

## ArevaEPRDCPEm Resource

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**From:** WELLS Russell (AREVA) [Russell.Wells@areva.com]  
**Sent:** Thursday, March 03, 2011 7:04 AM  
**To:** Tesfaye, Getachew  
**Cc:** BENNETT Kathy (AREVA); DELANO Karen (AREVA); ROMINE Judy (AREVA); WILLIFORD Dennis (AREVA); BALLARD Bob (AREVA); PATTON Jeff (AREVA); HALLINGER Pat (EXTERNAL AREVA)  
**Subject:** Revised Draft Response to U.S. EPR Design Certification Application RAI No. 280, FSAR Ch 12, Supplement 9  
**Attachments:** RAI 280 Supplement 9 Response Q12 03-12 04-17 US EPR DC - DRAFT.PDF

Getachew,

Attached is the revised draft response to RAI No. 280, FSAR Ch. 12, Question 12.03-12.04-17 (Parts 3 and 4), as shown below in advance of the March 23, 2011 final date. These changes were made in response to a design change discussed with the NRC Chapter 12 reviewer last August. Let me know if the staff has questions or if this can be sent as a final response.

*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*

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

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**From:** BRYAN Martin (External RS/NB)  
**Sent:** Friday, January 21, 2011 9:17 AM  
**To:** 'Tesfaye, Getachew'  
**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); WILLIFORD Dennis (RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 280, FSAR Ch 12, Supplement 8

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to the 3 questions in RAI No. 280 on February 26, 2010. To allow time for AREVA to discuss proposed responses to the questions with the NRC staff (which was performed during the Chapter 12 audit on April 23, 2010), a revised schedule was provided in RAI 280 Supplement 1. AREVA NP provided Supplement 2 on May 13, 2010 to provide responses to 2 of the 3 remaining questions. A revised schedule for the remaining question was submitted to the NRC via Supplement 3 on July 29, 2010, in Supplement 4 on September 13, 2010, and in Supplement 5 on October 8, 2010. A technically correct and complete response to Parts 1, 2, 5 and 6 of Question 12.03-12.04-17 was submitted via Supplement 6 on November 8, 2010. A revised schedule for submittal of the final response to Parts 3 and 4 of the remaining question was provided to the NRC in Supplement 7 on November 29, 2010.

To allow further time to discuss and finalize a related response for RAI 337, Question 09.01.04-14 which impacts the response to Parts 3 and 4 of RAI 280, Question 12.03-12.04-17, a revised schedule for submittal of the final response to Parts 3 and 4 of Question 12.03-12.04-17 is provided in this e-mail.

The schedule for a technically correct and complete response to the remaining question is provided below:

<b>Question #</b>	<b>Response Date</b>
<b>RAI 280 — 12.03-12.04-17 (Parts 3 &amp; 4)</b>	<b>March 23, 2011</b>

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:** Monday, November 29, 2010 3:14 PM  
**To:** 'Tefaye, Getachew'  
**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); WILLIFORD Dennis (RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 280, FSAR Ch 12, Supplement 7

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to the 3 questions in RAI No. 280 on February 26, 2010. To allow time for AREVA to discuss proposed responses to the questions with the NRC staff (which was performed during the Chapter 12 audit on April 23, 2010), a revised schedule was provided in RAI 280 Supplement 1. AREVA NP provided Supplement 2 on May 13, 2010 to provide responses to 2 of the 3 remaining questions. A revised schedule for the remaining question was submitted to the NRC via Supplement 3 on July 29, 2010, in Supplement 4 on September 13, 2010, and in Supplement 5 on October 8, 2010. A technically correct and complete response to Parts 1, 2, 5 and 6 of Question 12.03-12.04-17 was submitted via Supplement 6 on November 8, 2010.

To allow further time to discuss and finalize a related response for RAI 337, Question 09.01.04-14 which impacts the response to Parts 3 and 4 of RAI 280, Question 12.03-12.04-17, a revised schedule for submittal of the final response to Parts 3 and 4 of Question 12.03-12.04-17 is provided in this e-mail.

The schedule for a technically correct and complete response to the remaining question is provided below:

<b>Question #</b>	<b>Response Date</b>
<b>RAI 280 — 12.03-12.04-17 (Parts 3 &amp; 4)</b>	<b>January 26, 2011</b>

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:** Monday, November 08, 2010 5:32 PM  
**To:** Tesfaye, Getachew  
**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); WILLIFORD Dennis (RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 280, FSAR Ch 12, Supplement 6

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to the 3 questions in RAI No. 280 on February 26, 2010. To allow time for AREVA to discuss proposed responses to the questions with the NRC staff (which was performed during the Chapter 12 audit on April 23, 2010), a revised schedule was provided in RAI 280 Supplement 1. AREVA NP provided Supplement 2 on May 13, 2010 to provide responses to 2 of the 3 remaining questions. A revised schedule for the remaining question was submitted to the NRC via Supplement 3 on July 29, 2010, in Supplement 4 on September 13, 2010, and in Supplement 5 on October 8, 2010. The attached file, "RAI 280 Supplement 6 Response US EPR DC.pdf" provides a technically correct and complete response to Parts 1, 2, 5 and 6 of the remaining question.

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 does not contain any security-related information. The unredacted SUNSI 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 Parts 1, 2, 5 and 6 of RAI 280 Question 12.03-12.04-17.

The following table indicates the respective pages in the response document, "RAI 280 Supplement 6 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 280 — 12.03-12.04-17 (Parts 1,2, 5 & 6)	2	7

To allow time to discuss and finalize a related response for RAI 337, Question 09.01.04-14 which impacts the response to Parts 3 and 4 of RAI 280, Question 12.03-12.04-17, a revised schedule for submittal of the final response to Parts 3 and 4 of Question 12.03-12.04-17 is provided in this e-mail.

The schedule for a technically correct and complete response to the remaining question is provided below:

Question #	Response Date
RAI 280 — 12.03-12.04-17 (Parts 3 & 4)	December 2, 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 (External RS/NB)  
**Sent:** Friday, October 08, 2010 3:31 PM  
**To:** 'Tesfaye, Getachew'  
**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); WILLIFORD Dennis (RS/NB); NOXON David (RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 280, FSAR Ch 12, Supplement 5

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to the 3 questions in RAI No. 280 on February 26, 2010. To allow time for AREVA to discuss proposed responses to the questions with the NRC staff (which was performed during the Chapter 12 audit on April 23, 2010), a revised schedule was provided in RAI 280 Supplement 1. AREVA NP provided Supplement 2 on May 13, 2010 to provide responses to 2 of the 3 remaining questions. A revised schedule for the remaining question was submitted to the NRC via Supplement 3 on July 29, 2010, and in Supplement 4 on September 13, 2010.

To allow time to process FSAR changes associated with recent feedback with the NRC staff, a revised schedule for submittal of the final response to Parts 1 – 5 of Question 12.03-12.04-17 is provided in this e-mail.

The schedule for a technically correct and complete response to the remaining question is provided below:

<b>Question #</b>	<b>Response Date</b>
<b>RAI 280 — 12.03-12.04-17 (Parts 1 – 5)</b>	<b>November 8, 2010</b>
RAI 280 — 12.03-12.04-17 (Part 6)	November 8, 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 (External RS/NB)  
**Sent:** Monday, September 13, 2010 2:01 PM  
**To:** 'Tesfaye, Getachew'  
**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); WILLIFORD Dennis (RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 280, FSAR Ch 12, Supplement 4

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to the 3 questions in RAI No. 280 on February 26, 2010. To allow time for AREVA to discuss proposed responses to the questions with the NRC staff (which was performed during the Chapter 12 audit on April 23, 2010), a revised schedule was provided in RAI 280 Supplement 1. AREVA NP provided Supplement 2 on May 13, 2010 to provide responses

to 2 of the 3 remaining questions. On July 29, 2010 AREVA provided a revised schedule for the remaining question.

To allow time for interaction between AREVA and the NRC staff, a revised schedule for submittal of the final response is provided in this e-mail.

The schedule for a technically correct and complete response to the remaining question has been revised and is provided below:

<b>Question #</b>	<b>Response Date</b>
RAI 280 — 12.03-12.04-17 (Parts 1 – 5)	October 13, 2010
RAI 280 — 12.03-12.04-17 (Part 6)	November 8, 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:** Thursday, July 29, 2010 11:00 AM  
**To:** 'Tesfaye, Getachew'  
**Cc:** DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); WILLIFORD Dennis C (AREVA NP INC)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 280, FSAR Ch 12, Supplement 3

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to the 3 questions in RAI No. 280 on February 26, 2010. To allow time for AREVA to discuss proposed responses to the questions with the NRC staff (which was performed during the Chapter 12 audit on April 23, 2010), a revised schedule was provided in RAI 280 Supplement 1. AREVA NP provided Supplement 2 on May 13, 2010 to provide responses to 2 of the 3 remaining questions.

Additional time is required to finalize the response to the remaining question.

The schedule for providing a technically correct and complete response to the remaining question has been changed and is provided below.

<b>Question #</b>	<b>Response Date</b>
RAI 280 — 12.03-12.04-17	September 13, 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:** Thursday, May 13, 2010 4:02 PM  
**To:** 'getachew.tesfaye@nrc.gov'  
**Cc:** DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); WILLIFORD Dennis C (AREVA NP INC)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 280, FSAR Ch 12, Supplement 2

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to RAI No. 280 on February 26, 2010. To allow time for AREVA to discuss proposed responses to the questions with the NRC staff (which was performed during the Chapter 12 audit on April 23, 2010), a revised schedule was provided in RAI 280 Supplement 1. The attached file, "RAI 280 Supplement 2 Response US EPR DC.pdf" provides technically correct and complete responses to 2 of the remaining 3 questions.

A revised schedule to complete the remaining response is required in order to address NRC reviewer concerns discussed during the Chapter 12 audit on April 23, 2010 and during the follow-up telecon on April 28, 2010.

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 280 Question 12.02-5.

The following table indicates the respective pages in the response document, "RAI 280 Supplement 2 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
12.02-5	2	2
12.02-6	3	4

The schedule for a technically correct and complete response to the remaining question has been changed and is provided below:

Question #	Response Date
12.03-12.04-17	July 29, 2010

Martin (Marty) C. Bryan  
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---

**From:** WELLS Russell D (AREVA NP INC)  
**Sent:** Tuesday, April 20, 2010 10:55 AM  
**To:** 'Getachew Tesfaye'

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

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 280, FSAR Ch 12, Supplement 1

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to RAI No. 280 on February 26, 2010. To allow time for AREVA to discuss proposed responses to the remaining 3 questions with the NRC staff (scheduled for April 23, 2010), a revised schedule is provided in this e-mail.

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

Question #	Response Date
RAI 280 — 12.02-5	May 13, 2010
RAI 280 — 12.02-6	May 13, 2010
RAI 280 — 12.03-12.04-17	May 13, 2010

Sincerely,

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

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**From:** BRYAN Martin (EXT)

**Sent:** Friday, February 26, 2010 4:29 PM

**To:** 'Tefsaye, Getachew'

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

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 280, FSAR Ch. 12

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 280 Response US EPR DC.pdf" provides a schedule since a technically correct and complete response to the 3 questions is not provided.

The following table indicates the respective pages in the response document, "RAI 280 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 280 — 12.02-5	2	2
RAI 280 — 12.02-6	3	3
RAI 280 — 12.03-12.04-17	4	5

A complete answer is not provided for the 3 questions. The schedule for a technically correct and complete response to these questions is provided below.

<b>Question #</b>	<b>Response Date</b>
RAI 280 — 12.02-5	April 21, 2010
RAI 280 — 12.02-6	April 21, 2010
RAI 280 — 12.03-12.04-17	April 21, 2010

Martin (Marty) C. Bryan  
Licensing Advisory Engineer  
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---

**From:** Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]  
**Sent:** Thursday, August 27, 2009 3:10 PM  
**To:** ZZ-DL-A-USEPR-DL  
**Cc:** Bernal, Sara; Hinson, Charles; Frye, Timothy; Jennings, Jason; Colaccino, Joseph; ArevaEPRDCPEm Resource  
**Subject:** U.S. EPR Design Certification Application RAI No. 280 (3307, 3554),FSAR Ch. 12

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on August 25, 2009, and discussed with your staff on August 27, 2009. No changes were made to the draft RAI questions as a result of that discussion. The questions in this RAI are considered potential open items for Phases 2 and 3 reviews. As such, the schedule we have established for your application assumes technically correct and complete responses prior to the start of Phase 4 review. For any RAI question that cannot be answered prior to the start of Phase 4 review, it is expected that a date for receipt of this information will be provided 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:** 2638

**Mail Envelope Properties** (1F1CC1BBDC66B842A46CAC03D6B1CD41040BCF1D)

**Subject:** Revised Draft Response to U.S. EPR Design Certification Application RAI No. 280, FSAR Ch 12, Supplement 9  
**Sent Date:** 3/3/2011 7:03:55 AM  
**Received Date:** 3/3/2011 7:03:59 AM  
**From:** WELLS Russell (AREVA)

**Created By:** Russell.Wells@areva.com

**Recipients:**

"BENNETT Kathy (AREVA)" <Kathy.Bennett@areva.com>  
Tracking Status: None  
"DELANO Karen (AREVA)" <Karen.Delano@areva.com>  
Tracking Status: None  
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"BALLARD Bob (AREVA)" <Robert.Ballard@areva.com>  
Tracking Status: None  
"PATTON Jeff (AREVA)" <Jeff.Patton@areva.com>  
Tracking Status: None  
"HALLINGER Pat (EXTERNAL AREVA)" <Pat.Hallinger.ext@areva.com>  
Tracking Status: None  
"Tesfaye, Getachew" <Getachew.Tesfaye@nrc.gov>  
Tracking Status: None

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

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>	
MESSAGE	17973	3/3/2011 7:03:59 AM	
RAI 280 Supplement 9 Response Q12 03-12 04-17 US EPR DC - DRAFT.PDF			291975

**Options**

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

**Response to**

**Request for Additional Information No. 280, Supplement 9**

**8/27/2009**

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

**AREVA NP Inc.**

**Docket No. 52-020**

**SRP Section: 12.02 - Radiation Sources**

**SRP Section: 12.03-12.04 - Radiation Protection Design Features**

**Application Section: FSAR Ch. 12**

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

**DRAFT**

**Question 12.03-12.04-17:****POTENTIAL OPEN ITEM****Background**

GDC 61 requires that the fuel storage and transfer system, in addition to any other system which may contain radioactivity, be designed to ensure adequate safety and shielding, as well as designed to prevent the release of radioactive material during normal and accident conditions.

Generic Safety Issue 137 (GSI-137) "Refueling Cavity Seal Failure" was initiated to consider a Reactor Cavity Seal Ring failure as an initiating event for a Spent Fuel Pool accident sequence (see NRC Bulletin 84-03). GSI-137 noted the following possible consequences to a reactor cavity seal ring failure; (1) high radiation levels in the containment due to uncovering of spent fuel during transfer, (2) radioactive material release in the containment building due to rupture of fuel pins (by self-heating after uncovering), (3) high radiation levels in the spent fuel building due to uncovering of stored spent fuel, and (4) radioactive material release outside the containment building due to rupture of fuel pins in the storage pool. The mitigation actions for evaluation of this event was the installation of permanent reactor cavity seal rings, and the installation of cover dams between the refueling cavity and the spent fuel pool to prevent draining the SFP.

In their response to NRC Bulletin 84-03, "Refueling Cavity Water Seal," a number of licensees indicated that if a large seal leak occurred, the refueling cavity could drain rapidly and the procedures and makeup capability for refilling the refueling cavity would be insufficient to prevent the potential uncovering of a fuel assembly in transit. In anticipation of such an event, the licensees developed an abnormal occurrence procedure for safely storing a fuel assembly under water if one was positioned above the vessel flange level during a loss of the refueling cavity water.

**Question**

GSI 137 addresses rapid reactor cavity drain down due to cavity seal failure and the possibility of associated spent fuel pool drain down and the uncovering of stored spent fuel. The EPR design includes a welded reactor cavity seal ring which provides protection against potential loss of refueling water inventory through a seal failure. However, there is no discussion in the EPR FSAR addressing the following GSI 137 related issues:

1. A unique feature of the EPR design is the inclusion of a reactor cavity access room and door which facilitates work on the reactor vessel head (see Figure 12.3-2, "Reactor Cavity at the +17 Ft Elevation of the Reactor building"). However, given that the door is located at the bottom of the refueling pool the potential for rapid water inventory loss exists, should the door fail (due to damage from unintentional collisions with the reactor vessel head or internals, for example). Therefore, in accordance with the requirements of GDC 61, provide additional detail on the cavity door and access room design as well as a description of the proper use of the cavity door during refueling operations to provide reasonable assurance that this cavity access point will not serve as a point of significant inadvertent inventory loss.

2. Describe the design features of the reactor cavity door that would prevent leakage of refueling water into the access room. In the event of leakage into this room, provide information on where this leakage will be directed once it enters the access room, such that systems in proximity to the room will not be affected, and releases and contamination will be controlled in accordance with 10 CFR 20.1406 and GDC 61.
3. In addition to the reactor cavity access room door, identify any other penetrations to the reactor cavity and describe the associated design features that would prevent inadvertent cavity drain down through these penetrations.
4. Should the reactor cavity undergo rapid inadvertent drain down during refueling operations when a spent fuel assembly is positioned above the reactor vessel flange level, provide information on where a licensee could safely store a spent fuel assembly
5. The U.S. EPR FSAR Tier 2, Section 12.3.1.8.1, Reactor Building, states that an access room has been incorporated into the EPR design that allows workers to access the reactor cavity floor and reactor vessel head during refueling. The intent of the door is to facilitate worker access to the reactor vessel head. FSAR Tier 2, Section 12.3.1.8.1, "Reactor Building," states that this access room is equipped with double doors to prevent workers from entering the reactor cavity. To demonstrate compliance with GDC 61, provide information on the dose rates inside the access room and directly outside the access room should a spent fuel assembly be dropped on the cavity floor in close proximity to the access door (assuming the dropping of a maximum burnup assembly). Also provide a listing of the maximum dose rates in these areas during normal refueling operations assuming no dropped spent fuel rods. Provide information on the design controls incorporated into the room to prevent unauthorized access to the room itself and to the reactor cavity as well as to ensure unimpeded egress from the cavity and from the access room, in accordance with the requirements of 20.1601 or 20.1602 and the guidance of RG 8.38. Revise Section 12.3 of the FSAR to include information on the most restrictive radiation zone associated with this room during refueling as well as the information requested above on access controls.
6. If a design incorporating a reactor cavity floor access room is in use at any currently operating plants, describe any operating experience which would justify the use of such a design.

**Response to Question 12.03-12.04-17:****Item 1)**

A response was provided in RAI 280, Supplement 6 on November 8, 2010.

**Item 2)**

A response was provided in RAI 280, Supplement 6 on November 8, 2010.

**Item 3)**

Other reactor cavity penetrations and associated design features that would prevent a reactor cavity drain down are addressed in the Response to RAI 337, Question 09.01.04-14.

From the reactor cavity penetrations, there are four symmetrically arranged heating, ventilation, air conditioning (HVAC) ducts that penetrate the cavity shield wall at elevation +33.8 ft. These duct openings are 80 cm high x 60 cm wide and penetrate the 120 cm concrete cavity wall centered at elevation +33.8 ft. The duct penetrations are covered with a water tight steel door of about 2 cm thickness.

AREVA NP determined that during refueling operations a raised fuel assembly (FA) in the reactor cavity can pass in front of, or be located directly opposite these ducts. These ducts open into the steam generator rooms and provide a direct path for radiation, from a raised FA in the reactor cavity, to stream into the steam generator rooms.

Dose estimates of the potential transient radiation levels in the steam generator rooms, during normal fuel transfer operations, yielded values on the order of several mSv/hr (high radiation area) when a peripheral fuel assembly is moved. Higher levels (very high radiation area) may occur in the event an FA is inadvertently moved closer to the cavity wall or dropped.

AREVA NP has performed a design change to reduce the number of penetrations from four to two, and to relocate the penetrations to a location approximately centered at elevation +57 ft that is above the raised fuel assembly. The higher elevation for the penetration eliminates the potential high radiation area in the steam generator rooms.

**Item 4)**

Storage of a raised spent fuel assembly in the event of a cavity drain-down is addressed in the Response to RAI 337, Question 09.01.04-14.

**Item 5)**

A response was provided in RAI 280, Supplement 6 on November 8, 2010.

**Item 6**

A response was provided in RAI 280, Supplement 6 on November 8, 2010.

**FSAR Impact:**

The U.S. EPR FSAR will not be changed as a result of this question.