

Part 21 (PAR)

Event # 49522

<b>Rep Org:</b> FLOWSERVE <b>Supplier:</b> LIMITORQUE	<b>Notification Date / Time:</b> 11/08/2013 16:26 (EST) <b>Event Date / Time:</b> 09/04/2013 (EST) <b>Last Modification:</b> 11/08/2013
<b>Region:</b> 1 <b>City:</b> LYNCHBURG <b>County:</b> <b>State:</b> VA	<b>Docket #:</b> <b>Agreement State:</b> Yes <b>License #:</b>
<b>NRC Notified by:</b> JEFF MCCONKEY <b>HQ Ops Officer:</b> DONG HWA PARK <b>Emergency Class:</b> NON EMERGENCY <b>10 CFR Section:</b> 21.21(d)(3)(i) DEFECTS AND NONCOMPLIANCE	<b>Notifications:</b> ALAN BLAMEY R2DO CHRISTINE LIPA R3DO PART 21 GROUP EMAIL

PART 21 - MACHINING ERROR IDENTIFIED IN GEARED LIMIT SWITCHES

The following is a summary of information received from Flowserve via facsimile:

"On September 4, 2013, in-house inspection of Limitorque SMB Geared Limit Switch (GLS) cartridges revealed a machining error in a subcomponent used in the GLS. The deviation was caused by a dimensional error concerning the location of a drilled hole in a drive pinion shaft. This error results in a reduction of gear tooth engagement inside the GLS which could potentially reduce the service life of the GLS causing a loss of function. To date, Limitorque's investigation of this machining error has not shown this deviation to be significant enough to affect the safety related function of the GLS. However, Limitorque has requested all switches certified for nuclear safety related service which were manufactured in the designated time frame be returned for inspection and replacement as needed."

The components were sent to Perry Nuclear Generating Station.

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NRR

11/08/2013

*U.S. Nuclear Regulatory Commission Operations Center Event Report*

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Part 21 (PAR)

Event # 49522

Flowserve  
5114 Woodall Road  
Lynchburg, VA. 24502

# Flowserve

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**To:** NRC Operations Center      **Fax:** (301) 816-5151

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**From:** Jeff McConkey      **Date:** 11/8/2013

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**Re:**      **Pages:** 3 including this cover sheet

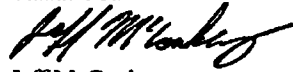
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Urgent     For Review     Please Comment     Please Reply     Please Recycle

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**Notes:** Limitorque Part 21 Notification Final Report Potential Defect in SMB Geared Limit Switch.

Thank You



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Flow Control Division  
Limitorque

November 8, 2013

To: U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555-0001

Attention: NRC Operations Center, Fax # 301-816-5151

From: Flowserve Corporation  
Limitorque  
5114 Woodall Road  
Lynchburg VA 24506

**Subject: Limitorque Part 21 Notification Report  
Potential Defect in SMB Geared Limit Switch**

Description:

On September 4, 2013, in-house inspection of Limitorque SMB Geared Limit Switch (GLS) cartridges revealed a machining error in a subcomponent used in the GLS. The deviation was caused by a dimensional error concerning the location of a drilled hole in a drive pinion shaft. This error results in a reduction of gear tooth engagement inside the GLS which could potentially reduce the service life of the GLS causing a loss of function. To date, Limitorque's investigation of this machining error has not shown this deviation to be significant enough to affect the safety related function of the GLS. However, Limitorque has requested all switches certified for nuclear safety related service which were manufactured in the designated time frame be returned for inspection and replacement as needed.

Components Affected:

SMB/SB/SBD Geared Limit Switch (GLS) assemblies manufactured between August 12, 2013 and September 4, 2013 were potentially affected.

GLS assemblies which were built and shipped during this time frame are limited to the two orders identified below. The customers listed below have been notified.

Limitorque Order No: 132845.005  
Customer: Areva Nuclear Parts Center  
Customer P.O. #: 1013031247  
Identifier: 2-train GLS, Part # 10153  
Quantity Affected: 11  
Location of Components

Qty (8) have been returned to Limitorque.

Qty (3) were shipped to OPG. At Limitorques request, Areva NP contacted OPG and the GLS assemblies have been returned for replacement.



Flow Control Division  
**Limitorque**

Limitorque Order No: 129231.001  
Customer: Flowserve FCD – Raleigh, NC  
Customer P.O. #: 201936  
Identifier: 2-train GLS Part # 10144 installed in SMB-000 / HBC-0 actuators  
Quantity Affected: 3 (Actuator Serial #s: 998306, 998307, 998308)  
Location of Components  
Actuators were shipped to FENOC, Perry NGS (Reference Perry P.O. # 454003386). Replacement of the GLS assemblies is in process. The MOVs have not been installed in the plant.

Cause and Corrective Action:

Limitorque QA investigation traced the potentially effected components to a single lot of drive pinions that was placed into Limitorque stock on August 12, 2013. Immediate corrective action involved 100% inspection of all drive pinions in stock. In addition, the drive pinions already installed in GLS assemblies in stock were inspected for the deviation. Limitorque has determined the cause of this machining deviation to be improper use of the drilling operation machining fixture for this component. An improved machining fixture for this subcomponent part has been designed and will be in place by Nov 30, 2013.

Technical questions related to the notification can be addressed to Kyle Ramsey, Chief Mechanical Engineer, Flowserve - Limitorque ([kramsey@Flowserve.com](mailto:kramsey@Flowserve.com))

Submitted By:

A handwritten signature in black ink, appearing to read "Jeff McConkey".

Jeff McConkey, Quality Assurance Manager,  
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