Sequence III Surveillance Panel
Teleconference Meeting Minutes

January 06, 2016
11:00 EST

Agenda

1.0) Attendance

The attendance is shown in Attachment 1.

2.0) Chairman Comments

Chairman Glaenzer commented that the Surveillance Panel is charged with finishing the IIIH development and bringing it to be a fully finished ASTM test method. Weekly teleconference meetings will be held to help accomplish this task.

3.0) Approval of minutes

3.1) Minutes from 11/20/2015 Conference Call

The minutes were approved (Clark, Altman) without objection.

4.0) Action Item Review

4.1) IIF/IIIG Fuel Injector Cleaning. Altman

Ed Altman reported that some progress has been made in cleaning injectors that have a failing spray pattern or drip. Ed will report back to the panel at a future meeting as further progress warrants.

5.0) Old Business

5.1) Analysis of IIIG run 7-10 data for differences. Dvorak

Todd Dvorak was not available for this meeting. He will report on this item at a future meeting.

6.0) New Business

6.1) Update on IIIH work underway by George Szappanos group.

The group has been meeting by teleconference. They have been focusing on operational data and any potential differences and what impact there may be. They've also conducted round robin on engine block measurements. They are currently investigating the possibility of building an engine as SwRI and send it to Afton for a test run on oil 434 in the hopes of isolating whether or not the lab differences are due to engine build or test operations. Afton expressed concern that this might not be a worthwhile experiment. They also commented that labs should attempt to identify potential differences in stand setup. The task force will continue their work and will report back at future meetings. It was noted that once the work has progressed, then a unified engine build might be necessary.

6.2) LTMS for IIIH OMalley presentation, form group to study

Kevin O'Malley provided a draft LTMS for consideration (Attachment 2). This item will be taken up during future meetings and the panel was encouraged to review the draft. It was suggested that the industry stats group work the issue and then bring forward a proposal.

7.0) Work Remaining

1. Review operational data and determine test validity of all matrix runs. **Underway**
2. Conduct and review matrix analysis using valid tests. **Underway**
3. Finalize Pass/Fail parameter(s). **TBD**
4. Calculate test standard deviation along with oil targets & standard deviations. **Underway**
5. Identify reference oil(s). **Done**
6. Set up LTMS. **Underway, Industry Stats Group**
7. Determine whether matrix stands can be considered calibrated based on their matrix tests **TBD, LTMS**
8. Review and finalize the Qi Limits **TBD**
9. Determine calibration and referencing protocols **LTMS**
10. Finalize the test procedure including any additional items including anything learned from the review of the matrix. Involve ASTM facilitator. **Underway, Terry Bates and Karin Haumann**
11. Surveillance Panel recommendation regarding test readiness for the category. **Ultimate Goal**
12. Appendix K Update. **ACC activity with our guidance, Jo Martinez**
13. Publish research report **TBD**

8.0) Next Meeting

8.1) Wednesday, January 13, 2016 11:00EST

9.0) Meeting Adjourned

The call concluded at 11:50 am.

ATTACHMENT 1

ASTM Sequence III Surveillance Panel (22 Voting members) date: 01/06/16

TELECONFERENCE

Name/Address	Phone/Fax/Email		Signature
Ed Altman Afton Chemical Corporation 500 Spring Street Richmond, VA 23219 USA	804-788-5279 804-788-6358 ed.altman@aftonchemical.com	Voting Member	Present ✓
Jeff Betz Chrysler Mopar Parts USA	jeff.betz@fcagroup.com	Voting Member	Present Hyung
Jason Bowden OH Technologies, Inc. 9300 Progress Parkway P.O. Box 5039 Mentor, OH 44061-5039 USA	440-354-7007 440-354-7080 jhbowden@ohtech.com	Voting Member Matt	Present ✓
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Name/Address	Phone/Fax/Email		Signature
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Name/Address	Phone/Fax/Email		Signature
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Charlie Lovell, IAR			✓
Terry Bates, FACILITATION			✓
Chris Taylor	VP Fuels		✓

ATTACHMENT 2

IIIH LTMS Requirements

The following are the specific IIIH calibration test requirements.

A. Reference Oils and Critical Performance Criteria

The critical performance criteria are Percent Viscosity Increase (PVIS), Weighted Piston Deposits (WPD), MRV Viscosity, and Phosphorus Retention. The reference oils required for test stand and test laboratory referencing are reference oils accepted by the ASTM IIIH Test Development Task Force. The means and standard deviations for the current reference oils for each critical performance criterion are presented below.

Percent Viscosity Increase (PVIS)
Unit of Measure: ln(PVIS)

Reference Oil	Mean	Standard Deviation
434-2	4.7292	0.3943
436	3.3308	0.3138
438-1	3.9773	0.9558

Weighted Piston Deposits
Unit of Measure: Merits

Reference Oil	Mean	Standard Deviation
434-2	4.12	0.68
436	4.62	0.28
438-1	3.65	0.43

MRV Viscosity
Unit of Measure: ln(MRV)

Reference Oil	Mean	Standard Deviation
434-2	11.2520	0.52391
436	9.7991	0.24233
438-1	10.0847	0.72094

Phosphorus Retention
Unit of Measure: Percent

Reference Oil	Mean	Standard Deviation

434-2	79.89	1.66
436	94.14	2.02
438-1	78.90	1.54

B. Acceptance Criteria

1. New Test Lab

a. The first two stands in a laboratory

- A minimum of two (2) operationally valid calibration tests and/or matrix tests, with no Level 3 e_i alarms must be conducted in a new laboratory on any approved reference oils.

- Note that industry matrix runs may be included, as well as reference runs, at the discretion of the surveillance panel.

- Following the necessary tests, check the status of the control charts and follow the prescribed actions

b. Third and subsequent stands in a laboratory

- New test stands in an existing lab, and test stands in an existing test lab that have not run an acceptable reference in the past two years, may calibrate with one test provided e_i Level 1 limits are not exceeded. Otherwise a second test is required for calibration.

- For an existing test stand in an existing lab run one test.

- Following the necessary tests, check the status of the control charts and follow the prescribed actions

3. Reference Oil Assignment

Once test stands have been accepted into the system, the TMC will assign reference oils for continuing calibration according to the reference oil mix:

- 100% of the scheduled calibration tests should be conducted on reference oils 434-2, 436, and 438-1.

4. Control Charts

In Section 1, the construction of the control charts that constitute the Lubricant Test Monitoring System is outlined. For the IIIH, Z_0=Mean Y_i of first two operationally valid tests in the stand. The constants used for the construction of the control charts for the IIIH, and the response necessary in the case of control chart limit alarms, are depicted below. Note that control charting all parameters is required.

LUBRICANT TEST MONITORING SYSTEM CONSTANTS

		EWMA Chart		Stand Prediction Error	
		Severity		Severity	
Chart Level	Limit Type	Lambda	Alarm	Limit Type	Limit
Lab	Level 1	0.3	0.000	Level 1	±1.351
	Level 2		±1.800	Level 2	±1.734
Industry	Level 1	0.2	±0.775	Level 3	±2.066
	Level 2		±0.859	--	--

The following are the steps that must be taken in the case of exceeding control chart limits. The steps are listed in order of priority, although charts should be studied simultaneously to determine the cause(s) of a problem. In the case of multiple alarms, contact the TMC for guidance. The laboratory always has the option of removing any stand from the system.

- Exceed Stand chart of Prediction Error (e_i)

  Level 3:

  – Immediately conduct one additional reference test in the stand that triggered the alarm. Do not update the control charts until the follow up reference test is completed and the Excessive Influence (refer to Section 1.A.5) has been performed.

  Level 2:

  – The Level 2 limit applies in situations that have been pre-determined by the surveillance panel to have a potential impact on test results. These situations may include the introduction of new critical parts, fuel batches, reference oil reblends, or other test components. When these conditions have been met and a Level 2 alarm is triggered, immediately conduct one additional reference test in the stand that triggered the alarm.

Level 1:

– The Level 1 limit also applies to stand in an existing test lab that has not run an acceptable reference in the past two years. The stand can calibrate with one test if the Level 1 limits are not exceeded. Otherwise, immediately conduct another reference test in the stand.

 Exceed Stand EWMA of Standardized Test Result (Z_i)

Level 2:

– Immediately conduct one additional reference test in the stand that triggered the alarm. The stand that triggered the alarm is not qualified for non-reference tests until the Level 2 alarm is cleared.
– In instances where surveillance panel has deemed that industry-wide circumstances are impacting the Level 2 alarm, the TMC may be asked to review stand calibration status in accordance with the surveillance panel's findings.

Level 1:

– The Level 1 limit applies to all reference tests that are control charted, even when other alarms have been triggered. Level 1 uses Z_i to determine the stand severity adjustment (SA). Calculate the stand SA as follows and confirm the calculation with the TMC:

Percent Viscosity Increase (ln(PVIS)): SA = $(-Z_i)$ x (0.4764)
Weighted Piston Deposits (WPD): SA = $(-Z_i)$ x (0.48)
MRV Viscosity (ln(MRV)): SA = $(-Z_i)$ x (0.427)
Phosphorus Retention (PHOS): SA = $(-Z_i)$ x (1.57)

 Exceed Industry EWMA of Standardized Test Result (Z_i)

Level 2:

– TMC informs the surveillance panel that the limit has been exceeded. The surveillance panel then investigates and pursues resolution of the alarm.

Level 1:

– The TMC investigates whether severity adjustments are adequately addressing the trend, investigates the possible causes, and communicates as appropriate with industry.