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

August 3, 1983

WBRD-50-390/82-102

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 UNIT 1 - USE OF INCORRECT ALLOWABLE LOADS FOR ANCHORS - WBRD-50-390/82-102 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector D. Quick on September 24, 1982 in accordance with 10 CFR 50.55(e) as NCR WBN SWP 8249. Interim reports were submitted on October 25, 1982 and March 4, 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
Atlanta, Georgia 30339

8308110116 830803
PDR ADOCK 05000390
S PDR

OFFICIAL COPY
IE 27

ENCLOSURE

WATTS BAR NUCLEAR PLANT UNIT 1
USE OF INCORRECT ALLOWABLE LOADS FOR ANCHORS
NCR WBN SWP 8249
WBRD-50-390/82-102
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

During the support design effort caused by the design basis accident (DBA) reanalysis under engineering change notice (ECN) 2104, a support designer used the Factored Load Design column, instead of the Service Load Design column of Civil Design Standard DS-C6.1, as allowable loads on expansion shells and wedge bolts with normalized design loads from TVA's Civil Engineering Support Branch's (CEB) support load tables. The root cause of this deficiency is that during the time frame of ECN 2104, many new designers were brought into the Watts Bar Design Project Mechanical Group. These new designers received inadequate training and their work received inadequate checking.

Safety Implications

The actions described above increased the allowable loads on the expansion shells and wedge bolts; thereby, reducing the design safety factors. This increases the risk of failure under accident conditions. This increased failure risk is considered to have the potential to adversely affect the safe operation of the plant.

Corrective Action

TVA has reviewed the calculations for support drawings issued under ECN 2104. Of the 775 drawings reviewed, only 2 supports were found inadequate due to the use of incorrect allowables from the Factored Load Design column out of Civil Design Standard DS-C6.1. One of these inadequate supports was deleted, and one was revised under ECN 2576 and is now adequate due to revised loads which are 50 percent less than the original design load under ECN 2104. All calculations using expansion shell and/or wedge bolt anchors for drawings issued under ECN 2315 were reviewed also. ECN 2315 was issued in the same time frame and involved most of the same support designers in question. All design calculations done under ECN 2315 were found to have had the correct allowables used. WBN vendors EDS and Bergen-Paterson (B-P) have been investigated for the same condition. EDS used the correct allowables. B-P design discrepancies were handled under NCR WBN SWP 8012 (WBRD-50-390/81-19 and WBRD-50-391/81-18).

Since the occurrence of this deficiency, a TVA Engineering Design (EN DES) Engineering Procedure (EP) training and utilization program was initiated by the manager of EN DES. This increased emphasis on training to applicable design procedures, particularly EN DES-EP 4.26 which emphasizes the responsibility of the checker, should prevent recurrence of this deficiency.