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

June 22, 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-09330

**Subject:** **Amended MHI's Response to US-APWR DCD RAI No. 158-1814 Revision 0 Question No. 16-104**

**Reference:**
1) "REQUEST FOR ADDITIONAL INFORMATION NO. 158-1814 REVISION 0, SRP Section: 16 - Technical Specifications, Application Section: 16, QUESTIONS for Technical Specification Branch (CTSB)" dated January 21, 2009.
2) Letter MHI Ref: UAP-HF-09058 from Y. Ogata (MHI) to U.S. NRC, "MHI's Responses to US-APWR DCD RAI No.158-1814 Revision 0," dated February 20, 2009.

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document as listed in Enclosure.

Enclosed is the amended response to Question No. 16-104 of the RAI contained within Reference 1. The initial response was contained in those submitted with Reference 2. The RAI response contained in this amended version involves reflection of the NRC's additional comment regarding the ANSI requirement, which was provided at the conference call held on June 8, 2009, and hence raises no additional technical issue.

As indicated in the enclosed materials, this document contains information that MHI considers proprietary, and therefore should be withheld from public disclosure pursuant to 10 C.F.R. § 2.390 (a)(4) as trade secrets and commercial or financial information which is privileged or confidential. A non-proprietary version of the document is also being submitted with the information identified as proprietary redacted and replaced by the designation "[ ]".

This letter includes a copy of the proprietary version (Enclosure 2), a copy of the non-proprietary version (Enclosure 3), and the Affidavit of Yoshiki Ogata (Enclosure 1) which identifies the reasons MHI respectfully requests that all materials designated as "Proprietary" in Enclosure 2 be withheld from public disclosure pursuant to 10 C.F.R. § 2.390 (a)(4).

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

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NRO

Sincerely,

Y. Ogata

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

Enclosure:

1. Affidavit of Yoshiki Ogata

2. Amended Response to Question No.16-104 of Request for Additional Information No. 158-1814 Revision 0 (proprietary version)

3. Amended Response to Question No.16-104 of Request for Additional Information No. 158-1814 Revision 0 (non-proprietary version)

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

Contact Information
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# Enclosure 1

Docket No. 52-021
MHI Ref: UAP-HF-09330

**MITSUBISHI HEAVY INDUSTRIES, LTD.**

**AFFIDAVIT**

I, Yoshiki Ogata, state as follows:

1. I am General Manager, APWR Promoting Department, of Mitsubishi Heavy Industries, LTD ("MHI"), and have been delegated the function of reviewing MHI's US-APWR documentation to determine whether it contains information that should be withheld from public disclosure pursuant to 10 C.F.R. § 2.390 (a)(4) as trade secrets and commercial or financial information which is privileged or confidential.

2. In accordance with my responsibilities, I have reviewed the enclosed document entitled "Amended Response to Question No.16-104 of Request for Additional Information No. 158-1814 Revision 0" dated June 22, 2009, and have determined that portions of the document contain proprietary information that should be withheld from public disclosure. Those pages containing proprietary information are identified with the label "Proprietary" on the top of the page and the proprietary information has been bracketed with an open and closed bracket as shown here "[ ]". The first page of the document indicates that all information identified as "Proprietary" should be withheld from public disclosure pursuant to 10 C.F.R. § 2.390 (a)(4).

3. The information identified as proprietary in the enclosed document has in the past been, and will continue to be, held in confidence by MHI and its disclosure outside the company is limited to regulatory bodies, customers and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and is always subject to suitable measures to protect it from unauthorized use or disclosure.

4. The basis for holding the referenced information confidential is that it describes the unique design and methodology developed by MHI for performing the nuclear design of the US-APWR reactor.

5. The referenced information is being furnished to the Nuclear Regulatory Commission ("NRC") in confidence and solely for the purpose of information to the NRC staff.

6. The referenced information is not available in public sources and could not be gathered readily from other publicly available information. Other than through the provisions in paragraph 3 above, MHI knows of no way the information could be lawfully acquired by organizations or individuals outside of MHI.

7. Public disclosure of the referenced information would assist competitors of MHI in their design of new nuclear power plants without incurring the costs or risks associated with the design of the subject systems. Therefore, disclosure of the information contained in the referenced document would have the following negative impacts on the competitive position of MHI in the U.S. nuclear plant market:

A. Loss of competitive advantage due to the costs associated with development of methodology related to the analysis.

B. Loss of competitive advantage of the US-APWR created by benefits of modeling information.

I declare under penalty of perjury that the foregoing affidavit and the matters stated therein are true and correct to the best of my knowledge, information and belief.

Executed on this 22nd day of June, 2009.

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

Enclosure 3

UAP-HF-09330
Docket No. 52-021

# Amended Response to Question No.16-104 of Request for Additional Information No.158-1814 Revision 0

June 2009
(Non-Proprietary)

## RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

**6/22/2009**

**US-APWR Design Certification**

**Mitsubishi Heavy Industries**

**Docket No. 52-021**

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|---|---|
| **RAI NO.:** | **NO. 158-1814 REVISION 0** |
| **SRP SECTION:** | **16 - TECHNICAL SPECIFICATIONS** |
| **APPLICATION SECTION:** | **16** |
| **DATE OF RAI ISSUE:** | **1/21/2009** |

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**QUESTION NO.: 16-104**

Justify deviation from American National Standard ANSI/ANS-19.6.1-2005 in regard to test required under the Physics Test program.

Mitsubishi Heavy Industries (MHI) supplied a document listing the justification for deviations between the US-APWR FSAR and the Standard Technical Specifications (STS) used, which in most cases was NUREG 1431 Rev. 3.1. In this document, it was stated that the NUREG 1431 Rev. 1 was used for Physics Test - Mode 1. The NUREG 1431 Rev. 3.1 does not contain a section for Mode 1 Physics Tests, only Mode 2.

NUREG 1431 Rev. 1 states the required tests to be performed on page B3.1-53. The first test listed is the Neutron Flux Symmetry test. The NUREG states that this test can be done in Mode 1 or 2, because the power limit for the test (less than or equal to 30% RTP) can be achieved in either Mode.

ANSI/ANS-19.6.1-2005, referenced in US-APWR section B3.1.8, contains Table 1 on page 3 which states the Flux symmetry test as one of the required tests to be performed during Physics Testing, and describes the test in detail on page 7, including the power level limit of less than or equal to 30% RTP.

The US-APWR FSAR does not contain the Flux Symmetry test in either the Physics Test - Mode 1 (B3.1.8), page B3.1.8-2 of DCD, or Physics Test - Mode 2 (B3.1.9), page B3.1.9-2 of FSAR. The omission of this test from the Physics Test program would not allow the program to be carried out in accordance with the American National Standard.

This justification is required to ensure that the Physics Testing is carried out in accordance with the American National Standard.

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**ANSWER:**

The US-APWR DCD Chapter 16, TS 3.1.8 BASES includes the test "The Power Distribution - Intermediate Power Test" as described on page B 3.1.8-2. The test is performed at least once before achieving 30% RTP.
This test covers the requirements for "The Neutron Flux Symmetry test". Therefore, the Physics

Test program of the US-APWR satisfies the requirement of ANSI/ANS-19.6.1-2005. The requirements for the Flux Symmetry test described in ANSI are satisfied as a part of validity checks for the Power Distribution test. [

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**Impact on DCD**

The DCD Chapter 16, TS 3.1.8 BASES, the last paragraph on page B 3.1.8-2 will be revised as the following page.

**Impact on COLA**

There are impacts on the COLA to incorporate the DCD change.

**Impact on PRA**

There is no impact on the PRA.

BASES

BACKGROUND (continued)

operation, and after each refueling. The PHYSICS TESTS requirements for reloaded fuel cycles ensure that the operating characteristics of the core are consistent with the design predictions, and that the core can be operated as designed (Ref. 4).

PHYSICS TESTS procedures are written and approved in accordance with established formats. The procedures include all information necessary to permit a detailed execution of the testing required to ensure that the design intent is met. PHYSICS TESTS are performed in accordance with these procedures, and test results are approved prior to continued power escalation and long term power operation.

The PHYSICS TESTS required for reload fuel cycles (Ref. 4) in MODE 1 are listed below:

a. Power Distribution – Intermediate Power,

DCD_16-105

b. Power Distribution – Full Power, and

c. HZP to HFP reactivity difference.~~Critical Boron Concentration – Full Power.~~

These tests are performed in MODE 1. These and other supplementary tests may be required to calibrate the nuclear instrumentation or to diagnose operational problems. These tests may cause the operating controls and process variables to deviate from their LCO requirements during their performance. The last two tests are performed at ≥ 90% RTP.

DCD_16-106

DCD_16-104

a. The Power Distribution – Intermediate Power Test measures the power distribution of the reactor core at intermediate power levels at least one time by 30% RTP and between 40% and 80% RTP. This test uses the incore flux detectors to measure core power distribution. The requirements for the Flux Symmetry Test described in ANSI/ANS-19.6.1-2005 (Ref. 4) are satisfied by the Power Distribution Test.