ATTACHMENT 1

D940912

The Honorable Ivan Selin
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Chairman Selin:

SUBJECT: PROPOSED GENERIC LETTER 94-XX, "VOLTAGE-BASED REPAIR CRITERIA FOR WESTINGHOUSE STEAM GENERATOR TUBES"

During the 412th meeting of the Advisory Committee on Reactor **Safeguards, August 4-5, 1994, we reviewed the subject generic** letter (GL), an associated differing professional opinion (DPO), and a draft of an Advance Notice of Proposed Rulemaking on Steam Generator Tube Integrity. During the 413th meeting, September 8-10, 1994, we discussed the NRC staff's revised calculations for radiological consequences of a main steamline break associated with a degraded steam generator. During our review, we had the benefit of discussions with representatives of the NRC staff and the Nuclear Energy Institute (NEI), as well as the author of the DPO. We also had the benefit of the documents referenced. In part, this report is in response to a request made by the Executive Director for Operations in a July 15, 1994, memorandum to the Executive Director of the Advisory Committee on Reactor Safeguards.

Although existing mechanics-based design criteria and evaluation methods have served to ensure adequate steam generator tube integrity, they appear to be overly conservative for some types of degradation, and result in unnecessary tube plugging or repair. The proposed GL provides an alternate approach applicable solely to axially oriented outside diameter stress corrosion cracking (ODSCC) of tubes at the tube-support-plate intersections in Westinghouse steam generators with drilled-hole support plates.

We support the issuance of the proposed GL for public comment. We have reviewed the DPO and do not believe that it identifies any fundamental shortcomings in the approach proposed in the GL.

The DPO cites a high core damage frequency (CDF) of 3.4 x 10-4/RY. This value was based on a preliminary scoping analysis performed by the Office of Nuclear Regulatory Research (RES). Subsequent analyses performed by RES in support of the application of the interim plugging criteria for the Trojan Nuclear Plant and for NUREG-1477 give CDFs of less than 2 x 10-6/RY. These values are based on conservative estimates of leakage from degraded tubes. Except perhaps for steamline breaks, the structural restraint provided by the tube-support plate provides a high degree of assurance against tube bursts.

The criticism in the DPO of the approach used in the proposed GL and in the Standard Review Plan to compute radiological releases during a main steamline break appears to warrant further consideration. The basis for the definition of the iodine spike during a rapid depressurization transient as 500 times the equilibrium release rate is not clear. However, an alternate calculation of the release based on the gap inventory of iodine in leaking fuel elements appears to give comparable releases. In both approaches there appears to be margin in meeting the 10 CFR Part 100 limits. The staff should review the spiking data or consider other approaches to estimate the iodine release to provide a more

satisfactory basis for the radiological dose estimates. In particular, we encourage the staff to quantify the level of conservatism in its analyses.

While the proposed GL appears to provide a useful interim approach for assessing steam generator tube integrity, the database for the present empirical correlations for burst pressure and leakage with the bobbin coil voltage, appears to be only marginally adequate, and more data need to be developed.

The use of such empirical correlations as the basis for assuring the integrity of steam generator tubing would also seem to require an ongoing tube-pull program with associated burst and leak testing and metallurgical examinations as outlined in the proposed GL to ensure that the correlations remain valid as degradation continues. In the longer term, it would be worthwhile to reconsider a fracture-mechanics-based approach utilizing improved non-destructive examination techniques that provide more accurate detection and characterization of degradation. Ongoing efforts in RES and in industry to develop and implement such an approach should be continued and encouraged.

We agree with the staff position that rulemaking is the preferred regulatory approach to the problem of steam generator tube degradation, although we are skeptical that a new rule can be developed as expeditiously as the proposed schedule suggests. The overall objective and attributes of the new rule, as described by the staff, pay proper obeisance to performance-based regulation. We would like to be kept informed of the progress by the staff in the implementation of a performance-based approach.

Sincerely,

T. S. Kress
Chairman

References:

1. Memorandum dated July 8, 1994, from F. J. Miraglia, Deputy Director, Office of Nuclear Reactor Regulation, for E. L. Jordan, Chairman, Committee to Review Generic Requirements, Subject: CRGR Review of Generic Letter 94-XX, "Voltage-Based Repair Criteria for Westinghouse Steam Generator Tubes"
2. Memorandum dated July 15, 1994, from J. M. Taylor, NRC Executive Director for Operations, for J. T. Larkins, ACRS Executive Director, Subject: ACRS Review of Proposed Generic Letter 94-XX, Voltage-Based Repair Criteria for Westinghouse Steam Generator Tubes
3. U.S. Nuclear Regulatory Commission, 10 CFR Part 50, RIN 3150-; Steam Generator Tube Integrity (7590-01), Draft Advance Notice of Proposed Rulemaking, received July 20, 1994
4. Memorandum dated August 17, 1994, from J. A. Calvo, NRC Office of Nuclear Reactor Regulation, for J. T. Larkins, ACRS Executive Director, Subject: Revisions to Slides Used by Staff During August 3, 1994, Subcommittee Briefing on Steam Generator Alternate Repair Criteria
5. U.S. Nuclear Regulatory Commission, NUREG-1477, "Voltage-Based Interim Plugging Criteria for Steam Generator Tubes," Draft Report for Comment, June 1993
6. Memorandum dated January 15, 1993, from E. S. Beckjord, Director, Office of Nuclear Regulatory Research, to T. E. Murley, Director, Office of Nuclear Reactor Regulation, Subject: Interim Plugging Criteria for Trojan Nuclear Plant