MITSUBISHI HEAVY INDUSTRIES, LTD.
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TOKYO, JAPAN

July 18, 2008

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-08132

Subject: **MHI's Partial Responses to the NRC's Requests for Additional Information on Topical Report MUAP-07034-P(0) "FINDS: Mitsubishi PWR Fuel Assemblies Seismic Analysis Code"**

References: 1) Letter from the NRC (ML081780082) to Y. Ogata (MHI), "Request for Additional Information on FINDS: Mitsubishi PWR Fuel Assemblies Seismic Analysis Code for US-APWR Topical Report" dated on July 7, 2008

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a partial response entitled "MHI's Partial Responses to the NRC's Requests for Additional Information on Topical Report MUAP-07034-P(0) FINDS: Mitsubishi PWR Fuel Assemblies Seismic Analysis Code". In the enclosed document, MHI provide the responses for RAI's 6 through 9 of those in Reference 1 ahead of the allotted 30 day response time-frame that is given from the date of the formal RAI issuance. All other responses to the RAI's listed in Reference 1 will be provided during the normal response schedule.

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) and 10 C.F.R § 9.17 (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 in this package (Enclosure 3). In the non-proprietary version, the proprietary information, bracketed in the proprietary version, is replaced by the designation "[ ]".

This letter includes a copy of the proprietary version (Enclosure 2), a copy of 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.

Sincerely,

Y. Ogata

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

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NRO

Enclosures:

1. Affidavit of Yoshiki Ogata

2. MHI's Partial Responses to the NRC's Requests for Additional Information on Topical Report MUAP-07034-P(0) "FINDS: Mitsubishi PWR Fuel Assemblies Seismic Analysis Code" (proprietary)

3. MHI's Partial Responses to the NRC's Requests for Additional Information on Topical Report MUAP-07034-P(0) "FINDS: Mitsubishi PWR Fuel Assemblies Seismic Analysis Code" (non-proprietary)

4. CD1:"Responses to RAI's 6 Through 9 of NRC Requests in ML081780082 (UAP-HF-08132 Rev.0)"

The files contained in this CD are listed in Attachment 1.

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-08132

MITSUBISHI HEAVY INDUSTRIES, LTD.

AFFIDAVIT

I, Yoshiki Ogata, being duly sworn according to law, depose and 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 disclosure pursuant to 10 C.F.R. § 2.390 (a)(4) and 10 CFR § 9.17 (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 "MHI's Partial Responses to the NRC's Requests for Additional Information on Topical Report MUAP-07034-P(0) FINDS: Mitsubishi PWR Fuel Assemblies Seismic Analysis Code" 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 code and files developed by MHI for the fuel of the US-APWR and also contains information provided to MHI under license from the Japanese Government. These code and files 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. MHI knows of no way the information could be lawfully acquired by organizations or individuals outside of MHI and the Japanese Government.

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 18th day of July, 2008.

Y. Ogata

Yoshiki Ogata

Enclosure 3

UAP-HF-08132, Rev.0

MHI's Partial Responses to the NRC's Requests for Additional Information on Topical Report MUAP-07034-P(0) "FINDS: Mitsubishi PWR Fuel Assemblies Seismic Analysis Code"

July 2008
(Non Proprietary)

MHI's Partial Responses to the NRC's Requests for Additional Information on Topical Report MUAP-07034-P(0) "FINDS: Mitsubishi PWR Fuel Assemblies Seismic Analysis Code"

Non-Proprietary Version

July 2008

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INTRODUCTION

This report documents MHI's partial responses to the NRC's RAI dated July 7 2008 concerning the Topical Report MUAP-07034-P(0) "FINDS: Mitsubishi PWR Fuel Assemblies Seismic Analysis Code".

In this report, MHI provides the responses for RAI's 6 through 9 ahead of the allotted 30 day response time-frame that is given from the date of the formal RAI issuance. All other responses to the RAI will be provided during the normal response schedule.

QUESTION-6

Please provide the 1980's government sponsored verification studies simulating seismic behavior of PWR and BWR fuel assemblies that are described in the abstract of MUAP-07034-P (R0).

RESPONSE

The government sponsored verification studies is provided in the following file, entitled "Proving Test on the Seismic Reliability for Nuclear Power Plant - PWR Reactor Core Internals." This information was provided to MHI by the Nuclear Power Engineering Test Center which is sponsored by the Japanese Government.

Electronic file : [ ]

QUESTION-7

Please provide an executable version of FINDS on Microsoft Windows, Unix, or Linux platform.

RESPONSE

An executable version of FINDS for the Linux platform is provided with the following file. The executable module is produced by Fortran compiler. Please see the readme to run the FINDS code.

Electronic file :[ ]

Readme :[ ]

QUESTION-8

Please provide the ANSYS input data for the verification problem in Section 5.1 of MUAP-07034-P (R0).

RESPONSE

In order to verify the beam model used in the FINDS code, vibration analyses of a single beam have been performed with the FINDS code and the ANSYS code.

The beam model in the ANSYS code consists of beam elements and rotational springs and is basically the same as the one in the FINDS code. The detailed explanation for the model is included in the attached "ReadMe" file.

The model is supported at the top and bottom ends and is accelerated laterally with three sinusoidal waves with different frequencies which correspond to the natural frequencies of the 1st, the 2nd and the 3rd mode of the model. The mode-superposition Method is applied for the calculation same as in the FINDS code.

Electronic files for the calculation for ANSYS are provided as the following files.

Electronic file:

The following input data correspond to Figure 5.1-1 through 5.1-3 for ANSYS in Section 5.1 of MUAP-07034, respectively.

- For 1st mode: ( )
- For 2nd mode:
- For 3rd mode:

The detail explanation for the model is included in the file below.

- ( )

QUESTION-9

Please provide the FINDS input data for the verification problem in Section 5.1 of MUAP-07034-P (R0).

RESPONSE

In order to verify the beam model used in the FINDS code, vibration analyses of a single beam have been performed with the FINDS code and the ANSYS code.

The detailed explanation for the FINDS model is included in the attached "ReadMe" file.

The model is supported at the top and bottom ends and is accelerated laterally with three sinusoidal waves with different frequencies which correspond to the natural frequencies of the 1st, the 2nd and the 3rd mode of the model.

Electronic files for the calculation for FINDS are provided as the following files.

Electronic file:

The following input data correspond to Figure 5.1-1 through 5.1-3 for FINDS in Section 5.1 of MUAP-07034, respectively.

- For 1st mode:
- For 2nd mode:
- For 3rd mode:

In addition, the following file is also attached which defines time that the time history analysis is conducted up to. It is common for the analyses.

The following output data calculated on Solaris platform with the above input files are also attached.

- For 1st mode:
- For 2nd mode:
- For 3rd mode:

The detailed explanation for the model and output file is included in the file below.

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ATTACHMENT 1

FILES CONTAINED IN CD 1

CD 1: "Responses to RAI's 6 Through 9 of NRC Requests in ML081780082 (UAP-HF-08132 Rev.0)"
–Proprietary information

Contents of CD

File Name	Size	Sensitivity level
• Report: NUPEC_document.pdf	3.5MB	Proprietary
• ReadMe.pdf (pdf format)	0.21MB	Proprietary
• finds4.2-us (FINDS executable file : Linux binary format)	1.3MB	Proprietary
• ANSYS Inputs:		
- ansys_mod1_us.dat	0.35MB	Proprietary
- ansys_mod2_us.dat	0.35MB	Proprietary
- ansys_mod3_us.dat	0.35MB	Proprietary
(ANSYS Input files used in Section 5.1, MUAP-07034: txt format)		
• FINDS inputs:		
- finds_mod1.dat	4KB	Proprietary
- finds_mod2.dat	4KB	Proprietary
- finds_mod3.dat	4KB	Proprietary
(FINDS Input files used in Section 5.1, MUAP-07034: txt format)		
- FILE77	1KB	Proprietary
(It defines time that the time history analysis is conducted up to. It is common for the analyses.)		
• FINDS outputs:		
- finds_mod1.FILE09	0.12MB	Proprietary
- finds_mod2.FILE09	0.12MB	Proprietary
- finds_mod3.FILE09	0.12MB	Proprietary
(These are calculated on Solaris platform with the above input files.)		