Chapter 16 Unresolved RAIS

UR-SRP16-CTSB-25

The applicant also proposed to change requirements specified in Surveillance Requirement (SR) 3.4.1.4 for monitoring RCS flow, to reflect an alternate testing method to the precision heat balance (an NRC accepted method). In RAI-SRP16-CTSB-25, the staff asked Westinghouse to provide justification for the change. In the December 2, 2008 response letter, Westinghouse provided additional details which form the basis for the alternate method but further stated:

> "The intent of the proposed Section 3.4.1 is to permit either method, whichever is demonstrated to provide less measurement uncertainty... ... The total uncertainty in measuring flow will depend upon analysis of the baseline flow measurements and the accuracy of the devices used to periodically measure dP caused by RCS flow. If the total uncertainty is not shown to be less than for the precision heat balance plus Delta-T method, then the alternate method would not be used."

Westinghouse also indicated that no change to the AP1000 DCD, or the TS 3.4.1 and associated bases is required.

In reviewing this response, the staff noted that the alternate testing method using elbow tabs had been approved for use at South Texas Project (STP) Electric Generating Station. A review of the current STP Technical Specifications found the following descriptions for the affected SRs:

> "SR 4.2.5.2 The RCS flow rate indicators shall be subjected to a channel calibration at least once per 18 months.
>
> SR 4.2.5.3 The RCS total flow rate shall be determined by precision heat balance or elbow tab dP measurements at least once per 18 months."

Based on the above, the staff believes a revision to the SR 3.4.1.4 and TS Bases 3.4.1 is needed to incorporate additional details regarding the choice of a testing method which produces better uncertainty analysis results including a new SR for a channel calibration of the RCS flow rate indicators. This is an unresolved RAI, UR-SRP16-CTSB-25.

UR-SRP-16-CTSB-54

In TS 3.4.14, the applicant proposed to replace the preliminary bracketed value of 9.3 square inches for the minimum RCS vent area with a final value of 4.15 square inches. In RAI-SRP16-CTSB-35, the applicant was asked to provide justification for the change. In its response dated December 12, 2008, the applicant stated that the change in a result of the final design of the RNS suction relief valve with its inlet changed from 4 inches to 3 inches. The staff finds the stated justification acceptable since either the RNS suction relief valve or a depressurized RCS with a vent area is considered acceptable means for the low temperature overpressure protection. RAI-SRP16-CTSB-35 is considered closed. In addition, in RAI-SRP16-CTSB-54, the applicant was asked to address inconsistencies in the TS bases B 3.4.14. The response to this RAI has not been received from Westinghouse. This is an unresolved RAI, UR-SRP16-CTSB-54.

UR-SRP16-CTSB-55

In TS 3.4.4, the applicant proposed to replace the preliminary bracketed values of 275 degree F with a new final value of 200 degree F and to use the preliminary bracketed value of 50 degree F as a final value, regarding temperature requirements for the primary coolant and the secondary side water as listed in Note 2 of LCO 3.4.4. In addition, the applicant proposed to add an extra precautionary Note regarding restrictive plant conditions prior to starting an RCP for the reactor vessel low temperature overpressure protection. In RAI-SRP16-CTSB-55, the applicant was asked to provide clarification on the selected value of 200 degree F. The response to this RAI has not been received from Westinghouse. This is an unresolved RAI, UR-SRP16-CTSB-55.

UR-SRP16-CTSB-62

The applicant also proposed to replace the preliminary bracketed value of 10000 gpm for the minimum RCS flow with a final value of 3000 gpm. Conforming changes were proposed in SR 3.4.8.1 and related information in the TS bases to match the new minimum flow value (e.g. the minimum pump speed setting of 25% was replaced with new value of 10%). Westinghouse cited the NRC accepted response to RAI 440.106 during the AP1000 Design Certification review as justification for the proposed flow reduction. In RAI-SRP16-CTSB-62, the applicant was asked to provide additional details to support these changes. In its response dated December 17, 2008, the applicant reiterated information that was provided in the response to RAI 440.106, but further stated:

> "AP1000 RCS flow calculations show that the expected RCS flow with a single reactor coolant pump (RCP) operating at its lowest allowable operating speed is approximately 17,000 gpm. The associated reactor vessel flow is approximately 11,000 gpm. This is well above the 3000 gpm flow mixing requirement from the LOFT testing, and also above the preliminary bracketed value of 10000 gpm ..."

The staff noted that the new proposed value of 10% for the pump minimum speed setting in SR 3.4.8.1, corresponding approximately to a calculated flow of 7875 gpm, appears to be inconsistent with the lowest allowable operating speed stated above. This is an unresolved RAI, UR-SRP16-CTSB-62.

UR-SRP16-CTSB-07

Although no change was proposed to TS 3.4.11/12 as part of the AP1000 DC Amendment application, the staff noted that the scope of Condition A was not clearly defined. In RAI-SRP16-CTSB-07, the staff asked Westinghouse to explain the difference in scope of inoperable equipment involved between TS 3.4.11/3.4.12 Condition A, which states "One required flow path inoperable," and Condition B, which states "One required stage 1 ADS flow path inoperable AND Either one required stage 2 or stage 3 ADS flow path inoperable."

In the October 27, 2008 response letter, Westinghouse stated:

> "As described in the 3.4.11 and 3.4.12 Bases, Conditions A and B cover two different combinations of ADS flow path inoperabilities ... ... Separate Conditions are specified, since both Conditions A and B may be entered at the same time. The inoperabilities covered by the two Conditions are permissible at the same time, since the safety function can be accomplished by the remaining seven ADS flow paths without a single failure. The loss of capacity while in Conditions A and B is equivalent to a single failure of the power to the valves in one division, as considered in the accident analyses."

Westinghouse further stated "the LCO 3.4.11 and LCO 3.4.12 and associated Bases are technically correct, as-is. However, to clarify the system status while in both Conditions A and B the following statement is added in each of the Bases at the beginning of the Actions sections.

> "The loss of ADS capacity, if both Conditions A and B are entered at the same time, is equivalent to a single failure of the power to the valves in one division, as considered in the accident analyses."

Based on this response and considering the four-stage ADS design, the staff believes that additional changes are required for the Condition A to explicitly list Stage 4 ADS flow path in its scope to clearly indicate the difference between Conditions A and B. This is an unresolved RAI, UR-SRP16-CTSB-07.

UR-SRP16.1.1-SEB1-01

Provide a calculation that shows the equipment hatch can be safely carried by four bolts. In RAI-SRP 16.1.1-SEB1-01, the applicant was asked to provide details on the equipment hatch and bolt design to ensure the equipment hatch can be safely installed with four bolts to meet the containment closure requirements during MODES 5 AND 6. In its response dated August 15, 2008, Westinghouse stated that final design information for the equipment hatch installation will be provided in design specification document APP-MV50-Z0-002. According to the technical staff in SEB1, an audit of the design specification document is needed to close RAI-SRP-16.1.1-SEB1-01. This is an unresolved RAI, UR- SRP16.1.1-SEB1-01.

UR-SRP16-CTSB-61

Revise TS Bases B 3.6.1, B 3.6.2, and B 3.6.3, References section to list specific sections of DCD Chapter 15 that support the specific accidents discussed in the body of the bases. In RAI-SRP16-CTSB-61, the staff asked Westinghouse to provide the specific sections of DCD Chapter 15 that support the specific accident discussed in the APPLICABLE SAFETY ANALYSES section of TS Bases B 3.6.1, 3.6.2, and 3.6.3.

In the November 19, 2008 response letter, Westinghouse stated "the level of detail provided by the 3.6.1, 3.6.2, and 3.6.3 Bases references to Chapter 15 is consistent with the STS," and no further change to the bases was made. The staff found this reason unacceptable. The staff's concern is that DCD Chapter 15 has a large volume containing more than 600 pages. Without pointing to a specific section, validation of information discussed in the affected TS Bases would require significant efforts and time from the plant operators who implement TS requirements and often refer to the TS Bases for needed clarifications in a timely manner. This is an unresolved RAI, UR-SRP16-CTSB-61.

UR-SRP16-CTSB-33

Provide the minimum tri-sodium phosphate (TSP) manufactured density including a discussion on how this minimum value is determined given different levels of impurity exist in commercial products. In RAI-SRP16-CTSB-33, the staff asked Westinghouse to provide the value of the minimum TSP manufactured density which is used to convert the required TSP amount from a mass number to a volume number. In the December 12, 2008 response letter, Westinghouse did not provide the requested information so that the staff can verify the accuracy and completeness of supporting information provided in the TS Bases B 3.6.9. This is an unresolved RAI, UR-SRP16-CTSB-33.

UR-SRP16-CTSB-32

In addition, the staff noted that the AP1000 GTS did not incorporate the NRC approved TSTF-448 which was issued to address safety issues identified in Generic Letter (GL) 2003-001, "Control Room Habitability." In RAI-SRP16-CTSB-32, the applicant was asked to address these issues. In its response dated November 11, 2008, the applicant stated that a new DCD Section 6.4.5.4, Main Control Room Envelope Habitability, was added under Revision 16 to address GL 2003-01. This DCD section describes the periodic testing of the main control room envelope (CRE) habitability during VES operation (pressurization mode) to measure the air inleakage in accordance with ASTM E741. Westinghouse concluded that this periodic testing commitment in DCD Section 6.4.5.4, combined with the existing LCO 3.7.6 requirements, adequately addresses the GL 2003-01 issues and provides requirements equivalent to those approved in TSTF-448. No further changes to the AP1000 DCD or the AP1000 GTS were proposed. The staff disagreed with this conclusion. This is an unresolved RAI, UR-SRP16-CTSB-32.

UR-SRP16-CTSB-42

In TS 3.3.1, Table 3.3.1-1, equations for overtemperature ΔT (Note 1) and overpower ΔT (Note 2) are provided. The staff previously requested, in RAI-SRP16-CTSB-42, that the applicant provide the technical bases and derivation of the revised overtemperature ΔT and overpower ΔT reactor trip setpoint equations presented in Revision 16, and provide a reference to a document approved by the staff for the basis of the revised equations, or submit the basis for the revised equations to the staff for further review. The response provided for RAI-SRP16-CTSB-42 via submittal ML083290461 did not fully address the staff's request. WCAP-8745-P-A, previously reviewed and approved by the staff, provided the bases for the overtemperature ΔT and overpower ΔT setpoint equations presented in Revision 15 of the DCD. The revised equations presented in DCD Revision 16 for these reactor trip functions differ from those previously submitted in Revision 15 of DCD 7.2.1.1.3 and Technical Specification Table 3.3.1-1, Note 1.

Based on this the staff believes that the applicant should document either by submitting a revision to WCAP-8745-P-A, submitting a revision to the DCD, or by submitting an equivalent topical document to be referenced appropriately in the DCD and Technical Specifications Section 5.6.5 per Generic letter 88-16. The submittal should document the bases for the revised equations; the bases for development of the tables of allowable core thermal power as a function of core inlet temperature at various pressures for the overtemperature ΔT trip equation; the bases for the determination of the preset bias K_4 in the overpower ΔT trip equation; and the bases for the constants and bracketed values that appear in the revised equations presented in Revision 16. The NRC identified this as unresolved RAI UR-SRP16-CTSB-42.

CHAPTER 16 CONFIRMATORY ITEMS

CI-SRP16-CTSB-01

In TS 1.1, the applicant proposed changes to the definition of "SHUTDOWN MARGIN" which is used in conjunction with TS 3.1.1, 3.1.4, 3.1.5 and 3.1.6, to clarify how the gray rod cluster assemblies (GRCA) will be accounted for in the calculation of SHUTDOWN MARGIN. In RAI-SRP16-CTSB-01, the staff requested additional details regarding this change. In its response letter dated November 11, 2008, the applicant provided the requested information including a markup of changes to TS Section 1.1 in AP1000 DCD, Revision 17. Verification that the change is correctly incorporated in the final revision of the AP1000 DCD is a confirmatory item, CI-SRP16-CTSB-01.

CI-SRP16-CTSB-02

The staff noted that an error in TS Section 1.4 had not been corrected in accordance with the NRC approved TSTF-485, that corrects Example 1.4-1, Revision 0. RAI-SRP16-CTSB-02 was issued to the applicant for its correction. In its response letter dated December 2, 2008, the applicant agreed to revise TS 1.4 in a future DCD revision. Verification that the change is correctly incorporated in the final revision of the AP1000 DCD is a confirmatory item, CI-SRP16-CTSB-02.

CI-SRP16-CTSB-66

In RAI-SRP-16-CTSB-66, the staff asked the applicant to make an editorial change regarding an acronym contained in the bases of Section 2.1.1. In a letter dated 12/2/08, the applicant acknowledged the need for the change and included a mark-up of the applicable section contained in AP1000 DCD, Revision 17. Verification that the change is correctly incorporated in the final revision of the AP1000 DCD is a confirmatory item, CI-SRP16-CTSB-66.

CI-SRP16-CTSB-34

In RAI-SRP-16-CTSB-34, the staff asked the applicant to clarify the mode of applicability for a Surveillance Requirement (SR) contained in the bases of Section 3.1.1. In a letter dated 12/2/08, the applicant acknowledged the need for the change and included a mark-up of the applicable section contained in AP1000 DCD, Revision 17. Verification that the change is correctly incorporated in the final revision of the AP1000 DCD is a confirmatory item, CI-SRP16-CTSB-34.

CI-SRP16-CTSB-67

In RAI-SRP-16-CTSB-67, the staff asked the applicant to make a minor editorial change regarding the title of an LCO contained in the bases portions of Sections 3.1.4 and 3.1.8. In a letter dated 12/2/08, the applicant acknowledged the need for the change and included a mark-up of the applicable sections contained in AP1000 DCD, Revision 17. Verification that the

change is correctly incorporated in the final revision of the AP1000 DCD is a confirmatory item CI-SRP16-CTSB-67.

CI-SRP16-CTSB-05

In RAI-SRP-16-CTSB-05, the staff asked the applicant to clarify certain notes and their corresponding applicability modes contained in the specification and bases portions of Sections 3.1.4, 3.1.5, and 3.1.6. In a letter dated 11/19/08, the applicant acknowledged the need for the change and included a mark-up of the applicable sections contained in AP1000 DCD, Revision 17. Verification that the change is correctly incorporated in the final revision of the AP1000 DCD is a confirmatory item, CI-SRP16-CTSB-05.

CI-SRP16-CTSB-60

In RAI-SRP-16-CTSB-60, the staff asked the applicant to make an editorial change regarding required actions stated in the bases of Sections 3.1.7. In a letter dated 12/2/08, the applicant acknowledged the need for the change and included a mark-up of the applicable sections contained in AP1000 DCD Revision 17. Verification that the change is correctly incorporated in the final revision of the AP1000 DCD is a confirmatory item, CI-SRP16-CTSB-60.

CI-SRP16-CTSB-43

In RAI-SRP-16-CTSB-43, the staff asked the applicant to make an editorial change regarding the required reactor power level stated in the specification and bases portions of Sections 3.1.8. In a letter dated 12/2/08, the applicant acknowledged the need for the change and included a mark-up of the applicable sections contained in AP1000 DCD Revision 17. Verification that the change is correctly incorporated in the final revision of the AP1000 DCD is a confirmatory item, CI-SRP16-CTSB-43.

CI-SRP16-CTSB-20

In RAI-SRP-16-CTSB-20, the staff asked the applicant to make an editorial change regarding the correct revision year for a reference used in the bases portion of Sections 3.1.8. In a letter dated 12/9/08, the applicant acknowledged the need for the change and included a mark-up of the applicable sections contained in AP1000 DCD Revision 17. Verification that the change is correctly incorporated in the final revision of the AP1000 DCD is a confirmatory item, CI-SRP16-CTSB-20.

CI-SRP16-CTSB-68

In RAI-SRP-16-CTSB-68, the staff asked the applicant to make an editorial change regarding the documentation of the use of a reference in the bases portion of Sections 3.2.3. In a letter dated 12/2/08, the applicant acknowledged the need for the change and included a mark-up of the applicable sections contained in AP1000 DCD Revision 17. Verification that the change is correctly incorporated in the final revision of the AP1000 DCD is a confirmatory item, CI-SRP16-CTSB-68.

CI-SRP16-CTSB-23

In RAI-SRP-16-CTSB-23, the staff asked the applicant to clarify the mode of applicability stated in the specification and bases portions of Sections 3.2.5. In a letter dated 12/2/08, the applicant

acknowledged the need for the change and included a mark-up of the applicable sections contained in AP1000 DCD Revision 17. Verification that the change is correctly incorporated in the final revision of the AP1000 DCD is a confirmatory item, CI-SRP16-CTSB-23.

CI-SRP16-CTSB-44

In RAI-SRP16-CTSB-44, the staff requested clarification / consistency of Function 6 (overtemperature ΔT) and Function 7 (overpower ΔT) "required channel" column in Table 3.3-1 Reactor Trip System Instrumentation. The applicant added "4 (2/loop)" in the required channel column for clarification. This has been reviewed and accepted by NRC staff. The applicant proposes to implement this change in Revision 18 of the DCD. Verification that these changes are correctly incorporated in the final revision of the AP1000 DCD is a confirmatory item, CI-SRP16-CTSB-44.

CI-SRP16-CTSB-45

In RAI-SRP16-CTSB-45, the staff requested clarification / consistency of Function 12 (RCP speed-low) "required channel" column in Table 3.3-1 Reactor Trip System Instrumentation. The applicant added "4 (1/pump)" in the required channel column for clarification. This has been reviewed and accepted by NRC staff. The applicant proposes to implement this change in Revision 18 of the DCD. Verification that these changes are correctly incorporated in the final revision of the AP1000 DCD is a confirmatory item, CI-SRP16-CTSB-45.

CI-SRP16-CTSB-52

In RAI-SRP16-CTSB-52, the staff requested resolution of conflicting information for the required minimum number of core exit thermocouples per core quadrant. The conflict was between not (b) in Table 3.3.-1 (Post Accident Monitoring) and DCD Table 7.5-1, sheet 2 (Instrumentation and Controls). The applicant changed the Number of Instruments required from "2 quadrants" to "2 quadrants per Division" in Table 7.5-1, sheet 2 (Instrumentation and Controls). This has been reviewed and accepted by NRC staff. The applicant proposes to implement this change in Revision 18 of the DCD. Verification that these changes are correctly incorporated in the final revision of the AP1000 DCD is a confirmatory item, CI-SRP16-CTSB-52.

CI-SRP16-CTSB-08

Although no change was proposed to TS 3.4.6 as part of the AP1000 DC Amendment application, the staff noted inconsistencies between SR 3.4.6.1 requirements and supporting information in the bases B 3.4.6, regarding lift setpoints for pressurizer safety valves. In RAI-SRP16-CTSB-08, the applicant was asked to address these inconsistencies. In its response dated December 17, 2008, the applicant proposed to revise the bases for SR 3.4.6.1 to indicate +/- 1% OPERABLE range for the valve lift settings, to be consistent with SR 3.4.6.1 and with the tolerance established in the AP1000 Overpressure Protection Report. The staff finds this change acceptable, however verification that the change is correctly incorporated in the final revision of the AP1000 DCD is a confirmatory item, CI-SRP16-CTSB-08.

CI-SRP16-CTSB-15

In RAI-SRP16-CTSB-15, the staff asked the applicant to correct Bases B 3.6.6 to accurately reflect the Action statements in TS 3.6.6. In letter dated October 17, 2008, the applicant acknowledged the need for the change and included a mark-up of the applicable sections contained in AP1000 DCD, Revision 17. The staff finds this change acceptable, however, verification that the change is correctly incorporated in the final revision of the AP1000 DCD is a confirmatory item, CI-SRP16-CTSB-15.

CI-SRP16-CTSB-16

In RAI-SRP16-CTSB-16, the staff asked the applicant to correct Bases B 3.6.7 to accurately reflect the Action statements in TS 3.6.7. In letter dated October 17, 2008, the applicant acknowledged the need for the change and included a mark-up of the applicable sections contained in AP1000 DCD, Revision 17. The staff finds this change acceptable, however, verification that the change is correctly incorporated in the final revision of the AP1000 DCD is a confirmatory item, CI-SRP16-CTSB-16.

CI-SRP16-CTSB-13

In RAI-SRP16-CTSB-13, the staff asked the applicant to clarify the Bases B 3.6.4 regarding maximum peak containment pressure. In letter dated December 2, 2008, the applicant acknowledged the need for clarification and included a mark-up of the changes that will be incorporated. The staff finds this change acceptable, however, verification that the change is correctly incorporated in the final revision of the AP1000 DCD is a confirmatory item, CI-SRP16-CTSB-13.

CI-SRP16-CTSB-11

The applicant proposed to change the tolerance for the as-found relief setting for MSSVs in Table 3.7.1-2 from 1% to 3%. In RAI-SRP16-CTSB-11, the applicant was asked to provide justification for the change in Table 3.7.1-2. In its response dated December 17, 2008, the applicant proposed to change this tolerance back to the original value of 1%. Verification that the change is correctly incorporated in the final revision of the AP1000 DCD is a confirmatory item, CI-SRP16-CTSB-11.

CI-SRP16-CTSB-38 and 39

In TS Section 4.3, Fuel Storage, the applicant proposed various changes to the description of the fuel storage area to reflect the final design for new and spent fuel storage racks and an increase of the maximum capacity of the spent fuel storage racks from 616 to 889 fuel assemblies. Evaluation of the final design modification is provided separately in Section 9.1 of this SER. Furthermore, in RAI-SRP16-CTSB-38 and 39, the applicant was asked to address inconsistencies between information provided in the TS 4.3 and DCD Section 9.1. In its response dated December 2, 2008, the applicant proposed revisions to TS Section 4.3 and DCD Section 9.1 to revolve these inconsistencies. Verification that changes are correctly incorporated in the final revision of the AP1000 DCD is a confirmatory item, CI-SRP16-CTSB-38 and 39.

CI-SRP16-CTSB-76

In TS 5.5, Programs and Manuals, and in TS 5.6, Reporting Requirements, the applicant proposed changes to TS 5.5.4, Steam Generator Program, and to TS 5.6.8, Steam Generator Tube Inspection Report, to reflect the implementation of the NRC approved TSTF-449, Revision 4. The staff finds these changes acceptable since implementing TSTF-449 is one acceptable option to address safety issues identified in GL 2006-001, "Steam Generator Tube Integrity and Associated Technical Specifications," Jan 20, 2006. However, since TSTF-449 was prepared to address issues involving steam generator (SG) replacements at current operating plants, in RAI-SRP16-CTSB-76, the staff requested the applicant to make one minor adjustment to their proposed changes in TS 5.5.4 to also accommodate SG initial installations at new nuclear power plants regarding the 100% tube inspection during the first refueling outage. In its response dated December 2, 2008, the applicant agreed to make the suggested adjustment in a future DCD revision. Verification that the change is correctly incorporated in the final revision of the AP1000 DCD is a confirmatory item, CI-SRP16-CTSB-76.