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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-09435

Subject: MHI's Responses to US-APWR DCD RAI 430-3269 Revision 1

Reference: 1) "REQUEST FOR ADDITIONAL INFORMATION 430-3269 REVISION 1, SRP Section: 10.04.04 – Turbine Bypass System, Application Section: 10.4.4, 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 430-3269 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,

Y. Ogata

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

Enclosure:

1. Responses to Request for Additional Information 430-3269 Revision 1

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

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Docket No. 52-021
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Enclosure 1

UAP-HF-09435
Docket No. 52-021

Responses to Request for Additional Information No. 430-3269
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. 430-3269 REVISION 1

SRP SECTION: 10.04.04 TURBINE BYPASS SYSTEM

APPLICATION SECTION: 10.4.4

DATE OF RAI ISSUE: 7/30/2009

QUESTION NO.: 10.03.04-3

Supplemental - Request for Additional Information

US-APWR Supplemental RAI 10.4.4-1

In order to conform to GDC 34 requirement, Item 2, Section III, "Review Procedures" of SRP Section 10.4.4, "Turbine Bypass System," which recommends to verify the relation between the TBS and MSRV capacity in terms of percentage of main steam flow, the maximum reactor power step change the system is designed to accommodate without a reactor or turbine trip, and the maximum electric load step change the reactor is designed to accommodate without reactor control rod motion or steam bypassing. Since the feature as recommended in the SRP guidance were not clear from the DCD, in a request for additional information (RAI) 10.4.4-1, dated January 21, 2009, the staff requested the applicant to provide further information as related to the TBS capacity for the maximum step change requirements in terms of percentage of the main steam conforming to the above SRP guidance as related to the GDC 34 requirement.

In a letter dated February 20, 2009, the applicant provided its response to US-APWR RAI 10.4.4-1 and described that, with 15 TBVs, the TBS has a capacity of 68 percent of the rated power main steam flow. This is reflected in the DCD Section 10.4.4.1.2. The applicant also stated that the sum of MSRV capacity is 10 percent of the rated power main steam flow. The applicant further stated that the reactor power is controlled following the electric load, and referred to the DCD Section 10.4.4.3, where it is described that the TBS is designed to accommodate the maximum 100 percent step change of electric load without a reactor or turbine trip and without the actuation of the MSRVs. Additionally, in Section 10.4.4.3, it is described that the reactor is designed to be able to follow the maximum 10 percent step change of electric load with control rod motion and without using the TBS.

Based on its response, the staff finds that the applicant adequately addressed the SRP guidance in meeting the GDC 34 requirement, as it relates to the maximum reactor power step change the system is designed to accommodate without a reactor or turbine trip, and the maximum electric load step change the reactor is designed to accommodate without reactor control rod motion or steam bypassing. However, it is not clear to the staff regarding the relation between the TBS capacity and the MSRV capacity in terms of percentage of rated maximum main steam flow. Therefore, the staff requests the applicant to provide clarification and/or additional information to meet the requirements of GDC 34, with respect to the relation between the capacities of the MSRVs and the TBS. The staff further requests the applicant to provide its response with proper justification and also to revise the FSAR to reflect its response(s). The staff's concern described

in US-APWR RAI 10.4.4-1 remains open. **[Open Item_USAPWR 10.4.4-1].**

ANSWER:

As presented in Tier 2 DCD Table 10.3.2-2, the capacity of the sum of all the Main Steam Relief Valves (MSRV) is 10% of rated main steam flow of 20,200,000 lb/h at the valve inlet pressure 1,150 psig. The 10 % capacity of the MSRVs performs adequate decay heat removal to keep the cooldown rate of Reactor Coolant System at 50 deg.F/h during normal plant shutdown if the condenser is not available. This meets the Residual Heat Removal requirements of GDC 34. The TBVs have 68% capacity at the valve inlet pressure 777 psig Each TBV has the capacity which is at least 4.5% of the rated main steam flow. Therefore, three cooling banks of TBVs perform adequate decay heat removal to keep the cooldown rate of Reactor Coolant System at 50 deg.F/h during normal plant shutdown. This also meets the requirement of GDC 34.

Impact on DCD

The last paragraph of Tier 2 DCD Subsection 10.4.4.4 will be revised as follows.

The TBS is designed to bypass steam to the main condenser during normal plant shutdown. The system removes the residual heat and cools the reactor coolant system to a point where the RHR system is placed in service for further cooldown. Three TBVs with 13.6 % of rated main steam flow of 20,200,000 lb/h at the valve inlet pressure 777 psig perform adequate decay heat removal to keep the cooldown rate of Reactor Coolant System at 50 deg.F/h during normal plant shutdown and thereby reduce the demands on systems important to safety in meeting GDC 34.

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.