

D860917

Mr. Victor Stello, Jr.  
Executive Director for Operations  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Mr. Stello:

SUBJECT: ACRS COMMENTS ON DEGRADED PIPING RESEARCH

During its 317th meeting, September 11-13, 1986, the Advisory Committee on Reactor Safeguards heard a report from its Subcommittee on Metal Components concerning a recent meeting at which the research program on degraded piping was reviewed. Our comments are based on that report.

The research on piping integrity is related to the NRC's need for answers to the following questions concerning leak-before-break analyses:

- What flaw size can be accepted during operation?
- Should the postulation of a guillotine break in piping continue to be required?
- What materials and environmental control should be used in BWR piping?

The quality of the work was very good; thus, the comments that follow deal with how the programs fit in with NRC needs or might be improved.

Because the NRC Staff presentations rarely mentioned the objectives of the programs in terms of NRC needs, the ultimate usefulness of the results was not made entirely clear, nor was it evident that these objectives are clearly understood by the people doing the work. It was uncertain how the necessary interaction with NRR is being handled in order to apply the results to the questions listed above.

The application of these results to piping systems in the field, as in Subsection IWB-3640 of the ASME Code, is predicated on the following assumptions:

- the crack is in straight pipe or a weld therein,
- the calculations of Pm and Pb (from the piping system analysis) are conservative,
- torsional moments do not affect allowable flaw size, and
- dynamically applied loads produce the same results as quasi-static.

The proposed International Piping Integrity Research Group (IPIRG) program will address the last of these, but in view of the uncertainties

inherent in these assumptions there must remain some residual concern with the routine application of Subsection IWB-3640.

The program to which we would give the lowest priority is at Materials Engineering Associates, Inc. on "Fatigue Crack Growth Rate in PWR Materials and Environments." The questions being addressed concern the conservatism of the ASME Code Sections III and XI design rules and the fact that they ignore the effect of temperature and the water environment. It is not clear whether the current approach leads to a conservative or nonconservative design especially for plant life extension purposes. With the demise of steel company research laboratories and the absence of new nuclear plant sales, the only group with interest and resources to pursue these questions seems to be the NRC and licensees. To date, however, the tests needed to establish better criteria are in the process of being defined. The work on the mechanism of environmentally assisted cracking may be just developing, but the guiding ideas were not made clear.

Sincerely,

David A. Ward  
Chairman

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