

January 24, 2008

Rick Libra, Chairman
BWR Vessel and Internals Project
DTE Energy
Electric Power Research Institute
3420 Hillview Avenue
Palo Alto, CA 94304-1395

SUBJECT: REQUEST FOR THE REVIEW OF ELECTRIC POWER RESEARCH INSTITUTE (EPRI) TOPICAL REPORT (TR) 1013390, "BWRVIP-168: BWR [BOILING WATER REACTOR] VESSEL AND INTERNALS PROJECT [BWRVIP], GUIDELINES FOR DISPOSITION OF INACCESSIBLE CORE SPRAY PIPING WELDS IN BWR INTERNALS" (TAC NO. MD6569)

Dear Mr. Libra:

By letter dated May 30, 2007, EPRI submitted TR 1013390, "BWRVIP-168: BWR Vessel and Internals Project, Guidelines for Disposition of Inaccessible Core Spray Piping Welds in BWR Internals" (BWRVIP-168) to the U.S. Nuclear Regulatory Commission (NRC) staff for review. BWRVIP-168 describes a risk-informed inservice inspection (RI-ISI) evaluation that is used to determine the risk-significant locations in core spray piping in BWR internals, to assess the risk consequences of not inspecting inaccessible core spray piping welds, to define a procedure to estimate the leak rate from inaccessible welds, and to develop strategies for the disposition of inaccessible weld connections.

As we notified you on December 18, 2007, we have completed our acceptance review of your application and all of the supporting information in accordance with the TR program criteria and have concluded that BWRVIP-168 is not acceptable for review for the reasons discussed below:

BWRVIP-168 references EPRI TR 106369, "BWR Vessel and Internals Project - Quantitative Safety Assessment of BWR Reactor Internals (BWRVIP-09)," EPRI TR 106369, Final Report, May 1997 (Legacy Library Accession No. 9706190446). By letter dated June 16, 1997, BWRVIP-09 was provided to the NRC staff "for information only" to support the NRC staff's review of EPRI TR 105707, "BWR Vessel and Internals Project, Safety Assessment of BWR Reactor Internals (BWRVIP-06)." As discussed in the NRC staff's September 15, 1998, safety evaluation (SE) on BWRVIP-06 (Legacy Library Accession No. 9809230183), the results of the BWRVIP-09 were used solely to verify the priority lists and the conclusions of the deterministic BWRVIP-06 report. Additionally, this SE noted that the NRC's Office of Nuclear Regulatory Research (RES) was, at that time, performing a confirmatory research program to evaluate the risk associated with BWR internal failures. RES has since completed risk studies to estimate the long-term risk associated with intergranular stress corrosion cracking of BWR vessel internals and reported the results in NUREG/CR-6677, "Evaluation of Risk Associated with Intergranular Stress Corrosion Cracking in Boiling Water Reactor Internals," July 2000 (ADAMS Accession No. ML003736113). BWRVIP-168 needs to be modified to address

how the results of these latest analyses affect the analysis and conclusions in BWRVIP-168 before the NRC staff can begin its review.

BWRVIP-168 relies upon the risk-informed framework and process used to support RI-ISI. Regulatory Guide (RG) 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," and RG 1.178, "An Approach for Plant-Specific Risk-Informed Decisionmaking for Inservice Inspection of Piping" provide applicable guidance for risk-informed submittals for proposed changes based on RI-ISI evaluations. RG 1.174 identifies five key principles which proposed changes are expected to meet and RG 1.178 provides additional guidance for these key principles. Three of the five key principles are consistency with the defense-in-depth philosophy, maintenance of sufficient safety margins, and monitoring the impact of the proposed change using performance measurement strategies. These deterministic principles are intended to be supplemented with risk insights, which is a separate key principle of RG 1.174. Our review of BWRVIP-168 found that it does not address defense-in-depth, while safety margins and monitoring are not evaluated against RG 1.174 guidelines. BWRVIP-168 needs to be modified to address each of these three principles before the NRC staff can begin its review.

BWRVIP-168 relies on the quantitative core damage frequency estimates from BWRVIP-09 to address the fourth key principle of RG 1.174, "When proposed changes result in an increase in core damage frequency or risk, the increases should be small and consistent with the intent of the Commission's Safety Goal Policy Statement..." RG 1.174 and RG 1.178 require that the scope, level of detail, and technical acceptability of a probabilistic risk analysis (PRA) are to be commensurate with the application for which it is intended and the role the PRA results play in the integrated decision process. BWRVIP-168 needs to be modified to include a discussion related to the quality of the PRA analysis in BWRVIP-09, and needs to articulate why the quality of this analysis is sufficient for the role the results play in the decision process. The NRC staff review of the quality of the PRA analysis may also require responses to requests for additional information about the PRA analyses in BWRVIP-09 and/or application-specific analysis and NRC staff review.

The failure frequencies proposed for use in BWRVIP-168 are taken from EPRI TR 111880, "Piping System Failure Rates and Rupture Frequencies for Use in Risk Informed In service Inspection Applications," dated September 1999. These frequencies have been used for welds in piping systems that contain the water on the inside of the piping. BWRVIP-168 needs to be modified to identify the differences and similarities between the operating conditions of piping welds and those welds in the core spray piping inside the reactor vessel and justify the continued applicability of the failure frequencies.

The NRC staff will accept a TR for review when the report contains complete and detailed information on the specific subject presented. As described above, the NRC staff has concluded that BWRVIP-168 is incomplete and, therefore, not acceptable for review. Changes which need to be made to BWRVIP-168 in order to complete the application and allow the NRC staff to begin its review are summarized below:

- BWRVIP-168 needs to address how the results of NUREG/CR-6677 affect the results.
- The TR needs to discuss the quality of the PRA analysis in BWRVIP-09 and address why this quality is sufficient for the role the results play in the decision process.
- EPRI needs to confirm that it will support the NRC staff review of BWRVIP-09 if the NRC staff determines that this review is necessary.
- BWRVIP-168 needs to address each of the three risk-informed principles: consistency with the defense-in-depth philosophy, maintenance of sufficient safety margins, and monitoring the impact of the proposed change using performance measurement strategies.
- BWRVIP-168 needs to identify the differences and similarities between the operating conditions of piping welds and those welds in the core spray piping inside the reactor vessel and justify the continued applicability of the failure frequencies.

On the basis of these factors, therefore, your request for the NRC staff review of BWRVIP-168 is denied.

Sincerely,

Ho K. Nieh, Deputy Director
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Project No. 704

cc: See next page

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 Ho K. Nieh, Deputy Director
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