

March 10, 2006

Bill Eaton, BWRVIP Chairman  
Entergy Operations, Inc.  
Echelon One  
1340 Echelon Parkway  
Jackson, MS 39213-8202

SUBJECT: NRC APPROVAL LETTER FOR BWRVIP-53-A, "BWR VESSEL AND  
INTERNALS PROJECT, STANDBY LIQUID CONTROL LINE REPAIR DESIGN  
CRITERIA"

Dear Mr. Eaton:

By letter dated September 21, 2005, the Boiling Water Reactor Vessel and Internals Project (BWRVIP) submitted Proprietary Report BWRVIP-53-A, "BWR Vessel and Internals Project, Standby Liquid Control Line Repair Design Criteria," for Nuclear Regulatory Commission (NRC) staff review.

The BWRVIP-53-A report provides general design acceptance criteria for the permanent and temporary repair of BWR standby liquid control (SLC) and core differential pressure (CDP) nozzles and internal lines. These guidelines are provided to assist BWR owners in designing repairs which maintain the structural integrity of the SLC and CDP nozzles and internal lines during normal operation, postulated transient, and design basis accident conditions for the remaining plant life or other service life as specified by the plant owner.

The BWRVIP-53-A report presents a compilation of information from the BWRVIP-53 report and the NRC staff final safety evaluation (SE) dated August 20, 2004, which includes the BWRVIP's associated responses to NRC requests for additional information (RAIs) and staff open items, as documented in the staff's initial safety evaluation (SE) dated October 26, 2000.

The NRC staff has reviewed the information in the BWRVIP-53-A report and has found that the report accurately incorporates all of the relevant information which was submitted by the BWRVIP in the documents noted above to support NRC staff approval of the report. The staff found that minimal revisions were made to the BWRVIP-53 report in the production of the BWRVIP-53-A report. These revisions are discussed in detail below.

The first revision was that the BWRVIP changed the references in Sections 3.2.2 and 3.2.2.1 of the BWRVIP-53 report from Reference 1 (BWRVIP-06, "Safety Assessment of BWR Reactor Internals") to Reference 2 (BWRVIP-27-A, "BWR Standby Liquid Control System/Core Plate  $\Delta P$  Inspection and Flaw Evaluation Guidelines") to address the staff's RAI No. 8, whereby the staff requested that the BWRVIP confirm that the references as cited in the BWRVIP-53 report were correct. The BWRVIP revised BWRVIP-53 to reference the BWRVIP-27-A report because the BWRVIP SLC inspection guidelines are contained in the BWRVIP-27-A report. The staff determined that the BWRVIP adequately revised the references in Section 3.2.2 and 3.2.2.1 of the BWRVIP-53 report to address RAI No. 8.

The second revision was that the BWRVIP modified the text in Section 8.3 of the BWRVIP-53 report to address the staff's RAI No. 9, whereby the staff requested that the BWRVIP include a requirement that the supporting plant-specific justification regarding the design of repairs for SLC and CDP nozzle and internals components which eliminate the above core plate pressure sensing function of the original plant design be submitted to the NRC for review. The staff determined that the BWRVIP adequately revised Section 8.3 of the BWRVIP-53 report to address RAI No. 9.

The third revision was that the BWRVIP revised the text in Section 3.2.1.2 to address the staff's Open Item 1, whereby the staff requested that the BWRVIP clarify the requirements regarding the use of roll-expansion as a repair approach. The BWRVIP included the following in Section 3.2.1.2 of the BWRVIP-53 report, "the NRC has not accepted roll-expansion as an acceptable means of permanent repair. The use of roll-expansion as a means to repair a leaking SLC nozzle would require prior NRC review and approval." The staff determined that the BWRVIP adequately revised Section 3.2.1.2 of the BWRVIP-53 report to address Open Item 1.

The fourth revision was with respect to the BWRVIP revising Appendix C of the BWRVIP-53 report to address the staff's Open Item 6, whereby the staff requested that the BWRVIP clarify that the discussions of the repair concepts in Appendix C are for information only. The BWRVIP revised Appendix C of the BWRVIP-53-A report to include a note that the repair approaches discussed in Appendix C have not necessarily been accepted by the NRC and the use of these techniques would require review and approval by the staff. The staff determined that the BWRVIP adequately revised Appendix C of the BWRVIP-53 report to address Open Item 6.

The fifth revision was that the BWRVIP revised Section A.1 of the BWRVIP-53 report to address the staff's Open Item 10, whereby the staff requested that the BWRVIP clarify that an evaluation is required to address potential loose parts and any associated consequences. The BWRVIP revised Section A.1 of the BWRVIP-53 report to include a statement that, "Plant-specific analyses should be conducted to evaluate the potential to generate loose parts (e.g., due to vibration) and the potential consequences." The staff determined that the BWRVIP adequately revised Section A.1 of the BWRVIP-53 report to address Open Item 10.

The sixth revision was with respect to the BWRVIP revising Section A.1 of the BWRVIP-53 report to address the staff's Open Item 11, whereby the staff requested that the BWRVIP include guidelines to address line blockage. The BWRVIP revised Section A.1 of the BWRVIP-53 report to include the following, "In cases where internal lines are known or suspected to be pinched, flushing tests shall be developed using plant-specific design requirements and conducted prior to startup from the outage of discovery and shall be repeated every two subsequent outages. Alternate flushing schedules are acceptable as approved by the NRC." The staff determined that the BWRVIP adequately revised Section A.1 of the BWRVIP-53 report to address Open Item 11.

The seventh revision was that the BWRVIP revised Section 10.2 to address the staff's concern regarding service inspection requirements for the repaired component. This was identified as an "Additional Item" in the staff's initial SE dated October 26, 2000. The BWRVIP revised Section 10.2 of the BWRVIP-53 report to include that inservice inspections shall be consistent with the intent of the inspections required in the BWRVIP-27 report, "BWR Standby Liquid Control System/Core Plate  $\Delta P$  Inspection and Flaw Evaluation Guidelines." The staff determined that the BWRVIP adequately revised Section 10.2 of the BWRVIP-53 report to address the additional item from the staff's initial SE.

The eighth revision was with respect to the deletion of text from Section 9.1, "Materials, Fabrication, and Welding," and Section 9.3, "Pre-Installation As-Built Inspection," of the BWRVIP-53 report. In addition, the BWRVIP removed References 3-5 of the BWRVIP-53 report and replaced these references with a reference (Reference 5) to the BWRVIP-84 report, "Guidelines for Selection and Use of Materials and Repairs." The BWRVIP determined that the material and fabrication requirements would be removed from the BWRVIP-53 report since they are already contained in the BWRVIP-84 report. The staff found this acceptable because the material and fabrication requirements are adequately included in the BWRVIP-84 report.

The ninth revision was that the BWRVIP revised Section 7.11 of the BWRVIP-53 report to apply the minimum corrosion allowance for exposed austenitic stainless steel surfaces of 0.003 inch for a 60-year design life. This corrosion allowance had originally been approved for a 40-year design life. This extension was based on the information that the BWRVIP provided in its response to RAI Item 2, with respect to the BWRVIP-50 report, "Top Guide/Core Plate Repair Design Criteria," in its letter dated December 6, 1999. By SE dated January 29, 2001, the staff found that the BWRVIP had adequately responded to RAI Item 2. Therefore, the staff determined that the BWRVIP adequately revised Section 7.11 of the BWRVIP-53 report to extend the minimum corrosion allowance for exposed austenitic stainless steel surfaces of 0.003 inch from a 40-year design life to a 60-year design life.

The next revision was that the BWRVIP revised Section 9.2 of the BWRVIP-53 report regarding crevices. The revisions were made for consistency with the other repair design criteria reports. A statement, "the design shall minimize crevices between new components, and between new components and original components, to minimize the potential for crevice-induced stress corrosion cracking," was included in Section 9.2 of the report. The staff determined that the BWRVIP adequately revised Section 9.2 of the BWRVIP-53 report to be consistent with the other repair design criteria reports regarding crevices.

The last revision was that the BWRVIP added Section 9.4, "Post Installation As-Built Inspection," to the BWRVIP-53 report for consistency with the other repair design criteria reports to ensure that the repair hardware is correctly installed. The staff determined that the BWRVIP adequately revised Section 9.4 of the BWRVIP-53 report to be consistent with the other repair design criteria reports regarding post-installation as-built inspections.

B. Eaton

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Based on the discussion above, the staff has determined that the BWRVIP-53-A report is acceptable. Please contact Meena Khanna of my staff at (301) 415-2150 if you have any further questions regarding this subject.

Sincerely,

*/RA/*

William H. Bateman, Deputy Director  
Division of Component Integrity  
Office of Nuclear Reactor Regulation

cc: BWRVIP Service List

B. Eaton

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Based on the discussion above, the staff has determined that the BWRVIP-53-A report is acceptable. Please contact Meena Khanna of my staff at (301) 415-2150 if you have any further questions regarding this subject.

Sincerely,

*/RA/*

William H. Bateman, Deputy Director  
Division of Component Integrity  
Office of Nuclear Reactor Regulation

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