

ArevaEPRDCPEm Resource

From: BRYAN Martin (EXTERNAL AREVA) [Martin.Bryan.ext@areva.com]
Sent: Wednesday, July 14, 2010 10:21 AM
To: Tesfaye, Getachew
Cc: DELANO Karen (AREVA); ROMINE Judy (AREVA); BENNETT Kathy (AREVA); GUCWA Len (EXTERNAL AREVA)
Subject: Response to U.S. EPR Design Certification Application RAI No. 394, FSAR Ch. 15, Supplement 1
Attachments: RAI 394 Supplement 1 Response US EPR DC.pdf

Getachew,

On June 10, 2010, AREVA NP Inc. (AREVA NP) provided a schedule for the final response to request for additional information (RAI) 394 as July 15, 2010. AREVA NP provided a draft response to the two questions in RAI 394 on June 16, 2010. Attached please find AREVA NP's final response to RAI 394. The attached file, "RAI 394 Supplement 1 Response US EPR DC.pdf," provides technically correct and complete responses to 2 of the 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 394 Questions 15.0.3-37 and 15.0.3-38.

The following table indicates the respective pages in the response document, "RAI 394 Supplement 1 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 394 — 15.00.03-37	2	2
RAI 394 — 15.00.03-38	3	3

This concludes the formal AREVA NP response to RAI 394, and there are no questions from this RAI for which AREVA NP has not provided responses.

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: Thursday, June 10, 2010 5:05 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); GUCWA Len T (EXT)
Subject: Response to U.S. EPR Design Certification Application RAI No. 394, FSARCh. 15

Getachew,

Attached please find AREVA NP Inc.'s (AREVA NP) response to the subject request for additional information (RAI). The attached file, "RAI 394 Response US EPR DC.pdf" provides a schedule since a technically correct and complete response to 2 of the 2 questions is not provided.

The following table indicates the respective pages in the response document, "RAI 394 Response US EPR DC.pdf" that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 394 — 15.00.03-37	2	2
RAI 394 — 15.00.03-38	3	3

A complete answer is not provided for 2 of the 2 questions. The schedule for a technically correct and complete response to these questions is provided below.

Question #	Response Date
RAI 394 — 15.00.03-37	July 15, 2010
RAI 394 — 15.00.03-38	July 15, 2010

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
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From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Tuesday, May 11, 2010 3:33 PM
To: ZZ-DL-A-USEPR-DL
Cc: Makar, Gregory; Terao, David; Carneal, Jason; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 394 (4663), FSARCh. 15

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on April 28, 2010, and discussed with your staff on May 11, 2010. No changes were 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: 1688

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Subject: Response to U.S. EPR Design Certification Application RAI No. 394, FSAR Ch. 15, Supplement 1
Sent Date: 7/14/2010 10:20:52 AM
Received Date: 7/14/2010 10:20:57 AM
From: BRYAN Martin (EXTERNAL AREVA)

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Options

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

Response to

Request for Additional Information No. 394(4663), Supplement 1, Revision 1

5/11/2010

U. S. EPR Standard Design Certification

AREVA NP Inc.

Docket No. 52-020

**SRP Section: 15.00.03 - Design Basis Accidents Radiological Consequence
Analyses for Advanced Light Water Reactors**

Application Section: 15.0

**QUESTIONS for Component Integrity, Performance, and Testing Branch 1
(AP1000/EPR Projects) (CIB1)**

Question 15.00.03-37:

In an email message dated January 28, 2009 (ML090280312), Areva NP Inc. provided a supplemental response (Supplement 1) to RAI No. 137, Question 15.00.03-33. The response provided tabulated values of the IRWST pH as a function of time over 30 days, as well as the acid quantities on which the pH values are based (Tables 15.00.03-33-1, -2, and -3). The response did not propose any FSAR revisions. The staff determined that the response addressed the technical concerns about the post-LOCA containment sump pH. However, the staff also determined that the tables should be included in U.S. EPR FSAR Section 15.0 to replace and supplement the existing Table 15.0-55 (FSAR Rev. 1). Therefore, please discuss your plans to include in the FSAR the information from Tables 15.00.03-33-1, -2, and -3 of the RAI No. 137 response, and provide the corresponding FSAR proposed revision.

Response to Question 15.00.03-37:

The Response to RAI 137, Supplement 1, Question 15.00.03-33 provided Table 15.00.03-33-2, which includes the results of sensitivity studies regarding different masses of Hypalon material. Because some of the information presented in the Response to RAI 137, Supplement 1, Table 15.00.03-33-2 does not represent the U.S. EPR design basis, it is not being added to the U.S. EPR FSAR.

U.S. EPR FSAR Tier 2, Table 15.0-64 will be added to include the information in the Response to RAI 137, Supplement 1, Table 15.00.03-33-3. U.S. EPR FSAR Tier 2, Table 15.0-65 will be added to include the information in the Response to RAI 137, Supplement 1, Table 15.00.03-33-2. U.S. EPR FSAR Tier 2, Section 15.0.3.12.3 will be revised to include descriptions of the added tables.

U.S. EPR FSAR Tier 2, Table 15.0-55 will be revised to properly designate a footnote in the column header.

FSAR Impact:

U.S. EPR FSAR Tier 2, Section 15.0.3.12.3 and Table 15.0-55 will be revised as described in the response and indicated on the enclosed markup. U.S. EPR FSAR Tier 2, Table 15.0-64 and Table 15.0-65 will be added as described in the response and indicated on the enclosed markup.

Question 15.00.03-38:

In an email message dated January 28, 2009 (ML090280312), Areva NP Inc. provided a supplemental response (Supplement 1) to RAI No. 137, Question 15.00.03-35. The response explains how the applicant will ensure the correct amount of trisodium phosphate (TSP) is stored in containment despite possible variations in purity and density. Please provide a revision to the EPR FSAR (for example, Section 15.0.3.12.3) to explain how the purity and density requirements will be applied to TSP purchase specifications to ensure the volume of stored TSP is adequate to provide the required neutralizing capability.

Response to Question 15.00.03-38:

U.S. EPR FSAR Tier 2, Section 15.0.3.12.3 will be revised to include provisions for establishing TSP purity and density requirements.

FSAR Impact:

U.S. EPR FSAR Tier 2, Section 15.0.3.12.3 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

100,000 lbm of Hypalon jacket and 4000 lbm of PVC cable jacketing. The H⁺ time history is provided in Table 15.0-55—H⁺ Added to IRWST. IRWST pH as a function of acid added is provided in Table 15.0-64—IRWST pH vs. Acid Added, and IRWST pH as a function of time is provided in Table 15.0-65—IRWST pH vs. Time.~~and~~

~~€~~The mass of TSP versus pH is provided in Table 15.0-56—Mass of TSP vs. pH at 30 Days. To verify the 12,200 lb_m of TSP shown on Table 15.0-56, the purity and density of the TSP-C (TSP in crystalline form) are included in the purchase specification to provide a minimum assay in accordance with Technical Specification requirements. Purchase requirements are then used to assess the vendors Certificate of Analysis (C of A). The known assay and as-purchased density are used to establish equivalency to the assumed 100 percent assay and 58 lb_m/ft³ density used for determining the volume required by the Technical Specifications.

15.0.3.13 Control Room Radiological Habitability

The MCR and TSC radiological habitability evaluation is included in Section 15.0.3.11.

15.0.4 Plant Cooldown

15.0.4.1 Post Chapter 15 Events Cooldown

The analysis of Chapter 15 events are generally terminated when the plant achieves a stable, controlled condition (i.e., the reactor is subcritical and remains subcritical, the core is covered, decay heat is being removed from the RCS, and secondary inventory levels are sufficient to maintain RCS temperatures). Subsequent actions, including cooldown, will be addressed in plant specific Emergency Operating Procedures (EOPs).

15.0.5 Compliance with Section C.I.15, “Transient and Accident Analyses,” of Regulatory Guide 1.206

Table 15.0-57—TMI Action Plan Items, Table 15.0-58—Unresolved Safety Issues, Table 15.0-59—Generic Safety Issues, Table 15.0-60—NRC Generic Letters, and Table 15.0-61—NRC Bulletins respectively present the disposition of the NRC issues listed in Section C.I.15. “Transient and Accident Analyses,” of RG 1.206, including specific TMI action plan items, unresolved safety issues (USIs), generic safety issues (GSIs), generic letters (GLs), and Bulletins (BLs).

15.0.6 References

1. NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants,” U.S. Nuclear Regulatory Commission, March 2007.
2. ANP-10287P, Revision 0, “Incore Trip Setpoint and Transient Methodology for U.S. EPR,” AREVA NP Inc., December 2007.

Table 15.0-55—H⁺ Added to IRWST

Time	HNO ₃ (mol/L)	HCl - Hypalon ¹ (mol/L)	HCl - PVC ¹ (mol/L)	H ⁺ (Σ col. 2-4) (mol/L)
1h	3.51E-06	9.98E-05	1.47E-05	1.18E-04
2h	4.83E-06	1.70E-04	2.49E-05	2.00E-04
5h	7.57E-06	3.26E-04	4.78E-05	3.81E-04
12h	1.21E-05	5.79E-04	8.50E-05	6.76E-04
1d	1.80E-05	8.94E-04	1.31E-04	1.04E-03
3d	5.16E-05	1.45E-03	2.13E-04	1.71E-03
10d	1.14E-04	2.45E-03	3.59E-04	2.92E-03
20d	1.53E-04	2.95E-03	4.33E-04	3.54E-03
30d	1.78E-04	3.21E-03	4.70E-04	3.86E-03

Note:

1. 100,000 lb_m of Hypalon jacket + 4000 lb_m of PVC jacket.

Table 15.0-56—Mass of TSP vs. pH at 30 Days

Mass TSP (lb _m)	PO ₄ (mol/L)	Starting pH	pH at 30 days
12,200	0.0061	7.5	7.1

Table 15.0-64—IRWST pH vs. Acid Added

<u>pH</u>	<u>H+</u>
<u>7.5</u>	<u>0.00E+00</u>
<u>7.4</u>	<u>1.24E-03</u>
<u>7.3</u>	<u>2.31E-03</u>
<u>7.2</u>	<u>3.23E-03</u>
<u>7.1</u>	<u>4.03E-03</u>
<u>7</u>	<u>4.71E-03</u>

Table 15.0-65—IRWST pH vs. Time

<u>Time (hours)</u>	<u>pH</u>
<u>0</u>	<u>7.5</u>
<u>48</u>	<u>7.38</u>
<u>96</u>	<u>7.34</u>
<u>144</u>	<u>7.30</u>
<u>192</u>	<u>7.26</u>
<u>240</u>	<u>7.23</u>
<u>288</u>	<u>7.21</u>
<u>336</u>	<u>7.2</u>
<u>384</u>	<u>7.19</u>
<u>432</u>	<u>7.18</u>
<u>480</u>	<u>7.17</u>
<u>528</u>	<u>7.16</u>
<u>576</u>	<u>7.15</u>
<u>624</u>	<u>7.14</u>
<u>672</u>	<u>7.13</u>
<u>720</u>	<u>7.12</u>