

Unapproved Minutes of the November 24, 2015

Sequence VG Surveillance Panel Conference Call

The meeting was called to order by Chairman Andy Ritchie at 10:00 AM EST.

Mike McMillan agreed to take the minutes of the meeting.

A list of the attendees on the call is included as Attachment 1.

Chairman Ritchie listed the agenda items he would like to cover in this call:

- 1) Attendance
- 2) Approval of minutes from October 28th 2015 meeting
- 3) Results from testing new fuel batch DJ0121NX10 with Oil 940
- 4) Old business
- 5) New business
- 6) Schedule for future Sequence V calls

Chairman Ritchie asked if there were any additions or corrections to the minutes from the October 28, 2015 VG Panel meeting in Southfield, MI. There being none, Jason Bowden moved and Ed Altman seconded a motion to approve the minutes. The motion was approved unanimously.

Chairman Ritchie made reference to the three tests on Oil 940 which have been or are being conducted with the new DJ fuel batch. The results from those 3 tests are shown in Attachments 2, 3 and 4. The SwRI and Intertek tests have been completed and the results reported; the Lubrizol test has completed, but the ratings have not been reported. Chairman Ritchie summarized the results, saying that they showed a lot of sludge, that the sludge ratings for the two completed and reported tests (6.16 and 5.81) were in a very tight range, and were severe of the 6.43 AES target for Oil 940 with the current AK fuel batch. (Note: An email was circulated during the call that showed a preliminary AES result from Lubrizol of 6.06, which falls within the range reported by the other two labs.) Chris Mileti noted that the Lubrizol results show fuel dilution about half of what has been obtained with the current fuel batch, that the kinematic viscosity increased much more rapidly than normal, and that the Fe level seemed to stabilize after 120

hours. Al Lopez and Cole Hudson agreed with Chris. Al also pointed out that the sludge ratings on the cylinder head valve decks were very low – in the 1 to 2 range – and that this contributed to the low overall AES rating. Cole re-iterated the comment about the fuel dilution being in the 5-8% range for the SwRI test, much lower than usual, and asked Mark Overaker from Haltermann if he could offer any explanation for the difference. Mark replied that he could not explain why this might be. Cole continued saying the distillation curves for the two fuel batches are very close, within 3-4 degrees of each other. Ed Altman noted that the Fe level obtained was similar to that obtained about 3 batches ago. Doyle Boese asked if we were at the practical minimum at an AES level of about 6.0. Ed and Cole both replied they had seen values in the low 5's before. Gordon Farnsworth asked if sludge on oil pans being less was where we wanted to be. Ron Romano answered yes.

Chairman Ritchie asked if anybody disagreed with the statement that we have met the objective of the sense check. There was no disagreement. He referred back to the minutes from the October 28 face-to-face meeting, during which the Panel had agreed if we met that objective, we would proceed to conduct all 15 of the matrix tests with the new VG hardware. Chairman Ritchie asked whether we want to do that, or perhaps investigate plated versus un-plated pistons? He continued saying there seem to be two issues – engine build and can we discriminate? Ron noted that we are severe of target, and he would like to see some results on Oil 1009. Ed said he was ok with this, but it was different than we had agreed at the October 28th meeting. Gordon offered that Mark Overaker's objective is to prove performance of the new fuel batch with existing hardware, and then it is our problem to work out the effects of part differences on the test results.

Rich Grundza suggested we should proceed with the matrix to see if we have discrimination. Ed suggested each lab run one test on Oil 1009 with current hardware (plated pistons) and then go to the new hardware. Jo Martinez said the Statistical Group had designed the matrix to be run with all the same hardware. Doyle said he would be uncomfortable interjecting new hardware in the designed matrix. Jerry Brys stated he thought we could modify the matrix to include the different hardware by adding 5 more tests. Gordon asked if we could just do it with 3 tests on Oil 1009. If we don't get separation from Oil 940 with that, then we wouldn't continue. Several others voiced their support, and with that Ed Altman made the following motion:

Motion: *Each of the three labs (SwRI, Intertek and Lubrizol) will run a VG test on Oil 1009 using current VG hardware and build practice and in the same stands that were used to conduct the Oil 940 tests.*

The motion was seconded by Jerry Brys and passed unanimously. Once these test results are obtained, members of the Statistical Group agreed they will determine if a revision to the current matrix is warranted.

Chairman Ritchie asked the labs when they could start such a test. Al replied that Intertek could start on 11/30, Lubrizol said they could probably start this week, and SwRI indicated they would check and advise Chairman Ritchie of the planned start date. Chairman Ritchie indicated he would schedule the next Sequence VG conference call when these tests are completed.

Old Business: There was no further Old Business brought before the Panel.

New Business: Ed Altman suggested that the VH Development Group may want to consider making a VH run with the new fuel since the new batch seems more severe than the current batch. VH tests conducted with the current fuel batch were directionally mild, so perhaps the new fuel batch might be more acceptable for the VH test.

Next Meeting: The next VG Panel conference call is at the call of the Chairman.

The conference call was adjourned at 11:00 AM EST.

Attachment 1

Attendance for 11/24/15 Sequence VG Call

Infineum: Andrew Ritchie, Mike McMillan, Gordon Farnsworth, Doyle Boese

Ashland: Amol Savant, Tim Caudell

VP Racing Fuels: Chris Taylor

GM: Bruce Matthews

Ford: Ron Romano

Toyota: Jim Linden

Haltermann : Mark Overaker, Tracey King

SwRI : Dan Worcester, Cole Hudson

Intertek: Al Lopez

Afton: Ed Altman

Lubrizol: Jerry Brys, Chris Mileti, Kevin O'Malley

Oronite: Jo Martinez

OHT: Jason Bowden, Matt Bowden

TEI: Dan Lanctot, Zack Bishop

Neste: Chris Castanien

Shell: Jeff Hsu

BP: David Tsu

TMC: Rich Grundza