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TOKYO, JAPAN

August 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-09436

Subject: MHI's Responses to US-APWR DCD RAI 431-3274 Revision 1

Reference: 1) "REQUEST FOR ADDITIONAL INFORMATION 431-3274 REVISION 1, SRP Section: 10.03 – Main Steam System, Application Section: 10.3, dated July 30, 2009.

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 431-3274 Revision 1."

Enclosed are the responses to a 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,



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

Enclosure:

1. Responses to Request for Additional Information 431-3274 Revision 1

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

Contact Information

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Enclosure 1

UAP-HF-09436
Docket No. 52-021

Responses to Request for Additional Information No. 431-3274
Revision 1

August 2009

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

8/28/2009

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

RAI NO.: NO. 431-3274 REVISION 1
SRP SECTION: 10.03 MAIN STEAM SYSTEM
APPLICATION SECTION: 10.3
DATE OF RAI ISSUE: 7/30/2009

QUESTION NO.: 10.03-4

US-APWR_Supplemental RAI 10.3-1

In order to complete a review of the main steam supply system of the US-APWR DCD, as related to 10 CFR 50.63 requirement for station blackout (SBO) event, the staff requested the applicant in US-APWR RAI 10.3-3 (No. 329-1860 Rev. 0), dated April 8, 2009 to provide design and operating details for the main steam supply system (MSSS) and its components as related to the SBO. Also, the staff requested the applicant to provide supporting justification that the alternating current (AC) power source to the MSSS components is adequate to withstand and recover from an SBO event.

In its response, dated May 26, 2009, the applicant stated that during SBO events the plant can be kept in hot-standby condition for more than eight hours. This is accomplished by using 105% rated steam flow capacity main steam valves for decay heat removal in conjunction with feedwater supply from the emergency feedwater system (EFWS). The applicant further stated that main steam depressurization valves (MSDVs) are not required in hot-standby condition. Further it is stated that the alternate alternating current (AAC) gas turbine generator (GTG) can power the MSDV via Class 1 E power system until power is restored in accordance with FSAR Tier 2 Section 8.4.1.4, "Recovery from SBO." However, this did not address staff's RAI with respect to which components of the MSSS are required to be functional and what their emergency power sources are during an SBO event. Additionally, the applicant did not address the MSIV functionality for containment isolation and emergency power source during an SBO. Therefore, the staff requests for further clarification and/or additional information to provide a complete response to US-APWR RAI 10.3-3. Also, the applicant needs to quantify there is sufficient margin for AAC GTG to supply power to critical MSSS components.

ANSWER:

The required components of the MSS for SBO and their power sources are shown below.

- **MSSVs**
During SBO, MSSVs are opened when the steam generator pressure reaches their set point to remove decay heat from the RCS in conjunction with the EFWS.
The MSSVs are spring loaded valves so the valves do not depend on any power source.

- **MSIVs**
During SBO, MSIVs are closed to keep inventory of steam generator. The type of MSIV will be changed to system medium actuated gate valve which uses valve inside pressure to close the valve itself. The valve has equalization passes between solenoid valves and valve inside and upper piston chamber. The solenoid valves are energized from Class 1E DC bus to keep closed position during power operation. To close the MSIV, the solenoid valves are de-energized to open to deliver pressure from valve inside to the upper piston chamber. Therefore, the DC power is not required for the MSIV to close during SBO.
- **MSBIVs**
During SBO, MSBIVs are closed to keep inventory of steam generator. The MSBIVs are fail closed air-operated valves and have some solenoid valves to release air from their diaphragm. The solenoid valves are powered from Class 1E DC power source. During power operation, the solenoid valves are de-energized to keep open position to release air from the diaphragm, and the MSBIVs are closed. Hence the DC power is not required for the MSBIV to close during SBO.

From the above discussion, any power source is not required for the MSS during SBO.

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.