

Part 21 (PAR)

Event # 50025

<b>Rep Org:</b> CAMERON MEASUREMENT SYSTEMS	<b>Notification Date / Time:</b> 04/10/2014 20:21 (EDT)
<b>Supplier:</b> CAMERON MEASUREMENT SYSTEMS	<b>Event Date / Time:</b> 04/10/2014 (PDT)
	<b>Last Modification:</b> 06/09/2014
<b>Region:</b> 4	<b>Docket #:</b>
<b>City:</b> INDUSTRY	<b>Agreement State:</b> Yes
<b>County:</b>	<b>License #:</b>
<b>State:</b> CA	
<b>NRC Notified by:</b> CHUCK ROGERS	<b>Notifications:</b> RAY POWELL R1DO
<b>HQ Ops Officer:</b> CHARLES TEAL	MALCOLM WIDMANN R2DO
<b>Emergency Class:</b> NON EMERGENCY	PATTY PELKE R3DO
<b>10 CFR Section:</b>	JAMES DRAKE R4DO
21.21(d)(3)(i) DEFECTS AND NONCOMPLIANCE	PART 21 GROUP EMAIL

## PART 21 - BARTON MODEL 288A AND 289A DIFFERENTIAL PRESSURE SWITCH DEFECT

Cameron Measurement Systems is reporting a defect affecting versions of the Barton Model 288A and 289A differential pressure indicating switches and spare switch assemblies for these products. The defect being reported is an out of specification concentricity issue with the roller that actuates the switches. This represents a switch setpoint repeatability concern.

Any additional safety significant issues that might be identified in our ongoing investigation will be addressed in subsequent advisories that will be published. If you have any questions please contact Chuck Rogers, Director of Quality and Safety, at (281) 582-9507 or Jim Greer, Engineering Manager, at (800) 291-3550.

\*\*\* UPDATE AT 1626 EDT ON 6/9/2014 FROM CHUCK ROGERS TO MARK ABRAMOVITZ \*\*\*

The following information was excerpted from an e-mail:

"Cameron has performed switch setpoint repeatability testing which has verified that rollers, even those with out of tolerance run-out, can meet the published 0.25% repeatability specification as long as the roller moves freely along the switch operating cam. However, if the roller were to 'skid' or 'skip' on the cam, or rotate when the roller is off the cam due to vibrations such that the roller does not return to the exact same radial position when it's on the cam at the switch setpoint there may be a setpoint shift unless the roller has no run-out. A change in the switch setpoint could be as much as  $\pm 0.32\%$  even for the current run-out specification of 0.0003 inches. As such, given that Cameron could ship product with switch repeatability verified to be 0.25% during production testing and that an additional 0.32% could be possible due to the allowable roller run-out, a field performance of 0.57% is possible. Given wear and other uncertainties Cameron would recommend that a user consider a conservative field repeatability value for switch setpoint calculations.

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"An important piece of information that was gleaned from the current testing effort is that switch repeatability testing is very dependent on the sensitivity of the calibration equipment utilized. Most calibration pressure sources and measurement displays have lags in the indication of the actual pressures applied that can cause errors and, even more critical, is the lag that occurs between the operator's response to the indication of the switch trip and the reading of the pressure source display. Cameron discovered that the observation of the indicator pointer (properly calibrated) is more accurate in verification of switch repeatability than any pressure source and electrical switch contact monitoring device we utilized. Once the switch setpoint is established, a pencil mark at this trip point on the indicator scale can be utilized to verify subsequent trip points.

"In conversations with customers that called to discuss the original Advisory concerns, Cameron became aware that some users may believe that the Model 288A and 289A switch performance is not impacted by changes in the environment where they are located. The Barton qualification for these products was a radiation augmented mild environment test program. A sample of products was exposed to 3 Mrads of radiation and then subjected to a 12G maximum seismic simulation. The products performed within specification for this limited testing at standard factory environmental conditions. In our opinion, field calibrations and switch setpoint testing should be performed at the same temperature conditions as expected when the instruments are required to perform their safety functions. Performance testing at one temperature may not necessarily ensure appropriate performance at another temperature.

"If you have any questions, want to place an order for a replacement instrument, switch actuation arm (with roller) or a switch and plate assembly, or want to begin the RMA process for an instrument factory repair please contact Mabel Loo, Customer Service Manager, Cameron Measurement Systems, City of Industry, CA at (800) 291-3550."

Notified the R1DO (Dental), R2DO (Freeman), R3DO (Daley), R4DO (Werner), and Part-21 Group (via e-mail).

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June 9, 2014

**SUBJECT: Notification of Defect – Supplementary Information and Closure**

Cameron Measurement Systems, at 4040 Capitol Ave in the City of Industry, CA 90601, is a supplier of basic components to the commercial nuclear power industry. The components of concern for this advisory are Barton Model 288A and 289A Differential Pressure Indicating Switches and spare switch assemblies for these products.

On April 10, 2014 Cameron made the NRC aware that there was a potential for Barton Model 288A and 289A Indicating Switches to suffer from switch repeatability concerns. The attached Advisory provides follow-up information and represents closure of the issue.

Best Regards,

Signed on behalf of Chuck Rogers by:

A handwritten signature in black ink that reads 'Manny Lenzales'.

Chuck Rogers  
Director, Quality & Safety  
Cameron Measurement Systems  
281-582-9507 (w)  
713-805-8787 (c)



Measurement Systems

## PRODUCT ADVISORY:

### Model 288A and 289A Differential Pressure Switch Deviation

DATE OF ISSUE: June 9, 2014

DOCUMENT NO.: 210036966.02

**ATTENTION: If you have Barton Model 288A or 289A DP Indicating Switches or spare switch assemblies for these products shipped from the Cameron factory please read the following notice in its entirety.**

Cameron Measurement Systems is a supplier of basic components to the commercial nuclear power industry. The components of concern for this Advisory are Barton Model 288A and 289A Differential Pressure Indicating Switches and spare switch assemblies for these products.

On April 10, 2014 Cameron made the NRC aware that there was a potential for Barton Model 288A and 289A Indicating Switches to suffer from switch repeatability concerns. Within a few days all of our customers for the affected safety related products were also notified of this situation. This Advisory provides follow-up information and represents closure of the issue.

The out of specification concentricity (hereafter referred to as run-out) issue associated with the switch actuator arm roller has been corrected by supplying replacement parts to our customers where the rollers now being utilized are in conformance with the original specification. Measures have been implemented to facilitate a more precise means of part inspections and the vendor making the parts has implemented process changes to eliminate the situation that caused the problem.

Cameron has performed switch setpoint repeatability testing which has verified that rollers, even those with out of tolerance run-out, can meet the published 0.25% repeatability specification as long as the roller moves freely along the switch operating cam. However, if the roller were to "skid" or "skip" on the cam, or rotate when the roller is off the cam due to vibrations such that the roller does not return to the exact same radial position when it's on the cam at the switch setpoint there may be a setpoint shift unless the roller has no run-out. A change in the switch setpoint could be as much as  $\pm 0.32\%$  even for the current run-out specification of 0.0003 inches. As such, given that Cameron could ship product with switch repeatability verified to be 0.25% during production testing and that an additional 0.32% could be possible due to the allowable roller run-out, a field performance of 0.57% is possible. Given wear and other uncertainties Cameron would recommend that a user consider a conservative field repeatability value for switch setpoint calculations.

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