

ArevaEPRDCPEm Resource

From: Pederson Ronda M (AREVA NP INC) [Ronda.Pederson@areva.com]
Sent: Tuesday, April 14, 2009 6:24 PM
To: Getachew Tesfaye
Cc: BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); KAY Jim (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 111, FSAR Ch 6, Supplement 6
Attachments: RAI 111 Supplement 6 Response US EPR DC.pdf

Getachew,

AREVA NP Inc. provided responses to 6 of the 10 questions of RAI No. 111 on December 3, 2008. AREVA NP submitted Supplement 1 to the response on January 27, 2009 to address portions of 2 of the remaining questions. AREVA NP submitted Supplement 2 to the response on February 11, 2009 to address portions of 1 of the remaining questions. AREVA NP submitted Supplement 3 to the response on February 27, 2009 to address portions of 1 of the remaining questions. AREVA NP submitted Supplement 4 to the response on March 10, 2009 to address portions of 1 of the remaining questions. AREVA NP submitted Supplement 5 to the response on April 1, 2009 to address portions of 2 of the remaining questions.

The attached file, "RAI 111 Supplement 6 Response US EPR DC.pdf" provides a technically correct and complete response to 2 of the remaining questions, as committed.

The following table indicates the respective page in the response document, "RAI 111 Supplement 6 Response US EPR DC.pdf," that contains AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 111—06.02.02-9	2	2
RAI 111—06.02.02-11	3	3

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

Question #	Response Date
RAI 111—06.02.02-8A3	June 23, 2009
RAI 111—06.02.02-8A4	June 23, 2009
RAI 111—06.02.02-8G	June 23, 2009

Sincerely,

Ronda Pederson

ronda.pederson@areva.com

Licensing Manager, U.S. EPR Design Certification
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: Wednesday, April 01, 2009 3:23 PM
To: 'Getachew Tesfaye'
Cc: BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); KAY Jim (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 111, Supplement 5

Getachew,

AREVA NP Inc. provided responses to 6 of the 10 questions of RAI No. 111 on December 3, 2008. AREVA NP submitted Supplement 1 to the response on January 27, 2009 to address portions of 2 of the remaining questions. AREVA NP submitted Supplement 2 to the response on February 11, 2009 to address portions of 1 of the remaining questions. AREVA NP submitted Supplement 3 to the response on February 27, 2009 to address portions of 1 of the remaining questions. AREVA NP submitted Supplement 4 to the response on March 10, 2009 to address portions of 1 of the remaining questions.

The attached file, "RAI 111 Supplement 5 Response US EPR DC.pdf" provides a technically correct and complete response to portions of 2 of the remaining questions, as committed. Appended to this file is the affected page of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which supports the response to RAI 111 Question 06.02.02-17.

The following table indicates the respective pages in the response document, "RAI 111 Supplement 5 US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 111—06.02.02-8C.1	2	4
RAI 111—06.02.02-8C.2	2	4
RAI 111—06.02.02-8C.5b	2	4
RAI 111—06.02.02-8C.5e	2	5
RAI 111—06.02.02-8K14	2	6
RAI 111—06.02.02-17.1	7	7

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

Question #	Response Date
RAI 111—06.02.02-8A3	June 23, 2009
RAI 111—06.02.02-8A4	June 23, 2009
RAI 111—06.02.02-8G	June 23, 2009
RAI 111—06.02.02-9	April 15, 2009
RAI 111—06.02.02-11	April 15, 2009

Sincerely,

Ronda Pederson

ronda.pederson@areva.com

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From: Pederson Ronda M (AREVA NP INC)
Sent: Wednesday, March 11, 2009 10:57 AM
To: 'Getachew Tesfaye'
Cc: DELANO Karen V (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 111, Supplement 4

Getachew,

AREVA NP Inc. provided responses to 6 of the 10 questions of RAI No. 111 on December 3, 2008. AREVA NP submitted Supplement 1 to the response on January 27, 2009 to address portions of 2 of the remaining questions. AREVA NP submitted Supplement 2 to the response on February 11, 2009 to address portions of 1 of the remaining questions. AREVA NP submitted Supplement 3 to the response on February 27, 2009 to address portions of 1 of the remaining questions.

The attached file, "RAI 111 Supplement 4 Response US EPR DC.pdf" provides a technically correct and complete response to portions of 1 of the remaining 4 questions, as committed.

The following table indicates the respective pages in the response document, "RAI 111 Supplement 4 US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 111—06.02.02-8I.3	2	4
RAI 111—06.02.02-8I.7-10	4	6
RAI 111—06.02.02-8J1	7	7
RAI 111—06.02.02-8K1	8	8
RAI 111—06.02.02-8K2	8	8
RAI 111—06.02.02-8K6	8	8
RAI 111—06.02.02-8K10	9	9

The schedule for technically correct and complete responses to the remaining 4 questions is unchanged and is provided below:

Question #	Response Date
RAI 111—06.02.02-8A3	June 23, 2009
RAI 111—06.02.02-8A4	June 23, 2009
RAI 111—06.02.02-8C1	April 1, 2009
RAI 111—06.02.02-8C2	April 1, 2009
RAI 111—06.02.02-8C5b	April 1, 2009
RAI 111—06.02.02-8C5e	April 1, 2009
RAI 111—06.02.02-8G	June 23, 2009
RAI 111—06.02.02-8K14	April 1, 2009
RAI 111—06.02.02-9	April 15, 2009
RAI 111—06.02.02-11	April 15, 2009
RAI 111—06.02.02-17.1	April 1, 2009

Sincerely,

Ronda Pederson

ronda.pederson@areva.com

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From: Pederson Ronda M (AREVA NP INC)**Sent:** Friday, February 27, 2009 5:05 PM**To:** 'Getachew Tesfaye'**Cc:** KAY Jim (AREVA NP INC); DELANO Karen V (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC)**Subject:** Response to U.S. EPR Design Certification Application RAI No. 111, Supplement 3

Getachew,

AREVA NP Inc. provided responses to 6 of the 10 questions of RAI No. 111 on December 3, 2008. The attached file, "RAI 111 Supplement 3 Response US EPR DC.pdf" provides a technically correct and complete response to portions of 1 question, as committed.

The following table indicates the respective pages in the response document, "RAI 111 Supplement 3 US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 111—06.02.02-8D2	2	3
RAI 111—06.02.02-8D4	2	3
RAI 111—06.02.02-8H13	2	3
RAI 111—06.02.02-8H15-19	2	5

The schedule for technically correct and complete responses to the remaining RAI No. 111 questions is unchanged and is provided below:

Question #	Response Date
RAI 111—06.02.02-8A3	June 23, 2009
RAI 111—06.02.02-8A4	June 23, 2009
RAI 111—06.02.02-8C1	April 1, 2009
RAI 111—06.02.02-8C2	April 1, 2009
RAI 111—06.02.02-8C5b	April 1, 2009
RAI 111—06.02.02-8C5e	April 1, 2009
RAI 111—06.02.02-8G	June 23, 2009
RAI 111—06.02.02-8I.3	March 15, 2009
RAI 111—06.02.02-8I.7-10	March 15, 2009
RAI 111—06.02.02-8J1	March 15, 2009
RAI 111—06.02.02-8K1	March 15, 2009
RAI 111—06.02.02-8K2	March 15, 2009
RAI 111—06.02.02-8K6	March 15, 2009
RAI 111—06.02.02-8K10	March 15, 2009
RAI 111—06.02.02-8K14	April 1, 2009
RAI 111—06.02.02-9	April 15, 2009
RAI 111—06.02.02-11	April 15, 2009
RAI 111—06.02.02-17.1	April 1, 2009

Sincerely,

Ronda Pederson

ronda.pederson@areva.com

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From: Pederson Ronda M (AREVA NP INC)

Sent: Wednesday, February 11, 2009 5:05 PM

To: 'Getachew Tesfaye'

Cc: BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); KAY Jim (AREVA NP INC)

Subject: Response to U.S. EPR Design Certification Application RAI No. 111, Supplement 2

Getachew,

AREVA NP Inc. provided responses to 6 of the 10 questions of RAI No. 111 on December 3, 2008. The attached file, "RAI 111 Supp 2 Response US EPR DC.pdf" provides a technically correct and complete response to portions of 1 question, as committed.

The following table indicates the respective pages in the response document, "RAI 111 Supp 2 US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 111—06.02.02-8E1	2	3
RAI 111—06.02.02-8E4	2	3

The schedule for technically correct and complete responses to the remaining RAI No. 111 questions is unchanged and is provided below:

Question #	Response Date
RAI 111—06.02.02-8A3	June 23, 2009
RAI 111—06.02.02-8A4	June 23, 2009
RAI 111—06.02.02-8C1	April 1, 2009
RAI 111—06.02.02-8C2	April 1, 2009
RAI 111—06.02.02-8C5b	April 1, 2009
RAI 111—06.02.02-8C5e	April 1, 2009
RAI 111—06.02.02-8D2	March 1, 2009
RAI 111—06.02.02-8D4	March 1, 2009
RAI 111—06.02.02-8G	June 23, 2009
RAI 111—06.02.02-8H13	March 1, 2009
RAI 111—06.02.02-8H15-19	March 1, 2009
RAI 111—06.02.02-8I.3	March 15, 2009
RAI 111—06.02.02-8I.7-10	March 15, 2009
RAI 111—06.02.02-8J1	March 15, 2009
RAI 111—06.02.02-8K1	March 15, 2009

Question #	Response Date
RAI 111—06.02.02-8K2	March 15, 2009
RAI 111—06.02.02-8K6	March 15, 2009
RAI 111—06.02.02-8K10	March 15, 2009
RAI 111—06.02.02-8K14	April 1, 2009
RAI 111—06.02.02-9	April 15, 2009
RAI 111—06.02.02-11	April 15, 2009
RAI 111—06.02.02-17.1	April 1, 2009

Sincerely,

Ronda Pederson

ronda.pederson@areva.com

Licensing Manager, U.S. EPR Design Certification

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3315 Old Forest Road

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From: WELLS Russell D (AREVA NP INC)

Sent: Tuesday, January 27, 2009 6:07 PM

To: 'Getachew Tesfaye'

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. 111, FSAR Ch 6, Supplement 1

Getachew,

AREVA NP Inc. provided responses to 6 of the 10 questions of RAI No. 111 on December 3, 2008. The attached file, "RAI 111 Supplement 1 Response US EPR DC.pdf" provides a technically correct and complete response to portions of 2 questions, as committed.

The following table indicates the respective pages in the response document, "RAI 111 Supplement 1 US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 111—06.02.02-8I.13	2	2
RAI 111—06.02.02-8K11	3	3
RAI 111—06.02.02-17.2	4	4

The schedule for technically correct and complete responses to the remaining RAI No. 111 questions is unchanged and is provided below:

Question #	Response Date
RAI 111—06.02.02-8A3	June 23, 2009
RAI 111—06.02.02-8A4	June 23, 2009
RAI 111—06.02.02-8C1	April 1, 2009
RAI 111—06.02.02-8C2	April 1, 2009

Question #	Response Date
RAI 111—06.02.02-8C5b	April 1, 2009
RAI 111—06.02.02-8C5e	April 1, 2009
RAI 111—06.02.02-8D2	March 1, 2009
RAI 111—06.02.02-8D4	March 1, 2009
RAI 111—06.02.02-8E1	February 15, 2009
RAI 111—06.02.02-8E4	February 15, 2009
RAI 111—06.02.02-8G	June 23, 2009
RAI 111—06.02.02-8H13	March 1, 2009
RAI 111—06.02.02-8H15-19	March 1, 2009
RAI 111—06.02.02-8I.3	March 15, 2009
RAI 111—06.02.02-8I.7-10	March 15, 2009
RAI 111—06.02.02-8J1	March 15, 2009
RAI 111—06.02.02-8K1	March 15, 2009
RAI 111—06.02.02-8K2	March 15, 2009
RAI 111—06.02.02-8K6	March 15, 2009
RAI 111—06.02.02-8K10	March 15, 2009
RAI 111—06.02.02-8K14	April 1, 2009
RAI 111—06.02.02-9	April 15, 2009
RAI 111—06.02.02-11	April 15, 2009
RAI 111—06.02.02-17.1	April 1, 2009

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

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From: WELLS Russell D (AREVA NP INC)

Sent: Wednesday, December 03, 2008 6:14 PM

To: 'Getachew Tesfaye'

Cc: BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); Pederson Ronda M (AREVA NP INC)

Subject: Response to U.S. EPR Design Certification Application RAI No. 111, FSAR Ch 6

Getachew,

The proprietary and non-proprietary versions of the response to RAI No. 111 are submitted via AREVA NP Inc. letter, "Response to U.S. EPR Design Certification Application RAI No. 111" NRC 08:094, dated December 3, 2008. An affidavit to support withholding of information from public disclosure, per 10CFR2.390(b), is provided as an enclosure to that letter.

The following table indicates the respective pages in the response document, "Response to U.S. EPR Design Certification Application RAI No. 111," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 111 — 06.02.02-8 A-K	2	36
RAI 111 — 06.02.02-9	37	37
RAI 111 — 06.02.02-10	38	38
RAI 111 — 06.02.02-11	39	39
RAI 111 — 06.02.02-12	40	40
RAI 111 — 06.02.02-13	41	41
RAI 111 — 06.02.02-14	42	42
RAI 111 — 06.02.02-15	43	43
RAI 111 — 06.02.02-16	44	44
RAI 111 — 06.02.02-17	45	45

The schedule for technically correct and complete responses to the remaining RAI No. 111 questions is provided below:

Question #	Response Date
RAI 111—06.02.02-8A3	June 23, 2009
RAI 111—06.02.02-8A4	June 23, 2009
RAI 111—06.02.02-8C1	April 1, 2009
RAI 111—06.02.02-8C2	April 1, 2009
RAI 111—06.02.02-8C5b	April 1, 2009
RAI 111—06.02.02-8C5e	April 1, 2009
RAI 111—06.02.02-8D2	March 1, 2009
RAI 111—06.02.02-8D4	March 1, 2009
RAI 111—06.02.02-8E1	February 15, 2009
RAI 111—06.02.02-8E4	February 15, 2009
RAI 111—06.02.02-8G	June 23, 2009
RAI 111—06.02.02-8H13	March 1, 2009
RAI 111—06.02.02-8H15-19	March 1, 2009
RAI 111—06.02.02-8I.3	March 15, 2009
RAI 111—06.02.02-8I.7-10	March 15, 2009
RAI 111—06.02.02-8I.13	February 1, 2009
RAI 111—06.02.02-8J1	March 15, 2009
RAI 111—06.02.02-8K1	March 15, 2009
RAI 111—06.02.02-8K2	March 15, 2009
RAI 111—06.02.02-8K6	March 15, 2009
RAI 111—06.02.02-8K10	March 15, 2009
RAI 111—06.02.02-8K11	February 1, 2009
RAI 111—06.02.02-8K14	April 1, 2009
RAI 111—06.02.02-9	April 15, 2009
RAI 111—06.02.02-11	April 15, 2009
RAI 111—06.02.02-17.1	April 1, 2009
RAI 111—06.02.02-17.2	February 1, 2009

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

Sent: Monday, November 03, 2008 4:31 PM

To: ZZ-DL-A-USEPR-DL

Cc: Clinton Ashley; Walton Jensen; Christopher Jackson; Charles Hammer; David Terao; Michael Miernicki; Joseph Colaccino; John Rycyna; James Steckel

Subject: U.S. EPR Design Certification Application RAI No. 111 (1446, 1471,1508), FSAR Ch. 6

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on October 20, 2008, and discussed with your staff on November 3, 2008. Draft RAI Questions 06.02.02-8 (C)(7) was deleted 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: 405

Mail Envelope Properties (5CEC4184E98FFE49A383961FAD402D31D58348)

Subject: Response to U.S. EPR Design Certification Application RAI No. 111, FSAR Ch
6, Supplement 6
Sent Date: 4/14/2009 6:23:59 PM
Received Date: 4/14/2009 6:24:00 PM
From: Pederson Ronda M (AREVA NP INC)

Created By: Ronda.Pederson@areva.com

Recipients:

"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

"KAY Jim (AREVA NP INC)" <Jim.Kay@areva.com>

Tracking Status: None

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

Tracking Status: None

Post Office: AUSLYNCMX02.adom.ad.corp

Files	Size	Date & Time
MESSAGE	17738	4/14/2009 6:24:00 PM
RAI 111 Supplement 6 Response US EPR DC.pdf		11224

Options

Priority: Standard

Return Notification: No

Reply Requested: No

Sensitivity: Normal

Expiration Date:

Recipients Received:

Response to

Request for Additional Information No. 111, Supplement 6

11/03/2008

U. S. EPR Standard Design Certification

AREVA NP Inc.

Docket No. 52-020

SRP Section: 06.02.02 - Containment Heat Removal Systems

Application Section: FSAR Ch. 6

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

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

Question 06.02.02-9:

Provide the limiting characterization and properties of ECCS post-LOCA debris laden recirculation water including the content of latent debris, chemicals, coatings, and other solids. Address the abrasiveness of the debris laden fluid on the wetted ex-vessel downstream components. Also, include the additional amounts of debris and the larger pieces of debris that could be ingested downstream as a result of possible use of the non-safety back flush system.

Response to Question 06.02.02-9:

Testing of the emergency core cooling system (ECCS) debris retention system determined that the concentration of particulates in the downstream effluent was 10 ppm or less. Additionally, recirculation flow water samples from downstream of the test strainers indicated a fibrous material length of less than approximately 0.04 inches. Refer to the response to Question 06.02.02-11 for additional details.

The non-safety related back-flush system is not used during a design basis accident and therefore cannot cause additional amounts of debris or larger pieces of debris to be ingested in the downstream ECCS flow.

FSAR Impact:

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

Question 06.02.02-11:

For the limiting debris laden recirculation water conditions, provide an evaluation of changes in system or equipment operation caused by wear of components (e.g., increased pump vibration due to shaft wear or the increase of pump internal bypass flow that decreases performance and may further accelerate internal wear.) Assess whether the system or component flow resistance changes or alters flow balances as a result of wear. Assess whether the system piping vibration response changes due to wear such that system integrity or its safety function may be affected. Address the capability to isolate components under debris laden conditions, including pump seals that encounter excessive wear, such that they will not leak excessively. Include those components in the non-safety SAHRS and CSS that may leak and require isolation as a result of ingesting debris laden water. Address whether leakage through pump seals or other components could increase local dose rates so that credited operator actions, if any, would not be met.

Response to Question 06.02.02-11:

Tests of the debris retention system have been performed to quantify and characterize the debris penetration of the reference EPR safety injection system (SIS) strainers. The tests used a debris source that included a large quantity of mineral wool insulation in comparison to the amount of reflective metal insulation (RMI). The SIS strainers incorporate a filtering screen that is sized to retain and capture small debris and prevent their transport to downstream locations. A two hour test of the SIS strainer assembly with the reference EPR debris source found the concentration of the solid content in the downstream water to be 10 ppm 30 minutes into the test, decreasing to non-measurable values at the end of the test. The test results are bounding for the U.S EPR because it predominantly uses RMI for the reactor coolant system piping and components, rather than mineral wool.

To reduce the potential for any adverse downstream effects to components, the U.S. EPR downstream component specifications will specify the ECCS recirculation fluid characteristics (i.e., particle size, composition, concentration, etc.) for manufacturer design consideration of component internals, material types and properties, geometry of wear parts, internal clearances, and fluid velocities.

The non-safety related severe accident heat removal system is isolated from the ECCS recirculation water during a design basis accident (DBA) and therefore, is not exposed to the effects of recirculation flow. The U.S. EPR does not take credit for the containment spray system during a DBA.

FSAR Impact:

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