PMNorthAnna3COLPEmails Resource

From: Stephen Campbell
Sent: Wednesday, October 29, 2008 12:14 PM
To: Jeffrey Cruz
Cc: Thomas Kevern; Chandu Patel; Chang Li; John Segala; NorthAnna3COL Resource
Subject: SUBMITTAL P2 NA 5.2.5 SER with Open Item
Attachments: NA P2 Input SER 5 2 5 10-28-08Final.doc

Jeff:

John Segala and I approve of the attached Phase 2 North Anna SER with one open item, **RAI 05.02.05-2,** which involved that the applicant restore a deleted statement regarding schedule commitment.

Stephen Campbell
Acting SBPB Branch Chief
301-415-2398

Hearing Identifier: NorthAnna3_Public_EX
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Subject: SUBMITTAL P2 NA 5.2.5 SER with Open Item
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From: Stephen Campbell

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MESSAGE	278	10/29/2008 12:13:52 PM
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Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
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Phase 2 Inputs SER for North Anna Unit 3

5.2.5 REACTOR COOLANT PRESSURE BOUNDARY (RCPB) LEAKAGE DETECTION

5.2.5.1 Introduction

The RCPB leakage detection systems are designed to detect and, to the extent practical, identify the source of reactor coolant leakage.

5.2.5.2 Summary of Application

In the North Anna, Unit 3 Combined License (COL) Final Safety Analysis Report (FSAR) Section 5.2, "Integrity of Reactor Coolant Pressure Boundary," the applicant incorporated by reference Section 5.2.5, "RCPB Leakage Detection," of the Economic Simplified Boiling Water Reactor (ESBWR) Design Certification Document (DCD) Tier 2, Revision 4 replacing one COL Information Item. The Information Item is described in FSAR Section 5.2.5.9, "Leak Detection Monitoring,"

COL FSAR Section 5.2.5 contains one COL information item related to the ESBWR DCD, Section 5.2.6, COL Information 5.2-2-H, "Leak Detection Monitoring," which refers to DCD Section 5.2.5.9, "COL Information for Leak Detection Monitoring," for detailed information of procedures to be developed by the COL applicant.

In North Anna FSAR Section 5.2.5.9, the applicant describes Standard Departure (STD) COL 5.2.2-H, which is discussed below in Section 5.2.5.4, "Technical Evaluation," of this report.

5.2.5.3 Regulatory Basis

The regulatory basis of the information incorporated by reference will be addressed within the Final Safety Evaluation Report (FSER) related to the DCD.

The staff reviewed the RCPB leakage detection system in accordance with NUREG 0800, "Standard Review Plan [SRP] for the Review of Safety Analysis Reports for Nuclear Power Plants," Section 5.2.5 "Reactor Coolant Pressure Boundary Leakage Detection," Revision 2, March 2007. Staff acceptance of the leakage detection design is based on its meeting the requirements of the following criteria:

- General Design Criteria (GDC 2), "Design Basis for Protection Against Natural Phenomena," as it relates to the capability of the design to maintain and perform its safety function following an earthquake

- GDC 30 as it relates to the detection, identification, and monitoring of the source of reactor coolant leakage.

5.2.5.4 Technical Evaluation

The NRC staff reviewed Section 5.2.5 of the North Anna, Unit 3 COL FSAR in accordance with the guidance in SRP Section 5.2.5. The NRC staff's review finds that the applicant appropriately incorporates by reference Section 5.2.5 of the ESBWR DCD, Rev. 4. Section 5.2.5 of the ESBWR DCD is being reviewed by the staff under docket number 52-010. The NRC staff's technical evaluation of the information incorporated by reference related to reactor

coolant pressure boundary leakage detection systems will be documented in the corresponding SER.

COL Information Item

North Anna, Unit 3, FSAR Section 5.2.5.9 identifies STD COL 5.2.2-H as follows:

> "Operators are provided with procedures to determine the identified and unidentified leakage in order to establish whether the leakage rates are within the limits in the Technical Specifications. These procedures assist operators in monitoring, recording, trending, determining the source of leakage, and evaluating potential corrective action. These procedures address the conversion of different parameter indications for identified and unidentified leakage (e.g., sump pump run time, sump level, condensate transfer rate) into common leak rate equivalent (e.g., volumetric or mass flow) and leak rate rate-of-change values. A description of the plant procedures program and implementation milestones are provided in Section 13.5."

The staff identified that this FSAR text differs from the DCD text of COL 5.2.2-H (DCD Revision 4, Section 5.2.6) by not referencing Section 5.2.5.9 and by inclusion of reference to "Technical Specifications" and, therefore, appears to inappropriately limit the intended scope of the procedures. In addition, inclusion in FSAR text of the examples "sump pump run time, sump level, and condensate transfer rate" without inclusion of "radioactivity" (DCD Section 5.2.5.9), also appears to inappropriately limit the scope of the procedures. DCD Revision 4, Section 5.2.5 and COL 5.2.2-H were under a parallel staff review, which had not been found acceptable at the time when the North Anna, Unit 3, application was submitted.

In the request for additional information **(RAI) 05.02.05-1 (RAI ID 370)**, the staff requested the applicant to clarify the following.

(a) Revise the FSAR to clarify the scope of procedures relative to Technical Specifications (TS). In addition to establishing the leakage rates for the limits in the TS, the operators should be able to use the procedures to identify and monitor the unidentified leakage at a level much lower than the TS limit so that the operator can monitor leakage, evaluate trends, determine the source of leakage, and evaluate potential corrective actions. This level to provide operators an early alert to initiate actions prior to the TS limit should be established as an alarm. The alarm level being established in an approved revision of DCD Tier 2 Section 5.2.5 is acceptable for the COL application.

(b) Confirm the procedure scope addresses the conversion of different parameter indications to include all three detection instrumentation in TSs Limiting Condition for Operation (LCO) 3.3.4.1, and clarify STD COL 5.2.2-H accordingly. The procedures should include indications from 1) the drywell floor drain high conductivity water sump monitoring system, 2) drywell air coolers condensate flow monitoring system, and 3) drywell fission product monitoring system.

By a letter, dated August 8, 2008, the applicant responded **RAI 05.02.05-1 (RAI ID 370)**. In its response, the applicant revised FSAR Section 5.2.5.9 and STD COL 5.2.2-H to clarify that the procedures will fully address the topics described in Items (a) and (b) of the RAI and will be consistent with DCD, Revision 5, Section 5.2.5. The revised FSAR Section 5.2.5.9 and STD COL 5.2.2-H states as follows.

> "Operators are provided with procedures for detecting, monitoring, recording, trending, and determining the sources of reactor coolant pressure boundary leakage. Examples of parameters that are monitored are sump pump run time, sump level, condensate transfer rate, and process chemistry/radioactivity.
>
> The procedures are used for converting different parameter indications for identified and unidentified leakage into common leak rate equivalents (volumetric or mass flow) and leak rate rate-of-change values, including indications from:1)the drywell floor drain high conductivity water sump monitoring system, 2) the drywell air coolers condensate flow monitoring system, and 3) the drywell fission product monitoring system.
>
> The procedures are used to monitor leakage at levels well below Technical Specifications limits and provide guidance for evaluating potential corrective action plans to prevent the plant from exceeding a Technical Specifications limit.
>
> An unidentified leakage rate-of-change alarm provides an early alert to the operators to initiate corrective actions prior to reaching a Technical Specifications limit."

The staff reviewed the RAI responses and the markup pages of the FSAR. The staff found that the responses address all the concerns identified in the RAI and that the applicant committed to be consistent with ESBWR DCD Tier 2, Revision 5, Section 5.2.5. DCD Revision 5, Section 5.2.5 includes an alarm that annunciates if a step increase in the unidentified leak rate occurs (reference DCD Section 5.2.5.4,"Limits for Reactor Coolant Leakage Rates within the Drywell." The standard design and procedures will enable the operators to monitor leakage at levels well below TS limits, and initiate actions to prevent the plant from exceeding a TS limit. Based on the above, the staff finds **RAI 05.02.05-1** resolved, and it becomes a **Confirmatory Item**.

In the comparison of the revised STD COL 5.2.2-H, the staff found that the applicant deleted a sentence regarding a commitment for the implementation schedule from the original text. The sentence reads "a description of the plant procedures program and implementation milestones are provided in Section 13.5." Deleting the above commitment is not acceptable **(RAI 05.02.05-2)**. This is an **Open Item**.

5.2.5.5 Post Combined License Activities

At the conclusion of the final review, this section will identify any applicable COL holder activities or follow-up actions for the NRC staff.

5.2.5.6 Conclusion

Based on the above evaluation, the staff concludes that the information pertaining to the North Anna, Unit 3 COL FSAR Section 5.2.5 is within the scope of the design certification and adequately incorporates by reference Section 5.2.5 of the ESBWR DCD, and is thus acceptable.

Request for Additional Information
Balance of Plant Systems Branch II
Docket No. 52-017
Application Section: 5.2
SRP Section 5.2.5
Reactor Coolant Pressure Boundary Leakage Detection

RAI 05.02.05-2

In the response to RAI 05.02.05-1 (RAI ID: 370) regarding STD COL 5.2.2-H, the staff found that the applicant deleted a sentence regarding a commitment for the implementation schedule from the original text. The sentence reads “a description of the plant procedures program and implementation milestones are provided in Section 13.5.” The applicant is requested to restore the above commitment in the FSAR.