ArevaEPRDCPEm Resource

From: WELLS Russell (AREVA) [Russell.Wells@areva.com]
Sent: Thursday, May 12, 2011 3:04 PM
To: Tesfaye, Getachew
Cc: GUCWA Len (EXTERNAL AREVA); BENNETT Kathy (AREVA); DELANO Karen (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA)
Subject: Response to U.S. EPR Design Certification Application RAI No. 89, Supplement 2, FSAR Ch 6
Attachments: RAI 89 Supplement 2 Response US EPR DC.PDF

Getachew,

AREVA NP Inc. provided responses to 6 of the 9 questions of RAI No. 89 on October 31, 2008. On December 15, 2008 AREVA NP provided responses to the three remaining questions of RAI No. 89.

Based on recent discussions with the NRC staff regarding RAI No. 378, Question 06.02.03-6, AREVA NP has revised the prior response to RAI No. 89, Question 06.02.03-3. The attached file, "RAI 89 Supplement 2 Response US EPR DC.pdf," provides a revised response to Question 06.02.03-3.

The following table indicates the respective pages in the response document, "RAI 89 Supplement 2 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 89 — 06.02.03-3	2	3

This concludes the formal AREVA NP response to RAI 89, and there are no questions from this RAI for which AREVA NP has not provided responses.

Sincerely,

Russ Wells
U.S. EPR Design Certification Licensing Manager
AREVA NP, Inc.
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Lynchburg, VA 24506-0935
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Russell.Wells@Areva.com

From: WELLS Russell D (AREVA US)
Sent: Monday, December 15, 2008 2:54 PM
To: 'Getachew Tesfaye'
Cc: 'John Rycyna'; PEDERSON Ronda (EP/PE); BENNETT Kathy (RS/NB); DELANO Karen (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 89, Supplement 1, FSAR Ch 6

Getachew,

AREVA NP Inc. provided responses to 6 of the 9 questions of RAI No. 89 on October 31, 2008. The attached file, "RAI 89 Supplement 1 Response US EPR DC.pdf" provides technically correct and complete responses to the remaining 3 questions, 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 89 Questions 06.04-2 and 06.04-3.

The following table indicates the respective pages in the response document, "RAI 89 Supplement 1 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 89 — 06.02.03-5	2	2
RAI 89 — 06.04-2	3	3
RAI 89 — 06.04-3	4	4

This concludes the formal AREVA NP response to RAI 89, and there are no questions from this RAI for which AREVA NP has not provided responses.

Sincerely,

(Russ Wells on behalf of)
Ronda Pederson
ronda.pederson@areva.com
Licensing Manager, U.S. EPR Design Certification
New Plants Deployment
AREVA NP, Inc.
An AREVA and Siemens company
3315 Old Forest Road
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Phone: 434-832-3694
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From: Pederson Ronda M (AREVA NP INC)
Sent: Friday, October 31, 2008 6:30 PM
To: 'Getachew Tesfaye'
Cc: DUNCAN Leslie E (AREVA NP INC); DELANO Karen V (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); WILLIFORD Dennis C (AREVA NP INC); WELLS Russell D (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 89 (1179, 1181), FSAR Ch. 6

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 89 Response US EPR DC.pdf" provides technically correct and complete responses to 6 of the 9 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 89 Questions 06.02.03-1 and 06.04-4.

The following table indicates the respective pages in the response document that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 89 — 06.02.03-1	2	2
RAI 89 — 06.02.03-2	3	3

RAI 89 — 06.02.03-3	4	5
RAI 89 — 06.02.03-4	6	6
RAI 89 — 06.02.03-5	7	7
RAI 89 — 06.04-1	8	8
RAI 89 — 06.04-2	9	9
RAI 89 — 06.04-3	10	10
RAI 89 — 06.04-4	11	11

A complete answer is not provided for 3 of the 9 questions. The schedule for a technically correct and complete response to these questions is provided below.

Question #	Response Date
RAI 89 — 06.02.03-5	December 15, 2008
RAI 89 — 06.04-2	December 15, 2008
RAI 89 — 06.04-3	December 15, 2008

Sincerely,

Ronda Pederson
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From: Getachew Tesfaye [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Thursday, October 02, 2008 10:22 PM
To: ZZ-DL-A-USEPR-DL
Cc: Nan Chien; Michael Miernicki; Christopher Jackson; Joseph Colaccino; John Rycyna
Subject: U.S. EPR Design Certification Application RAI No. 89 (1179, 1181),FSAR Ch. 6

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on September 26, 2008, and on October 2, 2008, 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/NARP
(301) 415-3361

Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 2963

Mail Envelope Properties (1F1CC1BBDC66B842A46CAC03D6B1CD41045A4D54)

Subject: Response to U.S. EPR Design Certification Application RAI No. 89, Supplement 2, FSAR Ch 6
Sent Date: 5/12/2011 3:03:50 PM
Received Date: 5/12/2011 3:04:02 PM
From: WELLS Russell (AREVA)

Created By: Russell.Wells@areva.com

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Tracking Status: None
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Files	Size	Date & Time
MESSAGE	6050	5/12/2011 3:04:02 PM
RAI 89 Supplement 2 Response US EPR DC.PDF	12112	

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

Response to

Request for Additional Information No. 89 (1179, 1181), Revision 0, Supplement 2

10/2/2008

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 06.02.03 - Secondary Containment Functional Design
SRP Section: 06.04 - Control Room Habitability System
Application Section: FSAR Ch 6

QUESTIONS for Containment and Ventilation Branch 1 (AP1000/EPR Projects)
(SPCV)

Question 06.02.03-3:

Annulus temperature

Provide details of the thermal analysis that demonstrate the AVS will maintain acceptable annulus air temperature during accidents. Please include the key analysis assumptions, annulus in-leakage, heat loads, containment wall temperatures, and other calculation input parameters. Is heat conduction through metal penetrations considered?

Response to Question 06.02.03-3:

This response supersedes the original response to this question.

The following assumptions were selected to maximize the annulus temperature response:

- Bounding maximum inleakages from the primary containment and environment into the annulus were used.
- The primary containment design temperature was used for the primary containment loss of coolant accident (LOCA) temperature.
- Heat transfer from the primary containment to the primary containment wall was modeled using an infinite heat transfer coefficient.
- The primary containment wall consists of various materials layers. The main portion of the containment in contact with the annulus is concrete, and there is an air gap between the concrete and a painted stainless steel liner. In the analysis, the primary containment wall was assumed to be only concrete, resulting in is less resistance to heat transfer.
- The maximum ambient temperature was used for the environment temperature.

The entire primary containment wall, including the sections occupied by penetrations, is assumed to be concrete. The total piping penetration cross-sectional area is approximately 1.1 percent of the containment wall outer surface area. The total cross-sectional area of other penetrations through the primary containment wall, such as electrical and instrumentation and controls (I&C) penetrations, spare penetrations, the equipment hatch, and airlocks is also approximately 1.1 percent of the containment wall outer surface area. Therefore, the total penetration area is approximately 2.2 percent of the containment wall outer surface area, of which only a fraction of that percentage is metal area. This small fraction of relatively conductive metal area is assumed to be a negligible contributor to conductive heat transfer. Further, the effect of the other assumptions offsets heat transfer conduction through the metal penetrations.

Heat loads in the annulus were not included in the analysis because the metal cross-sections of the penetrations are small and because the containment penetrations for high energy pipes are enclosed in guard pipes to minimize heat transfer between the piping and the annulus.

The annulus air temperature response during accidents was calculated using the GOTHIC computer code. The annulus air temperature increases slightly prior to AVS activation because of the conservative primary containment temperature, which results in a conservative air inleakage temperature, and because of the annulus volume step reduction resulting from the primary containment post-accident expansion. Immediately after AVS activation, the

temperature momentarily decreases because of the large drawdown rate. The annulus temperature then increases for the remainder of the transient. Using a bounding inleakage fluid temperature and flow rate, the annulus air temperature remains below the design temperature throughout the accident.

The results demonstrate that the AVS will maintain acceptable annulus air temperature during accidents.

FSAR Impact:

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