

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401  
400 Chestnut Street Tower II

December 22, 1983 DEC 29 8:59

WBRD-50-390/83-46  
WBRD-50-391/83-45

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 UNITS 1 AND 2 - ROUTING OF RADIOACTIVE AND  
NONRADIOACTIVE SYSTEM INSTRUMENT LINES - WBRD-50-390/83-46, WBRD-50-391/83-45 -  
FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector Linda Watson on July 29, 1983 in accordance with 10 CFR 50.55(e) as NCR W-130-P. Interim reports were submitted on August 29 and October 6, 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 (Enclosure):

Mr. Richard C. DeYoung, Director  
Office of Inspection and Enforcement  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Records Center  
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  
ROUTING OF RADIOACTIVE AND NONRADIOACTIVE SYSTEM INSTRUMENT LINES  
NCR W-130-P  
WBRD-50-390/83-46, WBRD-50-391/83-45  
10 CFR 50.55(e)  
FINAL REPORT

### Description of Deficiency

TVA drawing 47W600-0-4 requires that systems which present a radiation hazard must have instrument panel drains routed to the closed drain systems and any high point vents must also have the drain line routed to closed drain systems. Instruments from these systems are often installed on the same local panel with instruments from other plant systems which do not present a radiation hazard. When the 47W600 series drawings show a closed drain panel, all instruments installed on that panel, regardless of system number, are shown routed to the closed drain and hence the high point vents are also field routed to the closed drain. This presents the possibility of radiation entering systems not containing radioactive materials through instrument sense line drain valves and high point vent valves. In addition, this practice allowed nitrogen from a cold leg accumulator No. 4 pressure transmitter high point vent to enter the component cooling system via the high point vent for the loop 4 reactor coolant pump's (RCP) motor oil cooler flow transmitter. Enough nitrogen entered the system to cause the component cooling system pumps to cavitate. This is a source of potential common mode failure for this system.

Because the probability that two (or more) of the normally closed instrument drain lines being open simultaneously during operation was considered very unlikely and (assuming the condition occurred) so easily detected before operation, it was not considered in designing the routing of the high point vent and instrument drain lines to the closed drain system. All instruments installed on a panel which contained radiation hazard system instrumentation were routed to the closed drain system for ease and simplification of installation.

### Safety Implications

Uncontrolled system crossties could allow the introduction of a radioactive hazard into systems that are not designed to handle such materials. This could result in the release of radioactive materials to the environment in excess of the limits stipulated in 10 CFR 100. In addition, the possibility of safety-related pump degradation due to cavitation induced by the injection of gas into liquid-solid systems is a significant safety concern.

### Corrective Action

All instrument drain lines which are presently connected to the closed drain system but are not associated with a radiation hazard will be disconnected by TVA from the closed drain system by February 2, 1984. The remaining instrumentation connected to the closed drain system will be controlled by plant instructions to verify that no unacceptable crosstie exists before or during system operation. TVA will initiate the following actions to preclude system crossties:

1. Issue a Technical Instruction that will outline a program to number the pertinent valves before fuel load.
2. Issue a Maintenance Request to ensure that the pertinent valves are closed before fuel load.
3. Issue a revised instrument calibration Surveillance Instruction to verify valve positions by the first refueling outage.

The deficiency describe above was an isolated case with an extremely remote probability of recurrence. The valves are opened only after repairs or an outage and, even in the unlikely event of a recurrence, detection would be made before plant operation. (Note that detection of this incident was during preoperational tests.) No further action beyond the corrective action described above is required.