REQUEST FOR ADDITIONAL INFORMATION 452-3297 REVISION 1

9/1/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 14.03.02 - Structural and Systems Engineering - Inspections, Tests, Analyses, and Acceptance Criteria
Application Section: Sections 2.2, 2.4.2, 2.4.6, and 2.5.1 of DCD

QUESTIONS for Technical Specification Branch (CTSB)

14.03.02-9

ITAAC Item 1 in Table 2.2-4

The original RAI question 14.03.02-2 (RAI 1764, Q6454) stated the following:

The design commitment, ITA, and AC should refer to 'each PS/B' not 'the PS/B'. The AC should refer to 'as-built structural configurations' not 'as-build design configurations'. For the AC the reference to 'descriptions' is only applicable to the Table 2.2-2 not the figures. The figures are only horizontal and vertical layouts of the R/B and each PS/B.

In its response to that RAI question, the applicant made all the requested changes to be incorporated in Revision 2 of the DCD, but deleted any references to the figures identified in the original ITAAC in Revision 1 of the DCD.

The staff wants to know why the references to Figures 2.2-1 through 2.2-13 were deleted from the Design Commitment and the AC? The intent of the staff's original RAI question was to eliminate any confusion in the references to Table 2.2-2 and Figures 2.2-1 through 2.2-13 not to delete either of those references.

The staff suggests that the applicant modify the marked up versions of the Design Commitment and the AC in its response as follows: after the word “Table 2.2-2” insert the following: “and as shown on Figures 2.2-1 through 2.2-13.” The regulatory basis for these comments is 10 CFR 50.70 and 10 CFR 50, Appendix B, Criterion III. Design Control.

14.03.02-10

ITAAC Item 3 in Table 2.2-4

The original RAI question 14.03.02-3 (RAI 1764, Q6458) stated the following:

Why does the AC not state that the results of the SIT conformed to the ASME Code, Section III, and the PCCV retains structural integrity at 115% of the rated design pressure of 68 psig? The test pressure has to be 115% of design pressure, but the design commitment does not state a certain pressure just design pressures under 68 psig.

The applicant in its response revised the design commitment by deleting the word "under" and replacing it with the word "with."

The staff does not believe that the applicant addressed all the staff's concerns. The original RAI question addressed both proposed revisions to the design commitment and the AC. The applicant only made the revision to the design commitment. Why does the AC not state something similar to this: "the test results exist and conclude that the PCCV maintains its structural integrity at a test pressure of 115% of the design pressure of 68 psig in accordance with the requirements of ASME Code, Section III? The AC should indicate a measureable quantity that demonstrates the design commitment was met, and the AC should also indicate the difference between the test and design pressures. The regulatory basis for these comments is 10 CFR 50.70 and 10 CFR 50, Appendix B, Criterion III, Design Control.

14.03.02-11

ITAAC Item 15 in Table 2.2-4

The original RAI question 14.03.02-8 (RAI 1764, Q6645) stated the following:

The design commitment is more definitive than the AC. The AC establishes the criteria which ensures that the design commitment is met. The AC should be more definitive than the design commitment or the same as it. For example, the AC could be stated identical to the design commitment. The question is also applicable to the following ITAAC: ITAAC Item 15 in Table 2.2-4 - In addition, should the ITA for this ITAAC also include an analysis in addition to the inspection.

The original concern requested the applicant to modify the AC to be as or more definitive than the Design Commitment. The applicant was responsive to changes for ITAAC Item 14 in Table 2.2-4, however, the response did not fully address similar changes to ITAAC Item 15 which was also referred to in the original RAI question.

Why is the Design Commitment of ITAAC Item 14 not as or more definitve than the Design Commitment? Preferably, at a minimum, the AC should duplicate the Design Commitment.

The regulatory basis for these comments is 10 CFR 50.70 and 10 CFR 50, Appendix B, Criterion III, Design Control.

14.03.02-12

ITAAC Item 8 in Table 2.4.2-5

The original RAI question 14.03.04-26 (RAI 1842, Q7134) stated the following:

The piping identified here should be included with Item 7 in Table 2.4.2-5 or another separate ITAAC should be developed for the piping in this ITAAC. Also applicable the following ITAAC:

ITAAC Item 5.b in Table 2.7.1.2-5 in conjunction with ITAAC 5.a in same table.
ITAAC Item 5.b in Table 2.7.1.9-5 in conjunction with ITAAC 5.a in same table.
ITAAC Item 5.b in Table 2.7.1.10-5 in conjunction with ITAAC 5.a in same table.
ITAAC Item 5.b in Table 2.7.1.11-5 in conjunction with ITAAC 5.a in same table.
ITAAC Item 5.b in Table 2.7.3.1-5 in conjunction with ITAAC 5.a in same table.
ITAAC Item 5.b in Table 2.7.3.5-5 in conjunction with ITAAC 5.a in same table.

The applicant indicated that ITAAC Item 2 in Table 2.4.2-5 serves the same purpose for the piping in ITAAC Item 8 as does ITAAC Item 7.i for the equipment in Table 2.4.2-2.

The staff disagrees with that statement in that if Item 2 serves that purpose for RCS piping, then it also serves that purpose for the remainder of the equipment in the RCS identifed in Table 2.4.2-2. The staff again asks why the equipment in ITAAC Item 7 are treated differently than the piping in ITAAC Item 8? The staff agreed on a specific format for the seismic ITAAC in the other certified designs. The format of ITAAC Item 8 should be similar to the format in ITAAC Item 7. This is also applicable to the ITAAC listed in the original RAI question and to ITAAC Item 5.b in Table 2.4.6-5 (RAI question - 14.03.04-13) and to ITAAC Item 5b in both Tables 2.11.2-2 and 2.11.3-5 (RAI question - 14.03.11-20).

The regulatory basis for these comments is 10 CFR 50.70 and 10 CFR 50, Appendix B, Criterion III, Design Control.

14.03.02-13

ITAAC Items 14 and 15 in Table 2.4.2-5

The original RAI question 14.03.04-30 (RAI 1842, Q 7142) stated the following:

Table 2.4.2-4 lists alarms, displays, and control functions for both MCR and RSC. It seems that both these panels should be represented in Items 14 and 15. It would seem that both the MCR and RSC panels would have all of these alarms, dispalys, and control functions. If that is the case, then items 14 and 15 need to be revised along with Table 2.4.2-4. Several components are listed in US-APWR Tier 1 Table 2.4.2-4 with MCR alarms. No ITAAC entry was noted to verify the retrieval along with Table 2.4.2-4. Also applicable to following ITAAC:

ITAAC Items 11 and 12 in Table 2.4.4-5
ITAAC Items 12 and 13 in Table 2.4.5-5
ITAAC Items 12 and 13 in Table 2.4.6-5
ITAAC Items 10 and 11 in Table 2.7.1.2-5
ITAAC Items 10 and 11 in Table 2.7.1.9-5
ITAAC Items 10 and 11 in Table 2.7.1.11-5

The applicant in its response stated the following: Table 2.4.2-5 will be revised to indicate that the alarms and displays are located at MCR, and the alarms, displays, and

controls are located at RSC. Since controls from MCR are identified in ITAAC Items 8, 10.a, and 10.b, they are not included in ITAAC Item 14. Other similar tables that indicate alarms, displays, and controls, associated with ITAAC cited in the question, will be revised in the same manner as Table 2.4.2-5. The ITAAC cited above will be revised, as applicable, to include the capability of retrieving or verifying the existence of alarms, displays, and controls in the MCR and the RSC. If existing ITAAC items, e.g., for MCR controls of pumps and valves, do not provide complete coverage of the MCR control functions identified on the equipment tables, then the ITAAC are revised as necessary to ensure the control functions are verified. Alarms are included in the RSC ITAAC where necessary to provide complete coverage of RSC alarms, displays, and controls.

The reference in applicant's response of the MCR controls, for example, in Table 2.4.2-5 for the valves and pumps being verified in ITAAC 8, 10.a, and 10.b is incorrect, because those controls are found in ITAAC Items 11 and 13.a. However, Table 2.4.2-4 indicates controls for pressurizer heaters, reactor coolant flow and pressure (flow and pressure transmitters), reactor coolant pump speed (speed sensor), and pressurizer pressure and water level (pressurizer and level transmitters). Some of these identified as controls do not require manual switches to activate them, but the pressurizer heaters do have switches to activate the various banks of heaters. Since these controls in the MCR are not covered by ITAAC Items 11 and 13.a, should not ITAAC Item 14 be more comprehensive so as to include the remainder of MCR controls not included in those two ITAAC? In addition, the control functions for Items 11 and 13.a are determined by a test not an inspection, should not the additional MCR controls and the RSC controls not covered by ITAAC 11 and 13.a be verified by a test also? This RAI question is also applicable to all the ITAAC identified in the original RAI question above and to ITAAC Item 7 in both tables 2.7.5.1-3 and 2.7.5.2-3 (RAI question -14.03.07-18).

The regulatory basis for these comments is 10 CFR 50.70 and 10 CFR 50, Appendix B, Criterion III, Design Control.

14.03.02-14

ITAAC Item 4 in Table 2.5.1-5

The original RAI question 14.03.05-02 (RAI 2047, Q8183) stated the following:

The ITAAC makes reference to level switches in the design commitment and AC. Level switches in this connotation could have two meanings. Actual level switches for measuring level and also the classification of being at the division level. A clarification of what is actually meant is required.

The applicant in its response stated: ITAAC Item 4 in Table 2.5.1-5 requires testing to verify "The PSMS and MCR division level switches provide manual actuation for reactor trip and ESF actuations identified in Tables 2.5.1-2 and 2.5.1-3. From the context of the ITAAC wording, the switches are used to manually initiate reactor trip and ESF actuation functions. The manual switches are division level, not fluid level measurement switches.

The staff requests the applicant to revise this ITAAC to eliminate the term "divisional level" because it is misleading. Section 2.5.1-1 states the following: "The safety grade HSIS includes conventional switches for manual actuation of reactor trip and ESF actuation." Per Table 2.5.1-3, both Main Steam Line Isolation and Main Feedwater Isolation are ESF functions and can be manually actuated. The main steam system is provided with a main steam isolation valve (MSIV) and an associated main steam bypass isolation valve (MSBIV) in each main steam line. There are four main steam lines because there is one main steam line per steam generator, and there are four steam generators per Tier 2 section 10.3.1.1. The MSIVs are designed to fully close within 5 seconds upon receipt of following signals: low main steam line pressure, high-high containment pressure, high main steam line pressure negative rate, and manual actuation per Tier 2 section 10.3.2.3.5. One MFIV is installed in each of the four main feedwater lines outside the containment and downstream of the MFCV per Tier 2 section 10.4.7.2.2. Table 2.5.1-1 refers to switches in question as MCR division level switches. However, for both Main Steam Line Isolation and Main Feedwater Isolation, there are only two manual switches each per Tier 2 Tables 7.1-1 and 7.3-3. The staff wants to know how the manual switches referred to in this ITAAC can all be considered division level switches when there are only two manual switches provided for each of the four divisions of the main steam and main feedwater systems? The staff suggests that this ITAAC could be revised to state in the Design Commitment and AC the following: "PSMS switches in the MCR can be used to manually initiate reactor trip and the ESF functions identified in Tables 2.5.1-2 and 2.5.1-3."

The regulatory basis for these comments is 10 CFR 50.70 and 10 CFR 50, Appendix B, Criterion III, Design Control.

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