ArevaEPRDCPEm Resource

From: BRYAN Martin (EXTERNAL AREVA) [Martin.Bryan.ext@areva.com]
Sent: Wednesday, January 26, 2011 11:01 AM
To: Tesfaye, Getachew
Cc: DELANO Karen (AREVA); ROMINE Judy (AREVA); BENNETT Kathy (AREVA); NOXON David (AREVA)
Subject: Response to U.S. EPR Design Certification Application RAI No. 459, FSAR Ch. 12, New Phase 4 RAI
Attachments: RAI 459 Response US EPR DC.pdf

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 459 Response US EPR DC.pdf," provides the schedule for technically correct and complete responses to these questions.

The following table indicates the respective pages in the response document, "RAI 459 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 459 — 12.03-12.04-25	2	3
RAI 459 — 12.03-12.04-26	4	4

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

Question #	Response Date
RAI 459 — 12.03-12.04-25	June 10, 2011
RAI 459 — 12.03-12.04-26	June 10, 2011

Sincerely,

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

From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Tuesday, December 21, 2010 11:03 AM
To: ZZ-DL-A-USEPR-DL
Cc: Bernal, Sara; Roach, Edward; Patel, Jay; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 459 (5253), FSAR Ch. 12, New Phase 4 RAI

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on December 4, 2010, and on December 14, 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, excluding the time period of **December 24, 2010 thru January 3, 2011, to account for the holiday season** as discussed with AREVA NP Inc. For any RAIs that cannot be answered **within 45 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: 2474

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Subject: Response to U.S. EPR Design Certification Application RAI No. 459, FSAR Ch. 12, New Phase 4 RAI
Sent Date: 1/26/2011 11:00:55 AM
Received Date: 1/26/2011 11:01:33 AM
From: BRYAN Martin (EXTERNAL AREVA)

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

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Tracking Status: None

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Files	**Size**	**Date & Time**
MESSAGE	2294	1/26/2011 11:01:33 AM
RAI 459 Response US EPR DC.pdf	17835	

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

Response to

Request for Additional Information No. 459
12/21/2010

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 12.03-12.04 - Radiation Protection Design Features
Application Section: 12.3 Radiation Protection Design Features

QUESTIONS for Health Physics Branch (CHPB)

Question 12.03-12.04-25:

OPEN ITEM

New Phase 4 RAI

GDC 61 states that systems which contain radioactivity during normal and postulated accident conditions shall be designed with suitable shielding for radiation protection.

RG 1.206, Section C.I.12, states that the applicant should provide their shielding methodology including the assumptions, codes and techniques used in their calculations. The NRC has recently identified that the applicant made reductions in shielding wall thicknesses between revisions 0 and 1 of the EPR FSAR. These changes were classified as editorial in the summary of changes document provided with revision 1. Accordingly, no justification for these changes or analysis demonstrating the effects of these changes on occupational worker exposure were provided to NRC staff at the time of revision 1 submittal.

Based on independent calculations using the source term and assumptions outlined in the FSAR, the staff has identified a situation where the dose rates outside of the CPS demineralizer and filter rooms (Figure 12.3-44, room 22) are 4 to 7 times greater than the 2.5 mrem/hr radiation zone currently marked in chapter 12.

The staff requests additional information on the wall thickness reductions and the applicant's methodology as follows:

a. Describe the basis for the reductions in wall thicknesses seen in FSAR revision 1, chapter 12 figures. Discuss the impact of these reductions on the normal operational radiation zones and discuss any actions taken by the applicant to compensate for these impacts, such as assuming an administratively limited source term in shielding calculations, changing radiation zones, etc.

b. List the areas in the plant where an administratively limited source term was used to determine the radiation zone in revision 1 of the FSAR. Include in the listing information such as the dose rate that the source term was assumed to be administratively limited to, and the basis for the administratively limited dose rate (i.e., how was the dose rate chosen or calculated?)

c. Staff's independent calculations using the source term and assumptions outlined in the FSAR, show dose rates outside the CPS demineralizer rooms and the CPS filter rooms (Figure 12.3-44, room 22) which are 4 to 7 times greater than the 2.5 mrem/hr dose rate currently indicated. The NRC staff's calculated contact dose rate for inside the CPS demineralizer rooms is approximately 200 R/hr. This calculated contact dose rate is in agreement with current operational experience for U.S. plants for dose rates in the vicinity of the CPS demineralizers. Because the staff's estimated dose rate value of 200 R/hr inside these rooms is consistent with operational experience, the staff's calculated dose rates for outside these rooms (4 to 7 times greater than the FSAR radiation zone) are likely to also be a good representation of the radiation zone during normal operations. Therefore the staff is concerned that the dose rates directly outside these rooms, as designated in the EPR FSAR, are not in agreement with staff's calculated values. The staff requests that the applicant review and revise the radiation zone designations for the areas around the CPS filters and demineralizers to more accurately

reflect operating dose rates. Alternatively, the applicant can provide a revised methodology to justify the current radiation zones assuming a conservative contact dose rate of 200 R/hr for the CPS filters and demineralizers, or revise the FSAR to include a new COL item that will ask the applicant to commit to maintaining the CPS demineralizers and filter source terms to the administrative dose rate limit.

d. Changes in Chapter 12 figures in each redline/strike-out FSAR revision are indicated by a line on the left hand side of the drawing. Since it is not readily apparent from looking at these revised figures what changes have been made, please provide a summary document describing the changes that have been made to each of the revised Chapter 12 Radiation Zone figures since FSAR Revision 0. This document can show changes by providing marked-up figures, or by providing a written description of the change (e.g., Figure 12.3-12.4-xx: rooms x through y, wall and floor thicknesses have been reduced, etc.).

Response to Question 12.03-12.04-25:

A response to this question will be provided by June 10, 2011.

Question 12.03-12.04-26:

OPEN ITEM

Follow-up to RAI 280, Question 12.3-12.4-17

In the RAI 280, Supplement 6, Question 12.3-12.4-17 response, the applicant provided a description of an analysis that was performed and the design changes that resulted from that analysis. This analysis demonstrated that if fuel were dropped near the reactor cavity access room during fuel movement, the radiation levels in the cavity access room and the room adjacent to it would be unacceptably high (VHRA and HRA respectively). The applicant's analysis is acceptable to the staff. The FSAR mark-up provided in response to RAI 280, Question 12.3-12.4-17 item 5 does not clearly state whether the doors shown in the revised Figure 3.8-5 – Reactor Building Plan at Elevation +17 Feet, and Figure 12.3-2 – Reactor Cavity at the Elevation +17 Ft of the Reactor Building, are shielding doors, water tight hatches, or normal steel doors. This is because they are all drawn the same and because no additional detail was incorporated into the FSAR.

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.

Based on the above, the staff requests the following:

a. Because the Refueling Machine is not designated as Seismic I or II in Tier 1 of the FSAR, the significant occupational radiation hazard associated with a fuel assembly drop in the reactor cavity adjacent to the cavity access room should be explicitly addressed in the FSAR, specifically by crediting the design changes that were made in order to address this possibility. For example, revise the FSAR to justify the design change to add the two shielding doors between the reactor cavity and the access room at the +17 Ft Elevation of the reactor building. In the FSAR, specify that these shielding doors would reduce radiation dose rates to 1.7 rem/hr in room UJA15-024 and to 32 mrem/hr in UJA15-018 both at a meter from the shielding wall assuming the presence of a dropped maximum burn up spent fuel assembly parallel to the access door, 30 cm away.
b. Organic compounds, such as those used for seals on waterproof doors, have been shown to breakdown when exposed to large integrated doses of radiation. Because of the potential for high radiation levels adjacent to the cavity access door, describe the seals that will be used for the water proof door, and discuss their capacity to maintain their integrity when exposed to the potentially high integrated doses from a dropped fuel assembly adjacent to the cavity access door.
c. Revise the FSAR to include a discussion of how leakage around the cavity access hatch into the access room is contained and removed, in accordance with 10 CFR 20.1406.

Response to Question 12.03-12.04-26:

A response to this question will be provided by June 10, 2011.