

ArevaEPRDCPEm Resource

From: WILLIFORD Dennis (AREVA) [Dennis.Williford@areva.com]
Sent: Wednesday, May 25, 2011 4:42 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (AREVA); DELANO Karen (AREVA); HALLINGER Pat (EXTERNAL AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA); SHOOK Jeremy (AREVA); HUDSON Greg (AREVA)
Subject: Draft Response to U.S. EPR Design Certification Application RAI No. 485 (5743), FSAR Ch. 7, Question 7.9-70
Attachments: RAI 485 Question 07.09-70 Response US EPR DC - DRAFT.pdf

Getachew,

Attached is a draft response for RAI 485 Question 07.09-70 in advance of the June 29, 2011 final response date.

Let me know if the staff has questions or if this can be sent as a final response.

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Wednesday, May 25, 2011 3:16 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 485 (5743), FSAR Ch. 7

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file provides a schedule since a technically correct and complete response to the 2 questions cannot be provided at this time.

The following table indicates the respective pages in the response document, "RAI 485 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 485 — 07.09-69	2	3
RAI 485 — 07.09-70	4	4

A complete answer is not provided for the 2 questions in RAI 485. The schedule for a technically correct and complete FINAL response to these questions is provided below.

Question #	Response Date
RAI 485 — 07.09-69	June 29, 2011
RAI 485 — 07.09-70	June 29, 2011

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
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From: Tesfaye, Getachew [<mailto:Getachew.Tesfaye@nrc.gov>]
Sent: Monday, May 09, 2011 4:42 PM
To: ZZ-DL-A-USEPR-DL
Cc: Zhang, Deanna; Zhao, Jack; Spaulding, Deirdre; Jackson, Terry; Canova, Michael; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 485 (5743), FSAR Ch. 7

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on April 28, 2011, and discussed with your staff on May 2, 2011. Drat RAI Question 07.09-68 was deleted and 07.09-70 was modified 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: 3022

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Subject: Draft Response to U.S. EPR Design Certification Application RAI No. 485 (5743),
FSAR Ch. 7, Question 7.9-70
Sent Date: 5/25/2011 4:41:48 PM
Received Date: 5/25/2011 4:41:53 PM
From: WILLIFORD Dennis (AREVA)

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Response to

**Request for Additional Information No. 485(5743), Revision 0,
Question 07.09-70**

5/09/2011

U. S. EPR Standard Design Certification

AREVA NP Inc.

Docket No. 52-020

SRP Section: 07.09 - Data Communication Systems

Application Section: 7.9

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

DRAFT

Question 07.09-70:

The staff requests the applicant provide additional detail on the implementation of the service unit (SU) in terms of design functionality and administrative controls for plant operations.

10 CFR 52.47(a)(2) requires, in part, that the design descriptions of systems, structures and components shall be sufficient to permit understanding of the system design and their relationship to the safety evaluations. The staff understands that the SU is a non-safety tool that was originally planned to be permanently connected to the safety-related PS and SAS. To address independence between the non-safety SU and the safety systems, the design was altered, as described in interim Revision 3 of the U.S. EPR Design Control Document, Tier 2, Section 7.1, to have the SU disconnected during plant operation. The staff recognizes that the SU would need to be connected to support surveillance testing and maintenance similar to other maintenance and test equipment. However, administrative controls would need to be in place to ensure the SU is not connected beyond these circumstances since the credited independence mechanism between the SU and the safety systems is physical disconnection. Within interim Revision 3 Section 7.1, the staff noted that for the various operating modes of the TELEPERM XS-based safety systems (PS and SAS), when the SU is connected, the processors would be considered inoperable per Technical Specifications except for the cyclic processing mode. Currently, the staff does not see sufficient administrative controls to limit connection of the SU when the processors are in the cyclic processing mode (i.e., SU could be connected indefinitely in this mode).

Given the above-mentioned concerns, the staff requests the following items be addressed:

- a. Provide sufficient criteria to limit SU connectivity to PS and SAS for the cyclic processing mode of the TELEPERM XS processors.
- b. Provide an estimate of the amount of time per week, and per shift, that the SU would need to be plugged into a PS or SAS division to perform tasks that support plant operations and maintenance or for any other reasons.
- c. Identify the Technical Specification Surveillances that would require using the SU, what type of function processor is impacted by the surveillance (APU, ALU, or CU in SAS), and match these tests to the various operating modes of the function processor in which the tests would be performed.
- d. Explicitly state that the SU can only perform the functions stated in the U.S. EPR FSAR, and while the SU is not in use, it will be fully disconnected from safety-related structures, systems and components (SSCs).
- e. Define in specific terms, what is meant when a function processor's outputs are disabled and differentiate in terms of divisional and system-level impact to both PS (APUs/ALUs) and SAS(CUs). Match this refined definition to specific tasks in which the SU will be performing (refer to item C).

Response to Question 07.09-70:**Item a:**

U.S. EPR FSAR Tier 2, Section 7.1.1.6.4 is modified, and U.S. EPR Table 7.1-6 is added to provide sufficient criteria to limit SU connectivity. The following paragraph will be added to U.S. EPR FSAR Tier 2, Section 7.1.1.6.4:

The SU is not intended to be continuously connected or used. It is only used as part of approved procedures that implement the listed functions. When the SU is not in use as described, it is disconnected from the safety-related components by the hardwired SU isolation switch. The SU may be connected to a TXS function processor operating in the cyclic processing state for up to six hours under administrative procedure control. Connections to the TXS function processors operating in any other state or longer than six hours in the cyclic processing state require the associated TXS function processor to be declared inoperable in the Technical Specifications.

Items b, c, and e:

The information in Table 07.09-70-1 is an estimate of the time the service unit needs to be connected to perform Technical Specification required surveillances. It is not intended to be bounding or limiting, and is based on the information currently available.

Item d:

U.S. EPR FSAR Tier 2, Section 7.1.1.6.4 is modified to more explicitly state that the SU can only perform the functions stated in the U.S. EPR FSAR, and while the SU is not in use, it will be fully disconnected from safety-related structures, systems and components (SSCs).

Item e:

U.S. EPR FSAR Tier 2, Section 7.1.1.6.4 is modified, and U.S. EPR FSAR Tier 2, Table 7.1-6 is added to define in more specific terms the behavior of the function processor and related communication modules in the different states of operation to include how receiving function processors are impacted.

FSAR Impact:

U.S. EPR FSAR Tier 2, Sections 7.1.1.6.4 and Table 7.1-6 will be revised as described in the response and included with the enclosed markup provided with the response to RAI 442, Question 7.1-26.

Table 07.09-70-1—Surveillance Requirements from Technical Specifications

Number	Description	CPU	CPU State	Frequency	Total Time
SR 3.3.1.1	Compare results of calorimetric heat balance calculation to power range division output. Adjust power range division output if calorimetric heat balance calculations results exceed power range division output by more than +2% RTP.	APU	PrS	Adjusted only if >2% difference	0 hr
SR 3.3.1.2	Perform CALIBRATION (SPND).	APU	PrS	15 effective full power days	16 hrs
SR 3.3.1.3	Perform ACTUATING DEVICE OPERATIONAL TEST (per Table 3.3.1-1).	ALU	PrS	31 days	4 hrs
SR 3.3.1.4	Perform CALIBRATION (per Table 3.3.1-1).	APU	PrS	92 days	8 hrs
SR 3.3.1.5	Perform a SENSOR OPERATIONAL TEST (per Table 3.3.1-1).	APU	CP	24 months	36 hrs
SR 3.3.1.6	Perform CALIBRATION (per Table 3.3.1-1).	APU	CP	24 months	48 hrs
SR 3.3.1.8	Perform ACTUATING DEVICE OPERATIONAL TEST (per Table 3.3.1-1).	ALU	PrS	24 months	2 hrs
SR 3.3.1.9	Verify NTSPs (setpoints) properly loaded in APUs (per Table 3.3.1-1).	APU	CP	24 months	4 hrs
SR 3.7.2.4	Verify each MSIV actuates to the isolation position on an actual or simulated actuation signal.	APU	CP	24 months staggered test	2 hrs
SR 3.7.3.2	Verify each MFWFLIV, MFWFLCV, MFWLLIV, MFWLLCV, and MFWVLLCV actuates to the isolation position on an actual or simulated actuation signal.	APU	CP	24 months	4 hrs
SR 3.7.4.3	Verify each MSRIV automatically actuates on an actual or simulated steam pressure setpoints.	APU	CP	24 months	2 hrs
SR 3.7.4.4	Verify each MSRCV is automatically positioned on an actual or simulated actuation signal.	APU	CP	24 months	2 hrs
SR 3.7.5.4	Verify, on an actual or simulated actuation signal, each EFW automatic valve that is not locked, sealed, or otherwise secured in position actuates to the correct position and each EFW pump starts automatically.	APU	CP	24 months	2 hrs

Number	Description	CPU	CPU State	Frequency	Total Time
SR 3.7.7.3	Verify each CCW automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	APU	CP	24 months	3 hrs
SR 3.7.7.4	Verify each CCW pump starts automatically on an actual or simulated actuation signal.	APU	CP	24 months	2 hrs
SR 3.7.8.2	Verify each ESW automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	APU	CP	24 months	3 hrs
SR 3.7.8.3	Verify each ESW pump starts automatically on an actual or simulated actuation signal.	APU	CP	24 months	2 hrs
SR 3.7.10.3	Verify each CREF train actuates on an actual or simulated actuation signal.	APU	CP	24 months	3 hrs
SR 3.7.12.5	Verify each SBVS accident exhaust filtration train actuates on an actual or simulated actuation signal.	APU	CP	24 months	2 hrs
SR 3.9.2.2	Perform CALIBRATION (Nuclear Instrumentation).	APU	PrS	24 months	40 hrs
SR 3.1.8.2	Verify each VCT and letdown isolation valve actuates to the isolation position on an actual or simulated signal.	ALU	PrS	24 months	2 hrs
SR 3.4.10.1	Verify each PSRV is OPERABLE in accordance with the Inservice Testing Program. Following testing, lift settings shall be within $\pm 1\%$.	ALU	PrS	Inservice Testing Program	2 hrs
SR 3.5.2.4	Verify each ECCS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	ALU	PrS	24 months	3 hrs
SR 3.5.2.5	Verify each ECCS pump starts automatically on an actual or simulated actuation signal.	ALU	PrS	24 months	3 hrs
SR 3.6.3.7	Verify each automatic containment isolation valve that is not locked, sealed or otherwise secured in position, actuates to the isolation position on an actual or simulated actuation signal.	ALU	PrS	24 months	3 hrs

Number	Description	CPU	CPU State	Frequency	Total Time
SR 3.7.2.4	Verify each MSIV actuates to the isolation position on an actual or simulated actuation signal.	ALU	PrS	24 months staggered (only required in MODES 1 and 2)	2 hrs
SR 3.7.4.3	Verify each MSRIV automatically actuates on an actual or simulated steam pressure setpoints.	ALU	PrS	24 months	2 hrs
SR 3.8.1.11	Verify on an actual or simulated loss of offsite power signal: <ol style="list-style-type: none"> a. De-energization of emergency buses; b. Load shedding from emergency buses; c. Each EDG auto-starts from standby condition, and: <ol style="list-style-type: none"> 1. Energizes permanently connected loads in ≤ 15 seconds; 2. Energizes auto-connected shutdown loads through the Protection System; 3. Maintains steady state voltage ≥ 6555 V and ≤ 7260 V; 4. Maintains steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz; and 5. Supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes. 	ALU	PrS	24 months	8 hrs

NOTES:

- PrS – Parameterization State
- CP – Cyclic Processing State
- Hours per 24 month – 1110 hours
- Hours per week – 10.7 hours
- Hours per 12 hour shift – 0.76 hours assuming 1110 hours in a 24 month period averaged over the number of 12 hour shifts in the period. Up to 4 hours when performing SPND Calibrations every 15 EFPD (SR 3.3.1.2), assuming each APU division is tested on different shifts.

These are conservative estimates based on operating experience and information in the TXS Topical Report. The hours used in the “Total Time” column represent the estimated time that the service unit will be connected to perform the specified surveillance on the four divisions. The majority of these surveillances have a 24 month frequency, and many of them will be performed during outage.