MITSUBISHI HEAVY INDUSTRIES, LTD.
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TOKYO, JAPAN

February 28, 2013

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

Attention: Mr. Jeffery A. Ciocco

Docket No. 52-021
MHI Ref: UAP-HF-13038

Subject: Amended MHI's Response to US-APWR DCD RAI No. 374-2446 Revision 0 (SRP 03.09.05)

References: 1) "Request for Additional Information No. 374-2446 Revision 0, SRP Section: 03.09.05 – Reactor Pressure Vessel Internals, Application Section 03.09.05," dated May 21, 2009.

2) "MHI's Response to US-APWR DCD RAI No. 374-2446 Revision 0 (SRP 03.09.05)," UAP-HF-09387, dated July 17, 2009.

3) "Revised Design Completion Plan for US-APWR Piping Systems and Components" UAP-HF-12322, dated December 7, 2012.

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. 374-2446 Revision 0"

Enclosed is the amended response to Question 03.09.05-11 of the RAI374-2446 contained within Reference 1. This response amends the previously transmitted response submitted under MHI's Letter UAP-HF-09387 dated July 17, 2009 (Reference 2).

In Table-3 of UAP-HF-12322, dated December 7, 2012 (Reference 3) MHI provided the plan for amended RAI responses due to the proposed Technical Reports withdrawal. This amended RAI response is submitted in accordance with the plan.

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. The proprietary information is bracketed 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 Mr. Joseph Tapia, General Manager of Licensing Department, Mitsubishi Nuclear Energy Systems, Inc. if the NRC has questions concerning any aspect of this letter, his contact information is provided below.

D081
NRO

Sincerely,

Y. Ogata

Yoshiki Ogata,
Director, APWR Promoting Department
Mitsubishi Heavy Industries, LTD.

Enclosure:

1. Affidavit of Yoshiki Ogata

2. Amended Response to Request for Additional Information No. 374-2446, Revision 0 (Proprietary)

3. Amended Response to Request for Additional Information No. 374-2446, Revision 0 (Non-Proprietary)

CC: J. A. Ciocco
J. Tapia

Contact Information
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ENCLOSURE 1

Docket No.52-021
MHI Ref: UAP-HF-13038

MITSUBISHI HEAVY INDUSTRIES, LTD.

AFFIDAVIT

I, Yoshiki Ogata, being duly sworn according to law, depose and state as follows:

1. I am Director, 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 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 "Amended Response to Request for Additional Information No. 374-2446, Revision 0" and have determined that portions of the report 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 technical report indicates that all information identified as "Proprietary" should be withheld from public disclosure pursuant to 10 C.F.R. § 2.390 (a).

3. The information in the report identified as proprietary by MHI 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 methodologies developed by MHI for the US-APWR reactor internal design. These were developed at significant cost to MHI, since they required the performance of detailed calculations, analyses, and testing extending over several years. The referenced information is not available in public sources and could not be gathered readily from other publicly available information.

5. The referenced information is being furnished to the Nuclear Regulatory Commission ("NRC") in confidence and solely for the purpose of supporting the NRC staff's review of MHI's Application for certification of its US-APWR Standard Plant Design.

6. Public disclosure of the referenced information would assist competitors of MHI in their design of new nuclear power plants without the costs or risks associated with the design of new fuel systems and components. Disclosure of the information identified as proprietary would therefore have negative impacts on the competitive position of MHI in the U.S. nuclear plant market.

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 28th day of February, 2013.

Y. Ogata

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

Enclosure 3

UAP-HF-13038
Docket No. 52-021

Amended Response to Request for Additional Information
No.374-2446 Revision 0

February 2013
(Non-Proprietary)

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

2/28/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 374-2446 REVISION 0**
SRP SECTION:	**3.9.5 – REACTOR PRESSURE VESSEL INTERNALS**
APPLICATION SECTION:	**03.09.05**
DATE OF RAI ISSUE:	**5/21/2009**

QUESTION NO.: 03.09.05-11

In Subsection 3.9.5.2 of the DCD the applicant has identified the loading conditions that have been considered in the design of US-APWR core support structures and internals components. The list includes pressure differences due to coolant flow.

However, the applicant did not provide any details regarding the method used to determine the pressure differences for reactor internal components during different operating conditions or to validate the calculated values. The applicant is requested to provide a description and validation of the method for determining the maximum pressure differences for reactor internals during ASME Code, Section III, Level A, B, C, and D service conditions. Alternately, provide a reference document where this information is available. The requested information is needed to assure conformance with GDC-1, 2, 4, and 10. Revise the DCD to include the requested information or provide a reference where this information is available.

ANSWER (R1):

For the input to the stress analysis of the core support structures, the maximum pressure difference across the core barrel thickness is determined from the total pressure loss from the vessel inlet to the outlet by following formula.

Delta $P = k\,i\,(1/2)\rho\, vi^2$

Delta P: maximum pressure deference across the core barrel thickness.
k I : irrecoverable pressure loss coefficient for each part*.
vi : local flow velocity for the each part*.
ρ : fluid mass density.

*Each part means the downcomer, the lower plenum, the lower core support plate, the fuel assembly, the upper core plate and the upper plenum.

The formula and pressure loss coefficients are determined based on the design hand books

and verified with the experience of the current plants.

The Design Difference Pressure [ ] psi is determined based on [ ] which can represent the Level A (normal operation) and Level B (up-set) service conditions. The pressure difference in Level C service conditions is also represented by the design conditions.

For the Level D service condition, time histories of dynamic pressure differences in a LOCA event were obtained in the blow-down analysis as answered to RAI 3.9.2-54(RAI No.207-1577 revision 0 / ML090570118). Further information about the analysis method and the computer code is described in Reference (1).

Impact on DCD

There is no impact on the DCD.

Impact on R-COLA

There is no impact on the R-COLA.

Impact on S-COLA

There is no impact on the S-COLA.

Impact on PRA

There is no impact on the PRA.

Impact on Technical / Topical Reports

There is no impact on the Technical / Topical Reports.

Reference (1):MUAP-09002-P, "Summary of Seismic and Accident Load Conditions for Primary Components and Piping"