TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

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December 11, 1981

WBRD-50-390/81-54
WBRD-50-391/81-52

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:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - FOXBORO MCA TRANSMITTERS - WBRD-50-390/81-54, WBRD-50-391/81-52 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector R. V. Crlenjak on June 29, 1981 in accordance with 10 CFR 50.55(e) as NCR WBN EEB 8109. Interim reports were submitted on July 27, September 3, and October 7, 1981. Enclosed is our final report. TVA considers 10 CFR 21 applicable to this deficiency.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

for L. M. Mills, Manager
Nuclear Regulation and Safety

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

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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
FOXBORO MCA TRANSMITTERS
WBRD-50-390-81-54, WBRD-50-391/81-52
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

A letter from the Foxboro Company dated March 12, 1981, indicates that some Foxboro transmitters might have deficient components in the amplifier of the transmitter. The transmitters which might be affected are models E-11 and E-13 with suffix codes /MCA, /MCA/RRW, or /MCA/RR and a 10 to 50 mA output. These transmitters are located in the Feedwater, Safety Injection, and Main Steam Systems at Watts Bar.

The first issue involves the possible use of incorrect insulating sleeving on transistor and zener diode lead wires in the amplifier. Teflon sleeving has been substituted for acceptable silicone-coated glass radiation resistant sleeving in some transmitters. Tests have shown that teflon will become brittle and deteriorate after exposure to a substantial integrated radiation dose. Foxboro testing has demonstrated that the teflon sleeving used in these devices will withstand an integrated dose of 10 megarads with no noticeable deterioration. Tests of 200 megarads produce the brittle conditions which can result in the teflon flaking from the wires. This deficiency was caused by a mixup in stock where some teflon sleeving was mixed with the silicone-coated glass sleeving. This indicates a breakdown in the vendor's QA program.

The second issue involves the use of a specific vendor's capacitor, which is not hermetically sealed (although claimed to be so). As a result, the capacitor electrolyte can leak over a period of time under adverse conditions, specifically heat. This phenomenon was observed in recent tests of transmitters using these capacitors. The capacitor in question is manufactured by Cornell-Duebilier and can be specifically identified by a type number in the form TX-65-XXXX as well as a monogram in a box followed by a date code, e.g., CDE 0874. They are assigned Foxboro part No. N0141MF.

An identical NCR is being handled for Sequoyah Nuclear Plant unit 2 under report SQRD-50-328/81-43 (NCR SQN EEB 8118). No other TVA nuclear plants have these transmitters.

Safety Implications

The potentially deficient transmitters could generate erroneous signals to various safety system components, nullifying the safety functions of the systems which could adversely impact the safety of operations of the plant.

Corrective Action

To date, eight defective transmitters have been discovered in the Feedwater System (system 3) at Watts Bar. Inspection and replacement of defective amplifiers in transmitters in this system and the others containing these transmitters is continuing and will be completed before fuel loading for the respective units.

Cornell-Duebilier was on Foxboro's qualified vendors' list at the time TVA purchased the transmitters. However, they have since been taken off Foxboro's qualified vendors' list for supplying deficient capacitors. This action will prevent recurrence of problems related to that vendor. Also, the teflon and silicone-coated glass sleeving have been (widely) separated to prevent any future mixup in these materials.