MITSUBISHI HEAVY INDUSTRIES, LTD.
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TOKYO, JAPAN

February 20, 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-09061

Subject: MHI's Responses to US-APWR DCD RAI No.159-1955 Revision 0

Reference: 1) "REQUEST FOR ADDITIONAL INFORMATION NO. 159-1955 REVISION 0, SRP Section: 10.4.4 - Turbine Bypass System, Application Section: 10.4.4, dated January 21, 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 No.159-1955 Revision 0."

Enclosed is the response to the 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 No. 159-1955 Revision 0

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

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NRO

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Enclosure 1

UAP-HF-09061
Docket No. 52-021

Responses to Request for Additional Information No.159-1955
Revision 0

February 2009

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

2/20/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 159-1955 REVISION 0**
SRP SECTION:	**10.4.4 TURBINE BYPASS SYTEM**
APPLICATION SECTION:	**10.4.4**
DATE OF RAI ISSUE:	**1/21/2009**

QUESTION NO.: 10.4.4-1

In FSAR Tier 2 Section 10.4.4.1.2 "Non-safety Power Generation Design Bases," the US APWR DCD states that the TBS is designed to bypass steam to the main condenser during plant shutdown to facilitate a manually controlled cooldown of the RCS to the point where the residual heat removal system can be placed in service for further cooldown. Also, the DCD states that The TBS has the capacity to bypass 68% of the main steam flow to the main condenser at full power, and is designed to sustain a 100% load rejection, without generating a reactor trip, and without requiring actuation of the MSRVs, MSSVs, or pressurizer safety valve. The DCD further states that the TBS is designed to follow a rapid turbine load reduction greater than 10% but less than 100% with a reactor trip. This conforms to the GDC 34 requirements as related to its capability to support the RHR function for shutting down the plant during normal plant operation.

Further, as related to GDC 34 requirement, Item 2, Section III, "Review Procedures" of SRP Section 10.4.4, "Turbine Bypass System," 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.
However, the DCD does not address this feature as recommended in the SRP guidance. Therefore, in a request for additional information (RAI) 10.4.4-1, the staff requests 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.

ANSWER:

The TBS with 15 TBVs has the capacity of 68% of the rated power main steam flow as shown in the first bullet of the first paragraph in DCD 10.4.4.1.2 Non-safety Power Generation Design Bases. The sum of MSRV capacity is 10% of the rated power main steam flow.
The reactor power is controlled following the electric load, and the TBS is designed to accommodate the maximum 100% step change of electric load without a reactor or turbine trip and without the actuation of the MSRVs in the second sentence of the second paragraph in DCD

10.4.4.3 System Operation.
The reactor is designed to be able to follow the maximum 10% step change of electric load without the turbine bypass system (and with control rod motion) as shown in the third sentence of the third paragraph in DCD 10.4.4.3 System Operation.

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.