MITSUBISHI HEAVY INDUSTRIES, LTD.
16-5, KONAN 2-CHOME, MINATO-KU
TOKYO, JAPAN

April 1, 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-09143

Subject: MHI's Amended Response to US-APWR DCD RAI No. 194-2034

Reference: 1) "MHI's Response to US-APWR DCD RAI No. 194-2034, MHI Ref: UAP-HF-09065 dated February 24, 2009.
2) "Request for Additional Information No. 194-2034 Revision 0, SRP Section: 14.02 – Initial Plant Test Program – Design Certification and New License Applicants, Application Section: 14.2 Initial Test Program" dated February 9, 2009.

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Amended Response to Request for Additional Information No. 194-2034 Revision 0 . This amended response is submitted to correct the typographical errors of the DCD Chapter 14 markup proposed in Reference 1. No change is provided for other portion of the previous response.

Enclosed is the amended response to Question 14.02-108 (BNL 14.02-88 Sup. 1) that is contained within Reference 2. MHI replaces the previous letter (Reference 1) with this amended response letter.

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. Amended Response to Request for Additional Information No. 194-2034 Revision 0

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

DO81
NRO

Contact Information
C. Keith Paulson, Senior Technical Manager
Mitsubishi Nuclear Energy Systems, Inc.
300 Oxford Drive, Suite 301
Monroeville, PA 15146
E-mail: ck_paulson@mnes-us.com
Telephone: (412) 373-6466

Docket No. 52-021
MHI Ref: UAP-HF-09143

Enclosure 1

UAP-HF-09143
Docket No. 52-021

Amended Response to Request for Additional Information
No. 194-2034 Revision 0

April 2009

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

4/1/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 194-2034 REVISION 0**
SRP SECTION:	**14.02 – Initial Plant Test Program – Design Certification and New License Applicants**
APPLICATION SECTION:	**14.2**
DATE OF RAI ISSUE:	**2/9/2009**

QUESTION NO.: 14.02-108

RAI 194 (2034) Question 108 (8082) follows up MHI's original response to RAI 78, Question 14.02-88.

RAI 14.02-88 requested that MHI revise startup test 14.2.12.2.4.6 to include a demonstration of RCS cooldown by using the RHR system to hot shutdown conditions. In its RAI response, MHI agreed to revise the test per the RAI and provided draft changes to the DCD.

However, the proposed DCD change is inconsistent in that the Objective change states that the test will demonstrate cooldown to cold shutdown, while the test method and acceptance criteria go to hot shutdown. Please correct this discrepancy.

(BNL 14.02-88, Sup. 1)

ANSWER:

The intention of the proposed changes to startup test 14.2.12.2.4.6 included in MHI's response to RAI-78, Question 14.02-88 is to demonstrate the potential capability to cooldown the RCS to cold shutdown from outside the control room by cooling down the plant partially from the hot standby condition. This potential capability is demonstrated by reducing the RCS temperature by approximately 50 °F using the RHR system, consistent with the RG 1.68.2 NRC-accepted method to meet 10CRF50 Appendix A GDC 19 condition (2).

Therefore, the test objective of startup test 14.2.12.2.4.6 proposed in the RAI-78 Question 14.02-88 is stated in terms consistent with RG 1.68.2 section C.1, Objective c, demonstration that the plant has the potential for being safely cooled from hot standby to cold shutdown conditions from outside the control room.

The test method proposed in the RAI-78 Question 14.02-88 response, step C.7 of 14.2.12.2.4.6, reduces the RCS temperature from hot standby conditions (greater than 350 °F) to approximately 300 °F (i.e. hot shutdown conditions) using the RHR system. However, this step should be clarified to clearly specify the 50 °F cooldown test method outlined in RG 1.68.2 section C.4.d.

The acceptance criteria stated in startup test 14.2.12.2.4.6 section D.3 unclearly combines the test objective with the endpoint condition of the test, hot shutdown, and should be revised.

Accordingly, MHI will revise the DCD in order to clarify the intention of this startup test to comply with RG 1.68.2, as follows.

Impact on DCD

See Attachment 1 for a mark-up of DCD Subsection 14.2.12.2.4.6 incorporating the following additions. This revision supersedes the changes proposed in response to RAI-78, Question 14.02-88:

A. Objectives

3. To demonstrate the potential for safely cooling down the plant from hot standby to cold shutdown conditions from outside the control room.

C. Test Method

7. Following the hot standby demonstration, starting from approximately 350°F, reduce the reactor coolant temperature by at least 50 °F from outside the control room using the RHRS.

D. Acceptance Criteria

3. The potential ability to cool down from hot standby to cold shutdown conditions from outside the control room is demonstrated by reducing the reactor coolant temperature by at least 50 °F using the RHRS from outside the control room.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.

Attachment 1

US-APWR DCD Chapter 14 Mark-up

AMENDED RESPONSE TO RAI No. 194-2034 Revision 0

9. The stability index of radial power distribution is evaluated periodically after restoration to normal rod position.

D. Acceptance Criteria

1. Measured power distribution and peaking factors are consistent with prediction.

2. The sensitivity of the incore and excore instrumentation signals to the RCCA misalignment is demonstrated by the results of power distribution measurements.

3. The stability index of radial power distribution is negative.

14.2.12.2.4.6 Remote Shutdown Test

A. Objectives

1. To demonstrate the capability of performing a controlled reactor shutdown to the hot standby condition.

2. To maintain the plant in a hot standby condition from outside the control room.

3. To demonstrate the potential for safely cooling down the plant from hot standby to cold shutdown conditions from outside the control room~~by placing the residual heat removal system into service and reducing the reactor coolant temperature~~.

Note: Testing is conducted in accordance with RG 1.68.2.

B. Prerequisites

1. Reactor power is greater than or equal to 10%.

2. The controls and instrumentation associated with the remote shutdown console are available.

3. Plant systems are in the normal operating mode with the turbine generator in operation.

4. Approved operating procedures for performing a remote shutdown are available.

5. Preoperational testing of plant instrumentation, controls, and systems to be used at remote shutdown locations is completed. This preoperational testing includes verification that all systems to be used during shutdown operation from outside the control room are operable in the manner in which they would be used during the operation (i.e., control from remote stations, manual operation, use of available power supplies, etc.) and that communication is established and maintained among the personnel who is performing the shutdown operation.

6. The authority and responsibility of the control room observers are established and documented in the test procedure. Provisions are made for the following actions:

(a) Assumption of control of the plant if an emergency or unsafe condition develops during the testing that cannot be managed by the shutdown crew.

(b) Performance of non safety-related activities that would not be required during an actual remote shutdown. These could include protection of non safety-related equipment from mechanical damage during the transient and the placement of equipment into standby status when no longer required. Such activities have been previously defined and evaluated to ensure that, if they were not performed during an actual remote shutdown, safe shutdown of the plant can still be achieved.

C. Test Method

1. Transfer control from the control room to the remote shutdown console.

2. Perform a controlled reactor shutdown to the hot standby condition from the remote shutdown console.

3. Demonstrate the capability to achieve and maintain the plant in a hot standby condition from the remote shutdown console for a minimum of 30 minutes.

4. During the demonstration, use only the equipment for which credit is taken to perform an actual remote shutdown.

5. Perform the test with the minimum of personnel required to be at the reactor unit at any one time (minimum shift crew).

6. Obtain the data at locations outside the control room.

7. ~~Using the residual heat removal system in steam condensing mode~~Following the hot standby demonstration, starting from approximately 350°F, reduce the reactor coolant temperature by at least 50 °F from outside the control room using the RHRS.~~reduce the reactor coolant temperature from approximately 350°F to approximately 300°F at a rate that does not exceed Technical Specification limits.~~

D. Acceptance Criteria

1. Transfer of control from the control room to the remote shutdown console is achieved.

2. The ability to perform a controlled reactor shutdown to the hot standby condition and to maintain hot standby conditions from the remote shutdown console is demonstrated.

3. The potential ability to cool down from hot standby to ~~hot~~cold shutdown conditions from outside the control room is demonstrated by reducing the reactor coolant temperature by at least 50 °F using the RHRS from outside the control room.