MITSUBISHI HEAVY INDUSTRIES, LTD.
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TOKYO, JAPAN

March 24, 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-09099

Subject: MHI's Non-LOCA Response to NRC's Requests for Additional Information on Topical Reports MUAP-07010, MUAP-07011, and MUAP-07013

Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") the document entitled "MHI's Non-LOCA Response to NRC's Requests for Additional Information on Topical Reports MUAP-07010, MUAP-07011, and MUAP-07013." The enclosed materials provide MHI's responses of the non-LOCA portions of the NRC's "Requests for Additional Information (RAIs) MUAP-07010, MUAP-07011, and MUAP-07013," dated March 17, 2009. These RAIs arose from face-to-face meetings between MHI and the NRC on February 10, 2009. The LOCA portions of MHI's response are being submitted in a separate letter. The enclosed materials also include an Optical Storage Medium ("OSM") that contains electronic versions of the requested information related to MARVEL-M, such as input files, executable programs, and summaries of calculation memos. The files contained on the OSM are listed on the associated enclosure cover sheet.

As indicated in the enclosed materials, the OSM 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.

This letter includes the non-proprietary RAI response (Enclosure 2), an OSM containing the requested electronic files (Enclosure 3), and the Affidavit of Yoshiki Ogata (Enclosure 1) which identifies the reasons MHI respectfully requests that all material designated as "Proprietary" in Enclosure 3 be withheld from 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 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 Non-LOCA Response to NRC's Requests for Additional Information on Topical Reports MUAP-07010, MUAP-07011, and MUAP-07013
3. OSM: MARVEL-M Related Files (proprietary)

The file contained in OSM is listed in Attachment 1 hereto.

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

Contact Information

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ENCLOSURE 1

Docket No. 52-021

MHI Ref: UAP-HF-09099

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) 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 "MHI's Non-LOCA Response to NRC's Requests for Additional Information on Topical Reports MUAP-07010, MUAP-07011, and MUAP-07013" and the enclosed Optical Storage Medium ("OSM") dated March 24, 2009, and have determined that the OSM contains proprietary information that should be withheld from public disclosure. The labels on the OSM have been marked to indicate that the entire contents of the OSM should be withheld from public disclosure pursuant to 10 C.F.R. § 2.390 (a)(4).

3. The basis for holding the referenced information confidential is that it describes the unique design of the safety analysis, developed by MHI (the "MHI Information").

4. The MHI Information is not used in the exact form by any of MHI's competitors. This information was developed at significant cost to MHI, since it required the performance of research and development and detailed design for its software and hardware extending over several years. Therefore public disclosure of the materials would adversely affect MHI's competitive position.

5. The referenced information has in the past been, and will continue to be, held in confidence by MHI and is always subject to suitable measures to protect it from unauthorized use or disclosure.

6. The referenced information is not available in public sources and could not be gathered readily from other publicly available information.

7. 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.

8. 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 and testing of new 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 24th day of March, 2009.

Y. Ogata

Yoshiki Ogata

Enclosure 2

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MHI's Non-LOCA Response to NRC's Requests for Additional Information on Topical Reports MUAP-07010, MUAP-07011, and MUAP-07013

(Non-Proprietary)

RAI 1

Description and software (either provide or identify commercial source) to generate plotted output from MARVEL-M results. Provide method and directions for retrieving plot data from MARVEL-M binary output file.

Response

A simple FORTRAN program is used to convert the binary output file from MARVEL-M into a delimited text file that can be read using a spreadsheet application, such as Microsoft Excel. The delimited output is grouped according to the MARVEL-M output variables. The description of the output variables is included in Section 3.2 of the latest revision of the MARVEL-M Manual (Rev. 6), which is being submitted along with this response. The FORTRAN program to convert the binary output file to a delimited text file is attached as an executable file, including its source code. Once the delimited data has been imported into a spreadsheet application, such as Microsoft Excel, the spreadsheet application can be used to generate various plots as specified by the user. For completeness, this response also includes the version of the MARVEL-M executable file consistent with Rev. 6 of the MARVEL-M Manual (and compatible with the FORTRAN converter program).

The FORTRAN program requires the user to request, by number (from Section 3.2 of the MARVEL-M Manual), the MARVEL-M output variables to convert. The user specifies these requests using a very simple text input file; a sample file has been included as an attachment. The result will be a delimited file that contains a column for each of the user requested MARVEL-M output variables. The first column of data is always time. Each row of data is for a single MARVEL-M output time interval.

RAI 2

Electronic copies of the input files for MARVEL-M analysis corresponding to:

a. Uncontrolled RCCA bank withdrawal at power.
b. Partial loss of forced reactor coolant flow.
c. Complete loss of forced reactor coolant flow.
d. Reactor coolant pump shaft seizure.
e. Main steam line break (hot zero power with offsite power available).

Response

Electronic copies of all of the requested MARVEL-M input files are included with this submittal.

It is the understanding of MHI that the purpose of providing the input files is to independently confirm the results and/or assist in performing confirmatory analyses. The five input files that were requested and are being provided (as attached files) are:

- Uncontrolled RCCA bank withdrawal at power (US-APWR DCD Section 15.4.2)
- Partial loss of forced reactor coolant flow (US-APWR DCD Section 15.3.1.1)
- Complete loss of forced reactor coolant flow (US-APWR DCD Section 15.3.1.2)
- Reactor coolant pump shaft seizure (US-APWR DCD Section 15.3.3)
- Main steam line break (hot zero power with offsite power available case) (US-APWR DCD Section 15.1.5)

These five input files are the same as those used for the analyses of the corresponding sections of Chapter 15 of the DCD indicated above in the parentheses.

RAI 3

Please provide access to M-RELAP5 source code and PC executable. This will be used exclusively by the NRC and its contractor (ISL) in support of the M-RELAP5 code review.

Response

The response to this RAI question is included in the LOCA portion of the response, which will be submitted in a separate letter.

RAI 4

For the following two bullets, please provide the requested information if it is available in English (or some combination of English/Japanese). If the referenced material is solely written in Japanese, do not send this material but rather provide a listing of these items so that we can later decide which items may need to be translated into English.

- Documentation for M-RELAP5 SBLOCA US-APWR plant model – preferably a model development notebook. This will be used to aid in understanding the basis for the plant model that was developed (NRC and ISL will return to MNES Arlington on April 22, 2009 to review this material).
- Documentation (calculation notebooks) for the specific limiting SBLOCA, LBLOCA and Non-LOCA cases. Currently plans are to evaluate all limiting cases presented in the DCD for the SBLOCA, the limiting LBLOCA case in the DCD (including all parametric selections used for that case), the MSLB non-LOCA cooldown limiting case in the DCD (including hot zero power initialization and reactivity feedback effects), the loss-of-load non-LOCA limiting heatup case in the DCD and a SGTR transient. This information is requested to facilitate setting up the confirmatory RELAP5/MOD3.3 models.

Response

This RAI question refers to both LOCA (the entire first bullet and the first half of the second bullet) and non-LOCA (the second half of the second bullet) items. The LOCA portion of the response will be submitted in a separate letter. The non-LOCA portion of the response is below:

It is the understanding of MHI that the purpose of requesting the calculations memos (notebooks) is to assist with preparing the confirmatory analyses. MHI calculation memos are written in Japanese with the input parameters and values written in English. The calculation memos also describe initial conditions and event-specific input assumptions in Japanese. However, most of this information is provided in the applicable section for each event in Chapter 15 of the DCD. An English version of a summary of the initial conditions and event-specific input assumptions is included in the attachment to this response for the following three non-LOCA events:

- Main steam line break (hot zero power with offsite power available case)
- Loss of load (peak pressure case)
- Steam generator tube rupture (offsite dose evaluation case)

In addition to this information, electronic copies of the input files for these three events are also included as attachments to this response.

Attachment 1

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Contents of OSM:
MARVEL-M Related Files

File Name	Size	Sensitivity Level
001_Readme.pdf	9 KB	Proprietary
002_MarvelmV28.exe	1740 KB	Proprietary
003_Input Guide (MARVEL-M)R6.pdf	1042 KB	Proprietary
004_conv.exe	373 KB	Proprietary
005_conv.f	3 KB	Proprietary
006_IPLIST.txt	1 KB	Non-Proprietary
007_input_file (RWP).mar	15 KB	Proprietary
008_input_file (PLOF).mar	12 KB	Proprietary
009_input_file (CLOF).mar	12 KB	Proprietary
010_input_file (LR).mar	12 KB	Proprietary
011_input_file (SLB).mar	21 KB	Proprietary
012_input_file (LOL).mar	15 KB	Proprietary
013_input_file (SGTR).mar	23 KB	Proprietary
014_calc_memo_summary.pdf	442 KB	Proprietary