

## ArevaEPRDCPEm Resource

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**From:** WILLIFORD Dennis (AREVA) [Dennis.Williford@areva.com]  
**Sent:** Wednesday, May 30, 2012 11:38 AM  
**To:** Tesfaye, Getachew  
**Cc:** BENNETT Kathy (AREVA); DELANO Karen (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA); KOWALSKI David (AREVA)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 525 (6194, 6154), FSAR Ch. 9, Supplement 3  
**Attachments:** RAI 525 Supplement 3 Response US EPR DC.pdf  
**Importance:** High

Getachew,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the eighteen questions in RAI No. 525 on January 25, 2012. Supplement 1 response to RAI No. 525 was sent on February 24, 2012 to provide a revised schedule. Supplement 2 response to RAI No. 525 was sent on March 16, 2012 to provide a complete final response to Question 09.01.04-28.

The attached file, "RAI 525 Supplement 3 Response US EPR DC.pdf" provides a technically correct and complete revised final response to Question 09.01.04-28, which supersedes in its entirety the response to this question provided in Supplement 2.

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 525 Question 09.01.04-28.

The following table indicates the respective pages in the response document, "RAI 525 Supplement 3 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 525 — 09.01.04-28	2	2

The schedule for a technically correct and complete response to the remaining 17 questions has not changed as provided below.

Question #	Response Date
RAI 525 — 09.01.04-21	June 28, 2013
RAI 525 — 09.01.04-22	June 28, 2013
RAI 525 — 09.01.04-23	June 28, 2013
RAI 525 — 09.01.04-24	June 28, 2013
RAI 525 — 09.01.04-25	June 28, 2013
RAI 525 — 09.01.04-26	June 28, 2013
RAI 525 — 09.01.04-27	June 28, 2013
RAI 525 — 09.01.04-29	June 28, 2013
RAI 525 — 09.01.04-30	June 28, 2013
RAI 525 — 09.01.04-31	June 28, 2013
RAI 525 — 09.01.04-32	June 28, 2013

RAI 525 — 09.01.04-33	June 28, 2013
RAI 525 — 09.01.04-34	June 28, 2013
RAI 525 — 09.01.04-35	June 28, 2013
RAI 525 — 09.01.04-36	June 28, 2013
RAI 525 — 09.01.04-37	June 28, 2013
RAI 525 — 09.01.04-38	June 28, 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 16, 2012 3:05 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); KOWALSKI David (RS/NB)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 525 (6194, 6154), FSAR Ch. 9, Supplement 2

Getachew,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the eighteen questions in RAI No. 525 on January 25, 2012. Supplement 1 response to RAI No. 525 was sent on February 24, 2012 to provide a revised schedule.

The attached file, "RAI 525 Supplement 2 Response US EPR DC.pdf" provides a technically correct and complete final response to Question 09.01.04-28.

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 525 Question 09.01.04-28.

The following table indicates the respective pages in the response document, "RAI 525 Supplement 2 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 525 — 09.01.04-28	2	2

The schedule for technically correct and complete responses to the remaining seventeen questions has not changed and is provided below.

Question #	Response Date
RAI 525 — 09.01.04-21	June 28, 2013
RAI 525 — 09.01.04-22	June 28, 2013

RAI 525 — 09.01.04-23	June 28, 2013
RAI 525 — 09.01.04-24	June 28, 2013
RAI 525 — 09.01.04-25	June 28, 2013
RAI 525 — 09.01.04-26	June 28, 2013
RAI 525 — 09.01.04-27	June 28, 2013
RAI 525 — 09.01.04-29	June 28, 2013
RAI 525 — 09.01.04-30	June 28, 2013
RAI 525 — 09.01.04-31	June 28, 2013
RAI 525 — 09.01.04-32	June 28, 2013
RAI 525 — 09.01.04-33	June 28, 2013
RAI 525 — 09.01.04-34	June 28, 2013
RAI 525 — 09.01.04-35	June 28, 2013
RAI 525 — 09.01.04-36	June 28, 2013
RAI 525 — 09.01.04-37	June 28, 2013
RAI 525 — 09.01.04-38	June 28, 2013

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:** Friday, February 24, 2012 5:21 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); KOWALSKI David (RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 525 (6194, 6154), FSAR Ch. 9, Supplement 1

Getachew,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the eighteen questions in RAI No. 525 on January 25, 2012.

The schedule for technically correct and complete responses to the eighteen 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 525 — 09.01.04-21	<b>June 28, 2013</b>
RAI 525 — 09.01.04-22	<b>June 28, 2013</b>
RAI 525 — 09.01.04-23	<b>June 28, 2013</b>
RAI 525 — 09.01.04-24	<b>June 28, 2013</b>
RAI 525 — 09.01.04-25	<b>June 28, 2013</b>

RAI 525 — 09.01.04-26	<b>June 28, 2013</b>
RAI 525 — 09.01.04-27	<b>June 28, 2013</b>
RAI 525 — 09.01.04-28	<b>June 28, 2013</b>
RAI 525 — 09.01.04-29	<b>June 28, 2013</b>
RAI 525 — 09.01.04-30	<b>June 28, 2013</b>
RAI 525 — 09.01.04-31	<b>June 28, 2013</b>
RAI 525 — 09.01.04-32	<b>June 28, 2013</b>
RAI 525 — 09.01.04-33	<b>June 28, 2013</b>
RAI 525 — 09.01.04-34	<b>June 28, 2013</b>
RAI 525 — 09.01.04-35	<b>June 28, 2013</b>
RAI 525 — 09.01.04-36	<b>June 28, 2013</b>
RAI 525 — 09.01.04-37	<b>June 28, 2013</b>
RAI 525 — 09.01.04-38	<b>June 28, 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:** Wednesday, January 25, 2012 4:06 PM  
**To:** 'Tesfaye, Getachew'  
**Cc:** BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); KOWALSKI David (RS/NB); [Michael.Miernicki@nrc.gov](mailto:Michael.Miernicki@nrc.gov); [peter.hearn@nrc.gov](mailto:peter.hearn@nrc.gov)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 525 (6194, 6154), FSAR Ch. 9

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 525 Response US EPR DC.pdf," provides a preliminary schedule since a technically correct and complete response to these eighteen questions cannot be provided at this time.

The following table indicates the respective pages in the response document, "RAI 525 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 525 — 09.01.04-21	2	2
RAI 525 — 09.01.04-22	3	3
RAI 525 — 09.01.04-23	4	4
RAI 525 — 09.01.04-24	5	5
RAI 525 — 09.01.04-25	6	6
RAI 525 — 09.01.04-26	7	7

RAI 525 — 09.01.04-27	8	8
RAI 525 — 09.01.04-28	9	9
RAI 525 — 09.01.04-29	10	10
RAI 525 — 09.01.04-30	11	11
RAI 525 — 09.01.04-31	12	12
RAI 525 — 09.01.04-32	13	13
RAI 525 — 09.01.04-33	14	14
RAI 525 — 09.01.04-34	15	15
RAI 525 — 09.01.04-35	16	16
RAI 525 — 09.01.04-36	17	17
RAI 525 — 09.01.04-37	18	18
RAI 525 — 09.01.04-38	19	19

A preliminary schedule for technically correct and complete responses 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 525 — 09.01.04-21	February 21, 2012
RAI 525 — 09.01.04-22	February 21, 2012
RAI 525 — 09.01.04-23	February 21, 2012
RAI 525 — 09.01.04-24	February 21, 2012
RAI 525 — 09.01.04-25	February 21, 2012
RAI 525 — 09.01.04-26	February 21, 2012
RAI 525 — 09.01.04-27	February 21, 2012
RAI 525 — 09.01.04-28	February 21, 2012
RAI 525 — 09.01.04-29	February 21, 2012
RAI 525 — 09.01.04-30	February 21, 2012
RAI 525 — 09.01.04-31	February 21, 2012
RAI 525 — 09.01.04-32	February 21, 2012
RAI 525 — 09.01.04-33	February 21, 2012
RAI 525 — 09.01.04-34	February 21, 2012
RAI 525 — 09.01.04-35	February 21, 2012
RAI 525 — 09.01.04-36	February 21, 2012
RAI 525 — 09.01.04-37	February 21, 2012
RAI 525 — 09.01.04-38	February 21, 2012

Sincerely,

***Dennis Williford, P.E.***  
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**From:** Tesfaye, Getachew [<mailto:Getachew.Tesfaye@nrc.gov>]

**Sent:** Monday, December 19, 2011 4:19 PM

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

**Cc:** Curran, Gordon; McKenna, Eileen; Xu, Jim; Thomas, Brian; Hearn, Peter; Segala, John; ArevaEPRDCPEm Resource

**Subject:** U.S. EPR Design Certification Application RAI No. 525 (6194, 6154), FSAR Ch. 9

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on November 11, 2011, and discussed with your staff on December 2, 2011. Draft RAI Questions 09.01.04-24, 09.01.04-31, and 09.01.04-33 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, 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:** 3930

**Mail Envelope Properties** (2FBE1051AEB2E748A0F98DF9EEE5A5D4C81E5B)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 525 (6194, 6154), FSAR Ch. 9, Supplement 3  
**Sent Date:** 5/30/2012 11:37:55 AM  
**Received Date:** 5/30/2012 11:39:12 AM  
**From:** WILLIFORD Dennis (AREVA)

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

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"KOWALSKI David (AREVA)" <David.Kowalski@areva.com>

Tracking Status: None

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Tracking Status: None

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<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	10898	5/30/2012 11:39:12 AM
RAI 525 Supplement 3 Response US EPR DC.pdf		507162

**Options**

**Priority:** High

**Return Notification:** No

**Reply Requested:** No

**Sensitivity:** Normal

**Expiration Date:**

**Recipients Received:**

**Response to**

**Request for Additional Information No. 525(6194, 6154), Supplement 3**

**12/19/2011**

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

**AREVA NP Inc.**

**Docket No. 52-020**

**SRP Section: 09.01.04 - Light Load Handling System (Related to Refueling)**

**Application Section: 09.01.04**

**QUESTIONS for Balance of Plant Branch 1 (SBPA)**

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



**Question 09.01.04-28:**

**OPEN ITEM**

The applicant's proposed COL item requests that the cask design requirements be addressed prior to initial cask loading operations. Initial cask loading operations may occur many years after plant startup. The staff needs assurance that the facility has the capability to remove spent fuel once fuel is loaded. Therefore, the staff requests the applicant to revise the COL item and interface requirements. The COL item should instruct the COL applicant to identify an NRC approved cask and demonstrate that the cask can be safely connected to the certified EPR SFCTF and remove spent fuel from the SFP prior to initial fuel load and plant startup.

**Response to Question 09.01.04-28:**

U.S. EPR FSAR Tier 2, Table 1.8-2—U.S. EPR Combined License Information Items, Item No. 9.1-2 will be revised to state:

“A COL applicant that references the U.S. EPR design certification will perform appropriate tests and analyses, which demonstrate that an identified NRC-approved cask can be safely connected to the spent fuel cask transfer facility (SFCTF), and the cask and its adapter meet the criteria specified in Table 9.1.4-1, prior to initial fuel loading into the reactor.”

U.S. EPR FSAR Tier 2, Section 9.1.4 will be revised to incorporate this revision to COL Item No. 9.1-2.

This response supersedes in its entirety the Response to RAI 525, Supplement 2, Question 09.01.04-28.

**FSAR Impact:**

U.S. EPR FSAR Tier 2, Table 1.8-2 and Section 9.1.4, will be revised as described in the 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 22 of 41**

Item No.	Description	Section
8.3-1	A COL applicant that references the U.S. EPR design certification will monitor and maintain EDG reliability during plant operations to verify the selected reliability level target is being achieved as intended by RG 1.155.	8.3.1.1.5
8.3-2	A COL applicant that references the U.S. EPR design certification will describe inspection, testing and monitoring programs to detect the degradation of inaccessible or underground power cables that support EDGs, offsite power, ESW and other systems that are within the scope of 10 CFR 50.65.	8.3.1.1.8
8.4-1	A COL applicant that references the U.S. EPR design certification will provide site-specific information that identifies any additional local power sources and transmission paths that could be made available to resupply the power plant following a loss of offsite power (LOOP).	8.4.1.3
8.4-2	A COL applicant that references the U.S. EPR design certification will address the RG 1.155 guidance related to procedures and training to cope with SBO.	8.4.2.6.4
9.1-1	A COL applicant that references the U.S. EPR design certification will provide site-specific information on the heavy load handling program, including a commitment to procedures for heavy load lifts in the vicinity of irradiated fuel or safe shutdown equipment, and crane operator training and qualification.	9.1.5.2.5
9.1-2	<p>A COL applicant that references the U.S. EPR design certification will <u>perform appropriate tests and analyses, which demonstrate that an identified NRC-approved cask can be safely connected to the spent fuel cask transfer facility (SFCTF), and the cask and its adapter meet the criteria specified in Table 9.1.4-1, prior to initial fuel loading into the reactor.</u> <del>provide a cask design acceptable for interfacing with the SFCTF prior to initial cask loading operations. The design of the spent fuel cask must meet the following interface requirements:</del></p> <ul style="list-style-type: none"> <li><del>• The mating surface of the cask maintains a leak-tight connection with the penetration assembly when the cask is connected to the penetration.</del></li> <li><del>• The dose rates from a loaded cask during cask handling operations does not exceed those identified in Section 12.3.</del></li> <li><del>• A structural and seismic analysis of the SFCTM and cask demonstrates that the fluid boundary between the penetration assembly and connected cask is maintained to preclude the loss of significant inventory in the spent fuel pool during cask loading operations, including safe shutdown earthquake (SSE), and the postulated drop of a fuel assembly from the maximum handling height in the cask loading pit onto a connected cask.</del></li> </ul>	9.1.4

09.01.04-28

**9.1.4 Fuel Handling System**

The fuel handling system (FHS) provides a safe means for handling and performance monitoring of fuel assemblies and control components from the time of receipt of new fuel assemblies to the storage and removal of spent fuel. This includes installing and removing fuel assemblies in the reactor vessel, transferring irradiated fuel assemblies from the reactor vessel to the spent fuel pool (SFP), storage of irradiated fuel assemblies, and removal of irradiated fuel assemblies through the Spent Fuel Cask Transfer Facility (SFCTF). The system also provides a means of safely receiving, inspecting, storing, and handling new fuel.

The FHS design maintains occupational radiation exposures as low as is reasonably achievable (ALARA) during transportation and handling.

09.01.04-28

The specific cask design is not part of the FHS or SFCTF. ~~A COL applicant that references the U.S. EPR design certification will provide a cask design acceptable for interfacing with the SFCTF prior to initial cask loading operations. The design of the spent fuel cask must meet the following interface requirements:~~ A COL applicant that references the U.S. EPR design certification will perform appropriate tests and analyses, which demonstrate that an identified NRC-approved cask can be safely connected to the SFCTF, and the cask and its adapter meet the criteria specified in Table 9.1.4-1, prior to initial fuel loading into the reactor.

- ~~• The mating surface of the cask maintains a leak-tight connection with the penetration assembly when the cask is connected to the penetration.~~
- ~~• The dose rates from a loaded cask during cask handling operations do not exceed those identified in Section 12.3.~~
- ~~• A structural and seismic analysis of the SFCTM and cask demonstrates that the fluid boundary between the penetration assembly and connected cask is maintained to preclude the loss of significant inventory in the spent fuel pool during cask loading operations, including safe shutdown earthquake (SSE), and the postulated drop of a fuel assembly from the maximum handling height in the cask loading pit onto a connected cask.~~

**9.1.4.1 Design Bases**

The following major components are safety-related and designed to Seismic Category I requirements:

- New and spent fuel storage racks.
- Transfer tube, isolation devices, and expansion joints.
- Cask loading pit penetration assembly.