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TOKYO, JAPAN

September 3, 2010

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-10243

Subject: MHI's Responses to US-APWR DCD RAI No.608-4776 Revision 2

References: 1) "Request for Additional Information No. 608-4776 Revision 2, SRP Section: 19 – Probabilistic Risk Assessment and Severe Accident Evaluation," dated July 20, 2010.

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Responses to Request for Additional Information No. 608-4776 Revision 2".

Enclosed are the responses to the RAI that are 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. Responses to Request for Additional Information No. 608-4776 Revision 2

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

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Enclosure 1

UAP-HF-10243
Docket Number 52-021

Responses to Request for Additional Information No.608-4776
Revision 2

September, 2010

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

09/03/2010

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No.52-021

RAI NO.:	**NO. 608-4776 REVISION 2**
SRP SECTION:	**19 – Probabilistic Risk Assessment and Severe Accident Evaluation**
APPLICATION SECTION:	**19**
DATE OF RAI ISSUE:	**07/20/2010**

QUESTION NO. : 19-439

The staff has reviewed MHI's response to RAI 19-412. The staff did not find the core exit thermocouples (CETs) in D-RAP (Table 17.4-1). A total loss of the RHR function will result in a loss of temperature indication in the RCS vessel without the CETs. RCS boiling often results in level indication inconsistencies. Please add the CETs to Table 17.4-1 or justify why their omission is acceptable and is consistent with the staff recommendations outlined in GL 88-17.

ANSWER:

The CETs will be added as risk-significant SSCs in Table 17.4-1.

The US-APWR PRA has not modeled these sensors and CETs as a basic event, and risk importance measures (i.e. risk achievement worth or Fussell-Vesely importance) cannot be quantified. However, these sensors and associated CETs are necessary to perform operator actions modeled in PRA and failures can be risk significant. For example, an operator would perform charging injection upon detection of RCS temperature high or RCS water level low by those sensors and/or CETs. Therefore, these sensors and CETs will be taken into account as risk significant SSCs for an expert panel and will be added in Table 17.4-1.

Impact on DCD
Table 17.4-1 will be revised in the DCD tracking report by the end of this year.

Impact on COLA
There is no impact on COLA.

Impact on PRA
There is no impact on PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

09/03/2010

US-APWR Design Certification

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RAI NO.:	**NO. 608-4776 REVISION 2**
SRP SECTION:	**19 – Probabilistic Risk Assessment and Severe Accident Evaluation**
APPLICATION SECTION:	**19**
DATE OF RAI ISSUE:	**07/20/2010**

QUESTION NO. : 19-440

The staff has reviewed MHI's response to RAI 19-416. Please explain why the revised risk insight states, "Adoption of at least **one of the measures** listed below can reduce risk from surge line flooding...". Please update this insight to state that both measures will be adopted, or please justify why both measures would not be taken to mitigate an extended loss of the RHR function.

ANSWER:

MHI agrees with the NRC comment and will revise the response to RAI 19-416 as shown on the next page. The change in the DCD will be reflected in a DCD UTR by the end of this year.

Impact on DCD

Table 19.1-119 in the response to RAI 19-416 will be revised as follows:

Key Insights and Assumptions	Dispositions
13. Administrative controls ensure the RCS water level, temperature and pressure indication are available during shutdown.	19.2.5 COL 19.3(6) COL 13.5(7)
14. Surge line flooding may occur if the decay heat removal function is lost during plant operating states where the pressurizer manway is the only vapor release path from the RCS. Water held up in the pressurizer may create erroneous readings from the water level indicators measured with reference to the pressurizer. This phenomenon can also prevent gravity injection from the SFP. Measures to prevent accident evolution caused by surge line flooding are important. Adoption of ~~at least one of the~~ both measures listed below can reduce risk from the surge line flooding event. - Installation of a temporary RCP water level sensor that measures the MCP water level with reference to pressure at the reactor vessel head vent line and cross over leg when the RCS is vented at a high elevation. - Operational procedures to perform continuous RCS injections when loss of RHR occurs under conditions where the pressurizer manway is the only vapor release path from the RCS. The temporary equipment used to measure water level will satisfy the following specifications. · The water level can be read outside the containment vessel (CV) in order to be effective during events which involve harsh environment in the CV · Tygon tubing monometers will not be used · Instrumentation piping diameter will be sufficient to prevent delay in response	5.4.7.2.3.6 19.2.5 COL 19.3(6) COL 13.5(7)

Impact on COLA

There is no impact on COLA.

Impact on PRA

There is no impact on PRA.