

## ArevaEPRDCPEm Resource

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**From:** WILLIFORD Dennis (AREVA) [Dennis.Williford@areva.com]  
**Sent:** Tuesday, May 28, 2013 6:03 PM  
**To:** Snyder, Amy  
**Cc:** Buckberg, Perry; DELANO Karen (AREVA); LEIGHLITER John (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA); WILLS Tiffany (AREVA); HONMA George (EXTERNAL AREVA); LENTZ Tony (EXTERNAL AREVA); VANCE Brian (AREVA); GUCWA Len (EXTERNAL AREVA)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 527 (6179, 6205, 6180), FSAR Ch. 14, Supplement 3  
**Attachments:** RAI 527 Supplement 3 Response US EPR DC.pdf

Amy,

AREVA NP provided a schedule for responding to the nine questions in RAI No. 527 on January 25, 2012. Supplement 1 response was sent on February 26, 2012 to provide a revised schedule for responses to these questions. Supplement 2 response was sent on March 29, 2013 to provide a final response to five questions (Questions 14.03.02-57 through -61).

The attached file, "RAI 527 Supplement 3 Response US EPR DC.pdf," provides a technically correct and complete final response to Question 14.03.02-62.

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 527 Question 14.03.02-62.

The following table indicates the respective pages in the response document, "RAI 527 Supplement 3 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 527 — 14.03.02-62	2	3

The schedule for a technically correct and complete response to the remaining 3 questions is unchanged as provided below.

Question #	Response Date
RAI 527 — 14.02-163	June 21, 2013
RAI 527 — 14.03.02-56	August 30, 2013
RAI 527 — 14.03.07-38	June 21, 2013

Sincerely,

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

**AREVA NP Inc.**

7207 IBM Drive, Mail Code CLT 2B  
Charlotte, NC 28262

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

**Sent:** Friday, March 29, 2013 3:52 PM

**To:** Amy.Snyder@nrc.gov

**Cc:** Buckberg, Perry <Perry.Buckberg@nrc.gov> (Perry.Buckberg@nrc.gov); Jaffe, David; DELANO Karen (RS/NB); LEIGHLITER John (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); WILLS Tiffany (CORP/QP); HONMA George (EXT); LENTZ Tony (External RS/NB)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 527 (6179, 6205, 6180), FSAR Ch. 14, Supplement 2

Amy,

AREVA NP provided a schedule for responding to the nine questions in RAI No. 527 on January 25, 2012. Supplement 1 response was sent on February 26, 2012 to provide a revised schedule for responses to these questions.

The attached file, "RAI 527 Supplement 2 Response US EPR DC - Public.pdf," provides technically correct and complete final responses to 5 questions (Questions 14.03-2-57 through -61). Because the response file contains security-related sensitive information that should be withheld from public disclosure in accordance with 10 CFR 2.390, a public version is provided with the security-related sensitive information redacted. This email and attached file do not contain any security-related information. An unredacted security-related version is provided under separate email.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 527 Questions 14.03.02-57, 14.03.02-58, 14.03.02-59, 14.03.02-60 and 14.03.02-61.

The following table indicates the respective pages in the response document, "RAI 527 Supplement 2 Response US EPR DC - Public.pdf," that contain AREVA NP's response to the subject questions.

<b>Question #</b>	<b>Start Page</b>	<b>End Page</b>
RAI 527 — 14.03.02-57	2	3
RAI 527 — 14.03.02-58	4	5
RAI 527 — 14.03.02-59	6	6
RAI 527 — 14.03.02-60	7	8
RAI 527 — 14.03.02-61	9	9

The schedule for technically correct and complete responses to 3 of the 4 remaining questions has been changed as provided below.

<b>Question #</b>	<b>Response Date</b>
RAI 527 — 14.02-163	<b>June 21, 2013</b>
RAI 527 — 14.03.02-56	August 30, 2013
RAI 527 — 14.03.02-62	<b>May 28, 2013</b>
RAI 527 — 14.03.07-38	<b>June 21, 2013</b>

Sincerely,

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

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

**Sent:** Sunday, February 26, 2012 7:35 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); LENTZ Tony (External RS/NB)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 527 (6179, 6205, 6180), FSAR Ch. 14, Supplement 1

AREVA NP provided a schedule for a technically correct and complete response to the 9 questions in RAI 527 on January 25, 2012.

The schedule for a response to these 9 questions has been changed as provided below. This schedule was transmitted to the NRC in AREVA NP letter NRC:12:008 dated February 21, 2012.

<b>Question #</b>	<b>Response Date</b>
RAI 527 — 14.02-163	<b>March 29, 2013</b>
RAI 527 — 14.03.02-56	<b>August 30, 2013</b>
RAI 527 — 14.03.02-57	<b>March 29, 2013</b>
RAI 527 — 14.03.02-58	<b>March 29, 2013</b>
RAI 527 — 14.03.02-59	<b>March 29, 2013</b>
RAI 527 — 14.03.02-60	<b>March 29, 2013</b>
RAI 527 — 14.03.02-61	<b>March 29, 2013</b>
RAI 527 — 14.03.02-62	<b>March 29, 2013</b>
RAI 527 — 14.03.07-38	<b>March 29, 2013</b>

Sincerely,

**Dennis Williford, P.E.**  
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**From:** WILLIFORD Dennis (RS/NB)

**Sent:** Wednesday, January 25, 2012 8:05 AM

**To:** Tesfaye, Getachew

**Cc:** BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); LENTZ Tony (External RS/NB); [Michael.Miernicki@nrc.gov](mailto:Michael.Miernicki@nrc.gov); Jaffe, David

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 527 (6179, 6205, 6180), FSAR Ch. 14

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 527 Response US EPR DC.pdf" provides a schedule since a technically correct and complete response to these 9 questions cannot be provided at this time.

The following table indicates the respective pages in the response document, "RAI 527 Response US EPR DC.pdf" that contain AREVA NP's response to the subject questions.

<b>Question #</b>	<b>Start Page</b>	<b>End Page</b>
RAI 527 — 14.02-163	2	4
RAI 527 — 14.03.02-56	5	6
RAI 527 — 14.03.02-57	7	7
RAI 527 — 14.03.02-58	8	8
RAI 527 — 14.03.02-59	9	9
RAI 527 — 14.03.02-60	10	10
RAI 527 — 14.03.02-61	11	11
RAI 527 — 14.03.02-62	12	13
RAI 527 — 14.03.07-38	14	16

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

<b>Question #</b>	<b>Response Date</b>
RAI 527 — 14.02-163	February 21, 2012
RAI 527 — 14.03.02-56	February 21, 2012
RAI 527 — 14.03.02-57	February 21, 2012
RAI 527 — 14.03.02-58	February 21, 2012
RAI 527 — 14.03.02-59	February 21, 2012
RAI 527 — 14.03.02-60	February 21, 2012
RAI 527 — 14.03.02-61	February 21, 2012
RAI 527 — 14.03.02-62	February 21, 2012
RAI 527 — 14.03.07-38	February 21, 2012

Sincerely,

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

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

**Sent:** Friday, December 16, 2011 8:38 AM

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

**Cc:** Dehmél, Jean-Claude; Roach, Edward; Chakravorty, Manas; Thomas, Brian; Ford, Tanya; Jaffe, David; Colaccino, Joseph; ArevaEPRDCPEm Resource

**Subject:** U.S. EPR Design Certification Application RAI No. 527 (6179, 6205, 6180), FSAR Ch. 14

Attached please find the subject request for additional information (RAI). A draft of the RAI was provided to you on November 25, 2011, and on December 12, 2011, you informed us that the RAI is clear and no further clarification is needed. As a result, no change is made to the draft RAI. The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs, excluding the time period of **December 24, 2011 thru January 2, 2012, to account for the holiday season** as discussed with AREVA NP Inc. For any RAIs that cannot be answered **within 40 days**, it is expected that a date for receipt of this information will be provided to the staff within the 40-day period so that the staff can assess how this information will impact the published schedule.

Thanks,

Getachew Tesfaye

Sr. Project Manager

NRO/DNRL/NARP

(301) 415-3361

**Hearing Identifier:** AREVA\_EPR\_DC\_RAIs  
**Email Number:** 4507

**Mail Envelope Properties** (554210743EFE354B8D5741BEB695E65617A156)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 527 (6179, 6205, 6180), FSAR Ch. 14, Supplement 3  
**Sent Date:** 5/28/2013 6:02:42 PM  
**Received Date:** 5/28/2013 6:02:48 PM  
**From:** WILLIFORD Dennis (AREVA)

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

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Tracking Status: None

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

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	9174	5/28/2013 6:02:48 PM
RAI 527 Supplement 3 Response US EPR DC.pdf		125236

**Options**

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

**Response to**

**Request for Additional Information No. 527, Supplement 3**

**12/16/2011**

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

**AREVA NP Inc.**

**Docket No. 52-020**

**SRP Section: 14.02 - Initial Plant Test Program - Design Certification and New License Applicants**

**SRP Section: 14.03.02 - Structural and Systems Engineering - Inspections, Tests, Analyses, and Acceptance Criteria**

**SRP Section: 14.03.07 - Plant Systems - Inspections, Tests, Analyses, and Acceptance Criteria**

**Application Section: 14.03.02**

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

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

**Question 14.03.02-62:****OPEN ITEM****Follow Up to RAI 499, Question 14.03.02-55**

In RAI 499, Question 14.03.02-55 the applicant was asked to provide ITAAC language for the NAB that was consistent with the ITAAC for other building structures and that ITAAC be provided covering the required separation distance between the NAB and the NI. The staff has the following concerns regarding the response provided by the applicant.

- a. In its response to part (a) the applicant states that U.S. EPR Tier 1, Section 2.1.3, Item 3.1 will be revised to be consistent with the language provided in the ITAAC for the other structures. However the language is not consistent. For example, the Commitment Wording (CW) for item 2.1 of ITAAC Table 2.1.1-10 for the Safeguard Building states “The SB structures are Seismic Category I and are designed and constructed to withstand design basis loads, as specified below, without loss of structural integrity and safety-related functions.” The loads specified include normal operating loads as well as tornado and seismic loads. For the NAB, item 3.1 of ITAAC Table 2.1.3-1 under the CW states “The NAB is Seismic Category II and is designed to withstand design basis SSE and tornado wind loading without failure onto the adjacent FB or SB Division 4.” This is not the same as stating the NAB will be designed and constructed to withstand design basis loads including the design basis SSE and tornado wind loading without loss of structural integrity. In addition, per U.S. EPR FSAR Tier 2 Sections 3.3.2.3 and 3.7.2.8 the NAB is supposed to be designed to codes and standards associated with a SC I structure with a margin of safety that is equivalent to that of a Category I structure. The CW and Acceptance Criteria (AC) should reflect the requirements that there will be no loss of structural integrity under design basis loads including the design basis SSE and tornado wind loading and that the NAB has a margin of safety that is equivalent to that of a SC-I Structure. Part b of Item 3.1 of Table 2.1.3-1 under Inspection, Test, Analyses (ITA) states that deviations from the design will be analyzed. It does not specify what types of deviations are to be analyzed. Under AC it states that a report reconciles deviations to the design. In both cases the wording is not specific enough to make clear the intent, nor is the wording consistent with the wording for other structures in which the intent is to reconcile the as-designed structure with its as-built configuration. The applicant is requested to revise the language to maintain consistency with the ITAAC for other U.S. EPR structures.
- b. Regarding item 3.2 of ITAAC Table 2.1.3-1 covering the separation distance between the NI and the NAB, under ITA there should be a requirement that an analysis be performed to determine the required separation distance between the NI and the NAB under differential settlement and design basis loads. Under the ITA column, an inspection should be performed to verify the actual gap exceeds the separation required by the analyses. Currently, it states only that an inspection of the NAB will be performed, but does not state the purpose of the inspection. Under the AC of item 3.2, it is not sufficient to state that a minimum separation distance of 18 inches exists between the NAB and the NI common basemat. The AC should be that a gap of 18 inches exists and that this gap exceeds the required gap with margin as determined by analysis. The staff requests that the appropriate changes be made to item 3.2 of ITAAC Table 2.1.3-1 to address the staff's concerns.

**Response to Question 14.03.02-62:****Item a:**

U.S. EPR FSAR Tier 1, Section 2.1.3 and Table 2.1.3-1, Item 3.1 will be revised in the Response to RAI 557, Question 14.03.07-39. U.S. EPR FSAR Tier 1, Section 2.1.4 will be revised to include commitments for the Nuclear Auxiliary Building regarding other natural phenomena and man-induced hazards and design loads stipulated in Regulatory Guide 1.143, Tables 2, 3, and 4.

**Item b:**

The separation distance between the NAB and Nuclear Island (NI) common basemat structures is described in U.S. EPR FSAR Tier 2, Section 3.7.2.8 and shown in Figure 3B-1. U.S. EPR FSAR Tier 1, Section 2.1.3 and Table 2.1.3-1, Item 3.2 will be deleted and replaced with a U.S. EPR FSAR Tier 2, COL information item to address the separation requirement between the NAB and NI common basemat structures. The new COL Information Item was provided in the Response to RAI 370, Question 03.07.02-64. The COL Information Item will require the COL Applicant to perform a site-specific analysis to determine the bearing pressure demand and peak displacement of the NAB. The minimum required separation distance shall be a factor of two times the calculated absolute sum of the maximum combined site-specific NAB and U.S. EPR NI design displacements, but not less than 30 inches.

**FSAR Impact:**

U.S. EPR FSAR Tier 1, Section 2.1.3 and Table 2.1.3-1, Items 3.2 will be revised as described in the response and indicated on the enclosed markup.

# U.S. EPR Final Safety Analysis Report Markups

## 2.1.3 Nuclear Auxiliary Building

### Design Description

#### 1.0 System Description

The Nuclear Auxiliary Building (NAB) is a reinforced-concrete structure that houses non-safety related auxiliary systems required for normal power operation. There are no structures, systems, or components (SSC) required for safe shutdown located in the NAB. The NAB is located adjacent to the Fuel Building (FB), Safeguard Building (SB) Division 4, and Radioactive Processing Waste Building (RWB), as shown on Figure 2.1.3-1.

#### 2.0 Arrangement

2.1 The basic configuration of the NAB is as shown on Figure 2.1.3-1—Nuclear Auxiliary Building Location.

#### 3.0 Mechanical Design Features

3.1 The NAB is a Seismic Category II and RW-IIa structure and will withstand design basis loads listed in Regulatory Guide 1.143 without loss of structural integrity. ~~safe-shutdown earthquake (SSE) and tornado wind loadings without failure onto the adjacent FB or SB Division 4.~~

3.2 ~~Deleted. Separation is provided between the NAB and the NI common basemat as shown on Figure 2.1.3-1 to preclude interaction between the NAB and NI common basemat structures.~~

### Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.1.3-1 lists the NAB ITAAC.

Q 14.03.02-62

Table 2.1.3-1—Nuclear Auxiliary Building ITAAC

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
2.1	The basic configuration of the NAB is as shown on Figure 2.1.3-1.	An inspection of the basic configuration of the as-built NAB will be performed.	The basic configuration of the NAB is as shown on Figure 2.1.3-1.
3.1	The NAB is <u>a Seismic Category II and RW-IIa structure</u> and will withstand design basis loads listed in <u>Regulatory Guide 1.143 without loss of structural integrity.</u> <del>SSE and tornado wind loadings without failure onto the adjacent FB or SB Division 4.</del>	An inspection and analysis will be performed to verify the as-built NAB <u>structure</u> will withstand design basis loads. <del>SSE and tornado wind loadings without failure onto the adjacent FB or SB Division 4.</del>	A report concludes that the NAB <u>structure</u> will withstand design basis <u>loads listed in Regulatory Guide 1.143 without loss of structural integrity.</u> <del>SSE and tornado wind loadings without failure onto the adjacent FB or SB Division 4.</del>
3.2	<del>Separation is provided between the NAB and the NI common basemat as shown on Figure 2.1.3-1 to preclude interaction between the NAB and NI common basemat structures.</del>	<del>An inspection will be performed to verify the as-built physical separation between the NAB and the NI common basemat.</del>	<del>The NAB is separated from the NI common basemat as shown on Figure 2.1.3-1. A minimum separation distance of 18 inches exists between the NAB and NI common basemat structures.</del>

Q 14.03.02-62