March 8, 2006

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

SUBJECT: NRC APPROVAL LETTER FOR BWRVIP-19-A, "BWR VESSEL AND INTERNALS PROJECT, INTERNAL CORE SPRAY PIPING AND SPARGER 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-19-A, "BWR Vessel and Internals Project, Internal Core Spray Piping and Sparger Repair Design Criteria," for Nuclear Regulatory Commission (NRC) staff review. The BWRVIP-19-A report provides general design acceptance criteria for the temporary and permanent repair of 300 series stainless steel internal core spray piping and spargers. This report is intended to assist licensees in designing repairs which will maintain the structural integrity of the internal core spray piping and spargers during normal operation, postulated transient, and design basis accident conditions.

The BWRVIP-19-A report presents a compilation of information from the BWRVIP-19 report and the NRC staff final safety evaluation (SE) dated July 12, 2004, which includes the BWRVIP's associated responses to NRC staff requests for additional information (RAIs) and open items.

The NRC staff has reviewed the information in the BWRVIP-19-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-19 report in the production of the BWRVIP-19-A report. These revisions are discussed in detail below.

The first revision was that the BWRVIP modified Section 3.3.3 of the BWRVIP-19 report to address a staff RAI in which the staff requested that the BWRVIP provide clarification of the requirement to provide distribution of core spray flow over the core for a steam line break and the procedure to address the steam line break accident on a plant-specific basis. The staff determined that the BWRVIP adequately revised the text in Section 3.3.3 of the BWRVIP-19 report to address its concerns regarding steam line break accidents.

The second revision was that the BWRVIP modified Section 8.7 of the BWRVIP-19 report to address a staff RAI in which the staff requested that the BWRVIP include a requirement in the report that if the original design basis of the sparger spray distribution cannot be maintained, then a plant-specific analysis shall be performed to demonstrate that all functional requirements are satisfied. The staff determined that the BWRVIP adequately revised Section 8.7 of the BWRVIP-19 report to address its issue regarding the sparger spray distribution.

The third revision was that the BWRVIP modified Section 5.4 of the BWRVIP-19 report to address a staff RAI in which the staff requested that the BWRVIP specifically identify flow-induced loads for consideration in the evaluation of the structural integrity of core spray piping. The staff determined that the BWRVIP adequately revised Section 5.4 of the BWRVIP-19 report to address its concerns regarding the consideration of flow-induced loads with respect to the evaluation of the structural integrity of core spray piping.

The fourth revision was in regards to the modification of Section 5.5 of the BWRVIP-19 report to address a staff RAI in which the staff requested that the BWRVIP, with respect to retained flaws (i.e, flaws left in service), clarify that the repair shall be designed to maintain axial alignment across the flawed area and to control displacement along the pipe axis so as to be consistent with leakage analysis assumptions. The staff determined that the BWRVIP adequately revised Section 5.5 of the BWRVIP-19 report to address its concern regarding the control of piping displacement to be consistent with leakage analysis assumptions.

The fifth revision was that the BWRVIP modified Section 8.1.4, “Leakage Acceptance Criteria - Core Spray Spargers,” of the BWRVIP-19 report to address Open Item 2 from the staff’s July 12, 2004, SE. In Open Item 2, the staff requested that the BWRVIP include a requirement to evaluate sparger spray distribution and leakage on a plant-specific basis and to eliminate the terms such as “geometry critical” and “non-geometry critical.” The staff determined that the BWRVIP adequately revised Section 8.1.4 of the BWRVIP-19 report to include a requirement that a plant-specific analysis shall be performed to evaluate the sparger spray distribution and leakage. In addition, the staff verified that the BWRVIP removed the terms “geometry critical” and “non-geometry critical” from Section 8 of the BWRVIP-19 report.

The sixth 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-19 report. In addition, the BWRVIP removed References 6-15 of the BWRVIP-19 report and replaced these references with a reference (Reference 8) 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-19 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 seventh revision was that the BWRVIP revised Section 10.2 of the BWRVIP-19 report to address the staff's recommendation that pre- and post-installation inspections required for the repaired internal core spray piping and spargers assembly shall be consistent with the requirements and scope of the BWRVIP-18 report, "BWR Core Spray Internals Inspection and Flaw Evaluation Guidelines." The staff determined that the BWRVIP adequately revised Section 10.2 of the BWRVIP-19 report to address its recommendations regarding the pre- and post-installation inspections of the repaired internal core spray piping and spargers assembly to be consistent with the BWRVIP-18 report.

The eighth revision was that the BWRVIP revised Section 7.10 of the BWRVIP-19 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 7.10 of the BWRVIP-19 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-19 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-19 report to be consistent with the other repair design criteria reports regarding crevices.

The next revision was that the BWRVIP added Section 9.4, "Post Installation As-Built Inspection," to the BWRVIP-19 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-19 report to be consistent with the other repair design criteria reports regarding post-installation as-built inspections.

For the last revision, the BWRVIP added Item (f) to Section 9.5, "Installation Cleanliness," of the BWRVIP-19 report which requires the evaluation to include the specific requirements of the utility's loose parts or foreign material exclusion program. The staff determined that the BWRVIP adequately revised Section 9.5 of the BWRVIP-19 report to enhance the evaluations for minimizing the in-vessel debris generation with respect to the design criteria for the repair of the internal core spray piping and spargers.

Based on the discussion above, the staff has determined that the BWRVIP-19-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

Based on the discussion above, the staff has determined that the BWRVIP-19-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

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