

ArevaEPRDCPEm Resource

From: WILLIFORD Dennis (AREVA) [Dennis.Williford@areva.com]
Sent: Tuesday, August 30, 2011 4:34 PM
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. 398, FSAR Ch. 9, Supplement 13
Attachments: RAI 398 Supplement 13 Response US EPR DC - PUBLIC.pdf

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to the question in RAI No. 398 on July 21, 2010. Supplement 1, Supplement 2, Supplement 3, Supplement 4, Supplement 5, Supplement 6, Supplement 7, Supplement 8, Supplement 9, Supplement 10, Supplement 11 and Supplement 12 responses to RAI No. 398 were sent on August 31, 2010, October 5, 2010, October 26, 2010, November 22, 2010, January 6, 2011, February 9, 2011, March 2, 2011, April 5, 2011, May 4, 2011, June 3, 2011, June 30, 2011 and August 3, 2011, respectively, to provide a revised schedule.

The attached file, "RAI 398 Supplement 13 Response US EPR DC - PUBLIC.pdf" provides a technically correct and complete FINAL response to Question 09.01.04-18. 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 e-mail and attached file do not contain any security-related information. An unredacted SUNSI version is provided under separate e-mail.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which supports the response to Question 09.01.04-18.

The following table indicates the respective pages in the response document, "RAI 398 Supplement 13 Response US EPR DC - PUBLIC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 398 — 09.01.04-18	2	6

This concludes the formal AREVA NP response to RAI 398, and there are no questions from this RAI for which AREVA NP has not provided responses.

Sincerely,

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

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

From: WILLIFORD Dennis (RS/NB)
Sent: Wednesday, August 03, 2011 3:13 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)
Subject: Response to U.S. EPR Design Certification Application RAI No. 398, FSAR Ch. 9, Supplement 12

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to the question in RAI No. 398 on July 21, 2010. Supplement 1, Supplement 2, Supplement 3, Supplement 4, Supplement 5, Supplement 6, Supplement 7, Supplement 8, Supplement 9, Supplement 10 and Supplement 11 responses to RAI No. 398 were sent on August 31, 2010, October 5, 2010, October 26, 2010, November 22, 2010, January 6, 2011, February 9, 2011, March 2, 2011, April 5, 2011, May 4, 2011, June 3, 2011 and June 30, 2011, respectively, to provide a revised schedule.

Based on the audit of the cask handling system design held on July 19th and 20th, significant additional information was requested to be included in the final RAI response and related FSAR markups. The resulting change in the schedule for completion of the response to the remaining question in RAI 398 listed below was verbally communicated and discussed with NRC staff in a conference call yesterday afternoon. The schedule for a technically correct and complete response to the remaining question has been revised as provided below:

Question #	Response Date
RAI 398 — 09.01.04-18	August 31, 2011

Sincerely,

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

AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Thursday, June 30, 2011 4:48 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)
Subject: Response to U.S. EPR Design Certification Application RAI No. 398, FSAR Ch. 9, Supplement 11

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to the question in RAI No. 398 on July 21, 2010. Supplement 1, Supplement 2, Supplement 3, Supplement 4, Supplement 5, Supplement 6, Supplement 7, Supplement 8, Supplement 9 and Supplement 10 responses to RAI No. 398 were sent on August 31, 2010, October 5, 2010, October 26, 2010, November 22, 2010, January 6, 2011, February 9, 2011, March 2, 2011, April 5, 2011, May 4, 2011 and June 3, 2011, respectively, to provide a revised schedule.

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

Question #	Response Date
RAI 398 — 09.01.04-18	August 18, 2011

Sincerely,

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

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

From: RYAN Tom (RS/NB)
Sent: Friday, June 03, 2011 9:40 AM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); WILLIFORD Dennis (RS/NB); KOWALSKI David (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 398, FSAR Ch. 9, Supplement 10

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to the question in RAI No. 398 on July 21, 2010. Supplement 1, Supplement 2, Supplement 3, Supplement 4, Supplement 5, Supplement 6, Supplement 7, Supplement 8 and Supplement 9 responses to RAI No. 398 were sent on August 31, 2010, October 5, 2010, October 26, 2010, November 22, 2010, January 6, 2011, February 9, 2011, March 2, 2011, April 5, 2011 and May 4, 2011, respectively, to provide a revised schedule.

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

Question #	Response Date
RAI 398 — 09.01.04-18	June 30, 2011

Sincerely,

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

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

From: WELLS Russell (RS/NB)
Sent: Wednesday, May 04, 2011 1:10 PM
To: 'Tesfaye, Getachew'
Cc: KOWALSKI David (RS/NB); BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 398, FSARCh. 9, Supplement 9

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to the question in RAI No. 398 on July 21, 2010. Supplement 1, Supplement 2, Supplement 3, Supplement 4, Supplement 5, Supplement 6, Supplement 7 and Supplement 8 responses to RAI No. 398 were sent on August 31, 2010, October 5, 2010,

October 26, 2010, November 22, 2010, January 6, 2011, February 9, 2011, March 2, 2011 and April 5, 2011, respectively, to provide a revised schedule.

To provide additional time to interact with the NRC, a revised schedule is provided in this e-mail.

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

Question #	Response Date
RAI 398 — 09.01.04-18	June 3, 2011

Sincerely,

Russ Wells

U.S. EPR Design Certification Licensing Manager

AREVA NP, Inc.

3315 Old Forest Road, P.O. Box 10935

Mail Stop OF-57

Lynchburg, VA 24506-0935

Phone: 434-832-3884 (work)

434-942-6375 (cell)

Fax: 434-382-3884

Russell.Wells@Areva.com

From: WELLS Russell (RS/NB)

Sent: Tuesday, April 05, 2011 8:52 AM

To: 'Getachew.Tesfaye@nrc.gov'

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

Subject: Response to U.S. EPR Design Certification Application RAI No. 398, FSARCh. 9, Supplement 8

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to the question in RAI No. 398 on July 21, 2010. Supplement 1, Supplement 2, Supplement 3, Supplement 4, Supplement 5, Supplement 6 and Supplement 7 responses to RAI No. 398 were sent on August 31, 2010, October 5, 2010, October 26, 2010, November 22, 2010, January 6, 2011, February 9, 2011 and March 2, 2011, respectively, to provide a revised schedule.

To provide additional time to interact with the NRC, a revised schedule is provided in this e-mail.

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

Question #	Response Date
RAI 398 — 09.01.04-18	May 6, 2011

Sincerely,

Russ Wells

U.S. EPR Design Certification Licensing Manager

AREVA NP, Inc.

3315 Old Forest Road, P.O. Box 10935

Mail Stop OF-57

Lynchburg, VA 24506-0935

Phone: 434-832-3884 (work)

434-942-6375 (cell)

Fax: 434-382-3884

Russell.Wells@Areva.com

From: WELLS Russell (RS/NB)

Sent: Wednesday, March 02, 2011 10:10 AM

To: 'Tesfaye, Getachew'

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

Subject: Response to U.S. EPR Design Certification Application RAI No. 398, FSARCh. 9, Supplement 7

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to the question in RAI No. 398 on July 21, 2010. Supplement 1, Supplement 2, Supplement 3, Supplement 4, Supplement 5 and Supplement 6 responses to RAI No. 398 were sent on August 31, 2010, October 5, 2010, October 26, 2010, November 22, 2010, January 6, 2011 and February 9, 2011, respectively, to provide a revised schedule.

To provide additional time to interact with the NRC, a revised schedule is provided in this e-mail.

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

Question #	Response Date
RAI 398 — 09.01.04-18	April 7, 2011

Sincerely,

Russ Wells

U.S. EPR Design Certification Licensing Manager

AREVA NP, Inc.

3315 Old Forest Road, P.O. Box 10935

Mail Stop OF-57

Lynchburg, VA 24506-0935

Phone: 434-832-3884 (work)

434-942-6375 (cell)

Fax: 434-382-3884

Russell.Wells@Areva.com

From: BRYAN Martin (External RS/NB)

Sent: Wednesday, February 09, 2011 3:41 PM

To: 'Tesfaye, Getachew'

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

Subject: Response to U.S. EPR Design Certification Application RAI No. 398, FSARCh. 9, Supplement 6

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to the question in RAI No. 398 on July 21, 2010. Supplement 1, Supplement 2, Supplement 3, Supplement 4 and Supplement 5

responses to RAI No. 398 were sent on August 31, 2010, October 5, 2010, October 26, 2010, November 22, 2010 and January 6, 2011, respectively, to provide a revised schedule.

To provide additional time to interact with the NRC, a revised schedule is provided in this e-mail.

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

Question #	Response Date
RAI 398 — 09.01.04-18	March 9, 2011

Sincerely,

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

From: BRYAN Martin (External RS/NB)
Sent: Thursday, January 06, 2011 9:41 AM
To: Tesfaye, Getachew
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); KOWALSKI David (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 398, FSARCh. 9, Supplement 5

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to the question in RAI No. 398 on July 21, 2010. Supplement 1, Supplement 2, Supplement 3 and Supplement 4 responses to RAI No. 398 were sent on August 31, 2010, October 5, 2010, October 26, 2010 and November 22, 2010, respectively, to provide a revised schedule.

To provide additional time to interact with the NRC, a revised schedule is provided in this e-mail.

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

Question #	Response Date
RAI 398 — 09.01.04-18	February 10, 2011

Sincerely,

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

From: BRYAN Martin (External RS/NB)
Sent: Monday, November 22, 2010 4:26 PM

To: 'Tesfaye, Getachew'

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

Subject: Response to U.S. EPR Design Certification Application RAI No. 398, FSARCh. 9, Supplement 4

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to the question in RAI No. 398 on July 21, 2010. Supplement 1, Supplement 2 and Supplement 3 responses to RAI No. 398 were sent on August 31, 2010, October 5, 2010 and October 26, 2010, respectively, to provide a revised schedule.

To provide additional time to interact with the NRC, a revised schedule is provided in this e-mail.

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

Question #	Response Date
RAI 398 — 09.01.04-18	January 6, 2011

Sincerely,

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

From: BRYAN Martin (External RS/NB)

Sent: Tuesday, October 26, 2010 11:54 AM

To: 'Tesfaye, Getachew'

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

Subject: Response to U.S. EPR Design Certification Application RAI No. 398, FSARCh. 9, Supplement 3

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to the question in RAI No. 398 on July 21, 2010. The schedule was revised in Supplement 1 on August 31, 2010. The schedule was revised in Supplement 2 on October 5, 2010. To allow additional time to interact with the NRC, the schedule is being revised.

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

Question #	Response Date
RAI 398 — 09.01.04-18	November 23, 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

From: BRYAN Martin (External RS/NB)
Sent: Tuesday, October 05, 2010 5:37 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); KOWALSKI David (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 398, FSARCh. 9, Supplement 2

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to the question in RAI No. 398 on July 21, 2010. The schedule was revised in Supplement 1 on August 31, 2010. To allow additional time to interact with the NRC, the schedule is being revised.

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

Question #	Response Date
RAI 398 — 09.01.04-18	October 27, 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

From: BRYAN Martin (External RS/NB)
Sent: Tuesday, August 31, 2010 9:44 AM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); KOWALSKI David (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 398, FSARCh. 9, Supplement 1

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to the question in RAI No. 398 on July 21, 2010.

Since the response is still being processed, a revised schedule is provided in this e-mail. To facilitate the staff review, a draft is expected to be provided within two weeks.

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

Question #	Response Date
RAI 398 — 09.01.04-18	October 7, 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

From: BRYAN Martin (EXT)
Sent: Wednesday, July 21, 2010 1:23 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); KOWALSKI David J (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 398, FSARCh. 9

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 398 Response US EPR DC," provides a schedule since a technically correct and complete response to the question is not provided.

The following table indicates the respective pages in the response document, "RAI 398 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 398 — 09.01.04-18	2	2

The schedule for a technically correct and complete response to this question is provided below.

Question #	Response Date
RAI 398 — 09.01.04-18	August 31, 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

From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Thursday, June 24, 2010 4:50 PM
To: ZZ-DL-A-USEPR-DL
Cc: Bernal, Sara; Roach, Edward; Hearn, Peter; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 398 (4660), FSARCh. 9

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on May 4, 2010, and on June 24, 2010, 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. 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: 3372

Mail Envelope Properties (2FBE1051AEB2E748A0F98DF9EEE5A5D486D440)

Subject: Response to U.S. EPR Design Certification Application RAI No. 398, FSAR Ch. 9, Supplement 13
Sent Date: 8/30/2011 4:33:31 PM
Received Date: 8/30/2011 4:34:29 PM
From: WILLIFORD Dennis (AREVA)

Created By: Dennis.Williford@areva.com

Recipients:

"BENNETT Kathy (AREVA)" <Kathy.Bennett@areva.com>

Tracking Status: None

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

Tracking Status: None

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

Tracking Status: None

"RYAN Tom (AREVA)" <Tom.Ryan@areva.com>

Tracking Status: None

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

Tracking Status: None

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

Tracking Status: None

Post Office: auscharm02.adom.ad.corp

Files	Size	Date & Time
MESSAGE	20220	8/30/2011 4:34:29 PM
RAI 398 Supplement 13 Response US EPR DC - PUBLIC.pdf		143514

Options

Priority: Standard

Return Notification: No

Reply Requested: No

Sensitivity: Normal

Expiration Date:

Recipients Received:

Response to

Request for Additional Information No. 398, Supplement 13

Question 09.01.04-18

6/24/2010

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: 9.1.4, Fuel Handling System

QUESTIONS for Health Physics Branch (CHPB)

Question 09.01.04-18:

GDC 61 states, in part, that the design of the fuel storage and handling systems shall have suitable shielding for radiation protection and appropriate containment, confinement, and filtering systems. Sufficient shielding provides protection for workers from the spent fuel so that regulatory limits are not exceeded and overexposures do not occur.

Figure 9.1.4-7, Spent Fuel Cask Transfer Facility, shows the cask loading pit with a penetration at the bottom which has an upper plate cover (UPC) and a lower plate cover (LPC). Describe any design features/interlocks that would prevent a spent fuel assembly from being moved into the cask loading pit without a spent fuel cask being connected to the pit docking flange. If such design features/interlocks do not exist for this design, state the expected radiation dose rates to personnel located in the cask loading area below the lower plate cover in the event that a spent fuel assembly were located in the flooded cask loading pit with both the lower and upper plate covers in a closed position.

Historically operating plants have used submerged filtration units (e.g., Tri-Nuclear Filter) to supplement SFP purification to improve SFP clarity during outages. If there are no design features (or license restrictions) which prevent the placement of these filtration units in the cask pit (or the placement of any other type of source in the cask pit) describe the dose rates consequences to the area below the LPC. If the dose rate analysis takes credit for water shielding between the LPC and the UPC, describe the water level alarms, drain valve interlocks or cover interlocks that would prevent removal of this shielding with both fuel and non-fuel sources present in the cask loading pit. What provisions are provided to shield or clean the penetration space drain lines and the ultimate end point of the drain lines? Cavity drain lines tend to collect debris and crud (activated corrosion products) that can result in areas where doses of 10-100 Roentgen per hour on contact are not unusual.

Because there is no available U.S. operating experience for this cask loading design, demonstrate compliance with the shielding requirements of GDC 61 by providing a dose assessment for the cask loading process, including the personnel doses associated with:

- (1) The installation and removal of seismic restraints with spent fuel in the cask
- (2) The installation of the LPC with spent fuel in the cask
- (3) Installation of the biological cover closure with spent fuel in the cask
- (4) Dewatering and sealing the cask.

10 CFR 20.1406 requires that each facility be designed so as to minimize contamination of the facility and the environment and to facilitate decommissioning. Section 9.1.4 of the FSAR states that the cask is attached to a leak tight flange, in order to prevent leakage from the cask pit. Provide more detail on the flange design, including where it is located on Figure 9.1.4-7. Please demonstrate compliance with 10 CFR 20.1406 by describing the design features that would prevent any leaks in the cask loading area from contaminating the facility, or from exiting the building to the outside environment.

Response to Question 09.01.04-18:

The Spent Fuel Cask Transfer Facility (SFCTF) interlock, in combination with the Spent Fuel Machine (SFM) external interlock, prevents the SFM from moving a spent fuel assembly into the loading pit if the correct docking of the spent fuel cask with the loading penetration is not successfully accomplished. These interlocks prevent contamination of the loading hall during the operation of the SFCTF in accordance with 10 CFR 20.1406. They are described below.

The SFCTF is designed with an interlock that allows opening of the upper cover of the penetration only after confirming the correct docking of the spent fuel cask with the loading penetration, correct anti-seismic locking of the Spent Fuel Cask Transfer Machine (SFCTM), and correct water level in the spent fuel cask.

The SFM external interlock with the SFCTF allows the SFM access to the loading pit only if the swivel gate and slot gate, which separate the loading pit from the spent fuel pool (SFP), are opened and removed, respectively, and the loading pit upper cover is completely open.

In addition, the SFCTF video system, in conjunction with the video system that is part of the SFM and the intercom system, aids the operator in the operation of the SFCTF.

U.S. EPR FSAR Tier 2, Figure 9.1.4-7—Spent Fuel Cask Transfer Facility, shows the major parts of the SFCTF and also includes the cask loading pit and loading hall. This figure has been revised as part of the Response to RAI 385.

There are no design features or license restrictions that prevent the use of submerged filtration units in the loading pit. If submerged filtration units are used, their use is governed by the plant radiation protection program described in U.S. EPR FSAR Tier 2, Section 12.5.

The SFCTF is provided with fluid systems for filling, draining, rinsing and drying of the penetration and the cask. The SFCTF fluid systems are connected with various plant fluid systems. The fuel pool cooling and purification system (FPCPS) supplies water for filling the penetration and, also, for water flow in the penetration. The compressed air system (CAS) is used for drying of the penetration. Draining of the penetration and the cask is routed to the Nuclear Island drain/vent system (NIDVS). The penetration is rinsed after draining to prevent radioactive particle retention. The fluid systems of the SFCTF, which are in contact with borated water, are flushed to prevent radioactive particle retention. The FPCPS, CAS and NIDVS are described in U.S. EPR FSAR Tier 2, Sections 9.1.3, 9.3.1 and 9.3.3, respectively.

The non-safety-related SFCTF Instrumentation & Control (I&C) monitors water level in the cask and penetration. The SFCTF I&C displays an alarm in case of an abnormal water level during the operational sequences and closes the identified remote controlled valves of the SFCTF fluid systems. The FPCPS I&C monitors water level in the loading pit and displays an alarm in case of an abnormal water level. A manual isolation valve, provided on the FPCPS line connected to the bottom of the loading pit, is kept closed during fuel loading in order to minimize the likelihood of draining the loading pit. The SFCTF is provided with an emergency stop pushbutton to place the SFCTF in a safe position by closing the identified remote-controlled valves and advising the operator to check the closed status of the hand-operated valves to avoid accidental dewatering, and stopping the SFCTM. Draindown events are discussed in the response to RAI 385, Question 09.01.04-16.

The SFCTF design has the following provisions to keep personnel radiation exposures ALARA:

- (a) The SFCTF is interlocked with the external door of the loading hall such that the SFCTM can not be operated if the external door of the loading hall is open.
- (b) Video cameras fixed in the loading hall allow surveillance of operations conducted in the loading hall from the SFCTF control room. An intercom system connects the operating floor, the biological lid handling station, the loading hall, and the SFCTF control room.
- (c) A radiation monitor is provided to warn the operator of an increased radiation level in the loading hall. Area radiation monitoring instrumentation is described in U.S. EPR FSAR Tier 2, Section 12.3.4.1.
- (d) The SFCTF is equipped with biological shielding around the penetration, on the top of the transfer machine, around the top of the cask, and around the equipment and piping that are in contact with contaminated fluids.
- (e) All cask loading operations are automatically performed from the SFCTF control room. This includes automatic welding of the biological lid and its covers.

The maximum dose rates around the penetration station (close to the top of the cask), at the lid-handling station (highest position on the lid handling), and at the trolley platform are not expected to exceed about 100, 0.2, and 21 mrem/hr (1000, 2, and 210 μ Sv/hr), respectively, during the cask-loading process. The worst-case dose contributor is neutron radiation (from spontaneous fission and (α , n) reactions), with no boron assumed in any material composition. These dose rates are representative of maximum localized dose rates used to assess the occupational dose associated with manual intervention. However, the general area dose rates shown in room UFA10-015 (refer to U.S. EPR FSAR Tier 2, Figure 12.3-33—Fuel Building +0 ft Elevation Radiation Zones) during cask loading are much lower as discussed below.

The dose rates above were based on bounding source terms based on 4 MOX and 8 UO₂ fuel assemblies loaded into the cask. A maximum gamma and neutron source was used in the Monte Carlo N-Particle (MCNP) transport code to calculate the dose rates at the points of interest listed above.

All cask loading operations are automated and carried out remotely; therefore, the radiation zone color designation for room UFA10-015 (Fuel Building, Level \pm 0 ft and \pm 12 ft; U.S. EPR Tier 2, Figure 12.3-33 and Figure 12.3-34, respectively) is yellow (Zone 4, at \leq 25 mrem/hr) during cask-loading operations. Footnote 1 of Figure 12.3-33 and Figure 12.3-34 will be revised to clarify radiation zone designation for normal operations and fuel loading. The maximum dose rates indicated above are localized. Access to the penetration and lid-handling stations are controlled in accordance with 10CFR20.1601 (Control of Access to High Radiation Areas) should there be a need to access the trolley platform for manual intervention. For normal operation, the room radiation zone is green (Zone 3, at \leq 2.5 mrem).

The SFCTF design facilitates repair and maintenance so that the operational doses are low. In case of malfunction during cask loading, the operators have limited but safe access to the loading hall to conduct repairs.

The SFCTF has the following features to preclude contamination of the facility:

- (a) The fluid circuits have provisions to detect a leak via an abnormal pressure or level drop. The SFCTF is provided with an emergency stop pushbutton which can be actuated in case of leak detection.
- (b) The penetration is equipped with double-seals for the upper cover of the penetration, for the double-walled bellow flange, and for the leak-tightness flange. The space between the two seals is monitored for leak tightness, as well as the space between the two walls of the bellows. The water leak sensor, connected to the plant main control room, monitors for potential leakage caused by failure of the seal at the upper cover of the penetration.
- (c) The leak-tightness flange is connected at the upper end to the docking flange and the double walled bellows of the penetration. The lower end of the leak-tightness flange contacts the mating surface of the cask when the cask is docked to the penetration. When the transfer machine is not placed under the penetration, the leak-tightness flange is bolted with the lower cover of the penetration. The leak-tightness flange is equipped with two seals, each at the upper and lower end and an arrangement to monitor the space between the seals for leak-tightness. The leak-tightness flange is identified in U.S. EPR FSAR Tier 2, Figure 9.1.4-7—Spent Fuel Cask Transfer Facility and Figure 9.1.4-8—Cask Loading Pit Penetration Assembly.
- (d) An interlock permits opening of the upper cover of the penetration only after the correct docking has been confirmed, the anti-seismic locking of the SFCTM has been correctly engaged, and the correct water level has been attained. An accidental travel motion of the SFCTM when the penetration is docked is avoided using the interlock.
- (e) Water level in the cask is checked before lowering the lid, before undocking the penetration, and before moving the SFCTM from the penetration.
- (f) The geometry and surface finish of the immersed parts are selected to prevent the formation of radioactive-particle retention areas and to facilitate decontamination. Piping is designed to maintain minimum flow velocities and is installed with slopes to facilitate complete draining. The immersed parts, in particular the moving parts, are designed so that they can be easily and efficiently rinsed.
- (g) The penetration is designed to remain leak-tight during and after a safe shutdown earthquake (SSE), except that a brief unseating of the normally leak-tight connection at the mating surface of the cask may occur resulting in some seepage around the seals, but does not result in any significant loss of water inventory from the cask loading pit or SFP. Refer to the Responses to RAI 385, Questions 09.01.04-15, 09.01.04-16 and 09.01.04-17 for additional discussion concerning the operation of the SFCTF during and after an SSE.
- (h) Effluents created by a postulated leakage of the operational fluid circuits on the SFCTM are collected by the trolley platform from where they can be drained to the NIDVS or loading hall sumps.
- (i) The sumps in the loading hall are connected to the NIDVS, which prevents flooding of the loading hall.

(j) The SFCTM and the cask are checked for contamination before leaving the loading hall.

FSAR Impact:

U.S. EPR FSAR Tier 2, Figures 12.3-33 and 12.3-34, will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

Figure 12.3-33—Fuel Building +0 Ft Elevation Radiation Zones

Figure 12.3-34—Fuel Building +12 Ft Elevation Radiation Zones