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TOKYO, JAPAN

February 6, 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-09045

Subject: MHI's Responses to US-APWR DCD RAI No.151-1824

Reference: 1) "Request for Additional Information No. 151-1824 Revision 1, SRP Section: 19 - Probabilistic Risk Assessment and Severe Accident Evaluation, Application Section: Chapter 19.1," dated January 12, 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. 151-1824 Revision 1".

Enclosed is the response to RAIs that are contained within Reference 1. Of these RAIs, questions #19-285, #19-286, #19-288, #19-289 and #19-290 will not be answered within this package. These questions require additional time for internal discussions and computations, and will be answered by 13th of March 2009 for #19-285, #19-286 and #19-290 and 10th of April 2009 for #19-288 and #19-289.

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. Response to Request for Additional Information No.151-1824 Revision 1.

DOB
NRD

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

Contact Information

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Docket No. 52-021
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Enclosure 1

UAP-HF-09045
Docket Number 52-021

Responses to Request for Additional Information
No. 151-1824 Revision 1

February 2009

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

2/6/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No.52-021

RAI NO.: NO.151-1824 REVISION 1
SRP SECTION: 19 – Probabilistic Risk Assessment and Severe Accident Evaluation
APPLICATION SECTION: 19.1
DATE OF RAI ISSUE: 1/12/2009

QUESTION NO. : 19-287

It is stated In Chapter 25 of the US-APWR PRA: "ANSI/ANS-58.21-2007 " external events PRA methodology" notes that the fundamental screening-out criteria of other external events are (a) if it meets the criteria in the NRC's 1975 Standard Review Plan (NUREG-75/087) or later version; or (b) if it can be shown using a demonstrably conservative analysis that the mean value of the design-basis hazard used in the plant design is less than 1.0E-05 per year and that the conditional core damage probability is less than 1.0E-01, given the occurrence of the design basis event; or (c) if it can be shown using a demonstrably conservative analysis that the CDF is less than 1.0E-06 per year." However, the ANSI/ANS-58.21-2007 is applicable to operating reactors.

Applicants for new reactor design certifications, per 10 CFR Part 52, have to demonstrate how the risk associated with the design compares against the Commission's goals of less than 1E-4/year for core damage frequency and less than 1E-6/year for large release frequency (see RG 1.206 C.I.19.2 (C)). Using the ANSI/ANS-58.21-2007 criteria one cannot compare to the Commission's goals and conclude that the total large release frequency (LRF) is less than 1E-6/year. In addition, the staff believes that only those external events that do not contribute significantly to the total CDF and LRF of the plant can be screened out from further evaluation. Therefore, the criteria for screening out external events from the quantitative evaluation should be adjusted so that (a) it can be possible to demonstrate how the Commission's goals are met, and (b) it can be possible to identify significant external events contributors to the total plant risk. Please revise accordingly or discuss, as necessary.

ANSWER:

ANSI/ANS-58.21-2007 has been referred since it is the current available standard for external events PRA in the PRA report. Also, MHI intends to comply with the Commission's goal and RG 1.206 for the US-APWR as described in the subsection 19.0 and subsection 19.1.5 of the US-APWR DCD.

The one of the primary objectives of the US-APWR PRA is to meet with Commission's goal as stated in the subsection 19.0 of the US-APWR DCD, "to determine how the risk associated with the design compare against the NRC goals of less than 1E-4/year for core damage frequency (CDF) and less than 1E-6/year for large release frequency (LRF)." Also the subsection 19.1.5 of the US-APWR DCD states that "Evaluation of potential accidents for the nearby industrial, transportation, and military facilities in Chapter 2 is a probabilistic and predictive approach that will be followed and documented in the COLA to verify that a 10^{-7} per year occurrence rate has been demonstrated. For low probability events, where data may not be available, a 10^{-6} per year occurrence rate can be utilized when combined with reasonable qualitative arguments. Otherwise, a PRA may need to be performed to comply with the guidance of ANSI/ANS-58.21-2007. The screening criteria of US-APWR for other external events will be determined at COL phase confirming that the screening criteria are below the plant specific risk of US-APWR."

The above discussion will be involved in the Chapter 25 of the US-APWR PRA report MUAP-07030(R1).

Impact on DCD

No impact on DCD.

Impact on COLA

No impact on COLA.

Impact on PRA

Insert the following paragraph before the last paragraph in the page 25-1 of Chapter 25 of US-APWR PRA report (MUAP-07030(R1)).

"Other external events for US-APWR quantitative evaluation will be selected considering the requirement of NRC safety goal and RG 1.206. Evaluation of potential accidents for the site specific other external hazards are a probabilistic and predictive approach that will be followed and documented in the COLA to verify that a 10^{-7} per year occurrence rate has been demonstrated. For low probability events, where data may not be available, a 10^{-6} per year occurrence rate can be utilized when combined with reasonable qualitative arguments. Otherwise, a PRA may need to be performed to comply with the guidance of ANSI/ANS-58.21-2007. The screening criteria of US-APWR for the site specific other external events will be determined confirming that the screening criteria are below the plant specific risk of US-APWR."