PMBelCOL PEmails

From: Ravindra Joshi
Sent: Thursday, March 27, 2008 10:42 AM
To: alsterdis@tva.gov
Cc: Joseph Sebrosky; Brian Anderson; Jan Mazza; Tanya Simms; Stephanie Coffin; BelCol Resource
Subject: Bellefonte Units 3 and 4--Draft RAIs from Component Integrity, Performance & Testing Branch 1 (CIB1)
Attachments: RAI 36 (2).doc; RAI 38 (3).doc; RAI 48.doc; RAI 49 (2).doc

Andrea Sterdis,

By letter dated September 30, 2007, as supplemented by letters dated November 2, 2007, January 8, 2008 and January 14, 2008, Tennessee Valley Authority (TVA) submitted its application to the U. S. Nuclear Regulatory Commission (NRC) for a combined license (COL) for two AP1000 advance passive pressurized water reactors pursuant to 10 CFR Part 52. The NRC staff is performing a detailed review of this application to enable the staff to reach a conclusion on the safety of the proposed application.

The NRC staff has identified that additional information is needed to continue portions of the review. The staff's request for additional information (Draft-RAI) is contained in the enclosure (four Draft RAIs) to this e-mail.

Please review and let me know, if you would like to discuss the content of the RAIs. I will arrange a conference call with the Staff Technical Reviewers to discuss the RAIs.

Ravi Joshi
Project Manager
U. S. Nuclear Regulatory Commission
Office of New Reactor
Division of New Reactor Licensing
301-415-6191

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From: Ravindra Joshi

Created By: Ravindra.Joshi@nrc.gov

Recipients:
"Joseph Sebrosky" <Joseph.Sebrosky@nrc.gov>
Tracking Status: None
"Brian Anderson" <Brian.Anderson@nrc.gov>
Tracking Status: None
"Jan Mazza" <Jan.Mazza@nrc.gov>
Tracking Status: None
"Tanya Simms" <Tanya.Simms@nrc.gov>
Tracking Status: None
"Stephanie Coffin" <Stephanie.Coffin@nrc.gov>
Tracking Status: None
"BelCol Resource" <BelCol.Resource@nrc.gov>
Tracking Status: None
"alsterdis@tva.gov" <alsterdis@tva.gov>
Tracking Status: None

Post Office: HQCLSTR01.nrc.gov

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MESSAGE	1137	3/27/2008 10:42:19 AM
RAI 36 (2).doc	32250	
RAI 38 (3).doc	33274	
RAI 48.doc	34298	
RAI 49 (2).doc	33786	

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Request for Additional Information # 1 (Draft)

Bellefonte Units 3 and 4
TVA
Docket No. Dockets 52-014 and 52-015
SRP Section: 10.04.08 - Steam Generator Blowdown System
Application FSAR Section: 10.4

QUESTIONS from Component Integrity, Performance & Testing Branch 1

10.04.08-***

Section C.I.10.4 of Regulatory Guide 1.206 states that applicants should provide the expected and design temperatures for temperature-sensitive treatment processes. The purpose of the electrodeionization units is to purify the secondary water, which contributes to maintaining the integrity of the reactor coolant pressure boundary in accordance with General Design Criterion 14. This is a temperature-sensitive treatment process because of the deionization media. Please provide the expected operating range and design temperature for the electrodeionization units in the steam generator blowdown system, and show how this information will be included in the Bellefonte Units 3 and 4 Final Safety Analysis Report.

Request for Additional Information No. 2 (Draft)

Bellefonte Units 3 and 4
TVA
Docket No. Dockets 52-014 and 52-015
SRP Section: 05.02.03 - Reactor Coolant Pressure Boundary Materials
Application Section: 5.2.3

QUESTIONS from Component Integrity, Performance & Testing Branch 1

05.02.03-***
The applicant included the following supplemental information in Section 5.2.3:

"Monitoring of water chemistry is implemented using the guidance of EPRI TR-1002884 "Pressurized Water Reactor Primary Water Chemistry Guidelines: Volume 1", Appendix F."(Rev. 5 dated October 2003).

The cited appendix pertains specifically to sampling of soluble and insoluble corrosion products from the reactor coolant system. The Standard Review Plan, NUREG-0800, Section 5.2.3 does not provide guidance for details of PWR reactor coolant chemistry, but refers the reviewer to SRP Section 9.3.4, "Chemical and Volume Control System (PWR) Including Boron Recovery". SRP Section 9.3.4 recommends the Chemical and Volume Control System (CVCS) ensure that reactor coolant system chemistry meets General Design Criteria 14, by maintaining acceptable purity levels in the reactor coolant through the removal of insoluble corrosion products and dissolved ionic material by filtration and ion exchange. In addition, per SRP Section 9.3.4, the CVCS maintains proper RCS chemistry by controlling total dissolved solids, pH, oxygen concentration, and halide concentrations within the acceptable ranges. Further, RG 1.206, Section C.I.5.2.3.2, recommends that the applicant describe the reactor coolant water chemistry program, including maximum halogen, sulfate and oxygen content, permissible content of hydrogen and soluble poisons. Additionally, RG 1.206, section C.I.5.2.3.2, states that (COL Section 5.2.3) may reference the EPRI water chemistry guidelines to support the plant-specific program, and should fully describe and discuss the plant-specific water coolant chemistry control program and its compatibility with the RCPB materials.

Appendix F of the Primary Water Chemistry Guidelines only provides a recommended methodology for sampling RCS corrosion products, and does not provide acceptance criteria or methods for reducing/controlling RCS corrosion products. Further, other primary water chemistry parameters that the SRP and RG 1.206 recommend be addressed in the FSAR are not addressed by Appendix F, such as pH, oxygen, and halide concentrations. These parameters are addressed in DCD Section 5.2.3 and DCD Table 5.2.2, which provides maximum values of primary water chemistry parameters including oxygen, pH and halide concentration for the various plant operating modes.

Referencing Appendix F only of the Primary Water Chemistry Guidelines does not add any more detail or specificity for these other parameters.

Please explain the rationale for referencing only Appendix F to the “Pressurized Water Reactor Primary Water Chemistry Guidelines” rather than referencing the entire guidelines document.

Request for Additional Information No. 3 (Draft)

Bellefonte Units 3 and 4
TVA
Docket No. Dockets 52-014 and 52-015
SRP Section: 06.01.02 - Protective Coating Systems (Paints) - Organic Materials
Application Section: 6.1.2

QUESTIONS from Component Integrity, Performance & Testing Branch 1

06.01.02-***
In FSAR Section 6.1.2.1.6, the applicant provided the following information as STD COL 6.1-2 in order to resolve COL Information Item 6.1.3.2:

> "The protective coatings program controls the procurement, application, inspection, and monitoring of Service Level I and Service Level III coatings with the quality assurance features discussed above.
>
> The protective coatings program complies with Regulatory Guide 1.54, and is controlled and implemented by administrative procedures."

The DCD text to be replaced was the third paragraph under the subsection titled "Service Level I and Service Level III Coatings" within DCD subsection 6.1.2.1.6, which stated "The procurement, application, and monitoring of Service Level I and Service Level III coatings are controlled by a program described in subsection 6.1.3.2. DCD Section 6.1.3.2 stated "The Combined License applicants referencing the AP1000 will provide a program to control procurement, application, and monitoring of Service Level I and Service Level III coatings. The program for the control of the use of these coatings will be consistent with subsection 6.1.2.1.6."

The information provided for resolution of the COL information item indicates that the protective coatings program complies with Regulatory Guide 1.54, which provides an acceptable method to comply with the recommendation of Standard Review Plan Section 6.1.2, "Protective Coating Systems (Paints) - Organic Materials.' However, to complete its review, the staff requests the following information:

• A description of the coating program in sufficient detail to enable the staff to reach a conclusion that the coatings program will meet RG 1.54, addressing the following items:

> -The program description should address the standards to be applied for the procurement, application, and monitoring of Service Level I and III protective coatings.
>
> -RG 1.54 states that ASTM D 5144-00 and the other ASTM standards (listed in the regulatory guide) provide guidance on practices and programs that are acceptable to the NRC staff for the

selection, application, qualification, inspection, and maintenance of protective coatings applied in nuclear power plants. The COL information item committed the applicant to provide a program for procurement, application, and monitoring of Service Level I and Service Level III coatings, but did not address selection, qualification, or maintenance of coatings. The applicant should describe the standards to be applied to maintenance of the protective coatings in the program description. The description of the proposed coatings program should also describe the standards to be applied to selection and qualification of coatings, if the applicant intends to use coatings systems different than those described in the DCD, either during construction or after plant operation commences.

-The program description should describe the administrative controls that will be applied to the coatings program.

• Provide the schedule for full implementation of the coatings program with respect to major milestones in the construction of the plant; for example, prior to application of coatings, prior to preparation of surfaces to be coated, or prior to procurement of coatings materials.

Request for Additional Information No. 4 (Draft)

Bellefonte Units 3 and 4
TVA
Docket No. Dockets 52-014 and 52-015
SRP Section: 03.06.03 - Leak-Before-Break Evaluation Procedures
Application Section: 3.6.4.4

QUESTIONS from Component Integrity, Performance & Testing Branch 1

Subsection 3.6.3 – Leak-Before-Break Evaluation Procedures

In the Bellefonte COL application, the applicant states in its FSAR that Section 3.6, "PROTECTION AGAINST THE DYNAMIC EFFECTS ASSOCIATED WITH THE POSTULATED RUPTURE OF PIPING," of the referenced DCD is incorporated by reference with the following departures and/or supplements.

Subsection 3.6.4.4, "Primary System Inspection Program for Leak-before-Break Piping," of the AP1000 DCD states the following:

> Combined License applicants referencing the AP1000 certified design will develop an inspection program for piping systems qualified for leak-before-break. The inspection program will consider the operating experience of the materials used in the AP1000 piping systems qualified for leak-before-break, and will include augmented inspection plans and evaluation criteria consistent with those measures imposed on or adopted by operating PWRs as part of the ongoing resolution of concerns regarding the potential for PWSCC in operating plants. The AP1000 inspection program will be consistent with the inspection program adopted for operating PWRs that use Alloy 690, 52, and 152 in approved leak-before-break applications.

In Subsection 3.6.4.4, "Primary System Inspection Program for Leak-before-Break Piping," of the Bellefonte COL, the applicant states that the first paragraph of DCD Subsection 3.6.4.4 would be replaced with the following text:

> Alloy 690 is not used in leak-before-break piping. No additional or augmented inspections are required beyond the inservice inspection program for leak-before-break piping. An as-built verification of the leak-before-break piping is required to verify that no change was introduced that would invalidate the conclusion reached in this subsection.

3.6.3-1 – It is not clear why Alloy 690 is not used in leak-before-break piping applications. If Alloy 690 base material and alloy 52/152 weld material is not being used, please identify what material is being used for the leak-before-break piping.

3.6.3-2 – If a different base material is planned to be used (other than Alloy 690/52/152), please state the justification for using this material in leak-before-break piping applications based upon operating experience, and provide justification why no augmented inspection plans and evaluation criteria is considered necessary. Additionally, please provide a discussion that supports the use of an alternative material and explains why concerns for potential PWSCC should not be considered a factor.

3.6.3-3 – For leak-before-break piping requiring dissimilar-metal welds, if Alloy 52/152 is not being used for the weld material, please identify the weld material and provide justification for its use. Provide a discussion that supports the use of an alternative weld material and explains why concerns regarding the potential for PWSCC should not be considered a factor. Please note that there are currently ASME Code cases being developed for dissimilar-metal welds due to PWSCC concerns.