



COMMITTEE D02 on PETROLEUM PRODUCTS, LIQUID FUELS, AND LUBRICANTS

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SEQUENCE VI SURVELLANCE PANEL

Date – 27 Feb 2023

ATTENDANCE

SWRI	Dan Engstrom, Christine Eickstead, Pat Lang, Travis Kostan
INTERTEK	Adrian Alfonso
LUBRIZOL	Andrew Stevens, George Szappanos, Tony Catanese
AFTON	Bob Campbell, Ben Maddock
ORONITE	Robert Stockwell, Ricardo Affinito
INFINEUM	Andy Ritchie
TMC	Rich Grundza
GM	Frank Cooney
TOYOTA	
OHT	Matt Bowden
TEI	Dan Lanctot
FORD	
VALVOLINE	Amol Savant
HALTERMAN	
GAGE PRODUCTS	
HALTERMANN CARLESS	Izabela Gabrel
BP	
EXXONMOBIL	Paul Rubas
SHELL	
IMTS	

1. **Attendance. See table above.**

2. **Approve minutes from 2/8 meeting**

Approve at next meeting to allow everyone time to review.

3. **New business**

3.1 BL6 Testing Logistics

- **Test process alignment among labs**

- **Targets for completion**

- **Any outstanding questions/discussion**

Rich – One result reported from one lab in 3rd run (2nd candidate). I believe there is another 3rd run running and a 2nd run running as well. I have a commitment from one lab once they calibrate (mid-March) that they'll offer up the 2nd run on that engine. Awaiting response from 5th lab; submitted a PO to us today. Suspect that we'll be able to place that last test depending on what's available. Paul has graciously offered to send operational data. Based on that format, will ask other labs to send op data as well. Mainly looking to see that critical parameters are in spec.

Travis – Rich, able to comment on the one result you've seen so far?

Rich – Directionally different than BL5, but minimally. On average, 0.0012 kg (1g) difference between BL5 and BL6. BL6 higher in fuel consumed by 1g (weighted). Looks a lot better than the BL5 vs. BL2 data, but ranges are a lot tighter since it's one engine. Expect to see weighted fuel consumption in each stage a little more variable once we see more engines. Directionally the same.

Paul – You're only seeing a one gram difference? We're about halfway done and seeing 3-4g difference so far.

Rich – That is a run 2, the one I've received is a run 3.

Andrew – So we have a third run result, have a third run running, have a second run running, and one lab to calibrate mid-March. Fifth lab is working on deciding as well.

Rich – Correct.

Andrew – Do you have a plan for the lab that is going to calibrate in mid-March?

Rich – They offered a second run. That'll put us at 2 second runs, 2 third runs.

Andy – If you ran BL5 5 times, what would be the variability in grams? Not going to get the exact same answer 5 times. What would you get as a repeat?

Rich – Not sure. Can look at difference in BL5 in BLB1, BLB2, and potentially BLB3.

Andy – We're comparing BL6 to BL5. What would we expect to get if we compared BL5 to BL5 to BL5...? Not going to get the same number each time.

Adrian – Couldn't we apply the precision of the test and apply that to the baseline results?

Rich – Not sure how looking at test precision in terms of FEI% would work. We're looking at differences in BL by weighted fuel consumed.

Travis – The FEI comparison has variability in the BL and the reference oil. There is a sample size difference as well. We can find out, but it's not a straightforward answer.

Andy – Think we'll find out that BL6 is different than BL5 by a certain number. How much of that is real and how much is explainable by variability?

Rich – That would be interesting. When I looked at the first set of data, in some cases, BL5 is more fuel efficient and in some cases it's not. So it's different than what I saw comparing BL6 to BL2. The thing thus far is that there were no instances where BL6 was more fuel efficient than BL2. But in this case, we do see an occasional time where BL5 is less fuel efficient than BL6. All data will be available.

Andy – We're doing something we haven't done before. The further we get away from the original blend, we expect more variability. We may conclude that BL6 is not different than BL5. Comparing BL6 to BL5, if BL5 is sometimes more and sometimes less fuel efficient, then there's probably a very small difference between the two. Probably the best conclusion we can come to.

Andrew – Andy, good point. What is the natural variation in BL results? Is the difference between BL6 and BL5 within that? That's a valid experiment since it will prove to us with confidence that we're not affecting the test.

Rich – Due process, it's what we've always done. Question becomes was that really a valid experiment and is that telling us what we think it's telling us. I'm not saying that additional scrutiny may or may not validate what we do in the future and change what we do in the future. We saw something, we're doing our due diligence, and we'll see what happens. This may tell us that we don't need to do anything. It wasn't a waste of time/effort/money to make sure that what we experienced between BL2 and BL6 wasn't real when it comes to current testing. It may alter what we do in the future too in terms of what we compare to and how we do that. When we first did this, we would get 3-4 labs to participate, but people don't have excess capacity so we've generally done it with just the two independent labs. May be looking at doing some things different in the future.

Andrew – Want to revisit the runs. We have (2) 3rd runs, (2) 2nd runs. One of the 2nd runs to occur in late March. Fifth lab?

Ben – Afton is targeting March 14th as a start date.

Rich – Not sure what the 5th lab will have available yet. Not sure what we want either.

George – I think it'll be a second candidate run. Is that okay?

Rich – Yes, that's fine unless someone from SP has opposition to that.

Andrew – Yes, I think that's fine. I thought we had 6 candidate runs that we were going after?

Rich – We have funding for 6. Have 5 labs that committed to running this, 6th lab purchased no BL6 and wasn't going to be able to run BL6 procedure anytime soon.

Andrew – That’s fine, I just want to make sure we understand everything that’s out there and people know what’s expected from them. Sounds like end of March to expect results in hand.

Rich – I would hope so. I don’t think it will take long to get data together once these are run.

Andrew – Is that a joint effort between Rich and the stats group to present to us? We’ll put together the data and have a call before having stats group do a deep dive? I would prefer having everything as comprehensive as possible to look at.

Rich – My intent is to put data together and then have a discussion with the stats group, but I will have the data together.

Andy – My view is that this is important enough to have all hands-on deck for this.

Andrew – Yes, that’s why I’m bringing this up. If the testing is done by the end of March, then is mid-April our target for reviewing everything and making decisions on what to do with it?

Andy – I’d like some sort of interim report with a summary of how it’s going.

Rich – I’m happy to put out the initial summary once the data is together and we’ll have a stats call sometime shortly thereafter. As long as they’re not bogged down with other things, I expect that they’d be done in a few weeks.

Travis – If three or four results are complete, we can get a preliminary view of the data and update it as the other results come in.

Rich – I would hope that would be the approach we take. I wouldn’t expect to do anything until at least three of the results are available (hopefully in a couple weeks).

Travis – One done and two currently running right now?

Rich – Correct, we’ll have data to analyze in the next week or two.

Andrew – You’re going to get the data, and you’ll have to use special decoder ring for operational data, so there will be some processing time there too. As an intermediate, once we have some impressions from the first three, send out a quick update email on that? Does that sound reasonable?

Rich – Yes, absolutely.

Bob – Rich, once we have three data points, can you send out the data in some kind of tabular format so people can begin forming their own conclusions?

Rich – My intention was to put all the data on the website so anyone can grab what they want.

Bob – Perfect, thank you.

Andrew – Any other questions or commentary?

None

3.2 Coolant flow calibration discussion (see Appendix)

Andrew – We didn't land anywhere definitively last week. George, can you reintroduce the topic?

George – There's a little bit of a nuance in how you calibrate the coolant flow. You calibrate it in most cases with a mass flow meter, but read it with a volumetric flow meter. Instead of using water to calibrate, why not use 50/50 glycol to replicate what happens during the test? I thought we got pretty close to a motion, but further discussion then brought us back to a different conclusion? The original thought was to keep it simple – if you're going to run glycol in the test stand, then calibrate it with glycol. I recall some conversation that whether or not the particular mass meter used for calibration is NIST traceable using that media of glycol rather than water, and to be honest not sure if I can answer that. That's a muddled recap of what we talked about.

Andrew – Yeah, we had to have several iterations of modifications to the motion.

Adrian – On the last call, I fully supported since we're running with coolant why not use coolant instead of water. It looks like the standard is calibrated with water, so not sure if that concerns anyone? Then we'll be calibrating the stand with coolant instead of water.

George – Even if the standard is calibrated with water, I wouldn't expect much of a shift due to the fact that the medium is about 6% different in terms of density. I would expect that it's not significant.

Adrian – We've run 100% water and then a 50/50 mixture, and we didn't see much of a difference at all when trying to calibrate. Had an opportunity to do that experiment internally already. I support your point.

Rich – The other school of thought – shouldn't you be using the fluid that you're measuring to calibrate with? Even if you're not using same media that the traceable device was calibrated with.

Amol – Basically for mass based, it doesn't matter what fluid media is used since it detects the density. So for that, you can use water or 50/50 glycol. Issue lies when using volumetric flow meter, which is what the majority of the stands use.

Andrew – Change verbiage to water or 50/50 for mass flow meter?

Amol – Yes, or just specify for volumetric flow meters if you want to cover all your bases.

Motion:

In Section 10.2.5 of Seq. VIE and VIF procedures, add the following verbiage: Volumetric flow devices shall be calibrated using 50/50 Dexcool, mass-based flow devices can be calibrated using water or 50/50 Dexcool.

Motion made by George

Seconded by Ben

No waives. No negatives.

Motion passes unanimously.

Robert – Is there a temperature range around the volumetric flow check?

Andrew – Nothing about it in the procedure. Are you suggesting something Robert?

Robert – Hydrocarbon type products do change volume with temperature. I'm good with it as is, but wondering if we should add something extra.

4. Next meeting

5. Meeting adjourned