



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

July 21, 1998

Mr. L. Joseph Callan
Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Mr. Callan:

SUBJECT: PROPOSED FINAL SAFETY EVALUATION OF THE BWR VESSEL AND INTERNALS PROJECT, BWR PRESSURE VESSEL SHELL WELD INSPECTION RECOMMENDATIONS (BWRVIP-05) REPORT

During the 454th meeting of the Advisory Committee on Reactor Safeguards, July 8-10, 1998, we reviewed the proposed final safety evaluation of the BWR Vessel and Internals Project (BWRVIP-05) report concerning industry recommendations for reducing the scope of inservice inspection of BWR reactor vessel welds. During our review, we had the benefit of discussions with representatives of the NRC staff and of the documents referenced.

Conclusions

- We endorse the staff's recommendation that licensees be granted permanent relief from inservice inspection requirements for volumetric examination of BWR circumferential reactor pressure vessel welds if the licensee can demonstrate that the generic evaluation performed by the staff is applicable to its vessel.
- We concur with the staff's request that the BWRVIP provide a plan for followup analyses to determine more realistic estimates of the frequency of axial weld failures caused by cold-overpressure events and propose appropriate technical approaches to address this issue.

Discussion

In our September 10, 1997 letter, we recommended that the staff review the BWRVIP-05 report using the risk-informed process in Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Current Licensing Basis." We also recommended that additional efforts be taken to address uncertainties associated with the industry and staff analyses, in particular those associated with flaw size distributions and the sequences that could lead to vessel challenges. In addition, we recommended that the staff consider the value of partial inservice inspection of welds. In response, the staff and the industry estimated the frequency of vessel challenges through studies of potential precursor events, used recent research results from examination of actual pressure vessel welds to update flaw size distributions, and performed additional probabilistic fracture mechanics analyses.

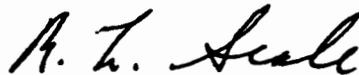
The staff and industry studies confirmed that the failure frequency of axial welds during cold over-pressure events is much greater than the failure frequency for circumferential welds. The circumferential weld failure frequency is below the criteria specified in Regulatory Guide 1.154, "Format and Content of Plant-Specific Pressurized Thermal Shock Safety Analysis Reports for Pressurized Water Reactors," for pressure vessel integrity. This finding supports the conclusion that inservice inspection of circumferential welds is not necessary during the current license term for operating BWRs.

The computed failure frequency of the axial welds does not meet the criteria of Regulatory Guide 1.154. This assessment is based on end-of-life neutron fluence levels that will not occur for many years and includes a number of additional conservatisms, and hence, failure of the axial welds is not a near-term safety concern. The staff requested additional analyses from the BWRVIP to obtain more realistic estimates of axial weld failure frequency.

The studies performed by the staff and the industry also demonstrate that inservice inspection of the axial welds is ineffective in reducing the likelihood of vessel failure due to fabrication flaws. An inspection program for these welds consistent with the intent of ASME Section XI, however, does provide assurance that service-induced degradation mechanisms will be detected and is an important element of defense in depth.

Dr. William J. Shack did not participate in the Committee's deliberation regarding this matter.

Sincerely,



R. L. Seale
Chairman

References:

1. Letter dated September 10, 1997, from R. L. Seale, Chairman, ACRS, to L. Joseph Callan, Executive Director for Operations, NRC, Subject: Boiling Water Reactor Pressure Vessel Shell Weld Inspection Recommendations (BWRVIP-05).
2. Memorandum dated June 3, 1998, from Frank J. Miraglia, Office of Nuclear Reactor Regulation, NRC, to Robert L. Seale, Chairman, ACRS, Subject: Transmittal of NRC Staff's Draft Safety Evaluation of the "BWR Vessel and Internals Project, BWR Reactor Pressure Vessel Shell Weld Inspection Recommendations (BWRVIP-05)" Report.