ArevaEPRDCPEm Resource

From: Pederson Ronda M (AREVA NP INC) [Ronda.Pederson@areva.com]
Sent: Friday, March 13, 2009 4:56 PM
To: Getachew Tesfaye
Cc: KOWALSKI David J (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. 174, Supplement 1
Attachments: RAI 174 Supplement 1 Response US EPR DC.pdf

Getachew,

AREVA NP Inc. provided responses to 8 of the 49 questions of RAI No. 174 on February 27, 2009. The attached file, "RAI 174 Supplement 1 Response US EPR DC.pdf" provides technically correct and complete responses to 4 of the remaining 41 questions, as committed.

The following table indicates the respective pages in the response document, "RAI 174 Supplement 1 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 174 — 09.02.02-39 (Parts a though e)	2	3
RAI 174 — 09.02.02-40	4	4
RAI 174 — 09.02.02-41	5	5
RAI 174 — 09.02.02-49	6	6
RAI 174 — 09.02.02-50	7	7

The schedule for a technically correct and complete response to the remaining questions is unchanged and provided below.

Question #	Response Date
RAI 174 — 09.02.02-7	May 20, 2009
RAI 174 — 09.02.02-8	May 20, 2009
RAI 174 — 09.02.02-9	May 20, 2009
RAI 174 — 09.02.02-11	April 3, 2009
RAI 174 — 09.02.02-12 (Parts 6, 7 and 8)	May 20, 2009
RAI 174 — 09.02.02-16	April 3, 2009
RAI 174 — 09.02.02-18	April 3, 2009
RAI 174 — 09.02.02-19	May 20, 2009
RAI 174 — 09.02.02-20	May 20, 2009
RAI 174 — 09.02.02-21	May 20, 2009
RAI 174 — 09.02.02-22	April 3, 2009
RAI 174 — 09.02.02-23	May 20, 2009
RAI 174 — 09.02.02-24	May 20, 2009
RAI 174 — 09.02.02-25	April 3, 2009
RAI 174 — 09.02.02-28	May 20, 2009
RAI 174 — 09.02.02-29	May 20, 2009
RAI 174 — 09.02.02-30	April 3, 2009
RAI 174 — 09.02.02-31	May 20, 2009
RAI 174 — 09.02.02-32	May 20, 2009
RAI 174 — 09.02.02-34	May 20, 2009
RAI 174 — 09.02.02-35	May 20, 2009

RAI 174 — 09.02.02-36	May 20, 2009
RAI 174 — 09.02.02-37	May 20, 2009
RAI 174 — 09.02.02-38	May 20, 2009
RAI 174 — 09.02.02-39 (Parts f and g)	May 20, 2009
RAI 174 — 09.02.02-42	May 20, 2009
RAI 174 — 09.02.02-43	May 20, 2009
RAI 174 — 09.02.02-44	May 20, 2009
RAI 174 — 09.02.02-45	May 20, 2009
RAI 174 — 09.02.02-46	May 20, 2009
RAI 174 — 09.02.02-47	May 20, 2009
RAI 174 — 09.02.02-48	May 20, 2009
RAI 174 — 09.02.02-51	May 20, 2009
RAI 174 — 09.02.02-52	May 20, 2009
RAI 174 — 09.02.02-53	May 20, 2009
RAI 174 — 09.02.02-54	May 20, 2009
RAI 174 — 09.02.02-55	May 20, 2009

Sincerely,

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From: Pederson Ronda M (AREVA NP INC)
Sent: Friday, February 27, 2009 5:46 PM
To: 'Getachew Tesfaye'
Cc: DELANO Karen V (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); KOWALSKI David J (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 174, FSAR Ch. 9

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 174 Response US EPR DC.pdf" provides technically correct and complete responses to 8 of the 49 questions.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which supports the response to RAI 174 Questions 09.02.02-10, 09.02.02-17 and 09.02.02-33.

The following table indicates the respective pages in the response document, "RAI 174 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 174 — 09.02.02-7	2	2
RAI 174 — 09.02.02-8	3	3

RAI 174 — 09.02.02-9	4	4
RAI 174 — 09.02.02-10	5	6
RAI 174 — 09.02.02-11	7	7
RAI 174 — 09.02.02-12	8	10
RAI 174 — 09.02.02-13	11	11
RAI 174 — 09.02.02-14	12	12
RAI 174 — 09.02.02-15	13	14
RAI 174 — 09.02.02-16	15	16
RAI 174 — 09.02.02-17	17	17
RAI 174 — 09.02.02-18	18	19
RAI 174 — 09.02.02-19	20	21
RAI 174 — 09.02.02-20	22	22
RAI 174 — 09.02.02-21	23	23
RAI 174 — 09.02.02-22	24	24
RAI 174 — 09.02.02-23	25	25
RAI 174 — 09.02.02-24	26	26
RAI 174 — 09.02.02-25	27	27
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RAI 174 — 09.02.02-28	30	30
RAI 174 — 09.02.02-29	31	31
RAI 174 — 09.02.02-30	32	32
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RAI 174 — 09.02.02-53	57	57
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RAI 174 — 09.02.02-55	59	59

A complete answer is not provided for 41 of the 49 questions. The schedule for a technically correct and complete response to these questions is provided below.

Question #	Response Date
RAI 174 — 09.02.02-7	May 20, 2009
RAI 174 — 09.02.02-8	May 20, 2009
RAI 174 — 09.02.02-9	May 20, 2009
RAI 174 — 09.02.02-11	April 3, 2009
RAI 174 — 09.02.02-12 (Parts 6, 7 and 8)	May 20, 2009
RAI 174 — 09.02.02-16	April 3, 2009
RAI 174 — 09.02.02-18	April 3, 2009
RAI 174 — 09.02.02-19	May 20, 2009
RAI 174 — 09.02.02-20	May 20, 2009
RAI 174 — 09.02.02-21	May 20, 2009
RAI 174 — 09.02.02-22	April 3, 2009
RAI 174 — 09.02.02-23	May 20, 2009
RAI 174 — 09.02.02-24	May 20, 2009
RAI 174 — 09.02.02-25	April 3, 2009
RAI 174 — 09.02.02-28	May 20, 2009
RAI 174 — 09.02.02-29	May 20, 2009
RAI 174 — 09.02.02-30	April 3, 2009
RAI 174 — 09.02.02-31	May 20, 2009
RAI 174 — 09.02.02-32	May 20, 2009
RAI 174 — 09.02.02-34	May 20, 2009
RAI 174 — 09.02.02-35	May 20, 2009
RAI 174 — 09.02.02-36	May 20, 2009
RAI 174 — 09.02.02-37	May 20, 2009
RAI 174 — 09.02.02-38	May 20, 2009
RAI 174 — 09.02.02-39 (Parts a though e) RAI 174 — 09.02.02-39 (Parts f and g)	March 13, 2009 May 20, 2009
RAI 174 — 09.02.02-40	March 13, 2009
RAI 174 — 09.02.02-41	March 13, 2009
RAI 174 — 09.02.02-42	May 20, 2009
RAI 174 — 09.02.02-43	May 20, 2009
RAI 174 — 09.02.02-44	May 20, 2009
RAI 174 — 09.02.02-45	May 20, 2009
RAI 174 — 09.02.02-46	May 20, 2009
RAI 174 — 09.02.02-47	May 20, 2009
RAI 174 — 09.02.02-48	May 20, 2009
RAI 174 — 09.02.02-49	March 13, 2009
RAI 174 — 09.02.02-50	March 13, 2009
RAI 174 — 09.02.02-51	May 20, 2009
RAI 174 — 09.02.02-52	May 20, 2009
RAI 174 — 09.02.02-53	May 20, 2009
RAI 174 — 09.02.02-54	May 20, 2009
RAI 174 — 09.02.02-55	May 20, 2009

Sincerely,

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From: Getachew Tesfaye [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Wednesday, January 28, 2009 3:56 PM
To: ZZ-DL-A-USEPR-DL
Cc: Larry Wheeler; John Segala; Peter Wilson; Peter Hearn; Joseph Colaccino; Michael Miernicki; Meena Khanna; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 174 (1806, 1810),FSAR Ch. 9

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on January 9, 2009, and discussed with your staff on January 22, 2009. No changes were made to the draft RAI 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: 312

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Subject: Response to U.S. EPR Design Certification Application RAI No. 174, Supplement 1
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MESSAGE	9001	3/13/2009 4:56:12 PM
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Priority: Standard
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Reply Requested: No
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Response to

Request for Additional Information No. 174, Supplement 1

01/28/2009

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 09.02.02 - Reactor Auxiliary Cooling Water Systems
Application Section: 9.2.2

QUESTIONS for Balance of Plant Branch 1 (AP1000/EPR Projects) (SBPA)

Question 09.02.02-39:

Standard Review Plan (SRP) 9.2.2 Section III, requires confirmation of the overall arrangement of the component cooling system (CCWS) which is being utilized as guidance for the review of the SCWS. The safety chilled water system (SCWS) description and piping and instrumentation diagrams (P&ID), Tier 2, FSAR Figure 9.2.8-1, were reviewed to assess the design adequacy of the SCWS for performing its heat removal functions. While the P&ID shows the SCWS components and identifies the boundaries between safety-related and non-safety-related parts of the system, some of the information is incomplete, inaccurate, or inconsistent. Consequently, the applicant needs to revise the Final Safety Analysis Report (FSAR) to address the following considerations in this regard:

a. Pipe sizes are not shown on the Tier 2, FSAR Figure 9.2.8-1, and the system description does not explain the criteria that were used in establishing the appropriate pipe sizes (such as limiting flow velocities).

b. The system description does not provide design details such as system operating temperatures, pressures, and flow rates for all operating modes and alignments.

c. Tier 2, FSAR Figure 9.2.8-1 does not show where indications are displayed (e.g., local, remote panel, control room), and what instruments provide input to a process computer and/or have alarm and automatic actuation functions.

d. Tier 2, FSAR Figure 9.2.8-1 does not show what the normal valve positions are, what valves are locked in position, and what valves have automatic functions; and these design features are not described.

e. Tier 2, FSAR Figure 9.2.8-1 does not show specific set point for system alarms (including head tank) and relief and the bases for these set points are not explained in the system description.

f. Isolation valves for taking components out of service for maintenance are not shown on the Tier 2, FSAR Figure 9.2.8-1.

g. Describe in Section 9.2.8 why filters are shown in the return lines from some but not all HVAC units.

Response to Question 09.02.02-39:

a. Specific SCWS line sizing details will be identified later in the design process. The final determination of pipe sizes is based on SCW user loads and flow requirements. Pipe sizes will be determined to optimize fluid velocities during operating scenarios.

b. Specific SCWS operating temperatures, pressures, and flow rates for all operating modes and alignments will be identified later in the design process. The final determination of these parameters depends on user loads and flow requirements as well as various plant operating scenarios. The SCWS will be designed in accordance with applicable codes and standards to provide the required flow and cooling to all system users under operating scenarios.

c. Specific SCWS indicator locations (e.g., local, remote, or main control room) will be identified later in the design process. Instrumentation that provides input to a process computer, alarm, or automatic function will be finalized later in the design process.

d. Specific SCWS design features (e.g., identification of normal valve positions, valves locked in position, and automatic valve functions) will be identified later in the design process.

e. Specific SCWS alarm and relief valve setpoints will be identified later in the design process. This information depends on SCW user loads and flow requirements as well as plant operating modes.

System design parameters of the SCWS are provided in U.S. EPR FSAR Tier 2, Table 9.2.8-1—Safety Chilled Water Design Parameters and flow diagrams of the four divisions are given in U.S. EPR FSAR Tier 2, Figure 9.2.8-1—Safety Chilled Water System Diagram. This information, along with the system description provided in U.S. EPR FSAR Tier 2, Section 9.2.8 is sufficient to confirm the overall arrangement of the system.

A response to Parts f and g of this question will be provided by May 20, 2009.

FSAR Impact:

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

Question 09.02.02-40:

The safety chilled water system (SCWS) must be capable of removing heat from structures, system and components (SSCs) important to safety during normal operating and accident conditions over the life of the plant in accordance with general design criteria (GDC) 44 requirements. In order for the staff to confirm that the SCWS has been adequately sized, the applicant needs to include additional information in Tier 2 of the Final Safety Analysis Report (FSAR), Section 9.2.8, to fully describe and explain what the minimum system heat transfer and flow requirements are for normal operating, refueling, and accident conditions, the bases for these requirements including limiting assumptions that apply (such as temperature considerations), how much excess margin is available and how this was determined, and what limiting system temperatures and pressures are assumed with supporting basis.

Response to Question 09.02.02-40:

The major SCWS users include:

- Divisions 1 and 4
  - Electrical division of safeguard building ventilation system heat exchangers
  - Main control room air conditioning system heat exchanger
  - Low head safety injection system pump motor and seal coolers
  - Safeguard building controlled-area ventilation system heat exchangers
  - Fuel building ventilation system heat exchanger
- Divisions 2 and 3
  - Electrical division of safeguard building ventilation system heat exchangers
  - Main control room air conditioning system heat exchanger
  - Safeguard building controlled-area ventilation system heat exchangers

Specific details of the SCWS minimum heat transfer and flow requirements for the various plant operating modes and accident conditions will be identified later in the design process. The final determination of these design values depends on SCWS user heat loads and flow requirements. The SCWS will be designed to satisfy these minimum heat transfer and flow requirements for each user under plant operating scenarios.

FSAR Impact:

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

Question 09.02.02-41:

General design criteria (GDC) 44 requires the transfer of heat from systems, structures and components (SSC) important to safety to a heat sink during both normal and accident conditions assuming a single active component failure coincident with the loss of offsite power. The Final Safety Analysis Report (FSAR) indicates that the safety chilled water system (SCWS) chillers are rated at 275 tons (Divisions 1 and 4) and 250 tons (divisions 2 and 3) but does not provide a basis for these capacities.

- Provide information on the major heat loads in the various SCWS divisions for which the chillers have been sized. Information should include both normal operations and postulated accident conditions.

Response to Question 09.02.02-41:

The major SCWS users include:

- Divisions 1 and 4
  - Electrical division of safeguard building ventilation system heat exchangers
  - Main control room air conditioning system heat exchanger
  - Low head safety injection system pump motor and seal coolers
  - Safeguard building controlled-area ventilation system heat exchangers
  - Fuel building ventilation system heat exchanger
- Divisions 2 and 3
  - Electrical division of safeguard building ventilation system heat exchangers
  - Main control room air conditioning system heat exchanger
  - Safeguard building controlled-area ventilation system heat exchangers

Specific details of the SCWS chiller sizing will be identified later in the design process. The final chiller sizing determination depends on a number of factors. SCWS user heat removal and flow requirements under all operating modes and alignments will form the basis for the SCWS chiller sizing. Based on these calculations, the SCWS chiller will be sized with margin to satisfy the minimum flow requirements and heat transfer requirements for each user under plant operating scenarios.

FSAR Impact:

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

Question 09.02.02-49:

The safety chilled water system (SCWS) must be designed so that periodic inspections of piping and components can be performed to assure that the integrity and capability of the system will be maintained over time in accordance with general design criteria (GDC 45) requirements. The staff finds the design to be acceptable if the Final Safety Analysis Report (FSAR) describes inspection program requirements that will be implemented and are considered to be adequate for this purpose. While Tier 2 FSAR Section 9.2.8.5 indicates that periodic inspections will be performed, the extent and nature of these inspections and procedural controls that will be implemented to assure that the SCWS is adequately maintained over time were not described. Consequently, the applicant needs to provide additional information in the FSAR to describe the extent and nature of inspections that will be performed and procedural controls that will be implemented commensurate with this requirement.

Response to Question 09.02.02-49:

U.S. EPR FSAR Tier 2, Section 6.6 provides details concerning the extent and nature of inservice inspection of Class 2 and 3 components. Implementing procedures will be developed later in the design process.

FSAR Impact:

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

Question 09.02.02-50:

The safety chilled water system (SCWS) must be designed so that periodic pressure and functional testing of components can be performed in accordance with general design criteria (GDC) 46 requirements to assure the structural and leak tight integrity of system components, the operability and performance of active components, and the operability of the system as a whole and performance of the full operational sequences that are necessary for accomplishing the SCWS safety functions. The staff finds the design to be acceptable if the Final Safety Analysis Report (FSAR) describes pressure and functional test program requirements that will be implemented and are considered to be adequate for this purpose. While Tier 2 FSAR Section 9.2.8.5 indicates that periodic testing will be performed, the extent and nature of these tests and procedural controls that will be implemented to assure continued SCWS structural and leak tight integrity and system operability over time were not described. Consequently, the applicant needs to provide additional information in the FSAR to describe the extent and nature of testing that will be performed and procedural controls that will be implemented commensurate with this requirement.

Response to Question 09.02.02-50:

Details concerning the extent and nature of inservice testing programs are addressed in U.S. EPR FSAR Tier 2, Section 3.9.6. Implementing procedures will be developed later in the design process.

FSAR Impact:

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