December 21, 2010

Mr. David Czufin, Chairman
Exelon Generation
Chairman, BWR Vessel and Internals Project
Electric Power Research Institute
3420 Hillview Avenue
Palo Alto, CA 94304-1395

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION APPROVAL LETTER WITH COMMENT FOR TECHNICAL REPORT BWRVIP-80-A, "BWR [BOILING WATER REACTOR] VESSEL AND INTERNALS PROJECT, EVALUATION OF CRACK GROWTH IN BWR SHROUD VERTICAL WELDS," ELECTRIC POWER RESEARCH INSTITUE TECHNICAL REPORT 1015457 (TAC NO. ME4494)

Dear Mr. Czufin:

By letter dated January 15, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML102300713), the BWR Vessel and Internals Project (BWRVIP) submitted Technical Report BWRVIP-80-A, "BWR Vessel and Internals Project, Evaluation of Crack Growth in BWR Shroud Vertical Welds," Electric Power Research Institute (EPRI) Technical Report 1015457 for U.S. Nuclear Regulatory Commission (NRC) staff review.

The BWRVIP-80-A Technical Report was submitted as a means of exchanging information with the NRC staff to support generic regulatory improvements related to the inspection and evaluation of BWR shroud vertical welds. The main objective of this BWRVIP-80-A Technical Report is to assess the different means of predicting the crack growth rate (CGR) for flaws in the BWR shroud vertical welds.

BWRVIP-80-A presents a compilation of information from different sources. The main body of the report with Appendices A and B are the original submittal, BWRVIP-80, EPRI Technical Report 100038 dated May 2000 that was referenced in the June 2, 2000, letter from the BWRVIP (ADAMS Accession No. ML003725377). Appendix C includes the initial NRC Safety Evaluation (SE) sent in a letter dated February 19, 2003 (ADAMS Accession No. ML030500288). Appendix D includes the final NRC SE sent in a letter dated November 28, 2006 (ADAMS Accession No. ML063380009). Appendix E is a summary of the revisions made to BWRVIP-80.

The NRC staff has reviewed the information in BWRVIP-80-A and has found that the technical report accurately incorporates the relevant information which was submitted by the BWRVIP in the documents noted above to support NRC staff approval of the technical report. The NRC staff found in Appendix E that seven revisions were made in the production of BWRVIP-80-A. These revisions are discussed in detail below.

The first revision was in Section 3.1 of BWRVIP-80-A to indicate that for calculation of the stress intensity factor (K_I) to be used in the crack growth evaluation, only the sustained normal operating stresses are considered. The NRC staff finds this revision acceptable because the modification adequately addressed the NRC staff's concern regarding the consideration of operating stresses in the crack growth.

The second revision was a clarification in the Executive Summary and Sections 2.7, 4.1, and 5.0 where the BWRVIP modified the text to indicate that the bending stress of 4 kilopounds per square inch (ksi) should be used in addition to the weld residual stresses and surface residual stress for crack growth evaluations. The NRC staff finds this revision acceptable because the revision addresses the concerns noted in the initial SE for the BWRVIP-80 Technical Report regarding the uncertainty over the fit-up/construction stresses and local weld repairs.

The third revision was in Section 4.0 where the normal water chemistry, hydrogen water chemistry, and noble metal chemical addition conditions were revised to specific electrochemical potential (ECP) cases to provide clarification to the fact that the ECP affects the CGR regardless of how the ECP is achieved. The NRC staff finds this revision acceptable because it clarifies the primary role of ECP.

The fourth revision changed all of the references to BWRVIP-63, "BWR Vessel and Internals Project Shroud Vertical Weld Inspection and Evaluation Guidelines," to BWRVIP-76, "BWR Core Shroud Inspection and Flaw Evaluation Guidelines," throughout the document. The NRC staff finds this revision acceptable because the revision reflects the fact that BWRVIP-63 has been superseded by BWRVIP-76.

The fifth revision updated the Executive Summary to reflect changes in the rest of the technical report. The NRC staff finds this revision acceptable as it is consistent with the changes made in the report.

The sixth revision updated Section 6.0 to be consistent with new references added to the technical report. The NRC staff finds this revision acceptable as it is consistent with the changes made in the technical report.

The seventh revision added a new paragraph, Section 1.3, "Implementation Requirements." The NRC staff finds this revision acceptable because the new section clarifies the goals of the technical report, specifically the methodology used for CGR calculations included in Section 4.1, as "Needed" in terms of the Nuclear Energy Institute 03-08, *Guideline for the Management of Materials Issues*.

Based on the discussion above, the NRC staff has determined that the BWRVIP-80-A technical report is acceptable. Please contact my staff, Andy Hon at (301) 415-8480 or Jonathan Rowley at (301) 415-4053, if you have any further questions regarding this subject.

Sincerely,

/RA/

John R. Jolicoeur, Acting Deputy Director
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Project No. 704

cc: See next page

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John R. Jolicoeur, Acting Deputy Director
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cc:

Randy Stark, EPRI BWRVIP
Integration Manager
Raj Pathania, EPRI BWRVIP
Mitigation Manager
Ken Wolfe, EPRI BWRVIP
Repair Manager
Larry Steinert, EPRI BWRVIP
Electric Power Research Institute
3420 Hillview Ave.
Palo Alto, CA 94304
rstark@epri.com,
rpathani@epri.com,
kwolfe@epri.com,
ldsteine@contractor.epri.com

Randy Schmidt, Technical Chairman
BWRVIP Assessment Committee
PSEG Nuclear
P. O. Box 236 (M/S H06)
Hancocks Bridge, NJ 08038-0236
randal.schmidt@pseg.com

Dennis Rickertsen, Technical Chairman
BWRVIP Mitigation Committee
Southern Nuclear Operating Company
P. O. Box 1295 (M/S B234)
Birmingham, AL 35201-1295
ddricker@southernco.com

Paul J. Davison, Executive Chairman
BWRVIP Assessment Committee
PSEG Nuclear, LLC
Salem/Hope Creek Nuclear Station
11 Yubas Ave.
Burlington, NJ 08016
paul.davison@pseg.com

Denver Atwood, Chairman
BWRVIP Repair Focus Group
Southern Nuclear Operating Co.
Post Office Box 1295
40 Inverness Center Parkway
(M/S B031)
Birmingham, AL 35242-4809
dgatwood@southernco.com

Rich Ciemiewicz, Chairman
BWRVIP Inspection Focus Group
Exelon Corporation
200 Exelon Way, Suite 210 (M/S KSA 2-N)
Kennett Square, PA 19349
richard.ciemiewicz@exeloncorp.com

Charles J. Wirtz, Technical Chairman
BWRVIP Integration Committee
FirstEnergy Corp.
Perry Nuclear Power Plant
(M/S A250)
10 Center Road
Perry, OH 44081
cjwirtz@firstenergycorp.com

Oscar Limpias,
BWROG Chairman
Entergy Nuclear Operations, Inc.
Echelon One
1340 Echelon Parkway.
Jackson, MS 39213-8202
olimpia@entergy.com

Robert Whalen, Executive Chairman
BWRVIP Mitigation Committee
Tennessee Valley Authority (TVA)
1101 Market Street
Chattanooga, TN 37402-2801
rjwhalen@tva.gov

Robert Carter, EPRI BWRVIP
Assessment Manager
Jeff Landrum, EPRI BWRVIP
Inspection Manager
EPRI NDE Center
P.O. Box 217097
1300 W. T. Harris Blvd.
Charlotte, NC 28221
bcarter@epri.com
jlandrum@epri.com

Dennis Madison
BWRVIP Vice Chairman
Site Vice President
Southern Nuclear Operating Co.
Edwin I. Hatch Nuclear Plant
11028 Hatch Parkway N
Baxley, GA 31515-2010
drmadiso@southernco.com