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April 6, 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-09160

Subject: MHI's Responses to US-APWR DCD RAI No. 267-2016 Revision 1

Reference: 1) "Request for Additional Information No. 267-2016 Revision 1, SRP Section: 06.02.06 – Containment Leakage Testing" dated March 9, 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. 267-2016 Revision 1."

Enclosed are the responses to Questions 6.2.6-14 through 6.2.6-22 that are contained within Reference 1.

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,

Y. Ogata

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

Enclosure:

1. Responses to Request for Additional Information No. 267-2016 Revision 1

CC: J. A. Ciocco
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Docket No. 52-021
MHI Ref: UAP-HF-09160

Enclosure 1

UAP-HF-09160
Docket No. 52-021

Responses to Request for Additional Information No. 267-2016
Revision 1

April 2009

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

04/06/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 267-2016 REVISION 1

SRP SECTION: SRP SECTION: 06.02.06 – CONTAINMENT LEAKAGE TESTING

APPLICATION SECTION: DCD SECTION: 6.2.6 CONTAINMENT LEAKAGE TESTING

DATE OF RAI ISSUE: 03/09/2009

QUESTION NO.: 6.2.6-14

Justify type C test that are not planned

Supplemental RAI to RAI 6.02.06-6. 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. The MHI response to Question 06.02.06-6 provides an acceptable explanation for most of the valves that are listed in DCD Table 6.2.4-3 as having no Type C test. These explanations use the allowable exception in ANS 58.6, Section 3.3.1 (1), namely "Boundaries that do not constitute potential primary containment atmospheric pathways during and following a DBA." The information provided in this RAI response is an important part of the US-APWR design basis and should be included in the DCD.

1. Include this information from the RAI response in a future DCD revision. The staff has reviewed the response and has also identified three aspects of the response that need to be addressed by the applicant:

1) Penetrations 209, 226, 257 & 273 are shown on Figure 6.2.4-1 Sheet 12. These are the four penetrations for the four CS/RHR pump suction lines. For each penetration there are three valves: SIS-VLV-225, RHS-MOV-002, and RHS-VLV-003. The MHI response groups this penetration with several other ECCS penetrations and states that "these valves are either normally open at the time of a LOCA or are opened at some time after the accident to effect immediate and long term core cooling." This is true for RHS-MOV-002, but is not true for SIS-VLV-225 and RHS-VLV-003. These valves are normally closed and don't open post-LOCA (see Table 6.2.4-3 sheet 2 of 8). Please provide an updated justification for these two valves in the DCD.

2) The response states in part, "The justification for the component cooling water (CCW) lines to and from the containment fan coolers..." However, it appears from Table 6.2.4-3, Figure 6.2.4-1, and DCD Chapter 9 that CCW does not cool the containment fan coolers. Further, Table 6.2.4-3 does not indicate penetrations for any such lines. Please correct.

3) The RAI response states in part, "The justification for ... the non-essential chilled water (CW) lines to and from CRDM cooling unit and containment fan cooler 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... Furthermore, inservice testing and inspection of these isolation valves and the associated piping system inside the containment is performed periodically under the inservice inspection requirements of ASME XI as described in subsection 3.9.6 and section 6.6." The CW lines are shown on Figure 6.2.4-1, Sheet 43, and use Penetrations 408 and 409. There is only one containment isolation valve (CIV) per penetration and it is outside containment. DCD Section 9.2.7.3.2, Safety Evaluation for the Non-Essential Chilled Water System, states, "With the exception of piping and valves between and including the containment isolation valves, the system does not perform any safety function." Please update Section 9.2.7.3.2 to include the information in the RAI response related to the CW system.

ANSWER:

MHI's response to RAI 6.2.6-6 will be factored into DCD Revision 2, with additional changes as described below.

Question 1:

SIS-VLV-225 (A,B,C,D) are ¾" test connection valves inside containment, that are normally closed under administrative control. RHS-VLV-003 (A,B,C,D) are relief valves inside containment that discharge to the refueling water storage pit (RWSP) and whose relief setpoints exceed 1.5 times the containment design pressure. SIS-VLV-225 (A,B,C,D) and RHS-VLV-003 (A,B,C,D) are associated with penetrations 209, 226, 257 & 273, as shown on Figure 6.2.4-1, Sheet 12. These penetrations are associated with the RCS hot leg flow path inside containment to the CS/RHR pump suction flow path, which is a closed system outside containment. These lines remain intact and filled with water during and following a DBA, thereby preventing a containment atmosphere pathway past valves SIS-VLV-225, RHS-MOV-002, and RHS-VLV-003 in conjunction with the closed system outside containment. In accordance with ANS 56.8-1994, Section 3.3.1, these valves are not required to be Type C tested. These penetrations will be tested periodically as part of the Containment Integrated Leak Rate Test.

DCD Table 6.2.4-3 will be updated to reflect this response.

Question 2:

Component Cooling Water (CCW) is not supplied to the containment fan cooler units. The Non-essential chilled water system is supplied to the CRDM cooling unit and containment fan cooler units. The response to RAI No. 50-329, Question 06.02.06-6 is revised as follows.

1st Paragraph: Delete the Phrase – "the containment fan coolers,", and change sentence to read, "Type C testing of the safety injection lines, residual heat removal lines, containment spray lines, safety injection pump suction lines, CS/RHR pump suction lines, the component cooling water lines to and from the excess letdown heat exchanger and letdown heat exchanger, ...".

3rd paragraph, 1st sentence: Delete the Phrase – ""the containment fan coolers,", and change 1st sentence to read, "The justification for the component cooling water lines to and from the excess letdown heat exchanger and letdown heat exchanger, ...".

Question 3:

Revision 2 of DCD Section 9.2.7.3.2 will include the information on the containment isolation boundary of CW system. The basis for not completing Type C leak rate testing of the containment isolation valves located in the non-essential chilled water system supply and return piping to the

CRDM cooling unit and containment fan cooler units will be shown in Table 6.2.4-3, as modified below under Question 1.

Impact on DCD

Question 1:

The response to RAI No. 50-329, Question 06.02.06-6, modified to include the clarification provided above, will be incorporated into Table 6.2.4-3 as follows:

Add Note 4 which states **"The justification for not Type C testing the safety injection lines, residual heat removal lines, containment spray lines, safety injection pump suction lines, and CS/RHR pump suction lines is that these systems are closed systems outside 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. Should the valves, including test connection valves or relief valves, leak slightly when closed, the fluid seal within the pipe or the closed piping system outside containment would preclude release of containment atmosphere to the environs. These penetrations will be tested periodically as part of the Containment Integrated leak Rate Test. Furthermore, inservice testing and inspection of these isolation valves and the associated piping system outside the containment is performed periodically under the inservice inspection requirements of ASME XI as described in subsection 3.9.6 and section 6.6. During normal operation, the systems are water filled, and degradation of valves or piping is readily detected. Therefore, in accordance with ANS 56.8-1994, Section 3.3.1, these valves are not required to be Type C tested.**

Note 4 will be added to Table 6.2.4-3 for the following penetrations: 152, 151, 153, 154, 155, 156, 157, 158, 209, 226, 257, 273,

Add Note 5 which states **"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 non-essential chilled water lines to and from CRDM cooling unit and containment fan cooler 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. Should the valves leak slightly when closed, the fluid seal within the pipe or the closed piping system inside containment would preclude release of containment atmosphere to the environs. These penetrations will be tested periodically as part of the Containment Integrated leak Rate Test. Furthermore, inservice testing and inspection of these isolation valves and the associated piping system inside the containment is performed periodically under the inservice inspection requirements of ASME XI as described in subsection 3.9.6 and section 6.6. During normal operation, the systems are water filled, and degradation of valves or piping is readily detected. Therefore, in accordance with ANS 56.8-1994, Section 3.3.1, these valves are not required to be Type C tested.**

Note 5 will be added to Table 6.2.4-3 for the following penetrations: 233, 235, 250, 252, 408, and 409.

Question 2:

There is no impact on the DCD.

Question 3:

The following paragraph will be added after first paragraph of Subsection 9.2.7.3.2.

> **The non-essential chilled water lines to and from CRDM cooling unit and containment fan coolers that form the containment penetration isolation boundary are designed and constructed to ASME III, Class 2 and Seismic Category I requirements**.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

04/06/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 267-2016 REVISION 1

SRP SECTION: SRP SECTION: 06.02.06 – CONTAINMENT LEAKAGE TESTING

APPLICATION SECTION: DCD SECTION: 6.2.6 CONTAINMENT LEAKAGE TESTING

DATE OF RAI ISSUE: 03/09/2009

QUESTION NO.: 6.2.6-15

Clarify the Type A test acceptance criteria for preoperational and operational tests

The staff requested in RAI 6.2.6-10, that the applicant provide details of pre-operational leak rate testing methods or provide an appropriate reference. The staff also requested that the applicant provide the acceptance criteria associated with pre-operational leakage rate test or provide an appropriate reference.

In a letter dated September 17,2008 Mitsubishi provided the following response to RAII 6.2.6-10:

"Preoperational test abstract 14.2.12.1.62, Containment Local Leak Rate Preoperational Test specifies acceptance criteria in item D.1 by reference to Technical Specifications SR 3.6.1.1 and B 3.6.1. Technical Specifications section B 3.6.1, Containment Bases, in the discussion of bases for SR 3.6.1.1, identifies acceptance leak rates of <0.6 La for combined Type B and C leakage and <0.75 La for overall Type A leakage, consistent with ANSI/ANS 56.8. The Applicable Safety Analyses section of B 3.6.1 specifies the values of La and Pa. The Background section of B 3.6.1 identifies the use of Option B of 10CFR50 Appendix J. Compliance with 10CFR50 Appendix J, RG 1.163 and NEI 94-01 is specified in subsections 6.2.6 and 6.2.6.4 of the DCD. NEI-94-01, revision 0, endorses ANSI/ANS-56.8-1994.
MHI will revise the subsections 14.2.12.1.62 and 14.2.12.1.63 to clearly specify the use of RG 1.163 and NEI 94-01 for test methods and acceptance criteria, and correct an error in Chapter 16 Subsection 5.5.16 to remain consistent with ANSI/ANS-56.8".

The staff has reviewed the response and has identified that the following needs to be addressed by the applicant:

The MHI response states that preoperational test methods and acceptance criteria will meet RG 1.163, NEI 94-01 and ANSI/ANS-56.8-1994. This is acceptable for the test methods. However, for acceptance criteria the preoperational test revision provided is not so clear.

Supplemental RAI to RAI 6.02.06-10. The NRC – endorsed guidance for Type A test acceptance

criteria from RG 1.163, NEI 94-01 and ANSI/ANS-56.8-1994 is somewhat detailed in that it involves statistical confidence levels and corrections for isolated or improperly vented/drained penetrations.

For the preoperational Type A test the MHI response to Question 06.02.06-10 states that preoperational test methods and acceptance criteria will meet RG 1.163, NEI 94-01 and ANSI/ANS-56.8-1994. This is acceptable. However, the proposed changes to DCD Chapter 14 test abstracts state that the testing will be done using the Containment Leak Rate Testing (CLRT) Program defined in TS Chapter 16 subsection 5.5.16. Please clarify in DCD 14.2.12.1.63 that acceptance criteria will meet the guidance in RG 1.163, NEI 94-01 and ANSI/ANS-56.8-1994.

For Type A tests during plant operation, DCD Section 6.2.6 refers only to TS Section 5.5.16 for acceptance criteria and gives a value of 0.75 La.

TS Section 5.5.16 also gives an acceptance value of 0.75 La however does not reference the guidance documents or provide more detail. Please clarify in DCD Section 6.2.6 that the operational Type A test acceptance criteria will meet the guidance in RG 1.163, NEI 94-01 and ANSI/ANS-56.8-1994.

ANSWER:

MHI will revise preoperational test 14.2.12.1.63, Acceptance Criterion D.1, to specify that acceptance criteria will meet the guidance in RG 1.163, NEI 94-01 and ANSI/ANS-56.8-1994.

MHI will revise section 6.2.6 to specify that the operational Type A test acceptance criteria will meet the guidance in RG 1.163, NEI 94-01 and ANSI/ANS-56.8-1994.

Impact on DCD

1. Further revise preoperational test 14.2.12.1.63, Containment Integrated Leak Rate Test (ILRT) Preoperational Test, in addition to changes identified in response to RAI-50 revision 0, Question 06.02.06-10, on page 14.2-88 as follows:

D. Acceptance Criterion

1. The containment integrated leakage does meet requirements for the "first unit startup following testing" Type A test defined in Chapter 16, Technical Specifications, Surveillance Requirement SR 3.6.1.1 and B 3.6.1, Containment, Bases and Chapter 16 subsection 5.5.16. **Test results meet the guidance for acceptance provided in RG 1.163, NEI 94-01 and ANSI/ANS-56.8-1994.**

2. The November 7, 2008 draft DCD Subsection 6.2.6.1 will be further revised as shown:

The maximum allowable containment leakage rate, L_a, the calculated peak containment internal pressure for the design basis loss of coolant accident, P_a, and the acceptance criteria for the Type A tests is specified by the Technical Specifications in Subsection 5.5.16. For the initial preoperational test, the integrated leak rate shall be < 0.75 L_a. For periodic Type A tests, the containment leakage rate acceptance criteria is 1.0 L_a. During the first unit startup following testing in accordance with the containment leak rate testing program, the leakage rate acceptance criteria are < 0.75 L_a for Type A tests. **Test methods, analysis and acceptance criteria for Type A testing meet the guidance of RG 1.163, NEI 94-01 and ANSI/ANS-56.8-1994.**

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

04/06/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 267-2016 REVISION 1

SRP SECTION: SRP SECTION: 06.02.06 – CONTAINMENT LEAKAGE TESTING

APPLICATION SECTION: DCD SECTION: 6.2.6 CONTAINMENT LEAKAGE TESTING

DATE OF RAI ISSUE: 03/09/2009

QUESTION NO.: 6.2.6-16

Confirm and document accommodation for Inspection of Containment Penetrations 10 CFR 50 App. A, GDC 53, states in part that "The reactor containment shall be designed to permit (1) appropriate periodic inspection of all important areas such as penetrations. DCD Section 6.2.1.6, Testing and Inspections, states that Section 6.2.4.4 provides a description of the testing and inspection of the containment isolation system DCD Section 6.2.4.4 discusses Type A, B & C leakage testing but does not mention inspection. Please confirm that the US-APWR containment will be designed to permit appropriate periodic inspection of all important areas such as penetrations.

ANSWER:

GDC 53, states in part that "The reactor containment shall be designed to permit (1) appropriate periodic inspection of all important areas such as penetrations. Section 3.1.5.4.1 provides discussion of compliance to GDC 53 and indicates that penetrations are to be visually inspected and pressure tested for leak-tightness at periodic intervals. Inspection, surveillance, and periodic testing of reactor containment penetrations, particularly those with resilient seals and expansion bellows, will be performed to provide assurance that containment penetrations will function as designed in terms of leakage and will not contribute unduly to offsite radiation doses. The containment will be designed to allow periodic inspection. The US-APWR leakage rate testing program implements RG 1.163 (Ref. 6.2-30) which endorses NEI 94-01 (Ref 6.2-31) with modifications. Section 9.2.1 of NEI 94-01 as modified by RG 1.163 provides guidance for the visual examination of accessible interior and exterior surfaces of the containment system. These inspections can be performed in conjunction with the ASME Boiler and Pressure Vessel Code, Section XI, required examinations.

Impact on DCD

DCD Section 6.2.4.4 will be revised by inserting the following paragraph in the last of Section 6.2.4.4:

> **Inspection, surveillance, and periodic testing of reactor containment penetrations, particularly those with resilient seals and expansion bellows, will be performed to provide assurance that containment penetrations will function as designed in**

accordance with the requirements of GDC 53. The US-APWR leakage rate testing program implements RG 1.163 (Ref. 6.2-30) which endorses NEI 94-01 (Ref 6.2-31) with modifications.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

04/06/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 267-2016 REVISION 1

SRP SECTION: SRP SECTION: 06.02.06 – CONTAINMENT LEAKAGE TESTING

APPLICATION SECTION: DCD SECTION: 6.2.6 CONTAINMENT LEAKAGE TESTING

DATE OF RAI ISSUE: 03/09/2009

QUESTION NO.: 6.2.6-17

Clarify the exception to venting and draining for type A tests.

The draft revision to DCD Section 6.2.6 dated Nov. 7, 2008, provides for vent and drain conditions to be established prior to the Type A test. One exception taken in the draft DCD is that "Pathways which are Type B or C tested within the previous 24 calendar months need not be vented or drained." This is contained in NEI 94-01 but has a number of added provisos, not included in the DCD. As stated in the DCD, this would permit the Type A test with no venting or draining of any penetration during the preoperational test. For operational Type A tests, make this exception consistent with the NEI 94-01 wording, and clarify that it does not apply to the preoperational Type A test.

ANSWER:

NEI 94-01 Provisions for Exceptions to Vent and Drain Requirements

Provisions applicable to the use of local leak rate test results as an alternative to venting and draining a leakage pathway during Type A test are found in Section 8 of NEI 94-01 as follows:

"It should be noted that the Type B or C tests performed on those pathways must test all of its containment barriers. This includes bonnets, packings, flanged joints, threaded connections, and compression fittings. If the Type B or C 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. The As-found and the As-left leakage rate for all pathways that are not drained and vented must be determined by Type B and Type C testing within the previous 24 calendar months of the time that the Type A test is performed and must be added to the Type A leakage rate UCL to determine the overall La surveillance acceptance criteria in accordance with the definition in ANSI/ANS 56.8-1994."

As described in the November 7, 2008 draft DCD Subsection 6.2.6, the containment leakage testing program uses the specific methods and guidance of NEI 94-01 and ANSI/ANS 56.8-1994. Therefore, the provisions quoted above apply to the US-APWR program. The DCD Subsection 6.2.6.1 description of venting and draining leakage pathways during Type A testing will be further clarified to invoke the provisions of NEI 94-01.

Applicability of Vent and Drain Exceptions to the Preoperational Type A Test

Paragraph 3.2.2 of ANSI/ANS 56.8-1994 applies to the preoperational Type A test and includes

criteria to account for Type B or C leakage that is not accounted for in the Type A test. If the criteria for exceptions to venting and draining leakage pathways are met during the preoperational Type A test, and Type B or C testing is used as an alternative to venting and draining, then paragraph 3.2.2 of ANSI/ANS 56.8-1994 would require the Type B or C leakage rate to be added to the Type A test leakage rate upper confidence limit.

As stated in the November 7, 2008 draft DCD Subsection 6.2.6, Type A testing is conducted in accordance with ANSI/ANS-56.8-1994. The DCD will be further clarified to state that exceptions to venting and draining leakage pathways during Type A tests are in accordance with ANSI/ANS 56.8-1994 and NEI 94-01.

Impact on DCD

The November 7, 2008 draft DCD Subsection 6.2.6.1 will be further revised by adding the last bullet shown below:

Vent and Drain conditions are established as follows prior to the Type A test:

- Portions of fluid systems, which are part of the containment boundary that may be opened directly to the containment or outside atmosphere under post-accident conditions, are opened or vented to the appropriate atmosphere to place the containment in conditions as close to post-accident conditions as possible.
- Portions of closed systems inside containment that penetrate containment and rupture as a result of a loss of coolant accident shall be vented to the containment atmosphere.
- All vented systems shall be drained of water or other fluids to the extent necessary to assure exposure of the system containment isolation valves to containment air test pressure and to assure they will be subjected to the post accident differential pressure.
- Systems that are required to maintain the plant in a safe condition during the test shall be operable in their normal mode, and need not be vented.
- Pathways in systems that are normally filled with fluid and operable during postaccident conditions are not required to be vented.
- Portions of the pathways outside of containment that are designed to Seismic Category I and to at least Safety Class 2 are not required to be vented.
- Pathways which are Type B or C tested within the previous 24 calendar months need not be vented or drained.
- For planning or scheduling purposes, or ALARA considerations, pathways in systems which are required for proper conduct of the Type A test need not be vented or drained.
- **Exceptions to venting and draining leakage pathways during Type A tests are in accordance with ANSI/ANS 56.8-1994 and NEI 94-01.**

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

04/06/2009

US-APWR Design Certification

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Docket No. 52-021

RAI NO.: NO. 267-2016 REVISION 1

SRP SECTION: SRP SECTION: 06.02.06 – CONTAINMENT LEAKAGE TESTING

APPLICATION SECTION: DCD SECTION: 6.2.6 CONTAINMENT LEAKAGE TESTING

DATE OF RAI ISSUE: 03/09/2009

QUESTION NO.: 6.2.6-18

Clarify Local Leak Rate Testing acceptance criteria in DCD 6.2.6

In an enclosure to a letter, dated November 7, 2008 you provided additional information on the test method for Type A, B & C Tests as Supplemental information related to COL item 6.2(8). This information is to be included in section 6.2.6 of Revision 2 of the DCD. The staff has reviewed this information and the following additional information is required:

The last paragraph of the Nov. 7, 09 draft of DCD Section 6.2.6.2, "Containment Penetration Leakage Rate Testing", discusses acceptance criteria for Type B or Type C testing. Please clarify that these criteria apply to both the preoperational and the periodic operational leak rate tests.

ANSWER:

DCD Subsection 6.2.6.2 will be revised to provide the requested clarification as shown below.

Impact on DCD

The last paragraph in the November 7, 2008 draft DCD Subsection 6.2.6.2 Containment Penetration Leakage Rate Testing will be revised as follows:

"Acceptance criteria for the combined As-left leakage rate for all penetrations subject to Type B or Type C **preoperational and periodic operational** testing is < 0.60 La, consistent with NEI 94-01 (Ref. 6.2-31). The combined leakage rate determinations are based on the latest leakage rate test data available and are maintained as a running summation of the leakage rates."

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

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04/06/2009

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SRP SECTION: SRP SECTION: 06.02.06 – CONTAINMENT LEAKAGE TESTING

APPLICATION SECTION: DCD SECTION: 6.2.6 CONTAINMENT LEAKAGE TESTING

DATE OF RAI ISSUE: 03/09/2009

QUESTION NO.: 6.2.6-19

Provide additional details regarding test connections, vents and drains for containment isolation valves.

In an enclosure to a letter, dated November 7, 2008 you provided additional information on the test method for Type A Tests as Supplemental information related to COL item 6.2(8). This information is to be included in section 6.2.6 of Revision 2 of the DCD. The staff has reviewed this information and the following additional information is required:

Include a discussion regarding administrative controls for test connections, vents and drains for containment isolation valves to ensure that containment integrity is restored after testing and maintained. Please state that all test, vent, and drain connections that are used to facilitate local leakage rate testing and the performance of the CILRT are under administrative control and are subject to periodic surveillance, to ensure their integrity and to verify the effectiveness of administrative controls.

ANSWER:

Test connections, vents, and drain connections that are part of the containment boundary are depicted in DCD Figure 6.2.4-1. The containment isolation provisions for such lines are identified in DCD Table 6.2.4-3, typically as ¾ -inch manual valves that are closed during normal, shutdown and post-accident conditions. Containment isolation of leak rate testing system (LTS) penetrations, using flanges, is also shown in DCD Figure 6.2.4-1 and Table 6.2.4-3. As is the case with containment isolation features in general, test connections, vents, and drain connections that are part of the containment boundary are subject to administrative control and periodic surveillance consistent with their containment isolation function. This includes verification of closure after being opened (e.g., for containment leakage rate testing).

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.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

04/06/2009

US-APWR Design Certification

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SRP SECTION: SRP SECTION: 06.02.06 – CONTAINMENT LEAKAGE TESTING

APPLICATION SECTION: DCD SECTION: 6.2.6 CONTAINMENT LEAKAGE TESTING

DATE OF RAI ISSUE: 03/09/2009

QUESTION NO.: 6.2.6-20

This item was deleted.

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04/06/2009

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SRP SECTION: SRP SECTION: 06.02.06 – CONTAINMENT LEAKAGE TESTING

APPLICATION SECTION: DCD SECTION: 6.2.6 CONTAINMENT LEAKAGE TESTING

DATE OF RAI ISSUE: 03/09/2009

QUESTION NO.: 6.2.6-21

Clarify where the Containment Leakage Testing Program will reside.

TS 5.5.16 and TS 3.6.1 both refer to a Containment Leakage Testing Program. Rev. 1 of the DCD specified that this Program was to be developed by the COL holder. The draft revision to the DCD dated Nov. 7, 2008 removes that requirement from the COL item, but it has not revised the TS. Is this program to be the new DCD section 6.2.6 or is it a licensee program that is still to be developed? Clarify the Containment Leakage Testing Program referred to by the TS and when it will be developed.

ANSWER:

US-APWR Technical Specification (TS) 5.5.16 requires a COL holder referencing the certified design to implement a containment leakage testing program as required by 10 CFR 50.54(o) and 10 CFR 50 Appendix J. TS 5.5.16 is based on the NUREG-1431 standard TS and is not impacted by the changes to COL 6.2(8) cited in this question. The November 7, 2008 draft DCD Subsection 6.2.6 provides a description of the containment leakage testing program, to provide more detail than the standard TS program requirement and facilitate NRC review of the program's acceptability. DCD COL 6.2(8), as revised in MHI's letter of November 7, 2008, requires the COL applicant to identify the implementation milestone for the containment leakage rate testing program. COL 6.2(8) is consistent with the general approach to addressing operational programs as described in DCD Section 13.4, which includes the following COL item:

> *"COL 13.4(1) The COL Applicant is to develop a description and schedule for the implementation of operational programs. The COL Applicant is to "fully describe" the operational programs as defined in SECY-05-0197 (Ref. 13.4-1) and provide commitments for the implementation of operational programs required by regulation. In some instances, programs may be implemented in phases. The COL Applicant is to include the phased implementation milestones in their submittal."*

Impact on DCD

There is no impact to the DCD.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

04/06/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 267-2016 REVISION 1

SRP SECTION: SRP SECTION: 06.02.06 – CONTAINMENT LEAKAGE TESTING

APPLICATION SECTION: DCD SECTION: 6.2.6 CONTAINMENT LEAKAGE TESTING

DATE OF RAI ISSUE: 03/09/2009

QUESTION NO.: 6.2.6-22

Provide additional details regarding test prerequisites and testing of instrumentation lines that are not locally leakage rate tested.

In an enclosure to a letter, dated November 7, 2008 you provided additional information on the test method for Type A Tests as Supplemental information related to COL item 6.2(8). This information is to be included in section 6.2.6 of Revision 2 of the DCD. The staff has reviewed this information and the following information is required:

Include a discussion regarding Type A testing methods for instrumentation lines. Please confirm that instrumentation lines that are not locally leakage rate tested are not isolated from the containment atmosphere during the performance of the CILRT. Confirm that measured leakage rates from instrumentation lines that are locally leakage rate tested and isolated during the CILRT are added to the CILRT results. Confirm that provisions are made to ensure that instrumentation lines isolated to the CILRT are restored to their operable status following the test.

ANSWER:

Instrument lines penetrating containment are depicted in DCD Figure 6.2.4-1 for the following penetrations:

Containment pressure instrumentation penetrations:
P220
P222
P416
P417
P405L

Containment pressure detection (for containment purge)
262R
262L

Containment leak rate testing pressure detection line
223
405R

Containment isolation provisions for each of these penetrations are listed in Table 6.2.4-3, which identifies Type C leak rate testing applicability. As is the case with potential containment leakage pathways in general, instrument lines penetrating containment are accounted for as potential

leakage pathways (i.e. via local leak rate testing or Type A testing) in accordance with the containment leakage testing program that conforms to ANSI/ANS 56.8-1994, NEI 94-01 and NRC RG 1.163.

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.