ArevaEPRDCPEm Resource

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Sent: Wednesday, October 21, 2009 2:53 PM
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Cc: Hernandez, Raul; Segala, John; Bernal, Sara; Frye, Timothy; McCann, Edward; Hearn, Peter; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 298 (3736,3708,3753), FSAR Ch. 9
Attachments: RAI_298_SBPA_3736_CHPB_3708_SBPA_3753.doc

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on September 22, 2009, and discussed with your staff on October 8 and 21, 2009. Draft RAI Question 09.01.02-30 was modified as a result of those discussions. 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,
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Request for Additional Information No. 298 (3736, 3708, 3753), Revision 1

10/21/2009

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 Chapter 9

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

09.01.02-28

Follow-up to RAI Question 9.1.2-8

In RAI 9.1.2-8, the staff requested the applicant to include in the FSAR the design basis for the drainage system credited to prevent submerging the new stored fuel, including the sizing requirements.

In its response to RAI Question 9.1.2-8, AREVA stated that the New Fuel Storage Facility (NFSF) does not rely on the floor drainage system described in FSAR Tier 2, Section 9.3.3 to prevent accumulation of water or other moderation media. Building features such as door thresholds, curbs, and floor openings are provided to prevent entry of water or other moderation media into the NFSF.

SRP 9.1.2, “New and Spent Fuel Storage,” III. “Review Procedures.”2.L instructs the reviewer to verify that:

> “If new fuel is intended to be stored dry, adequate drainage for the new fuel storage vault to prevent accumulation of any liquid moderators. The drain system should be sized to handle the maximum flow from the rupture of the largest water pipe in the area. Backflow into the vault through the drain system should be prevented.”

FSAR Section 9.1.2.2.1 “[Facilities Description] New Fuel Storage,” describes the NFSF as a dry storage facility.

The staff requests the applicant to:

a. include in the FSAR the methodology for handling the maximum flow, from the rupture of the largest water pipe in the area, by the building features (such as

door thresholds, curbs, and floor openings); and to

b. justify in the FSAR the absence of backflow protections, as recommended by SRP 9.1.2.III.2.L, for the floor drains located in the NFSF.

09.01.02-29

Follow-up to RAI Questions 9.1.2-11 and 9.1.2-12

In RAI 9.1.2-11, the staff requested the applicant to include in the FSAR the elevation of the top of the spent fuel storage racks and to confirm that the spent fuel storage rack maximum height limitation is included in COL Information Item 9.1.4.

In response to RAI Question 9.1.2-11, the applicant stated that FSAR Tier 2, Section 9.1.2.2.2 will be revised to delete the normal water volume because it is dependent on the number of fuel assemblies stored in the pool and the volume of the racks. The applicant stated that the critical parameter is the height of water above the top of the stored fuel assemblies. The applicant will revise this value in FSAR Tier 2, Section 9.1.2.2 to reflect a nominal spent fuel pool (SFP) water depth of 45 feet 7 inches and approximately 29 feet of water above the top of the spent fuel assemblies seated in the storage racks. As long as at least 23 feet of water is provided above the top of the stored fuel assemblies, it is unnecessary to add the SFP rack maximum height limitation to the existing COL item.

The staff determined that this response is insufficient. In response to RAI 9.1.2-12, the applicant stated that the bottom of the loading pit gate is approximately 2 feet 6 inches above the top of the spent fuel assemblies in the storage racks. SRP 9.1.2, “New and Spent Fuel Storage,” III.H, “Review Procedures” specifies that the bottoms of any gates should be above the top of the fuel assemblies. The staff considers that these two parameters (a minimum of 23 feet of water coverage above the top of the stored fuel assemblies and the top of the fuel assemblies remains below bottom of the loading pit gate) should be included in COL Information Item 9.1.4.

The staff requests the applicant to justify in the FSAR the absence of the need to include the spent fuel storage rack maximum height limitation in COL Information Item 9.1.4.

09.01.02-30

Follow-up to RAI 9.1.2-12

In RAI 9.1.2-12, the staff requested the applicant to specify in the FSAR that the bottoms of the gates are above the top of the fuel assemblies and to include in the ITAAC for the SFSF verification that the elevation of the bottom of the loading pit gate is as shown in FSAR Tier 2, Figure 3.8-52.

The applicant responded to RAI 9.1.2-12 in Supplement 2 to RAI No. 84 by referring to RAI 84, Supplement 2 Question 09.01.02-11, which states the elevation of the top of the fuel assemblies seated in the spent fuel storage racks is at elevation 33 feet 2 inches. Therefore, the bottom of the loading pit gate is approximately 2 feet 6 inches above the top of the spent fuel assemblies in the storage racks. The applicant stated that the

location of the bottoms of the loading pit gates is not a safety-significant design feature and is not included in FSAR Tier 1. The applicant stated that the FSAR should not be changed as a result of this question.

The location of the bottoms of the loading pit gates related to the top of the stored fuel is a key design parameter that ensures that there are no openings or drains in the spent fuel pool below the stored fuel. The spent fuel pool and the SFP liner are seismic category 1 structures that are credited to maintain stored fuel covered with water under all accident scenarios. In Tier 1 Table 2.1.1-11, "Fuel Building ITAAC," Commitment 2.3, the applicant proposes to verify the minimum depth of the spent fuel pool. The staff considers that the key design features (no gates, openings, pipes or drainages are located below the active fuel) are important to safety and need to be verified through ITAAC.

09.01.02-31

Follow-up to RAI Question 9.1.2-15

In RAI 9.1.2-15, the staff requested the applicant to justify in the FSAR the absence of an anti-siphon device and Seismic Category 1 criteria for the demineralized water distribution system (GHC) piping.

In response to RAI 9.1.2-15, the applicant stated that siphoning is not a concern based on the elevation of the demineralized water distribution system pipe to "just below the spent fuel pool water surface".

The staff considers that any piping that reaches below the minimum water level should contain an anti-siphon device. It is not clear to the staff that the GHC piping does not extend below the minimum water level. One of the bases of the thermal analysis report of the spent fuel pool is that no pipe is capable of draining the spent fuel pool below the minimum inventory level, and to assure this, some pipes are adapted with anti-siphon devices. The staff also identified that the applicant has not proposed an ITAAC to verify that all pipes that extend below the minimum water level have a working anti-siphon device.

The staff requests the applicant to:

a. clarify that the GHC piping does not extend below the minimum water level and

b. justify the absence of an ITAAC to verify that no pipe extends below the minimum water level without a working anti-siphon device.

09.01.02-32

Follow-up to RAI Questions 9.1.2-16 and 9.1.2-20

In RAI 9.1.2-16, the staff requested the applicant to include in the FSAR a description of the initial testing and liner leakage monitoring. In response to RAI 9.1.2-16, the applicant stated that this question is very similar to RAI #86, Question 9.1.2-20. In response to RAI 9.1.2-20, the applicant stated that the proper fabrication and

construction of the leak chase system (LCS) reduces the chance of formation of blockages. The staff could not find an ITAAC or an Initial Plant Test that will verify that the LCS has been properly constructed or that it is free of obstructions.

The staff requests the applicant to justify in the FSAR the absence of an ITAAC or an Initial Plant Test that will verify that the LCS has been properly constructed or that it is free of obstructions.

09.03.02-17

Follow-up to RAI Question 9.3.2-15

The applicant stated in their “supplement 1” response to RAI 223, Question 9.3.2-15 (ML092370014), that the Severe Accident Sampling System (SASS) has no radiation monitors associated with it. However, GDC 64 states, in part, that means shall be provided to monitor spaces containing components for recirculation of loss-of-coolant accident fluids and to monitor the plant environs for radioactivity that may be released during postulated accidents. Section 12.3.5.2, Postaccident Access to Radiological Vital Areas,” states that the Post-LOCA SASS room and the Post-LOCA SASS ventilation air sampling room, both of which are located in the fuel building, may be accessed after an accident. In accordance with the requirements of GDC 64, provide information on the means that will be used to monitor the severe accident sampling rooms for radioactivity during post-LOCA sampling vital area missions, such that worker exposure due to the operation of the SASS will be maintained ALARA. Revise Tier 2, Sections 12.3 and 9.3.2 of the FSAR to include information on the radiation monitoring of the SASS rooms, as appropriate.

09.05.01-72

Follow-up to RAI Question 09.05.01-67

RG 1.189, regulatory position 4.1.7(b) guidance states that “A portable radio communications system should be provided for use by the fire brigade and other operations personnel required to achieve safe plant shutdown” and also states that "Preoperational and periodic testing should demonstrate that the frequencies used for portable radio communication will not affect the actuation of protective relays." AREVA’s response to RAI 169 Question 09.05.01-67 took exception to RG 1.189 guidance by restricting radio use in sensitive locations to prevent spurious equipment operation. The staff has noticed that other new type reactor designs do not have radio restrictions due to EMI/RFI effects and intent to follow RG 1.189 guidance. AREVA needs to follow RG 1.189 guidance to ensure radio communication is provided in all vital areas and to ensure that the radio frequencies used do not adversely affect digital equipment or provide additional details justifying not shielding digital equipment, designed, installed, and tested such that there are no adverse digital equipment EMI/RFI radio effects. Additionally, AREVA must ensure if radios are not going to be used in restricted areas that the backup communication system used is free of fire effects for any fire area that requires communication in restricted areas.

AREVA’s response to RAI 169 Question 09.05.01-67 stated that “In the context of RG 1.189,

Section 4.1.7, Communications," Rev. 1, the portable wireless system is considered the emergency system for fire fighting and operational post-fire safe shutdown activities. A dedicated fixed emergency communication system is not provided. The radios of the portable wireless system are provided with the capability to interface with both the public address and digital telephone systems which are fixed systems." RG 1.189 Regulatory Position 4.1.7 considers the portable radio system to be separate from fixed emergency communications. RG 1.189 Regulatory Position 4.1.7 does not require a dedicated to fire protection fixed emergency communication system rather that the fixed emergency communications only needs to be independent of the normal plant communication system. Independent means a communication system that is a separate unrelated system from the normal communication system for which electrical separation does not need to be in accordance with RG 1.189 Regulatory Position 5.3. Using two independent fixed communication systems is one way to satisfy the intent of RG 1.189 Regulatory Position 4.1.7.a. AREVA needs to clarify the compliance of the FSAR with RG 1.189 Regulatory Position 4.1.7.a given the above clarification.