TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

October 28, 1982

WBRD-50-390/82-70
WBRD-50-391/82-67

U.S. Nuclear Regulatory Commission
Region II
Attn: Mr. James P. O'Reilly, Regional Administrator
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - STEAM GENERATOR LOWER SUPPORT BOLTS - WBRD-50-390/82-70, WBRD-50-391/82-67 - SECOND INTERIM REPORT

The subject deficiency was initially reported to NRC-OIE Inspector R. V. Crlenjak on June 10, 1982 in accordance with 10 CFR 50.55(e) as NCR GEN NEB 8201. Our first interim report was submitted on July 9, 1982. Enclosed is our second interim report. We expect to submit our next report on or about April 18, 1983. Similar conditions at Bellefonte Nuclear Plant are being handled under a separate report (BLRD-50-438/81-56, BLRD-50-439/81-58).

If you have any questions concerning this matter, please get in touch with R. H. Shell at FTS 858-2668.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills, Manager
Nuclear Licensing

Enclosure
cc: Mr. Richard C. DeYoung, Director (Enclosure)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

OFFICIAL COPY

IE 27

ENCLOSURE

WATTS BAR NUCLEAR PLANTS UNITS 1 AND 2
STEAM GENERATOR LOWER SUPPORT BOLTS
NCR GEN NEB 8201
WBRD-50-390/82-70, WBRD-50-391/82-67
10 CFR 50.55(e)
SECOND INTERIM REPORT

Description of Deficiency

Watts Bar Nuclear Plant

The ASTM A564 type XM-16 (Carpenter Custom 455) steam generator lower support bolts supplied by Westinghouse for Watts Bar have two potential areas of nonconformance: (1) the yield strength may not meet Final Safety Analysis Report commitments for these bolts at operating temperatures; and (2) TVA cannot verify adherence to the Westinghouse-suggested preload on the bolts; consequently, the material may be susceptible to stress corrosion cracking. These potential problems have arisen from an apparent design basis error regarding material selection because of a lack of allowable stress trend curves as a function of temperature. In addition, the industry has experienced recent failure experience with ultra high strength bolting in primary component supports.

Interim Progress

TVA now believes that the Watts Bar bolts can be reheat-treated to a condition which possesses adequate strength, with more than adequate fracture toughness and resistance to stress corrosion cracking, without bolting replacement. The fracture mechanics evaluation of the Watts Bar steam generator lower support bolts is near completion.

The applied K_I values have been calculated based on bolt loadings and geometry. Determination of critical fracture toughness (K_{IC}) and stress corrosion potential (K_{ISCC}) for the specific material is being finalized. Laboratory test results to date indicate that reheat-treatment of the material to a higher aging temperature (975°F) will provide adequate strength at temperature as verified by hot tensile tests. The 975° F aging treatment will also provide increased K_{IC} and K_{ISCC} values which offer greater factors of safety over the minimum material requirements established by calculation.