

Nickel-Base Alloy, Vessel Penetration Conference Planned for Spring, 2003

NRC Research is planning a three-day conference addressing issues of flaw detection and crack growth rate modeling and applications for nickel-base alloys used as PWR pressure boundary components, including vessel head penetrations (VHPs – upper and lower), safe-ends, and other attachments involving mixed metal, nickel-base alloy welds. The discovery of cracks and leakage from the control rod drive (CRD) housings of several US and foreign reactors has raised this issue to a high level of regulatory concern.

This conference will take place in the Washington, DC area, on March 24 – 26, 2003. Participants will include a domestic and an international audience consisting of reactor operators, regulatory personnel, and researchers involved in the solution of the structural integrity issues arising from crack growth and leakage through nickel-base alloy components, cladding and associated attachment welds. The materials and structural elements fabricated from them to be discussed include Alloys 600 and 690, compatible mixed metal welds of Alloys 82/182 and 52/152. The structure of the conference will include presentations by industry, regulatory and laboratory representatives, as well as open discussion of the critical issues. The proceedings will be published as Conference Proceedings of the Nuclear Regulatory Commission (NUREG/CP-series).

The topics on the program will include (a) flaw inspection procedures, descriptions of NDE results, and user experience with vessel head mock-ups or other NDE training and certification procedures; (b) descriptions of crack growth rate (CGR) experiments, interpretation and analysis of CGR data; (c) probabilistic fracture mechanics analysis of VHP structural elements, including experimental or analytical stress analyses; (d) programs that address the mitigation of the cracking or other corrective actions, especially repair procedures; and (e) the application of these results in operating plants, including follow-on inspections of repaired components, and evaluations of success or failure of these methods.

Details of the conference will be posted on the NRC's public website, under Nuclear Reactors, at the Alloy 600 link.