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TOKYO, JAPAN

July 24th, 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-09399

Subject: MHI's Responses to US-APWR DCD RAI No. 413 COLP-2998 Revision 1

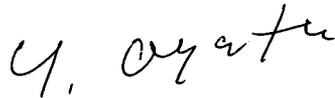
Reference: 1) "Request for Additional Information No. 413 COLP-2998 Revision 1,
SRP Section: 18 - Human Factors Engineering, Application Section:
18.10 Verification and Validation," dated June 24th, 2009.

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. 413 COLP-2998 Revision 1."

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,



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

Enclosure:

1. Responses to Request for Additional Information No. 413 COLP-2998 Revision 1

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



Contact Information

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Enclosure 1

UAP-HF-09399
Docket No. 52-021

Responses to Request for Additional Information No. 413 COLP-2998
Revision 1

July 2009

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

7/24/2009

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

RAI NO.: NO. 413 COLP-2998 REVISION 1
SRP SECTION: 18 - HUMAN FACTORS ENGINEERING
APPLICATION SECTION: 18.10 VERIFICATION AND VALIDATION
DATE OF RAI ISSUE: 6/24/2009

QUESTION NO. 18-63

Acceptance Criteria:

NUREG-0711 section 11 provides acceptance criteria for HFE design verification and validation.

Evaluation:

The staff has reviewed the DCD Chapter 18 section 10; MUAP-07007-P, Revision 1, "HSI system Design Description and HFE Process;" and Technical Report MUAP-08014-P, Rev. 0, "Human System Interface Verification and Validation (Phase 1a)."

In general the V&V information is not of sufficient detail to support an implementation plan level review. This is based on the following conclusions:

1. NUREG-0711 acceptance criteria are consistently either quoted or summarized with no further detail explaining how the acceptance criteria will be met. With no more information than a restatement of the NUREG criteria, the staff cannot evaluate whether appropriate methods are used to implement the criteria.
2. The dependency on Japanese predecessor plant design is continued in this section. As communicated previously, there is insufficient information on the predecessor design. The basis for the Japanese predecessor plant HFE design must be explained because it has not been previously approved for operation in the United States.
3. A V&V implementation plan has not been submitted while MUAP-08014 is submitted as a results summary report. Review and approval of subproducts specified by the NUREG acceptance criteria (Operational conditions, scenarios, performance characteristics, performance measures) are needed before results summary reports can be evaluated. (NOTE: The phase 1a V&V described in MUAP08014 more closely corresponded to a performance based test as

described in NUREG-0711 section 8.4.6.2 than V&V)

Information Request:

Please explain how each of the NUREG-0711 V&V criterion is (or will be) accomplished.

ANSWER:

Items 1 and 3: MHI believes the level of detail the Staff is requesting is included in documents that have already been submitted. MHI will create a cross reference table which compares the criteria of NUREG0711 Section 11 to the MHI documents which define the V&V program element; this includes Topical Report MUAP-07007, DCD Section 18.10, report MUAP-08014 and MUAP-09019. Any gaps will be specifically identified along with the document that will be revised to address that gap. MHI will submit this cross reference table by the end of October 2009.

Item 2: MHI has previously explained that while the Japanese program followed the NUREG-0711 program elements, there is insufficient program documentation. The Phase 1 V&V program was conducted to demonstrate that the Basic HSI System conforms to HFE design principles, and will enable personnel to successfully and safely achieve operational goals. Achievement of these goals has been demonstrated through person-in-the-loop testing, using a full scope dynamic simulator and with licensed US operators. Therefore Phase 1 V&V compensates for a lack of formal documentation in the Japanese HFE program. For each application of the US Basic HSI System, MHI will generate plant specific Implementation Plans, Implementation Procedures and Reports for each HFE Program Element.

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

This completes MHI's responses to the NRC's questions.