

Sequence V Surveillance Panel Meeting December 7th, 2020 10 AM EST

Roll Call:

Afton: E. Altman, B. Campbell, B. Maddock
Ford: M. Deegan, R. Romano
GM: B. Cosgrove
Haltermann: P. Tumati, E. Hennessy, Q. Dunford
HCS Group: T. King
Infineum: D. Boese, C. Laufer, C. Leverett, A. Ritchie (Chair)
Intertek: A. Lopez
Lubrizol: J. Brys
OHT: J. Bowden
Oronite: R. Stockwell
Shell: J. Hsu
SwRI: A. Chaudhry, T. Kostan, P. Lang, D. Engstrom
TEI: D. Lanctot
TMC: R. Grundza
Valvoline: A. Savant
Willis Advanced Consulting: A. Willis

Meeting Summary:

The panel met to discuss what data would be required for fuel suppliers to provide to demonstrate their technical capability to the Surveillance Panel. Many options were considered, and the panel will reconvene next week to approve testing requirements. A clarification on how much fuel remaining was made; In order to avoid any confusion in the future, it was requested that the fuel inventory report be clear to include both above heel and heel amounts as the whole planning process is based on accurate understanding of the inventory. With input from the labs, TMC will provide a hardware summary for VH. The severity shift and how we address it will be discussed at the next meeting at the panel level, not a newly formed TF.

Actions:

1. **Panel** to provide clear list of required data for alternate fuel supply to be considered.
2. **Labs** to provide parts inventory to TMC. **TMC** to collate hardware info from each of the labs.
3. **Ford** to look into the possibility of finding more VH blocks.
4. Open action from [June 24th meeting](#): **Haltermann** to look at fuel data from Sec 8.2.6 requirement and report back to panel.

Next meeting: December 14th, 2020 @ 10 AM EST

Meeting was adjourned at approximately 11:30 AM EST

Meeting Details:

The Surveillance Panel reconvened to review:

- 1) Issues around the preparation and approval of a new batch of fuel.
- 2) Parts inventory for VH to allow an updated projection of the life of the Sequence VH.
- 3) Plans for the SP to review the possible operational and/or hardware causes for the recent RACS and AES mild shifts which triggered a number of VH test key alarms.

The Chair opened with asking Prasad Tumati (Haltermann) to provide an update on the fuel inventory. Prasad explained that in 2018, we started with 655,000 gallons. There is a total of 315,000 gallons remaining. 187,000 gallons is above the heel. In other words, we have 128,000 gallons more fuel than we thought we had remaining based on last week's update.

The Chair summarized that we have about 50% of what we started with. Although Haltermann's preference is to build on top of the heel, the Chair made clear that fuel batches should not be mixed, to which Ron Romano (Ford) concurred. Prasad Tumati (Haltermann) confirmed that they take orders until the heel is reached, then will drain the remaining fuel, which they will continue to sell, into ISO containers.

Due to the confusion on total remaining fuel inventory, it was requested that going forward, the inventory report be clear to include both above heel and heel amounts as the whole planning process is based on accurate understanding of the inventory.

Tracey King (HCS Group) asked how long ~300,000 gallons would last. The Chair commented that since we started in Jan 2018, there have been 412 candidate tests* to date and 91 reference tests... for a total of 512 test runs. With last week's understanding of the fuel inventory, we believed we had enough to get into the first half of 2021. With the updated inventory of 315,000 gallons, we have another year left. This assumes of about 15 tests per month. If the testing rate is more like 30 tests per month, we'll be out of fuel by 3Q next year. With the uncertainty on consumption rate, it is time to press on with planning for the next fuel batch, to which no one on the panel disagreed. Ron Romano (Ford) added we should be planning this, especially if we're looking at alternate suppliers.

In terms of the process, the Chair stated that any fuel supplier would need to demonstrate technical capability to be considered a fuel supplier. The contract negotiation follows including any fuel supplier which has demonstrated their technical capability to the SP to blend the fuel. Due to the commercial nature of the contract review process, this activity is totally separate from the SP. The contract group, which is the lab managers led by Mike Lochte, would look at the submissions from the suppliers and will make the decision on which supplier to select. The contract group will communicate their decision to the SP. The SP will then work with the selected fuel supplier to assess the data from the full test approval matrix. Bob Campbell (Afton) agreed that this description of the process is right. Al Lopez (IAR) added that last time, the contract process started before a batch size was made.

Jeff Hsu (Shell) commented that the only way this will work is for ASTM or another entity to own the fuel recipe. The Seq V fuel has been developed by the industry and we shoulder a lot of the testing matrix costs. There were a number of options put forward for what tests would be required for fuel suppliers to provide but no consensus was made. Discussion included

questioning if all 3 reference oils would be needed, how many labs, how many stands, what the testing would need to demonstrate (discrimination, repeatability, reproducibility, comparison to current batch of fuel, etc.). Ultimately, the SP will reconvene next week to agree on testing requirements but comments from the discussion are captured here:

- Travis Kostan (SwRI) advised we need to identify what we see in round 1, knowing that we'll get more data in the matrix. Question to answer is: What technical dataset is required to demonstrate technical capability and to be able to run the fuels matrix? Rich Grundza (TMC) added: This is a proof of concept, as Angela Willis (Willis Advanced Consulting) mentioned, to which Rich agreed. Ron Romano (Ford) reminded the group that we've never had a new supplier, so this is brand new territory and we need to come up with the required tests.
- Ron Romano (Ford) asked if we run 3 tests? 3 tests plus 1 repeat? Or do we run 4 tests with repeats of the two high and low reference oils to show discrimination and repeatability?
- Al Lopez (IAR) referenced a 2018 report from the statisticians that showed the first row of testing was designed to show discrimination. For the incumbent or new supplier, same exercise would be done to prove they have discrimination in bad and good oils. The 2nd row of testing continues with repeatability and reproducibility. TMC 1009, the oil with the most variability, isn't tested until row 3.
- Al also mentioned that the contract was started before a batch size was made. There were clauses on consumption rate and how much is needed based on a forecast. Once the contract was made, Haltermann went ahead and built a batch.
- A panel member asked if there's anything we can leverage from other SPs to guide us and asked if we need to consider tie-back to the current fuel. Ron Romano (Ford) commented that this may be addressed if the results are near their respective targets. Bob Campbell (Afton) added that testing on a new fuel would follow reference testing on the current fuel so there's comparison (reference to the extensive work on this by Travis Kostan (SwRI)) and suggested that the group needs to think about how this lives on in the procedure.
- Rich Grundza (TMC) stated that this whole process should be defined. Angela Willis (Willis Advanced Consulting) agreed that this panel should make sure this is a standardized process so that this doesn't have to be rehashed each time.
- Re: number of labs, Al Lopez (IAR) cautioned that if you look at the TMC database, one will see some off-target results. If you use only 1 lab and get mild results but still calibrate, there'll be a question about if the fuel is behaving properly or if it's mild.

The Chair said this panel will reconvene next week to agree on the requirements.

Re: hardware, the Chair informed the panel that Angela Willis (Willis Advanced Consulting), as PCEOCP Chair, has asked each SP to provide a summary of parts supply for each test. This SP will need to report how many parts remain and project the life of VH tests. Rich Grundza (TMC) to collate the info from the labs. Angela added that based on the 2019 data from the independent labs, her modeling forecast showed the VH in solid shape until 2028/2029. However, we need an update for 2020 as it sounds like there could be some concern with dexos1 Gen 3 coming out required that VH testing be done on final formulations which will drive usage for the next couple of years. Run rates should also be closely monitored. Ron Romano (Ford) reported that he's contacted the piston and ring supplier to see if another batch can be made as this may be the limiting factor. He also reported they'll need to address the blocks and the heads. Al Lopez (IAR) reported that his guess is that Intertek has about 3 years left and that his concern is with the blocks. He questioned if we're confident we'll find / salvage blocks from

this 2013 model; Ron commented that there should be a decent quantity but will investigate the block situation and see how far back the changes went.

Re: the 3rd agenda item, the Chair confirmed that operational group to look at the severity shift will be kept at the panel level, not a newly formed TF. He announced that any interested panel members can choose to join or not join. Ron agreed to this approach.

The Chair closed the meeting and summarized for next week's call that we will cover the following:

- Approval of fuel testing requirements
- Parts inventory
- Severity shift and how we address it

* Appendix: Number of registered VH tests by month (up through Nov 30th) plotted below. A total of 421 VH registered tests.

