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

January 9, 1984

WBRD-50-390/83-56

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 - PRESSURIZER LEVEL TRANSMITTERS DO NOT COVER PROCESS RANGE - WBRD-50-390/83-56 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector Linda Watson on August 29, 1983 in accordance with 10 CFR 50.55(e) as NCR W-138-P. Our first interim report was submitted on September 28, 1983. Enclosed is our final report. We consider 10 CFR Part 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

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

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Safety Implications

If this deficiency had gone undetected, the transmitters would have been field-adjusted to the required process range and the 5-percent adjustment limit would have been exceeded by less than 1 percent of the calibrated span. The consequence of operating outside the 5-percent adjustment limit is higher than the assumed inaccuracy. The magnitude and direction of the potential additional errors cannot be predicted within the scope of available information.

Consequently, since the affected component is safety-related, TVA conservatively assumes the condition to be adverse to the safe operation of the plant.

Corrective Action

The unit 1 transmitters have been returned to ITT Barton under Westinghouse Field Deficiency Report (FDR) WATM-10222 to be adjusted to the correct range. The transmitters will be reinstalled in unit 1 by February 20, 1984. The original unit 2 transmitters were transferred to Sequoyah and are being replaced. The replacement transmitters will be delivered with the corrected range and installed in unit 2 by November 1, 1984.

The Westinghouse transmitter specification sheets have been corrected to reflect the new ranges for unit 1 and are being revised for unit 2.

Westinghouse has instituted a program to incorporate improvement in the methodology of pressurizer level range calculation. To date, this methodology has been applied to 15 Westinghouse plants.

ENCLOSURE

WATTS BAR NUCLEAR PLANT UNIT 1
PRESSURIZER LEVEL TRANSMITTERS DO NOT COVER PROCESS RANGE
NCR W-138-P
WBRD-50-390/83-56
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

The pressurizer level transmitters (manufactured by ITT Barton, City of Industry, California) were supplied with a calibrated span which is inadequate for the pressurizer level process range. Although the transmitters are field adjustable to the needed span, the NSSS vendor (Westinghouse Electric Corporation, Pittsburgh, Pennsylvania) has imposed an adjustment limitation of ± 5 percent of the calibrated span, and the required range is more than 5 percent outside of the calibrated span of the existing instruments. TVA is unaware of the origin or the basis for the ± 5 percent limitation, but does comply with it at Westinghouse's oral recommendation. Reportedly, qualified accuracy cannot be assured under normal or postaccident conditions if the transmitter is adjusted outside of the 5-percent limits.

It is common practice to receive transmitters calibrated to best estimate ranges and then field adjust them as necesary during plant scaling. It is not uncommon to return transmitters to the manufacturer for reranging when the required range is outside available field adjustment. The pressurizer level transmitter range mismatch is judged to be a significant condition, however, because of the apparent breakdown of a portion of Westinghouse's quality assurance program. Westinghouse's review of this deficiency revealed that the original ranges were not incorrect because of a wrong assumption of the condensate pot elevation that had been postulated in our last report. The following factors have been identified as contributors to the improper specification of the transmitter ranges:

1. The original range calculation did not consider the thermal expansion of the pressurizer shell and reference legs.

2. The original range calculation assumed a reference leg ambient temperature of 100°F, whereas the currently assumed temperature is 120°F.

3. The original range calculation did not consider the head contributed by the steam column in the pressurizer.

4. Density values were inconsistently rounded off in the original range calculation.