



NUCLEAR ENERGY INSTITUTE

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

SUBJECT: Materials Reliability Program Inspection Plan for Reactor Vessel Closure Heads

PROJECT NUMBER: 689

The EPRI Materials Reliability Program has completed Revision 0 of MRP-117, *Materials Reliability Program Inspection Plan for Reactor Vessel Closure Head Penetrations in U.S. PWR Plants*. This inspection plan is intended to maintain structural integrity of the reactor vessel closure head and its penetrations by maintaining an acceptably low probability of developing cracking that could lead to nozzle ejection or loss of ASME Code margins due to consequential wastage. The MRP plan also maintains an acceptably low probability of pressure boundary leakage. The industry briefed the staff on the contents of MRP-117 in a meeting on September 8, 2004. Staff comments from that meeting have been considered and the resulting document is hereby forwarded for your information.

Revision 0 of MRP-117 is not intended for implementation by utilities because NRC Order EA-03-009 establishes PWR reactor vessel head inspection requirements. Rather, it has been issued to support development of ASME Code Case Code N-729, *Alternative Examination Requirements for PWR Closure Heads with Nozzles Having Pressure-Retaining Partial-Penetration Welds*. We are working with ASME on this Code Case to provide technically sound long-term inspection requirements as an alternative to, and possible replacement for, Order EA-03-009. This activity is consistent with the Commission's August 6, 2004, Staff Requirements Memorandum responding to SECY 04-0115.

The enclosed report is based on the comprehensive reactor vessel closure head safety assessment (MRP-110) submitted to the NRC staff in April 2004. It is emphasized that the safety assessment shows that:

- Axial cracks in the nozzle wall and cracks of any orientation in the J-groove weld cannot credibly directly cause a rupture of the primary pressure boundary.
- Considerable operating time exists between the initiation of hypothetical stress corrosion cracks and the possibility of large, structurally significant circumferential cracks in the nozzle wall located near or above the top of the J-groove weld, providing ample time for detection via regular visual and non-visual inspections.
- The small amounts of leakage typical of through-wall cracking in reactor vessel closure head penetrations cannot produce structurally significant boric acid corrosion of the low-alloy steel head material. The bare metal visual inspections specified in the MRP inspection plan would detect with high confidence the relatively large amounts of boron deposits that must precede the possibility of structurally significant wastage because relatively large leak rates are necessary to produce rapid boric acid corrosion.

Industry will consider comments provided by the NRC staff on the enclosed document or on the associated MRP safety assessments and will also consider changes indicated by the final approved version of Code Case N-729. However, since we expect to address inspection requirements through the Code process, NEI is not requesting a formal review of MRP-117 or issuance of an NRC safety evaluation on this document.

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,



Alex Marion

Enclosure

- c: Mr. Richard Barrett, U. S. Nuclear Regulatory Commission
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