MITSUBISHI HEAVY INDUSTRIES, LTD.
16-5, KONAN 2-CHOME, MINATO-KU
TOKYO, JAPAN

December 25, 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-08294

Subject: **MHI's Response to US-APWR DCD RAI No. 122-795 Revision 0**

Reference: 1) "Request for Additional Information No. 122-795 Revision 0, SRP Section: 06.02.01.05, Application Section: 6.2.1.5" dated December 3, 2008.

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Response to Request for Additional Information No. 122-795 Revision 0."

Enclosed is the response to one RAI contained within Reference 1.

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,

Y. Ogata

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

Enclosure:

1. Response to Request for Additional Information No. 122-795 Revision 0

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

Contact Information
C. Keith Paulson, Senior Technical Manager
Mitsubishi Nuclear Energy Systems, Inc.
300 Oxford Drive, Suite 301
Monroeville, PA 15146
E-mail: ck_paulson@mnes-us.com
Telephone: (412) 373-6466

D081
NRO

Enclosure 1

UAP-HF-08294
Docket Number 52-021

Response to Request for Additional Information No. 122-795 Revision 0

December 2008

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

12/25/2008

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**122-795**
SRP SECTION:	**06.02.01.05- MINIMUM CONTAINMENT PRESSURE ANALYSIS FOR EMERGENCY CORE COOLING SYSTEM PERFORMANCE CAPABILITY STUDIES**
APPLICATION SECTION:	**SRP 6.2.1.5**
DATE OF RAI ISSUE:	**12/3/2008**

QUESTION NO. : 06.02.01.05-8

6.2.1.5: Figs. 6.2.1-80 and 6.2.1-81 show the peak temperature and pressure in the containment occur around 10 s, but the peak heat transfer coefficient in Fig. 6.2.1-83 occurs at 33 s. Table 6.2.1-28 shows an end of blow-down also at about 33 s. Please, explain/clarify the discrepancy on the timing of these peaks (10s vs 33s).

ANSWER:

The peak pressure and temperature in the containment generally occur when the heat absorption from the containment atmosphere exceeds the energy release rate.

Figure-1 shows the total heat absorption rate from the containment atmosphere and the comprising parts, i.e. heat transfer and condensation to the passive heat sink surfaces, to the containment spray flow, and to the ECCS spillage flow. Additionally, there is some small heat absorption due to interfacial heat and mass transfer on the condensed RWSP that is negligible compared with the above. Figure-1 indicates that the total heat absorption rate is dominated by the heat transfer and condensation at the passive heat sink surfaces.

The heat absorption by the passive heat sinks depends on not only the heat transfer coefficient on the surface but also the difference of temperature between the containment atmosphere and the surface of the passive heat sinks. Figure-2 shows the heat transfer coefficient on the surface of the containment dome. As expected with the Tagami heat transfer option, the heat transfer coefficient increases linearly to the specified peak value at the end of blow-down. Figure-3 shows the containment atmospheric temperature and the containment dome surface temperature, and indicates that the temperature difference decreases with the progress of the blow-down. Therefore, the peak heat absorption rate by the passive heat sinks appears not at about 33 s when the peak heat transfer coefficient occurs but at about 14 s.

Figure-4 shows the comparison of the released break energy flow and the total heat absorption rate, and indicates that the heat absorption exceeds the energy release rate at about 14 s. As a result, as shown in Figure-5, the peak temperature and pressure in the containment occur at about 14 s.

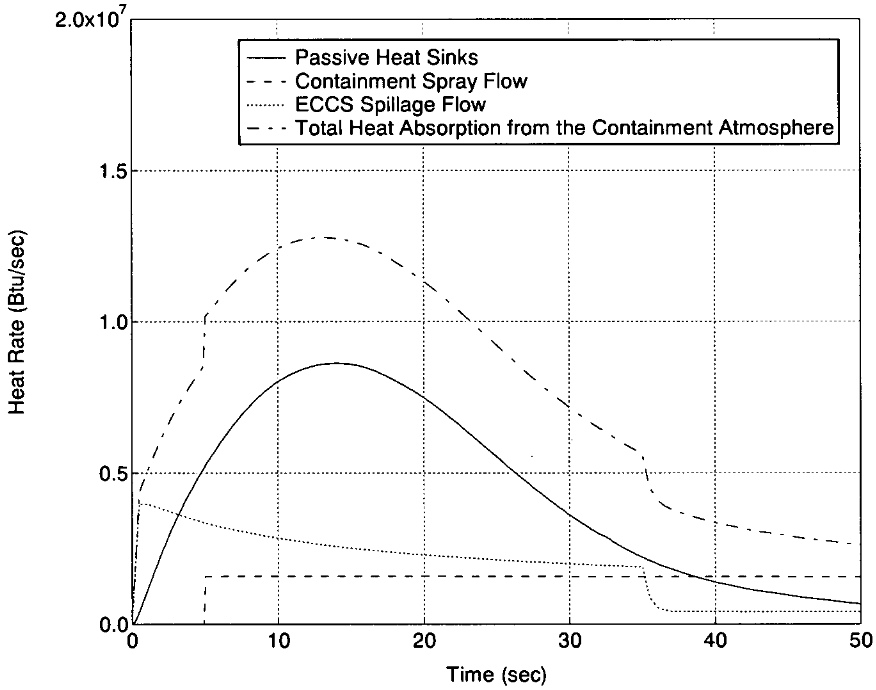

Figure-1 Heat Absorption Rate from the Containment Atmosphere

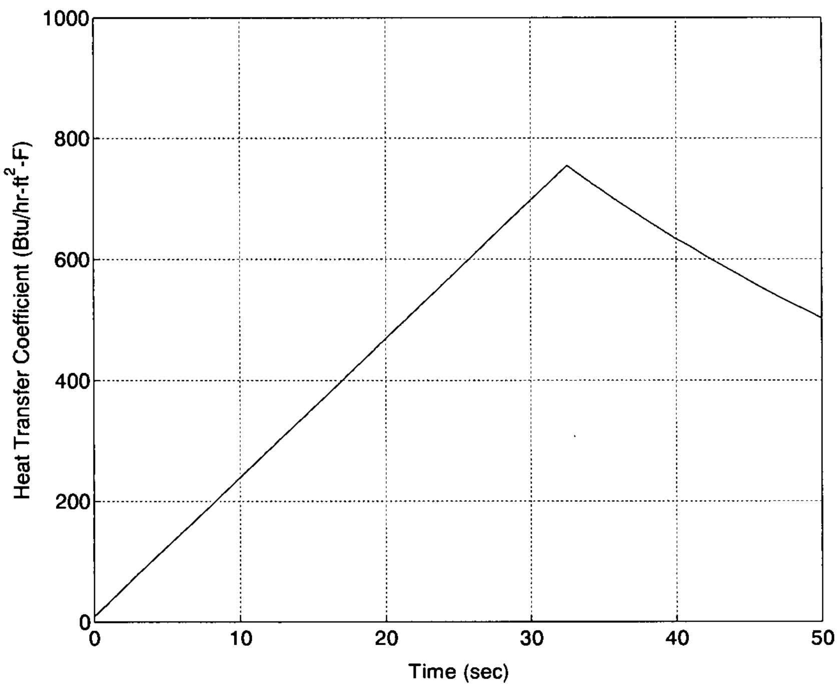

Figure-2 Heat Transfer Coefficient on the Containment Dome Surface

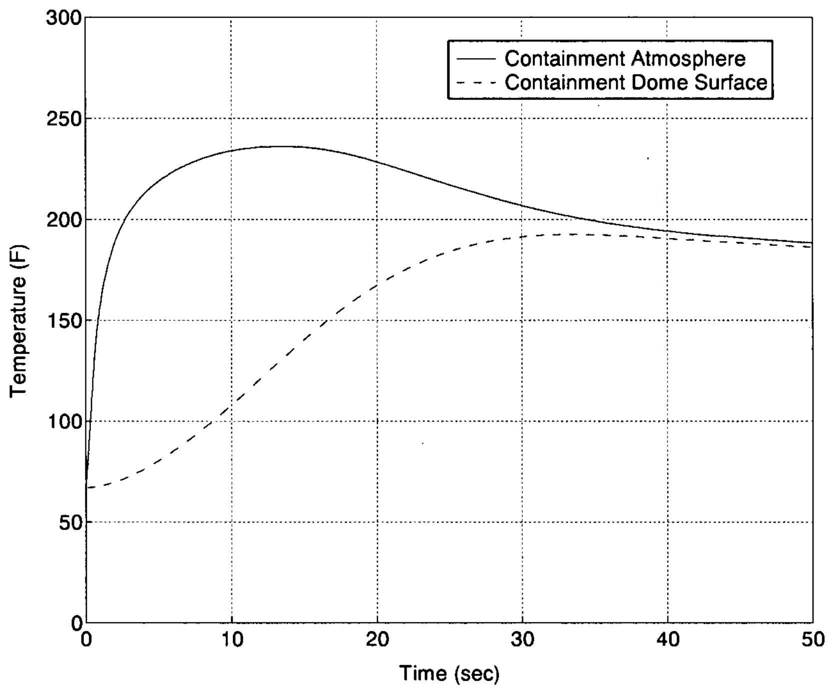

Figure-3 Comparison of the Containment Atmospheric Temperature and the Containment Dome Surface Temperature

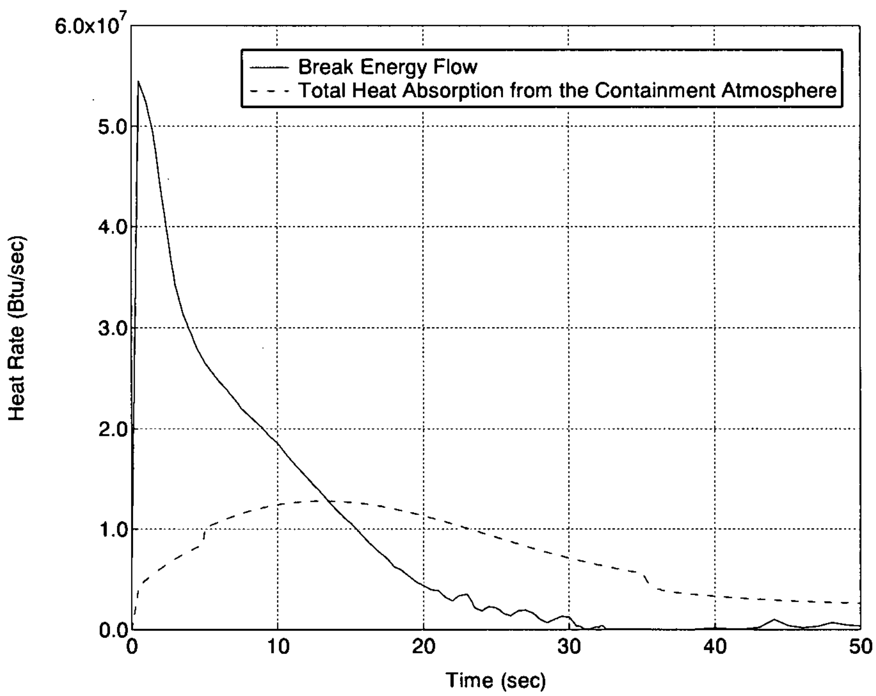

Figure-4 Comparison of the Break Energy Release Rate and the Total Heat Absorption Rate

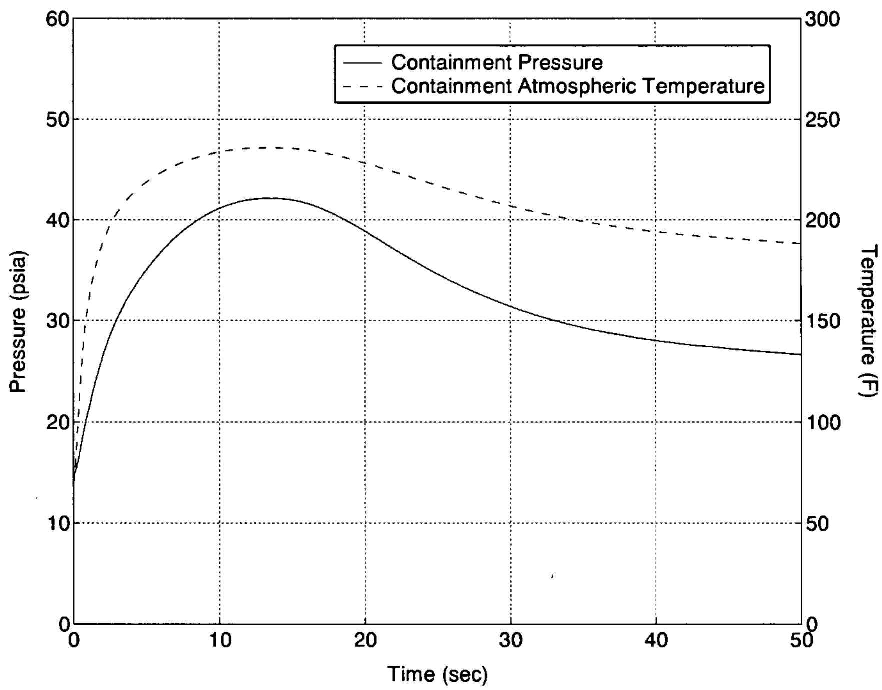

Figure-5 Containment Pressure and Atmospheric Temperature

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

This completes MHI's response to the NRC's question.