

### 16-5, KONAN 2-CHOME, MINATO-KU TOKYO, JAPAN

March 30, 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-09133

Subject: MHI's Responses to US-APWR DCD RAI No. 271-2292

Reference: 1) "Request for Additional Information No. 271 Revision 0, SRP Section:

14.02 – Initial Plant Test Program – Design Certification and New License Applicants, Application Section: 14.2 Initial Test Program" dated March 10,

2009.

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Response to Request for Additional Information No. 271 Revision 0".

Enclosed is the response to Questions 14.02-113 and 14.02-114 that is 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,

M. Dy & Lu

Yoshiki Ogata,

General Manager- APWR Promoting Department

Mitsubishi Heavy Industries, LTD.

Enclosure:

1. Responses to Request for Additional Information No. 271-2292 Revision 0

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

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# **Contact Information**

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Docket No. 52-021 MHI Ref: UAP-HF-09133

# Enclosure 1

UAP-HF-09133 Docket No. 52-021

Responses to Request for Additional Information No. 271 Revision 0

March 2009

#### RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

3/30/2009

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

RAI NO .:

NO. 271-2292 REVISION 0

SRP SECTION:

14.02 - Initial Plant Test Program - Design Certification and New

**License Applicants** 

**APPLICATION SECTION: 14.2** 

DATE OF RAI ISSUE:

3/10/2009

**QUESTION NO.: 14.02-113** 

In telecons held with MHI on February 17 and February 26, 2009, the staff requested, and MHI accepted, the modifications to MHI's response to RAI No. 70, Question 14.02-87 bolded in the text below. This supplemental RAI is being submitted to MHI to document MHI's acceptance of the staff's recommended changes to MHI's response to RAI No. 70, Question 14.02-87.

#### 14.2.8.2 Prototype Test Results

14.2.8.2.1 Natural Circulation Testing

For subsequent plants, the COL applicant(s) shall either perform the test, or shall provide a justification for not performing the test based on an evaluation of the results of previous natural circulation tests and a comparison of RCS hydraulic resistance coefficients applicable to normal flow conditions, with NRC concurrence, provided that:

- Test results from the US-APWR reference prototype plant indicate that natural circulation flow rates are adequate to ensure that core decay heat removal, boron mixing, plan cooldown/ depressurization, and stable natural circulation conditions are maintained throughout the test.
- The as-built plant and US-APWR reference prototype plant configurations are the same relative to the general configuration of the piping and components in each reactor coolant loop, the general arrangement of the reactor core and internals, and similar elevation head represented by these components and the system piping.
- The hydraulic resistance coefficients applicable to normal flow conditions and temperature data, and loss of coolant flow delay-time data (as measured during the RCS Flow Measurement Test in Subsection I4.2.12.2.4.12 and during the RCS Flow Coastdown Test in Subsection 14.2.12.2.1.13) are comparable with the reference prototype plant.
- The results of the natural circulation test from the US-APWR reference prototype plant are
  incorporated into the operator simulator a plant-referenced simulator that meets the
  requirements of 10 CFR § 55.46 (c) and used in the operator training program to provide
  training on plant evaluation and off-normal events for each operating shift.

(Supplement to RAI No. 70, Question 14.02-87)

#### ANSWER:

MHI concurs with the changes proposed above and has provided a revised response to RAI-70

Question 14.02-87 per UAP-HF-09092 (Reference 1).

Impact on DCD

See UAP-HF-09092 (Reference 1).

Impact on COLA

See UAP-HF-09092 (Reference 1).

Impact on PRA

There is no impact on the PRA.

#### Reference 1:

"MHI's Amended Response to RAI-70 US-APWR DCD RAI No.70 Revision 0" dated April 3, 2009 (MHI ref. UAP-HF-09092)

#### RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

3/30/2009

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

RAI NO .:

NO. 271-2292 REVISION 0

SRP SECTION:

14.02 - Initial Plant Test Program - Design Certification and New

**License Applicants** 

**APPLICATION SECTION: 14.2** 

DATE OF RAI ISSUE:

3/10/2009

**QUESTION NO.: 14.02-114** 

In telecons held with MHI on February 17 and February 26, 2009, the staff requested, and MHI accepted, the modifications to MHI's response to RAI No. 27, Question 14.02-8 bolded in the text below. This supplemental RAI is being submitted to MHI to document MHI's acceptance of the staff's recommended changes to MHI's response to RAI No. 27, Question 14.02-8.

In response to RAI No. 27, Question 14.02-8, MHI letter UAP-HF-08199, dated September 30, 2008, transmitted MUAP-08009, "US-APWR Test Program Description," Revision 0, to the staff. Enclosure 1 of the MHI letter documents MHI's proposed changes to the US-APWR DCD, Revision 1.

As noted in Enclosure 1, based on MHI's submittal of MUAP-08009, MHI will delete the following COL information items in the next revision of the DCD:

COL information items 14.2(1), 14.2(3), 14.2(4), 14.2(5), and 14.2(6).

MHI's submittal of MUAP-08009 also partially resolves COL information item 14.2(2), which will now read:

The COL Applicant reconciles the site-specific organization, organizational titles, organizational responsibilities, and reporting relationships to be consistent with <u>USAPWR Test Program</u> <u>Description Technical Report</u>, MUAP-08009 (Reference 14.2-29).

COL information items 14.2(7), 14.2(8), 14.2(9) and 14.2(10) remain unchanged.

The staff agrees with MHI's proposed changes to the COL information items documented in Section 14.2.13, "Combined License Information," of the DCD, Revision 1.

The staff proposes the following change to MHI's original response:

The staff recommends that COL information items 14.2(7), 14.2(8), and 14.2(9) be combined into one COL information item. The new COL information item should also include the RG 1.68, Section C.4, recommendation that approved test procedures for satisfying FSAR

testing requirements should be made available to the NRC approximately 60 days prior to their intended use.

Supplement to RAI No. 27, Question 14.02-8)

#### ANSWER:

MHI concurs with the NRC recommendations.

Changes pending to revision 1 of the DCD in section 14.2.13 are summarized as follows:

Proposed changes to COL Items 14.2(1) through 14.2(6) remain consistent with the changes proposed in UAP-HF-08199 (Reference 3), Enclosure 1, i.e., deletion of items 14.2 (1), (3), (4), (5), and (6) and revision to 14.2(2).

COL items 14.2(7), 14.2(8), 14.2(9) will be combined as COL item 14.2(7).

MHI will add a new COL item for the RG 1.68, Section C.4, recommendation that approved test procedures for satisfying FSAR testing requirements should be made available to the NRC approximately 60 days prior to their intended use. Since this is a commitment that can not be closed by the COL application, MHI proposes to keep this as a separate requirement. Note that this requirement is also stated in sections 14.2.3 (2<sup>nd</sup> paragraph), 14.2.11 (2<sup>nd</sup> paragraph) 14.2.12.1 (2<sup>nd</sup> paragraph) of the DCD.

#### Impact on DCD

#### See Attachment 1.

Other changes to the DCD revision 1 shown in Attachment 1 have been proposed separately by UAP-HF-08199 (Reference 1) for items 14.2(1) though (6), UAP-HF-08265 (Reference 2) for 14.2(10) and UAP-HF-08163 (Reference 3) for 14.2(11).

#### Impact on COLA

This revision impacts revision 0 of the COLA FSAR (Docket #s 52-034 and 52-035) in Subsection 14.2.1 through 14.2 6, 14.2.13, Appendix 14AA, and Table 1.8-201.

#### Impact on PRA

There is no impact on the PRA.

#### Reference 1:

"Transmittal of the Technical Report "US-APWR Test Program Description" (MUAP-08009)" dated September 30, 2008 (MHI Ref. UAP-HF-08199)

#### Reference 2

"MHI's Response to US-APWR DCD RAI No. 93 Revision 0" dated December 5, 2008 (MHI Ref. UAP-HF-08265)

#### Reference 3:

"MHI's Response to US-APWR DCD RAI No. 31" dated August 29, 2008 (MHI ref. UAP-HF-08163)

# Attachment 1

US-APWR DCD Chapter 14 Mark-up

**RESPONSE TO RAI No. 271 Revision 0** 

#### 14.2.13 Combined License Information

- COL 14.2(1)

  <u>Deleted The COL applicant is responsible for describing the program for the testing of other components and systems that are site-specific. Testing of these items demonstrates that they meet requirements as defined in the Final Safety Analysis Report (FSAR). [14.2.1]</u>
- COL 14.2(2) The COL applicant provides a description of the organization(s) responsible for all phases of the ITP, and provide a description of the administrative controls that assure that experienced and qualified supervisory personnel and other principal participants are responsible for managing, developing, and conducting the ITP. [14.2.2]The COL Applicant reconciles the site-specific organization, organizational titles, organizational responsibilities, and reporting relationships to be consistent with US-APWR Test Program Description Technical Report, MUAP-08009 (Reference 14.2-29) [14.2.2].
- COL 14.2(3) <u>Deleted The COL applicant provides the process used to develop test specifications and test procedures. [14.2.3]</u>
- COL 14.2(4) <u>Deleted</u>The <u>COL</u> <u>applicant</u> <u>develops a description of the administrative controls that govern the conduct of test program. These controls include requirements that govern the activities of the startup organization and their interface with other organizations. [14.2.4]</u>
- COL 14.2(5)

  <u>Deleted</u>The <u>COL</u> applicant develops a description of the specific controls for the review, evaluation, and approval of test results of the program by appropriate personnel and/or organizations, including the methods and schedules for approval of test data for each major phase. [14.2.5]
- COL 14.2(6) <u>Deleted</u>The COL applicant develops a description of the specific controls for the preparation and retention of test records. [14.2.6]
- COL 14.2(7) The COL applicant provides an event-based schedule, relative to fuel loading, for conducting each major phase of the test program, and a schedule for the development of plant procedures that assures required procedures are available for use during the preparation, review and performance of preoperational and startup testing. For multiunit sites, the COL applicant discusses the effects of overlapping initial test program schedules on organizations and personnel participating in each ITP. The COL applicant identifies and cross-references each test or portion of a test required to be completed prior to fuel load which satisfies ITAAC requirements. [14.2.9] [14.2.11]
- COL 14.2(8) The COL applicant-provides an event-based schedule, relative to fuel

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loading, for conducting each major phase of the test-program. For multiunit sites, the COL applicant discusses the effects of overlapping initial test program schedules on organizations and personnel participating in each ITP. Deleted [14.2.11]

- COL 14.2(9) <u>Deleted The COL applicant identifies and cross-references each test</u> or portion of a test required to be completed prior to fuel load which satisfies ITAAC requirements. [14.2.11]
- The COL applicant is responsible for the testing outside scope of the certified design in accordance with the test criteria described in subsection 14.2.1.—And testing of the following is required. [14.2.12]

  Personnel monitors and radiation survey instruments
- COL 14.2(11)

  The COL holder for the first plant is to perform these tests. For subsequent plants, either these tests are performed, or the COL applicant provides a justification that the results of the first-plant only tests are applicable to the subsequent plant and are not required to be repeated. [14.2.8]
- COL 14.2(12) The COL holder makes available approved test procedures for satisfying testing requirements described in Section 14.2 to the NRC approximately 60 days prior to their intended use. [14.2.3, 14.2.11, 14.2.12.1]

#### 14.2.14 References

- 14.2-1 'Tests,' "Rules of General Applicability to domestic Licensing of Byproduct Material," <u>Energy</u>, Title 10, Code of Federal Regulations, Part 30.53, U.S. Nuclear Regulatory Commission, Washington, DC.
- 14.2-2 'Contents of Applications; Technical Information.' "Domestic Licensing of Production and Utilization Facilities," <u>Energy</u>, Title 10, Code of Federal Regulations, Part 50.34, U.S. Nuclear Regulatory Commission, Washington, DC
- 14.2-3 'Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants,' "Domestic Licensing of Production and Utilization Facilities," <u>Energy</u>, Title 10, Code of Federal Regulations, Part 50, Appendix B, U.S. Nuclear Regulatory Commission, Washington, DC.
- 14.2-4 'Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors,' "Domestic Licensing of Production and Utilization Facilities," <u>Energy</u>, Title 10, Code of Federal Regulations, Part 50, Appendix J, U.S. Nuclear Regulatory Commission, Washington, DC.
- 14.2-5 'Contents of Applications; Technical Information,' "Licenses, Certifications, and Approvals, for Nuclear Power Plants," <a href="Energy">Energy</a>, Title 10, Code of Federal Regulations, Part 52.79, U.S. Nuclear Regulatory Commission, Washington, DC.