ArevaEPRDCPEm Resource

From: BRYAN Martin (EXT) [Martin.Bryan.ext@areva.com]
Sent: Wednesday, May 12, 2010 5:36 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. 295, FSAR Ch. 12, Supplement 2
Attachments: RAI 295 Supplement 2 Response US EPR DC.pdf

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to RAI No. 295 on February 26, 2010. A revised schedule was transmitted to the NRC via RAI 295 Supplement 1 on April 20, 2010 in order to provide an opportunity for AREVA to discuss the proposed draft response with the NRC staff during the Chapter 12 audit on April 23, 2010.

The attached file, "RAI 295 Supplement 2 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 support the response to RAI 295 Question 12.03-12.04-18.

The following table indicates the respective pages in the response document, "RAI 295 Supplement 2 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
12.03-12.04-18	2	3

This concludes the formal AREVA NP response to RAI 295, and there are no questions from this RAI for which AREVA NP has not provided responses.

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: Tuesday, April 20, 2010 3:02 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. 295, FSAR Ch. 12, Supplement 1

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to RAI No. 295 on February 26, 2010. As agreed with the NRC staff, the response date is being revised to provide an

opportunity for AREVA to discuss the proposed response to the remaining question. A discussion on this response is currently scheduled for April 23, 2010.

The schedule for a technically correct and complete response to the remaining question has been changed as provided below:

Question #	Response Date
RAI 295 — 12.03-12.04-18	May 13, 2010

Sincerely,

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

From: BRYAN Martin (EXT)
Sent: Friday, February 26, 2010 4:43 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); ROMINE Judy (AREVA NP INC); WILLIFORD Dennis C (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 295, FSAR Ch. 12

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 295 Response US EPR DC.pdf" provides a schedule since a technically correct and complete response to the question is not provided.

The following table indicates the respective pages in the response document, "RAI 295 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 295 — 12.03-12.04-18	2	2

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

Question #	Response Date
RAI 295 — 12.03-12.04-18	April 21, 2010

Sincerely,

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

From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Tuesday, September 22, 2009 6:17 PM
To: ZZ-DL-A-USEPR-DL
Cc: Bernal, Sara; Dehmel, Jean-Claude; Jennings, Jason; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 295 (3761), FSARCh. 12

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on September 18, 2009, and on September 22, 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 question in this RAI is considered a potential open item for Phases 2 and 3 reviews. As such, the schedule we have established for your application assumes technically correct and complete responses prior to the start of Phase 4 review. If the RAI cannot be answered prior to the start of Phase 4 review, it is expected that a date for receipt of this information will be provided 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: 1415

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From: BRYAN Martin (EXT)

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Tracking Status: None
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Tracking Status: None

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

Response to

Request for Additional Information No. 295, Supplement 2

9/22/2009

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: Section 12.3-12.4 Radiation Protection Design Features

QUESTIONS for Health Physics Branch (CHPB)

Question 12.03-12.04-18:

POTENTIAL OPEN ITEM

According to RG 1.206, Section C.I.12.4, applicants should provide the calibration methods and frequency for the installed area radiation monitors to demonstrate compliance with 10 CFR 20.1501.

EPR FSAR, Revision 1, Section 12.3.4, Area and Airborne Radioactivity Monitoring Instrumentation, states that "Additional information on instrument calibration is provided as part of the Radiation Protection Program (see Section 12.5)."

1. In response to RAI 150 Question 12.03-12-04-3, the applicant described at a high level the calibration techniques that will be employed for the EPR installed area radiation monitors (ARMs), including that the calibration techniques would be based on the guidance of ANSI 6.8.1. The applicant also stated that ANSI 6.8.1 has been withdrawn. Given that ANSI 6.8.1 has been withdrawn, provide an alternative industry standard or describe the calibration methodology that will be used, including criteria for establishing calibration intervals and set points for installed ARM equipment. Alternatively, add a COL information item to have the COL applicant's provide this information.
2. All EPR COL applicants are referencing NEI 07-03, "Generic FSAR Template Guidance for Radiation Protection Program Description" to address the COL information item in Section 12.5 of the EPR FSAR. NRC staff in RAI 150 Question 12.3-12.04-3 pointed out that the radiation protection program, as described in NEI 07-03, does not provide information on the calibration of fixed area and airborne monitors. Therefore the pointer provided in EPR FSAR, Tier 2, section 12.3.4, to EPR FSAR Section 12.5, “Radiation Protection Program” is misleading. Update the FSAR to remove this pointer and to include information on calibration methodology, including frequency and setpoint determination for installed ARMs.

Response to Question 12.03-12.04-18:

1. The following statement regarding calibration methodology of radiation monitors will be incorporated into U.S. EPR FSAR Tier 2, Section 7.1.1.5.5:

   “Calibrations are performed in accordance with industry standards and manufacturer recommendations.”
2. U.S. EPR FSAR Tier 2, Section 12.3.4 will be revised by removing the reference to Section 12.5, “Radiation Protection Program” for additional information on instrument calibration and replacing it with a reference to Section 7.1.1.5.5.

   In addition, a pointer will also be added in U.S. EPR FSAR Tier 2, Section 12.3.4 referencing Section 7.1.2.4.7 for additional information on setpoints.

   U.S. EPR FSAR Tier 2, Section 7.1.2.4.7 will be revised to indicate that additional guidance for setpoints associated with both safety and non-safety-related systems is described in ISA-TR67.04.09-2005, *Graded Approaches to Set Point Determination.* In addition, U.S. EPR FSAR Tier 2, Section 7.1.3 will be revised by adding this guidance document to the list of references.

FSAR Impact:

U.S. EPR FSAR Tier 2, Section 7.1.1.5.5, Section 7.1.2.4.7, Section 7.1.3 and Section 12.3.4 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

operation or refueling. Calibrations are performed in accordance with industry standards and manufacturer recommendations.

In addition, the RMS subsystems and components incorporate features for periodic and unscheduled maintenance, repair, and inspection. The purpose of these system inspection and maintenance capabilities is to minimize the occurrence of system faults and to increase RMS availability. Inspection intervals depend on the local situation and the working condition of the RMS. If a subsystem or component of the RMS is unavailable or removed for maintenance, inspection or repair, the ability of the redundant divisions to perform their safety-related functions is not impaired.

Access to the internally set parameters (e.g., calibration factors, alarm thresholds, and analog output ranges) is prohibited while the instrument is in operation. However, a dedicated portable test computer allows access to the internal parameters when the RMS is removed from service, and the test procedures described above are done with the help of this test computer. While the instrument is removed from service for testing, maintenance, or repair, it is put in a test mode that makes any output signal or alarm invalid.

The RMS consists of various detectors and processing equipment throughout the plant. Refer to Section 7.3.1 for radiation monitors used in ESF actuation functions. For radiation monitors used for PAM, refer to Section 7.5.1. For other monitoring functions, refer to Chapter 11 and Chapter 12.

7.1.1.5.6 Hydrogen Monitoring System

Classification

The hydrogen monitoring system (HMS) is classified as safety-related.

Description

The HMS is described in Section 6.2.5.

7.1.1.5.7 Reactor Pressure Vessel Level Measurement System

Classification

The reactor pressure vessel level (RPVL) measurement system is classified as supplemented grade (NS-AQ).~~safety-related.~~

Description

Figure 4.4-8—Arrangement of Incore Instrumentation (Top View) shows the arrangement of the various components within the core.

7.1.2.4.5 RG 1.75 – Criteria for Independence of Electrical Safety Systems

The applicable I&C systems listed in Table 7.1-2 shall be designed to meet the guidance of RG 1.75, which endorses IEEE Std 384-1992 (Reference 15) with modifications. The design features that provide for independence are described in Section 7.1.1.6.4.

7.1.2.4.6 RG 1.97 – Criteria for Accident Monitoring Instrumentation for Nuclear Power Plants

The applicable I&C systems listed in Table 7.1-2 shall be designed to meet the guidance of RG 1.97, which endorses IEEE Std 497-2002 (Reference 16) with modifications. Accident monitoring instrumentation is described in Section 7.5.1.2.

7.1.2.4.7 RG 1.105 – Setpoints for Safety-Related Instrumentation

The setpoints for the applicable I&C systems listed in Table 7.1-2 shall be developed using the guidance of RG 1.105, with the exception of those differences described in Instrument Setpoint Topical Report (ANP-10275P) (Reference 17). The setpoint methodology described in ANP-10275P (Reference 17) implements the guidance of Setpoints for Nuclear Safety Related Instrumentation (ANSI/ISA-67.04.01-2006) (Reference 18) which accounts for recent industry advances in setpoint methodologies. ANP-10275P (Reference 17) provides justification for its use as an acceptable method for calculating setpoints. The single-sided measurement uncertainty reduction factor shall not be used in determining U.S. EPR setpoints. Additional guidance for setpoints associated with both safety-related and non-safety-related systems is described in ISA-TR67.04.09-2005, "Graded Approaches to Setpoint Determination" (Reference 44).

12.03-12.04-18

7.1.2.4.8 RG 1.118 – Periodic Testing of Electric Power and Protection Systems

The applicable I&C systems listed in Table 7.1-2 are designed to meet the guidance of RG 1.118, which endorses IEEE Std 338-1987 (Reference 19) with modifications. The measures for continuous self testing and periodic testing of the protection system actuation functions are described in Section 7.2.2.3.5 and Section 7.3.2.3.6.

7.1.2.4.9 RG 1.151 – Instrument Sensing Lines

The applicable I&C systems listed in Table 7.1-2 are designed to meet the guidance of RG 1.151, which endorses ISA-S67.02-1980 (Reference 20) with modifications. The design features of the controls systems that minimize and limit challenges to the PS failures of a single sensing line common to both protection and control functions are described in Section 7.7. The redundancy and independence of the PS that maintain functionality in the event of a single sensor failure are described in Section 7.1, Section 7.2, and Section 7.3.

33. BTP 7-11, "Guidance on Application and Qualification of Isolation Devices," U.S. Nuclear Regulatory Commission, Standard Review Plan, Branch Technical Position, Rev. 3, March 2007.

34. BTP 7-12, "Guidance on Establishing and Maintaining Instrument Setpoints," U.S. Nuclear Regulatory Commission, Standard Review Plan, Branch Technical Position, Rev. 3, March 2007.

35. BTP 7-13, "Guidance on Cross-Calibration of Protection System Resistance Temperature Detectors," U.S. Nuclear Regulatory Commission, Standard Review Plan, Branch Technical Position, Rev. 3, March 2007.

36. BTP 7-14, "Guidance on Software Reviews for Digital Computer-Based Instrumentation and Control Systems," U.S. Nuclear Regulatory Commission, Standard Review Plan, Branch Technical Position, Rev. 3, March 2007.

37. BTP 7-17, "Guidance on Self-Test and Surveillance Test Provisions," U.S. Nuclear Regulatory Commission, Standard Review Plan, Branch Technical Position, Rev. 3, March 2007.

38. BTP 7-18, "Guidance on the Use of Programmable Logic Controllers in Digital Computer-Based Instrumentation and Control Systems," U.S. Nuclear Regulatory Commission, Standard Review Plan, Branch Technical Position, Rev. 3, March 2007.

39. BTP 7-19, "Guidance for Evaluation of Diversity and Defense-In-Depth in Digital Computer-Based Instrumentation and Control Systems," U.S. Nuclear Regulatory Commission, Standard Review Plan, Branch Technical Position, Rev. 3, March 2007.

40. BTP 7-21, "Guidance on Digital Computer Real-Time Performance," U.S. Nuclear Regulatory Commission, Standard Review Plan, Branch Technical Position, Rev. 3, March 2007.

41. BTP 5-2, "Overpressurization Protection of Pressurized-Water Reactors While Operating at Low Temperatures," U.S. Nuclear Regulatory Commission, Standard Review Plan, Branch Technical Position, Rev. 3, March 2007.

42. EMF-2341(P), Revision 1, "Generic Strategy for Periodic Surveillance Testing of TELEPERM™ XS Systems in U.S. Nuclear Generating Stations," Siemens Power Corporation, March 2000.

43. EPRI TR-106439, "Guidance on Evaluation and Acceptance of Commercial Grade Digital Equipment for Nuclear Safety Applications," Electric Power Research Institute, October 1996.

44. ISA-TR67.04.09-2005, "Graded Approaches to Setpoint Determination," The Instrumentation, Systems, and Automation Society, October 2005.

12.03-12.04-18

workers from nearby components. These filter room design features, including a representative layout of the filter housings, are shown in Figure 12.3-35.

Provisions for testing, isolation, and decontamination are described in detail in Section 9.4. Filters are monitored for pressure drops so that filter elements can be replaced before radiation levels become an ALARA concern or personnel hazard. Filters with a radioactivity level (because of a postulated accident) so high that a change of filter elements constitutes a personnel hazard can be removed intact. Filters with a buildup of short-lived radioisotopes are allowed to decay prior to being changed.

12.3.4 Area Radiation and Airborne Radioactivity Monitoring Instrumentation

The area radiation and airborne radioactivity monitoring instrumentation is designed to:

- Assess radiation and airborne radioactivity levels at various plant locations to assist in the detection of abnormal operational conditions.
- Assess the magnitude of radionuclide releases to the environment.
- Assess accessibility to radiological vital areas during accident conditions.
- Provide a local readout, an audible alarm, and visual alarms in each monitored area to alert operating personnel. Visual alarms are provided in high noise areas as well as outside of each monitored area so that they are visible to operating personnel prior to entry.
- Display data from these monitors in the MCR using the process information and control system.
- Provide indication and alarms in the MCR and health physics office.

12.03-12.04-18

The instrumentation complies with the requirements of 10 CFR 20.1501, 10 CFR 50.34, and GDC 63, and conforms to applicable portions of RG 8.8 and RG 8.25. Additional information on instrument calibration is provided in Section 7.1.1.5.5.~~as part of the Radiation Protection Program (see Section 12.5)~~. Setpoint information is provided in Section 7.1.2.4.7.

12.3.4.1 Area Radiation Monitoring Instrumentation

12.3.4.1.1 Normal Operations

The area radiation monitoring instrumentation for use during normal operation and AOOs is provided to:

- Measure the radiation levels in specific areas of the plant.