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

84 APR 12 A8:52 April 6, 1984

WBRD-50-390/83-70
WBRD-50-391/83-65

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 - CONTROL ROOM PRESSURIZATION BOUNDARY LOSS THROUGH FLOOR AND EQUIPMENT DRAINS -WBRD-50-390/83-70, WBRD-50-391/83-65 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector P. E. Fredrickson on November 21, 1983 in accordance with 10 CFR 50.55(e) as NCR WBN WBP 8335. Interim reports were submitted on December 21, 1983 and January 24 and February 15, 1984. 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, 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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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
CONTROL ROOM PRESSURIZATION BOUNDARY LOSS THROUGH FLOOR AND EQUIPMENT DRAINS
NCR WBN WBP 8335
WBRD-50-390/83-70, WBRD-50-391/83-65
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

Floor and equipment drains as well as potable water (pw) lines which penetrate the floor slab of the main control room (elevation 755) were designed without considering the need to prevent the loss of the main control room habitability system (MCRHS) pressure boundary. As such, a method to ensure that pipe traps maintain enough water to seal off the leak paths between the MCRHS and other areas during control room isolation has not been provided, nor are the pipes supported to maintain their pressure boundary in a seismic event.

The design discrepancy was discovered while implementing the corrective action for NCR WBN QAB 8204 (WBRD No. 50-390/82-71, 391/82-66). This was caused by a lack of procedural controls which would assure identification of all piping requiring seismic supports and would ensure that piping would be analyzed and supported.

Safety Implications

The main control room (MCR) is designed for minimum air leakage in the event of room isolation so that the MCRHS can maintain a slightly positive air pressure within the room. This positive pressure prevents the entrance of airborne contaminants which may exist outside the MCR. Loss of drain lines or traps in the lines could create sufficient leakage to eliminate the room's positive pressure and allow the entrance of contaminants forcing evacuation of the MCR. While the plant could then be safely shutdown from the auxiliary control room, TVA considers this potential loss of the MCR an unnecessary challenge to the plant's safety systems.

Corrective Action

TVA has instituted design changes through ECN 4451 to cover all piping penetrating the MCR boundary such that:

1. Floor and equipment drain lines have been redesigned and seismic supports provided to maintain both the MCRHS pressure boundary and water seals in the traps. These traps were moved from the MCR floor slab and additional traps were designed in certain areas where it was determined necessary to guard against the affects of postulated MSLB. The drains were then provided seismic supports from the floor penetrations to a point just downstream of the traps where pipe anchors were provided to terminate the seismic analysis. A direct connection to the PW system was also designed to provide a continuous drip supply of water to the trap seals.

2. PW system piping in the control room has been redesigned to include two check valves in the 2-inch PW supply line, a manually-operated butterfly valve in the 4-inch vent pipe at a location just below the ceiling slab at elevation 777.0', and two motor-operated plug valves in the 4-inch waste drain piping downstream of the last tributary branch line. Seismic supports to assure pressure boundary integrity were then provided for the 2-inch PW supply line from the floor penetrations to the upstream check valve, for the 4-inch vent pipe from the ceiling slab to the butterfly valve, and for the waste drain piping from the MCR floor slab penetrations to the downsteam valve. In addition, the control panel for the two motor-operated plug valves was located within the habitability zone.

All design work has been completed and the subsequent construction work is scheduled for cmpletion by May 17, 1984.

To prevent recurrence of this problem, TVA believes that the recent issuance of Watts Bar Project (WBP) Engineering Procedure (EP) 43.24, "Piping Analysis Techniques - Selection," will be adequate even though this procedure was issued as part of the corrective action for item WBN SWP 8265 (WBRD-50-390,391/83-05) and not specifically as a correction for this NCR. TVA's opinion is based on the fact that EP 43.24 specifically mentions piping which penetrates the MCRH zone as requiring seismic analysis while generally providing guidance to the piping designer in identifying the proper seismic analysis requirements for all piping in seismic category I structures.