MITSUBISHI HEAVY INDUSTRIES, LTD.
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TOKYO, JAPAN

July 29, 2009

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-09404

Subject: Amended MHI's Responses to US-APWR DCD RAI No. 272-1585

References: 1) "Request for Additional Information No. 272-1585 Revision 0, SRP Section: 03.09.02 – Dynamic Testing and Analysis of Systems Structures and Components, Application Section: DCD, Tier 1 – Section 3.9.2.3," dated 3/10/2009.
2)" MHI's Response to US-APWR DCD RAI No. 272-1585, UAP-HF-09149, dated 4/9/2009"

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Amended Responses to Request for Additional Information No. 272-1585 Revision 0."

Enclosed are the responses to question 30 of the RAI (Reference 1).

These responses amend the previously transmitted answers submitted under MHI Reference UAP-HF-09149 on April 9, 2009 (Reference 2) in order to correct typographical errors.

As indicated in the enclosed materials, this submittal 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 "[ ]" (brackets).

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) and 10 C.F.R.§ 9.17 (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 this submittal. His contact information is provided below.

D081
NRO

Sincerely,

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

Y. Ogata

Enclosures:

1. Affidavit of Yoshiki Ogata
2. Amended Response to Request for Additional Information No. 272-1585, Revision 0 (Proprietary)
3. Amended Response to Request for Additional Information No. 272-1585, Revision 0 (Non- Proprietary)

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

Contact Information
C. Keith Paulson, Senior Technical Manager
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Enclosure 1

Docket No. 52-021
MHI Ref: UAP-HF-09404

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 Request for Additional Information No. 272-1585, Revision 0", dated July 2009, and have determined that portions of the document contain proprietary information that should be withheld from public disclosure. Those pages contain 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 are as follows:

   A. They include the know-how and outputs of analyses used by mathematical models developed at significant cost to MHI. Since it required the performance of detailed design calculations, supporting 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. MHI knows of no way the information could be lawfully acquired by organizations or individuals outside of MHI.

   B. They include the information that is provided to MHI pursuant to licensing agreements with third parties (the "Licensors") for MHI's use and under the obligation to maintain their confidentiality. Furthermore, MHI has an ownership interest in the referenced information by having paid significant sums of money to the Licensors for the rights to the intellectual property therein such that public disclosure of the materials would adversely affect MHI's competitive position.

   C. They include the information directly referred from books the copyrights of which are

reserved.

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. 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 systems and components. Disclosure of the information identified as proprietary would therefore have negative impacts on the competitive position of MHI and the Licensors 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 29th day of July 2009.

Y. Ogata

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

Enclosure 3

UAP-HF-09404
Docket No. 52-021

Amended Response to Request for Additional Information No. 272-1585, Revision 0

July 2009
(Non-Proprietary)

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

7/29/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 272-1585**
SRP Section:	**03.09.02 – Dynamic Testing and Analysis of Systems Structures and Components**
APPLICATION SECTION:	**3.9.2.3**
DATE OF RAI ISSUE:	**03/10/09**

QUESTION NO.: RAI 3.9.2-30

In Subsection 3.4.2 of the vibration assessment report MUAP-07027-P the applicant discussed the alternating stress SaFIV resulting from flow-induced forces. A stress index factor K is used to account for structural discontinuity. The value of the stress index K clearly affects the maximum alternating stress level and the safety margin with respect to the ASME Code of fatigue limit.

The staff review of the relevant documents showed that the DCD did not discuss the stress index K, and the vibration assessment report did not give the values that were used for welds and structural discontinuities. The applicant is requested to discuss the assumed values of the stress index for structural discontinuities (factor K) that are used in the equation of the alternating stress (SaFIV) given in page 46 of the vibration assessment report MUAP-07027-P. In particular, provide the values used for welds and for joints of components with different thicknesses. Review of this safety margin is essential to assure conformance with GDC-1 and 4. Revise the comprehensive vibration report to include the value of K used in the alternating stress equation.

ANSWER:

A constant value [ ] was used as the stress index (stress concentration factor K) for structural discontinuities in the equation of alternating stresses (SaFIV) in accordance with ASME Boiler and Pressure Vessel Code, Section III.

This value will be added in the high cycle fatigue evaluation in Subsection 3.4.2 (2) in the vibration assessment report MUAP-07027-P, by adding the following new sentence follows.

" (2) High Cycle Fatigue Evaluation
The alternating peak stress due to the flow turbulent and the RCP pulsation is determined from the FEM response as shown in the following equations.

Sa_{FIV} = [ ] (σrms_{FIV}) K (E/E p)
Sa_{RCP} = ($\sigma 0$-P_{RCP}) K (E/E p)

where,
Sa_{FIV} : alternating peak stress due to the flow
Sa_{RCP} : alternating peak stress due to the RCP pulsation
σrms_{FIV} : RMS amplitude of alternating stress due to the flow
$\sigma 0$-p_{RCP} : zero to peak amplitude of the alternating stress due to the RCP
K : stress index for the structural discontinuous ([ ] is used)
E : young modulus in the room temperature
Ep : young modulus in the plant operating condition
[ ] : conversion coefficients for the peak stress from the RMS value

Total of alternating peak stress is assumed as the simple sum of those due to the flow turbulence and the RCP-induced pulsation as following equation.

$Sa_{total} = Sa_{FIV} + Sa_{RCP}$ "

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.
