

April 4, 2006

MEMORANDUM TO: Matthew A. Mitchell, Chief
Vessels & Internals Integrity Branch
Division of Component Integrity
Office of Nuclear Reactor Regulation

FROM: Meena K. Khanna, Materials Engineer /RA/
Vessels & Internals Integrity Branch
Division of Component Integrity
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF MARCH 14, 2006, TECHNICAL MEETING
BETWEEN THE NRC STAFF AND REPRESENTATIVES
FROM THE BOILING WATER REACTOR VESSEL AND
INTERALS PROJECT

On March 14, 2006, the Nuclear Regulatory Commission (NRC) staff and a representative from Pacific Northwest National Laboratory met with representatives of the Boiling Water Reactor Vessel and Internals Project (BWRVIP) to discuss various issues with respect to the staff's review of the BWRVIP-03, Revision 6 report, "Reactor Pressure Vessel and Internals Examination Guidelines," and the BWRVIP-108 report, "Technical Basis for the Reduction of Inspection Requirements for the BWR Nozzle to Vessel Shell Welds and Nozzle Blend Radii." In addition, the BWRVIP and the staff also discussed various topics related to the review of the BWRVIP-104 report, "Evaluation and Recommendations to Address Shroud Support Cracking in BWRs," and the BWRVIP-139 report, "Steam Dryer Inspection and Flaw Evaluation Guidelines." A brief discussion was held with respect to the review of the BWRVIP-62 report, "Technical Basis for Inspection Relief for BWR Internal Components with Hydrogen Injection" and the BWRVIP-34 report, "Technical Basis for Part Circumference Weld Overlay Repair of Vessel Internal Core Spray Piping." A brief summary of each of the discussions are provided below.

A BWRVIP representative began the meeting by providing a background of the BWRVIP-03, Revision 6 report. The BWRVIP representative then stated the following with respect to the BWRVIP's present position regarding the BWRVIP-03, Revision 6 report: (1) the BWRVIP's processes as previously accepted by the staff have not changed, (2) the visual and ultrasonic testing techniques are well-established and continually improving and the limitations of these techniques are understood and documented, and (3) there have been no failures of internal component locations examined in accordance with BWRVIP inspection and evaluation guidelines. The BWRVIP representative then provided a discussion regarding the staff's draft

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request for additional information (RAI). The BWRVIP had grouped the staff's RAI questions into the following categories: (1) enhanced visual testing issues, (2) differences from Appendix VIII to Section XI of the American Society of Mechanical Engineers Code, (3) BWRVIP program structure, document flow, and responsibilities, and (4) level of detail published on non-destructive examination demonstrations. The BWRVIP representative provided a discussion with respect to each of these categories and then opened the floor for questions. An action item was identified whereby the staff requested that the BWRVIP link the staff's draft RAI questions to the slides that were presented during the meeting. The BWRVIP provided this listing to the staff on March 22, 2006.

A BWRVIP representative then provided a technical discussion to the staff regarding the BWRVIP-108 report. The discussion was in regard to the staff's RAI on this report that was issued on September 6, 2005. The BWRVIP representative stated that the staff's RAI focused on two main issues, which included: (1) sensitivity analyses regarding probabilistic fracture mechanics (PFM) calculations to assess the variability of failure probabilities due to certain parameters such as crack growth rate and nil-ductility transition temperature of the reactor vessel forging and (2) inspections performed using "reliable" inspection techniques. The BWRVIP discussed its approach to address the staff's RAI which included conducting additional PFM calculations and compiling inspections performed for nozzle inner radius and nozzle-to-shell welds. An action item was taken by the staff to schedule a conference call whereby the BWRVIP could clarify its approach in responding to the staff's RAI on the BWRVIP-108 report before a formal response was submitted to the NRC. The conference call was held between the BWRVIP and the staff on March 23, 2006.

Next, a BWRVIP representative provided technical discussions regarding the BWRVIP-104 report whereby he addressed the staff's RAI with respect to the inspections of the core shroud H9 welds. The BWRVIP representative addressed the limitations on inspecting the H9 welds and provided a discussion regarding the fracture mechanics analysis for both axial and circumferential cracks at the H9 weld location. The BWRVIP representative then provided several conclusions which included the following: adequate margins for both the circumferential and axial cracking in the H9 weld exists when realistic considerations of length change are considered; substantial margin exists for the shroud support plate; field experience at Tsuruga confirms that crack extension into the vessel did not occur; postulated crack extension into low alloy steel has been evaluated and shown to be acceptable; the BWRVIP technical evaluation shows that the inspections as required by the BWRVIP-38 report, "Shroud Support Inspection and Flaw Evaluation Guidelines," are adequate to maintain shroud support integrity; and, examinations will be performed on the bottom side of the H8 and H9 welds when access is made available, in accordance with the BWRVIP-47-A report, "BWR Lower Plenum Inspection and Flaw Evaluation Guidelines." The staff requested that the BWRVIP include, in its response to the staff's RAI, information on the number of plants that have outside diameter surface access to perform UT inspections of the H9 welds, and what, if any, indications have been found.

A discussion was then held between the staff and the BWRVIP regarding the BWRVIP-139 report. The staff provided a brief discussion regarding the draft RAI questions that were submitted to the BWRVIP. The staff discussed the importance of including comprehensive background information in the BWRVIP-139 report to ensure that the licensees realize that the

degradation of the steam dryers may not be a plant-specific or steam dryer design issue. Other issues were discussed regarding acoustic loadings with respect to power uprates, loose parts generation, etc. The BWRVIP and the staff agreed that it would be beneficial for the BWRVIP to update the BWRVIP-139 report to reflect what is learned as more inspections of the steam dryers are completed. An action item was taken by the staff to schedule a conference call between the staff and the BWRVIP to discuss the particular details of the staff's RAI questions. The conference call was held between the staff and the BWRVIP on April 3, 2006.

A brief discussion was then held regarding the staff's review schedules with respect to the BWRVIP-62 report and the BWRVIP-34 report. Issues were identified with respect to the review of the BWRVIP-34 and BWRVIP-62 reports, which included issuances of supplementary RAIs and timeliness of the review, etc. The staff acknowledged the BWRVIP's concerns and provided feedback regarding staff resources and contractor support.

In conclusion, representatives of the BWRVIP and the staff summarized the action items that resulted from the meeting, which included the following: the BWRVIP would provide a list that would link the staff's draft RAI questions on the BWRVIP-03, Revision 6 report to the slides that were presented during the meeting and that the staff would schedule a conference call to discuss the staff's RAIs with regard to the BWRVIP-108 and BWRVIP-139 reports. It should be noted that these action items have been completed, as discussed above.

The NRC staff expressed its appreciation to the BWRVIP representatives for the presentations. Both parties agreed that the technical discussions that were held were productive in addressing various issues related to the staff's review of the BWRVIP topical reports. An attendance list is provided in the enclosure. The slides used during the meeting are available in ADAMS under accession numbers ML060820065, ML060820070, and ML060820077. It should be noted that the meeting slides are proprietary in nature.

Enclosure:
Meeting Attendees

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ADAMS Accession Nos.: ML060960503

Meeting Notice: ML060480374

Meeting Summary: **ML060960486**

Presentation Materials: ML060820065, ML060820070, and ML060820077

OFFICE	DCI/CVIB	DCI/CVIB
NAME	MKhanna	MMitchell
DATE	04/03/2006	04/03/2006

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MEETING ATTENDEES

MEETING WITH THE BOILING WATER REACTOR VESSEL AND INTERNALS PROJECT

MARCH 14, 2006

BWRVIP

Tom Mulford
Robin Dyle
Robert Carter
Gary Park
Chuck Wirtz
Randy Stark
Greg Selby
Larry Steinert
George Inch
Jeff Landrum

NRC

Matthew Mitchell
Terence Chan
Kim Gruss
Kamal Manoly
Don Naujock
Meena Khanna
William Koo
Barry Elliot
Tom Scarbrough
John Tsao
John Wu
Geoffrey Ottenberg
Wallace Norris

PNNL

Michael Anderson

PUBLIC

F.J. Reedy, Jr.

ENCLOSURE