TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

April 23, 1981

SQRD-50-328/81-25
BLRD-50-438/81-27
BLRD-50-439/81-30
WBRD-50-390/81-30
WBRD-50-391/81-29
YCRD-50-566/81-08
YCRD-50-567/81-06

Mr. James P. O'Reilly, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Region II - Suite 3100
101 Marietta Street
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

SEQUOYAH NUCLEAR PLANT UNIT 2, WATTS BAR, YELLOW CREEK AND BELLEFONTE NUCLEAR PLANTS UNITS 1 AND 2 - ERROR IN TPIPE PROGRAM - SQRD-50-328/81-25, WBRD-50-390/81-30, WBRD-50-391/81-29, YCRD-50-566/81-08, YCRD-50-567/81-06, BLRD-50-438/81-27, BLRD-50-439/81-30 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector J. Crlenjak on March 27, 1981, in accordance with 10 CFR 50.55(e) as NCR's SQN CEB 8106, WBN CEB 8105, BLN CEB 8103 and YCN CEB 8103. Enclosed is our final report.

If you have any questions concerning this matter, please get in touch with D. L. Lambert at FTS 857-2581.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills, Manager
Nuclear Regulation and Safety

Enclosure
cc: Mr. Victor Stello, Jr., Director (Enclosure)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555

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ENCLOSURE
SEQUOYAH NUCLEAR PLANT UNIT 2
WATTS BAR, BELLEFONTE, AND YELLOW CREEK NUCLEAR PLANTS UNITS 1 AND 2
ERROR IN TPIPE PROGRAM
10 CFR 50.55(e)
SQRD-50-328/81-25
BLRD-50-438/81-27 AND BLRD-50-439/81-30
WBRD-50-390/81-30 AND WBRD-50-391/81-29
YCRD-50-566/81-08 AND YCRD-50-567/81-06
FINAL REPORT

Description of Deficiency

The TVA TPIPE computer program was producing erroneous results when running a modal superposition time history analysis on a problem with multiple support excitation and over 60 unique ground motions applied to the structure. Results from TPIPE versions 4.1 through 4.3A were in error. A review of the TPIPE program which resulted in the discovery of the error was begun because the program would not run. Indepth analysis showed that under certain circumstances the program would run and produce incorrect results without stopping. Therefore, the error could have potentially generated bad design information if not found and corrected.

Safety Implications

The magnitude of any deficiency in analyzed piping systems caused by the error in the TPIPE code is a function of the given piping system and is impossible to evaluate without running each problem in question. This condition of erroneous results when running a modal superposition time history analysis with multiple support excitation and over 60 unique ground motions applied to the structure could have potentially jeopardized the safe operation of the plant had it remained uncorrected in that the piping systems affected would not have been analytically verified as required.

Corrective Action

To correct the described deficiency, a new corrected version of the TPIPE program was verified and put into production in place of the version in error. The verification benchmark problems are being reviewed and modified to help locate this type of problem area. Also, all users which were using or had used the erroneous TPIPE versions were polled to determine if any incorrect design information had been issued. The results of this poll showed that no incorrect design data had been issued.