ArevaEPRDCPEm Resource

From: Pederson Ronda M (AREVA NP INC) [Ronda.Pederson@areva.com]
Sent: Monday, August 24, 2009 4:15 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); SLIVA Dana (AREVA NP INC); KOWALSKI David J (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 223, FSAR Ch. 9, Supplement 1
Attachments: RAI 223 Supplement 1 US EPR DC.pdf

Getachew,

AREVA NP Inc. provided responses to 3 of the 4 questions of RAI No. 223 on July 9, 2009. The attached file, "RAI 223 Supplement 1 Response US EPR DC.pdf" provides a technically correct and complete response to the remaining question, as committed.

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 223 Question 09.03.02-15.

The following table indicates the respective pages in the response document, "RAI 223 Supplement 1 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 223 — 09.03.02-15	2	4

This concludes the formal AREVA NP response to RAI 223, and there are no questions from this RAI for which AREVA NP has not provided responses.

Sincerely,

Ronda Pederson
ronda.pederson@areva.com
Licensing Manager, U.S. EPR Design Certification
AREVA NP Inc.
An AREVA and Siemens company
3315 Old Forest Road
Lynchburg, VA 24506-0935
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From: Pederson Ronda M (AREVA NP INC)
Sent: Thursday, July 09, 2009 5:00 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. 223, FSAR Ch. 9

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 223 Response US EPR DC.pdf" provides technically correct and complete responses to 3 of the 4 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 223 Questions 09.03.02-14 and 09.05.01-69.

The following table indicates the respective pages in the response document, "RAI 223 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 223 — 09.01.02-27	2	4
RAI 223 — 09.03.02-14	5	6
RAI 223 — 09.03.02-15	7	8
RAI 223 — 09.05.01-69	9	11

A complete answer is not provided for 1 of the 4 questions. The schedule for a technically correct and complete response to this question is provided below.

Question #	Response Date
RAI 223 — 09.03.02-15	August 28, 2009

Sincerely,

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From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Tuesday, June 09, 2009 6:10 PM
To: ZZ-DL-A-USEPR-DL
Cc: Poehler, Jeffrey; Terao, David; Andrukat, Dennis; Radlinski, Robert; Hearn, Peter; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 223 (2677, 2678,2509), FSAR Ch. 9

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on May 11, 2009, and discussed with your staff on June 9, 2009. Draft RAI Questions 09.05.01-69 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: 749

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Sent Date: 8/24/2009 4:15:23 PM
Received Date: 8/24/2009 4:15:27 PM
From: Pederson Ronda M (AREVA NP INC)

Created By: Ronda.Pederson@areva.com

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RAI 223 Supplement 1 US EPR DC.pdf	52481	

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

Response to

Request for Additional Information No. 223, Supplement 1

6/09/2009

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 09.01.02 - New and Spent Fuel Storage
SRP Section: 09.03.02 - Process and Post-Accident Sampling Systems
SRP Section: 09.05.01 - Fire Protection Program
Application Section: FSAR Ch. 9

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

Question 09.03.02-15:

Background

As measures to assist in compliance with 10 CFR 20.1406 with respect to minimizing, to the extent practicable, contamination of the facility and the environment, RG 4.21 Appendix A recommends, in part:

- Provide for adequate leak detection capability to provide prompt detection of (radioactive) leakage for any structure, system, or component which has the potential for leakage,
- Use leak detection methods (e.g., instrumentation, automated samplers) capable of early detection of leaks in areas where it is difficult or impossible to conduct regular inspections (such as for spent fuel pools, tanks that are in contact with the ground, and buried, embedded, or subterranean piping) to avoid release of contamination from undetected leaks and to minimize contamination of the environment,
- Reduce the need to decontaminate equipment and structures by decreasing the probability of any release, reducing any amounts released, and decreasing the spread of the contaminant from the source,

In the response to RAI 12.03 and 12.04-1(Reference 1), the applicant provided information related to the process sampling system. Under "System Specific Design Features, Process Sampling System, (i) Facility Contamination," the response states:

> "As described in U.S. EPR FSAR Tier 2, Section 11.5, the process sampling systems monitor radioactivity levels in plant process streams and atmospheres, indicate and alarm excessive radioactivity levels, …"

FSAR Section 11.5 describes the process and effluent radiological monitoring systems which "monitor, record, and (for certain subsystems) control the release of radioactive materials that may be generated during normal operation, anticipated operational occurrences (AOOs), and postulated accidents."

The US EPR FSAR Section 9.3.2 describes the four subsystems of the Process Sampling System (PSS) as the Nuclear Sampling Systems (NSS), Secondary Sampling System (SECSS), Severe Accident Sampling System (SASS) and Hydrogen Monitoring System (HMS). None of these systems have in-line or adjacent-to-line radiation monitors that perform monitoring functions on the PSS itself, nor does the PSS control or reduce the concentration of radionuclides. This was clarified in the licensee's response to Question 09.03.02-3 of RAI 113, and those changes are to be incorporated into FSAR Section 9.3.2.1 (Reference 2). Therefore, the process and effluent radiological monitoring systems appear to be a completely separate and distinct system from the PSS, but the response to RAI 12.03 and 12.04-1 describes the systems as if they are the same system.

Requested Information

1. Provide clarification as to which specific systems and subsystems have radiation monitors specifically associated with the function and monitoring of the individual system.
2. Describe the interface between the process sampling system described in section 9.3.2 and the process and effluent monitoring system described in section 11.5. Confirm that the systems share common piping or components or are the systems are completely separate.

References

1. Response to Request for Additional Information No. 23, Supplement 1, Revision 0, 06/24/2008 U.S. EPR Standard Design Certification AREVA NP Inc. Docket No. 52-020 SRP Section: 12.03-12.04 – Radiation Protection Design Features Application Section: 12 CHPB Branch (ADAMS Accession No. ML083091032)

2. Response to Request for Additional Information No. 113 (1284, 1455), Revision 0, 11/06/2008, 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: FSAR Ch. 9, QUESTIONS for Component Integrity, Performance, and Testing Branch 1, (AP1000/EPR Projects) (CIB1), QUESTIONS for Health Physics Branch (CHPB) (ADAMS Accession No. ML083430814)

Response to Question 09.03.02-15:

1. U.S. EPR FSAR, Tier 2, Section 9.3.2 states that the following four subsystems comprise the process sampling systems (PSS): nuclear sampling system (NSS), secondary sampling system (SECSS), severe accident sampling system (SASS), and hydrogen monitoring system (HMS). These subsystems have radiation monitors as described below:

    a) NSS – The noble gas activity of the primary coolant is continuously monitored.

    b) SECSS – The blowdown water of each individual steam generator is continuously monitored for radioactivity.

    U.S. EPR FSAR, Tier 2, Table 7.5-1—Initial Inventory of Post–Accident Monitoring Variables, includes both steam generator (SG) secondary side sample radiation monitors and SG blowdown radiation monitors. As the SG secondary side sample radiation monitors are actually the SG blowdown radiation monitors, this table will be revised to remove the “SG secondary side sample radiation monitors.”

    c) SASS – This system has no radiation monitors.

    The primary objective of the SASS is to provide plant damage information after a severe accident for accident management decisions to reduce doses to plant personnel and the public.

    Radiation exposure is minimized by applying as low as reasonably achievable (ALARA) concepts in the system design so the occupational doses remain below the 10 CFR 20.1201 limits.

    Contamination spread is minimized by applying ALARA concepts in the design of the SASS so the contaminated areas and effluents released will be minimal and will comply with 10 CFR 20.1406. The design enables the operator to aggressively control contamination release, minimize contaminated areas, and eliminate hot spots.

    d) HMS – This system has no radiation monitors.

The HMS measures hydrogen concentrations and monitors steam content in the containment atmosphere during design basis accidents.

2. The process sampling systems are a subset of the process and effluent monitoring system, which is described in U.S. EPR FSAR, Tier 2, Section 11.5. U.S. EPR FSAR, Tier 2, Section 9.3.2 will be revised to clarify this.

FSAR Impact:

U.S. EPR FSAR, Tier 2, Table 7.5-1 and Section 9.3.2 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

Table 7.5-1—Initial Inventory of Post-Accident Monitoring Variables
Sheet 2 of 2

Variable Description
Containment pressure
Pressurizer relief tank (PRT) pressure
PRT temperature
PRT level
RCS loop flow
RCS boron concentration
Extra borating system (EBS) flow
Chemical and volume control system (CVCS) charging flow
CVCS letdown flow
Volume control tank (VCT) level
Reactor pressure vessel high point vent valve position indication
Containment hydrogen monitors
Reactor coolant pump (RCP) motor amps
Reactor vessel level indication
Steam generator (SG) level (WR)
SG level (NR)
SG pressure
Main steam flow
SG blowdown flow
Emergency feedwater (EFW) flow
Main feedwater (MFW) flow
Startup shutdown system (SSS) flow
Condensate flow
Main steam isolation valve (MSIV) position indication
Main steam safety valve (MSSV) position indication
Main steam relief isolation valve (MSRIV) position indication
Condenser vacuum
ntainment isolation valve position indication (not including check valves)
Main steam line radiation monitors
Turbine Building main condenser beta activity monitor
~~SG secondary side sample radiation monitors~~
SG blowdown radiation monitors
Containment high range radiation monitors

09.03.02-15

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Next File

9.3.2 Process Sampling Systems

The process sampling systems comprise the following:

- Nuclear sampling system (NSS).
- Secondary sampling system (SECSS).
- Severe accident sampling system (SASS).
- Hydrogen monitoring system (HMS).

The HMS is described in U.S. EPR FSAR Tier 2, Section 6.2.5.2.2.

These process sampling systems provide centralized and local facilities for obtaining liquid and gaseous samples for the purpose of determining the physical and chemical characteristics and control parameters by measurements and analyses. Samples are obtained from the following:

- Primary and secondary coolant.
- Containment atmosphere.
- Liquid and gaseous waste treatment systems.
- In-containment refueling water storage tank (IRWST).

09.03.02-15

The process sampling systems are a subset of the process and effluent monitoring system, which is described in Section 11.5.

9.3.2.1 Design Bases

The processing sampling systems perform the following safety-related functions:

- Maintain containment isolation. Sample lines in the process sampling systems penetrating the containment are capable of isolation upon receipt of a containment isolation signal (CIS) from the reactor protection system.
- Maintain integrity of reactor coolant pressure boundary (RCPB). Motor-operated isolation valves in three NSS lines connected to the reactor coolant system (RCS) maintain RCPB integrity.

The process sampling systems have the following design basis requirements and criteria:

- The process sampling systems are designed to provide engineering information based upon sound radiation protection principles to achieve occupational doses and doses to members of the public as low as is reasonably achievable (ALARA) (10 CFR 20.1101(b)).