

## ArevaEPRDCPEm Resource

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**From:** BRYAN Martin (EXT) [Martin.Bryan.ext@areva.com]  
**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  
**Attachments:** RAI 273 Supplement 6 Response US EPR DC.pdf

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.

Question #	Start Page	End Page
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:

Question #	Supplement Date (providing FSAR Markup)
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.

Question #	Response Date
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  
[Martin.Bryan.ext@areva.com](mailto:Martin.Bryan.ext@areva.com)

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**From:** BRYAN Martin (EXT)  
**Sent:** Wednesday, March 31, 2010 4:36 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 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

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
RAI 273 — 11.04-15	May 19, 2010

Sincerely,

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

---

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

**Sent:** Thursday, December 10, 2009 6:29 PM

**To:** 'Tefaye, 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
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

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

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

**To:** 'Tesfaye, 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

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**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.

Question #	Response Date
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.**

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

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

**To:** 'Teskaye, 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:

<b>Question #</b>	<b>Supplement Date (providing FSAR Markup)</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

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.**

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Cell: 434-841-8788

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

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

**To:** 'Tsfaye, 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

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**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:** 1422

**Mail Envelope Properties** (BC417D9255991046A37DD56CF597DB7106312768)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 273, FSAR Ch  
11, Supplement 6  
**Sent Date:** 5/19/2010 3:07:48 PM  
**Received Date:** 5/19/2010 3:07:54 PM  
**From:** BRYAN Martin (EXT)

**Created By:** Martin.Bryan.ext@areva.com

**Recipients:**

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

Tracking Status: None

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

Tracking Status: None

"BENNETT Kathy A (OFR) (AREVA NP INC)" <Kathy.Bennett@areva.com>

Tracking Status: None

"NOXON David B (AREVA NP INC)" <David.Noxon@areva.com>

Tracking Status: None

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

Tracking Status: None

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

Files	Size	Date & Time
MESSAGE	21719	5/19/2010 3:07:54 PM
RAI 273 Supplement 6 Response US EPR DC.pdf		177105

**Options**

**Priority:** Standard

**Return Notification:** No

**Reply Requested:** No

**Sensitivity:** Normal

**Expiration Date:**

**Recipients Received:**

**Response to**  
**Request for Additional Information No. 273, Supplement 6**

**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 11.04-15:**

FSAR Table 11.4-1 presents estimates of yearly waste volumes and activity levels of radwaste shipped for disposal or processing by waste brokers. A review indicates that some entries show radioactivity levels being shipped in packages that are greater than predicted as yearly estimates. For example, the expected activity level for non-compressible DAW is 0.297 Ci per year, while the average activity shipped is 2.97 Ci per package. The factor of 10 is presumed to be associated with the assumed number of containers (shown as 0.1), but as tabulated the data imply that the average activity level per package is 10 times that of the total expected annual estimate. This inconsistency should be addressed and the header of the last column of Table 11.4-1 should be revised and explained with appropriate footnotes. The waste stream listed in Table 11.4-1 should be expanded to include waste volumes estimates for spent charcoal and desiccant and HEPA filters.

**Response to Question 11.04-15:**

The column heading in U.S. EPR FSAR Tier 2, Table 11.4-1 will be changed from “average curies per package” to “average curies per fully loaded container,” and the column heading “maximum number of containers” will be changed to “number of containers based on maximum expected shipping volume,” with a footnote stating that only full containers are expected to be shipped, which clarifies any inconsistencies.

Descriptions of dry active waste in U.S. EPR FSAR Tier 2, Section 11.4.2.1 and Section 11.4.2.4 are expanded to include high efficiency particulate air (HEPA) filters and iodine filters. A footnote will be added to U.S. EPR FSAR Tier 2, Table 11.4-1 noting that the total dry active waste volume totals include HEPA filters and iodine filter media.

Descriptions for the handling of delay bed spent charcoal and spent desiccant from the gaseous waste processing system (GWPS) will be added to U.S. EPR FSAR Tier 2, Section 11.4.2.4. The revised text describes that spent charcoal and spent desiccants from the GWPS are designed to last the life of the plant, but in the event of contamination can be processed in accordance with a plant-specific process control program (PCP). U.S. EPR FSAR Tier 2, Section 11.3.2.3.8 and Section 11.3.2.3.9 will be revised. A footnote will be added to U.S. EPR FSAR Tier 2, Table 11.4-1 that states that “Delay bed spent charcoal and spent desiccant are not routinely generated by the GWPS and will be disposed of in accordance with a plant specific PCP.”

Information regarding the processing of delay bed spent charcoal, spent desiccants from the GWPS, HEPA filters, and iodine filter media in this response supersedes information provided in the Response to RAI 273, Question 11.04-11.

The markups to this response include changes to clarify that 7.5 years is the “drum” storage capacity. If the generated solid waste (excluding dry active waste) was drummed and stored in dedicated drum storage areas, the plant would be able to provide 7.5 years of drum storage capacity. High integrity containers located in the plant provide additional storage capacity not accounted for in the 7.5 year drum storage calculation. Clarification of inputs used to calculate the drum storage capacity will be revised in Section 11.4.1.2.1 where it states that the waste volume used in the calculation is based on the maximum annual shipping volume found in U.S. EPR FSAR Tier 2, Table 11.4-1. A footnote will be added to U.S. EPR FSAR Tier 2, Table 11.4-1 to specify which value the 7.5 year drum storage capacity calculation utilizes.

The additional information on drum storage capacity clarifies the information provided in the prior Response to RAI 273, Supplement 1, Question 11.04-8.

**FSAR Impact:**

U.S. EPR FSAR Tier 2, Section 11.3.2.3.8, Section 11.3.2.3.9, Section 11.4.1.2.1, Section 11.4.2.1, Section 11.4.2.4, and Table 11.4-1 will be revised as described in the response and indicated on the enclosed markup.

# U.S. EPR Final Safety Analysis Report Markups



used is sensitive to liquid water, but has enhanced adsorption properties. In the event that the gel drier inventory is damaged, the gel can be removed and replaced. Spent desiccant can be processed by the solid waste management system (SWMS) in accordance with a plant-specific process control program (PCP).

Two motor-operated valves located in the piping interface between the purge system and the delay system control the direction of gas flow through the gel drier. Under normal conditions, the purge gas stream enters the top of the gel drier, flows down through the two types of silica gel desiccant, then returns to the purge system through reducing station 2. When the gaseous waste processing system automatically switches to surge gas operation, gas flow is redirected through the gel drier in the opposite direction for adsorptive drying en route to the delay beds.

#### 11.3.2.3.9 Delay Beds

The delay beds retain the radioactive fission product gases that enter the delay system. These gases (e.g., xenon and krypton) are dynamically adsorbed by the activated charcoal media in the delay beds, which provides the holdup times required for natural decay. The holdup time for xenon is 27.7 days and the holdup time for krypton is 40 hours.

The delay beds consist of three vertical pressure vessels connected in series. Two moisture sensors are configured in parallel upstream of the delay beds to provide warning and interlock signals if the moisture content of waste gas entering the delay beds exceeds acceptable levels. A radiation sensor is also located upstream of the delay beds to monitor influent activity levels. Two pressure sensors monitor pressure upstream of the delay beds to provide warning signals for high or low operating pressure conditions and to provide interlock signals. Though the delay beds are protected from water and chemical contamination due to their physical location and protective interlocks, provisions to remove and replace spent charcoal are included in the vessel design. Spent charcoal can be processed by the SWMS in accordance with a plant-specific PCP.

#### 11.3.2.3.10 Delay Line Gas Filter

The gas filter downstream of the delay beds protects reducing station 3 by removing particles that are generated in or passed through the delay beds, such as solid decay products or charcoal dust. The gas filter is a vertical pressure vessel with internal filter elements.

#### 11.3.2.3.11 Release Isolation Valve

The waste gas processing system release isolation valve is a motor-operated valve located downstream of reducing station 3. It is the last active component in the

#### 11.4.1.2.1 Capacity

The facilities in the Radioactive Waste Processing Building have the capacity to store ~~several years~~ a minimum of 7.5 years’ volume of solid waste (excluding dry active waste) resulting from plant operation. The solid wastes can be stored in one of two onsite storage areas in the Radioactive Waste Processing Building (see Figure 12.3-52). One area is a tubular shaft store for the higher activity drums and the other is a drum store for low activity drums. The storage area has a capacity of approximately 200 drums in the tubular shaft storage and approximately 350 drums in the drum store. When off-site disposal options for Class B and C wastes are not available, the U.S. EPR solid waste processing system provides the flexibility necessary to treat potential Class B and C waste types such that the final container for these wastes are 55-gallon waste drums. The normal container for some of these waste types is high-integrity container (HIC), however the solid waste management system is able to store these wastes in drums if necessary. Assuming the maximum annual shipping volume of solid waste in Table 11.4-1 (with the exception of dry active waste) is stored in 55-gallon drums and must be placed in the drum storage area or tubular shaft storage area, there would be 72.9 drums annually that would need to be stored. This results in a drum storage capacity of approximately 7.5 years.

Storage and offsite shipping of solid radioactive waste maintains exposure ALARA to personnel onsite or offsite under normal conditions or extreme environmental conditions, such as tornados, floods, or seismic events. The solid waste management system is designed with sufficient waste accumulation capacity and redundancy to allow temporary storage of the maximum generated waste during normal plant operation and AOOs.

The estimated annual volume of solid waste generated in the plant and shipped offsite is provided in Table 11.4-1—Estimated Solid Waste Annual Activity and Volume.

#### 11.4.1.2.2 Quality Group Classification

Design criteria pertinent to systems classified as RG 1.143 safety classification RW-IIa (High Hazard) and tabulated in RG 1.143, Table 2 (Natural Phenomena and Internal/ External Man-Induced Hazard), Table 3 (Design Load Combinations), and Table 4 (SSC Design Capacity Criteria) are used in design analyses of the solid waste management system. The quality classification of solid waste management system components is Quality Group D, as defined and described in Section 3.2.

#### 11.4.1.2.3 Seismic Design Classification

The solid waste management system is classified as radwaste seismic (RS). Structures, systems, and components composing the solid waste management system that are classified as RG 1.143 safety classification RW-IIa (High Hazard) are designed to

~~processing systems is subject to the hydrostatic test requirements in accordance with NUREG-0800, BTP 11-3 (Reference 1) and RG 1.143. However, such an optional mobile or vendor-supplied system is a site-specific design feature that is outside the scope of the design certification.~~

## 11.4.2 System Description

### 11.4.2.1 Solid Waste Processing and Storage System (Dry Solid Waste)

The solid waste processing and storage system handles the waste generated in the different controlled areas of the plant independent from the plant operating conditions. Solid radioactive wastes consist of paper, plastic, cloth, wood, metal parts, worn-out items, concrete, glass, electrical parts, HEPA filters, iodine filter media, ~~spent charcoal from the gaseous waste management system,~~ and other potentially contaminated discarded materials generated throughout the controlled area. These wastes are collected, segregated, and treated according to their properties. The wastes are placed in different containers to simplify handling, storage, and transport of the waste in the plant. Typical waste containers used are plastic bags, drums, or bins, which are transferred and placed in interim storage areas of the Radioactive Waste Processing Building. Solid waste treatment facilities include the sorting box for sorting waste. This sorting box contains a shredder and a compactor for in-drum compaction of compressible waste.

Wastes are initially classified as combustible, compressible or noncombustible and noncompressible. Compressible waste is compacted to reduce its volume. The wastes are further segregated based on properties, sizes, materials, and activity of the waste material. Waste containing moisture is collected and stored separately to avoid wetting dry active waste and to allow short-term treatment to prevent decomposition and hydrogen formation.

The combustible and compressible wastes are transferred from the storage rooms to the treatment area (e.g., compaction and compression), placed into storage drums, and compacted for temporary storage. The noncombustible and noncompressible wastes (thick metal parts, for example) are transported to the hot workshop, fragmented, and transferred into a drum.

Drums containing low-level radioactive waste are stored in the drum store area of the Radioactive Waste Processing Building until they are ready to be transported to offsite disposal. Drums stored in the drum store area have an activity level low enough that they meet ALARA dose criteria. Tubular shaft storage is provided for higher-level radioactive waste such as filter cartridges and treated resin waste.

The solid waste management processing and storage system is shown in Figure 11.4-1—Solid Waste Management Flow Diagram. Table 11.4-14—Solid Waste Management System Component Data lists the major equipment ~~and corresponding~~

decontamination of the wastes in the decontamination rooms. Once decontamination operations are completed, the waste is placed in large transport containers or is taken apart, as much as possible, to allow it to fit in disposal containers. As addressed in Section 11.4.3, the elements of the Process Control Program will be described by the COL applicant. This program will include site-specific information on operational practices to indicate what fraction, if any, of waste processing will be contracted out to waste brokers or specialized facilities and whether such wastes will be returned to the plant for disposal or shipped directly by the processor for disposal.

The waste characteristics shipped for disposal meet the requirements specified in 10 CFR 61.56. For the transfer and manifesting of radioactive waste shipped offsite, the requirements of Appendix G, “Requirements for Transfers of Low-Level Radioactive Waste Intended for Disposal at Licensed Land Disposal Facilities and Manifests,” to 10 CFR Part 20, [10 CFR 20.2006](#), and [10 CFR 20.2108](#) will be met. Based on industry experience, the radioactive waste shipped offsite for disposal is expected to consist of 79 percent Class A, 11 percent Class B, and 10 percent Class C waste.

The containers used for solid waste shipments meet the requirements of 49 CFR Parts 171-180 (Department of Transportation Radioactivity Material Regulations) and 10 CFR Part 71 (Packaging of Radioactive Materials for Transport). The solid waste system is designed to allow for the use of 55-gallon drums for shipment of evaporator concentrates, wastes collected from the centrifuge portion of the liquid waste processing system, sludge from the bottom of the liquid waste storage system storage tanks, spent resins from the coolant purification system, spent resins from the demineralizer system, spent filter cartridges, wet solid wastes, DAW ([including iodine filter media and HEPA filters](#)), and mixed wastes. Alternatively, DAW may be shipped in transportable cargo (e.g., SeaLand) containers, and HICs may be used for the shipment of spent resins from the coolant purification system, spent resins from the demineralizer system, wet wastes from the demineralizers, mixed wastes, spent filter cartridges, drummed evaporator concentrates, and drummed sludges. [Delay bed spent charcoal and spent desiccant from the GWPS are processed in accordance with a plant-specific process control program \(PCP\). These types of wastes are not routinely generated.](#)

Untreated solid waste is stored near its generating area until it is ready to be processed. If provisions for additional onsite storage become necessary (i.e., due to disposal site temporary unavailability), the guidance in NUREG-0800, Appendix 11.4-A, “Design Guidance for Temporary Storage of Low-Level Radioactive Waste” of Reference 2 is followed. Once treated, the solid waste, along with the treated concentrates, is shipped offsite in a HIC, transportable cargo container, or is stored in one of two onsite drum storage areas. One area is a tubular shaft store for the higher activity drums and the other is a temporary drum store for lower activity drums. Once the activity has reduced to a low enough level, the drums are transported to an NRC-licensed offsite



Table 11.4-1—Estimated Solid Waste Annual Activity and Volume  
Sheet 1 of 2

Waste Type	Quantity (ft³)	Activity (Ci)		Shipping Volume (ft³)		Average Curies per Fully Loaded Package Container		Maximum Number of Containers Based on Maximum Shipping Volume <sup>5</sup>
		Expected	Maximum	Expected	Maximum	Expected	Maximum	
Wet Solid Waste								
Evaporator Concentrates	710	1.50E+02	9.12E+03	-	140	7.81E+00	4.75E+02	19.2 <sup>1</sup>
Coolant purification and spent fuel pool spent resins	90	1.07E+03	5.23E+04	90	90	1.07E+03	5.23E+04	1.0 <sup>2</sup>
Demineralizer spent resins	140	2.96E+01	1.80E+03	140	140	1.85E+01	1.13E+03	1.6 <sup>2</sup>
Demineralizer wet waste	8	1.69E+00	1.03E+02	8	8	1.69E+01	1.03E+03	0.1 <sup>2</sup>
Centrifuge sludge	8	1.69E+00	1.03E+02	-	8	1.54E+00	9.36E+01	1.1 <sup>1</sup>
Spent cartridge filters	120 (3.40 m³)	6.86E+02		120	120	5.28E+02		1.3 <sup>2</sup>
Storage tank sludge	70	1.48E+01	9.00E+02	-	35	3.70E+01	2.25E+03	0.4 <sup>2</sup>
Total Solid Waste (stored in drums)	1146	1.95E+03	6.50E+04	358	541 <sup>2</sup>			
Mixed Waste	2	4.00E-02	2.43E+00	2	2	0.13	8.10	0.3 <sup>1</sup>

Table 11.4-1—Estimated Solid Waste Annual Activity and Volume  
Sheet 2 of 2

Waste Type	Quantity (ft³)	Activity (Ci)		Shipping Volume (ft³)		Average Curies per Fully Loaded Package Container		Maximum Number of Containers Based on Maximum Shipping Volume <sup>5</sup>
		Expected	Maximum	Expected	Maximum	Expected	Maximum	
Dry Active Waste								
Noncompressible DAW	70	2.97E-01	1.81E+01	70	70	2.97E+00	1.81E+02	0.1 <sup>3</sup>
Compressible DAW	1415	6.01E+00	3.66E+02	707	707	4.29E+00	2.61E+02	1.4 <sup>3</sup>
Combustible DAW	5300	3.19E+01	1.94E+03	5300	5300	6.02E+00	3.66E+02	5.3 <sup>3</sup>
Total Dry Active Waste <sup>4</sup>	6785	3.82E+01	2.32E+03	varies	varies	varies	varies	varies
Total								
Overall Totals	7933 <sup>6</sup>	1.99E+03	6.73E+04	varies	varies	varies	varies	varies

**Notes:**

1. 55 gal drum.
2. 8-120 HIC.
3. SEALAND.
4. Includes HEPA and iodine filter media.
5. Only full containers are expected to be shipped.



6. Delay Bed spent charcoal and spent desiccant are not routinely generated by the GWPS and will be disposed of in accordance with a plant-specific PCP.
7. Basis for 7.5 years drum storage capacity for class B and C waste (not including DAW).