ArevaEPRDCPEm Resource

From: Pederson Ronda M (AREVA NP INC) [Ronda.Pederson@areva.com]
Sent: Wednesday, July 22, 2009 5:06 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. 255,FSAR Ch. 14
Attachments: RAI 255 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 255 Response US EPR DC.pdf," provides technically correct and complete responses to 2 of 3 questions.

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 255 Question 14.02-97.

The following table indicates the respective pages in the response document, "RAI 255 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 255 — 14.02-97	2	2
RAI 255 — 14.02-98	3	3
RAI 255 — 14.03.03-38	4	4

A complete answer is not provided for 1 of the 3 questions. The schedule for a technically correct and complete response to the remaining question is provided below.

Question #	Response Date
RAI 255 — 14.03.03-38	September 10, 2009

Sincerely,

Ronda Pederson
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AREVA NP Inc.
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From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Thursday, June 25, 2009 7:25 AM
To: ZZ-DL-A-USEPR-DL
Cc: Crane, Samantha; Peralta, Juan; Ng, Ching; Dixon-Herrity, Jennifer; Miernicki, Michael; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 255 (1885, 3094),FSAR Ch. 14

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on May 18, 2009, and on June 24, 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: 680

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Subject: Response to U.S. EPR Design Certification Application RAI No. 255,FSAR Ch. 14
Sent Date: 7/22/2009 5:05:35 PM
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From: Pederson Ronda M (AREVA NP INC)

Created By: Ronda.Pederson@areva.com

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Files	**Size**	**Date & Time**
MESSAGE	2466	7/22/2009 5:05:37 PM
RAI 255 Response US EPR DC.pdf	54945	

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

Response to

Request for Additional Information No. 255

6/25/2009

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 14.02 - Initial Plant Test Program - Design Certification and New License Applicants
SRP Section: 14.03.03 - Piping Systems and Components - Inspections, Tests, Analyses, and Acceptance Criteria
Application Section: FSAR Ch. 14

QUESTIONS for Quality and Vendor Branch 1 (AP1000/EPR Projects) (CQVP)
QUESTIONS for Engineering Mechanics Branch 2 (ESBWR/ABWR Projects) (EMB2)

Question 14.02-97:

RG 1.68 Appendix A.1.h.5 states that cold water interlocks (including logic, circuitry, and final control devices used to prevent cold water injection into the reactor vessel) should be tested as part of the engineered safety features testing. Section 14.2.12 of the US EPR FSAR does not provide for testing of cold water interlocks. The staff requests that AREVA indicate in which test in Section 14.2.12 the cold water interlocks will be tested, revise section 14.2.12 to include testing of cold water interlocks, or justify the exclusion of cold water interlock testing.

Response to Question 14.02-97:

The U.S. EPR does not have a “cold water interlocks” system or function. However, the protection system (PS) has interlocks to provide low temperature overpressure protection (LTOP) as described in U.S. EPR FSAR Tier 2, Section 7.6.1.2.4. The LTOP interlock is provided to support brittle fracture protection in case of a safety injection system (SIS) actuation during low temperature operation. Testing of the components to support this feature is described in U.S. EPR FSAR Tier 2, Chapter 14.2, Test #014 and Test #146. U.S. EPR FSAR Tier 2, Chapter 14.2, Test #146 will be revised to clarify that PS interlocks are to be tested.

FSAR Impact:

U.S. EPR FSAR Tier 2, Section 14.2, Test #146 will be revised as described in the response and indicated on the enclosed markup.

Question 14.02-98:

RG 1.68 Appendix A.1.i describes testing to demonstrate that the containment will function as designed. This testing includes testing of the main steamline leakage sealing systems and testing of the containment and containment annulus vacuum-breakers. Section 14.2.12 of the US EPR FSAR does not provide for testing of the main steamline leakage sealing systems and testing of the containment and containment annulus vacuum-breakers. The NRC staff requests that AREVA indicate where in Section 14.2 the main steamline leakage sealing systems and the containment and containment annulus vacuum-breakers are being tested, revise Section 14.2.12 to include testing of the main steamline leakage sealing systems and testing of the containment and containment annulus vacuum-breakers, or justify the exclusion of these tests.

Response to Question 14.02-98:

The U.S. EPR does not have a “main steamline leakage sealing” system or function. This feature is typically found on boiling water reactor (BWR) plants where the main steam system is expected to contain low level radioactivity.

The U.S. EPR does not have a “containment and containment annulus vacuum-breakers” system or function. These components are typically installed on BWR and ice condenser containments to protect the relatively small containment from vacuum conditions that could potentially damage the containment or components credited with accident mitigation. The U.S. EPR can meet design requirements following postulated events that create a negative containment or containment annulus pressure without crediting the operation of vacuum-breaker devices.

FSAR Impact:

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

Question 14.03.03-38:

Follow-up to RAI 156, Question 14.03.03-27

In its letter dated April 29th, 2009, AREVA responded to RAI 14.03.03-27 by revising the ITAAC related to piping systems in Tier 1 Table 2.2.1-5. ITAAC related to piping design was modified and ITAAC related to as-built reconciliation as well as fabrication and installation were also added. The staff requests the following changes to improve clarity and inspectibility of the ITAAC.

a. Piping design reports ITAAC:
For item 3.20 of Tier 1, Table 2.2.1-5, AREVA modified the Inspections, Tests, and Analyses (ITA) and included the ASME Code Section III Design Reports (NCA-3550) in the Acceptance Criteria (AC). The staff has two concerns about the proposed changes. First, in the ITA, the staff found that inspections for the existence of the Design Reports are not the objectives of the ITAAC. Rather, the ITA should be reworded as "Inspections of the ASME Code Section III Design Reports (NCA-3550) and required documents will be performed". Second, the AC should be reworded as "ASME Code Section III Design Reports (NCA-3550) exist and conclude that for portions of the RCS piping shown as ASME Code Section III in Figure 2.2.1-1 comply with the ASME Code Section III requirements."

b. Piping as-built reconciliation ITAAC:
For item 3.21, of Tier 1, Table 2.2.1-5, AREVA included the ITAAC to address the as-built reconciliation activity. Three modifications should be made to clarify the statements in the Commitment Wording, ITA, and AC: (i) Revise the Commitment Wording to "The as-built portions of the RCS piping shown in ASME Code Section III in Figure 2.2.1-1 shall be reconciled with the piping design requirements." (ii) The staff found that an inspection is not appropriate. Rather, the ITA should be "A reconciliation analysis of the piping using the as-designed and as-built information and ASME Code certified Design Report (NCA-3550) will be conducted." (iii) Modify the AC to "For portions of….in Figure 2.2.1-1, ASME Code Design Report(s) exist and conclude that design reconciliation has been completed in accordance with the ASME Code for as-built reconciliation. The report(s) document the results of the reconciliation analysis."

c. Piping fabrication and installation ITAAC:
For item 3.24, of Tier 1, Table 2.2.1-5, AREVA incorporated the ITAAC to address the fabrication and installation activities. The staff requests three minor modifications. (i) In the ITA, it should state that "An inspection of the piping will be conducted." (ii) In the Commitment Wording, instead of "…are installed…" it should be "…are fabricated, installed, and inspected…" Similarly in the AC, instead of "…conclude that installation is…" the AC should be "…conclude that fabrication, installation, and inspection are…"

Response to Question 14.03.03-38:

A response to this question will be provided by September 10, 2009.

U.S. EPR Final Safety Analysis Report Markups

2.4 Test instrumentation is available and calibrated.

3.0 TEST METHOD

3.1 Verify hydrogen monitoring system logic and indication.

3.2 Verify hydrogen monitoring system response to sample hydrogen concentrations.

3.3 Verify that the hydrogen monitoring system operates over the design range using actual or simulated signals.

3.4 Verify that the hydrogen monitoring system responds as designed to actual or simulated limiting malfunctions or failures.

3.5 Verify that the hydrogen monitoring system response meets the accident analysis assumptions, such as time response, and accuracy.

3.6 Verify redundancy and electrical independence of the hydrogen monitoring system design.

3.7 Check electrical independence and redundancy of power supplies for safety-related functions by selectively removing power and determining loss of function.

4.0 DATA REQUIRED

4.1 Response to hydrogen samples.

5.0 ACCEPTANCE CRITERIA

5.1 The low range HMS consists of hydrogen sensors arranged in the following containment areas: upper dome, upper pressurizer compartment, upper steam generator compartments 1/2 and 3/4, annular rooms.

5.2 The low range HMS signal processing unit is located in Safeguard Building 1 and is powered from the Class 1E electrical power supply.

5.3 Verify that safety-related components meet electrical independence and redundancy requirements.

5.4 The HMS functions as described in Section 6.2.5.

14.2.12.11.22 Protection System (Test #146)

1.0 OBJECTIVE

1.1 To demonstrate the proper operation of the safety-related protection system (PS).

1.2 To determine the PS response times.

1.3 To demonstrate electrical independence and redundancy of safety-related power supplies.

1.4 Verify operation of PS interlocks. 14.02-97

3.5 Simulate PS inputs that would generate a SIS actuation signal and observe SIS response.

3.6 Simulate PS inputs that would generate an EFWS actuation signal and observe EFWS response.

3.7 Initiate a manual reactor trip from SICS and observe the following:

3.7.1 Reactor trip breaker operation.

3.7.2 Reactor trip contactor operation.

3.7.3 CRDM operating coil transistor discharge.

3.8 Initiate each manual ESF actuation from SICS while observing ESF system response.

3.9 Check the operation of bypass features including, where applicable, observation ~~of the setpoints at which the trip~~that operating bypasses are cancelled automatically.

3.10 Inject signals into appropriate sensors or sensor terminals and measure the elapsed time to achieve actuation of the field device (e.g., breaker, contactor). Trip or actuation paths may be tested in several segments.

3.11 Observe protection system operation over the design range using actual or simulated input signals.

3.12 Check electrical independence and redundancy of power supplies for safety-related functions by selectively removing from service (i.e., loss of power condition) ~~three of four~~ PS divisions and determining which functions are lost on the energized PS division and which overall PS functions are lost. Repeat test for all PS divisions.

14.02-97

3.13 Verify operation of PS interlocks using actual or simulated inputs and verify corresponding interlock function.

4.0 DATA REQUIRED

4.1 Power supply voltages.

~~4.2 Resistance for ground fault detector operation.~~

4.2 Circuit breaker and indicator operational data.

4.3 PS functional logic diagrams.

4.4 ~~Point of actuation of bi-stable comparators~~PS activation values.

4.5 Reset margin and rate of setpoint change of variable setpoints.

4.6 Maximum and minimum values of variable setpoints.

4.7 PS ~~and trip and actuation path~~ response times described in the safety analyses.

4.8 ~~Local coincidence logic operation~~ESF system actuator operational data.

~~4.9 List of functional components when only one PS division is available.~~