



Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381

JUN 11 1991

WBRD-50-390/91-09
WBRD-50-391/91/09

10 CFR 50.55(e)

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of the Application of)
Tennessee Valley Authority) Docket Nos. 50-390
50-391

WATTS BAR NUCLEAR PLANT (WBN) UNITS 1 AND 2 - LIMITORQUE SMB 00 TORQUE
SWITCH ROLL PIN FAILURES - WBRD-50-390/91-09, WBRD-50-391/91-09 - FINAL
REPORT

The subject deficiency was initially reported to NRC Region II on
March 12, 1991, in accordance with 10 CFR 50.55(e) as Problem Evaluation
Reports (PERs) WBP 910142 PER and WBP 910143 PER. These PERs have been
upgraded to Significant Corrective Action Reports (SCARs) WBSA 910213
and WBSA 910214. An interim report was submitted to NRC on April 11,
1991. Enclosure 1 provides TVA's final report on this subject.

The commitments made in this report are provided in Enclosure 2.

If there are any questions, please telephone P. L. Pace at (615) 365-1824.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

JH Gaulty for
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Enclosures
cc: See page 2

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U.S. Nuclear Regulatory Commission

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ENCLOSURE 1

WATTS BAR NUCLEAR PLANT (WBN)
LIMITORQUE SMB 00 TORQUE SWITCH ROLL PIN FAILURES
SIGNIFICANT CORRECTIVE ACTION REPORTS (SCARs)
WBCA 910213 AND WBCA 910214
WBRD-50-390/91-09 AND WBRD-50-391/91-09

FINAL REPORTDESCRIPTION OF DEFICIENCY

TVA has determined that Limitorque SMB 00 torque switches with potentially defective roll pins are installed on valve actuators used in safety-related applications at WBN.

On December 11, 1990, the Limitorque Corporation notified the NRC and affected utilities by letter of a potential 10 CFR 21 concern. Limitorque determined that reported failures of SMB 00 torque switch roll pins used in SMB, SB, and SBD 00 actuators (serial numbers 233218 and greater) had the potential for creating a substantial safety hazard. Discussions with Limitorque indicate that the subject torque switch roll pins that have been subjected to a number of declutching operations while under load could potentially fail during later motor operation. Recent engineering studies of torque switch roll pin failures performed by Limitorque revealed that the SMB 00 torque switch may fail after as few as 11 declutching operations from the seated position with heavy spring packs, but may take longer to show up in the lighter spring packs.

Torque switches are designed to prevent actuator motor degradation or valve component damage when cycling the valve. For valves that have the torque switch limiting actuator output during mid-stroke, the torque switch will trip the actuator motor under high run load conditions. For valves that are torque seated, the torque switch trips the actuator motor at the end of the valve stroke.

Roll pins are located on both ends of the torque switch shaft. One pin secures the actuation link to the torque switch shaft. The other pin secures the lever arm to the torque switch shaft. Failure of either pin could prevent the torque switch from tripping the actuator motor. Additionally, failure of the pin securing the lever arm to the torque switch shaft could cause the roller arm inside the drive sleeve gear area to become loose and interfere with actuator operation (i.e., cause actuator motor binding and stop valve stem travel). This condition could exist even if the torque switch was electrically bypassed or jumpered out due to the potential mechanical binding in the drive sleeve gear area.

SAFETY IMPLICATIONS

TVA has determined that Limitorque SMB 00 torque switches with potentially defective roll pins are installed on valve actuators used in safety-related applications at WBN. For example, 1- and 2-FCV-70-87-A are containment isolation valves which receive a safety injection signal to close. Failure of these valves to close properly could potentially allow incomplete containment isolation. Therefore, this condition could have adversely affected the safe operation of the plant had it remained uncorrected.

ENCLOSURE 1

WATTS BAR NUCLEAR PLANT (WBN)
LIMITORQUE SMB 00 TORQUE SWITCH ROLL PIN FAILURES
SIGNIFICANT CORRECTIVE ACTION REPORTS (SCARs)
WBCA 910213 AND WBCA 910214
WBRD-50-390/91-09 AND WBRD-50-391/91-09

FINAL REPORTCORRECTIVE ACTION

1. TVA has determined that the potentially defective Limitorque SMB 00 torque switches are specified for use on 120 safety-related Unit 1 and Unit 2 Limitorque actuators located in the following systems:
 - 1 - Main Steam
 - 26 - High Pressure Fire Protection
 - 62 - Chemical and Volume Control
 - 63 - Safety Injection
 - 67 - Essential Raw Cooling Water
 - 68 - Reactor Coolant
 - 70 - Component Cooling
 - 72 - Containment Spray
 - 74 - Residual Heat Removal
2. TVA has verified that at least 45 of the 120 safety-related Unit 1 and Unit 2 Limitorque actuators have the potentially defective Limitorque SMB 00 torque switches installed.
3. Potentially defective Limitorque SMB 00 torque switches existing in Power Stores have been located and placed in a hold status.
4. Any potentially defective Limitorque SMB 00 torque switches installed on the 120 identified Unit 1 and Unit 2 safety-related Limitorque actuators will be replaced. Safety-related Limitorque actuators are on an 18-month preventive maintenance schedule. Torque switch replacement will be complete by January 31, 1993, for safety-related Limitorque actuators required to support Unit 1 operation. The remaining potentially defective Limitorque SMB 00 torque switches installed on Unit 2 safety-related Limitorque actuators will be replaced before fuel load.
5. The new style Limitorque torque switch will allow 200 declutching operations, while the actuator spring pack is loaded, before roll pin failure would be expected to occur. Based on an estimated 4 declutching operations in 18 months for maintenance activities and 4 declutching operations per year for operational activities, the new style Limitorque torque switches are expected to last for 20 refueling cycles or 30 years. Master PM 1380V, "Routine Inspection and Maintenance of Limitorque Motor Actuators," will be revised by October 15, 1991, to require new style Limitorque torque switch periodic replacement on safety-related Limitorque actuators after initial torque switch replacement.

ENCLOSURE 2

LIST OF COMMITMENTS

1. Any potentially defective Limitorque SMB 00 torque switches installed on safety-related Limitorque actuators required for Unit 1 operation will be replaced by January 31, 1993. The remaining potentially defective Limitorque SMB 00 torque switches installed on Unit 2 safety-related Limitorque actuators will be replaced before fuel load.
2. Master PM 1380V, "Routine Inspection and Maintenance of Limitorque Motor Actuators," will be revised by October 15, 1991, to require new style Limitorque torque switch periodic replacement on safety-related Limitorque actuators after initial torque switch replacement.