ArevaEPRDCPEm Resource

From: Pederson Ronda M (AREVA NP INC) [Ronda.Pederson@areva.com]
Sent: Wednesday, July 08, 2009 6:26 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); KOWALSKI David J (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 237, FSARCh. 9
Attachments: RAI 237 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 237 Response US EPR DC.pdf" states that a complete answer cannot be currently provided for this question.

The following table indicates the pages in the response document, "RAI 237 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 237 — 09.03.02-16	2	5

The schedule for a technically correct and complete response to this question is provided below.

Question #	Response Date
RAI 237 — 09.03.02-16	August 14, 2009

Sincerely,

Ronda Pederson
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Sent: Friday, June 05, 2009 5:59 PM
To: ZZ-DL-A-USEPR-DL
Cc: Jeffrey Poehler; David Terao; Peter Hearn; Joseph Colaccino; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 237 (2907), FSARCh. 9

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on May 21, 2009, and on June 5, 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: 632

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Subject: Response to U.S. EPR Design Certification Application RAI No. 237, FSARCh. 9
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Created By: Ronda.Pederson@areva.com

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MESSAGE	2093	7/8/2009 6:26:30 PM
RAI 237 Response US EPR DC.pdf	72667	

Options
Priority: Standard
Return Notification: No
Reply Requested: No
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Response to

Request for Additional Information No. 237

6/05/2009

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 09.03.02 - Process and Post-Accident Sampling Systems
Application Section: 9.3.2

QUESTIONS for Component Integrity, Performance, and Testing Branch 1
(AP1000/EPR Projects) (CIB1)

Question 09.03.02-16:

Background

10 CFR 52.47(a)(8) requires that standard design certification applications address the information necessary to demonstrate compliance with any technically relevant portions of the Three Mile Island requirements set forth in 10 CFR 50.34(f), except paragraphs (f)(1)(xii), (f)(2)(ix), and (f)(3)(v).

10 CFR 50.34(f)(2)(xxvi) requires that applicants, "Provide for leakage control and detection in the design of systems outside containment that contain (or might contain) accident source term radioactive materials following an accident. Applicants shall submit a leakage control program, including an initial test program, a schedule for re-testing these systems, and the actions to be taken for minimizing leakage from such systems. The goal is to minimize potential exposures to workers and public, and to provide reasonable assurance that excessive leakage will not prevent the use of systems needed in an emergency. (III.D.1.1)"

III.D.1.1 refers to the TMI Action Plan requirement which is detailed and further clarified in NUREG-0737, "Clarification of TMI Action Plan Requirements." Systems listed by Item III.D1.1 as potentially in scope of the requirement are residual heat removal (RHR), containment spray recirculation, high-pressure injection recirculation, containment and primary coolant sampling, reactor core isolation cooling, makeup and letdown (PWRs only), and waste gas (includes headers and cover gas system outside of containment in addition to decay or storage system)

The US-EPR FSAR, Tier 2, lists 10 CFR 50.34(f)(2)(xxvi) among the design bases of several systems, including RHR, ECCS, PSS, and CVCS. However, the level of design information provided to demonstrate meeting the criterion is inconsistent for the systems. Further, the interface requirements with the COL applicants with respect to the programmatic aspects of the criterion appear to be incomplete. The criterion is addressed for specific systems as described below.

Residual Heat Removal System (RHRS)

US-EPR FSAR Tier 2, Table 1.9-3, "U.S. EPR Conformance with TMI Requirements (10 CFR 50.34(f)) and Generic Issues (NUREG-0933)," indicates that 10 CFR 50.34(f)(2)(xxvi) is addressed in FSAR Tier 2 Section 5.4.7 (Residual Heat Removal System). FSAR Tier 2 Section 5.4.7.1, "Design Bases," states that the Safety Injection System/Residual Heat Removal System (SIS/RHRS) is designed to control and detect leakage outside containment following an accident. The section of the SIS/RHRS that is located outside the containment can be isolated from the containment in the event of a break in the SIS/RHRS piping (10 CFR 50.34(f)(2)(xxvi)). Leakage from the system is detected, monitored, and controlled by plant operating procedures and programs.

Emergency Core Cooling Systems (ECCS)

For the ECCS systems, FSAR Tier 2 Section 6.3.1, "Design Bases," states that the ECCS is designed with the capability for leakage detection and control to minimize the leakage from those portions of the SIS outside of the containment that may contain radioactive material following an accident (10 CFR 50.34(f)(2)(xxvi)). FSAR Tier 2 Section 6.3.2.2.1, "System Overview," further states that leakage from the SIS in the Safeguards Buildings (SBs) is

detected and monitored by operating procedures and programs. Each SB has sump level indication to detect SIS/RHRS leakage.

Process Sampling System (PSS)

For the PSS, Section 9.3.2.1, "Design Bases," states that non-safety-related portions of the process sampling systems are designed to have provisions for a leakage detection and control program to minimize the leakage from those portions of the process sampling systems outside of the containment that contain or may contain radioactive material following an accident (10 CFR 0.34(f)(2)(xxvi)). Further, Section 9.3.2.3, "Safety Evaluation," states:

"The design of the process sampling systems satisfies 10 CFR 50.34(f)(2)(xxvi) regarding having provisions for a leakage detection and control program to minimize the leakage from those portions of the process sampling systems outside of the containment that contain or may contain radioactive material following an accident.

- The NSS (Nuclear Sampling System) samples the RCS (Reactor Coolant System) to provide information necessary to assess and control the plant under accident conditions.
- The SASS (Severe Accident Sampling System) obtains and analyzes gaseous samples from the containment atmosphere following a severe accident for the purpose of confirming whether the containment atmosphere contains airborne activity.
- The NSS and SASS contains proper equipment to prevent unnecessary high exposures to workers and minimize leakage from the system to ALARA.
- Safety-related CIVs (containment isolation valves) close on receipt of a CIS (containment isolation signal) and contain radioactive material inside the RB (reactor building). Refer to Section 6.2.4."

Chemical and Volume Control System (CVCS)

For the CVCS system, Section 9.3.4.1, "Design Bases," states that safety-related portions of the CVCS are designed to have provisions for a leakage detection and control program to minimize the leakage from those portions of the CVCS outside of the containment that contain or may contain radioactive material following an accident (10 CFR 50.34(f)(2)(xxvi)).

Section 9.3.4.3, "Safety Evaluation," states that the design of safety-related portions of the CVCS satisfies 10 CFR 50.34(f)(2)(xxvi) regarding detection of reactor coolant leakage outside containment by providing leakage control and detection systems in the CVCS and implementation of appropriate leakage control program.

- The CVCS isolates components or piping so that the CVCS safety function is not compromised. Design provisions include the capability to identify and isolate the leakage or malfunction, and to isolate the non-safety-related portions of the system.

Section 9.3.4.2.3.5, "Accident Conditions," contains the following information with regard to detecting system leaks outside containment:

Postulated System Leaks in the Fuel Building - In the event of a CVCS or RCP seal water system leak in the Fuel Building, reactor coolant with temperatures of approximately 120°F is released.

Due to the loss of reactor coolant, the following alarms are also generated:

- VCT (volume control tank) low water level.
- Sump high water level in the FB (Fuel Building) vent and drain system.

Gaseous Waste Management System

For the gaseous waste management system, 10 CFR 50.34(f)(2)(xxvi) is not listed in the FSAR among the design bases, although provisions to minimize system leakage are described in FSAR Tier 2 Section 11.3. This system would be the equivalent to the waste gas system listed as one of the systems potentially in scope of TMI Action Item III.D.1.1.

Technical Specifications

Additionally, FSAR Tier 2 Chapter 16, Technical Specification 5.5.2, "Primary Coolant Sources Outside Containment," states the following:

"This program provides controls to minimize leakage from those portions of systems outside containment that could contain highly radioactive fluids during a serious transient or accident to levels as low as practicable. The systems include Low Head Safety Injection, Medium Head Safety Injection, and Nuclear Sampling. The program shall include the following:

a. Preventive maintenance and periodic visual inspection requirements; and

b. Integrated leak test requirements for each system once per 24 months."

This appears to describe a program intended to fulfill the requirements of 10 CFR 50.34(f)(2)(xxvi). However, Technical Specification 5.5.2 does not contain all the elements required by NUREG-0737 Item III.D.1.1, and the list of systems is inconsistent with those systems that list 10 CFR 50.34(f)(2)(xxvi) as a design bases. Finally, the initial and periodic tests required by Item III.D1.1 would be performed by the COL holder. However, the US-EPR FSAR does not identify a COL information item to ensure the COL holder has a leakage control program, and the initial leak test is not addressed in the initial test program information included in the FSAR.

Requested Information

1. Other than RHR, ECCS, PSS, and CVCS, identify any other systems in scope of 10 CFR 50.34(f)(2)(xxvi). If any systems expected to contain radioactive materials after an accident are excluded from the leakage detection program, justify the exclusion of these systems.
2. For the PSS, describe the design provisions that facilitate minimization and detection of leakage for each of the systems in accordance with 10 CFR 50.34(f)(2)(xxvi). Specifically, describe the "proper equipment" mentioned in Section 9.3.2.3 in more detail. Confirm that the PSS credits the SB building sump level indication as in the case of the CVCS system.
3. For those systems that credit building sump level indication/alarms for leakage detection, describe the identification process for the location of the specific leakage.
4. Discuss the need to include a COL information item in the FSAR to ensure the COL holder develops a program for leakage monitoring and prevention to fulfill the requirements of 10 CFR 50.34(f)(2)(xxvi).

5. Clarify whether proposed Technical Specification 5.5.2 is intended to fulfill the requirements of 10 CFR 50.34(f)(2)(xxvi). If so, these criteria should be referenced in the technical specification.
6. In FSAR Tier 1 and Tier 2, provide the initial test program information for leakage control and detection for all systems outside containment that contain (or might contain) accident source term radioactive materials following an accident.

Response to Question 09.03.02-16:

A response to this question will be provided by August 14, 2009.