

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

September 30, 1983

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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 - FAILURE OF SAFETY-RELATED
WESTINGHOUSE GATE VALVES - NCR WBN NEB 8013 AND IE BULLETIN 81-02 -
FINAL REPORT**

The subject condition was initially reported to NRC-OIE Inspector R. W. Wright on October 31, 1980 in accordance with 10 CFR 50.55(e). Interim reports were submitted on December 1, 1980; March 23, June 3, September 1, and November 18, 1981; February 11, April 13, July 22, and October 22, 1982; and January 26 and June 17, 1983. This report also constitutes our final response to IE Bulletin 81-02 on Watts Bar. TVA considers 10 CFR Part 21 applicable to this nonconformance.

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

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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
FAILURE OF SAFETY-RELATED WESTINGHOUSE GATE VALVES
WBN NEB 8013 AND IE BULLETIN 81-02
10 CFR 50.55(e)
FINAL REPORT

Description of Condition

Westinghouse has informed TVA of problems encountered at two Westinghouse nuclear plants during preoperational testing of 3-inch and 4-inch gate valves manufactured by the Westinghouse Electro-Mechanical Division (EMD). The valves failed to close completely under preoperational test flow conditions which are less severe than the equipment specification design conditions. This problem may affect valves of this type when used in "active" application (i.e., where the mechanical operation of the valve is required to accomplish a safety function). Watts Bar Nuclear Plant has received several of these valves as part of the NSSS contract.

Further investigation by Westinghouse has revealed that this deficiency exists for all Westinghouse EMD gate valves in sizes from 3 to 18 inches.

The assignable cause of the deficiency has been determined by Westinghouse to be an incorrect design basis which assumed friction factors between the valve disc and seat, based on historical information. Subsequent testing by Westinghouse has indicated that these friction factors are much higher than originally anticipated.

Safety Implication

Valves of the type identified by Westinghouse may not be able to perform their intended safety function when used in applications that require mechanical operation to accomplish that safety function. Thus, this condition could degrade the functioning of a safety-related system and, thereby, adversely affect the safety of the plant.

Corrective Action

TVA has completed the field modifications per Westinghouse's instructions. For some valves, the modification involves adjusting the torque switch settings. Other valves required motor operator gear ratio changes and rewiring from torque switch closure control to limit switch closure control.

The affected valves were modified for unit 1 per Westinghouse field change notices (FCNs) WATM-10621A and WATM-10621B, and for unit 2 per FCNs WBTM-10601A, WBTM-10601B, and WBTM-10601C. All applicable Westinghouse and TVA drawings have been revised to show these modifications.

Westinghouse has also performed an extensive development test program in which new friction factors have been developed for materials used in present and future valve designs. These corrective actions should prevent recurrence of this type deficiency.