

## ArevaEPRDCPEm Resource

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**From:** WELLS Russell D (AREVA NP INC) [Russell.Wells@areva.com]  
**Sent:** Wednesday, November 04, 2009 3:20 PM  
**To:** Tesfaye, Getachew  
**Cc:** Pederson Ronda M (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 266, FSAR Ch 6, Supplement 1  
**Attachments:** RAI 266 Supplement 1 Response US EPR DC.pdf

Getachew,

AREVA NP, Inc. provided a response to 1 of the 15 questions of RAI No. 266 on October 12, 2009. As indicated in our response, a schedule for the response to Questions 06.02.01.02-2, 06.02.01.02-3, 06.02.01.02-4, would be provided by November 5, 2009. Accordingly, the schedule for the response to these questions is provided in the attached file, "RAI 266 Supplement 1 Response US EPR DC.pdf" and reflected in the below table.

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

Question #	Response Date
RAI 266 — 06.02.01-47	December 10, 2009
RAI 266 — 06.02.01-48	February 25, 2010
RAI 266 — 06.02.01.02-2	May 5, 2010
RAI 266 — 06.02.01.02-3	May 5, 2010
RAI 266 — 06.02.01.02-4	May 5, 2010
RAI 266 — 06.02.01.03-2	December 10, 2009
RAI 266 — 06.02.01.03-3	February 25, 2010
RAI 266 — 06.02.01.04-2	February 25, 2010
RAI 266 — 06.02.01.04-3	February 25, 2010
RAI 266 — 06.02.01.04-4	February 25, 2010
RAI 266 — 06.02.01.04-5	February 25, 2010
RAI 266 — 06.02.01.04-6	December 18, 2009
RAI 266 — 06.02.01.04-7	December 18, 2009
RAI 266 — 06.02.02-33	June 30, 2010

Sincerely,

(Russ Wells on behalf of)

*Ronda Pederson*

[ronda.pederson@areva.com](mailto: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

Lynchburg, VA 24506-0935

Phone: 434-832-3694

Cell: 434-841-8788

**From:** Pederson Ronda M (AREVA NP INC)

**Sent:** Monday, October 12, 2009 6:38 PM

**To:** Tesfaye, Getachew

**Cc:** BEELMAN Ronald J (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 266, FSAR Ch. 6

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 266 Response US EPR DC.pdf" provides technically correct and complete responses to 1 of the 15 questions.

The following table indicates the respective pages in the response document, "RAI 266 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

<b>Question #</b>	<b>Start Page</b>	<b>End Page</b>
RAI 266 — 06.02.01-47	2	2
RAI 266 — 06.02.01-48	3	3
RAI 266 — 06.02.01.02-2	4	4
RAI 266 — 06.02.01.02-3	5	5
RAI 266 — 06.02.01.02-4	6	6
RAI 266 — 06.02.01.03-2	7	7
RAI 266 — 06.02.01.03-3	8	8
RAI 266 — 06.02.01.04-2	9	9
RAI 266 — 06.02.01.04-3	10	10
RAI 266 — 06.02.01.04-4	11	11
RAI 266 — 06.02.01.04-5	12	12
RAI 266 — 06.02.01.04-6	13	13
RAI 266 — 06.02.01.04-7	14	14
RAI 266 — 06.02.02-33	15	15
RAI 266 — 06.02.02-34	16	16

A complete answer is not provided for 14 of the 15 questions. The schedule for a technically correct and complete response to these questions is provided below.

<b>Question #</b>	<b>Response Date</b>
RAI 266 — 06.02.01-47	December 10, 2009
RAI 266 — 06.02.01-48	February 25, 2010
RAI 266 — 06.02.01.02-2	Schedule to be provided by November 5, 2009
RAI 266 — 06.02.01.02-3	Schedule to be provided by November 5, 2009
RAI 266 — 06.02.01.02-4	Schedule to be provided by November 5, 2009
RAI 266 — 06.02.01.03-2	December 10, 2009
RAI 266 — 06.02.01.03-3	February 25, 2010
RAI 266 — 06.02.01.04-2	February 25, 2010
RAI 266 — 06.02.01.04-3	February 25, 2010
RAI 266 — 06.02.01.04-4	February 25, 2010
RAI 266 — 06.02.01.04-5	February 25, 2010
RAI 266 — 06.02.01.04-6	December 18, 2009
RAI 266 — 06.02.01.04-7	December 18, 2009

Sincerely,

*Ronda Pederson*

[ronda.pederson@areva.com](mailto:ronda.pederson@areva.com)

Licensing Manager, U.S. EPR Design Certification

**AREVA NP Inc.**

An AREVA and Siemens company

3315 Old Forest Road

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**From:** Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]

**Sent:** Thursday, September 10, 2009 9:10 AM

**To:** ZZ-DL-A-USEPR-DL

**Cc:** Jensen, Walton; Jackson, Christopher; Snodderly, Michael; Carneal, Jason; Colaccino, Joseph; ArevaEPRDCPEm Resource

**Subject:** U.S. EPR Design Certification Application RAI No. 266(3408,3443,3444,3445,3446), FSAR Ch. 6

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on August 3, 2009, and discussed with your staff on August 13, 2009. RAI Questions 06.02.01-47, 06.02.01-48, 06.02.01.04-2, 06.02.01.04-5, and 06.02.01.04-7 were revised 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:** 936

**Mail Envelope Properties** (1F1CC1BBDC66B842A46CAC03D6B1CD41022950F5)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 266, FSAR Ch  
6, Supplement 1  
**Sent Date:** 11/4/2009 3:20:26 PM  
**Received Date:** 11/4/2009 3:20:29 PM  
**From:** WELLS Russell D (AREVA NP INC)

**Created By:** Russell.Wells@areva.com

**Recipients:**

"Pederson Ronda M (AREVA NP INC)" <Ronda.Pederson@areva.com>

Tracking Status: None

"BENNETT Kathy A (OFR) (AREVA NP INC)" <Kathy.Bennett@areva.com>

Tracking Status: None

"DELANO Karen V (AREVA NP INC)" <Karen.Delano@areva.com>

Tracking Status: None

"Tesfaye, Getachew" <Getachew.Tesfaye@nrc.gov>

Tracking Status: None

**Post Office:** AUSLYNCMX02.adom.ad.corp

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	5437	11/4/2009 3:20:29 PM
RAI 266 Supplement 1 Response US EPR DC.pdf		66934

**Options**

**Priority:** Standard

**Return Notification:** No

**Reply Requested:** No

**Sensitivity:** Normal

**Expiration Date:**

**Recipients Received:**

**Response to**

**Request for Additional Information No. 266, Supplement 1**

**9/10/2009**

**U. S. EPR Standard Design Certification**

**AREVA NP Inc.**

**Docket No. 52-020**

**SRP Section: 06.02.01 - Containment Functional Design**

**SRP Section: 06.02.01.02 - Sub-compartment Analysis**

**SRP Section: 06.02.01.03 - Mass and Energy Release Analysis for Postulated  
Loss-of-Coolant Accidents (LOCAs)**

**SRP Section: 06.02.01.04 - Mass and Energy Release Analysis for Postulated  
Secondary System Pipe Ruptures**

**SRP Section: 06.02.02 - Containment Heat Removal Systems**

**Application Section: FSAR Chapter 6**

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

**Question 06.02.01.02-2:**

This question relates to conservativeness of subcompartment differential pressure calculations in FSAR Section 6.2.1.2. In RAI #82 06.02.01.02-1a1, the staff requested additional justification that the use of the homogeneous equilibrium model (HEM) is conservative for the prediction of break flow for subcompartment analysis. AREVA supplied additional information in response to this RAI and also in response to RAI #1 06.02.01-8. The response to RAI #1 06.02.01-8 and RAI #82 06.02.01.02-1a1 are insufficient. AREVA has not submitted sufficient information to demonstrate that use of HEM for break flow is appropriate for subcompartment analysis. Use of other more conservative correlations is recommended in SRP 6.1.2-3. The values of break mass flux calculated by AREVA in FSAR table 6.2.1.2-2 using the HEM model are much lower than the break mass flux calculated by the staff using the SRP recommended models. In the response to RAI #82 06.02.01.02-a1, AREVA refers to the response to RAI #1 06.02.01-8 and to EPRI Report NP-2192 (Critical-Flow Data Review and Analysis). In the EPRI Report, predictions with HEM are compared with Marviken full scale test data. The measured flow rate is in many cases significantly higher than predicted by the HEM model. AREVA admits that HEM produces, in some of the subcompartments, significantly lower blow down flow than would be obtained using the models listed as acceptable in SRP 6.1.2-3, but states that the impact on the pressurization of critical rooms is negligible. AREVA did not present analyses to prove that the effect on the pressure loads is small if the recommended models were used. AREVA's answer does not provide justification that the use of HEM is conservative for the prediction of break flow for subcompartment analysis.

In order to resolve this issue, unless there is new convincing evidence or justification for use of the HEM, provide new subcompartment analyses using the models listed as acceptable in SRP 6.1.2-3 for the prediction of break flow for subcompartment analysis. The above questions are follow-up questions to previously issued RAIs and the containment audit held in Lynchburg on July 14 and 15, 2009.

**Response to Question 06.02.01.02-2:**

A response to this question will be provided by May 5, 2010.

**Question 06.02.01.02-3:**

This question relates to conservativeness of subcompartment differential pressure calculations in FSAR Section 6.2.1.2. In RAI #82 6.01.02.02-1a3 the staff noted that not all subcompartments with high energy lines are considered in the for pressure evaluation. AREVA has limited the subcompartment analysis to those compartments that support the nuclear steam supply system components. Subcompartments that experience a pressure load but do not support NSSS components are omitted. SRP 6.2.1.2 defines subcompartments as any fully or partially enclosed volume within the primary containment that houses high-energy piping and which limit the flow of fluid to the main containment in the event of a pipe rupture within the volume. The NRC staff is required to review the nodding scheme, initial thermodynamic condition, vent flow path and distribution of mass and energy released, design pressure, ITAAC and COL action items and certification requirements and restrictions for all subcompartments with high energy lines. AREVA has not provided sufficient information for the staff to perform this review.

In order to resolve this issue for all subcompartments with high energy lines, provide evaluations of the potential pressure loads including the accident pressures and comparisons of the calculated subcompartment pressure with the maximum pressure allowed. The above questions are follow-up questions to previously issued RAIs and the containment audit held in Lynchburg on July 14 and 15, 2009.

**Response to Question 06.02.01.02-3:**

A response to this question will be provided by May 5, 2010.

**Question 06.02.01.02-4:**

This question relates to conservativeness of subcompartment differential pressure calculations in FSAR Section 6.2.1.2. In RAI #82 06.02.01.02-1b.2 the staff requested that for each subcompartment for which the pressure response to a high energy pipe break was calculated, that AREVA provide a comparison of the calculated subcompartment pressure with the maximum pressure allowed by the subcompartment design and justify that sufficient margin is available. In response, AREVA provided a table of calculated subcompartment differential pressures with the maximum differential pressure allowed for some of the subcompartments in FSAR Table 6.2.1-10 but not all of the subcompartments. Provide this information for all the subcompartments described in FSAR Table 6.2.1-10 as well as the additional subcompartments for which the staff has requested analyses under RAI # 82 6.02.01.02-1 a.3 to close this issue.

The above questions are follow-up questions to previously issued RAIs and the containment audit held in Lynchburg on July 14 and 15, 2009.

**Response to Question 06.02.01.02-4:**

A response to this question will be provided by May 5, 2010.