

May 13, 2009

APPLICANT: MITSUBISHI HEAVY INDUSTRIES, LTD.

FACILITY: MITSUBISHI NUCLEAR ENERGY SYSTEMS

SUBJECT: SUMMARY OF APRIL 22, 2009, MEETING WITH MITSUBISHI HEAVY INDUSTRIES, LTD. ON THE REVIEW OF THE US-APWR ACCIDENT ANALYSES TOPICAL REPORTS - COMPUTER CODES AND CONFIRMATORY ANALYSES

On April 22, 2009, a Category 1 meeting was held between the U.S. Nuclear Regulatory Commission's (NRC), its contractor, Information Systems Laboratories (ISL), and representatives of Mitsubishi Heavy Industries (MHI), Ltd., at Mitsubishi Nuclear Energy Systems, 2300 Wilson Boulevard, Arlington, Virginia. A public meeting notice was issued on April 9, 2009, and was posted on the NRC's public web site (ADAMS Accession No. ML090970462). The notice included the meeting agenda, which was also available as a handout at the meeting. The purpose of the meeting was to: (1) present to MHI, the proposed review schedules for the M-RELAP5 computer code, the MARVEL-M computer code, and the confirmatory analyses for the Non-Loss-of-Coolant Accident (LOCA), Small Break LOCA, and Large Break LOCA Topical Reports; and (2) allow ISL and NRC staff to perform a technical review of MARVEL-M and M-RELAP5 calculation notebooks, which are considered proprietary information. A list of attendees is provided as Enclosure 1, but may not be all-inclusive.

The first part of the meeting was open to the public. NRC staff presented and discussed the details of all three review schedules, which are provided as Enclosure 2. Mr. Alan Levin, of AREVA NP Inc., questioned if any additional computer codes were available to perform the confirmatory analyses, and the purpose for performing the confirmatory analyses. The staff responded that the development of another computer code (TRACE) was also being coordinated by NRC staff, and that the confirmatory analyses needed to be performed as required by NRC regulations. The next portion of the meeting was then closed to the public and the remainder of the day was spent by members of NRC, ISL and MHI reviewing and discussing the proprietary calculation notebooks for M-RELAP5 and MARVEL-M computer codes used for the United States - Advanced Pressurized Water Reactor design.

In conclusion, it was agreed that the meeting provided a good understanding to NRC and ISL members in support of their reviews of the computer codes. It was also agreed that another meeting would occur in three weeks with a new agenda of items to discuss and review.

Although members of the public were in attendance during the open portion of the meeting, no Public Meeting Feedback forms were submitted. Please direct any inquiries to me at (301) 415-7871, or via e-mail to [Michael.Takacs@nrc.gov](mailto:Michael.Takacs@nrc.gov).

*/RA/*

Michael Takacs, Project Manager  
US-APWR Projects Branch  
Division of New Reactor Licensing  
Office of New Reactors

Docket No. 52-021

Enclosures:

1. List of Attendees
2. Review Schedules

cc w/enclosures: See next page

Although members of the public were in attendance during the open portion of the meeting, no Public Meeting Feedback forms were submitted. Please direct any inquiries to me at (301) 415-7871, or via e-mail to [Michael.Takacs@nrc.gov](mailto:Michael.Takacs@nrc.gov).

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<b>OFFICE</b>	DNRL/NMIP: PM	DNRL/NMIP: LA	DNRL/NMIP: PM
<b>NAME</b>	MTakacs	CSmith	JCiocco
<b>DATE</b>	05/12/2009	05/11/2009	05/13/2009

**OFFICIAL RECORD COPY**

Meeting with Mitsubishi Heavy Industries Regarding the Review of M-RELAP5 and  
MARVEL-M Computer Codes and the Confirmatory Analyses of the Non-LOCA,  
SBLOCA and LBLOCA Topical Reports - April 22, 2009

List of Attendees

<u>Name</u>	<u>Affiliation</u>
Dan Prelewicz	ISL
Edward Throm	ISL
Robert Beaton	ISL
William Arcieri	ISL
Joo-Seok Baek	ISL
Doug Wood	MHI
Hiroshi Fujishiro	MHI
Junto Ogawa	MHI
Yuta Maruyama	MNES
Kazuya Hayashi	MNES
Keith Paulson	MNES
Masanori Onuzuka	MNES
Ruriko Takanashi	MNES
Ryan Sprengal	MNES
Shinji Otani	MNES
Masayuki Kambara	MNES
Jeff Ciocco	NRC
Jeff Schmidt	NRC
Mike Takacs	NRC
Shawn Marshall	NRC
Elizabeth Langworthy	Sutherland (202) 383-0100
Alan Levin	AREVA (301) 841-1655

**PROPOSED M-RELAP5 REVIEW SCHEDULE**

**TO SUPPORT THE US-APWR TOPICAL REPORT  
SBLOCA METHODOLOGY [MUAP-07013-P(R0)]**

**04/22/2009**

**Mitsubishi Heavy Industries, Ltd.**

**Docket No. 52-021**

**SRSB Branch**

Item No.	Milestone Description	Date	Comment
1	Kickoff Meeting (NRC/ISL)	02/04/09	Completed
2	Orientation Meeting (with MHI)	02/10/09	Completed
3	Information needs listed	02/10/09	Completed
4	Complete familiarization	02/12/09	Completed
5	Information exchange meeting (with MHI).	02/26/09	Completed
6	Review Earlier SBLOCA RAIs - letter report evaluation	04/14/09	Completed
7	Calculation Notebook Review at MHI Offices	04/22/09	
8	Identify items needing further clarification	05/31/09	Provide information to MHI
9	Draft RAIs on fundamental equations to NRC	07/31/09	
10	Draft RAIs on assessment cases and results to NRC	08/31/09	
11	Draft RAIs on code applicability (modeling approach for SBLOCA) to NRC	09/30/09	Requires results of confirmatory calculations (07/31/09 scheduled)
12	DRAFT TER with RAIs to NRC	11/15/09	
13	RAIs to MHI	12/15/09	
14	RAI responses due	01/15/10	
15	Review/evaluate RAI responses	02/15/10	
16	Design Audit	03/15/10	
17	Final TER	05/01/10	
18	All input processed into SER	06/01/10	
19	SBLOCA Topical Report SER review and approval complete.	09/29/10	

**PROPOSED MARVEL-M REVIEW SCHEDULE**

**TO SUPPORT THE US-APWR TOPICAL REPORT  
NON-LOCA METHODOLOGY [MUAP-07010-P(R0)]**

**04/22/2009**

**Mitsubishi Heavy Industries, Ltd.**

**Docket No. 52-021**

**SRSB Branch**

No.	Milestone Description	Date	Comment
1	Kickoff Meeting (NRC/ISL)	02/04/09	Completed
2	Orientation Meeting (with MHI)	02/10/09	Completed
3	Information needs listed	02/10/09	Completed
4	Information needs listed	02/12/09	Completed
5	Information exchange meeting (with MHI).	02/26/09	Completed
6	Review Earlier non-LOCA RAIs - letter report evaluation	04/14/09	Completed
7	Calculation Notebook Review at MHI Offices	04/22/09	
8	Identify items needing further clarification	06/30/09	Provide information to MHI
9	Draft RAIs on fundamental equations to NRC	08/31/09	
10	Draft RAIs on assessment cases and results to NRC	09/30/09	
11	Draft RAIs on code applicability (modeling approach for non-LOCA) to NRC	12/15/09	Requires results of confirmatory calculations (11/30/09 scheduled)
12	DRAFT TER with RAIs to NRC	01/25/10	
13	RAIs to MHI	02/10/10	
14	RAI responses due	03/10/10	
15	Review/evaluate RAI responses	04/07/10	
16	Design Audit	04/12/10	
17	Final TER	05/03/10	
18	All input processed into SER	06/01/10	
19	NON-LOCA Topical Report SER review and approval complete.	09/29/10	

**PROPOSED CONFIRMATORY CALCULATION SCHEDULE**

**FOR THE US-APWR ACCIDENT ANALYSES TOPICAL REPORTS  
MUAP-07013-P(R0), MUAP-07010-P(R0), MUAP-07011-P(R0)**

**04/22/2009**

**Mitsubishi Heavy Industries, Ltd.**

**Docket No. 52-021**

**SRSB Branch**

No.	Milestone Description	Date	Comment
1	Kickoff meeting (NRC/ISL).	02/04/09	Completed
2	Orientation meeting (with MHI).	02/10/09	Completed
3	Information exchange meeting (with MHI).	02/26/09	Completed
4	Information needed from MHI.	03/02/09	Completed
5	Familiarization of ISL staff with design documents, topical reports and MHI analyses.	03/03/09	Completed
6	Identification of RELAP5/MOD3.3.confirmatory runs.	03/03/09	Completed
7	Develop project plan and schedule.	03/15/09	Completed
8	Steady-state RELAP5/MOD3.3 SBLOCA model completed.	04/30/09	SBLOCA plant model simulating full-power operation
9	SBLOCA limiting case and sensitivity cases completed.	07/31/09	Letter report on comparison to SBLOCA confirmatory calculation results and DRAFT SBLOCA confirmatory calculation TER with RAIs.
10	SBLOCA confirmatory calculation RAIs transmitted to MHI	08/15/09	
11	SBLOCA confirmatory calculation RAI responses transmitted to NRC	09/30/09	
12	Steady-state RELAP5/MOD3.3 LBLOCA model completed	09/30/09	LBLOCA plant model simulating full-power operation
13	Steady-state RELAP5/MOD3.3 Non-LOCA model completed.	09/30/09	Non-LOCA plant model simulating full-power and hot zero power operation.
14	LBLOCA limiting case and sensitivity cases completed.	10/31/09	Letter report on comparison to LBLOCA results and recommendations for possible LBLOCA RAIs.

**PROPOSED CONFIRMATORY CALCULATION SCHEDULE**

**FOR THE US-APWR ACCIDENT ANALYSES TOPICAL REPORTS  
MUAP-07013-P(R0), MUAP-07010-P(R0), MUAP-07011-P(R0)**

**04/22/2009**

**Mitsubishi Heavy Industries, Ltd.**

**Docket No. 52-021**

**SRSB Branch**

No.	Milestone Description	Date	Comment
15	Non-LOCA limiting cases and sensitivity cases completed.	11/30/09	Letter report on comparison to Non-LOCA results and recommendations for possible Non-LOCA RAIs.
16	Review/evaluate SBLOCA confirmatory calculation RAI responses	12/15/09	
17	Revised SBLOCA confirmatory calculation TER with open items.	12/31/09	
18	SBLOCA confirmatory calculation design audit.	01/15/10	
19	Final SBLOCA confirmatory calculation TER.	02/28/10	
20	Final SBLOCA confirmatory calculation SER (To be referenced by SBLOCA, LBLOCA & Non-LOCA Topical Report SERs).	03/15/10	



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(Revised 04/01/2009)

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