

May 16, 2011

Mr. James Cirilli, Chairman
PWROG Materials Subcommittee
Exelon Nuclear
Corporate Engineering Programs, Asset Management
Mail Code KSA2-N
200 Exelon Way
Kennett Square, PA 19348

Dear Mr. Cirilli:

At the April 18 & 19, 2011, meeting with the Pressurized Water Reactor Owners Group (PWROG) Materials Subcommittee, Dr. Aladar Csontos of my staff requested assistance from the PWROG in obtaining certain data. The PWROG requested that the Office of Nuclear Regulatory Research (RES) make the request in writing so that the PWROG could adequately consider the request.

In recent years, operating experience has shown that Alloy 82/182/600 materials used in reactor coolant pressure boundaries (RCPB) of pressurized water reactors (PWRs) are susceptible to primary water stress corrosion cracking (PWSCC). These materials are present in piping systems that were approved by the NRC for Leak-Before-Break (LBB) before PWSCC was found in RCPB butt welds. The recent operating experience led to concerns regarding the potential effect of (PWSCC) on the existing LBB analyses.

The commercial nuclear power industry has implemented strategies to manage potential or existing PWSCC at Alloy 82/182 dissimilar metal welds in PWRs. One strategy is to manage potential PWSCC by inspection alone. The other general strategy consists of management by a combination of mitigation plus inspection. One of the mitigation techniques being used in piping approved for LBB is application of the mechanical stress improvement process (MSIP).

At the direction of RES, Pacific Northwest National Laboratory (PNNL) is assisting in the assessment of these strategies for managing potential PWSCC in piping systems approved for LBB. These strategies depend heavily upon the reliability of the nondestructive examination (NDE) techniques being applied. RES is assessing whether inspections alone or inspections plus mitigation are needed to manage PWSCC.

The U.S. Nuclear Regulatory Commission (NRC) is also working on a program to update the LBB requirements from the deterministic approach in NRC Standard Review Plan 3.6.3 to a probabilistic approach. The probabilistic approach is referred to as the "Extremely Low Probability of Rupture" (xLPR) approach. The scope of the xLPR project is to determine strategies for managing PWSCC in LBB systems to assure that the probability of fluid system piping rupture remains extremely low in accordance with the requirements of GDC-4.

J. Cirilli

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In the transition from the LBB approach to xLPR, it would greatly assist RES if the industry would assist RES with the following:

- (1) RES is interested in reviewing field data on the evaluation and distinction of ultrasonic testing (UT) indications for service-induced PWSCC and false-positive signals. One source of false-positive UT signals that is of interest is indications from fabrication flaws.
- (2) RES is interested in reviewing pre- and post-MSIP UT crack data in Alloy 82/182 welds, for example from welds mitigated by MSIP at Salem, Seabrook, and Calvert Cliffs.

RES would like to initially review this data with industry experts available through the PWROG. RES is also requesting that this UT data be made available for subsequent review at the PNNL facility.

Should you have any questions regarding this request, please contact Wallace E. Norris of my staff at (301) 251-7650.

Sincerely,

/RA/

Michael Case, Director
Division of Engineering
Office of Nuclear Regulatory Research

cc: T. Lupold, NRR
J. Molkenthin, Westinghouse
R. Dyle, EPRI

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