



NUCLEAR ENERGY INSTITUTE

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U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: Materials Reliability Program Inspection Plan for
Primary System Piping Butt Welds

PROJECT NUMBER: 689

The EPRI Materials Reliability Program has completed Revision 0 of MRP-139, *Materials Reliability Program: Primary System Piping Butt Weld Inspection and Evaluation Guideline*. This inspection plan is intended to maintain structural integrity of the primary system dissimilar metal butt welds by maintaining an acceptably low probability of cracking that could lead to consequential rupture or wastage. The guideline is enclosed for your information. The industry will brief the staff on the contents of MRP-139 in a meeting scheduled for August 4, 2005.

Revision 0 of MRP-139 has been categorized as “mandatory” under the industry’s Materials Initiative. This “mandatory” classification means that all PWRs must implement Sections 5 and 6 of MRP-139 within the timeframe specified in Section 1.2. Industry Initiatives represent internal industry commitments between the Chief Nuclear Officers. The programs and processes associated with primary system inspection guidance (such as that provided in Sections 5 and 6 of MRP-139) are governed by current NRC regulations, e.g. 10 CFR Part 50, General Design Criteria, and Appendix B.

The Butt Weld Inspection and Evaluation Guideline is based on a comprehensive butt weld safety assessment (MRP-113) submitted to the NRC staff on July 20, 2004. The safety assessment showed that there is a very low probability of pipe rupture as a result of primary water stress corrosion cracking (PWSCC) of Alloy 82/182 welds in primary system applications. The following are the main conclusions from MRP-113:

- The butt welds have been inspected non-destructively at intervals specified by Section XI of the ASME Code. Only a small number of welds have been found to contain axial cracks, only two welds worldwide have been found to have small leaks from axial cracks, and only one weld had a reported circumferential crack which was both short and shallow. None of these cases involved significant risk of failure due either to cracks reaching critical size or boric acid corrosion.

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- Axial cracking is far more likely than circumferential cracking.
- Probabilistic analysis shows that the impact of butt weld PWSCC on core damage frequency is insignificant. There is a high probability that leakage will be detected prior to failure.
- The potential for significant boric acid corrosion is low.

We have also enclosed MRP-140, *Materials Reliability Program: Leak-Before-Break Evaluation for PWR Alloy 82/182 Welds*, for your information. This document is a key reference in MRP-139 and supports our conclusion that the technical basis for leak-before-break (LBB) remains valid even recognizing the possibility of PWSCC in systems approved for LBB. We will also brief the staff on the contents of MRP-140 at the August 4th meeting.

We would appreciate any comments provided by the NRC staff on the enclosed documents or on the associated MRP safety assessment. We recognize the benefit of establishing the continuing acceptability of leak-before-break methodology, and we are interested in using these documents as a means of establishing a regulatory basis for future licensing submittals. However, at this time NEI is not requesting approval of MRP-139, MRP-140, or issuance of an NRC safety evaluation on these documents. It is possible that NRC review of MRP-140 may be requested at a later date.

The proprietary information in the enclosed reports is supported by the signed affidavits in Enclosure 3. The affidavits set forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity, the consideration listed in paragraph (b)(4) of Section 2.390 of the Commission's regulations. Accordingly, we respectfully request that the information, which is proprietary to EPRI, be withheld from public disclosure in accordance with 10 CFR 2.390. Non-proprietary versions of this information are provided in Enclosure 4 and 5.

If you have any questions on this matter, please contact me at 202-739-8080; am@nei.org or Jim Riley at 202-739-8137; jhr@nei.org.

Sincerely



Alexander Marion

Enclosures

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