ArevaEPRDCPEm Resource

From: BRYAN Martin (EXTERNAL AREVA) [Martin.Bryan.ext@areva.com]
Sent: Friday, August 13, 2010 4:31 PM
To: Tesfaye, Getachew
Cc: DELANO Karen (AREVA); ROMINE Judy (AREVA); BENNETT Kathy (AREVA); PANNELL George (AREVA)
Subject: Response to U.S. EPR Design Certification Application RAI No. 373, FSAR Ch 7, Supplement 3
Attachments: 373 Supplement 3 Response US EPR DC.pdf

Getachew,

On May 10, 2010, AREVA provided a schedule for technically correct and complete response to the 5 questions. To provide an opportunity to interact with the NRC on the proposed responses, a revised schedule was provided on June 11, 2010 and July 9, 2010. A draft response was provided on June 15, 2010. Based on results of the August 10, 2010 telecom with the staff, enclosed are final responses to RAI 373 supplement 3 , questions 7.1-21 and 7.1-22. Additional time is needed to address comments and have additional interaction with the staff on the three remaining questions.

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

Question #	Response Date
RAI 373 — 07.01-23	October 28, 2010
RAI 373 — 07.01-24	October 28, 2010
RAI 373 — 07.01-25	October 28, 2010

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
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702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (EXT)
Sent: Friday, July 09, 2010 5:17 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); PANNELL George L (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 373, FSAR Ch 7, Supplement 2

Getachew,

On May 10, 2010, AREVA provided a schedule for technically correct and complete response to the 5 questions. To provide an opportunity to interact with the NRC on the proposed responses, a revised schedule was provided on June 11, 2010. A draft response was provided on June 15, 2010. To allow additional time to interact with the staff, a revised schedule is provided below.

Question #	Response Date
RAI 373 — 07.01-21	August 15, 2010
RAI 373 — 07.01-22	August 15, 2010
RAI 373 — 07.01-23	August 15, 2010
RAI 373 — 07.01-24	August 15, 2010
RAI 373 — 07.01-25	August 15, 2010

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From: BRYAN Martin (EXT)
Sent: Friday, June 11, 2010 3:31 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); PANNELL George L (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 373, FSAR Ch 7, Supplement 1

Getachew,

On May 10, 2010, AREVA provided a schedule for technically correct and complete response to the 5 questions. To provide an opportunity to interact with the NRC on the proposed responses, a revised schedule is provided below.

A complete answer is not provided for 5 of the 5 questions. The schedule for a technically correct and complete response to these questions is changed and is provided below.

Question #	Response Date
RAI 373 — 07.01-21	July 9, 2010
RAI 373 — 07.01-22	July 9, 2010
RAI 373 — 07.01-23	July 9, 2010
RAI 373 — 07.01-24	July 9, 2010
RAI 373 — 07.01-25	July 9, 2010

Sincerely,

Martin (Marty) C. Bryan
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From: WELLS Russell D (AREVA NP INC)
Sent: Monday, May 10, 2010 7:49 PM

To: 'Getachew Tesfaye'
Cc: BRYAN Martin (EXT); BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 373, FSAR Ch 7

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 373 Response US EPR DC.pdf," provides a schedule since a technically correct and complete response to the 5 questions is not provided.

The following table indicates the respective pages in the response document, "RAI 373 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 373 — 07.01-21	2	2
RAI 373— 07.01-22	3	3
RAI 373 —07.01-23	4	4
RAI 373 —07.01-24	5	5
RAI 373 —07.01-25	6	6

A complete answer is not provided for 5 of the 5 questions. The schedule for a technically correct and complete response to these questions is provided below.

Question #	Response Date
RAI 373 —07.01-21	June 11, 2010
RAI 373— 07.01-22	June 11, 2010
RAI 373 —07.01-23	June 11, 2010
RAI 373 —07.01-24	June 11, 2010
RAI 373 —07.01-25	June 11, 2010

Sincerely,

(Russ Wells on behalf of)
Martin (Marty) C. Bryan
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From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Friday, April 09, 2010 4:16 PM
To: ZZ-DL-A-USEPR-DL
Cc: Suggs, LaDonna; Spaulding, Deirdre; Jackson, Terry; Canova, Michael; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 373 (4393), FSAR Ch. 7

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on February 25, 2010, and on April 9, 2010, 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: 1841

Mail Envelope Properties (BC417D9255991046A37DD56CF597DB7107358386)

Subject: Response to U.S. EPR Design Certification Application RAI No. 373, FSAR Ch 7, Supplement 3
Sent Date: 8/13/2010 4:31:27 PM
Received Date: 8/13/2010 4:31:41 PM
From: BRYAN Martin (EXTERNAL AREVA)

Created By: Martin.Bryan.ext@areva.com

Recipients:
"DELANO Karen (AREVA)" <Karen.Delano@areva.com>
Tracking Status: None
"ROMINE Judy (AREVA)" <Judy.Romine@areva.com>
Tracking Status: None
"BENNETT Kathy (AREVA)" <Kathy.Bennett@areva.com>
Tracking Status: None
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Tracking Status: None
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Tracking Status: None

Post Office: AUSLYNCMX02.adom.ad.corp

Files	**Size**	**Date & Time**
MESSAGE	6338	8/13/2010 4:31:41 PM
373 Supplement 3 Response US EPR DC.pdf	288074	

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

Response to

Request for Additional Information No. 373(4393), Supplement 3

4/09/2010

U.S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 07.01 - Instrumentation and Controls - Introduction
Application Section: 7.1

QUESTIONS for Instrumentation, Controls and Electrical Engineering 1 (AP1000/EPR Projects) (ICE1)

Question 07.01-21:

Provide clarification of the apparent discrepancy in the use and definition of firmware.

Section 7.1, Definitions, defines system software as referring to "relevant software including an operating system, firmware, and runtime software that is integrated to form a generic I&C platform." Section 7.1.1.4.3 of the FSAR states that "the logic for the safety related priority module is implemented with firmware-only based devices (e.g. EEPROM) with no system software or application software." This assertion in Section 7.1.1.4.3 that firmware is not considered software is inconsistent with the definition. Provide clarification of the apparent discrepancy.

Response to Question 07.01-21:

U.S. EPR FSAR Tier 2, Section 7.1, "Definitions" and Section 7.1.1.4.3, "Priority and Actuator Control System" will be revised to eliminate inconsistency regarding use of the term "firmware."

The use of the term "firmware" in U.S. EPR FSAR Tier 2, Section 7.1.1.4.3 was intended to illustrate contrast between software that can be changed without replacing a hardware component, and the programmed logic used in the priority and actuator control system (PACS) priority module which cannot be changed without removing and replacing the priority module itself. U.S. EPR FSAR Tier 2, Section 7.1.1.4.3 will be revised to reflect this.

The definition of system software in Section 7.1, "Definitions," was intended to illustrate contrast between layers of TXS software that do not change based on a specific application, and those that are configured uniquely for each specific application. Table 07.01-21-1 is a reproduction of EMF-2110NP(A), Figure 3.5 that provides graphical representation of the different layers of software on a TXS processor. The operating system and platform software layers shown in EMF-2110NP(A), Figure 3.5 are those considered "system software" in the TXS platform. The definition of "system software" in U.S. EPR FSAR Tier 2, Section 7.1 will be revised:

Institute of Electrical and Electronics Engineers (IEEE) Standard Glossary of Software Engineering Terminology, Std. 610.12-1990, defines firmware as follows:

> "The combination of a hardware device and computer instructions and data that reside as read-only software on that device."
>
> Notes: (1) This term is sometimes used to refer only to the hardware device or only to the computer instructions or data, but these meanings are deprecated. (2) The confusion surrounding this term has led some to suggest that it be avoided altogether."

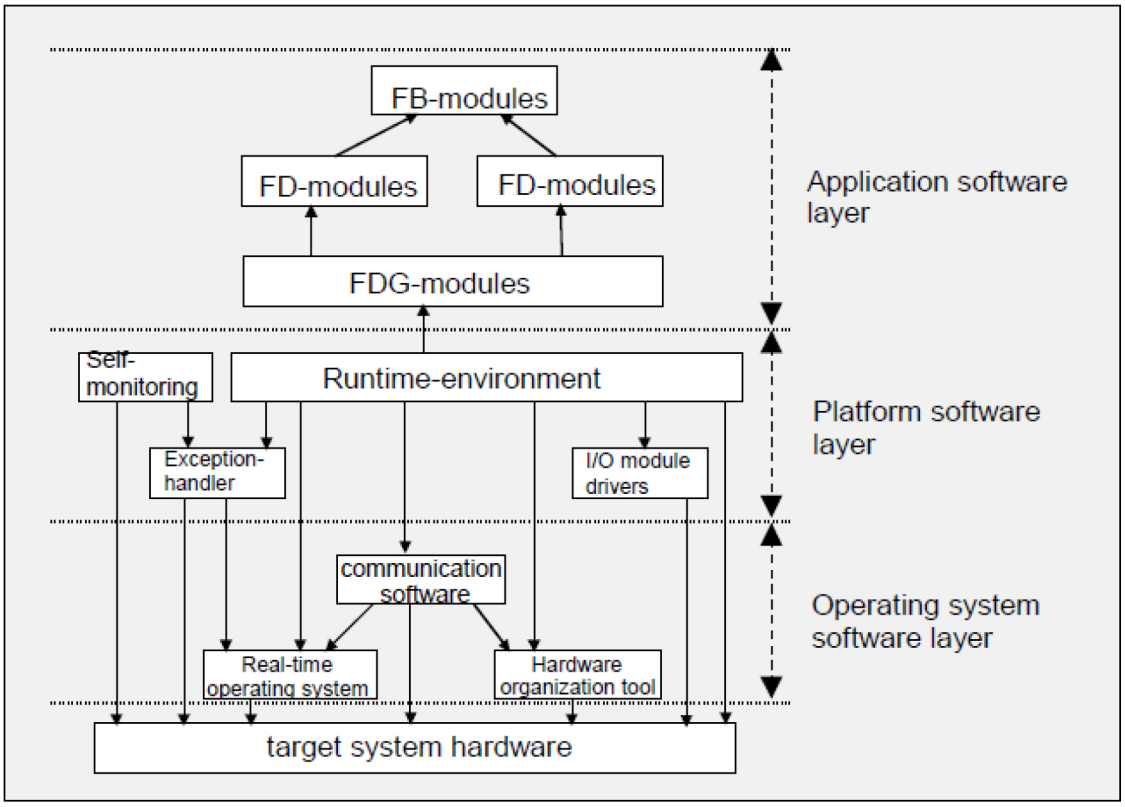
AREVA NP agrees with Note 2 contained in the IEEE definition of firmware. Use of the term "firmware" leads to confusion, and does not provide adequate understanding of the technology to be deployed in the U.S. EPR design. Therefore, the term "firmware" will be eliminated from the U.S. EPR FSAR.

It should be noted that a word-search of ANP-10310P, "Methodology for 100% Combinatorial Testing of the U.S. EPR Priority Module Technical Report" revealed no instances of the term "firmware" in the document. No revisions to ANP-10310P are required to address this topic.

FSAR Impact:

U.S. EPR FSAR Tier 2, Section 7.1 will be revised as described in the response and indicated on the enclosed markup.

Table 07.01-21-1—EMF-2110NP(A), Figure 3.5, "Software Layers of the Runtime System of One Processing Module"



Question 07.01-22:

Provide a description of how the Priority Actuation and Control System (PACS) meets Criterion 5.2 “Completion of Protective Action” of IEEE Std. 603-1998.

The staff evaluated the completion of protective action characteristics of the PACS against Criterion 5.2 of IEEE Std. 603-1998 which requires the safety system to be designed so that, once initiated automatically or manually, the intended sequence of protective actions of the execute features continue until completion. The NRC staff was unable to locate specific information regarding completion of protective action for the PACS in the applicant’s submittal and therefore requests that the applicant provide a description of how this requirement is being addressed in PACS.

Response to Question 07.01-22:

In the U.S. EPR design, the PACS does not perform any functionality needed to confirm completion of protective actions. Logic in the protection system (PS) upstream of the PACS, and electrical switchgear downstream of the PACS provide for completion of protective actions.

U.S. EPR FSAR Tier 2, Section 7.1.2.6.13 specifically addresses compliance with completion of protection action requirements. This section contains an inaccurate reference to U.S. EPR FSAR Tier 2, Section 7.3.2.2 for more detail. That detail is actually found in U.S. EPR FSAR Tier 2, Section 7.3.2.3. A revision will be made to correct this inaccuracy.

U.S. EPR FSAR Tier 2, Section 7.3.2.3.4 addresses compliance with completion of protection action requirements for engineered safety feature (ESF) actuations.

U.S. EPR FSAR Tier 1, Section 2.4.1, ITAAC commitment 4.2 verifies that features for completion of protective action exist in the as-built design.

FSAR Impact:

U.S. EPR FSAR Tier 2, Section 7.1.2.6.13 will be revised as described in the response and indicated on the enclosed markup.