ArevaEPRDCPEm Resource

From: WELLS Russell D (AREVA NP INC) [Russell.Wells@areva.com]
Sent: Wednesday, November 04, 2009 3:02 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. 56, FSAR Ch 7, Supplement 8
Attachments: RAI 56 Supplement 8 Response US EPR DC.pdf

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI No. 56 on November 26, 2008. AREVA NP submitted Supplement 1 to the response on January 14, 2009 to address 14 of the remaining 45 questions. AREVA NP submitted Supplement 2 to the response on February 4, 2009 to address 5 of the remaining questions. AREVA NP submitted Supplement 3 to the response on March 3, 2009 to address 9 of the remaining questions. AREVA NP submitted Supplement 4 to the response on March 31, 2009 to address 9 of the remaining questions. AREVA NP submitted Supplement 5 to the response on June 12, 2009 to address 6 of the remaining 8 questions. The schedule for the remaining 2 questions was revised by AREVA NP in Supplements 6 and 7 dated August 17, 2009 and October 21, 2009, respectively. The attached file, RAI 56 Supplement 8 Response US EPR DC.pdf" provides technically correct and complete responses to 2 of the remaining 2 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 56 Question 07.09-2.

The following table indicates the respective pages in the response document, "RAI 56 Supplement 8 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 56 — 07.09-2	2	3
RAI 56 — 07.09-4	4	5

This concludes the formal AREVA NP response to RAI 56, 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
Lynchburg, VA 24506-0935
Phone: 434-832-3694
Cell: 434-841-8788

From: Pederson Ronda M (AREVA NP INC)
Sent: Wednesday, October 21, 2009 6:58 PM
To: ALUMBAUGH Billy R (AREVA NP INC); BALLARD Robert W (AREVA NP INC); BUDZIK Dennis M (AREVA NP INC); CARPENTER Mike (AREVA NP INC); DELANO Karen V (AREVA NP INC); MCINTYRE Brian (AREVA NP INC); POWELL Ronald C (AREVA NP INC); RYAN Tom (AREVA NP INC); SANDERS Harris I (AREVA NP INC); SANDERS Mitchell K. (AREVA NP INC); Sharpe Robert O ; SLIVA Thomas E (AREVA NP INC); SLOAN Sandra M (AREVA NP INC); STOUDT Roger H (AREVA NP INC); TUTTLE Eileen B (AREVA NP INC); VANCE Brian (AREVA NP INC); WELLS Russell D (AREVA NP INC); WILLIFORD Dennis C (AREVA NP INC)
Cc: DELANO Karen V (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC)
Subject: FW: Response to U.S. EPR Design Certification Application RAI No. 56, FSAR Ch 7, Supplement 7

Revised schedule to response by two weeks due to inherent difficulties with processing the necessary FSAR markups (figures). NRO PM concurred with decision to defer response rather than submitting response without markups and tracking the need to send FSAR markups at a later date.

Ronda Pederson
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From: Pederson Ronda M (AREVA NP INC)
Sent: Wednesday, October 21, 2009 6:47 PM
To: 'Getachew Tesfaye'
Cc: BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); PANNELL George L (AREVA NP INC); BUDZIK Dennis M (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 56, FSAR Ch 7, Supplement 7

Getachew,

AREVA NP is unable to provide responses to the two RAI responses that remain due to a delay in processing the FSAR markups.

The revised schedule for technically correct and complete responses to the remaining 2 questions is provided below:

Question #	Response Date
RAI 56 — 07.09-2	November 5, 2009
RAI 56 — 07.09-4	November 5, 2009

Sincerely,

Ronda Pederson
ronda.pederson@areva.com
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AREVA NP Inc.
An AREVA and Siemens company
3315 Old Forest Road
Lynchburg, VA 24506-0935
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Cell: 434-841-8788

From: Pederson Ronda M (AREVA NP INC)
Sent: Monday, August 17, 2009 6:13 PM
To: 'Getachew Tesfaye'
Cc: BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); PANNELL George L (AREVA NP INC); BUDZIK Dennis M (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 56, FSAR Ch 7, Supplement 6

Getachew,

AREVA NP is unable to provide responses to the two RAI responses that remain due to a delay in obtaining adequate technical basis information for properly supporting the submittal.

The revised schedule for technically correct and complete responses to the remaining 2 questions is provided below:

Question #	Response Date
RAI 56 — 07.09-2	October 22, 2009
RAI 56 — 07.09-4	October 22, 2009

Sincerely,

Ronda Pederson
ronda.pederson@areva.com
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Cell: 434-841-8788

From: Pederson Ronda M (AREVA NP INC)
Sent: Friday, June 12, 2009 6:49 PM
To: 'Getachew Tesfaye'
Cc: BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); WELLS Russell D (AREVA NP INC); PANNELL George L (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 56, FSAR Ch 7, Supplement 5

Getachew,

AREVA NP Inc. (AREVA NP) provided a schedule for a technically correct and complete response to RAI No. 56 on November 26, 2008. AREVA NP submitted Supplement 1 to the response on January 14, 2009 to address 14 of the remaining 45 questions. AREVA NP submitted Supplement 2 to the response on February 4, 2009 to address 5 of the remaining questions. AREVA NP submitted Supplement 3 to the response on March 3, 2009 to address 9 of the remaining questions. AREVA NP submitted Supplement 4 to the response on March 31, 2009 to address 9 of the remaining questions. The attached file, "RAI 56 Supplement 5 Response US EPR DC.pdf" provides technically correct and complete responses to 6 of the remaining 8 questions.

The two RAI responses, listed in the second table below, have been rescheduled due to a delay in obtaining adequate technical basis information for properly supporting the submittal.

The following table indicates the respective pages in the response document, "RAI 56 Supplement 5 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 56 — 07.09-9	2	4
RAI 56 — 07.09-26	5	5
RAI 56 — 07.09-31	6	7
RAI 56 — 07.09-40	8	10
RAI 56 — 07.09-42	11	12
RAI 56 — 07.09-43	13	14

The revised schedule for technically correct and complete responses to the remaining 2 questions is provided below:

Question #	Response Date
RAI 56 — 07.09-2	August 17, 2009
RAI 56 — 07.09-4	August 17, 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: WELLS Russell D (AREVA NP INC)
Sent: Tuesday, March 31, 2009 1:20 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. 56, FSAR Ch 7, Supplement 4

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to RAI No. 56 on November 26, 2008. AREVA NP submitted Supplement 1 to the response on January 14, 2009 to address 14 of the remaining 45 questions. AREVA NP submitted Supplement 2 to the response on February 4, 2009 to address 5 of the remaining 31 questions. AREVA NP submitted Supplement 3 to the response on March 3, 2009 to address 9 of the remaining 26 questions. The attached file, "RAI 56 Supplement 4 Response US EPR DC.pdf" provides technically correct and complete responses to 9 of the remaining 17 questions, as committed.

The following table indicates the respective pages in the response document, "RAI 56 Supplement 4 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 56 — 07.09-3	2	3
RAI 56 — 07.09-6	4	5
RAI 56 — 07.09-10	6	6
RAI 56 — 07.09-14	7	7
RAI 56 — 07.09-18	8	9
RAI 56 — 07.09-23	10	10
RAI 56 — 07.09-27	11	11
RAI 56 — 07.09-39	12	13
RAI 56 — 07.09-41	14	14

The revised schedule for technically correct and complete responses to the remaining 8 questions is provided below:

Question #	Response Date
RAI 56 — 07.09-2	June 12, 2009
RAI 56 — 07.09-4	June 12, 2009
RAI 56 — 07.09-9	June 12, 2009
RAI 56 — 07.09-26	June 12, 2009
RAI 56 — 07.09-31	June 12, 2009
RAI 56 — 07.09-40	June 12, 2009
RAI 56 — 07.09-42	June 12, 2009
RAI 56 — 07.09-43	June 12, 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.
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Phone: 434-832-3694
Cell: 434-841-8788

From: Pederson Ronda M (AREVA NP INC)
Sent: Tuesday, March 03, 2009 3:16 PM

To: Getachew Tesfaye
Cc: BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); PANNELL George L (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 56, Supplement 3

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to RAI No. 56 on November 26, 2008. AREVA NP submitted Supplement 1 to the response on January 14, 2009 to address 14 of the remaining 45 questions. AREVA NP submitted Supplement 2 to the response on February 4, 2009 to address 5 of the remaining 31 questions. The attached file, "RAI 56 Supplement 3 Response US EPR DC.pdf" provides technically correct and complete responses to 9 of the remaining 26 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 56 Question 07.09-22.

The following table indicates the respective pages in the response document, "RAI 56 Supplement 3 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 56 — 07.09-8	2	2
RAI 56 — 07.09-13	3	4
RAI 56 — 07.09-15	5	5
RAI 56 — 07.09-16	6	8
RAI 56 — 07.09-20	9	9
RAI 56 — 07.09-21	10	10
RAI 56 — 07.09-22	11	12
RAI 56 — 07.09-24	13	13
RAI 56 — 07.09-38	14	14

The schedule for response to RAI 56 – 07.09-18 has been changed from March 3, 2009 to March 31, 2009. The schedule for technically correct and complete responses to the remaining 17 questions is unchanged, as indicated in the table provided below:

Question #	Response Date
RAI 56 — 07.09-2	March 31, 2009
RAI 56 — 07.09-3	March 31, 2009
RAI 56 — 07.09-4	March 31, 2009
RAI 56 — 07.09-6	March 31, 2009
RAI 56 — 07.09-9	March 31, 2009
RAI 56 — 07.09-10	March 31, 2009
RAI 56 — 07.09-14	March 31, 2009
RAI 56 — 07.09-18	March 31, 2009
RAI 56 — 07.09-23	March 31, 2009
RAI 56 — 07.09-26	March 31, 2009
RAI 56 — 07.09-27	March 31, 2009
RAI 56 — 07.09-31	March 31, 2009
RAI 56 — 07.09-39	March 31, 2009
RAI 56 — 07.09-40	March 31, 2009
RAI 56 — 07.09-41	March 31, 2009
RAI 56 — 07.09-42	March 31, 2009
RAI 56 — 07.09-43	March 31, 2009

Sincerely,

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From: Pederson Ronda M (AREVA NP INC)
Sent: Wednesday, February 04, 2009 2:34 PM
To: 'Getachew Tesfaye'
Cc: BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); PANNELL George L (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 56, Supplement 2

Getachew,

AREVA NP Inc. (AREVA NP) submitted Response to RAI No. 56, Supplement 1 on January 14, 2009 to address 14 of the 45 questions. The attached file, "RAI 56 Supplement 2 Response US EPR DC.pdf" provides technically correct and complete responses to 5 of the remaining 31 questions, as committed.

The following table indicates the respective pages in the response document, "RAI 56 Supplement 2 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 56 — 07.09-29	2	3
RAI 56 — 07.09-34	4	6
RAI 56 — 07.09-36	7	9
RAI 56 — 07.09-37	10	12
RAI 56 — 07.09-44	13	14

The schedule for technically correct and complete responses to the remaining 26 questions is unchanged and provided below:

Question #	Response Date
RAI 56 - 07.09-2	March 31, 2009
RAI 56 - 07.09-3	March 31, 2009
RAI 56 - 07.09-4	March 31, 2009
RAI 56 - 07.09-6	March 31, 2009
RAI 56 - 07.09-8	March 3, 2009
RAI 56 - 07.09-9	March 31, 2009
RAI 56 - 07.09-10	March 31, 2009
RAI 56 - 07.09-13	March 3, 2009
RAI 56 - 07.09-14	March 31, 2009
RAI 56 - 07.09-15	March 3, 2009
RAI 56 - 07.09-16	March 3, 2009
RAI 56 - 07.09-18	March 3, 2009

RAI 56 - 07.09-20	March 3, 2009
RAI 56 - 07.09-21	March 3, 2009
RAI 56 - 07.09-22	March 3, 2009
RAI 56 - 07.09-23	March 31, 2009
RAI 56 - 07.09-24	March 3, 2009
RAI 56 - 07.09-26	March 31, 2009
RAI 56 - 07.09-27	March 31, 2009
RAI 56 - 07.09-31	March 31, 2009
RAI 56 - 07.09-38	March 3, 2009
RAI 56 - 07.09-39	March 31, 2009
RAI 56 - 07.09-40	March 31, 2009
RAI 56 - 07.09-41	March 31, 2009
RAI 56 - 07.09-42	March 31, 2009
RAI 56 - 07.09-43	March 31, 2009

Sincerely,

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3315 Old Forest Road
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Phone: 434-832-3694
Cell: 434-841-8788

From: Pederson Ronda M (AREVA NP INC)
Sent: Wednesday, January 14, 2009 1:26 PM
To: 'Getachew Tesfaye'
Cc: PANNELL George L (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. 56, Supplement 1

Getachew,

The attached file, "RAI 56 Supplement 1 Response US EPR DC.pdf," provides technically correct and complete responses to 14 of the 45 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 56 Question 07.09-7.

The following table indicates the respective page(s) in the response document, "RAI 56 Supplement 1 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 56 - 07.09-1	2	3
RAI 56 - 07.09-5	4	4
RAI 56 - 07.09-7	5	7
RAI 56 - 07.09-11	7	8

RAI 56 - 07.09-12	9	9
RAI 56 - 07.09-17	10	13
RAI 56 - 07.09-19	14	14
RAI 56 - 07.09-25	15	16
RAI 56 - 07.09-28	17	18
RAI 56 - 07.09-30	19	19
RAI 56 - 07.09-32	20	20
RAI 56 - 07.09-33	21	22
RAI 56 - 07.09-35	23	23
RAI 56 - 07.09-45	24	24

The schedule for technically correct and complete responses to the remaining 31 questions is unchanged and provided below:

Question #	**Response Date**
RAI 56 - 07.09-2	March 31, 2009
RAI 56 - 07.09-3	March 31, 2009
RAI 56 - 07.09-4	March 31, 2009
RAI 56 - 07.09-6	March 31, 2009
RAI 56 - 07.09-8	March 3, 2009
RAI 56 - 07.09-9	March 31, 2009
RAI 56 - 07.09-10	March 31, 2009
RAI 56 - 07.09-13	March 3, 2009
RAI 56 - 07.09-14	March 31, 2009
RAI 56 - 07.09-15	March 3, 2009
RAI 56 - 07.09-16	March 3, 2009
RAI 56 - 07.09-18	March 3, 2009
RAI 56 - 07.09-20	March 3, 2009
RAI 56 - 07.09-21	March 3, 2009
RAI 56 - 07.09-22	March 3, 2009
RAI 56 - 07.09-23	March 31, 2009
RAI 56 - 07.09-24	March 3, 2009
RAI 56 - 07.09-26	March 31, 2009
RAI 56 - 07.09-27	March 31, 2009
RAI 56 - 07.09-29	March 3, 2009
RAI 56 - 07.09-31	March 31, 2009
RAI 56 - 07.09-34	March 3, 2009
RAI 56 - 07.09-36	March 3, 2009
RAI 56 - 07.09-37	March 3, 2009
RAI 56 - 07.09-38	March 3, 2009
RAI 56 - 07.09-39	March 31, 2009
RAI 56 - 07.09-40	March 31, 2009
RAI 56 - 07.09-41	March 31, 2009
RAI 56 - 07.09-42	March 31, 2009
RAI 56 - 07.09-43	March 31, 2009
RAI 56 - 07.09-44	March 3, 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, November 26, 2008 3:18 PM
To: 'Getachew Tesfaye'
Cc: PANNELL George L (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. 56, FSAR Ch 7, Revised Schedule

Getachew,

On October 10, 2008, AREVA NP provided a schedule for responding to the 45 questions in NRC's RAI No. 56. On October 22, 2008, a public meeting was held between AREVA NP Inc. and the NRC to discuss the U.S. EPR FSAR Chapter 7 and RAI No.'s 56 through 61.

A revised schedule for a technically correct and complete response to each of the 45 questions of RAI No. 56 is provided below.

Question #	Response Date
RAI 56 - 07.09-1	January 15, 2009
RAI 56 - 07.09-2	March 31, 2009
RAI 56 - 07.09-3	March 31, 2009
RAI 56 - 07.09-4	March 31, 2009
RAI 56 - 07.09-5	January 15, 2009
RAI 56 - 07.09-6	March 31, 2009
RAI 56 - 07.09-7	January 15, 2009
RAI 56 - 07.09-8	March 3, 2009
RAI 56 - 07.09-9	March 31, 2009
RAI 56 - 07.09-10	March 31, 2009
RAI 56 - 07.09-11	January 15, 2009
RAI 56 - 07.09-12	January 15, 2009
RAI 56 - 07.09-13	March 3, 2009
RAI 56 - 07.09-14	March 31, 2009
RAI 56 - 07.09-15	March 3, 2009
RAI 56 - 07.09-16	March 3, 2009
RAI 56 - 07.09-17	January 15, 2009
RAI 56 - 07.09-18	March 3, 2009
RAI 56 - 07.09-19	January 15, 2009
RAI 56 - 07.09-20	March 3, 2009
RAI 56 - 07.09-21	March 3, 2009

RAI 56 - 07.09-22	March 3, 2009
RAI 56 - 07.09-23	March 31, 2009
RAI 56 - 07.09-24	March 3, 2009
RAI 56 - 07.09-25	January 15, 2009
RAI 56 - 07.09-26	March 31, 2009
RAI 56 - 07.09-27	March 31, 2009
RAI 56 - 07.09-28	January 15, 2009
RAI 56 - 07.09-29	March 3, 2009
RAI 56 - 07.09-30	January 15, 2009
RAI 56 - 07.09-31	March 31, 2009
RAI 56 - 07.09-32	January 15, 2009
RAI 56 - 07.09-33	January 15, 2009
RAI 56 - 07.09-34	March 3, 2009
RAI 56 - 07.09-35	January 15, 2009
RAI 56 - 07.09-36	March 3, 2009
RAI 56 - 07.09-37	March 3, 2009
RAI 56 - 07.09-38	March 3, 2009
RAI 56 - 07.09-39	March 31, 2009
RAI 56 - 07.09-40	March 31, 2009
RAI 56 - 07.09-41	March 31, 2009
RAI 56 - 07.09-42	March 31, 2009
RAI 56 - 07.09-43	March 31, 2009
RAI 56 - 07.09-44	March 3, 2009
RAI 56 - 07.09-45	January 15, 2009

Sincerely,

Ronda Pederson
ronda.pederson@areva.com
Licensing Manager, U.S. EPR(TM) Design Certification
AREVA NP Inc.
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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 10, 2008 6:50 PM
To: 'Getachew Tesfaye'
Cc: DELANO Karen V (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); PANNELL George L (AREVA NP INC); DUNCAN Leslie E (AREVA NP INC); WELLS Russell D (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 56 (942), FSAR Ch7

Getachew,

The attached file, "RAI 56 Response US EPR DC.pdf" provides an interim response to each of the 45 questions.

A complete answer is not provided for 45 of the 45 questions.

A complete response to each of the questions will be provided by December 1, 2008.

Sincerely,

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
Lynchburg, VA 24506-0935
Phone: 434-832-3694
Cell: 434-841-8788

From: Getachew Tesfaye [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Friday, September 12, 2008 5:44 PM
To: ZZ-DL-A-USEPR-DL
Cc: Deanna Zhang; Terry Jackson; Michael Canova; Joseph Colaccino; John Rycyna; Mario Gareri
Subject: U.S. EPR Design Certification Application RAI No. 56 (942), FSAR Ch7

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on August 26, 2008, and on September 5, 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: 937

Mail Envelope Properties (1F1CC1BBDC66B842A46CAC03D6B1CD41022950B0)

Subject: Response to U.S. EPR Design Certification Application RAI No. 56, FSAR Ch 7, Supplement 8
Sent Date: 11/4/2009 3:02:18 PM
Received Date: 11/4/2009 3:02:40 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

Files	**Size**	**Date & Time**
MESSAGE	23648	11/4/2009 3:02:40 PM
RAI 56 Supplement 8 Response US EPR DC.pdf	350197	

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

Response to

Request for Additional Information No. 56, Supplement 8

9/12/2008

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 07.09 - Data Communication Systems
Application Section: Section 7.1
ICE1 Branch

Question 07.09-2:

Clarify the classification of safety components within the SICS. In addition, how is independence achieved between safety portions and non-safety portions of the SICS to meet IEEE Std. 603-1991, Clause 5.6.3, and 10 CFR Part 50, Appendix A, General Design Criteria (GDC) 24?

Clause 5.6.3 of IEEE 603-1991 requires independence between safety systems and other systems such that credible failures in and consequential actions by other systems shall not prevent the safety systems from completing their safety functions. 10 CFR Part 50, Appendix A, GDC 24, "Separation of Protection and Control Systems," requires the protection system to be separated from control systems to the extent that failure of any single control system component or channel, or failure or removal from service of any single protection system component or channel which is common to the control and protection systems leaves intact a system satisfying all reliability, redundancy, and independence requirements of the protection system. The D FSAR, Tier 2, Section 7.1.1.3.1 states that the SICS is classified as safety-related. However, this section also states that the SICS has safety-related portions and non-safety related portions. The safety-related portion of the SICS includes the panel interface (PI), service units (SU), and qualified display system (QDS), and the non-safety related portion of the SICS includes the SU, QDS, and gateway (GW). Clarify whether the PI, SU, and QDS are classified and qualified as safety related for all portions of the SICS. In addition, how is independence achieved between safety portions and non-safety portions of the SICS to meet IEEE Std. 603-1991, Clause 5.6.3 and 10 CFR Part 50, Appendix A, GDC 24? Provide the necessary ITAACs to demonstrate that communications independence requirements for SICS will be verified.

Response to Question 07.09-2:

The safety information and control system (SICS) is classified as a safety-related system, but it contains independent safety-related and non-safety-related portions (see U.S. EPR FSAR Tier 2, Figure 7.1-2).

The safety-related portions of the SICS are:

- QDS monitors and QDS computers that interface to safety-related Level 1 instrumentation and controls (I&C) systems.
- Panel interfaces.
- Conventional, hardwired controls and/or indicators.

The non-safety-related portions of the SICS include:

- QDS monitors and computers that interface to non-safety-related Level 1 I&C systems.
- SUs.
- Gateways that connect non-safety-related QDS computers to the plant bus (see U.S. EPR FSAR Tier 2, Figure 7.1-4).
- Conventional, hardwired controls and/or indicators.

Independence between the safety-related and the non-safety-related portions of the SICS is similar to other safety- and non-safety-related I&C systems. The SICS provides physical separation, electrical isolation, and communication independence. These independence principles are described in U.S. EPR FSAR Tier 2, Section 7.1.1.6.4.

The SICS deviates from the independence techniques described in U.S. EPR FSAR Tier 2, Section 7.1.1.6.4 through the SU interface to the QDS. The standard QDS design solution does not include a monitoring and service interface (MSI) to provide communication independence between the SU and the QDS computers. U.S. EPR FSAR Tier 2, Section 7.1.1.6.4 will be revised to identify this difference.

In place of a MSI, communication independence is achieved by disconnecting the SUs from the QDS computers when the QDS computers are inservice and performing their safety-related functions.

Although the non-safety-related QDS SUs load QDS software and off-line troubleshoot, the QDS computers are not normally connected to the SUs. The SU is only connected to the QDS when the QDS is out of service. A key lock switch maintains disconnection between the QDS and the SUs during normal operation and is controlled administratively. The switches include a device that provides electrical isolation between the QDS and the SU, and the switches interrupt the communication channel between the QDS and the SU, consistent with ISG-4. U.S. EPR FSAR Tier 1, Section 2.4.2, Item 4.13, U.S. EPR FSAR Tier 2, Section 7.1.1.3.1, Figure 7.1-3, and Figure 7.1-21 will be revised to include a switch between the QDS and the SU. The revised ITAAC will demonstrate how communication independence is maintained by keeping the devices disconnected.

The SICS panel interface (PI) computers have SUs, which are different from the QDS SUs. In this case, the SUs are connected to the PI computers through safety-related MSI computers. U.S. EPR FSAR Tier 2, Section 7.1.1.6.4 discusses the MSI computers and how they maintain isolation and communication independence.

FSAR Impact:

U.S. EPR FSAR Tier 1, Section 2.4.2, Item 4.13 and Table 2.4.2-2, Item 4.13 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR FSAR Tier 2, Section 7.1.1.3.1, Section 7.1.1.6.4, Figure 7.1-3, and Figure 7.1-21 will be revised as described in the response and indicated on the enclosed markup.

Question 07.09-4:

Demonstrate how the interface between the qualified display system (QDS) and the non-safety service unit (SU) satisfies IEEE Std. 603-1991, Clauses 5.6.3 and 5.9 requirements.

The DC FSAR, Tier 2, Section 7.1.1.3.1 states that the communication between the service unit (SU) and the qualified display system (QDS) uses bi-directional, networked data connections implemented with the TELEPERM XS Ethernet protocol. The SU is an auxiliary feature, and this network is a non-safety related network provided for servicing of the QDSs. These data connections use dedicated ports on the QDS separate from the PI-QDS connections. The system software provides for isolation between the safety-related and non-safety-related data. Software modifications cannot be performed with the QDS in operation. Access is authorized only with appropriate administrative controls.

Clause 5.6.3 of IEEE Std. 603-1991 requires independence between safety systems and other systems such that credible failures in and consequential actions by other systems shall not prevent the safety systems from performing the intended safety functions. Since the QDS is safety-related and the SU is non-safety related, demonstrate how independence requirements are met. Specifically, provide specific details regarding the system software that provides the isolation between the QDS and the SU. In addition, Clause 5.9 of IEEE Std. 603-1991 provides access control requirements for safety systems. This clause requires the safety system design to permit the administrative control of access to safety system equipment. These administrative controls shall be supported by provisions within the safety systems, by provision in the generating station design, or by a combination thereof. Describe the specific access controls available for the SUs that service the QDS and how those controls meet Clause 5.9.

Response to Question 07.09-4:

The Response to Question 7.09-2 discusses the IEEE 603, Clause 5.6.3 independence requirements and will add key lock switches to U.S. EPR FSAR Tier 1 and Tier 2 that interrupt the communication path between the safety-related QDS and the non-safety-related SUs during normal operation. Communication between the QDS and the SU is enabled when the QDS is out of service.

Regarding IEEE 603, Clause 5.9 access control requirements, the QDS SU is password protected so that only authorized users can access the SU. Following a proper login to the SU, user rights dictate the functionality that can be performed. Each password is configured to give or refuse the user the right to:

- Load a new QDS application software on the QDS units.
- Access the error logs from the QDS units.
- Check the valid software information on the QDS units.
- Check QDS print screen received.

An administrative procedure governs which personnel have access to the SU and their level of user rights.

The key lock switches described in the Response to Question 7.09-2 verify that even if a user is logged into the SU, that user can not access the software of a safety-related QDS computer unless that computer has been actively taken out of service.

FSAR Impact:

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

U.S. EPR Final Safety Analysis Report Markups

4.5 The SICS hardware and software are developed using a design process composed of five life cycle phases with each phase having design outputs which must conform to the requirements of that phase. The five life cycle phases are the following:

1. Basic design phase.
2. Detailed design phase.
3. Manufacturing phase.
4. Testing phase.
5. Installation and commissioning phase.

4.6 Electrical isolation is provided on connections between the RSS and the MCR for the SICS.

4.7 Electrical isolation is provided on connections between the four SICS divisions.

4.8 Communications independence is provided between the four SICS divisions.

4.9 Communications independence is provided between SICS equipment and non-Class 1E equipment.

4.10 The SICS is designed so that safety-related functions required for design basis events (DBE) are performed in the presence of the following:

- Single detectable failures within the SICS concurrent with identifiable but non-detectable failures.
- Failures caused by the single failure.
- Failures and spurious system actions that cause or are caused by the DBE requiring the safety function.

4.11 The equipment for each SICS division is distinctly identified and distinguishable from other identifying markings placed on the equipment, and the identifications do not require frequent use of reference material.

4.12 Locking mechanisms are provided on the SICS cabinet doors located outside of the MCR. Opened SICS cabinet doors are indicated in the MCR.

4.13 Key lock switches on the QDS restrict connections between the QDS and the QDS service unit. 07.09-2

4.14 The SICS is capable of performing its safety function when one of the SICS divisions is out of service. Out of service divisions of SICS are indicated in the MCR.

5.0 Electrical Power Design Features

5.1 ~~The~~ Class 1E SICS components ~~identified as Class 1E in Table 2.4.2-1~~ are powered from ~~the~~ a Class 1E division ~~as listed in Table 2.4.2-1~~ in a normal or alternate feed condition.

Table 2.4.2-2—Safety Information and Control System ITAAC
(~~4~~ 8 Sheets)

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
		c. Tests and inspections will be performed to verify an indication exists in the MCR when a SICS cabinet door located outside of the MCR is in the open position.	c. Opened SICS cabinet doors located outside of the MCR are indicated in the MCR.
4.13	Key lock switches on the QDS restrict connections between the QDS and the QDS service unit.	Tests will be performed to verify that the key lock switches on the QDS restrict modifications to the SICS software.	Key lock switches on the QDS restrict modifications to the SICS software.
4.14	The SICS is capable of performing its safety function when one of the SICS divisions is out of service. Out of service divisions of SICS are indicated in the MCR.	a. A test of the SICS will be performed to verify the SICS can perform its safety function when one of the SICS divisions is out of service. b. Inspections will be performed to verify the existence of indications in the MCR when a SICS division is placed out of service.	a. The SICS can perform its safety functions when one of the SICS divisions is out of service. b. Out of service divisions of SICS are indicated in the MCR.
5.1	~~The~~ Class 1E SICS components ~~identified as Class 1E in Table 2.4.2-1~~ are powered from ~~the~~ a Class 1E division ~~as listed in Table 2.4.2-1~~ in a normal or alternate feed condition.	a. Testing will be performed for components identified as Class 1E in Table 2.4.2-1 by providing a test signal in each normally aligned division. b. Testing will be performed for components identified as Class 1E in Table 2.4.2-1 by providing a test signal in each division with the alternate feed aligned to the divisional pair.	a. The test signal provided in the normally aligned division is present at the respective Class 1E components identified in Table 2.4.2-1. b. The test signal provided in each division with the alternate feed aligned to the divisional pair is present at the respective Class 1E components identified in Table 2.4.2-1.

Next File

- Monitoring and control of essential non-safety-related systems to achieve and maintain hot-standby on a loss of PICS (MCR).
- Monitoring and control of systems to mitigate severe accidents (MCR).
- Backup safety parameter display system (SPDS) functions (MCR).
- Display high priority alarms (MCR).

Architecture

The SICS consists of a safety-related portion and a non-safety-related portion to perform its functions.

Safety-Related Portion of SICS

Figure 7.1-3—Safety Information and Control System Architecture (Safety-Related Portion) provides a functional representation of the safety-related portion of the SICS.

The safety-related portion of the SICS is organized into four independent divisions located in separate Safeguards Buildings. HMI equipment is located in the MCR and RSS, and is physically separated.

The safety-related portion of the SICS consists of these functional units:

- Panel interfaces (PI)
- Qualified display systems (QDS).
- ~~Service units (SU).~~ 07.09-2

PIs perform data processing functions and are provided to interface between the various Level 1 systems and the HMI devices in the MCR or RSS. Control PIs process manual commands initiated from the HMI devices and information related to actuator status for display. Monitoring PIs only transfer information to the HMI devices for display to the operator. Hardwired connections to non-safety-related I&C systems may be used as required by the SICS human factors design and are isolated as described in Section 7.1.1.6.4.

Control QDSs provide the capability to initiate manual commands and display actuator-related information. Monitoring QDSs only provide information to the operator. The number and physical arrangement of QDSs provided in the MCR and RSS are determined based on functional and human factors requirements.

Hardwired I&C is used to provide information to the operator and provide the ability to actuate and control plant equipment. Hardwired I&C is connected to the PIs, various Level 1 I&C systems, and the reactor trip devices.

Section 7.2 and Section 7.3 describe the methods used for manual actuation of reactor trip and engineered safety features. For other manual controls, the human factors principles described in Chapter 18 shall be used to select the type of HMI used.

Non-Safety-Related Portion of SICS

Figure 7.1-4—Safety Information and Control System Architecture (Non-Safety-Related Portion) provides a functional representation of the non-safety-related portion of the SICS.

These functional units are implemented in the non-safety-related portion of the SICS:

- Gateways (GW).
- Qualified display systems.
- Service units.

GWs are provided to interface to the plant data network.

QDSs provided in divisions 2 and 3 to monitor and control other non-safety-related I&C systems via GWs on a loss of PICS.

QDSs are provided in divisions 1 and 4 to monitor and control equipment dedicated to mitigate severe accidents. These QDS utilize point-to-point data connections to transmit and receive information to the severe accident I&C (SA I&C).

The QDSs have dedicated SUs that are only connected to the QDS. The number and location of SUs is determined based on the number and layout of QDSs.

Hardwired I&C is also provided to monitor and control non-safety-related I&C systems. The human factors principles described in Chapter 18 are used to select the type of HMI used.

SUs are provided for configuration and maintenance of the SICS. The PIs are serviced by the SUs of the safety automation system (SAS) via the monitoring and service interface (MSI) of the SAS. The QDSs have dedicated non-safety-related SUs that are only connected to the QDS when the QDS is out of service. They are normally isolated through a key lock switch. The number and location of SUs is determined based on the number and layout of QDSs.

07.09-2

Equipment

The SICS is implemented with the TXS digital I&C platform and hardwired I&C equipment.

- PI-QDS (Monitoring) – uni-directional (PI to QDS), point-to-point data connections implemented with the TXS Ethernet protocol.

- PI-PI (Monitoring) – bi-directional, point-to-point data connections implemented with the TXS Profibus protocol. This network is provided to allow the display of redundant divisional information on a single QDS for optimization of the human factors design. The design features that provide for independence between redundant divisions are described in Section 7.1.1.6.4.

Data communications implemented in the non-safety-related portion of the SICS are:

- SU-QDS – bi-directional, networked data connections implemented with the TXS Ethernet protocol. The SU is an auxiliary feature, and this network is a non-safety-related network provided for servicing of the QDSs. These data connections use dedicated ports on the QDS separate from the PI-QDS connections. The SU-QDS link is normally broken by a switch that isolates the two computers. The switch is key lock, and the key is controlled administratively. ~~The system software provides for isolation between the safety-related and non-safety-related data.~~ Software modifications cannot be performed with the QDS in operation. ~~Access is authorized only with appropriate administrative controls.~~ Fiber optic cable is provided for electrical isolation.

07.09-2

- SA I&C-SICS – bi-directional, point-to-point data connections implemented with the TXS Ethernet protocol.

- GW-QDS – bi-directional, point-to-point data connections implemented with the TXS Ethernet protocol.

- GW-Plant Data Network – bi-directional, networked communications.

- SU-QDS – bi-directional, networked data connections.

Power Supply

The safety-related portion of the SICS is powered from the Class 1E uninterruptible power supply (EUPS). The EUPS provides backup power with two-hour batteries and the emergency diesel generators (EDG) in the case of a loss of offsite power (LOOP). In the event of a station blackout (SBO), the EUPS has the capability of receiving power from the station blackout diesel generators (SBODG).

The non-safety-related portion of the SICS is powered from the 12-hour uninterruptible power supply (12hr UPS). The 12hr UPS provides backup power with 12-hour batteries and the SBODGs during a LOOP.

The electrical power systems are described in detail in Chapter 8.

07.09-2

Figure 7.1-3—Safety Information and Control System Architecture (Safety-Related Port

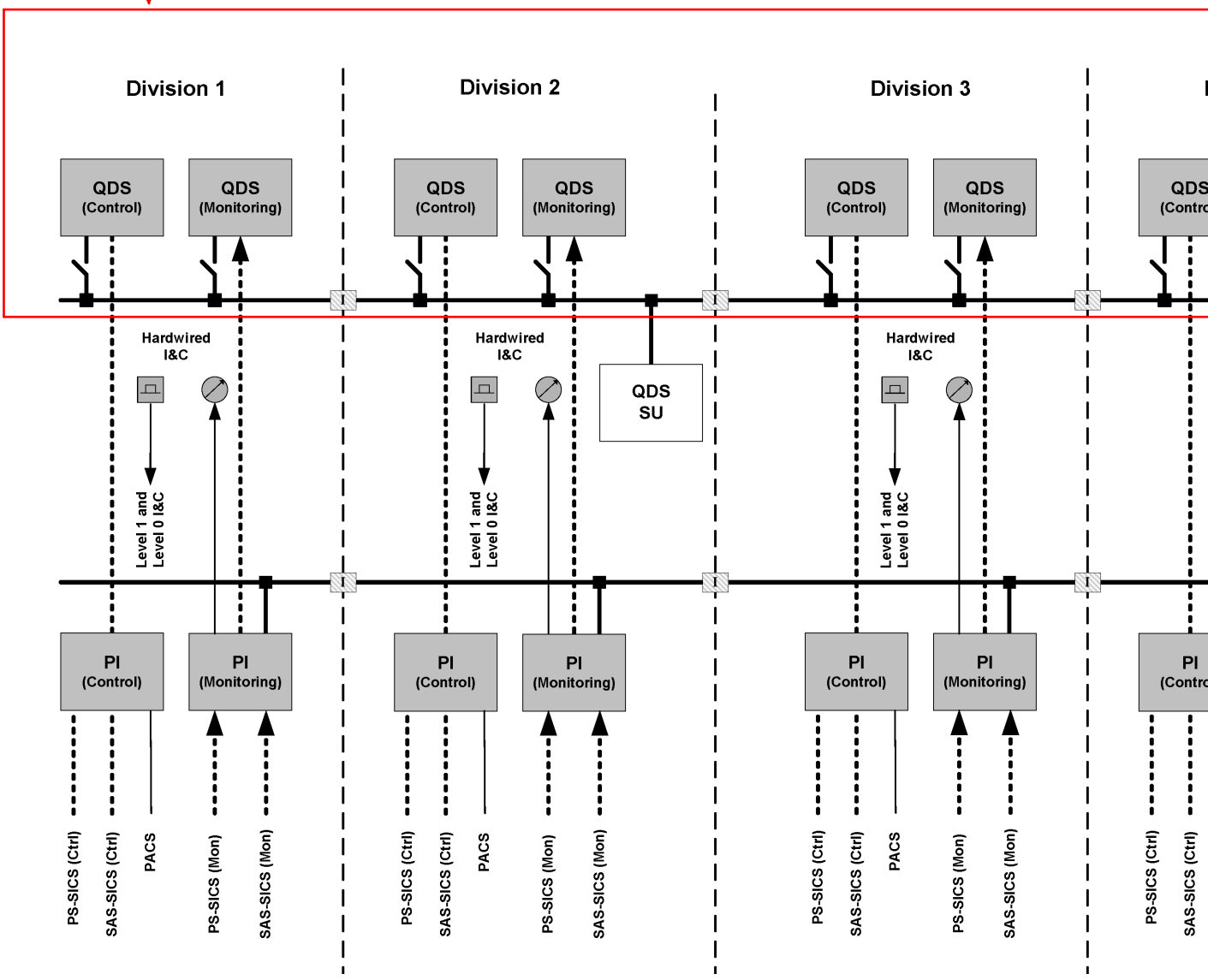

Figure 7.1-21—Levels of Defense for Cybersecurity