Limitorque

Limitorque Corporation

Automated Valve Actuators and Jacks for Industry

5114 Woodall Road • P.O. Box 11318 • Lynchburg, VA 24506-1318
Telephone (804) 528-4400 • FAX (804) 845-9736

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U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

ATTENTION: Document Control Desk

SUBJECT: Potential 10 CFR 21 Condition

REFERENCE: Nuclear Grade Torque Switch
SMB/SB/SBD 0, 1, 2, 3, 4, 4T, 5, 5T & 5XT Actuators

U. S. nuclear utilities have experienced failures of the referenced component. The failure mechanism is the shearing of a roll pin which renders the torque switch inoperable. The sheared roll pin may be the result of oscillatory forces imparted to the pin during the unseating phase of a stuck, locked or thermally bound valve. This driving force may be a function of the combined effects of valve design, system parametrics and actuator configuration.

Limitorque Corporation does not have the required expertise relative to valve and system design to perform a root cause analysis of this phenomenon. Therefore, it is suggested that a utility task force be formed to acquire and analyze all available industry data relative to this issue and perform a comprehensive root cause analysis. Limitorque Corporation will assist as required in this effort.

Identification of Basic Component

The basic component is the nuclear grade torque switch utilized on actuator sizes SMB/SB/SBD 0, 1, 2, 3, 4, 4T, 5, 5T & 5XT.

The following part numbers are applicable to these torque switches:

SMB/SB/SBD	Part Number
0	11500-018
1	11500-026
2	11500-034
3	11500-042
4, 4T	11500-050
5, 5T, 5XT	11500-058

Discovery Date

This is not a previously unknown industry issue.

Nature of the Defect

A valve under torque switch control logic requires the control torque switch contacts to open and de-energize the actuator motor contactor upon sensing the required torque level.

A torque switch with a sheared roll pin results in an inoperable torque switch which will not allow the contacts to open and de-energize the actuator motor. The resultant is a stalled motor/actuator input to the valve with a potential for motor failure and a loss of subsequent valve operability.

Equipment Affected

The equipment affected is actuator sizes SMB/SB/SBD 0, 1, 2, 3, 4, 4T, 5, 5T and 5XT (that utilize the nuclear grade torque switch) that are used with valves and/or system parametrics that subject the torque switch roll pin to abnormal forces. The following details the effect of a sheared roll pin on valve operability:

A. Isolation Valve (torque switch control at closure)

The valve function is to move from an open position to a full closed position and isolate flow. This valve is operable and capable of closure. However, this valve cannot be relied on to reopen.

B. Injection Valve (Position switch control at full open and torque switch control at closure)

The valve function is to move from a closed position to a full open position. This valve is operable and capable of opening and reclosing provided that no abnormalities were present during the previous valve closure - such as motor thermal overload trip or abnormal motor current draw at valve closure.

Licensee Corrective Action

Acquire and analyze site data relative to this issue. It is recommended that this data be shared with the aforementioned utility task group.

Limitorque Corporation Corrective Action

Limitorque Corporation has modified the basic component by replacing the 3/32" diameter roll pins with 1/8" diameter shear proof pins and replaced the 303 stainless steel shaft material with 416 stainless steel material. This modification results in a significant strengthening of the previously mentioned failure location. This modified switch is available as a replacement component and will be phased into future nuclear actuator production.

The part numbers for the modified torque switches are:

SMB/SB/SD	Part Number
0	11501-018
1	11501-026
2	11501-034
3	11501-042
4, 4T	11501-050
5, 5T, 5XT	11501-058

Technical Conduct

Any questions or clarifications regarding the above notification should be directed to Pat McQuillan, Special and Nuclear Projects Manager.

Very truly yours,

I. E. Wilkinson
Vice President of Engineering
Limitorque Corporation

PM/lab

cc: T. Mignogna
J. Brennan
P. McQuillan
10 CFR 21 - File

NRC Operations Center
FAX #301-492-8187