

May 26, 2011

Mr. Michael A. Macfarlane  
Southern Nuclear Company (SNC)  
Fleet Engineering Programs Manager  
P.O. Box 1295  
42 Inverness Center Parkway  
Birmingham, AL 35201

Dear Mr. Macfarlane,

The purpose of this letter is to request SNC support for an Office of Nuclear Regulatory Research (RES) initiative in the area of reliability of nondestructive examination (NDE) for detection and characterization of stress corrosion cracking (SCC). Domestic and foreign operating experience (OE) has demonstrated that Alloy 82/182/600 materials exposed to primary coolant water (or steam) at the normal operating conditions of pressurized water reactors (PWRs) are susceptible to cracking due to primary water SCC (PWSCC). Similar OE demonstrates that these materials exposed to primary coolant water (or steam) at the normal operating conditions of boiling water reactors have also cracked due to intergranular SCC (IGSCC).

General Design Criterion (GDC) - 4, "Environmental and dynamics effects design bases," allows the dynamic effects associated with postulated pipe ruptures to be excluded from the design basis when analyses reviewed and approved by the Commission demonstrate that the probability of fluid system piping rupture is extremely low. The Materials Reliability Project (MRP) has prepared inspection and evaluation guidelines for dissimilar metal butt welds in the reactor coolant system. These guidelines are contained in MRP-139, "Primary System Piping Butt Weld Inspection and Evaluation Guidelines." These guidelines were issued with "mandatory" implementation under the NEI 03-08, "Guidelines for the Management of Materials Initiatives." The purpose of these guidelines is to manage PWSCC through a combination of inspection and mitigation. To rely on inspections as a management technique, the inspections have to be capable of detecting PWSCC before the probability of failure would no longer be considered extremely low.

To verify that inspections can be relied upon to manage PWSCC, RES requests ultrasonic testing (UT) data acquired by American Society of Mechanical Engineers (ASME) Code-qualified methods on actual welds where service-induced SCC has been documented. NRCstaff members conversed with Mr. Gary Lofthus and Mr. Daniel Cordes of SNC at a recent ASME Code, Section XI meeting.

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During those conversations, the NRC staff learned that encoded UT data was acquired at two SNC plants, where SCC was detected and subsequently mitigated by weld overlay. The first weld is a surge line dissimilar metal weld containing PWSCC flaws at Plant Farley, Unit 2; ultrasonic data was acquired in the spring 2007 outage. The second weld was a Control Rod Drive (N9 nozzle) dissimilar metal weld containing IGSCC flaws at Plant Hatch, Unit 1; data acquired in the Spring 2008 outage. NRC understands that in order to mitigate the flaws in these plants, these nozzle welds received full structural weld overlays.

The NRC staff would be very interested in the opportunity to review the UT data on the flaws acquired at these two SNC plants. Because the data will be used as part of an RES assessment, the plant names are not necessary. Please feel free to contact Wallace Norris of my staff at 301-251-7650 if you have any questions regarding this request.

Sincerely,

*/RA/*

Aladar A. Csontos, Chief  
Component Integrity Branch  
Division of Engineering  
Office of Nuclear Regulatory Research

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