response to Question 11.05-2:**

This supplements the response to this question provided in RAI 273, Supplement 4 and Supplement 16.

Additional conforming changes to the U.S. EPR FSAR were identified for consistency with the FSAR changes provided in the prior response to this question in RAI 273, Supplement 16, and to address minimization of contamination required by 10CFR 20.1406.

In order to prevent inadvertent contamination of the environment, consistent with 10CFR20.1406, the Turbine Island effluent line will be connected downstream of the retention pond. U.S. EPR FSAR Tier 2, Section 11.5.4.15 will therefore be revised to change the Turbine Island effluent path from the retention pond to the plant liquid release path. U.S. EPR FSAR Tier 2, Figure 11.5-1 currently shows this detail and does not require revision. The need for backflow prevention to prevent contamination of the retention pond is dependent on site characteristics such as the gradient (slope) of the effluent pipe to the NPDES permitted discharge point, the flood lines (100 and 200 year) and where the Liquid Waste Management System connects to the effluent line. The COL information item in U.S. EPR FSAR Tier 2, Table 1.8-2 (Item 11.2-2) and in Section 11.2.3.3 will therefore be revised to require a COL applicant that references the U.S. EPR design certification to identify the need for backflow prevention from the plant liquid release path to the retention pond.

Additionally, discussions with NRC staff revealed that an area radiation monitor in Safeguard Building Mechanical Division 1 had been removed from U.S. EPR FSAR Tier 2, Table 12.3-3 in the FSAR markup for the response to this question in Supplement 16, and in U.S. EPR FSAR Revision 3. After further investigation, AREVA discovered this entry in the table had been inadvertently removed. The entry for the area monitor for the service corridor near the Safety Injection System at Elevation -31 feet will be added back to Table 12.3-3.

**FSAR Impact:**

U.S. EPR FSAR Tier 2, Sections 11.2.3.3, 11.5.4.15, and Tables 1.8-2 and 12.3-3 will be revised as described in this response and indicated on the enclosed markup.

**Question 11.05-5:**

FSAR Sections 11.5.2 to 11.5.4 present the descriptions of PERMSS subsystems and Table 11.5-1 lists radiation monitoring instrumentation used to monitor process and effluent streams. However, a review of subsystems listed in Table 11.5-1 and Figure 11.5-1 indicates that the descriptions are inconsistent and incomplete. For example:

- 1) Several PERMSS subsystems listed in Table 11.5-1 are not described in FSAR Sections 11.5.2 to 11.5.4. Section 11.5.4 provides descriptions for six subsystems with in-process radiation detectors while Table 11.5-1 lists 15. Similarly, there are differences between the text and tables in nomenclatures used to describe subsystems, e.g., condenser air removal RMS (Section 11.5.4.2) vs condenser evacuation system (Table 11.5-1).
- 2) FSAR Table 11.5-1 does not differentiate between safety and non safety-related PERMSS subsystems.
- 3) FSAR Table 11.5-1 does not indicate which radiation detectors will be equipped with built-in radioactive check sources for the purpose of performing channel checks.
- 4) The operational range noted for the upstream radiation monitor of the GWMS delay beds is presented in a meaningless radiological unit. The range should be expressed in  $\mu\text{Ci/cc}$  instead of counts per second (cps).
- 5) FSAR Section 10.4.3.2.2 states that the exhaust from the turbine gland seal exhausters is routed to the "turbine building air removal system" where they are monitored for radioactivity. Table 11.5-1 does not list a radiation monitor for the turbine air removal system. FSAR Section 9.4.4 states that the Turbine Building does not include the means to control radioactive effluents. Accordingly, the design descriptions of Section 10.4.3 and 9.4.4 should be reviewed and corrected to indicate that there is no turbine building air removal system and that instead the exhaust from the turbine gland seal exhausters is a system exhaust that is directed and discharged via the Nuclear Auxiliary Building Exhaust.
- 6) For the Nuclear Auxiliary Building exhaust, Figure 9.3.4-2 shows a radiation detector on the ductwork going into Cell 1 of the NABVS but it is not clear if this radiation detector is an extra one or is it the same as that shown in Figure 11.3-1 given its location.
- 7) Figure 9.3.4-2 shows a radiation detector in Cell 3 of the NABVS but it is not clear if this radiation detector is part of an existing PERMSS subsystem and not described in FSAR Sections 11.5 and 9.4.3, or is part of another system, such as used for monitoring ambient airborne radioactivity levels in radiological controlled areas.
- 8) Figure 9.4.3-3 does not include a radiation detector in the Reactor Building Exhaust (last input on lower left side of drawing).
- 9) FSAR Table 11.5-1 implies that there are two continuous noble gas monitors for the containment building ventilation purge subsystem, but FSAR Figure 9.4.7-2 shows one monitor on the low flow purge exhaust and none for the full flow purge exhaust.
- 10) FSAR Figure 11.5-1 shows a radiation monitor on the Turbine Building Plant drainage line, but this monitor is not listed in FSAR Table 11.5-1.

- 11) FSAR Table 11.5-1 does not indicate any automatic control features for GWMS, but FSAR Section 11.3.3.1 states that discharge requirements consider gaseous waste activity and “automatic isolation settings.”
- 12) FSAR Table 11.5-1 does not indicate any automatic control features for the NABVS, but FSAR Section 9.4.3.2.1 states that the exhaust from the NABVS is diverted to an iodine filtration system upon receiving a radiation alarm.
- 13) FSAR Table 11.5-1 does not indicate any automatic control features (ACF) for the SBVS, but FSAR Section 9.4.5.1 states that the exhaust from the SBVS is diverted to charcoal filtration beds upon receiving a radiation alarm.
- 14) FSAR Table 11.5-1 presents operational ranges for gaseous and liquid process and effluent radiation monitors. A review of this information indicates that it is incomplete. For gaseous process and effluent monitors, the supporting text to this table does not present the technical basis for the stated operational ranges for those that are included and does not provide corresponding sets of values for the plant vent radiation monitor used in confirming compliance with Part 20, Appendix B effluent concentration limits. For particulate, iodine, and tritium expected in gaseous streams, Table 11.5-1 does not include operational ranges and surrogate radionuclides for the corresponding radiation monitoring systems. The above comments also apply to radiation monitors assigned to liquid process and effluent streams.
- 15) FSAR Table 11.5-1 presents operational ranges for gaseous process and effluent radiation monitors. A review of this information indicates that it is incomplete. The description does not indicate whether the plant vent radiation monitoring system will be used to monitor radioactivity levels during normal operations and accident conditions with a sufficient range to encompass the entire range of effluent concentration levels listed in Regulatory Guide (RG) 1.97 (Rev. 3) and BTP 7-10 (SRP, NUREG-0800) for Type E variables, as they relate to compliance with Part 50.34(f)(2)(xvii) and (xxvii). If multiple radiation monitoring components are part of the design of the plant vent monitor to comply with the operational ranges of RG 1.97, the FSAR should describe the additional radiation monitoring components and address overall system accuracies in the overlapping ranges of the components of both systems when operating in the upper end of expected radioactivity levels.

Collectively, the above observations should be reviewed and, if confirmed, should be corrected in the FSAR.

**Response to Question 11.05-5:**

This supplements the response to this question provided in RAI 273, Supplement 4 and in Supplement 16.

Additional conforming changes to the U.S. EPR FSAR were identified for consistency with the FSAR changes provided in the prior response to this question in RAI 273, Supplement 16, and to address minimization of contamination required by 10CFR 20.1406. In order to prevent inadvertent contamination of the environment, consistent with 10CFR20.1406, the Turbine Island effluent line will be connected downstream of the retention pond. U.S. EPR FSAR Tier 2, Section 11.5.4.15 will therefore be revised to change the Turbine Island effluent path from the

retention pond to the plant liquid release path. U.S. EPR FSAR Tier 2, Figure 11.5-1 currently shows this detail and does not require revision.

**FSAR Impact:**

U.S. EPR FSAR Tier 2, Section 11.5.4.15 will be revised as described in this response and indicated on the enclosed markup.

# U.S. EPR Final Safety Analysis Report Markups

**Table 1.8-2—U.S. EPR Combined License Information Items  
Sheet 27 of 40**

Item No.	Description	Section
10.4-3	A COL applicant that references the U.S. EPR design certification will provide the description of the site-specific portions of the CWS.	10.4.5.2.1
10.4-4	A COL applicant that references the U.S. EPR design certification will provide the specific chemicals used within the chemical treatment system as determined by the site-specific water conditions.	10.4.5.2.2
10.4-5	A COL applicant that references the U.S. EPR design certification will provide the site-specific CWS piping design pressure.	10.4.5.2.2
10.4-6	If a vacuum priming system is required, a COL applicant that references the U.S. EPR design certification will provide the site-specific information.	10.4.5.2.2
10.4-7	A COL applicant that references the U.S. EPR design certification will provide information to address the potential for flooding of safety-related equipment due to failures of the site-specific CWS,	10.4.5.3
11.2-1	A COL applicant that references the U.S. EPR design certification will perform a site-specific liquid waste management system cost-benefit analysis.	11.2.4
11.2-2	A COL applicant that references the U.S. EPR design certification will provide site-specific information on the release pathway, including a detailed description of the discharge path and plant sources of dilution, <u>the need for backflow prevention to the retention pond</u> , the discharge flow rate, and dilution factors at or beyond the point of discharge.	11.2.3.3
11.2-3	A COL applicant that references the U.S. EPR design certification will confirm that the site-specific parameters are bounded by those provided in Table 11.2-5 and the dose pathways provided in Section 11.2.3.4.1. For site-specific parameters that are not bounded by the values provided in Table 11.2-5 and dose pathways other than those provided in Section 11.2.3.4.1, a COL applicant that references the U.S. EPR design certification will perform a site-specific liquid pathway dose analysis following the guidance provided in RG 1.109 and RG 1.113, and compare the doses to the numerical design objectives of 10 CFR Part 50, Appendix I and demonstrate compliance with requirements of 10 CFR Part 20.1302 and 40 CFR Part 190.	11.2.3.4.2

RAI 273 Q 11.05-2



Effluent Discharge Point (Ci/yr) Calculated by GALE Code.

**11.2.3.3 Release Points and Dilution Factors**

The liquid waste storage system has a single release point. The release is further diluted to meet the ALARA design objectives of 10 CFR Part 50, Appendix I. This regulation specifies maximum annual values for dose and dose commitment for individuals in an unrestricted area from the pathways of exposure. The U.S. EPR complies with these values with a dilution flow of 100 cubic feet per second (cfs) without additional downstream dilution. Since dilution is site dependent, discharge flow rates vary for each release.

The activity in the liquid effluent is diluted by two potential means prior to reaching a given dose receptor. The first is the mixing that occurs in the discharge canal, prior to the effluent reaching the plant outfall. The flowrate for this discharge dilution is site-specific, and may be provided by cooling tower blowdown, dilution pumps, and/or other plant discharges. The second dilution source is the mixing with, and subsequent dilution by, the receiving water body prior to reaching the dose receptor (e.g., fish, drinking water supply intake). The value of this dilution is also site-specific and varies with factors such as distance between the outfall and the dose receptor, hydrological mixing characteristics of the receiving body, and design and location of the outfall structure.

The combination of pre-outfall dilution from the discharge flowrate and the post-outfall mixing after the liquid effluent reaches the receiving water body determines the effective dilution of the radioactive effluents. For the generic design calculation of doses from liquid effluents, it is assumed that the discharge flow rate is 100 cfs and that no further mixing or dilution occurs beyond the plant outfall. However, equivalent effective dilution may be achieved by various combinations of pre-outfall dilution from the discharge flowrate and post-outfall mixing, where a reduction in discharge flowrate is offset by a proportional increase in post-outfall dilution.

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The physical release location and dilution factors for treated effluent are site-specific. A COL applicant that references the U.S. EPR design certification will provide site-specific information on the release pathway including a detailed description of the discharge path and plant sources of dilution, the need for backflow prevention to the retention pond, the discharge flow rate and dilution factors at or beyond the point of discharge.

**11.2.3.4 Estimated Doses**

**11.2.3.4.1 Liquid Pathways**

The LADTAP II computer program (Reference 2) was used to calculate doses to the maximally exposed individual (MEI) from liquid effluents. LADTAP II implements

check laundry from an offsite facility to verify the cleanliness of the protective clothing. This monitor is also suitable to measure the contamination of the clothes before washing to divide the clothes into very high, high, and low contamination categories for selection of individual washing programs at the offsite facility.

The R-42 measurement point process monitor consists of one protective clothing monitor. This measurement point grab sample provision consists of one liquid sample point of the decontamination waste at the measurement point. The monitors for this measurement point do not initiate automatic actions.

The safety classification for the R-42 instrument is non-safety. Portable check sources are used to check the detector and instrumentation circuitry of measurement points R-42.

**11.5.4.13 Solid Radwaste System**

The radiation monitoring of waste packages will be performed in the drum measuring station. The solid radwaste monitoring equipment, R-43, is comprised of seven dose rate monitors, one gamma spectroscopy system with a multi-channel analyzer, and drum identification, weighing, rotation, registration and archiving-equipment. R-43 is shown in Figure 11.4-1. The dose rate is measured at several positions while the drum is turning. The background dose rate level is measured at a representative position close to the drum measuring equipment. Simultaneously, the activity of gamma emitting nuclides will be detected and measured. A liquid grab sample may be drawn from the drum and analyzed in the laboratory.

Measurement ranges of the solid radwaste monitoring system are shown in Table 11.5-1. The safety classification for the R-43 instruments is non-safety. Portable check sources are used to check the detector and instrumentation circuitry.

**11.5.4.14 Reactor Boron and Water Makeup System**

The reactor boron and water makeup monitoring system consists of one measurement point, R-45. The R-45 measurement point grab sample provision consists of one liquid sample point at the measurement point. The safety classification for the R-45 sample point is non-safety.

**11.5.4.15 Turbine Building Drains and Vents System**

The Turbine Building drains and vents monitoring system consists of one measurement point, R-50 on the common release line as shown in Figure 11.5-1. The task for this measurement point is to monitor the liquid effluent from the Plant Drainage System for radioactivity before it is discharged via the plant liquid release path to the retention pond.

RAI 273 Q 11.05-2, 11.05-5





**Table 12.3-3—Radiation Monitor Detector Parameters**  
Sheet 2 of 3

RAI 273 Q 11.05-2

Monitor Location	Monitor Provisions		Range
	Continuous	ACF	
Safeguard Building (Mechanical)	1 monitor - Service Corridor near Containment Heat Removal System (elevation -31' Division 1)	---	1E-4 – 1E+4 rem/hr
	1 monitor – Service Corridor near Safety Injection System (elevation -31' Division 2)	---	1E-4 – 1E+4 rem/hr
	1 monitor – Service Corridor near Safety Injection System (elevation -31' Division 3)	---	1E-4 – 1E+4 rem/hr
	1 monitor – Service Corridor near Severe Accident Heat Removal System (elevation -31' Division 4)	---	1E-4 – 1E+4 rem/hr
	1 monitor – Personnel Air Lock Area (elevation 0' Division 2)	---	1E-4 – E+4 rem/hr
	1 monitor – MCR (+53' elevation Division 2/3)	---	1E-4 – 1E+4 rem/hr
	1 monitor – Filter Changing Equipment Room (elevation 0')	---	1E-4 – 1E+1 rem/hr
	1 monitor – In the primary sampling room (elevation -31')	---	1E-5 – 1E+0 rem/hr
	1 monitor – In the active laboratory (elevation -31')	---	1E-5 – 1E+0 rem/hr
	1 monitor – In the hot workshop (elevation +64')	---	1E-5 – 1E+0 rem/hr
Reactor Building	4 monitors inside containment – Service Compartment	Signals Reactor Building air filtration isolation and RHR valve closure	1E-1 – 1E+7 rad/hr