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TOKYO, JAPAN

November 24, 2009

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Attention: Mr. Jeffrey A. Ciocco

Docket No. 52-021
MHI Ref: UAP-HF-09532

Subject: MHI's Responses to US-APWR DCD RAI No.472-3794 Revision 1

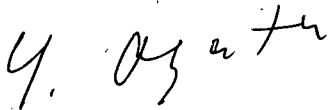
Reference: 1) "REQUEST FOR ADDITIONAL INFORMATION 472-3794 REVISION 1, SRP Section: 06.02.06 – Containment Leakage Testing Application Section: 6.2.6, QUESTIONS for Containment and Ventilation Branch 1 (AP1000/EPR Projects) (SPCV)" dated October 14, 2009.

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Responses to Request for Additional Information No.472-3794 Revision 1."

Enclosed is the responses to Questions 06.02.06-23 through 06.02.06-25 that are contained within Reference 1. The responses to Questions 06.02.06-26 and 06.02.06-27 will be submitted by November 27, 2009.

Please contact Dr. C. Keith Paulson, Senior Technical Manager, Mitsubishi Nuclear Energy Systems, Inc. if the NRC has questions concerning any aspect of the submittals. His contact information is below.

Sincerely,

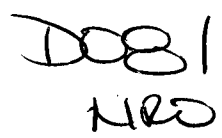


Yoshiaki Ogata,
General Manager- APWR Promoting Department
Mitsubishi Heavy Industries, LTD.

Enclosure:

1. Responses to Request for Additional Information No.472 Revision 1

CC: J. A. Ciocco
C. K. Paulson



Contact Information

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Docket No. 52-021
MHI Ref: UAP-HF-09532

Enclosure 1

UAP-HF-09532
Docket No. 52-021

Responses to Request for Additional Information No.472-3794
Revision 1

November 2009

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

11/13/2009

**US-APWR Design Certification
Mitsubishi Heavy Industries
Docket No. 52-021**

RAI NO.: NO. 472-3794 REVISION 1
SRP SECTION: 06.02.06 – CONTAINMENT LEAKAGE TESTING
APPLICATION SECTION: 6.2.6
DATE OF RAI ISSUE: 10/14/2009

QUESTION NO.: 06.02.06-23

RAI 6.2.6-23:

The staff requested in RAI 6.02-06-5 the applicant to provide:

- 1) A list of those containment isolation valves that will be locally (Type C) leakage rate tested with the test pressure applied in a direction opposite to that which would occur in a DBA.
- 2) For each isolation valve identified in 1), above, please justify that any Type C containment leakage test results conducted in such manner will result in equivalent or more conservative test results.
- 3) Also, provide Figures that are complete and meet the Type C test requirements and guidance related to test direction or provide the required exemption requests and justification.

In a letter dated September 17, 2008, Mitsubishi responded to RAI 6.2.6-5 that Revision 2 of the DCD shall be revised as follows:

Subsection 6.2.6.3 will be revised to add the following text at the end of the subsection:

"CIVs are tested so that the test pressure is applied in the same direction that would occur in a DBA."

During a review of US-APWR DCD Tracking Report #3, the NRC Staff noted that the DCD change was not made as committed in the RAI response. Specifically, the response stated that the following would be added to DCD Section 6.2.6.3

"CIVs are tested so that the test pressure is applied in the same direction that would occur in a DBA." The problem is the proviso "unless shown to be conservative" has been added. This was the issue in the original RAI. If there are to be exceptions to testing in the correct direction, they need to be identified, and the justifications submitted for NRC review at this time. The response stated that there are no exceptions, Yet, the DCD revision did not include a statement to this effect.

Please revise DCD section 6.2.6.3 to clarify that there will be no exceptions to testing in the same direction that would occur in a DBA, or identify exceptions.

ANSWER:

DCD Subsection 6.2.6.3 will be revised to clarify that there will be no exceptions.

Impact on DCD

The second paragraph of the DCD Subsection 6.2.6.3 will be revised as follows:

"CIVs are typically tested so that the test pressure is applied in the same direction that would occur in a DBA. ~~If the test pressurizes any of the pathway's containment barriers in the reverse direction, it must be shown that test results are not affected in a nonconservative manner by directionality.~~"

Impact on COLA

There are no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

11/13/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 472-3794 REVISION 1
SRP SECTION: 06.02.06 – CONTAINMENT LEAKAGE TESTING
APPLICATION SECTION: 6.2.6
DATE OF RAI ISSUE: 10/14/2009

QUESTION NO.: 06.02.06-24

RAI 6.2.6-24:

The staff requested, in RAI 6.2.6-6, that the applicant provide justification for those lines with CIVs indicated on DCD Table 6.2.4-3 which are not planned to be Type C tested. In a letter dated September 17, 2008 MHI provide a response to RAI 6.2.6-6.

The NRC staff reviewed the response and issued RAI 6.2.6-14 to specify that the response to RAI 6.2.6-6 be added to the DCD and to resolve outstanding questions.

In a letter dated April 6, 2009, MHI provided a response to RAI 6.2.6-14.

The NRC staff has reviewed the response and the following issues remain:

Question 1: The NRC staff requested MHI provide an updated justification that clarifies the arrangement of penetrations 209, 226, 257, and 273 in figure 6.2.4-1 Sheet 12. In addition to the proposed changes provided in the response to RAI 6.2.6-14, the text of "Note 4" for Table 6.2.4-3 should be further changed to include the discussion on the steam generator and associated secondary system piping and the containment pressure instrumentation. This discussion is the last two paragraphs of RAI 6.2.6 RAI response.

RAI 6.2.6-14, Question 1, requested an updated justification for not Type C testing CIVs SIS-VLV-225 and RHS-MOV-002 in penetrations 209, 226, 257 & 273. These are valves in the four CS/RHR pump suction lines and are shown on Figure 6.2.4-1 Sheet 12. The MHI response to this question states that SIS-VLV-225 (A,B,C,D) are 3/4" test connection valves inside containment, that are normally closed, under administrative control. Please clarify and indicate on the DCD figure that there are two series valves on this 3/4" line.

ANSWER:

The text of "Note 5" for Table 6.2.4-3 will be revised to include the discussion on the steam generator and associated secondary system piping. The "Note 9" will be newly added to provide justification not planned to be Type C for the containment pressure instrumentation.

Figure 6.2.4-1 Sheet 12 will be revised to indicate size of SIS-VLV-225A, B, C, D is 3/4".

Impact on DCD

Note 5 for Table 6.2.4-3 will be revised as follows:

"The justification for not Type C testing the component cooling water lines to and from the excess letdown heat exchanger and letdown heat exchanger, **and the steam generator and associated**

secondary system piping is that these systems are closed systems inside containment designed and constructed to ASME III, Class 2 and Seismic Category I requirements and as such they do not constitute a potential containment atmosphere leak path during or following a loss-of-coolant accident with a single active failure of a system component.”

“Note 5” will be added in Remark columns of P501, P502, P503, P504, P505, P506, P507, P508, P509, P510, P511, P512, P237R, P237L, P239R and P239L.

Note 9 for Table 6.2.4-3 will be added as follows:

“Note 9 - These lines sense the pressure of containment atmosphere on the inside and are connected to pressure transmitters on the outside. Each of channels has a separate penetration and each pressure transmitter is located immediately adjacent to the outside of the containment wall. It is connected to a sealed bellows located immediately adjacent to the inside containment wall by means of a sealed fluid filled tube. This tubing along with the transmitter and bellows is conservatively designed and subject to strict quality control and to regular in-service inspections to assure its integrity. This arrangement provides a double barrier (one inside and one outside) between the containment and the outside containment. Should a leak occur outside containment, the sealed bellows inside containment, which is designed to withstand full containment design pressure, will prevent the escape of containment atmosphere. Should a leak occur inside containment the diaphragm in the transmitter, which is designed to withstand full containment design pressure, will prevent any escape of containment atmosphere. This arrangement provides automatic double barrier isolation without operator action and without sacrificing any reliability with regard to its safeguards functions. Both the bellows and the tubing inside containment and the transmitter and tubing outside containment are enclosed by protective shielding. The shielding (box, channel, etc.) prevents mechanical damage to the components from missiles, water jets, dropping tools, etc. Because of this sealed fluid filled system, a postulated severance of the line during either normal operation or accident conditions will not result in any release from the containment. If the fluid in the tubing is heated during the accident, the flexible bellows will allow expansion of the fluid without overpressurizing the system and without significant detriment to the accuracy of the transmitter. This arrangement is intended to provide guidance in satisfying Criterion 56 on the other defined basis in that it meets NRC Regulatory Guide 1.11 and consists of a missile protected closed system inside and outside containment. Therefore, in accordance with ANS 56.8-1994, Section 3.3.1, these valves are not required to be Type C tested. (Ref. 6.2-35)”

“Note 9” will be added in Remark columns of P220, P222, P416, P417, P405L, P262R and P262L.

Figure 6.2.4-1 Sheet 12 will be revised to indicate size of SIS-VLV-225A, B, C, D is 3/4”.

Impact on COLA

There are no impacts on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

11/13/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 472-3794 REVISION 1
SRP SECTION: 06.02.06 – CONTAINMENT LEAKAGE TESTING
APPLICATION SECTION: 6.2.6
DATE OF RAI ISSUE: 10/14/2009

QUESTION NO.: 06.02.06-25

RAI 6.2.6-25:

The staff requested the applicant show appropriate vent and drain connections in Figure 6.2.4-1 and the system P&IDs in the DCD.

In a letter dated September 17, 2008, Mitsubishi responded to RAI 6.2.6-7 that Revision 2 of the DCD shall include revisions to subsection 6.2.6.3 as indicated in response to RAI 6.2.6-5, to include P&IDs in the DCD that show all applicable vent and drain connections to support containment isolation testing.

The staff has reviewed the response and when the applicant provides the revised Figure 6.2.4-1 and P&IDs, the staff will review the revision for acceptability of the vent and drain connections shown.

Based on the review of MHI draft Rev. 3 DCD RAI tracking report, the NRC has the following follow up question.

There is some new notation for the added connections: namely, TC, T.C, and TV. TC is defined on the Symbols page (sheet 1, page 6.2-276) as a test connection. Is there a difference between T.C and TC, as both are used on the Figure sheets? If there is a difference, please add definition. If it is a typo, please correct. TV is not defined but in the 8/19 phone call, MHI stated that it is a test vent. Please add this to the notes on Sheet 1 of 51.

During the call MHI stated that the line size of the TC and TV connections was 3/4". Please add this to the notes on Sheet 1 of 51.

The drain connections are still not clearly identified or discussed. During the 8/19 phone call, MHI stated that system valves, not shown on Figure 6.4.2-1, would be used to drain the piping for normal maintenance and also for leak rate testing.

Please add such a statement to Chapter 6, either with Figure 6.4.2-1 or in Section 6.2.6 and clarify that system piping design will allow full draining of fluids from the CIV valve seats.

Staff noted that the P&IDs have not yet been updated to show the test, vent and drain (TVD) connections. During the call MHI stated that would take a longer time and would not be part of Rev. 3 to the DCD. When will this be done?

The staff noted that one P&ID was checked for a test boundary valve for the leak testing of the inboard CIV (CVS-AOV-005) for penetration 277, sheet 5 of 51, CVCS. MHI stated that there was no one boundary valve and that the large portion of the CVCS system shown on DCD Figure 9.3.4-1 would be pressurized as part of the Type C leak rate test. It was stated that this would

probably be the case for other penetrations as well. This raises questions as to the practicality of this approach:

- Are there problems with pressurizing such a large portion of the system with air, including HX tubes and relief valves?
- Will multiple valves, 5 in this example, be sufficiently leak tight to allow the test of the CIV to be completed effectively?

Will the program count leakage out of these 5 boundary valves as part of the leakage for valve CVS-AOV-005 and the Type C test total for Tech Spec purposes?

ANSWER:

These questions are the same of 06.02.04-52, RAI #451-3588. The responses to these questions, UAP-HF-09467, dated September 30, have been submitted to the NRC. Please see this letter.

Impact on DCD

There is no impact on the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.