

May 13, 2011

APPLICANT: MITSUBISHI HEAVY INDUSTRIES, LTD.

APPLICATION: UNITED STATES - ADVANCED PRESSURIZED WATER REACTOR DESIGN CONTROL DOCUMENT

SUBJECT: SUMMARY OF THE JANUARY 19 - 21, 2011, CLOSED AND PUBLIC MEETINGS WITH MITSUBISHI HEAVY INDUSTRIES, LTD. TO DISCUSS THE STATUS OF THE UNITED STATES - ADVANCED PRESSURIZED WATER REACTOR DIGITAL INSTRUMENTATION AND CONTROLS DESIGN REVIEW

On January 19 - 21, 2011, a series of closed and public meetings were held between the U.S. Nuclear Regulatory Commission (NRC), Mitsubishi Heavy Industries, Ltd. (MHI), Mitsubishi Nuclear Energy Systems, Inc. (MNES), and members of the public. On January 19, 2011, a closed meeting was held at the MNES office, 1001 19<sup>th</sup> Street North, Arlington, Virginia. On January 20, 2011, a closed meeting was held at the NRC Headquarters, Two White Flint North, 11545 Rockville Pike, Rockville, Maryland. On January 21, 2011, a Category 1 public meeting was held at the NRC Headquarters, One White Flint North, 11555 Rockville Pike, Rockville, Maryland. The purpose of the meetings was to discuss the status of the NRC staff's review of the United States - Advanced Pressurized Water Reactor (US-APWR) Digital Instrumentation and Controls (I&C) Design and for MHI to present its proposed path forward to resolve the key open issues. The meeting held on January 19, 2011, was announced on January 12, 2011, and was documented in the Agencywide Documents Access and Management System (ADAMS) under accession number ML110110070. The meeting held on January 20, 2011, was announced on January 12, 2011, and was documented in ADAMS under accession number ML110110085. The meeting held on January 21, 2011, was publicly noticed on January 10, 2011, and was documented in ADAMS under accession number, and ML110100358. A list of attendees is provided as Enclosure 1.

On January 19, 2011, a closed meeting was held at the MNES office, 1001 19<sup>th</sup> Street North, Arlington, Virginia. The purpose of the meeting was to discuss planned changes to the US-APWR data communications and independence. The meeting lasted the entire day.

MHI conducted a presentation and provided ten pages of additional detailed diagrams of data communication processes. MHI's presentation and handout are not available to the public because they contain information that is proprietary in nature. MHI demonstrated the recent changes to the digital I&C design which have already been planned in order to satisfy the NRC staff's concerns about bi-directional communications between safety and non-safety systems. Then MHI presented four alternative design approaches to resolve the NRC staff's concerns. The alternatives were identified as 1a, 1b, 2, and 3. The purpose of the alternatives was to reduce the NRC staff review time and resources. Details of those alternatives are not available to the public because it contains information that is proprietary in nature.

MHI stated that the alternatives added complexity and were not necessarily safer, but would address the NRC staff's specific concerns. The NRC staff caucused after the presentation, then provided feedback to MHI. The intent of the feedback was to give the NRC staff's opinion on

whether the alternatives had the potential to address the NRC staff's concerns and how they may affect the NRC staff resources and review schedule. In general, the NRC staff agreed that the alternatives appeared to add complexity without degrading safety, but also without necessarily improving safety.

The NRC staff also commented that the detail presented in the session is the adequate level of detail to present when docketing responses to Requests for Additional Information (RAIs). Specifically, the NRC staff stated that alternatives 1b and 3 would have potentially significant schedule impacts. However, only alternative 3 appeared to benefit safety. The NRC staff stated that RAIs were being written based on currently docketed information. But, MHI's responses could identify the direction it would like to head and include information similar to and at the level of detail presented in the meeting. Some of the information could be left for verification by an audit. Additional RAIs related to the day's discussions were already in progress and would be issued within a couple of weeks. MHI requested the NRC staff to continue their review of the current design. MHI will also modify their technical report to better demonstrate Interim Staff Guidance-04 compliance. Lastly, the NRC staff and MHI agreed on the need for additional meetings and teleconference calls to discuss details of design changes that MHI may propose and to define the depth of detail for submissions to be docketed in the future.

A short discussion at the end of the meeting concerned quality assurance regarding non-safety inputs and how 'augmented quality' is applied. MHI stated that it will research how this was handled in other design centers and will clarify the application of 'augmented quality' and when it is applied.

On January 20, 2011, a closed meeting was held at the NRC Headquarters, Two White Flint North, 11545 Rockville Pike, Rockville, Maryland. The purpose of the meeting was for the NRC staff to provide MHI with feedback regarding two draft revisions of Software Program Manuals (SPMs) submitted on January 14, 2011, and to discuss the future revisions of the remaining SPMs. The meeting lasted the entire day.

MHI conducted a presentation regarding the recent history of SPMs and the two draft SPMs submitted the week before. MHI's presentation is not available to the public because it contains information that is proprietary in nature. The purpose of the presentation was to explain the process used to prepare the next revisions of the SPMs and how conformance to the NRC staff expectations is established. MHI's process relied on an analysis of the gap between the current SPMs and the underlying requirements and comparison with other design centers.

The NRC staff then followed with its own presentation regarding the review of the two draft SPMs which was documented in ADAMS under accession number ML111210005. The NRC also followed with a discussion of the proprietary enclosure of a letter from the NRC to MHI, dated December 22, 2010. The letter was documented in ADAMS under accession number ML103420424. The presentation touched on verification and validation organizational independence, standard terminology, the use of a project plan, software quality metrics, risk management, and checklists. Detailed feedback regarding the draft SPMs was then provided. Overall, the NRC staff agreed that the draft SPMs were an improvement and appeared to be much closer to what the NRC staff expected in a SPM. MHI submitted the revised SPMs on January 31, 2011.

The meeting concluded with the discussion of three proprietary RAI responses. In this discussion, the NRC staff clarified their expectations for the RAI responses and suggested additional information which needed to be docketed in order to close the RAIs. MHI agreed to revise and resubmit the RAI responses.

On January 21, 2011, a Category 1 public meeting was held at the NRC Headquarters, One White Flint North, 11555 Rockville Pike, Rockville, Maryland. The purpose of the meeting was for the NRC staff to inform MHI of the status of RAI response reviews. The meeting was held in the morning only. No members of the public attended or connected to the meeting via the telephone bridge line that was arranged per the request of one member of the public.

The NRC staff conducted a presentation regarding the overall status of RAI submissions and reviews. The presentation was documented in ADAMS under accession number ML111210006. The NRC staff then provided feedback regarding nine RAI responses which failed to meet the NRC staff's expectations. Handouts containing the RAI response details were provided at the meeting and were also documented in ADAMS under accession number ML111210007. After discussion of each RAI response, MHI agreed to revise and resubmit the RAI response.

The meeting concluded with a discussion of plans to commence a regular teleconference call and to hold another public meeting in late February 2011.

Please direct any inquiries to me at 301-415-7038, or via e-mail at [William.Ward@nrc.gov](mailto:William.Ward@nrc.gov).

Sincerely,

*/RA/*

William R. Ward, Senior Project Manager  
US-APWR Projects Branch  
Division of New Reactor Licensing  
Office of New Reactors

Docket No. 52-021

Enclosure:  
List of Attendees

cc w/encl: See next page

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Please direct any inquiries to me at 301-415-7038, or via e-mail at [William.Ward@nrc.gov](mailto:William.Ward@nrc.gov).

Sincerely,

*/RA/*

William R. Ward, Senior Project Manager  
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Office of New Reactors

Docket No. 52-021

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List of Attendees

cc w/encl: See next page

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ADAMS Accession No.: ML111250537

NRC-001

<b>OFFICE</b>	DNRL/NMIP: PM	DNRL/NMIP: LA	DNRL/NMIP: PM
<b>NAME</b>	WWard	CSmith	(WWard for) JCiocco
<b>DATE</b>	05/13/2011	05/10/2011	05/13/2011

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List of Attendees

Closed and Public Meetings with Mitsubishi Heavy Industries, Ltd. to Discuss the Status of the Digital Instrumentation and Controls Design Review for the United States - Advanced Pressurized Water Reactor, Held between January 19 - 21, 2011

<u>NAME</u>	<u>AGENCY/AFFILIATION</u>	<u>Jan 19</u>	<u>Jan 20</u>	<u>Jan 21</u>
Robert Atkinson	Dominion Virginia Power	X	X	X
Timothy Butler	Dominion Virginia Power	X	X	X
Katsumi Akagi	Mitsubishi Electric Company	X	X	X
Makoto Itoh	Mitsubishi Electric Company	X	X	X
Gil Remley	Mitsubishi Electric Power Products, Inc.	X	X	X
Gyota Yasoda	Mitsubishi Electric Power Products, Inc.	X	X	X
Shigeki Hayashi	Mitsubishi Heavy Industries, Ltd.		X	
Makoto Takashima	Mitsubishi Heavy Industries, Ltd.	X	X	X
Yuichi Tanaka	Mitsubishi Heavy Industries, Ltd.	X		X
Bruce Geddes	Mitsubishi Heavy Industries, Ltd. / SES	X	X	X
Viviana Ishida	Mitsubishi Nuclear Energy Systems, Inc.	X		
Shinji Kawanago	Mitsubishi Nuclear Energy Systems, Inc.	X	X	X
Shinji Kiuchi	Mitsubishi Nuclear Energy Systems, Inc.	X		X
Kenji Mashio	Mitsubishi Nuclear Energy Systems, Inc.	X	X	
C. Keith Paulson	Mitsubishi Nuclear Energy Systems, Inc.	X	X	X
Hiroshi Shirasawa	Mitsubishi Nuclear Energy Systems, Inc.	X		X
Pat Samples	Mitsubishi Nuclear Energy Systems, Inc.			X
Ryan Sprengel	Mitsubishi Nuclear Energy Systems, Inc.	X	X	X
Ruliann Takanashi	Mitsubishi Nuclear Energy Systems, Inc.	X		
Ken Scarola	Mitsubishi Nuclear Energy Systems, Inc. / NAE	X	X	X
Christina Antonescu	U.S. Nuclear Regulatory Commission		X	
Ilka Berrios	U.S. Nuclear Regulatory Commission			X

Enclosure

<b><u>NAME</u></b>	<b><u>AGENCY/AFFILIATION</u></b>	<b><u>Jan 19</u></b>	<b><u>Jan 20</u></b>	<b><u>Jan 21</u></b>
Joseph Ashcraft	U.S. Nuclear Regulatory Commission	X		X
Royce Beacom	U.S. Nuclear Regulatory Commission	X	X	
Kimberley Corp	U.S. Nuclear Regulatory Commission			X
Ian Jung	U.S. Nuclear Regulatory Commission	X	X	X
Hulbert Li	U.S. Nuclear Regulatory Commission	X	X	X
Erick Martinez	U.S. Nuclear Regulatory Commission	X		X
Khoi Nguyen	U.S. Nuclear Regulatory Commission	X	X	X
Sang Rhow	U.S. Nuclear Regulatory Commission		X	
Daniel Santos	U.S. Nuclear Regulatory Commission		X	
Dinesh Taneja	U.S. Nuclear Regulatory Commission	X	X	X
Tung Truong	U.S. Nuclear Regulatory Commission		X	
Hossein Hamzehee	U.S. Nuclear Regulatory Commission		X	
William Ward	U.S. Nuclear Regulatory Commission	X	X	X

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(Revised 04/19/2011)

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