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TOKYO, JAPAN

June 29, 2011

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-11193

Subject: Transmittal of the Technical Report entitled "US-APWR Sump Strainer Performance" (MUAP-08001, Revision 4)

- **References:** [1] Letter MHI Ref: UAP-HF-11103 from Y. Ogata (MHI) to U.S. NRC, "Closure Plan for Issues Associated with GSI-191 for the US-APWR" dated May 24, 2011.
 - [2] Letter MHI Ref: UAP-HF-0948 from Y. Ogata (MHI) to U.S. NRC.
 "Amended MHI's response to US-APWR RAI No. 354-2585 Revision 0", dated October 19, 2009.
 - [3] Letter MHI Ref: UAP-HF-10066 from Y. Ogata (MHI) to U.S. NRC. "MHI's response to US-APWR RAI No. 530-3989 Revision 0", dated March 4, 2010.
 - [4] Letter MHI Ref: UAP-HF-11181 from Y. Ogata (MHI) to U.S. NRC.
 "Amended MHI's response to US-APWR RAI No. 740-5719 Revision 2", dated June 14, 2011.

The purpose of this letter is to formally transmit the revised technical report entitled "US-APWR Sump Strainer Performance" (MUAP-08001, Revision 4) from Mitsubishi Heavy Industries, Ltd. ("MHI") to the U.S. Nuclear Regulatory Commission ("NRC").

The report incorporates outcomes from the US-APWR GSI-191 Closure Plan which has been proposed by MHI (Reference [1]). As proposed in the enclosure document attached to the letter (Reference [1], Enclosure 2), the following are the principal changes from the previous revision of the report:

1. Debris source term and debris transport

MHI reduced design fiber insulation from the Zone of Influence (ZOI), which is a problematic material and challenging to long term core cooling after the accident. ZOI=4D has been utilized for debris generation of qualified coating debris. Additional quantities of degraded coating and fiber insulation have been incorporated to account for operation over plant life. No credit for debris entrapment has been considered. Different debris splits per operable sumps have been considered for each of strainer head loss and bypass debris.

2. NPSH calculation

Editorial corrections and other updates incorporating the NRC feedback to the previous report have been included. As proposed in the document (Reference [1], Enclosure 2), the final NPSH calculation will be incorporated and submitted to the NRC by August 31, 2011. Vortex, air injection, and steam flashing were not revised in this submittal, and they

will be revised by August 31, 2011.

3. RAI responses

MHI responses to RAI 06.02.02-24 (Reference [2]), RAI 04.04-40 (Reference [3]), and RAI 06.02.02-64 (Reference [4]), which are associated with the upstream evaluation to determine the minimum water level of the sump pool, have been incorporated. The responses to RAI 06.02.02-24 and RAI 04.04-40 were partly updated by the response to RAI 06.02.02-64, which is the follow-up RAI based on the NRC audit to the NPSH calculation conducted on April 7, 2011. Other RAIs which need to be addressed in the report will be incorporated in the next revision of the report (August 31, 2011).

4. Strainer head loss test and bypass fiber test plans

The strainer head loss tests and bypass fiber tests have been implemented and completed in June 2011. The report sections associated with these tests have been updated, and actual the test procedure has been incorporated. Test results are not incorporated to this revision because MHI and the test vendor have been implementing post-test assessment of the test results. Final test results will be incorporated in the next revision of the report (August 31, 2011).

As proposed in the letter (Reference [1]), MHI is going to further revise the report to complete the resolution of upstream issues regarding GSI-191 of the US-APWR. The final report will include strainer head loss tests and bypass fiber tests results. The design basis strainer head loss will be determined based on post-test assessment and will be utilized for NPSH calculations, including vortex, air injection and steam flashing evaluations. The next revision of the report will be submitted to the NRC by August 31, 2011.

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. A non-proprietary version of the document is also being submitted with the information identified as proprietary redacted and replaced by the designation "[]".

Enclosed are 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 Dr. C. Keith Paulson, Senior Technical Manager, Mitsubishi Nuclear Energy Systems, Inc. if the NRC has questions concerning any aspect of the submittals. His contact information is below.

Sincerely,

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

Enclosures:

- 1. Affidavit of Yoshiki Ogata
- 2. CD1: US-APWR Sump Strainer Performance (MUAP-08001-P Rev.4) - Version Containing Proprietary Information
- 3. CD2: "US-APWR Sump Strainer Performance (MUAP-08001-NP Rev.4) - Version <u>Not</u> Containing Proprietary Information

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CC: J. A. Ciocco

C. K. Paulson

Contact Information

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ENCLOSURE 1

Docket No.52-021

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 "US-APWR Sump Strainer Performance" dated June 2011, and have determined that portions of the document 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 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 is that it describes the unique design of the chemical effects evaluation and the strainer head loss and bypass test procedure related to the US-APWR design, developed by MHI and sub-vendors not used in the exact form by any 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.
- 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. The referenced information is not available in public sources and could not be gathered readily from other publicly available information. Other than through the provisions in paragraph 3 above, MHI knows of no way the information could be lawfully acquired by organizations or individuals outside of MHI.
- 7. Public disclosure of the referenced information would assist competitors of MHI in their design of new nuclear power plants without incurring the costs or risks associated with the design of the subject systems. Therefore, disclosure of the information contained in the referenced document would have the following negative impacts on the competitive position of MHI in the U.S. nuclear plant market:

- A. Loss of competitive advantage due to the costs associated with the development of the test configuration, methodology and the test procedure. Providing public access to such information permits competitors to duplicate or mimic the methodology without incurring the associated costs.
- B. Loss of competitive advantage of the US-APWR created by benefits of enhanced plant safety, and reduced operation and maintenance costs associated with the safety and the plant specific strainer system design.

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 June, 2011.

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

ATTACHMENT 1

FILE CONTAINED IN CD 1

CD 1: "US-APWR Sump Strainer Performance (MUAP-08001-P)" – Version Containing Proprietary Information

Contents of CD

File Name 001 MUAP-08001-P(R4).pdf <u>Size</u> 19.1 MB

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Sensitivity Level Proprietary

ATTACHMENT 2

FILE CONTAINED IN CD 2

CD 2: "US-APWR Sump Strainer Performance (MUAP-08001-NP)" – Version Not Containing Proprietary Information

Contents of CD

File Name 001 MUAP-08001-NP(R4).pdf <u>Size</u> 6.22 MB

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Sensitivity Level Non-Proprietary