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

October 5, 1983

WBRD-50-390/83-48
WBRD-50-391/83-46

U.S. Nuclear Regulatory Commission
Region II
Attn: Mr. James P. O'Reilly, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - MASS OF HVAC SUPPORTS NOT INCLUDED IN FREQUENCY CALCULATIONS - WBRD-50-390/83-48, WBRD-50-391/83-46 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector Linda Watson on August 9, 1983 in accordance with 10 CFR 50.55(e) as NCR WBN SWP 8254 R1. Our first interim report was submitted on September 6, 1983. Enclosed is our final report.

If you have any questions, please get in touch with R. H. Shell at FTS 858-2688.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills

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

Records Center (Enclosure)
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
MASS OF HVAC SUPORTS NOT INCLUDED IN FREQUENCY CALCULATIONS
NCR WBN SWP 8254 R1
WBRD-50-390/83-48, WBRD-50-391/83-46
10 CFR 50.55(e)
FINAL REPORT

## Description of Deficiency

During a design review TVA engineers identified five heating, ventilating, and air conditioning (HVAC) typical support designs (identified in drawings 47A055-48, -62, -118, -125 and -209) which appeared to not meet requirements set forth in Watts Bar Design Criteria WB-DC-40-31.8 "Seismically Qualifying Round and Rectangular Duct." The specific requirement which apparently had not been met call for the inclusion of a support's mass in the evaluation of the natural frequency of the support in the restrained direction when the greater than 50 percent of the supported mass. (These modifications are done through "variances" and represent unique supports.) The cause of this error was a lack of awareness by a few design engineers of the full requirements set forth in the design criteria.

## Safety Implication

Failure to include support mass into natural frequency evaluations as required could result in support anchor loads or structural members exceeding design allowances which could cause support failures and subsequent failure of safety related HVAC duct. These failures could adversely effect safe operation of the plant.

## Corrective Action

TVA has reviewed the five typical drawings identified by this nonconformance and has determined that drawings 47A055-125 and 47A055-209 meet criteria requirements; 47A055-62 is an acceptable engineered support as it was deleted as a typical by field change request (FCR) MH-1330; 47A055-118 has been used only once for each unit and the two supports are acceptable due to location; and 47A055-48 required additional bracing to meet design criteria. This additional bracing is being incorporated into the drawing through engineering change notice (ECN) 4276 which will also change 47A055-118 from a typical to an engineered support.

TVA has also reviewed all of the other 222 Watts Bar HVAC typical support drawings as well as all variances worked before this problem was identified. All the typical drawings meet the design criteria, and all but four variances have been found to be adequate. Revised designs for these four variances are complete and the field rework of these supports as well as the support work required by ECN 4276 will be completed by January 1, 1984.

TVA's review of this problem has determined that only a small number of typicals were affected. TVA believes that there is no procedural inadequacies needing correction and that a memorandum from the Watts Bar Project Manager to all duct support designers instructing them on evaluation of natural frequency is sufficient to prevent a recurrence of this problem. This memorandum was issued on September 20, 1983.