ArevaEPRDCPEm Resource

From: Pederson Ronda M (AREVA NP INC) [Ronda.Pederson@areva.com]
Sent: Friday, October 02, 2009 4:05 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); DUNCAN Leslie E (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 284, FSARCh. 14
Attachments: RAI 284 Response US EPR DC.pdf

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 284 Response US EPR DC.pdf," provides a technically correct and complete response to the one question.

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 284 Question 14.03.05-24.

The following table indicates the respective page in the response document, "RAI 284 Response US EPR DC.pdf," that contains AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 284 — 14.03.05-24	2	2

This concludes the formal AREVA NP response to RAI 284, and there are no questions from this RAI for which AREVA NP has not provided responses.

Sincerely,

Ronda Pederson
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From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Wednesday, September 02, 2009 7:11 PM
To: ZZ-DL-A-USEPR-DL
Cc: Cheung, Calvin; Jackson, Terry; Canova, Michael; Miernicki, Michael; Jennings, Jason; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 284 (3617), FSARCh. 14

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on August 25, 2009, and on August 26, 2009, 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: 853

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Subject: Response to U.S. EPR Design Certification Application RAI No. 284, FSARCh. 14
Sent Date: 10/2/2009 4:05:14 PM
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From: Pederson Ronda M (AREVA NP INC)

Created By: Ronda.Pederson@areva.com

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Response to

Request for Additional Information No. 284 (3617), Revision 0

9/02/2009

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 14.03.05 - Instrumentation and Controls - Inspections, Tests, Analyses, and Acceptance Criteria
Application Section: 14.03.05

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

Question 14.03.05-24:

ITAAC addressing Protection System Interlocks (U.S. EPR FSAR Tier 1, Table 2.4.1-9, Item 4.13) is not adequate to verify that the as-built functionality meets the design. The ITAAC acceptance criteria states, “The PS interlocks exist as provided in Table 2.4.1-8." Modify the ITAAC to verify both existence as well as proper functionality to meet design criteria.

10 CFR 52.47(b)(1) states that “the proposed inspections, tests, analyses, and acceptance criteria that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, a facility that incorporates that design certification has been constructed and will operated in conformity with the design certification, the provisions of the Act, and the Commission’s rules and regulations.” Modify the ITAAC provided as Item 4.13 to both address its existence and its proper functionality.

Response to Question 14.03.05-24:

U.S. EPR FSAR Tier 1, Section 2.4.1, Item 4.13 and Table 2.4.1-7, Item 4.13, which address protection system (PS) interlocks, will be revised to test the functionality of the interlocks. A test that verifies proper functionality implicitly verifies existence of the function. Therefore, explicit verification of existence is unnecessary and will be removed.

The Response to RAI 78, Supplement 2, Question 14.03.05-4 renumbered U.S. EPR FSAR Tier 1, Table 2.4.1-9 to U.S. EPR FSAR Tier 1, Table 2.4.1-7.

FSAR Impact:

U.S. EPR FSAR Tier 1, Section 2.4.1 and Table 2.4.1-7 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

4.5 The PS is capable of performing its safety function when PS equipment is in maintenance bypass (inoperable). Bypassed PS equipment is indicated in the MCR.~~Bypassed or inoperable PS channels status information is retrievable in the MCR.~~

4.6 Setpoints associated with the automatic RT signals ~~reactor trips listed in Table 2.4.1-3~~ and the automatic~~ally~~ ~~actuated engineered safety features~~ESF signals ~~listed in Table 2.4.1-4~~ are determined using a methodology that addresses the determination of applicable contributors to instrumentation loop errors, the method in which the errors are combined, and how the errors are applied to the design analytical limits.

4.7 Input variables provide the inputs for generating RT signals and ESF signals.~~The PS receives input signals from the sources listed in Table 2.4.1-2—Protection System Input Signals.~~

4.8 Electrical isolation is provided on connections between PS equipment and non-Class 1E equipment.~~The PS provides signals to the non safety related control systems through electrical isolation devices.~~

4.9 Deleted.~~Electrical isolation devices exist in the data communication paths between the PS and the non safety related displays and controls.~~

4.10 ~~The~~ Class 1E PS equipment ~~listed as Class 1E in Table 2.4.1-1~~ can perform its safety function when subjected to electromagnetic interference (EMI), radio-frequency interference (RFI), electrostatic discharges (ESD), and power surges.

4.11 Controls exist in the MCR to allow manual actuation ~~-~~at the system level. ~~of the functions identified in Table 2.4.1-5—Protection System Manually Actuated Functions.~~

4.12 Controls exist in the MCR and RSS to allow validation or inhibition of manual permissives. ~~listed in Table 2.4.1-7—Protection System Permissives.~~

4.13 The PS performs interlock functions. ~~interlocks exist as provided in Table 2.4.1-8—Protection System Interlocks~~.

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4.14 The PS 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.

4.15 Controls exist in the RSS that allow manual actuation of RT.

4.16 Electrical isolation is provided on connections between the four PS divisions.

Table 2.4.1-79—Protection System ITAAC (5 12 Sheets)

14.03.05-24

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
4.13	The PS performs interlock functions.interlocks exist as provided in Table 2.4.1-8.	Tests will be performed on the as-built PS using test signals to simulate plant conditions that require the interlock functions operation of the interlocks listed in Table 2.4.1-86.	The PS generates the correct output signals for each interlock function listed in Table 2.4.1-6 when the test signals are such that the interlock function is required.interlocks exist as provided in Table 2.4.1-8.
4.14	The PS 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.	a. Inspections will be performed to verify that the PS basic design phase process has design outputs. b. Analyses will be performed to verify that the design outputs for the PS basic design phase conform to the requirements of that phase. c. Inspections will be performed to verify that the PS detailed design phase process has design outputs. d. Analyses will be performed to verify that the design outputs for the PS detailed design phase conform to the requirements of that phase. e. Inspections will be performed to verify that the PS manufacturing phase process has design outputs. f. Inspections will be performed to verify that the PS testing phase process has design outputs.	a. A report exists and provides the design outputs for the basic design phase of the PS hardware and software design process. b. A verification and validation (V&V) report exists and concludes that the design outputs conform to the requirements of the PS basic design phase. c. A report exists and provides the design outputs for the detailed design phase of the PS hardware and software design process. d. A V&V report exists and concludes that the design outputs conform to the requirements of the PS detailed design phase. e. A report exists and provides the design outputs for the manufacturing phase of the PS hardware and software design process. f. A report exists and provides the design outputs for the testing phase of the PS hardware and software design process.