

July 13, 2016

**Caterpillar Surveillance Panel
COAT Task Force Teleconference Minutes**

Teleconference Attendees:

Jim Gutzwiller (Chairman), Caroline Laufer, Elisa Santos – Infineum
Jim Carroll (Secretary), Randy Harmon – SwRI
Hind Abi-Akar, Mark Jarrett – CAT
Jim Matasic, Greg Miranda – Lubrizol
Sean Moyer – TMC
Mark Cooper – Chevron Oronite
Jim Moritz, Tim Griffin – Intertek
Bob Campbell – Afton
Jason Bowden – Bowden
Christian Porter
Andy Burnet, Ray Landerburg, Mike Hicks, Rich Hall, Tim Patton - Emerson

AGENDA

COAT Micro-Motion density measurement discussion

Emerson provided the attached presentation (Questions for Emerson...) during the discussion. Additional notes to each question are provided here:

11. The temperature compensation coefficients are nearly constant across all sensors, so Emerson uses an average value. Density calibrations are done with air and water because the vibration frequency changes. There is no technical need for re-calibration. But most clients perform a check or calibration every 1-5 years. It depends on the service and any required documentation. Without erosion, sensors are accurate and stable for decades.

Calibration means adjusting the sensor but we could send the sensor to Emerson for a validation or verification to check if it is in spec and they will not adjust anything if it is. Emerson noted that water is very well characterized and other fluids may not be. If a known density fluid does not match with the sensor, the density meter factor can be adjusted on site.

Some flow through the sensor is needed in order to equilibrate temperatures throughout the sensor in a reasonable period.

Individual meter coefficients can be protected with passwords, and external locks on the hardware.

Model 5700 transmitters have an audit trail (or historian) that records all adjustments to the meter. Emerson thinks it is not erasable but will verify this.

The core processor (usually mounted on the sensor) must be kept below 60C. But, it can be mounted remotely.

12. Zero verification can be enabled in 5700 transmitters for a fee.

Discussion of data collection by Elisa Santos

Attached presentation shows the goal and direction of Ms. Santos' request. (v2 t 12 2016 MM data analysis)

Elisa asked the laboratories to send more specific data to her to combine Micromotion sensor data with LTMS data. Her goal is to correlate laboratory changes to changes in reference results.

ACTION: The laboratories were requested to update information with all adjustments to hardware and software and inform her.

Emerson noted that 'older' sensors are analog and may be more prone to drift.

Discussion by Greg Miranda and Caterpillar of 1R-1808 oil filters

Greg found that different filters produced different results during candidate testing at Lubrizol. The attached presentation (CAT Meeting COAT Variability Oil filter...) shows particulars. By EOT certain filters could affect aeration by around -0.6% and also take a long time for aeration to rise before stabilizing.

Greg noted that oil pressure correlated inversely to the change in aeration.

ACTION: Laboratories were told to update the LTMS data sets with oil filter date codes ASAP.

Caterpillar has started an Interim Corrective Action to investigate the filters. They are to begin a root cause analysis.

Caterpillar has secured a pallet of 144 filters for COAT test distribution.

Some filter comparison tests may need to be run by the laboratories.

ACTION: Laboratories should take stock of the filters they have on hand, and review previous tests for aeration trends similar to those found by Greg.

CAT provided the attached EXCEL file decodes the date codes on the filters.

Discussion of Micromotion calibration period in light of current findings

Jim Moritz will draft a motion to rescind or delay the current requirement to re-calibrate Micromotion sensors once a year.

Next conference is scheduled for 7-15-16 at 11am CDT.