

September 15, 1995

The Honorable Shirley A. Jackson  
Chairman  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

Dear Chairman Jackson:

SUBJECT: DEVELOPMENT OF IMPROVED NONDESTRUCTIVE EXAMINATION (NDE)  
TECHNIQUES

During the 424th meeting of the Advisory Committee on Reactor Safeguards, September 7<sup>th</sup>, 1995, we heard presentations from representatives of the Electric Power Research Institute (EPRI), the EPRI Technical Advisory Group on NDE, Zetec, Babcock & Wilcox Nuclear Technologies, ABB-Combustion Engineering, and Westinghouse Electric Corporation regarding activities to improve NDE techniques for more accurately detecting and assessing steam generator tube defects. The status of staff activities on the development of a new steam generator rule and a supporting research program was also discussed. We had the benefit of the documents referenced.

In the June 16, 1995 Staff Requirements Memorandum, the Commission asked the ACRS to assist the staff in encouraging the industry to develop improved NDE techniques for steam generator tube inspections. The industry presentations at our meeting indicated that substantial progress is being made on the development of techniques that will provide significantly improved capabilities for detecting and sizing circumferential flaws. Not surprisingly, industry efforts are focused on a rapid resolution of the circumferential cracking problem using evolutionary improvements in eddy current technology. In addition, development is proceeding on innovative techniques such as ultrasonic guided (Lamb) waves, in situ fluorescent dye-penetrant inspections, in situ tube burst pressure testing, and combined ultrasonic and eddy current probes. Improved methods of signal processing and display are being developed to aid interpretation of NDE results. We believe modern, real time, signal processing technologies could provide great improvements in signal interpretation, defect detection, and defect sizing.

The staff and industry both recognize that the current regulatory approach to steam generator inspections discourages the development and adoption of improved NDE techniques. In the current framework, an increased detection capability leads to more plugging or repairs without necessarily improving safety. We believe that adoption of a new steam generator rule with realistic requirements for demonstrating tube integrity could provide the industry with a strong economic incentive to develop more effective NDE techniques.

Careful thought must be given to the requirements for adequate performance demonstrations of the NDE techniques essential for implementing a new rule. The steam generator mockup being developed by Westinghouse Electric Corporation under the Office of Nuclear Regulatory Research sponsorship may provide a useful independent regulatory check on the adequacy of NDE inspection techniques.

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

Sincerely,

/s/

T. S. Kress  
Chairman

References:

1. Staff Requirements Memorandum dated June 16, 1995, from Andrew L. Bates, Acting Secretary of the Commission, Subject: Meeting with ACRS, June 8, 1995
2. NRC Information Notice 94-88, "Inservice Inspection Deficiencies Result in Severely Degraded Steam Generator Tubes," dated December 23, 1994
3. NRC Generic Letter 95-03, "Circumferential Cracking of Steam Generator Tubes," dated April 28, 1995

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