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October 28, 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-09501

Subject: MHI's Response to US-APWR DCD RAI No. 463-3746 Revision 0 and Open Item OI-SRP16-CTSB-1769/284

Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") the document entitled "MHI's Response to US-APWR DCD RAI No. 463-3746 Revision 0 and Open Item OI-SRP16-CTSB-1769/284". The material in Enclosure 1 provides MHI's response to the NRC's "Request for Additional Information (RAI) 463-3746 Revision 0," dated October 6, 2009, and Open Item 16-1769/284 of "Open Items 16.4.6," dated September 16, 2009.

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.

Enclosures:

1. MHI's Response to US-APWR DCD RAI No. 463-3746 Revision 0 and Open Item OI-SRP16-CTSB-1769/284 (non-proprietary)

CC: J. A. Ciocco
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ENCLOSURE 1

UAP-HF-09501
Docket No. 52-021

MHI's Response to US-APWR DCD RAI No. 463-3746 Revision 0 and
Open Item OI-SRP16-CTSB-1769/284

October 2009

(Non-Proprietary)

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

10/28/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 463-3746 REVISION 0**
SRP SECTION:	**16 - TECHNICAL SPECIFICATIONS**
APPLICATION SECTION:	**16**
DATE OF RAI ISSUE:	**10/06/2009**

QUESTION NO.: 16-299

Provide the additional information and update the following RAI response for Post Accident Monitoring (PAM) Instrumentation Tech Spec 3.3.3.

Request for Additional Information No. 167-1769

QUESTIONS for Technical Specification Branch (CTSB)

16-284

In RAI-SRP16-CTSB-1769/284, the staff requested the applicant provide a summary of the analyses to confirm that the list of Post Accident Monitoring (PAM) instrumentation contained in the APWR GTS, Table 3.3.3-1, includes the entire population of instruments required to address the requirements of General Design Criteria (GDC) 13, 19 and 64, the guidance in Revision 4 of Regulatory Guide (RG) 1.97, and the selection criteria included in IEEE Standard 497-2002. Endorsed IEEE Standard 497-2002 provides criteria for selecting PAM instrumentation variables, instead of providing a list of variables to monitor (which was the approach taken in the 1983 Revision 3 of RG 1.97). The discussion of these criteria on page iv of IEEE Standard 497-2002 states "Accident monitoring variable selection must be consistent with the plant specific emergency operating procedures (EOPs) and abnormal operating procedures (AOPs). The variables selected from these procedures need to be the minimum set to assess that safety-related functions are performed and safety systems operate acceptably." The applicant's response (provided in Chapter 7 Request For Additional Information item 07.05-8), does not describe how it is possible to provide a "complete" PAM Instrumentation Technical Specification prior to COL issuance, when PAM variable selection criteria in RG 1.97, Revision 4, depend on prior development of Emergency Procedure Guidelines (EPGs), EOPs and AOPs (guidelines and procedures which cannot be developed before COL issuance). This issue is identified as Open Item OI-SRP16-CTSB-1769/284 in the U.S. APWR Safety Evaluation Report.

The staff has reviewed its current position, as stated in the STS Reviewer's Note, regarding which accident monitoring instrumentation should be in technical specifications, in comparison to Regulatory Guide 1.97, "Criteria for Accident Monitoring Instrumentation for Nuclear Power Plants," Revision 4, June 2008. It is the NRC staff's position that technical specifications should include (1) all Regulatory Guide 1.97, Revision 4, Type A instruments, and (2) all Regulatory Guide 1.97, Revision 4, Type B and Type C instruments in accordance with the units Regulatory

Guide 1.97 Safety Evaluation Report. Therefore, a COL applicant should include a technical specification that meets this staff position if the applicant references Regulatory Guide 1.97, Revision 4.

Identification of Regulatory Guide 1.97, Revision 4, Type A, Type B, and Type C accident monitoring instrumentation functions depends on development of emergency operating procedures (EOPs) and abnormal operating procedures (AOPs), which is a post-COL activity. Therefore COL applicants implementing Regulatory Guide 1.97, Revision 4, should use guidance from DC/COL-ISG-8, "Necessary Content of Plant-Specific Technical Specifications When a Combined License Is Issued," December 2008, in order to complete the plant-specific technical specification list of PAM instrumentation functions. This guidance provides three options:

- Option 1 involves the use of plant-specific information. Option 1 appears impracticable for PAM instrumentation technical specifications because the list of Type A, Type B, and Type C PAM instrumentation functions cannot be finalized before COL issuance.

- Option 2 involves the use of useable bounding information. Option 2 may be practical if the COL applicant is able to develop a truly bounding list of Type A, Type B and Type C PAM instrumentation functions to be included in the plant-specific technical specifications. However, if a Regulatory Guide 1.97, Revision 4, analysis considering plant-specific EOPs and AOPs, which are based on the as-built plant, shows that additional PAM instrumentation functions are necessary, then the COL holder would need to request a license amendment to make changes to the plant-specific technical specification PAM instrumentation required functions list. The NRC would need to approve this amendment before the COL holder would be allowed to load fuel.

- Option 3 involves an administrative program to control PAM instrumentation functions. Option 3 would require establishing a plant-specific administrative controls program technical specification that would require using an NRC-approved methodology to determine the required PAM instrumentation functions, and maintaining the list of required PAM instrumentation functions in a specified document with appropriate regulatory controls. Option 3 may be practical because the approved methodology, Regulatory Guide 1.97, Revision 4, is already established. This approach is advantageous because COL holders would not necessarily need to request a license amendment to make changes to the PAM instrumentation required functions list post COL. However, the program technical specification would need to be developed prior to COL issuance.

The applicant is requested to propose changes as described in the attached document.

ANSWER:

The US-APWR DCD and associated Technical Specifications have been developed based on Option 2 described in this RAI and associated supplemental document. A bounding list of Type A, Type B, and Type C instrumentation functions have been defined and reflected in DCD Section 7.5 and in the US-APWR Generic Technical Specifications (GTS) Section 3.3.3. Notwithstanding the US-APWR commitment to RG 1.97 Revision 4, this bounding list has been developed based on a combination of previous revisions of RG 1.97, Japanese domestic and US operating plant experience and EOPs, and known differences between the US-APWR and current operating PWRs. Because the US-APWR design is very similar to the current US operating plants, there is high confidence that the list is bounding and complete.

The Emergency Response Guidelines (ERGs) and draft US-APWR EOP being developed by MHI for use by COL applicants in the development of their plant-specific EOPs use the PAM instrument lists in the US-APWR DCD and GTS as those instruments available to use in the ERGs and EOPs.

Based on this sequential development (bounding PAM instrument list used to develop the ERGs, EOPs, and AOPs), MHI does not expect that additional PAM instruments will need to be added after the ERGs, EOPs, and AOPs are developed. As a part of the normal internal checking and independent verification done at the completion of ERG and EOP development, consistency between the instrumentation list and procedures will be verified. This consistency review is considered an internal quality review activity that does not require a regulatory submittal or ITAAC.

In the unlikely event that a COL applicant identifies changes or additions to the bounding list as a result of plant-specific as-built design, EOPs, AOPs, or supporting analyses, the COL applicant will request a license amendment for these changes, consistent with Option 2. At that time, the COL license amendment may propose a change to Option 3.

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.

RESPONSE TO OPEN ITEMS

10/28/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

OPEN ITEM NO:	**16.4.6**
SRP SECTION:	**16.4.6 INSTRUMENTATION TECHNICAL SPECIFICATIONS BRANCH**
APPLICATION SECTION:	**16**
DATE OF OI ISSUE:	**9/16/2009**

OPEN ITEM NO.: OI-SRP16-CTSB-1769/284

This question is related to RAI 16-1769/284.

In RAI-SRP16-CTSB-1769/284, the staff requested the applicant provide a summary of the analyses to confirm that the list of Post Accident Monitoring (PAM) instrumentation contained in the APWR GTS, Table 3.3.3-1, includes the entire population of instruments required to address the requirements of General Design Criteria (GDC) 13, 19 and 64, the guidance in Revision 4 of Regulatory Guide (RG) 1.97, and the selection criteria included in IEEE Standard 497-2002. Endorsed IEEE Standard 497-2002 provides criteria for selecting PAM instrumentation variables, instead of providing a list of variables to monitor (which was the approach taken in the 1983 Revision 3 of RG 1.97). The discussion of these criteria on page iv of IEEE Standard 497-2002 states "Accident monitoring variable selection must be consistent with the plant specific emergency operating procedures (EOPs) and abnormal operating procedures (AOPs). The variables selected from these procedures need to be the minimum set to assess that safety-related functions are performed and safety systems operate acceptably." The applicant's response (provided in Chapter 7 Request For Additional Information item 07.05-8), does not describe how it is possible to provide a "complete" PAM Instrumentation Technical Specification prior to COL issuance, when PAM variable selection criteria in RG 1.97, Revision 4, depend on prior development of Emergency Procedure Guidelines (EPGs), EOPs and AOPs (guidelines and procedures which cannot be developed before COL issuance). This issue is identified as Open Item OISRP16-CTSB-1769/284.

ANSWER:

The NRC issued RAI 463-3746 Question 16-299 to facilitate closure of this open item, and defined three options for addressing the open item that are acceptable to the NRC staff. In the response to this RAI question, MHI explained that the US-APWR DCD and associated Technical Specifications have been developed based on Option 2 (described in the RAI). A bounding list of Type A, Type B, and Type C instrumentation functions have been defined and reflected in DCD Section 7.5 and in the US-APWR Generic Technical Specifications (GTS) Section 3.3.3. As such, this list is considered part of the US-APWR design and is being used to define the instruments that are available to be used in the US-APWR Emergency Response Guidelines (ERGs) and

subsequently, plant-specific EOPs and AOPs. Based on this sequential development (bounding PAM instrument list used to develop the ERGs, EOPs, and AOPs), MHI does not expect that additional PAM instruments will need to be added after the ERGs, EOPs, and AOPs are developed. The RAI response acknowledges that in the unlikely event that a COL applicant identifies changes or additions to the bounding list as a result of plant-specific as-built design, EOPs, AOPs, or supporting analyses, the COL applicant will request a license amendment for these changes, consistent with Option 2. As a result, the PAM instrument lists in the US-APWR DCD Section 7.5 and Generic Technical Specification Section 3.3.3 are accurate and complete for the purpose of completing the NRC US-APWR Design Certification review.

Based on the information in this response, US-APWR Open Item 16-1769/284 can be closed.

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.