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COMMITTEE D02 on PETROLEUM PRODUCTS, LIQUID FUELS, AND LUBRICANTS

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SEQUENCE VI SURVEILLANCE PANEL

Date – 12 July 2023

ATTENDANCE

SWRI	Dan Engstrom, Christine Eickstead, Pat Lang
INTERTEK	Adrian Alfonso
LUBRIZOL	Andrew Stevens, George Szappanos, Tony Catanese
AFTON	Amanda Stone, Jason Lekarich
ORONITE	Ricardo Affinito, Jo Martinez
INFINEUM	Caroline Laufer, Todd Dvorak
TMC	Rich Grundza
GM	
TOYOTA	
OHT	
TEI	Dan Lanctot
FORD	
VALVOLINE	Amol Savant
HALTERMAN	William Hairston, Ed Hennessey
GAGE PRODUCTS	Jim Carter
HALTERMANN CARLESS	Izabela Gabrel
BP	
EXXONMOBIL	Paul Rubas
SHELL	Jeff Hsu, Seth Demel
IMTS	
CHRYSLER	

1. Attendance. See table above.

2. Approve minutes from 5/3 call

Motion to approve minutes: Andrew Stevens, Second: Adrian Alfonso

Motion passes unanimously.

3. New business

3.1 BL5/BL6 analysis and discussion

Amanda – presented BL5/BL6 analysis presentation

Overall model for total FC weighted and unweighted looked at for engine hour, oil and lab indicates significant difference but small

Equates to a 0.05% FEI change (1.83% performance level, 0.22 sigma shift)

Consecutive run analysis doesn't show consistent shift between BL5 and BL6

Plot of data by lab – seems to be an engine order impact (FC shifts lower moving further into runs)

Few instances where consecutive runs failed unweighted baseline shift rule

Overall model – both for weighted and unweighted (used engine hour, lab, and oil)

Engine hour estimated by run start, each consecutive run added 12 hrs/run

Weighted coefficient is -0.001, 0.2 sigma shift

Consecutive run analysis – all labs had 3 instances where ran BL5 and BL6 consecutively, and 3 instances where they ran BL6 then BL5 consecutively

Removed outliers that failed procedural limit (only of the same BL)

BL6-BL5 shows higher difference than all the rest, BL5-BL6 shows almost no difference

BL6-BL6 seems to be performing best and really close to each other

Matched pairs comparison – when BL6 was run first then BL5, there was a significant difference. But also saw significant difference when compared BL5-BL5. Inconsistency of data.

Recommendation – with extremely low SD shift with overall model and inconsistent results from consecutive runs, not seeing anything that needs an additional correction factor

Perform additional analysis in 8-10 months or when panel deems necessary

Discussion –

Rich – Obviously, we've been baffled given the silence

Andrew – No comments or are people still digesting?

Todd – For the most part, not much of a difference. BL6 slightly higher, but minimal effect on the FEI. If there is a marginal effect, accounted for in severity adjustment. Don't see any reason why you can't move forward with BL6 for candidate testing

Rich – Obviously, introduce it with a reference and all candidate tests run with same BL batch. Gut feel – even if the difference looks large in terms of fuel consumed, still coming up with a difference of ~0.25 sigma. Which, in terms of real units, is 0.05% on FEI1. Correction factor adjusting it in the severe direction of 0.5 sigma. Severity adjustments will get this rather quickly because of the lambda that we use.

Amol – Wasn't paying a whole lot of attention, but it doesn't really affect me because I have enough BL5 to last inventory of engines. Are all other labs going to be switching to BL6 soon?

Rich – Im sure one lab will switch relatively quickly, but not sure about other labs. Testing seems to be picking up a bit as well.

Amol – One concern – if there's any movement or departure from targets as a result of using BL6, shouldn't really affect the stands or labs using BL5.

Andrew – Rich, you will monitor as BL6 references come online to make sure that performance is okay?

Rich – Yes, of course. We have a lot of things going on, reblands of reference oils and reblend of BL. Last time we saw some labs coming up on it in 6-8 months, so may see other labs switching shortly too. Not sure if everyone is willing to give an estimate or not

Amol – So all that talk about seeing almost a 1 sigma shift because of BL6 last year, that all got diluted by running multiple other runs?

Andrew – Are you talking about initial analysis of BL2 vs BL6? Reason we did this analysis was because we didn't feel like we had sufficient data to judge BL6 performance

Rich – In addition, miscalculating/back applying weighted fuel consumed number incorrectly and didn't catch it when I first said that. After we looked at the first stab at all the data, some data in there that we weren't sure of and had to remove due to rich set of AFRs. Believe my statement could be as much as 1-1.5 SD.

Amol – Yes, I remember that and ran numbers as well to verify

Rich – Based on those preliminary numbers, now we have a much larger spread across 5 engines. How much of that is based on engine, etc.

Andrew – Hearing no additional questions/comments, think it would be prudent to approve BL6 for test

Paul – Motion should also mention that there's not going to be a correction factor, correct?

Rich – Yes, I think that's a good thing to include

Todd – Just a follow-on, if running BL6 on candidates, have to reference on BL6 as well

Rich – Motion to accept BL6 for use, to be introduced with a reference with no correction factor. Subsequent candidates will be run on the same batch of BL as used in the reference.

Adrian – Second

Andrew – Additional questions or discussion?

Any negatives? No

Any waives? Jeff Hsu (Shell)

Motion carries, BL6 is approved for use.

Andrew – Any other items that anyone would like to bring up today?

Meeting adjourned.