ArevaEPRDCPEm Resource

From: BRYAN Martin (EXTERNAL AREVA) [Martin.Bryan.ext@areva.com]
Sent: Thursday, October 28, 2010 1:45 PM
To: Tesfaye, Getachew
Cc: Hearn, Peter; KOWALSKI David (AREVA); GARDNER Darrell (AREVA)
Subject: FW: AREVA meeting 10/26/10--- for today's chapter 9 call
Attachments: Draft Response to Question 09-02-01-38ab(revised).pdf

Importance: High

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From: GARDNER Darrell (RS/NB)
Sent: Thursday, October 28, 2010 1:39 PM
To: BRYAN Martin (External RS/NB)
Subject: FW: AREVA meeting 10/26/10
Importance: High

please send to Getachew/Pete for today's call to address the reviewer comment on Q38ab.

thanks

Darrell

From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Wednesday, October 27, 2010 9:28 AM
To: BRYAN Martin (External RS/NB)
Cc: KOWALSKI David (RS/NB); Hearn, Peter
Subject: FW: AREVA meeting 10/26/10

From: Wheeler, Larry
Sent: Wednesday, October 27, 2010 9:27 AM
To: Tesfaye, Getachew; Hearn, Peter
Subject: FW: AREVA meeting 10/26/10

Tesfaye:

Meeting notes from Oct. 26, 2010.

Thanks

RAI 351

Q9.2.5-30 part d - Draft response is OK to submit
Q9.2.5-31 part b – No comments on changed COL wording. OK to submit that part

RAI 345

Q9.2.1-35 part e and g - Draft response is OK to submit, no issues

Q9.2.1-36 – (email submittal). The staff has no issue with this proposed markup of Section 9.2.1.3.5 since it provided clarification that site chemistry limits corrosion, prevents scaling, and limits biological/sedimentary fouling. The text as part of 9.2.1.6 is more a high level statement about 89-13. If AREVA wishes to combined the two sections, that would be acceptable. The reference to reactor boron and water makeup system could not be found in the discussion in Q9.2.5-24. Q9.2.5-24 is still under review. **Will talk more on the next phone call.**

Q9.2.1-38 - (email submittal). The staff has no issue with this proposed markup of new COL 9.2.x item related to buried piping and ASME Section XI IWA-5244.. However, since there are additional safety related buried piping components, this many need to be added as a COL 3.8.x item (see 3.8.4.1.9 and 3.8.4.4.5). AREVA to determine and **will talk more on the next phone call.**

Q9.2.1-42 - (email submittal). Draft response is OK to submit, no issues (references Q9.2.5-27 and 9.2.5-24a).

Other comments: Please verify the DBA heat load from RAI 406 Q9.2.2-110 is correct. I see that there is a new load (293.35) as part of RAI 351 Q9.2.5-27 that does not reflect my latest draft copy of Q9.2.2-110 of 291.8.

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From: BRYAN Martin (EXTERNAL AREVA)

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Question 09.02.01-38:

Follow-up to RAI 119, Question 9.2.1-12

The ESWS must be designed so that periodic inspections of piping and components can be performed to assure that the integrity and capability of the system will be maintained over time in accordance with GDC 45 requirements. The staff finds the design to be acceptable if the FSAR describes inspection program requirements that will be implemented and are considered to be adequate for this purpose. While Tier 2 FSAR Section 9.2.1.6 indicates that periodic inspections will be performed, the extent and nature of these inspections and procedural controls that will be implemented to assure that the ESWS is adequately maintained over time were not described. Furthermore, the accessibility and periodic inspection of buried ESWS piping is of particular interest and needs to be addressed. Consequently, the applicant needs to provide additional information in the FSAR to describe the extent and nature of inspections that will be performed and procedural controls that will be implemented commensurate with this requirement.

Based on the staff's review of response to RAI 119, Question 9.2.1-12 and an audit by the staff conducted on October 27, 2009, this item remains open and requires further resolution and/or clarification by the applicant. The following description provides the results of the staff's evaluation of the applicant's initial response and justification for the item remaining open.

a. Testing in accordance with ASME XI, IWA-5244, "Buried Components," needs to be addressed by the COL.

b. Based on past operating experiences, the applicant should consider implementing periodic inspections under maintenance programs for larger diameter buried pipe to ensure ongoing material condition. EPRI has a recommended program for buried piping which should be considered as a COL information item. This program is considered good practice to inspect the buried piping system in addition to the requirements of IWA-5244.

c. FSAR Tier 2 Section 9.2.1.6 "Testing and Inspections" for ESWS does NOT include pointers to the appropriate FSAR Sections for ISI, IST and Surveillance Testing that are present in 9.2.2.5. Section 9.2.1.5 only states "after the plant is brought into operation periodic inspections and tests of the ESWS components and subsystems are performed.

Response to Question 09.02.01-38:

Part (a)

Buried piping and components are not within the scope of the U.S. EPR FSAR as noted in Item 3-5 of U.S. EPR FSAR Table 1.8-1. However, a new COL information item will be added to U.S. EPR FSAR Section 3.8.4.7 to require the COL Applicant to address examination of buried safety-related piping in accordance with ASME Section XI, IWA-5244, "Buried Components,"

Deleted: 9.2.1.6

Deleted: testing

Deleted: ESWS

Part (b)

Buried piping and components are not within the scope of the U.S. EPR FSAR as noted in Item 3-5 of U.S. EPR FSAR Table 1.8-1. The extent to which a COL Applicant adopts voluntary industry practices is a decision to be made by the COL Applicant. This question should be directed to the review of the COL application as part of the new COL information item added in response to Part (a) above.

Part (c)

U.S. EPR FSAR Tier 2, Section 9.2.1.6, which addresses testing and inspections for essential service water systems (ESWS), was revised in response to RAI 119, Question 9.2.1-13 to include pointers to the appropriate U.S. EPR FSAR Tier 2 sections for inservice inspection, inservice testing, and surveillance testing. The following text was included:

> "U.S. EPR FSAR Tier 2, Section 3.9 and Section 6.6 outline the inservice testing and inspection requirements. Refer to U.S. EPR FSAR Tier 2, Section 16.0, Surveillance Requirement (SR) 3.7.8 for surveillance requirements that verify continued operability of the ESWS."

FSAR Impact:

U.S. EPR FSAR Tier 2, Table 1.8-2 and Section 3.8.4.7 will be revised as described in the response and indicated on the enclosed markup.

Deleted: 9.2.1.6

Table 1.8-2—U.S. EPR Combined License Information Items
Sheet 13 of 37

Item No.	Description	Section
3.8-12	A COL applicant that references the U.S. EPR design certification will describe the program to examine inaccessible portions of below-grade concrete structures for degradation and monitoring of groundwater chemistry.	3.8.5.7
3.8-13	A COL applicant that references the U.S. EPR design certification will identify if any site-specific settlement monitoring requirements are required for Seismic Category I foundations based on site-specific soil conditions.	3.8.5.7
3.8-14	A COL applicant that references the U.S. EPR design certification will describe the design and analysis procedures used for buried conduit and duct banks, and buried pipe and pipe ducts.	3.8.4.4.5
3.8-15	A COL applicant that references the U.S. EPR design certification will use results from site-specific investigations to determine the routing of buried pipe and pipe ducts.	3.8.4.4.5
3.8-16	A COL applicant that references the U.S. EPR design certification will perform geotechnical engineering analyses to determine if the surface load will cause lateral and/or vertical displacement of bearing soil for the buried pipe and pipe ducts and consider the effect of wide or extra heavy loads.	3.8.4.4.5
3.9-1	A COL applicant that references the U.S. EPR design certification will submit the results from the vibration assessment program for the U.S. EPR RPV internals and piping systems specified in U.S. EPR FSAR Tier 2, Section 3.9.2.1, in accordance with RG 1.20.	3.9.2.4
3.9-2	A COL applicant that references the U.S. EPR design certification will prepare the design specifications and design reports for ASME Class 1, 2, and 3 components, piping, supports and core support structures that comply with and are certified to the requirements of Section III of the ASME Code. The COL applicant will address the results and conclusions from the reactor internals material reliability programs applicable to the U.S. EPR reactor internals with regard to known aging degradation mechanisms such as irradiation-assisted stress corrosion cracking and void swelling.	3.9.3
3.9-3	A COL applicant that references the U.S. EPR design certification will examine the feedwater line welds after hot functional testing prior to fuel loading and at the first refueling outage, in accordance with NRC Bulletin 79-13. A COL applicant that references the U.S. EPR design certification will report the results of inspections to the NRC, in accordance with NRC Bulletin 79-13.	3.9.3.1.1
3.9-4	As noted in ANP-10264NP-A, a COL applicant that references the U.S. EPR design certification will confirm that thermal deflections do not create adverse conditions during hot functional testing.	3.9.3.1.1

Modular construction methods are used to the extent practical for pre-fabricating portions of the spent fuel pool liner, other tank liners, distribution system supports, reinforcing, concrete formwork, and other portions of other Seismic Category I structures. Such methods have been used extensively in the construction industry. Rigging is pre-engineered for heavy lifts of modular sections. Permanent and temporary stiffeners are used on liner plate sections and other modularized items to satisfy code requirements for structural integrity of the modular sections during rigging operations.

Steel decking and plates and supporting steel beams may be used to form concrete floors. In these instances, the decking thickness is in addition to the nominal floor thicknesses. The decking, plates, and beams may be left in place, in which case they are designed for applicable seismic loads and other loading conditions. Other types of formwork may also be used that are left in place and become a permanent part of the structure. Such items meet code requirements and are designed to prevent their failure from affecting Seismic Category I SSC.

3.8.4.7 Testing and Inservice Inspection Requirements

Monitoring and maintenance of other Seismic Category I structures is performed in accordance with the requirements of 10 CFR 50.65 and supplemented with the guidance in RG 1.160 (GDC 1).

Testing and inservice inspection of the spent fuel pool leak chase channels in the FB is addressed in Section 9.1.

Refer to Section 9.1.5 for testing and inservice inspection requirements applicable to cranes.

Physical access is provided to perform inservice inspections of exposed portions of other Seismic Category I structures.

Examination of inaccessible portions of below-grade concrete structures for degradation and monitoring of ground water chemistry are addressed in Section 3.8.5.7.

3.8.5 Foundations

3.8.5.1 Description of the Foundations

Foundations for Seismic Category I structures are provided for the following buildings and structures:

- NI Common Basemat Structure foundation basemat.
- EPGB foundation basemats.

Table 1.8-2—U.S. EPR Combined License Information Items
Sheet 21 of 37

Item No.	Description	Section
9.1-1	A COL applicant that references the U.S. EPR design certification will provide site-specific information on the heavy load handling program, including a commitment to procedures for heavy load lifts in the vicinity of irradiated fuel or safe shutdown equipment, and crane operator training and qualification.	9.1.5.2.5
9.2-1	A COL applicant that references the U.S. EPR design certification will provide site specific information for the UHS support systems such as makeup water, blowdown, and chemical treatment (to control biofouling).	9.2.5.2
9.2-2	A COL applicant that references the U.S. EPR design certification will provide site-specific details related to the sources and treatment of makeup to the potable and sanitary water system along with a simplified piping and instrument diagram.	9.2.4.2.1
9.2-3	The raw water supply system (RWSS) and the design requirements of the RWSS are site-specific and will be addressed by the COL applicant.	9.2.9
9.2-4	A COL applicant that references the U.S. EPR design certification will provide a description of materials that will be used for the essential service water system (ESWS) at their site location, including the basis for determining that the materials being used are appropriate for the site location and for fluid properties that apply.	9.2.1.3.5
9.2-5	A COL applicant that references the U.S. EPR design certification will provide a description of materials that will be used for the UHS at their site location, including the basis for determining that the materials being used are appropriate for the site location and for the fluid properties that apply.	9.2.5.2
9.4-1	A COL applicant that references the U.S. EPR design certification will provide site-specific design information for the turbine building ventilation system (TBVS).	9.4.4
9.4-2	A COL applicant that references the U.S. EPR design certification will provide site-specific design information for the switchgear building ventilation system, turbine island (SWBVS).	9.4.4
9.5-1	A COL applicant referencing the U.S. EPR certified design will identify additional site-specific communication locations necessary to support effective communication between plant personnel in all vital areas of the plant during normal operation, as well as during accident conditions.	9.5.2.3
9.5-2	A COL applicant that references the U.S. EPR design certification will submit site specific information to address the Regulatory Guide 1.189, Regulatory Position C.1.7.1, Design and Procurement Document Control.	Table 9.5.1-1 C.1.7.1

Section 3.5, Section 3.6 and Section 9.5.1 provide the hazards analyses to verify that a safe shutdown, as outlined in Section 7.4, can be achieved and maintained.

The four division design of the ESWS provides complete redundancy; therefore a single failure will not compromise the ESWS system safety-related functions. Each division of ESWS is independent of any other division and does not share components with other divisions or with other nuclear power plant units.

Considering a single failure and preventative maintenance, two ESW divisions may be lost, but the ability to achieve the safe shutdown state under DBA conditions can be reached by the remaining two ESWS divisions. In case of LOOP the four ESW pumps have power supplied by their respective division EDGs.

During SAs, containment heat is removed by the dedicated cooling chain consisting of the severe accident heat removal system (SAHRS), dedicated CCWS, and dedicated ESWS. This cooling chain is manually actuated. In case of loss of the dedicated ESWS division, the SAHRS cooling chain is lost. This condition is outside the DBA.

In the event of an LOCA during power operations, the engineered safety features system (ESFS) (refer to Section 7.3) initiates a safety injection and containment isolation phase 1 signal. The ESWS divisions previously not in operation are automatically started by the PS.

9.2.1.6 Inspection and Testing Requirements

The ESWS is initially tested with the program given in Section 14.2, Test # 48.

The installation and design of the ESWS provides accessibility for the performance of periodic inservice inspection and testing. Periodic inspection and testing of all safety-related equipment verifies its structural and leak tight integrity and its availability and ability to fulfill its functions. Inservice inspection and testing requirements are in accordance with Section XI of the ASME BPV Code and the ASME OM Code.

U.S. EPR FSAR Tier 2, Section 3.9 and Section 6.6 outline the inservice testing and inspection requirements. Refer to U.S. EPR FSAR Tier 2, Section 16.0, Surveillance Requirement (SR) 3.7.8 for surveillance requirements that verify continued operability of the ESWS.

Pursuant to the recommendations included in Generic Letter 89-13 (Reference 2), the design of safety-related portions of the ESWS considers the potential for capability and performance degradation and subsequent system failure due to siltation, erosion, corrosion, protective coating failure, and the presence of organisms that subject the system to microbiological influenced corrosion, as well as macro-fouling. A combination of design means, such as chemical treatment to reduce biological challenges; provisions to permit regular, periodic inspections, preventative