

August 2, 2017

Caterpillar Surveillance Panel Teleconference Minutes

Teleconference Attendees:

Jim Gutzwiller (Chairman, Elisa Santos– Infineum
Jim Carroll (Secretary), Jim McCord - SwRI
Hind Abi-Akar – Caterpillar
Alex Ebner, Kevin O'Malley – Lubrizol
Jim Moritz, Tim Griffin – Intertek
Sean Moyer - TMC
Christian Porter - Afton
Mark Cooper – Chevron-Oronite

Agenda

1-Generate list of questions to send to Emerson prior to the face-to-face meeting in Boulder Aug 15 & 16

2-Test stand differences.

3-New business

Jim G: Thinks that Greg Miranda had photos put together of all parts in the aeration measurement system.

Tim: I sent a list of parts.

Moritz: That was back when all sent in photos instead of flying between labs. I can't find them.

Action: Labs should do this again.

Jim G:: First let's work on the list of questions for Emerson.

Hind put up a list of questions from Alex and Jim Moritz.

Panel went through the list

We need to send models of transmitter sensor etc. and firmware version to Emerson.

Moritz: Can firmware versions affect results?

Tim: Last time Emerson it did not.

Elisa's list is different from the current list.

McCord: We updated to get smart meter verification. Also include the Puck in the list. It does all the control and calculations.

Moritz: What is the Puck?

McCord: It's the control and processor, the old one allowed adjustment of RTD temp, the new one does not.

Hind: Does it control the vibration.

Tim: It interprets the vibration.

Second group of questions were left alone.

Alex: Need to include earlier meter/transmitter/puck information sent to Emerson. Need to add serial numbers to the list.

We added a question about difference between RTD and fluid temperature.

Alex: Could we calibrate for density to compensate?

Hind: Are we talking about the skin of the inner tube?

McCord: Yes. Older ones had a surface RTD, newer have a 'well' measurement. The RTD is not as good an approximation of the tube temperature as our fluid temperature.

Sean: I back calculated the 'mid-point' temperature of the RTD. I will be sending out updated data set in the next few days.

Hind: What are the differences between RTD and fluid temperatures.

Sean: 84 to 90C depending on lab.

Moritz: Emerson literature says the accuracy is plus/minus 1C.

Hind: It seems that our TC are for control. The Micromotion uses its T to calculate density.

McCord Add what standard calcs are done and what other calcs can be done to the questions.

Jim G: Can they calibrate at Ts closer to our operation.

McCord: Ask for a detailed schematic of the hardware. Are we talking about uncertainty or accuracy?

Moritz: It is only an indicated temperature, it could be off. We have heard it is not calibrated. Ask for the thickness of the tube.

Hind: How does knowing the thickness of the tube going to help us. Isn't it more important to know effects?

Moritz: What is the potential difference due to the temperature gradient?

Hind: Will we use it?

Moritz: With a temperature gradient the modulus may be different at different parts of the tube.

Hind: Only thing left is the meter differences.

Moritz: I will send the list to you.

Jim G: If the labs that made changes to the density meter we should document them.

Alex: Need serial numbers.

Jim G: Add dates to the changes.

RE Trip to Emerson: They are setting up rooms in the Hampton Inn near them.

Hind: What is the rate?

Jim G: Don't know.

Jim McCord took a count and will get with Emerson to get price and code.

Jim G will send the list of questions to Emerson and follow up with the

LAB Differences

McCord: How do we look at the different photos Powerpoint?

Jim G: Not sure. Looked for photos Greg Miranda put together at the start of the matrix.

McCord: We may need to decide on any changes before the next reference test.

Sean: We should not reference until this is resolved.

Hind: Should we have another meeting before we got to Emerson.

Elisa: Looking at the data may generate more questions.

Sean: Compared the slope and offset at the three labs, and the differences. It looked like one lab had a significant adjustment. The post MM calibration and correction to tube temperature as average of RTD and fluid temperatures made the best "correction". I did not run control charts. Not sure if what I did was appropriate.

Alex: Is our calibration method appropriate? Should there be flow?

Sean: Did everyone did the calculation for DVT during calibration?

All labs said yes.

Sean: We may be double booking corrections.

Moritz: What are the real objectives?

McCord: All labs report density at the same temperature is my goal.

Hind: To make sure the final reported number for density is accurate.

Alex: To have aeration measurement the same at all labs.

Moritz Aeration is an arbitrary scale dependent on pressure.

McCord: We need to match as close as possible to D4052.

Tim: We (Intertek and SwRI) are basically at the same RTD temperature yet have different results.

McCord: We can't compare the labs until RTD temperature is accounted for.

Moritz: Lab A and Lab G are running at the same temperature.

McCord: I agree, Intertek's stand is more severe..

Sean: There are a number of factors that could be making the difference.

Alex: I am working on the components of the stand. And making a timeline of changes to the stand(s).

Other business

Alex: Best practice for a flow calibration needs to be put together. I sent out a package from Emerson on this on July 18.

Jim G: We need some time to get a quick overview.

Alex: Maybe we should bring it up with Emerson. It is written to comply with CFR 40....

Jim G. We should have another meeting next week.

Alex: I think we should have a meeting to look at aeration plots and my list of differences.

Next meeting August 9, Tuesday 9-10 CDT.

Labs to put together photos and list of differences.