TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401
5N 157B Lookout Place

February 11, 1986

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WBRD-50-390/84-11
WBRD-50-391/84-11

U.S. Nuclear Regulatory Commission
Region II
Attention: Dr. J. Nelson Grace, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Dear Dr. Grace:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 -- NEW DEFICIENCIES IN BARTON PRESSURE TRANSMITTERS - WBRD-50-390/84-11, WBRD-50-391/84-11 - REVISED FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector Dave Verrelli on February 23, 1984 in accordance with 10 CFR 50.55(e) as NCR WBN NEB 8401. Our final report was submitted on May 14, 1984. Enclosed is our revised final report. We consider 10 CFR Part 21 applicable to this deficiency.

Al Ignatonis was notified of this change to our corrective action on November 18, 1985.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

R. L. Gridley
Manager of Licensing

Enclosure
cc: Mr. James Taylor, 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

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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
NEW DEFICIENCIES IN BARTON PRESSURE TRANSMITTERS
WBRD-50-390/84-11, WBRD-50-391/84-11
NCR WBN NEB 8401
10 CFR 50.55(e)
REVISED FINAL REPORT

Description of Deficiency

Westinghouse Electric Corporation, Pittsburgh, Pennsylvania, supplies pressure and differential pressure transmitters manufactured by ITT Barton, City of Industry, California, for safety-related applications at Watts Bar Nuclear Plant (WBN). In 1982, Westinghouse notified TVA that certain Barton Model 763 and Model 764 transmitters located in a harsh environment are potentially subject to additional errors at elevated temperatures due to calibration techniques and electrical leakage through the span and zero potentiometers. These temperature-related errors introduce a positive bias in the transmitter output. Westinghouse's letter of notification also made reference to a separate problem of output shift in model 763, suppressed zero transmitters. The output shift occurs upon exposure to operating pressure and is always negative.

Safety Implications

Had these deficiencies gone uncorrected, the positive bias introduced by the thermal effects could have prevented or delayed safety injection upon receipt of a low pressurizer pressure signal thus resulting in an accident not currently analyzed. The negative shift in suppressed zero pressure transmitter output which is caused by exposure to operating pressure only affects the pressurizer pressure transmitters. Westinghouse's evaluation concludes that no adverse safety consequences result from the negative output shift.

Corrective Action

ITT Barton has corrected the thermal nonrepeatability problem (caused by improper calibration techniques and current leakage) in all transmitters manufactured or repaired at their facility since January 1, 1983. Transmitters built to the corrected design are traceable by baseline design configuration number. TVA has compared the baseline certification for each Barton 763 and 764 transmitter installed in unit 1 to the baseline configuration number for the corrected design. The only safety-related unit 1 transmitters subject to the thermally induced positive bias are the pressurizer pressure transmitters (1 PT-68-322, -323, -334, and -340). One of the original wide-range reactor coolant system (RCS) pressure transmitters (1-PT-68-69) has been eliminated. The other original wide-range pressure transmitter (1-PT-68-68) no longer serves a safety function. The new safety- related wide-range RCS pressure

transmitters J(1-PT-68-63 and -64) are located outside containment and are not subject to the accident environments.

The thermal positive bias introduced in the pressurizer pressure channel has been considered in the setpoint analysis of the low pressurizer pressure reactor trip and safety injection protective channels. Adequate margin exists for the reactor trip function. Margin was restored for the safety injection function by lowering the safety analysis limit to 1700 lb/in^2g. In addition to the thermal positive bias, the pressurizer pressure transmitters are suppressed zero transmitters and are therefore subject to negative drift upon exposure to operating pressure. Westinghouse has evaluated the impact of the negative drift (which could reach 4.2 percent of span between calibrations) and determined that it is only nonconservative for the high pressurizer pressure reactor trip. The negative drift has been considered in the setpoint analysis of the high pressurizer pressure protection channel and adequate margin exists between the setpoint and the safety analysis limit. Therefore, Westinghouse has concluded that no hardware corrective action is required for the pressurizer pressure transmitters.

As unit 2 transmitters are installed, any necessary corrective action will be performed in accordance with TVA's program plan for meeting the requirements