ArevaEPRDCPEm Resource

From: WILLIFORD Dennis (AREVA) [Dennis.Williford@areva.com]
Sent: Monday, January 23, 2012 5:05 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (AREVA); DELANO Karen (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA); WELLS Russell (AREVA); Miernicki, Michael
Subject: Response to U.S. EPR Design Certification Application RAI No. 510 (6026,6016), FSAR Ch. 3, Supplement 2
Attachments: RAI 510 Supplement 2 Response US EPR DC.pdf

Getachew,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the 4 questions in RAI No. 510 on November 11, 2011. A revised schedule was provided in Supplement 1 on December 8, 2011.

The attached file, "RAI 510 Supplement 2 Response US EPR DC.pdf" provides technically correct and complete final responses to 2 of the remaining 4 questions.

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 510 Questions 03.09.05-29 and 03.09.05-30.

The following table indicates the respective pages in the response document, "RAI 510 Supplement 2 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 510 — 03.09.05-29	2	2
RAI 510 — 03.09.05-30	3	3

The schedule for technically correct and complete final responses to the remaining 2 questions is unchanged as provided below.

Question #	Response Date
RAI 510 — 03.02.01-19	February 29, 2012
RAI 510 — 03.09.05-28	February 29, 2012

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, December 08, 2011 4:26 PM

To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); NOXON David (RS/NB); WELLS Russell (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 510 (6026,6016), FSAR Ch. 3, Supplement 1

Getachew,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the 4 questions in RAI No. 510 on November 11, 2011.

The schedule for complete responses to Questions 03.02.01-19, 03.09.05-29 and 03.09.05-30 has been changed as provided below. The response date for Question 03.09.05-28 is unchanged.

Question #	Response Date
RAI 510 — 03.02.01-19	**February 29, 2012**
RAI 510 — 03.09.05-28	February 29, 2012
RAI 510 — 03.09.05-29	**February 29, 2012**
RAI 510 — 03.09.05-30	**February 29, 2012**

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, November 11, 2011 12:47 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); WILLIFORD Dennis (RS/NB); WELLS Russell (RS/NB); NOXON David (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 510 (6026,6016), FSAR Ch. 3

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 510 Response US EPR DC.pdf" provides a schedule for technically correct and complete FINAL responses to the 4 questions.

The following table indicates the respective pages in the response document, "RAI 510 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 510 — 03.02.01-19	2	2
RAI 510 — 03.09.05-28	3	3

RAI 510 — 03.09.05-29	4	4
RAI 510 — 03.09.05-30	5	5

A complete answer is not provided for the 4 questions. The schedule for a technically correct and complete FINAL response to these questions is provided below.

Question #	Response Date
RAI 510 — 03.02.01-19	December 9, 2011
RAI 510 — 03.09.05-28	February 29, 2012
RAI 510 — 03.09.05-29	December 12, 2011
RAI 510 — 03.09.05-30	December 12, 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
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From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Wednesday, October 12, 2011 9:46 AM
To: ZZ-DL-A-USEPR-DL
Cc: McNally, Richard; Spicher, Terri; Dixon-Herrity, Jennifer; Miernicki, Michael; Clark, Phyllis; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 510 (6026,6016), FSAR Ch. 3

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on August 31, 2011, and discussed with your staff on October 4, 2011. No change is made to the draft RAI 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. 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: 3702

Mail Envelope Properties (2FBE1051AEB2E748A0F98DF9EEE5A5D4AA0066)

Subject: Response to U.S. EPR Design Certification Application RAI No. 510 (6026,6016), FSAR Ch. 3, Supplement 2
Sent Date: 1/23/2012 5:04:40 PM
Received Date: 1/23/2012 5:05:11 PM
From: WILLIFORD Dennis (AREVA)

Created By: Dennis.Williford@areva.com

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Files	**Size**	**Date & Time**
MESSAGE	5623	1/23/2012 5:05:11 PM
RAI 510 Supplement 2 Response US EPR DC.pdf	132469	

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

Response to

Request for Additional Information No. 510(6026, 6016), Revision 0
Supplement 2

10/12/2011

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 03.02.01 - Seismic Classification
SRP Section: 03.09.05 - Reactor Pressure Vessel Internals

Application Section: 3.2.1

QUESTIONS for Engineering Mechanics Branch 2 (ESBWR/ABWR Projects) (EMB2)
QUESTIONS for Engineering Mechanics Branch 1 (AP1000/EPR Projects) (EMB1)

Question 03.09.05-29:

Follow-up to RAI 184, Question 03.09.05-14

In RAI 184, Question 03.09.05-14, the staff requested the applicant to provide sufficient details about the design of the upper core plate and its interface with the fuel assemblies, core barrel, upper support columns, and lower guide tubes. Also, explain how these component assemblies are evaluated against possible excitation mechanisms of flow-induced vibration and revise Section 3.9.5 of the FSAR to include sufficient information about the design arrangement of the upper core plate and associated internals components including a discussion of the evaluation of the potential adverse effects of flow induced vibration and vortex shedding.

In response, the applicant provided a description of several potential sources of UCP flow excitation and made available for NRC inspection, AREVA NP drawings of the UCP design details and interfaces. The staff accepts this response. However, the applicant did not revise Section 3.9.5 of the FSAR to include sufficient information about the design arrangement of the UCP and associated internal components including a discussion of potential adverse effects of FIV and vortex shedding. Please revise the FSAR with this requested information. The staff needs this information to assure conformance with GDC-1 and 4.

Response to Question 03.09.05-29:

U.S. EPR FSAR Tier 2, Section 3.9.5.1.3.2, will be revised to add the requested information.

FSAR Impact:

U.S. EPR FSAR Tier 2, Section 3.9.5.1.3.2, will be revised as described in the response and indicated on the enclosed markup.

Question 03.09.05-30:

Follow-up to RAI 184, Question 03.09.05-15

In RAI 184, Question 03.09.05-15, the staff requested the applicant to provide design details together with relevant flow-induced vibration analysis for the horizontal support plates and tie rods inside the control rod guide assemblies (CRGAs.) In particular, the applicant is requested to provide drawing/sketches of the control rod guide and to clarify any differences of this design from that of other currently operating PWR reactors and their impact on potential flow excitation mechanisms. Also, revise Section 3.9.5 of the FSAR to provide the requested information.

In response, the applicant made available for NRC inspection, the CRGA design details which are shown in AREVA NP upper internals drawings. The applicant also referred to several RAI responses from Section 3.9.2. The staff finds this acceptable; however, the applicant did not revise Section 3.9.5 of the FSAR. Please revise Section 3.9.5 of the FSAR with the requested information. The staff needs this information to assure conformance with GDC-1 and 4.

Response to Question 03.09.05-30:

U.S. EPR FSAR Tier 2, Section 3.9.5.1.3.3, will be revised to add the requested information. As noted in the Response to RAI 184, Question 03.09.05-15, the control rod guide assembly (CRGA) design details are shown in AREVA NP upper internals drawings which are available for NRC inspection.

FSAR Impact:

U.S. EPR FSAR Tier 2, Section 3.9.5.1.3.3, will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

- Upper core plate.
- Control rod guide assemblies (CRGAs).
- Columns.

3.9.5.1.3.1 Upper Support Assembly

The upper support assembly is a circular skirt with an integrated flange that is welded to the USP. The upper support assembly flange is part of the internals hold-down stack in the RPV. The upper support assembly flange rests on the hold-down spring, which rests on the core barrel flange, which in turn is supported on the ledge machined in the RPV flange. The upper support assembly flange is held in place and preloaded by the RPV closure head flange. Its outer diameter is customized to the corresponding vessel dimension in order to control the radial gap between the flanges. The radial gap controls lateral displacements in normal and faulted conditions.

3.9.5.1.3.2 Upper Core Plate

03.09.05-29

The UCP encloses the top of the core cavity and is attached to the USP via columns. It contains holes located opposite the fuel assemblies for core coolant outlet flow which are designed to equilibrate the outlet flow from the core. The UCP contains fuel alignment pins at each fuel assembly location that position, align, and restrain the fuel assemblies. The UCP is not susceptible to excitation from turblence or any other flow-induced vibration mechanisms. This is due to the high fundamental frequency that this component exhibits due to the rigidity provided by the support columns and the plate thickness. Additional information is provided in ANP-10306P (Reference 5 of Section 3.9.2.7).

3.9.5.1.3.3 Control Rod Guide Assemblies

The CRGAs consist of guide tubes held together with support plates and tie rods. The guide tube assemblies provide a straight, low-friction channel to insert, withdraw, and drop the control rod drive mechanism (CRDM) drive shafts and the attached RCCAs. The guide tube assemblies are located inside housings and columns (see Section 3.9.5.1.3.4 below). The housings are attached to the top of the USP and the columns are attached to the bottom of the USP and also to the UCP. The housings and columns also protect the RCCAs from static and dynamic hydraulic loads and other mechanical loads.

03.09.05-30

Information on flow-induced vibration analyses and flow testing for CRGA components is provided in Section 3.9.2. The support plates are not susceptible to excitation resulting from the vertical flow through the CRGA columns.