

-Meeting Agenda-

US-APWR MHI/NRC Weekly

DCD Chapter 7 Conference Call

September 1, 2011 7:30 – 9:00 am EDT

Room T10-C2

Bridge Line information:

Domestic: 888-455-8930

International: 1-210-839-8710

Pass Code: 87052

Topics for Discussion

Feedback from NRC

1. RAIs:

a. Official Responses

- i. RAI 07.08-11 and 12 (AIL#43)
 - 1. Will provide status in 9/1 call
- ii. RAI 07.09-24 (AIL#42)
 - 1. Staff is reviewing; will provide status in 9/8 call

b. Drafts

- i. RAI 07.01-37, 38 and 39 (AIL#12)
 - 1. Staff has issued response 8/31
 - 2. Issues still open on these questions
 - 3. Provide written response
- ii. RAI 07.08-23 and 24 (AIL#24)
 - 1. Staff will review response including Power Supply discussion
 - 2. See request below on draft Figure 4.2-6
- iii. MHI answer to NRC question on surveillance (AIL#44)
 - 1. Clarification on Question 1-7 – The effectiveness of the Memory Integrity Check vs. the software checks, already being done by the diagnostics in the safety system software, needs to be compared. The amount of overlap of the software faults found and the reliability of the MIC and if it can determine expected changes vs. unexpected changes or errors.
- iv. MHI answer to NRC question on D3 parameters (AIL#45)
 - 1. Staff is reviewing; will provide status in 9/1 call
- v. MHI answer to NRC questions on ISG-04 Conformance Analysis (AIL#46)
 - 1. Staff has received these clarifying responses 8/31 and is reviewing.

2. New Questions

- a. Please see the attachment 1 to this agenda on HFE questions.

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- b. In the DCD Rev.3, concerning Tables 7.2-3/4 “Reactor Trip Variables, Ranges, Accuracies, Response Times, and Setpoints (Nominal).” Did MHI propose those as nominal trip setpoints based on their setpoint methodology?
 - c. Draft of DAS Changes - Attachment-4 to Draft Response to RAI 775-5836, (5/8), Figure 4.2-6 “Configuration of DAS,” does not contain any specific details on the DAS logic. MHI should provide an actual figure of the DAS configuration showing the DAS logic.
 - d. Please see the attachment 2 to this agenda on Tier 1 questions regarding RTS/ EFS. Please do not respond until September 8 conference call. Thank you.
3. Inspections & Audits – Path forward
- a. I&C staff continues have internal meetings with Quality and Vendor Branch
 - b. The intent is to coordinate audits and inspections

Feedback from MHI

- 1. Discussion of Action Items List (Revision 18), as necessary
- 2. Discussion on future MHI submittals, as necessary

Future calls and meetings:

- The next conference call will be September 8.

Opportunity for Public Comment

Adjourn

Attachment 1:

HFE Questions

1. Regulatory guidance:

NUREG-0800, Appendix 18A, Section C states, "A diversity and defense-in-depth (D3) analysis should include the justification of any operator actions that are credited for response to an AOO/PA concurrent with software CCF as described in BTP 7-19.

Evaluation:

MUAP-07006, Section 3.1.3 states: Operator actions may be required within 30 minutes for some events such as feedwater line break and small break loss-of-coolant accidents.

MUAP-07014 contains no mention of operator actions for a feedwater line break.

Question:

1. Are there manual actions associated with feedwater line breaks?

2. Regulatory guidance:

NUREG-0800, Appendix 18A, Section C states, "A diversity and defense-in-depth (D3) analysis should include the justification of any operator actions that are credited for response to an AOO/PA concurrent with software CCF as described in BTP 7-19.

Evaluation:

MUAP-07014, Section 3.3 states: "The Diverse HSI Panel (DHP), which is located in the main control room (MCR), contains conventional switches for manual actuation of the systems and the components which are required to cope with a CCF." (Emphasis added)

The list from the MUAP is reproduced below along with the staff's understanding of how the control is used. Some of these controls do not appear to be credited in the Best Estimate analyses summarized in section 5.

- Manual reactor trip / Turbine trip / Main feedwater isolation
Staff understanding: credited as the diverse reactor trip function and in the SGTR response; otherwise, redundant to automatic signal
- Manual emergency feedwater actuation

Attachment 1:

HFE Questions

Staff understanding: Not credited - Redundant to automatic signal

- Manual emergency core cooling system (ECCS) actuation
Staff understanding: Not credited - Redundant to automatic signal
- Manual containment isolation
Staff understanding: ?? Not addressed in section 5 but appears to be a manual action operators would have to perform.
- Manual operation of emergency feedwater control valves
07014 pg 29: "Since BTP-19 allows the use of best estimate methods, only normal pre-event plant conditions are considered in the D3 Coping Analysis. It is also noted, that spurious closure of these valves due to CCF, concurrent with a design basis event, does not need to be considered, as discussed in Section 5.5 of MUAP-07006 and Section 4 of DI&C Interim Staff Guidance 02. Can CCF shut these valves as part of the event? Same logic is used for SI valves.
- Manual operation of main steam depressurization valves
Staff understanding: Not credited because inadvertent opening is bounded by Chapter 15 event analysis
- Manual operation of safety depressurization valve
Staff understanding: ?? Not addressed in section 5 but appears to be a manual action operators would have to perform.
- Manual operation of main steam isolation valves: 4 switches
Staff understanding: Credited in SGTR

Question:

1. Clarify whether DAS manual actions associated with the controls are credited or just available. If containment isolation and/or operation of the safety depressurization valve actions are credited please include these manual actions in the analysis descriptions in section 5.

3. Regulatory guidance:

NUREG-0800, Appendix 18A, Analysis criterion 4: The sequence of actions uses only alarms, controls, and displays that would be available in the MCR and operable during the assumed CCF scenario(s), as documented in the Failure Modes and Effects Analysis.

Evaluation:

MUAP-07006, Section 3.1.3 states, "Any operator actions credited prior to 30 minutes are justified based on human factors engineering (HFE) evaluation."

MUAP-07014, Section 3.4 (bottom of page 3-6) states, "As described in MUAP-07006, any operator actions credited in the D3 coping analysis are justified based on a Human Factor Engineering (HFE) evaluation."

Attachment 1:

HFE Questions

Several paragraphs later in MUAP-07014, Section 3.4 states, “Tasks for all credited time critical manual operator actions will be analyzed according to the Special Event procedures to confirm adequate time margin between time available and time required.”

Since MUAP-07006 doesn’t actually say what MUAP-07014 says and MUAP-07014 has statements that could be interpreted inconsistently, the staff is asking for MHI to confirm that all manual actions credited in the coping analysis are justified with an HFE evaluation. Many of the manual actions that occur greater than 30 minutes are local actions and thus are inconsistent with regulatory guidance which suggests that any DAS credited actions should be implemented from the control room. The staff is reviewing the use of local manual action as an alternate method and has used the HFE evaluation (and subsequent V&V) as the basis for accepting local manual actions.

Question:

1. Confirm MUAP-07014 statement that, “any operator actions credited in the D3 coping analysis are justified based on a Human Factor Engineering (HFE) evaluation.”
2. Is reference to MUAP-07006 appropriate?

4. Regulatory Guidance:

NUREG-0800, Appendix 18A, Analysis criterion 1: The analysis establishes the time available using an analysis method and acceptance criteria consistent with the guidance of BTP 7-19. The basis for the time available is documented.

Evaluation:

MHI’s Responses to NRC’s RAIs on Topical Report MUAP-07006-P(R1) Defense-in-Depth and Diversity (UAP-HF-08070-P, Revision 0), Response To The Second RAI (APRIL 2, 2008) pgs29-30, RAI #1-analyzed events states:

“SBLOCA violates the integrity of RCPB as an initiator. Therefore, the containment vessel (CV) integrity should be maintained. The US-APWR Probabilistic Risk Assessment, MUAP-07030 shows that for SBLOCA the operator has 4.91 hrs for manual actuation of CV spray to prevent the violation of CV integrity. DAS provides the low pressurizer pressure reactor trip actuation prompting alarm and the CV pressure indicator alerts the operator to the potential need for manual actions to maintain CV integrity. The design attributes for local controls credited in the D3 Coping Analysis, including immunity from the CCF and state based priority, will be added to the next revision of MUAP-07006.”

MUAP-07014 states that the operator has 24 hours to start containment spray

Question:

1. Why is there such a big difference in the time required for operator action between these two documents?

Attachment 2:

Tier 1 Questions on RTS/ ESF ITAAC

New questions for SER Section 7.2, based on Tier 1, Table 2.5.1-6 RT & ESF ITAAC

1. What is the ITAAC that verifies the conformance to RG 1.62? The typical hardwired functions for Reactor trip, ECCS actuation, Turbine trip, Containment vessel spray actuation, Containment vessel isolation, Main steam line isolation, and MCR ventilation isolation have hardwired signal paths that bypass as much computer based processing as is practical. [MUAP-07004, 4.1 Overall I&C System Architecture]
2. What is ITAAC to verify IEEE 601 Section 4.11 "RTS fails to a safe state?" Table 14.3-8 says IEEE 603, 5.1 verifies ITAAC 21.
3. What is ITAAC to verify IEEE 601 Section 4.5?
4. What IEEE 603 section is ITTAC 3 connected to?