

ArevaEPRDCPEm Resource

From: WILLIFORD Dennis (AREVA) [Dennis.Williford@areva.com]
Sent: Wednesday, April 04, 2012 1:03 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (AREVA); DELANO Karen (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA); NOXON David (AREVA)
Subject: Response to U.S. EPR Design Certification Application RAI No. 510 (6026,6016), FSAR Ch. 3, Supplement 6
Attachments: RAI 510 Supplement 6 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. Supplement 2 was sent to NRC on January 23, 2011 which provided a technically correct and complete final response to 2 of the 4 questions. Supplement 3 was sent to the NRC on February 11, 2012 to revise the schedule for a response to Question 03.09.05-28. Supplement 4 was sent to NRC on February 26, 2012 to provide a revised schedule. Supplement 5 was sent to NRC on March 20, 2012 to provide a technically correct and complete final response to 1 of the remaining 2 questions.

The attached file, "RAI 510 Supplement 6 Response - US EPR DC.pdf," provides a technically correct and complete final response to the remaining question.

The following table indicates the respective pages in the response document, "RAI 510 Supplement 6 Response - US EPR DC.pdf," that contain AREVA NP's response to the subject question.

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

This concludes the formal AREVA NP response to RAI 510, 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: Tuesday, March 20, 2012 4:55 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); WELLS Russell (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 510 (6026,6016), FSAR Ch. 3, Supplement 5

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. Supplement 2 was sent to NRC on January 23, 2011 which provided a technically correct and complete final response to 2 of the 4 questions. Supplement 3 was sent to the NRC on February 11, 2012 to revise the schedule for a response to Question 03.09.05-28. Supplement 4 was sent to NRC on February 26, 2012 to provide a revised schedule for the remaining two questions

The attached file, "RAI 510 Supplement 5 Response US EPR DC.pdf" provides a technically correct and complete final response to 1 of the remaining 2 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 Question 03.09.05-28.

The following table indicates the respective pages in the response document, "RAI 510 Supplement 5 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

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

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

Question #	Response Date
RAI 510 — 03.02.01-19	April 5, 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: Sunday, February 26, 2012 8:02 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)
Subject: Response to U.S. EPR Design Certification Application RAI No. 510 (6026,6016), FSAR Ch. 3, Supplement 4

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. Supplement 2 was sent to NRC on January 23, 2011 which provided a technically correct and complete final response to 2 of the 4 questions. Supplement 3 was sent to the NRC on February 11, 2012 to revise the schedule for a response to Question 03.09.05-28.

The schedule for a technically correct and complete response to the remaining two 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.

Question #	Response Date
RAI 510 — 03.02.01-19	April 5, 2012
RAI 510 — 03.09.05-28	April 5, 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: Saturday, February 11, 2012 3:40 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); WELLS Russell (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 510 (6026,6016), FSAR Ch. 3, Supplement 3

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. Supplement 2 was sent to NRC on January 23, 2011 which provided a technically correct and complete final response to 2 of the 4 questions.

The schedule for a technically correct and complete final response to Question 03.09.05-28 has been changed as shown below. The schedule for a response to the other remaining question (Question 03.02.01-19) is unchanged.

Question #	Response Date
RAI 510 — 03.02.01-19	February 29, 2012
RAI 510 — 03.09.05-28	April 7, 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: Monday, January 23, 2012 5:05 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); WELLS Russell (RS/NB); Michael.Miernicki@nrc.gov
Subject: Response to U.S. EPR Design Certification Application RAI No. 510 (6026,6016), FSAR Ch. 3, Supplement 2

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
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

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: 3864

Mail Envelope Properties (2FBE1051AEB2E748A0F98DF9EEE5A5D4BAFC77)

Subject: Response to U.S. EPR Design Certification Application RAI No. 510 (6026,6016),
FSAR Ch. 3, Supplement 6
Sent Date: 4/4/2012 1:02:32 PM
Received Date: 4/4/2012 1:00:24 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
"NOXON David (AREVA)" <David.Noxon@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	12612	4/4/2012 1:00:24 PM
RAI 510 Supplement 6 Response - US EPR DC.pdf		71490

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 6

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 03.02.01-19:

FSAR Rev.2 Section 3.2.1 states that to meet the requirements of both GDC 2 and 10 CFR 50, Appendix S with regard to the design for earthquakes, U.S. EPR SSC are seismically classified in accordance with RG 1.29. Also, Table 1.9-2 of the FSAR Tier 2 states that the U.S. EPR complies with RG 1.29, Revision 4. RG 1.29 regulatory position C.1.c. identifies that the systems that are required for post accident containment atmosphere cleanup (e.g., hydrogen removal system) are designated as Seismic Category I and must be designed to withstand the effects of the SSE and remain functional. However, FSAR Table 3.2.2-1 identifies that the Passive Autocatalytic Recombiners in the Combustible Gas Control System are classified as Seismic Category II rather than Seismic Category I. Therefore, in RAI 481 Question 03.02.01-18, the applicant was requested to describe the basis for the seismic classification of the Passive Autocatalytic Recombiners as Seismic Category II and clarify why this classification is consistent with RG 1.29 or revise the FSAR to show this as an exception to RG 1.29 and justify the acceptability of this exception.

The Response to Question 03.02.01-18 references FSAR Tier 2, Section 6.2.5 that states the hydrogen concentration during design basis accidents remains below the threshold passive autocatalytic recombiners (PARs) are required and credited for accident mitigation. For that reason, the PARs are not safety-related components and are only required for severe accident mitigation. During a safe shutdown earthquake, it is only necessary for the PARs to maintain integrity, and their function is not required during a seismic event. They are therefore classified as Seismic Category II. The response does not address if this is an exception to RG 1.29 or revise the FSAR.

On the basis that the PARs are not relied upon for design basis events they are not considered safety-related or seismic Category I. However, the response does not address the exception to RG 1.29 or revise the FSAR, and the response is incomplete. NRC staff is concerned that this seismic classification represents an exception to RG 1.29 and the FSAR should be revised to identify this as an exception with an appropriate justification. This also appears to represent an exception to RG 1.7, normally addressed in FSAR Section 6.2.5, that should also be included in the FSAR. The applicant is requested to evaluate the seismic classification of the PARs and associated equipment used to remove hydrogen to determine if this classification represents an exception to RG 1.7 and 1.29 and revise the FSAR to identify this as an exception with an appropriate justification. The applicant should specifically explain in the FSAR if the combustible gas control system is important to safety and if the system is needed to be functional after an earthquake in order to satisfy GDC 2. If FSAR Chapter 19 explains the basis for designation of important to safety SSCs relied upon for mitigating severe accidents and assigning their appropriate seismic requirements, the response should so clarify.

Response to Question 03.02.01-19:

RG 1.29, position C.1.c (3) applies to safety-related structures systems and components (SSC) pertaining to post accident containment atmosphere cleanup. RG 1.29 indicates that the list of SSC is based on existing technology, and prior applications. It also states, in position c.1 : "Certain SSCs previously considered Seismic Category I may no longer have a safety-related function requiring Seismic Category I classification". For the U.S. EPR design the PARs perform no credited design basis accident functions, and therefore are not safety-related.

The U.S. EPR PRA-based seismic margin assessment does not credit any non-seismic equipment to meet the commitment for a high confidence low probability of failure plant-level capacity of 1.67 times the safe shutdown earthquake (SSE) (see U.S. EPR FSAR Tier 2, Section 19.1.5.1.2.4). Therefore, no additional risk significant SSC currently classified as non-seismic are required to meet GDC 2, or any other licensing commitments related to seismic design.

Since the PARs are not required for design basis seismic events, and there is sufficient seismic margin for the U.S. EPR design, without crediting the functioning of the PARs in the PRA-based SMA, the PARs are not considered to be important to safety with respect to seismic events and GDC 2.

Classifying the PARs as Seismic Category II is not an exception to RG 1.29 because the PARs are not considered to be important to safety with respect to seismic events, they are not safety-related for design basis accidents, and are, therefore, not required to be classified as Seismic Category I.

For RG 1.7, Part C.1 states the following with respect to combustible gas control systems:

"The required system performance criteria will be based on the results of design-specific reviews that include probabilistic risk assessment as required by 10 CFR 52.47(a). Because these requirements address beyond-design-basis combustible gas control, SSCs provided to meet these requirements need not be subject to the environmental qualification requirements of 10 CFR 50.49, quality assurance requirements of Appendix B to 10 CFR Part 50, and redundancy/diversity requirements of Appendix A to 10 CFR Part 50. Guidance such as that found in Appendices A and B to Regulatory Guide 1.155 (Ref. 7) is appropriate for equipment used to mitigate the consequences of severe accidents."

RG 1.155, Appendix B does not require seismic qualification, therefore classifying the PARs as Seismic Category II is not an exception to RG 1.7.

FSAR Impact:

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