

**TENNESSEE VALLEY AUTHORITY**

USNRC REGION II  
CHATTANOOGA, TENNESSEE 37401  
ATL 400 Chestnut Street Tower II

WBRD-50-390/82-19  
WBRD-50-391/82-18

83 NOV 25 P 2: 00 November 22, 1983

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 LIMITORQUE MOTOR  
OPERATORS DURING VALVE CLOSURE - WBRD-50-390/82-19, WBRD-50-391/82-18 -  
FINAL REPORT**

The subject deficiency was initially reported to NRC-OIE Inspector R. V. Crlenjak on January 26, 1982 in accordance with 10 CFR 50.55(e) as NCR 3793R1. Interim reports were submitted on February 25, April 22, July 21, and October 21, 1982 and January 27, June 22, and September 26, 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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ENCLOSURE  
WATTS BAR NUCLEAR PLANT UNITS 1 AND 2  
FAILURE OF LIMITORQUE MOTOR OPERATORS DURING VALVE CLOSURE  
NCR 3793R1  
10 CFR 50.55(e)  
FINAL REPORT

Description of Deficiency

During operational testing of certain gate valves manufactured by Westinghouse Electromechanical Division (WEMD), Pittsburgh, Pennsylvania, three Limitorque motor operators failed and rendered the valves inoperable. These valves are supplied by Westinghouse under the Watts Bar NSSS contract. All of the operators which failed are Limitorque Model SB-00 units. The SB-00 design utilizes a floating drive sleeve restrained in the axial direction by Belleville springs which are enclosed in a cast housing. The housing, therefore, receives the motor torque after the springs have compressed. On each of the failed operators, the housing fractured during valve closure which could cause the gate valve to leak or prevent the operator from being able to open the valve.

Safety Implications

The SB-00 motor operator is used on various safety-related NSSS valves that are required to either close or open to perform a safety function. The cracked housing of the operator could allow the valve to leak (in systems requiring closure) or fail to open (in systems requiring opening), thus preventing the valve from performing its intended function.

Corrective Action

Westinghouse has notified TVA in their letter No. WAT-D-5741 dated October 26, 1983, that Westinghouse has revised their position and no longer believes that the motor operator compensator housing failures were caused by misuse or misoperation by TVA. Westinghouse now takes the position that the TVA procedure by which the limit and torque switch set points were set (TVA general construction specification No. G-50) was adequate and that it paralleled the procedure outlined in the Westinghouse valve instruction book. This position was taken after an October 19, 1983, meeting among TVA, Limitorque, and Westinghouse representatives to review TVA's method of setting limit and torque switch set points. The possible cause of the compensator housing failures was also discussed at that meeting.

Based upon the aforementioned meeting and investigations conducted by WEMD and Limitorque, Westinghouse has concluded that the failures are not a generic concern; rather, they are random failures possibly resulting from the effects of prior damage which may have occurred during shipping, handling, or installation. The investigations include Limitorque's successful testing of an operator with a cast iron housing of similar construction to the failed housings at Watts Bar. Limitorque has stall-tested every operator supplied to WEMD and has not experienced any failures.

In subsequent discussions with TVA, Limatorque noted that replacement of the grey cast iron housings with ductile iron housings would reduce the possibility of this type of failure. TVA has decided, as a precaution, to replace the cast iron compensator housings on all WPM- supplied valves with model SB-00 operators. All unit 1 housings have been tested and verified as being made of ductile iron, or have been replaced with ductile iron housings. All affected unit 2 housings will be replaced by December 1, 1984.

Since TVA agrees with the Westinghouse position and considers the failures to be random, no further action to prevent recurrence will be required or taken.