October 07, 2009

MEMORAMDUM TO: Aladar A. Csontos, Chief
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Office of Nuclear Regulatory Research

FROM: Wallace E. Norris, Senior Materials Engineer ***/RA/***
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SUBJECT: SUMMARY OF SEPTEMBER 29, 2009, MEETING BETWEEN EPRI AND NRC — POD CURVES FOR xLPR

The Office of Nuclear Regulatory Research (RES), Division of Engineering, Component Integrity Branch, hosted a Category 2 public meeting on September 29, 2009, between the NRC staff and the Electric Power Research Institute (EPRI) to discuss preliminary results of the EPRI assessment of the probability of detection (POD) of flaws in dissimilar metal welds. The purpose of the assessment is to produce POD curves in support of the re-evaluation of General Design Criterion 4, *Environmental and dynamic effects design basis*, of 10 CFR Part 50, Appendix A. The NRC staff initiated the re-evaluation of GDC 4 in order to investigate the requirement that there be an extremely low probability of rupture (xLPR) in reactor pressure boundary piping. It was determined that the re-evaluation was necessary to quantify the effects of primary water stress corrosion cracking (PWSCC) and other potentially active degradation mechanisms not considered in the original analyses. The meeting attendance is provided in Enclosure 1.

A task in this xLPR Program is the development of a modular probabilistic fracture mechanics (PFM) code capable of estimating extremely low probabilities of rupture in piping systems. One of the inputs to the PFM code is information related to the reliability of the non-destructive examination (NDE) techniques applied to piping welds. EPRI maintains an extensive database related to qualification of NDE procedures and personnel in accordance with Appendix VIII, *Performance Demonstrations for Ultrasonic Examination Systems*, Section XI, of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. However, the database was not intended to infer POD. However, in support of the RES program to develop a PFM code for piping, EPRI agreed to interrogate the database to provide information about NDE reliability.

EPRI has conducted quality checks of the data and extracted data that may be relevant to the re-evaluation project. Representatives from EPRI summarized some of the results at this meeting. EPRI's presentation slides are provided in Enclosure 2. EPRI plans to publish a final report entitled "Development of Probability of Detection of Curves for Ultrasonic Examination of Dissimilar Metal Welds (MRP-262) Typical PWR Leak Before Break Line Locations," by the end of October 2009. The report will be available to the public and the report number is 1019088.

The ultimate goal of the project is to develop a more robust, fully probabilistic approach to GDC–4. The development of the probabilistic fracture mechanics evaluation methodology and software tools will take several years to develop.

NRC staff did not make a formal presentation. The meeting was noticed as a Category 2 public meeting. However, no members of the public, other than industry representatives, were present. No meeting feedback forms have been received.

If you have any questions or comments, please contact Wallace Norris at 301-251-7650.

Enclosures:
As stated

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Enclosures:
As stated

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