

  
**MITSUBISHI HEAVY INDUSTRIES, LTD.**  
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TOKYO, JAPAN

August 11, 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-09422

**Subject: MHI's Responses to US-APWR DCD RAI No. 387-2931 Revision 1**

**Reference:** [1] "Request for Additional Information No. 387-2931 Revision 1, SRP Section: 09.01.02 – New and Spent Fuel Storage - Design Certification and New License Applicants, Application Section: 9.1.2," dated June 11, 2009.

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. 387-2931 Revision 1".

Enclosure 1 is a response to a question that is contained within Reference [1]. Of these questions, the response to Question 09.01.02-23 was scheduled for within 60 days of receipt of the RAIs, as it discusses compliance with RG 4.21 which was issued after the US-APWR DCD docketing.

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,



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

**Enclosures:**

1. Second Response to Request for Additional Information No. 387-2931 Revision 1.



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

Contact Information

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Enclosure 1

UAP-HF-09422  
Docket No. 52-021

Second Response to Request for Additional Information  
No. 387-2931 Revision 1

August 2009

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**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION**

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08/11/2009

**US-APWR Design Certification  
Mitsubishi Heavy Industries, Ltd.  
Docket No. 52-021**

**RAI NO.:** NO. 387-2931 REVISION 1  
**SRP SECTION:** 9.1.2 – New and Spent Fuel Storage  
**APPLICATION SECTION:** 9.1.2  
**DATE OF RAI ISSUE:** 06/11/2009

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**QUESTION NO.: 09.01.02-23**

In RAI No. 132-1538, Question No.: 09.01.02-013, the staff requested the applicant to include in the DCD a detailed description of the SFP liner leakage collection system monitoring schedule, system capacity, how is the system operability evaluated, and what are the testing intervals. The staff also requests the applicant to justify why there is no need for an ITAAC to test the proper operation of the SFP leakage collection system.

In its response to this RAI dated January 29, 2009, the applicant stated that:

A leakage collection monitoring schedule is not necessary, as such unexpected leakage would be alarmed upon its occurrence. The capacity of the collection system has not yet been set, but the insignificance of such leakage eliminates concerns about collection system overflows or alarms for such potential overflows - any significant unexpected leakage would be indicated by the SFP level detectors that alarm both locally and in the main control room. During construction, the operability of the leakage collection system will be confirmed to assure no blockages, system leakages, etc. The simplicity of the system eliminates the need for subsequent testing, or for an ITAAC to further confirm the proper operation of the SFP leakage collection system.

The staff finds the answer to RAI No. 132-1538, Question No.: 09.01.02-013 inadequate. Operational experience has shown that SFP liner leakage collection systems are susceptible to be obstructed by slow buildup of boric acid residue and/or minerals.

NRC Information Notice 2004-05, "Spent Fuel Pool Leakage to Onsite Groundwater," March 3, 2004, discusses the case of Salem Nuclear Generating Station Unit 1. Salem's SFP includes an integral liner leakage detection and collection system. On September 18, 2002, the licensee identified evidence of radioactive water leakage. The licensee's reviews discovered that over the years since initial facility startup, materials such as boric acid residue and minerals accumulated within the SFP liner leak collection and detection system and restricted the normal drainage of liquid. The leakage itself was not accompanied by large fluctuations in SFP water levels and was likely masked by approximately equal volumes of evaporation from the SFP.

Regulatory Guide (RG) 4.21, "Minimization of Contamination and Radioactive Waste Generation: Life-Cycle Planning," Appendix A 1.i states that the during design and/or process selection, where

applicable, processes should be selected that eliminate streams that have the potential for the encrustation of precipitates or crystallization at ambient temperatures that could result in line blockages. RG 4.21, Appendix A.1.j states that pipes should be adequately sized to minimize the potential for blockage by the encrustation of precipitates and to facilitate the removal of such blockage from the pipes.

The applicant has not demonstrated that the spent fuel pool leakage collection system is in compliance with 10 CFR 20.1406. The staff requests the applicant to justify how the spent fuel pool leakage collection system meets the requirements of 10 CFR 20.1406 if the system is not periodically inspected to identify blockages. Additionally, the staff requests the applicant to clarify in the DCD that the spent fuel pool leakage collection system is sized to allow cleaning of blockages as specified in RG 4.21.

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**ANSWER:**

The DCD will be revised as below "Impact on DCD" to meet the requirements of 10CFR20.1406 and RG 4.21.

**Impact on DCD**

The DCD Tier 2 Subsection 9.1.2.2.2 on Spent fuel storage, 5<sup>th</sup> paragraph will be revised with the following description:

A liner leakage collection system is provided to collect possible leakage from liner plate welds on the pit walls and floor. The stainless steel liners are welded to the C-shape embedment in the pit walls and floors, and the embedment are interconnected and drain through the leakage collection pipes to a collection point which is monitored to determine whether leakage is occurring.

The spent fuel pit leakage collection pipes connected to the C-shape embedment are closed by valves or caps located in the collection points. Any leakage from liner plate welds is detected by opening the valves or caps on patrols conducted weekly. To meet the requirements of 10CFR20.1406, the inside of the spent fuel pit leakage collection pipes are inspected using a device such as a fiberscope approximately every refueling outage. Should materials such as accumulated boric acid residue and minerals be detected, the inside of the pipes are cleaned. The spent fuel pool leakage collection pipes are sized to allow cleaning of blockages as specified in RG 4.21.

**Impact on COLA**

There is no impact on the COLA.

**Impact on PRA**

There is no impact on the PRA.