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TOKYO, JAPAN

December 20, 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-11446

Subject: MHI's Response to US-APWR DCD RAI No. 851-6065 REVISION 3 (SRP 03.09.03)

Reference: 1) "Request for Additional Information 851-6065 Revision 3, SRP Section: 03.09.03 – ASME Code Class 1, 2 and 3 Components, Application Section: 03.09.03", dated October 24, 2011.

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. 851-6065 Revision 3".

Enclosed is the response to one RAI, Question 03.09.03-28, contained within Reference 1. This transmittal completes the response to this RAI.

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.

Enclosures:

1. Response to Request for Additional Information No.851-6065 Revision 3

D081
NRO

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

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Enclosure 1

UAP-HF-11446
Docket Number 52-021

Response to Request for Additional Information No.851-6065
Revision 3

December 2011

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

12/20/2011

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 851-6065 REVISION 3**
SRP SECTION:	**03.09.03 – ASME Code Class 1,2 and 3 Components**
APPLICATION SECTION:	**03.09.03**
DATE OF RAI ISSUE:	**10/24/2011**

QUESTION NO.: 03.09.03-28

This RAI 6065 is a supplemental RAI to RAI 209, Question 03.09.03-8:

RAI 209, Question 03.09.03-8 addresses concerns that some ASME Class 2 and 3 components are exposed to high radiation or high thermal cycles and therefore the materials are susceptible to environmental fatigue. In response to RAI 209 Question 03.09.03-8, MHI stated that ASME Class 2 and 3 components are out of scope of the environmental fatigue evaluation based on the guidance in RG 1.207.

In DCD Tier 2 Section 3.9.3.1.5, MHI stated that "The environmental impact on fatigue of Class 2 and 3 components will follow guidelines established by the NRC at the time of actual analysis". Since this statement does not reflect the current RG 1.207 guidance that applies only to Class 1 components and there is no NRC guidance for environmental fatigue impact on Class 2 and 3 components, the statement should be modified to reflect the actual approach to be followed or deleted from the DCD.

ANSWER:

RG 1.207, "Guidelines for Evaluating Fatigue Analyses Incorporating the Life Reduction of Metal Components due to the Effects of the Light-Water Reactor Environment for New Reactors", provides guidance for evaluating the environmental fatigue impact of Class 1 components. Currently, there is not a similar guideline for evaluating the environmental fatigue impact on Class 2 and 3 components. The environmental impact on fatigue will be applied to Class 1 components based on the current RG 1.207, and the statement concerning environmental impact on fatigue of Class 2 and 3 components will be deleted from US-APWR DCD.

Impact on DCD

DCD Subsection 3.9.3.1.5, "ASME Code, Section III, Class 2 and 3 Components" will be revised as shown in Attachment A.

Impact on R-COLA

There is no impact on the R-COLA.

Impact on S-COLA

There is no impact on the S-COLA.

Impact on PRA

There is no impact on the PRA.

Impact on Topical/Technical Report

There is no impact on Topical/Technical Report.

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design life of the plant. ~~The environmental impact on fatigue of Class 2 and 3 components will follow guidelines established by the NRC at the time of the actual analysis.~~ DCD_03.09.03-28

Class 2 and 3 safety-related active components (including valves and pumps) and the associated supports require functionality, functional capability, and operability. Functionality and functional capability for these components and supports consist of the ability of a component, including its supports, to deliver a rated flow and to retain dimensional stability when the design and service loads, and their resulting stresses and strains, are at prescribed ASME Code, Section III (Reference 3.9-1) service levels. The operability of the components and supports consists of the ability of an active component, including its support, to perform the mechanical motion required to fulfill its designated safety function consistent with operational limits and Technical Specification requirements. Active valves and pump requirements are further described in Subsection 3.9.3.3 on pump and valve operability assurance.

In addition to the above requirements, stress demand is kept low enough in relation to stress capacity limits for these components so that the pressure-retaining boundary integrity is maintained.

3.9.3.2 Design and Installation of Pressure-Relief Devices

The design of pressure relieving valves complies with the requirements of ASME Code, Section III (Reference 3.9-1), Appendix O, "Rules for the Design of Safety Valve Installations." When there is more than one valve on the same run of pipe, the sequence of valve openings is based on the anticipated sequence of valve opening. This sequence is determined by the setpoint pressures or control system logic. The applicable stress limits are satisfied for the components in the piping run and connecting components including supports. The reaction forces and moments are based on a DLF of 2.0 unless a dynamic structural analysis is performed to calculate these forces and moments.

3.9.3.2.1 Pressure Relief Devices Connected to the Pressurizer

The pressurizer safety valves provide over-pressure protection for the RCS. The safety valves connected to the pressurizer are the only ASME Code, Section III (Reference 3.9-1), Class 1 pressure relief valves in the US-APWR.

The pressurizer safety valves are supported by the downstream piping module of safety depressurization valves and the safety valves. The safety valves are connected to four nozzles located in the pressurizer upper head. The spring loaded safety valves are designed to prevent system pressure from exceeding the design pressure by more than 10%.

If the pressure exceeds the setpoint of the safety valve, the valve opens and steam is discharged to the pressurizer relief tank. The pressurizer volume is sized so that opening of the safety valve is not required for any Level A service condition transient. The connecting pipe between the pressurizer and the safety valves includes a loop seal in order to prevent the leak of the steam and any non-condensible gas in the upper portion of the pressurizer.