


MITSUBISHI HEAVY INDUSTRIES, LTD.
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TOKYO, JAPAN

March 27, 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-09100

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

Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") the document entitled "MHI's Response to NRC's Requests for Additional Information on Topical Reports MUAP-07010, MUAP-07011, and MUAP-07013 (LOCA Parts)" The enclosed materials provide MHI's responses for the 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 the face-to-face meetings between MHI and the NRC on February 10, 2009. The Non-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 source code and executable programs of the M-RELAP5. The files contained in 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,



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

DO81
w/cd

Enclosures:

1. Affidavit of Yoshiki Ogata
2. MHI's LOCA Response to NRC's Requests for Additional Information on Topical Reports MUAP-07010, MUAP-07011, and MUAP-07013
3. OSM: M-RELAP5 Related Files (proprietary)

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

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-09100

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 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 27th day of March, 2009.

Y. Ogata

Yoshiki Ogata

Enclosure 2

**UAP-HF-09100
Docket No. 52-021**

March 2009

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

(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

The response to this RAI question is included in the Non-LOCA portion of the response, which is being submitted in a separate letter (UAP-HF-09099).

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

The response to this RAI question is included in the Non-LOCA portion of the response, which is being submitted in a separate letter (UAP-HF-09099).

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 required source code and PC executable are included in the enclosure to this response to RAI 3. In addition, the following information from the Idaho National Laboratory (INL) is necessary for this RAI.

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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, 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 LOCAs (the entire first bullet and the first half of the second bullet) and non-LOCA (the second half of the second bullet) items. The Non-LOCA portion of the response is being submitted in a separate letter (UAP-HF-09099). The LOCA portion of the response is as follow:

Documentation for M-RELAP5 SBLOCA US-APWR plant model

The related documents consist of the following three parts:

- Basic Input Data
- M-RELAP5 Input Data
- M-RELAP5 Transient Calculation Input Data

The description of those documents are given as follows. Most of the contents are written in Japanese with the input parameters and values written in English.

Basic Input Data

This document describes basic input data for M-RELAP5. Basic input data is a processed data necessary to develop input data for the M-RELAP5 from the design data.

The document name and number are as follows.

“Basic Input Data” UAP-KS-L0217,R5

M-RELAP5 Input Data

These documents describe the processed input for M-RELAP5 developed from the basic input data. The document names and numbers are as follows.

“Reactor vessel hydraulic input data” UAP-KS-L0218,R3
“Reactor vessel heat structure input data” UAP-KS-L0219,R3
“Loop hydraulic & heat structure input data” UAP-KS-L0220,R3
“Core, fuel and kinetics input data” UAP-KS-L0221,R3
“Trip & control variable input data” UAP-KS-L0222,R2

M-RELAP5 Transient Calculation Input Data

This document describes input data for transient calculation. The document name and number is as follows.

"M-RELAP5 transient Input Data" UAP-KS-L0336,R2

Documentation (calculation notebooks) for the specific limiting SBLOCA and LBLOCA cases

Documentation (calculation notebooks) for the specific limiting SBLOCA and LBLOCA cases also describes the initial conditions and event-specific input assumptions, written in Japanese.

The documents regarding SBLOCA analysis condition and the result are as follows.

"Steady State Calculation Results" UAP-KS-L0335,R1

This memo contains steady state calculation procedure, adjusted parameters, targets and results of steady state and their differences, and time trend figures of principal parameters.

"Transient Analysis Results" UAP-KS-L0332,R2

This memo contains time sequence table and time trend figure of principal parameters described in the DCD.

The documents regarding LBLOCA analysis condition and the result are as follows.

"Steady State Calculation Results" UAP-KS-L0255,R0

This memo contains adjusted parameters and target values for steady state results of steady state and their differences and time trend figure of principal parameters.

"Hot Assembly Location Confirmatory Analysis Results" UAP-KS-L0256,R0

"Confirmatory Analysis Results" UAP-KS-L0258,R0

These memos contain results of sensitivity analyses performed prior to statistical calculations. The condition for the reference case run using statistical calculation is obtained and defined from the result of the sensitivity analysis.

"ASTRUM Analysis Results" UAP-KS-L0261,R1

This memo contains the reference transient calculation result of 124 cases performed using the WCOBRA/TRAC(M1.0) and HOTSPOT.

Attachment 1

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March 2009

Contents of OSM: M-RELAP5 Related Files

<u>Folder and File Name</u>	<u>Size</u>	<u>Sensitivity Level</u>
m-relap5/documents		
Readme_M-RELAP5.pdf	60KB	Proprietary
Release Authorization Letter.pdf	102KB	Proprietary
m-relap5/execute		
relap5.exe	8061KB	Proprietary
tpfd2o	535KB	Proprietary
m-relap5/sources*	26.5MB	Proprietary

* m-relap5/sources folder contains 12 sub-folders and 1266 files. The description of files are given in Readme_M-RELAP5.pdf (Proprietary).