November 24, 1993

Docket No. 50-390

Tennessee Valley Authority
ATTN: Dr. Mark O. Medford, Vice President
Technical Support
3B Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

Dear Dr. Medford:

SUBJECT: WATTS BAR UNIT 1 - AUDIT OF U-BOLT ANALYSIS (TAC M79718)

As part of our review efforts on Watts Bar's use of U-bolts as pipe clamps, we plan to perform an audit of your documentation related to U-bolt supports, as described in your correspondence to the staff, including your October 25, 1993, submittal. As agreed upon with Mr. Wayne Massie of your staff, the audit will take place at the Watts Bar site during December 13-15.

The audit will be performed by Messrs. J. Fair, L. Raghavan, and T. Chan. The enclosure provides some of the specific issues we plan to review during the audit. Mr. Fair will contact Mr. Massie to discuss the logistics of the audit.

Sincerely,

Original signed by

Peter S. Tam, Sr. Project Manager
Project Directorate II-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

cc: See next page

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WATTS BAR NUCLEAR PLANT

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Enclosure

WATTS BAR NUCLEAR PLANT, UNIT 1

ISSUES TO BE REVIEWED IN THE U-BOLT AUDIT

Deflection Criteria

a. The October 25, 1993, submittal states that local deformation was evaluated for each U-bolt location. The staff would like to review these evaluations.

b. The October 25, 1993, submittal states that the Belleville washer stiffness has negligible effect on the overall stiffness of the pipe U-bolt assembly under seismic compressive loads (Page E2-2). The staff would like to review the evaluation that led to this conclusion.

Applicability of Test Results to Fittings

a. Enclosure 2 of the October 25, 1993, submittal discusses the applicability of the testing and analyses performed on straight pipe to other fittings, such as elbows. The submittal states that the U-bolts suppress ovalization of elbows and, therefore, the stresses in the elbow due to bending would be similar to that of straight pipe. The staff would like to review TVA's evaluation of the loads imposed on the U-bolt due to the suppression of the ovalization of the elbow. The staff would also like to review TVA's evaluation of the piping analysis for the effect of the suppression of the elbow ovalization.

b. The data in Table 1 of the October 25, 1993, submittal contains a listing of intensified moments at the highest stressed locations. This data was presented in a different format in Table II-2 of the April 8, 1993 submittal. The staff would like to review the basis for the data in the current submittal.

General Areas of Review

a. The October 25, 1993, submittal states that U-bolts were generally used in areas where there was limited room for standard supports. Nevertheless, some of the pipe support examples in the photographs provided in the October 25, 1993, submittal appear to show sufficient space for standard supports. The staff would like to verify that these space limitations exist where the U-bolts are used. The staff would also like to randomly select and audit a sample of U-bolt support design packages.

b. The October 25, 1993, submittal states that the local bearing load evaluation meets ASME Code requirements. This statement is based on the ASME Code sections referenced on Page E1-16. The staff would like to review TVA's evaluation of the ASME Code criteria.

c. The October 25, 1993, submittal states that TVA considers the Westinghouse seismic test to be a positive demonstration of the adequacy of U-bolts under dynamic load conditions. The staff would like to review TVA's evaluation of this test. This includes a review of the possible test failure modes given the physical configuration of the test.