

Part 21 (PAR)

Event # 47842

<b>Rep Org:</b> SWAGELOK COMPANY		<b>Notification Date / Time:</b> 04/17/2012 13:51 (EDT)	
<b>Supplier:</b> SWAGELOK COMPANY		<b>Event Date / Time:</b> 04/17/2012 (EST)	
		<b>Last Modification:</b> 04/17/2012	
<b>Region:</b>		<b>Docket #:</b>	
<b>City:</b>		<b>Agreement State:</b>	No
<b>County:</b>		<b>License #:</b>	
<b>State:</b>			
<b>NRC Notified by:</b> BRUCE FLUSCHE	<b>Notifications:</b>	REBECCA NEASE	R2DO
<b>HQ Ops Officer:</b> JOHN SHOEMAKER		NEIL OKEEFE	R4DO
<b>Emergency Class:</b> NON EMERGENCY		PART 21 GROUP	EMAIL
<b>10 CFR Section:</b>			
21.21(d)(3)(i)	DEFECTS AND NONCOMPLIANCE		

PART 21 REPORT - SWAGELOK U SERIES BELLOWS VALVES LOOSENING OF STEM TIPS

'Swagelok received a return from Duke Energy (Oconee) for two 8U series bellows valves for investigation of stem tips that had loosened during performance testing of equipment.

"Our evaluation confirmed loosening of the stem tips and determined the root cause to be higher than normal torque being applied to the valve handle during closure. (Please note that we did not specify a minimum or maximum torque for our operating instructions.) This caused the stem and the stem insert interface to loosen, but not fully disengage. Our tests show that closure to catalog specification of 4.0 x 10-9 atm. cc/sec of helium can still be achieved with this condition.

"Therefore, it is the opinion of Swagelok that there is no inherent safety risk associated due to this condition, however lower than expected flow through the valve, or erratic flow, can occur if the stem tip loosens. If utilities consider full flow as a safety function, they should evaluate the valves currently in service for this condition.

"Applicability - There have been no other field returns for this condition. The possible condition extends to the Swagelok 4U, 6U and 8U series bellows valves. Only hand operated valves are susceptible; air operated valves are excluded, as are the 12U series valves supplied by Swagelok."

Callaway may also be affected and will be notified by the Supplier.

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JE19  
NRR

## HOO Hoc

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**To:** HOO Hoc  
**Subject:** Event Notice #47842: Swagelok Part 21 Notice - 4/17/2012  
**Attachments:** Swagelok Part 21.pdf; Summary.pdf; Events.pdf

See attached.

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Date: April 17, 2012  
To: Document Control Desk  
Nuclear Regulatory Commission  
From: Bruce Flusche  
Part 21 Coordinator  
Swagelok Company  
Total  
Pages: 7 (including cover)  
Subject: Potential part 21 notification

Will call you shortly to confirm receipt

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April 17, 2012

Nuclear Regulatory Commission  
Document Control Desk  
Washington, D.C. 20555-0001

**Subject: Potential 10CFR21 notification**

**Purpose**

We are writing to inform you of a potential issue regarding manually operated Swagelok U series bellows valves.

Swagelok received a return from Duke Energy for two 8U series bellows valves for investigation of stem tips that had loosened during performance testing of equipment.

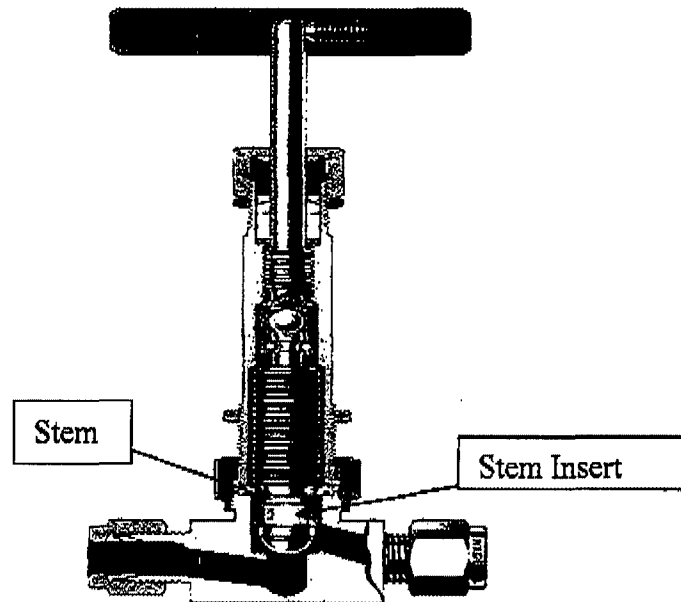
Our evaluation confirmed loosening of the stem tips and determined the root cause to be higher than normal torque being applied to the valve handle during closure. *(Please note that we did not specify a minimum or maximum torque for our operating instructions.)* This caused the stem and the stem insert interface to loosen, but not fully disengage. Our tests show that closure to catalog specification of  $4.0 \times 10^{-9}$  atm. cc/sec of helium can still be achieved with this condition.

Therefore, it is the opinion of Swagelok that there is no inherent safety risk associated due to this condition, however lower than expected flow through the valve, or erratic flow, can occur if the stem tip loosens. If utilities consider full flow as a safety function, they should evaluate the valves currently in service for this condition.

**Applicability**

There have been no other field returns for this condition. The possible condition extends to the Swagelok 4U, 6U and 8U series bellows valves. Only hand operated valves are susceptible; air operated valves are excluded, as are the 12U series valves supplied by Swagelok.

## Discussion



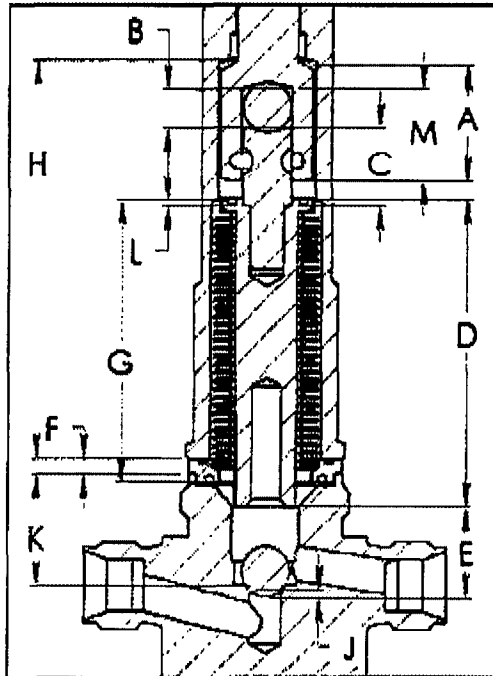
The picture above shows a cutaway version of a valve in question.

Although the stem tip may loosen when higher than normal torque is applied to close the valve, the tip will not become completely disengaged from the stem insert. The document below shows the stack up of tolerances on the 8U valve, with a loose stem tip. Even with the tip loosened until it contacts the valve body, at least one thread of engagement still remains between the tip and stem insert. This means the stem tip will remain captured within the valve body and will not enter the process stream. Similar conditions apply to the 4U and 6U Series valves.

**Tolerance stack-ups between the stem and stem tip for the 8U Series valve**

Output of component stack-ups. Details Proprietary

<b>MAX STROKE</b>	<b>0.1755</b>
<b>NOM STROKE</b>	<b>0.1207</b>
<b>MIN STROKE</b>	<b>0.0959</b>



distance of stem adapter flat to top	0.270
distance of stem adapter flat to top- Max Stroke	0.0945
lead in to threads on stem adapter	0.026
threads per inch on adapter	24.0000
number of threads engaged at max stroke with loose stem (28E-29E*30E)	1.64

The continued engagement of the stem threads also means that the valve can be shut off, even if the threads had loosened. We have tested several conditions of the loose stem tips and confirmed that closure to catalog specification of  $4.0 \times 10^{-9}$  atm. cc/sec of helium can be achieved.

**Action**

Lower than expected flow through the valve, or erratic flow, can occur if the stem tip loosens. If utilities consider full flow as a safety function, they should evaluate the valves currently in service for this condition.

Swagelok will be working with the individual plants in question to assess their application of the valve and will take appropriate action.

Revised drawings will be created for the affected utilities, showing both the recommended and maximum allowable closure torques, for the affected valve series.

**10CFR21 Implications**

We will confirm receipt of this message to you under the requirements of Part 21 and will forward it to the utilities on the attached list.

If you have any questions, please contact:

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## Sales to Duke Energy/Oconee

Distributor Branch	Part Number	Customer PO#	Factory Order Number	Ship Date	10CFR21 Invoked?	Sales Qty	
CLMBA	SS-4UG-7825	94861	BA39260030	11/28/2007	Y	6	
		105670	BL75360010	08/25/2008	Y	2	
		105670	BL75360020	09/05/2008	Y	3	
		105670	BL75360030	09/19/2008	Y	5	
		113568	BU92680010	01/28/2009	Y	10	
		52300157	K573540000	12/08/2006	Y	6	
	SS-8UG-25017	00122829 Rev 002	EG36780070	11/17/2009	Y	19	
	SS-8UG-4019	98799	BD97100010	02/04/2008	Y	2	
	SS-8UG-5825	93579	B859860010	10/24/2007	Y	10	
		94861	BA25760030	11/28/2007	Y	9	
		102772	BJ58420030	05/20/2008	Y	12	
		102772	BJ58420040	06/10/2008	Y	5	
		103936	BL42030030	07/17/2008	Y	2	
		103936	BL42030040	08/18/2008	Y	6	
		108841	BR01530020	09/19/2008	Y	2	
		108841	BR01530040	12/03/2008	Y	10	
		110943	BS33570010	12/05/2008	Y	15	
		113568	BU92670010	02/16/2009	Y	16	
		52300157	K626240000	12/01/2006	Y	10	
	SS-8UG-5826	52300215	B643180010	10/10/2007	Y	10	
	SS-8UG-5826-25017	00141535 Rev 001	NE44760020	04/12/2011	Y	4	
		00141535 Rev 002	NE44760030	05/20/2011	Y	4	
		152238	NT57100020	02/07/2012	Y	13	
	SS-8UG-7675	105670	BM36530060	08/19/2008	Y	49	
		105670	BM36530070	09/15/2008	Y	1	
	GRNVL	SS-4UG-7825	N/A	N505000000	08/21/2002	Y	10
		SS-8UG-4019	NM19759	E199160000	02/04/2005	Y	1
SS-8UG-5825		NM22035	E362490000	08/25/2005	Y	5	
		N/A	N343810000	05/09/2002	Y	17	
		N/A	N406470000	07/01/2002	Y	16	
		N/A	N635170000	04/22/2003	Y	8	
		N/A	N779470000	11/10/2003	Y	13	
		DP72960007310074	N816810000	07/21/2006	Y	9	
		DP72960007310074	N816810000	06/05/2006	Y	1	
SS-8UG-5826		DP72960007310068	N708590000	05/03/2006	Y	6	
		DP72960007310005	N13065001	10/04/2004	Y	8	
		DP72960007310074	N816800000	06/01/2006	Y	17	
SS-8UG-7675		N/A	N222180000	02/14/2002	Y	61	
		DP72960007310074	N817280000	07/14/2006	Y	12	
		DP72960007310074	N817280000	06/22/2006	Y	25	



**Ameren Power**

<b>Date</b>	<b>Distributor</b>	<b>Customer Name</b>	<b>Customer PO</b>	<b>Part number</b>	<b>Qty</b>	<b>Manufacturer Order Number</b>
07/01/2011	DBORN	Ameren Power	539176	SS-6UW-25017	2	MJ1932001