

ArevaEPRDCPEm Resource

From: McLellan, Judith
Sent: Friday, September 07, 2012 2:34 PM
To: ArevaEPRDCPEm Resource
Subject: FW: Response to U.S. EPR Design Certification Application RAI No. 533 (6224), FSAR Ch. 3, Supplement 1
Attachments: RAI 533 Supplement 1 Response US EPR DC.pdf

From: WILLIFORD Dennis (AREVA) [<mailto:Dennis.Williford@areva.com>]
Sent: Thursday, March 22, 2012 11:14 AM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (AREVA); DELANO Karen (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA); WELLS Russell (AREVA)
Subject: Response to U.S. EPR Design Certification Application RAI No. 533 (6224), FSAR Ch. 3, Supplement 1

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for the response to the **one** question in RAI No. 533 on February 13, 2012. The attached file, "RAI 533 Supplement 1 Response US EPR DC.pdf" provides a technically correct and complete FINAL response to the **single** question, as committed.

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 533 Question 03.06.01-13.

The following table indicates the respective pages in the response document, "RAI 533 Supplement 1 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 533 — 03.06.01-13	2	2

This concludes the formal AREVA NP response to RAI 533, 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: Monday, February 13, 2012 6:00 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. 533 (6224), FSAR Ch. 3

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 533 Response US EPR DC.pdf" provides a schedule since a technically correct and complete response to the 1 question cannot be provided at this time.

The following table indicates the respective pages in the response document, "RAI 533 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 533 — 03.06.01-13	2	2

A complete answer is not provided for the one question. The schedule for a technically correct and complete final response to this question is provided below.

Question #	Response Date
RAI 533 — 03.06.01-13	March 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: Tesfaye, Getachew [<mailto:Getachew.Tesfaye@nrc.gov>]

Sent: Tuesday, January 17, 2012 4:35 PM

To: ZZ-DL-A-USEPR-DL

Cc: Hernandez, Raul; McKenna, Eileen; Miernicki, Michael; Segala, John; ArevaEPRDCPEm Resource

Subject: U.S. EPR Design Certification Application RAI No. 533 (6224), FSAR Ch. 3

Attached please find the subject request for additional information (RAI). A draft of the RAI was provided to you on December 8, 2011, and on January 17, 2012, 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/LB1

(301) 415-3361

Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 4024

Mail Envelope Properties (A41C2340DAB39B44AD0B9623285CB3337FA7572E33)

Subject: FW: Response to U.S. EPR Design Certification Application RAI No. 533 (6224),
FSAR Ch. 3, Supplement 1
Sent Date: 9/7/2012 2:34:27 PM
Received Date: 9/7/2012 2:34:28 PM
From: McLellan, Judith

Created By: Judith.McLellan@nrc.gov

Recipients:
"ArevaEPRDCPEm Resource" <ArevaEPRDCPEm.Resource@nrc.gov>
Tracking Status: None

Post Office: HQCLSTR02.nrc.gov

Files	Size	Date & Time
MESSAGE	4183	9/7/2012 2:34:28 PM
RAI 533 Supplement 1 Response US EPR DC.pdf		512639

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

Response to

**Request for Additional Information No. 533(6224), Revision 0
Supplement 1**

1/17/2012

U. S. EPR Standard Design Certification

AREVA NP Inc.

Docket No. 52-020

**SRP Section: 03.06.01 - Plant Design for Protection Against Postulated Piping
Failures in Fluid Systems Outside Containment
Application Section: Section 3.6.1**

QUESTIONS for Balance of Plant Branch 1 (SBPA)

Question 03.06.01-13:

Open Item

Follow-up to RAI 354, Question 03.06.02-42

In response to RAI 354, Question 03.06.02-42, Part C, the applicant proposed to revise U.S. EPR FSAR Tier 2, Table 1.8-2, COL Item 3.6-1 and Item 3.6-2, to specify reconciliation of the as-designed pipe break hazards analysis. The staff review the applicant's response and found it to be inadequate. The staff determined that the resulting COL Information Item can not be addressed by the COL applicant within the review phase.

The staff requests the applicant to revise U.S. EPR FSAR Tier 2, Table 1.8-2, COL Item 3.6-1 and Item 3.6-2, to remove the reference to the reconciliation of deviations between the as-built configuration and the as-design analysis.

Response to Question 03.06.01-13:

In RAI 354, Supplement 6, Question 03.06.02-42, Part C, as requested by the NRC, AREVA NP revised U.S. EPR FSAR Tier 2, Table 1.8-2, COL Items 3.6-1 and 3.6-2 to state that a COL applicant will perform the pipe break hazards analysis and reconcile deviations in the as-built configuration to the as-designed analysis. Also, in the response to RAI 354, Supplement 6, Question 03.06.02-42, AREVA NP added ITAAC in U.S. EPR FSAR Tier 1, Section 3.8, "Pipe Break Hazards," which requires performance of the pipe break hazards analysis and reconciliation of deviations to the pipe break hazards analysis.

Therefore, COL Items 3.6-1 and 3.6-2 are not necessary and are redundant to the ITAAC in U.S. EPR FSAR Tier 1, Section 3.8. AREVA NP will delete COL Items 3.6-1 and 3.6-2 from U.S. EPR FSAR Tier 2, Table 1.8-2, and Sections 3.6.1 and 3.6.2.

FSAR Impact:

U.S. EPR FSAR Tier 2, Table 1.8-2, and Tier 2, FSAR Sections 3.6.1 and 3.6.2 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

Table 1.8-2—U.S. EPR Combined License Information Items
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Item No.	Description	Section
3.6-1	Deleted. A COL applicant that references the U.S. EPR design certification will perform the pipe break hazards analysis and reconcile deviations in the as-built configuration to the as-designed analysis.	3.6.1
3.6-2	Deleted. A COL applicant that references the U.S. EPR design certification will perform the pipe break hazards analysis and reconcile deviations in the as-built configuration to the as-designed analysis.	3.6.2.1
3.6-3	A COL applicant that references the U.S. EPR design certification will confirm that the design LBB analysis remains bounding for each piping system and provide a summary of the results of the actual as-built plant specific LBB analysis, including material properties of piping and welds, stress analyses, leakage detection capability, and degradation mechanisms.	3.6.3
3.6-4	A COL applicant that references the U.S. design certification will provide diagrams showing the final as-designed configurations, locations, and orientations of the pipe whip restraints in relation to break locations in each piping system.	3.6.2.5.1
3.6-5	A COL applicant that references the U.S. EPR design certification will implement the ISI program as augmented with NRC approved ASME Code cases that are developed and approved for augmented inspections of Alloy 690/152/52 material to address PWSCC concerns.	3.6.3.3.4.1
3.7-1	A COL applicant that references the U.S. EPR design certification will confirm that the site-specific seismic response is within the parameters of section 3.7 of the U.S. EPR standard design.	3.7.2
3.7-2	A COL applicant that references the US EPR design certification will provide the site-specific separation distances for the access building and turbine building.	3.7.2.8
3.7-3	A COL applicant that references the U.S. EPR design certification will provide a description of methods used for seismic analysis of site-specific Category I concrete dams, if applicable.	3.7.3.13
3.7-4	A COL applicant that references the U.S. EPR design certification will determine whether essentially the same seismic response from a given earthquake is expected at each of the units in a multi-unit site or instrument each unit. In the event that only one unit is instrumented, annunciation shall be provided to each control room.	3.7.4.2

- Identification of the systems and components that are located proximate to high- or moderate-energy pipe systems, that are deemed essential to plant safety, and that are required to safely shut down the plant. The safety-related SSC which require protection from pipe rupture are listed in Section 3.2.
- Identification of the failures for which protection is being provided and design basis assumptions used in the evaluations (Section 3.6.1.1.2).
- Identification of the protection considerations that are utilized in the design to safeguard the essential equipment from the postulated failures (Section 3.6.1.2). Separation and redundancy of essential systems, methods of analyzing the dynamic and environmental effects of the postulated piping failures, and habitability of the main control room (MCR) are also addressed.

The following GDC apply to this section:

- GDC 2 as it relates to protection against natural phenomena, such as seismically-induced failures of non-seismic piping. The application of GDC 2 to this section is to incorporate environmental effects of full-circumferential ruptures of non-seismic moderate-energy piping in areas where effects are not already bounded by failures of high-energy piping. As noted in Section 3.6.1.1, the criteria used to evaluate pipe failure protection conform to the guidance in BTP 3-3 (Reference 1). Additionally, seismic classifications of SSC are provided in Section 3.2.
- GDC 4 as it relates to SSC important to safety being designed to accommodate the effects of and to be compatible with the environmental conditions associated with postulated pipe rupture. In the event of a high- or moderate-energy pipe failure within the plant, protection is provided so that essential SSC are not impacted by the adverse effects of the postulated piping failure. Also, as noted in Section 3.6.1.1, the criteria used to evaluate pipe failure protection conform to the guidance in BTP 3-3. The U.S. EPR design also prevents the dynamic effects of postulated pipe ruptures based on the application of the LBB approach as described in Section 3.6.3.

Table 3.6.1-1 lists those systems that contain high- and moderate-energy lines that are considered when determining the need for protection of essential systems.

Table 3.6.1-2 provides a listing of terminal end breaks for the high-energy systems, and provides the location for these breaks by building and room number.

Table 3.6.1-3 provides a summary of the evaluation of a subset of the terminal end breaks where there are nearby essential systems and components requiring protection.

Table 3.6.1-3 also lists the essential system targets, as well as the type of protection to be designed.

03.06.01-13

A GOL applicant that references the U.S. EPR design certification will perform the pipe break hazards analysis and reconcile deviations in the as-built configuration to the as-designed analysis.

03.06.01-13

For ASME Class 1, 2, and 3 piping, breaks are postulated at terminal end locations which are determined according to the applicable piping isometrics. Intermediate breaks and cracks in ASME Class 1, 2, and 3 piping are postulated per the guidance described in the sections that follow. ~~A GOL applicant that references the U.S. EPR design certification will perform the pipe break hazards analysis and reconcile deviations in the as-built configuration to the as-designed analysis.~~

The pipe break hazards analysis identifies each piping run considered for break postulation. For complex systems (e.g., those containing arrangements of headers and parallel piping running between headers) the piping is included within a designated run for the purposes of break postulation. The following information will be provided in the pipe break hazards analysis report:

- A summary of the dynamic analyses applicable to high-energy piping systems, including:
 - Sketches showing the locations of the resulting postulated pipe ruptures, including identification of longitudinal and circumferential breaks; structural barriers, if any; restraint locations; and the constrained directions in each restraint.
 - A summary of the data developed to select postulated break locations, including, for each point, the calculated stress, the calculated primary plus secondary stress/stress intensity range, and the calculated cumulative usage factor as delineated in BTP 3-4.
 - An evaluation of the impact of a one square foot break on the main steam and main feed lines, within the pipe break exclusion zone.
- For failure in the moderate-energy piping systems, descriptions showing how safety-related systems are protected from spray wetting, flooding, and other adverse environmental effects.
- Identification of protective measures provided against the effects of postulated pipe failures for protection of each of the essential systems and components.
- A conclusion that the plant can be shut down safely and maintained in cold safe shutdown following a pipe break with loss of offsite power.

3.6.2.1.1 Locations of High-Energy Line Breaks and Leakage Cracks

3.6.2.1.1.1 Break Locations in Containment Penetration Areas

For the portions of fluid systems in containment penetration areas, breaks and cracks are not postulated from the containment wall up to and including the inboard and outboard containment isolation valves, when the systems meet the requirements of Subarticle NE-1120 in Section III of the ASME Boiler and Pressure Vessel Code (Reference 2), and where the additional requirements listed in Items 1 through 3