ArevaEPRDCPEm Resource

From: WELLS Russell (AREVA) [Russell.Wells@areva.com]
Sent: Monday, May 09, 2011 9:37 AM
To: Tesfaye, Getachew
Cc: NOXON David (AREVA); BENNETT Kathy (AREVA); DELANO Karen (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA)
Subject: Response to U.S. EPR Design Certification Application RAI No. 360, FSAR Ch 12, Supplement 9 - PHASE 4 RAI
Attachments: RAI 360 Response Supplement 9 US EPR DC.PDF

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to RAI No. 360 on April 2, 2010. AREVA NP submitted Supplement 1 to the response on May 10, 2010, providing a technically correct and complete response to portions of one of the remaining 2 questions. AREVA NP submitted Supplement 2 to the response on June 28, 2010, providing a revised schedule for the remaining questions. AREVA NP submitted Supplement 3 to the response on July 12, 2010, providing technically correct and complete responses to two parts of one of the remaining questions and one part of the other remaining question. AREVA NP submitted RAI 360 Supplement 4 on September 16, 2010, Supplement 5 on November 22, 2010, Supplement 6 on January 13, 2011, Supplement 7 on February 9, 2011 and Supplement 8 on March 29, 2011, providing a revised schedule for the one remaining question.

The attached file, "RAI 360 Supplement 9 Response US EPR DC.pdf" provides a technically correct and complete FINAL response to Question 12.03-12.04-21, Part 1, as committed.

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 360, Question 12.03-12.04-21.

The following table indicates the respective pages in the response document, RAI 360 Supplement 9 Response US EPR DC.pdf," that contains AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 360 — 12.03-12.04-21, Part 1	2	4

This concludes the formal AREVA NP response to RAI 360, and there are no questions from this RAI for which AREVA NP has not provided responses.

Sincerely,

Russ Wells
U.S. EPR Design Certification Licensing Manager
AREVA NP, Inc.
3315 Old Forest Road, P.O. Box 10935
Mail Stop OF-57
Lynchburg, VA 24506-0935
Phone: 434-832-3884 (work)
434-942-6375 (cell)
Fax: 434-382-3884
Russell.Wells@Areva.com

From: WELLS Russell (RS/NB)
Sent: Tuesday, March 29, 2011 4:21 PM
To: 'Tesfaye, Getachew'
Cc: NOXON David (RS/NB); BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 360, FSAR Ch 12, Supplement 8 - PHASE 4 RAI

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to RAI No. 360 on April 2, 2010. AREVA NP submitted Supplement 1 to the response on May 10, 2010, providing a technically correct and complete response to portions of one of the remaining 2 questions. AREVA NP submitted Supplement 2 to the response on June 28, 2010, providing a revised schedule for the remaining questions. AREVA NP submitted Supplement 3 to the response on July 12, 2010, providing technically correct and complete responses to two parts of one of the remaining questions and one part of the other remaining question. AREVA NP submitted RAI 360 Supplement 4 on September 16, 2010, Supplement 5 on November 22, 2010, Supplement 6 on January 13, 2011, and Supplement 7 on February 9, 2011 providing a revised schedule for the one remaining question.

Additional time is required to complete a response to the remaining question and to interact with the NRC staff.

The schedule for providing a complete response to the remaining question has been revised as indicated below.

Question #	Response Date
12.03-12.04-21, Part 1	May 6, 2011

Sincerely,

Russ Wells
U.S. EPR Design Certification Licensing Manager
AREVA NP, Inc.
3315 Old Forest Road, P.O. Box 10935
Mail Stop OF-57
Lynchburg, VA 24506-0935
Phone: 434-832-3884 (work)
434-942-6375 (cell)
Fax: 434-382-3884
Russell.Wells@Areva.com

From: BRYAN Martin (External RS/NB)
Sent: Wednesday, February 09, 2011 1:39 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); NOXON David (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 360, FSAR Ch 12, Supplement 7 - PHASE 4 RAI

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to RAI No. 360 on April 2, 2010. AREVA NP submitted Supplement 1 to the response on May 10, 2010, providing a technically correct and complete response to portions of one of the remaining 2 questions. AREVA NP submitted Supplement 2 to the response on June 28, 2010, providing a revised schedule for the remaining questions. AREVA NP

submitted Supplement 3 to the response on July 12, 2010, providing technically correct and complete responses to two parts of one of the remaining questions and one part of the other remaining question. AREVA NP submitted RAI 360 Supplement 4 on September 16, 2010, Supplement 5 on November 22, 2010 and Supplement 6 on January 13, 2011, providing a revised schedule for the one remaining question.

Additional time is required to complete a response to the remaining question and to interact with the NRC staff.

The schedule for providing a complete response to the remaining question has been revised as indicated below.

Question #	Response Date
12.03-12.04-21, Part 1	March 31, 2011

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016
702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (External RS/NB)
Sent: Thursday, January 13, 2011 2:30 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); NOXON David (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 360, FSAR Ch 12, Supplement 6 - PHASE 4 RAI

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to RAI No. 360 on April 2, 2010. AREVA NP submitted Supplement 1 to the response on May 10, 2010, providing a technically correct and complete response to portions of one of the remaining 2 questions. AREVA NP submitted Supplement 2 to the response on June 28, 2010, providing a revised schedule for the remaining questions. AREVA NP submitted Supplement 3 to the response on July 12, 2010, providing technically correct and complete responses to two parts of one of the remaining questions and one part of the other remaining question. AREVA NP submitted Supplement 4 and Supplement 5 to the response on September 16, 2010 and November 22, 2010 respectively, providing a revised schedule for the one remaining question.

Additional time is required to complete a response to the remaining question and to interact with the NRC staff.

The schedule for providing a complete response to the remaining question has been revised as indicated below.

Question #	Response Date
12.03-12.04-21, Part 1	February 14, 2011

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager

AREVA NP Inc.
Tel: (434) 832-3016
702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (External RS/NB)
Sent: Monday, November 22, 2010 3:28 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); NOXON David (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 360, FSAR Ch 12, Supplement 5 - PHASE 4 RAI

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to RAI No. 360 on April 2, 2010. AREVA NP submitted Supplement 1 to the response on May 10, 2010, providing a technically correct and complete response to portions of one of the remaining 2 questions. AREVA NP submitted Supplement 2 to the response on June 28, 2010, providing a revised schedule for the remaining questions. AREVA NP submitted Supplement 3 to the response on July 12, 2010, providing technically correct and complete responses to two parts of one of the remaining questions and one part of the other remaining question. AREVA NP submitted Supplement 4 to the response on September 16, 2010, providing a revised schedule for the one remaining question.

Additional time is required to complete a response to the remaining question and to interact with the NRC staff.

The schedule for providing a complete response to the remaining question has been revised as indicated below.

Question #	Response Date
12.03-12.04-21, Part 1	January 13, 2011

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016
702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (External RS/NB)
Sent: Thursday, September 16, 2010 4:41 PM
To: 'Getachew.Tesfaye@nrc.gov'
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); NOXON David (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 360, FSAR Ch 12, Supplement 4 - PHASE 4 RAI

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to RAI No. 360 on April 2, 2010. AREVA NP submitted Supplement 1 to the response on May 10, 2010, providing a technically correct and complete response to portions of one of the remaining 2 questions. AREVA NP submitted Supplement 2 to the response on June 28, 2010, providing a revised schedule for the remaining questions. AREVA NP

submitted Supplement 3 to the response on July 12, 2010, providing technically correct and complete responses to two parts of one of the remaining questions and one part of the other remaining question, as committed.

Additional time is required to complete a response to the remaining question and to interact with the NRC staff.

The schedule for providing a complete response to the remaining question has been revised as indicated below.

Question #	Response Date
12.03-12.04-21, Part 1	November 22, 2010

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016
702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (EXT)
Sent: Monday, July 12, 2010 2:56 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); NOXON David B (AREVA NP INC); WILLIFORD Dennis C (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 360, FSAR Ch 12, Supplement 3 - PHASE 4 RAI

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to RAI No. 360 on April 2, 2010. AREVA NP submitted Supplement 1 to the response on May 10, 2010, providing a technically correct and complete response to portions of one of the remaining 2 questions. AREVA NP submitted Supplement 2 to the response on June 28, 2010, providing a revised schedule for the remaining questions. The question number in the table for the first entry was incorrect in RAI 360 Supplement 2 and is corrected below here in RAI 360 Supplement 3. The attached file, "RAI 360 Supplement 3 Response US EPR DC" provides technically correct and complete responses to two parts of one of the remaining questions and one part of the other 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 support the response to RAI 360 Questions 12.04-12.04-20, and 12.04-12.04-21.

The following table indicates the respective pages in the response document, "RAI 360 Supplement 3 Response US EPR DC," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 360 — 12.03-12.04-20, Parts 2 & 3	2	3
RAI 360 — 12.03-12.04-21, Part 2	4	5

The schedule for a technically correct and complete response to Part 1 of the remaining question is unchanged and is provided below:

Question #	Response Date
12.03-12.04-21, Part 1	September 16, 2010

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016
702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (EXT)
Sent: Monday, June 28, 2010 7:19 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); NOXON David B (AREVA NP INC); WILLIFORD Dennis C (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 360, FSAR Ch 12, Supplement 2 - PHASE 4 RAI

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to RAI No. 360 on April 2, 2010. AREVA NP submitted Supplement 1 to the response on May 10, 2010, providing a technically correct and complete response to portions of one of the remaining 2 questions.

A revised schedule to complete the remaining responses is required in order to support interaction with the NRC.

The schedule for technically correct and complete responses to the remaining questions has been changed and is provided below:

Question #	Response Date
12.03-12.04-20	July 30, 2010
12.03-12.04-21, Part 2	July 30, 2010
12.03-12.04-21, Part 1	September 16, 2010

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016
702 561-3528 cell
Martin.Bryan.ext@areva.com

From: WELLS Russell D (AREVA NP INC)
Sent: Monday, May 10, 2010 6:08 PM

To: 'Getachew Tesfaye'
Cc: BRYAN Martin (EXT); BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 360, FSAR Ch 12, Supplement 1 - PHASE 4 RAI

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to RAI No. 360 on April 2, 2010. The attached file, "RAI 360 Supplement 1 Response US EPR DC.pdf" provides a technically correct and complete response to portions of one of the remaining 2 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 360 Supplement 1 Question 12.03-12.04-20 (Part 1).

The following table indicates the respective pages in the response document, "RAI 360 Supplement 1 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
12.03-12.04-20 (Parts 1 & 4)	2	4

A revised schedule to complete the remaining responses is required in order to address NRC reviewer concerns discussed during the Chapter 12 audit on April 23, 2010 and during the follow-up telecon on April 28, 2010. The revised schedule for technically correct and complete responses to the remaining questions is provided below:

Question #	Response Date
12.03-12.04-20 (Parts 2 & 3)	June 29, 2010
12.03-12.04-21	June 29, 2010

Sincerely,

(Russ Wells on behalf of)
Martin (Marty) C. Bryan
Licensing Advisory Engineer
AREVA NP Inc.
Tel: (434) 832-3016
Martin.Bryan.ext@areva.com

From: BRYAN Martin (EXT)
Sent: Friday, April 02, 2010 12:31 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); WILLIFORD Dennis C (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 360 (4132), FSAR Ch. 12 - PHASE 4 RAI

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 360 Response US EPR DC.pdf" provides a schedule since a technically correct and complete response to the 2 questions is not provided.

The following table indicates the respective pages in the response document, "RAI 360 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 360 — 12.03-12.04-20	2	2
RAI 360 — 12.03-12.04-21	3	3

A complete answer is not provided for the 2 questions. The schedule for a technically correct and complete response to these questions is provided below.

Question #	Response Date
RAI 360 — 12.03-12.04-20	May 10, 2010
RAI 360 — 12.03-12.04-21	May 10, 2010

Sincerely

Martin (Marty) C. Bryan
Licensing Advisory Engineer
AREVA NP Inc.
Tel: (434) 832-3016
Martin.Bryan@areva.com

From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Thursday, March 04, 2010 3:17 PM
To: ZZ-DL-A-USEPR-DL
Cc: Bernal, Sara; Roach, Edward; Jennings, Jason; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 360 (4132), FSAR Ch. 12 - PHASE 4 RAI

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on January 22, 2010, and discussed with your staff on March 2, 2010. 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: 2946

Mail Envelope Properties (1F1CC1BBDC66B842A46CAC03D6B1CD410456CB9B)

Subject: Response to U.S. EPR Design Certification Application RAI No. 360, FSAR Ch 12, Supplement 9 - PHASE 4 RAI
Sent Date: 5/9/2011 9:37:15 AM
Received Date: 5/9/2011 9:37:46 AM
From: WELLS Russell (AREVA)

Created By: Russell.Wells@areva.com

Recipients:
"NOXON David (AREVA)" <David.Noxon@areva.com>
Tracking Status: None
"BENNETT Kathy (AREVA)" <Kathy.Bennett@areva.com>
Tracking Status: None
"DELANO Karen (AREVA)" <Karen.Delano@areva.com>
Tracking Status: None
"ROMINE Judy (AREVA)" <Judy.Romine@areva.com>
Tracking Status: None
"RYAN Tom (AREVA)" <Tom.Ryan@areva.com>
Tracking Status: None
"Tesfaye, Getachew" <Getachew.Tesfaye@nrc.gov>
Tracking Status: None

Post Office: AUSLYNCMX02.adom.ad.corp

Files	**Size**	**Date & Time**
MESSAGE	18679	5/9/2011 9:37:46 AM
RAI 360 Response Supplement 9 US EPR DC.PDF	393285	

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

Response to

Request for Additional Information No. 360, Supplement 9

3/04/2010

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: 12.03-12.04 - Radiation Protection Design Features

QUESTIONS for Health Physics Branch (CHPB)

Question 12.03-12.04-21:

This is a follow-up to OPEN ITEM RAI 228, Question No. 12.3-12.4-9

1. A review of Areva's response to RAI 228, Question 12.03-12.04-9, part 3, indicates that much of the information presented is a recap of system features and operational concepts already described in the FSAR. However, one aspect that is not well discussed for Section 11.5 are 10 CFR 20.1406 design features associated with process and effluent monitoring and sampling systems. There is a need to expand the discussion on design features of the process and effluent monitoring and sampling systems and their interconnections to non-radioactive systems. Subsystem interconnections to non-radioactive systems include purge air, purge water, instrument air, and makeup water for filling loop seals. The design features should describe how these non-radioactive system interconnections are protected from contamination due to leakage, spillage, valving errors, or other operating conditions. For example, for equipment requiring the use of purge air, the air should be taken from ambient or room atmosphere where the sampling subsystem is located, passed through prefilters, and then, upon demand, made available for purging, with the purged flow not returned to its supply source. For liquid process or effluent rad monitors that require flush water, the design of these interconnections should confirm that flush water supply is either temporarily connected during maintenance and then completely removed upon termination of the flush, or, if permanently connected, protected by backflow preventers and pressure differentials. Again, the purge flow should be forwarded to the most appropriate radioactive system and not returned to its supply source. Where loop seals are utilized, the loop seals should be isolated from the makeup water source by use of isolation valves and backflow preventers. Similar design features should be described for instrument air. This expanded discussion should be presented in FSAR Section 12.3.6.5.2 or 12.3.6.5.4, with internal cross-referencing. If, as part of this response, new or additional design features are described, then they should all be incorporated into the relevant FSAR sections where the systems are described.

"Refer to Sections 12.3.6.5.2 and 12.3.6.5.4 for process and effluent monitoring and sampling systems design features which demonstrate compliance with the requirements of Part 20.1406 and guidance of IE Bulletin 80-10."

Response to Question 12.03-12.04-21, Part 1:

The Response to RAI 23, Question12.03-12.04-1, Supplement 1 addresses how the process sampling system complies with 10 CFR 20.1406 with respect to minimizing contamination of the facility and the environment.

U.S. EPR FSAR Tier 2, Section 9.3 will be revised to include the following features:

- Maintenance and decontamination connections are either temporary or completely removed upon termination of the flush. Non-contaminated systems that are permanently connected are protected by a backflow preventer and differential pressure.

- Process sample systems prevent the inadvertent transfer of contaminated fluids to non-contaminated drainage systems by sending contaminated fluids either back to the system being sampled or to an appropriate radwaste system. Flushing or purging media are routed to the appropriate system.

- Sample lines are normally flushed with sample media.

- Sample glove boxes are used to confine spills and limit any liquid or gaseous release to environment.

- Sample glove boxes are purged by taking air from the room atmosphere. The air is passed through pre-filters, made available for purging, and then discharged to the appropriate gaseous system.

An internal cross-reference linking U.S. EPR FSAR Tier 2, Section 12.3.6.5.2 with U.S. EPR FSAR Tier 2, Section 9.3.2 will be added.

The compressed air system (CAS) interfaces with potentially contaminated systems in the Reactor Building, Safeguard Buildings, Nuclear Auxiliary Building, Fuel Building, and Radioactive Waste Processing Building, through both permanent and temporary connections. The CAS contains certain design features to prevent the cross-contamination of the CAS by interfacing systems. These CAS design features reflect the lessons learned from IE Bulletins 80-10 and IE 85-06, and show conformance with Title 10 of the Code of Federal Regulations, Part 20.1406 (10CFR20.1406), "Minimization of Contamination."

The minimum operating pressure of the CAS at each system interface is higher than that of the interfacing system and the air is not recycled. A pressure instrument and an isolation valve that closes to prevent backflow, are located at the entrance to each Nuclear Island (NI) building in which CAS has a connection with a potentially contaminated system. There is also an isolation valve in the CAS piping as it enters the NI that can isolate the CAS piping to prevent contamination spread outside of the NI. All temporary hose connections are fitted with self-sealing quick disconnect connectors, and have normally-closed, branch manual isolation valves immediately upstream of the connections, which isolate individual connections from the remainder of the CAS. The CAS is designed to prevent backflow when compressor pressure is lost by ‘defense in depth’ consisting of sufficient capacity in the air receiver, and multiple barriers such as isolation valves.

The CAS is designed for a single unit and is not shared with other units. The CAS does not provide any breathing air. The CAS air is normally pressurized and is not recycled.

The overall design configuration of the CAS and its interfaces with contaminated systems includes sufficient barriers to prevent radioactive contamination of the CAS.

U.S. EPR FSAR Tier 2, Section 12.3.6.5.10 will be changed to include the information as described in the response. An internal cross-reference linking U.S. EPR FSAR Tier 2, Section 12.3.6.5.10 with U.S. EPR FSAR Tier 2, Section 9.3.1 will be added.

The isolation valves located on the CAS piping as it enters the NI are currently shown on U.S. EPR FSAR Tier 2 Figure 9.3.1.1. Other important design details are duly noted during the final design stages based on the documentation provided in U.S. EPR FSAR Tier 2, Section 12.3.6.5.10. The U.S. EPR FSAR figures showing simplified drawings of the CAS (U.S. EPR FSAR Tier 2 Figure 9.3.1.1 – Compressed Air Generation System and U.S. EPR FSAR Tier 2 FSAR Figure 9.3.1.2 – Compressed Air Distribution System) will not be changed.

FSAR Impact:

U.S. EPR FSAR Tier 2, Section 9.3.1, Section 9.3.2.1, Section 9.3.2.2.1.1, Section 12.3.6.5.2, and Section 12.3.6.5.10 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

9.3 Process Auxiliaries

9.3.1 Compressed Air System

The compressed air system (CAS) consists of compressors, dryers, filters, receivers and other equipment required for performing its non-safety-related functions.

9.3.1.1 Design Bases

The CAS provides compressed air for the following services:

- Instrument air for non-safety-related valves and other equipment located in the Conventional Island (CI).
- Instrument air for opening the containment ventilation purge dampers.
- Instrument air to valves, pumps and other equipment located in the Radioactive Waste Building, blowdown demineralization, fuel handling and other systems for non-safety-related functions.
- Service air throughout the plant (for using air-operated tools and purging tanks).

The containment isolation features for the containment penetrations in the CAS are described in Section 6.2.4.

There are no air-operated valves (AOV) or air-operated equipment required to function in response to an accident where the compressed air is provided by the CAS.

The design of the CAS is in compliance with the resolution of NUREG-0933, Generic Safety Issue 43, Reliability of Air Systems (Reference 1).

The CAS is designed for a single unit and is not shared with other units.

12.03-12.04-21

Instrument air is designed to meet ANSI/ISA 7.0.01-1996 (Reference 3).

Refer to Section 12.3.6.5.10 for compressed air system design features which demonstrate compliance with the requirements of 10 CFR 20.1406.

9.3.1.2 System Description

9.3.1.2.1 General Description

The CAS consists of a compressed air generation system and a compressed air distribution system. The compressed air generation system is located entirely in the Turbine Building (TB). It supplies compressed air to the compressed air distribution systems in the Nuclear Island (NI) and CI. The location of the compressed air generation system in the TB minimizes the likelihood of leakage from radioactive systems being ingested into the CAS.

- Non-safety-related portions of the process sampling systems are designed to monitor the fuel storage and radioactive waste systems and detect conditions that may result in excessive radiation levels (GDC 63).

- Non-safety-related portions of the process sampling systems include means for monitoring the reactor containment atmosphere, spaces containing components for recirculation of loss-of-coolant accident (LOCA) fluids, effluent discharge paths and the plant environs for radioactivity that may be released from normal operations, including AOOs and postulated accidents (GDC 64).

- 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 50.34(f)(2)(xxvi)).

The process sampling systems are designed to meet the following functional criteria:

- Obtain liquid and gaseous samples from the primary coolant, liquid and gaseous waste treatment systems, auxiliary systems and inside containment.

- Purge sampling lines and reduce plateout (buildup of chemical residue) in sample lines, demonstrating compliance with RG 1.21, position C7. Sample lines are normally flushed/purged with sample media.

- Representative samples from gaseous process streams and tanks are in accordance with American National Standards Institute/Health Physics Society (ANSI/HPS) Standard N13.1-1999. These criteria conform to RG 1.21, position C.6.

- Size RCS sample lines to minimize loss of reactor coolant following rupture of sample line.

12.03-12.04-21, Part 1

- Recycle primary side samples according to their source to minimize waste.

- Continuously monitor secondary side activity and chemistry.

- Recycle secondary side samples to steam generator blowdown demineralizing system.

- Continuously monitor and obtain manual grab samples from selected points in the secondary side, main cycle and auxiliary systems.

- Sample glove boxes are purged by taking air from the room atmosphere. The air is passed through pre-filters, made available for purging, then discharged to the appropriate gaseous system.

- Maintenance and decontamination connections are either temporary or completely removed upon termination of the flush. Non-contaminated systems that are permanently connected are protected by a backflow preventor or differential pressure.

- Process sample systems prevent the inadvertent transfer of contaminated fluids to non-contaminated drainage systems by sending contaminated fluids either back to the system flushing or purging media are routed to the appropriate system.

9.3.2.2 System Description

9.3.2.2.1 General Description

Refer to Section 12.3.6.5.2 for process sampling system design features which demonstrate compliance with the requirements of 10 CFR 20.1406.

9.3.2.2.1.1 Nuclear Sampling System

The NSS obtains liquid and gaseous samples from the primary coolant, liquid and gaseous waste treatment systems, and auxiliary systems, in order to determine the characteristics of these samples by measurements and analyses. NSS samples are categorized as active liquid samples, slightly active liquid samples and gaseous samples. The NSS is contained within the Nuclear Island (NI).

Active Liquid Samples

The NSS continuously collects active liquid samples from the RCS at three different locations:

- Crossover leg loop 3.
- Pressurizer (liquid phase).
- Hot leg loop 1.

Each line is equipped with a motor-operated sampling isolation valve in close proximity to the sampling point and two containment isolation valves (CIV).

Samples of the reactor coolant are taken degassed or non-degassed in order to analyze separately either the dissolved gases or the degassed liquid.

Sample (glove) boxes are used to collect active liquid grab samples from:

- CPS.
- Coolant supply and storage system (CSSS).
- Coolant treatment system (CTS).
- Chemical and volume control system (CVCS).
- Four trains of low head safety injection (LHSI) system.
- NSS (upstream of boron meter).

The NSS also collects local grab samples, specifically for corrosion product sampling, from:

- CPS - upstream and downstream of mechanical filters.
- Fuel pool purification system (FPPS) - upstream and downstream of mechanical filter.

To obtain a sample, the respective sample line is chosen by opening the associated solenoid valve. The sample flow rate is adjusted by control valves using local flow meters. After an elapsed purge time has passed to achieve a representative sample, the grab sample is taken inside a glove box. It is possible to perform parallel sampling from all connected systems. Sample glove boxes are used to confine spills and limit any liquid or gaseous release to the environment.

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In consideration of ALARA principles:

- One sample stream is degassed at a time to remove dissolved noble gases. The sample stream is routed through a multiple position valve into a degassing vessel. The vessel is purged before sampling to avoid cross-contamination. When the vessel inlet is isolated, dissolved gases are stripped off the liquid by nitrogen. Grab samples are taken from the vessel.
- The primary sample station and collection tank are shielded by being located in separate rooms, which reduces exposure by isolating the radiation source.
- Refer to Section 12.3.1.9.2 for additional information on sampling station accessibility and shielding.

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To provide assurance that representative samples are obtained from liquid processes, sample points are located in turbulent flow zones (where applicable). For tanks, samples are taken from the bulk volume to avoid low points and sediment traps. Tanks with a high solids content will have provisions for agitation prior to sampling. Sample lines are flushed with sample fluid for a sufficient period of time prior to sample extraction in order to remove sediment deposits and air and gas pockets. This design conforms to RG 1.21, position C.6.

Slightly Active Liquid Samples

The NSS collects slightly active liquid grab samples from auxiliary systems containing slightly active liquids. Sample (glove) boxes are used to obtain grab samples from:

- Four safety injection system (SIS) accumulators inside Reactor Building (RB).
- Reactor boron and water makeup system (RBWMS).
- Fuel pool cooling system (FPCS).

radioactivity from the atmosphere above the spent fuel pool and processes it through high efficiency particulate air filters and charcoal adsorber units to the unit vent.

There are no portions of the spent fuel pool system handling potentially contaminated material that are buried or routed through exterior boundaries. Leak detection under the spent fuel pool provides full coverage in case of a leak, and leak detection equipment in channels aid in identifying the location of the leak. Sumps that collect potential spent fuel pool leakage are double lined with non-porous material. In addition, walls and curbs are used in areas with potential leaks of contaminated fluids to prevent the spread of these fluids.

12.3.6.5.2 Process Sampling System

The process sampling systems of the U.S. EPR are designed to minimize contamination of the facility and the environment as described in the general protective design features listed in Sections 12.3.6.1 and 12.3.6.2. Nuclear sampling, sample activity monitoring, and radiation monitoring comprise the process sampling system.

The process sampling system is described in Section 9.3.2. ← 12.03-12.04-21, Part 1

Design Provisions for Minimizing Contamination of the Facility

To minimize potential contamination of the facility, the process sampling systems are designed to:

- Monitor for potential higher than normal levels of radiation in the facility, and thereby, provide a means to mitigate it from spreading to other parts of the facility.
- Monitor variables and systems over their anticipated ranges to assure adequate safety, including those variables and systems that can affect the integrity of the reactor core and the reactor coolant pressure boundary.
- Provide a confinement boundary against any releases from the sampling system.
- Confirm that contaminated fluids are not transferred to non-contaminated fluids.

The process sampling systems monitor radioactivity levels in plant process streams and atmospheres, indicate and alarm excessive radioactivity levels, and in some cases automatically initiate protective isolation actions to minimize potential contamination of the facility. The systems consist of permanently installed, continuous monitoring devices together with a program of, and provisions for, specific sample collections and laboratory analyses. For example, area radiation monitors located in the Safeguard and Radioactive Waste Processing Buildings are provided to continually monitor radiation levels in the spaces which contain components for recirculation of loss of coolant accident (LOCA) fluids and components for processing radioactive wastes. In case of high levels of radiation, both local alarms and signals to the MCR are provided.

and the RHRS. In addition to the CCWS/SCWS HX, there is a second HX barrier between the CCWS and RHRS. To directly transfer contaminated water to the SCWS, two HXs must fail simultaneously. It is unlikely that two monitored systems will fail simultaneously and remain undetected. Radiation monitors are located in the CCWS to detect radioactive contamination in the system.

12.3.6.5.10 Compressed Air System

12.03-12.04-21

The compressed air system is designed to minimize contamination of the facility and the environment as described in the general protective design features listed in Sections 12.3.6.1 and 12.3.6.2.

The CAS design is consistent with the U.S. EPR containment philosophy to comply with the requirements of 10 CFR 20.1406. This applies to both the instrument air and the service air portions of the CAS. The minimum operating pressure of the CAS at each system interface is higher than that of the interfacing system and the air is not recycled. A pressure instrument and an isolation valve that closes to prevent backflow are located at the entrance to each NI building in which CAS has a connection with a potentially contaminated system. There is also an isolation valve in the CAS piping as it enters the NI that can isolate the CAS piping to prevent contamination spread outside of the NI. The temporary hose connections are fitted with self-sealing quick disconnect connectors, and have normally-closed, branch manual isolation valves immediately upstream of the connections, which isolate individual connections from the remainder of the CAS. The CAS is designed to prevent backflow when compressor pressure is lost by "defense in depth" consisting of sufficient capacity in the air receiver, and multiple barriers such as isolation valves.

The CAS is designed for a single unit and is not shared with other units. The CAS does not provide any breathing air. The CAS air is normally pressurized and is not recycled. The overall design configuration of the CAS and its interfaces with contaminated systems includes sufficient barriers to prevent radioactive contamination of the CAS.

~~The connections to instrument air are temporary in nature involving hose connections and quick release connectors. Immediately upstream of the quick connects are branch isolation valves used to isolate individual connections from the remainder of the instrument air header. Each instrument air sub-header contains an isolation valve that isolates the sub-header from the remainder of the instrument air system. These connections preclude contamination of other systems and components if contamination is detected. The instrument air system is normally pressurized and does not recycle air. There is no path for contamination to be picked up from interfacing systems and carried back through the instrument air system.~~