

HEAVY-DUTY ENGINE OIL CLASSIFICATION PANEL
OF
ASTM D02.B0.02
June 27, 2017
Sheraton Boston Back Bay – Commonwealth Room
Boston, Massachusetts USA

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ACTION ITEMS

MINUTES

- 1.0 Call to order
 - 1.1 The Heavy Duty Engine Oil Classification Panel (HDEOCP) was called to order by Chairman Shawn Whitacre at 1:30 p.m. on Tuesday June 27, 2017, in the Commonwealth Room of the Sheraton Boston Back Bay Hotel, Boston, Massachusetts.
 - 1.2 There were 11 members present and 75 guests present. The attendance list is included as **Attachment 2**.
- 2.0 Agenda
 - 2.1 The agenda circulated prior (included as **Attachment 1**) was not changed. The Antitrust Statement was presented. **Attachment 3**.
- 3.0 Minutes
 - 3.1 The minutes from December 2016 were approved as written.
- 4.0 Membership
 - 4.1 Gordon Lee is representing Mike Alessi for ExxonMobil and Dave Duncan is representing Gail Evans for Lubrizol.
- 5.0 Existing tests/categories
 - 5.1 Review of status of carry-over engine tests that support API CK-4, FA-4 and legacy categories (Sean Moyer, TMC)
 - 5.1.1 Sean Moyer **Attachment 4**. Availability of legacy tests:
 - 5.1.2 CAT Tests, no new issues. Ongoing work to develop replacement auxiliary components. C13 will get new liners which will be introduced with coordinated references. COAT is available again and all labs are calibrated. New oil filters were introduced and no correction factor was needed.
 - 5.1.3 T-11 engine out of production, no new issues.
 - 5.1.4 T-12 engine out of production, new rings were introduced and possible issues with the head gasket.

- 5.1.5 Cummins tests, no current issues. New batch of reference oil for the ISM will need to be introduced into the system late 2017. Panel studying some issues on the ISB.
- 5.1.6 All other tests: RFWT has a long supply of parts and the CPD has enough. The IIIF/IIIG is projected to be depleted late 2017 or early 2018. EOAT runs with higher oil temperature on the last engine. The Panel needs to develop a COAT to EOAT correlation.
- 5.2 CAT Oil Aeration Test (Hind Abi-Akar, CAT) **Attachment 5.**
 - 5.2.1 Test has been reinstated. Conducted an 11 test matrix with a new oil filter and Micromotion calibration procedure. Labs now calibrate the Micromotion before each reference test. Procedure updates to include these changes. Oil Filters are now batch controlled. Statisticians reviewed the data and conclusions are that no change to the current standard deviation or correction factors needed.
 - 5.2.2 Chairman Whitacre asked about a plan for the COAT to EOAT correlation.
- 5.3 DD13 Build Workshop, Patrick Joyce. **Verbal update.**
 - 5.3.1 Suzanne presented to AAA in Europe and there was much interest. Build workshop was conducted at Lz and very few differences between labs noted. A new liner batch is coming soon.
- 6.0 Old Business
 - 6.1 Replacement of TMC 1006 reference oil (Brent Calcut, Afton) **Attachment 6.**
 - 6.1.1 A year and half ago this topic came up. 1006 cannot be replaced so a task group was created. 1006 dates back to 1997 and cannot be rebleded due to the basestock is no longer available. 1800 gallons at TMC. Still have several years of inventory. Oil is used across many tests. 1006 is SF105 for elastomers and is the only oil used. Performance standards are relative to SF105 and could change with a new oil. A 2 drum pilot batch is available for testing to compare to 1006-2. The selected Group 1 basestock should be available for the foreseeable future. The new oil will get a new designation since it is a new oil. Separate efforts to improve the repeatability of elastomer test methods ongoing.
- 7.0 New Business
 - 7.1 Greg Shank asked about volatility test availability. Shawn spoke for Josh Frederick. Josh indicated that the volatility concerns doesn't really affect HD. Test is in operation. People are running D5800. TMC monitoring will start for D5800. Chairman will make sure topic is covered at the next meeting.
- 8.0 Next meetings
 - 8.1 The next meeting will be at the call of the chairman or during ASTM in Houston December 2017.
- 9.0 The meeting was adjourned at 2:02 pm.

DRAFT - AGENDA
D02.B0.02.1
Heavy-Duty Engine Oil Classification Panel
Tuesday, June 27, 2017 1:30pm EDT
Sheraton Boston Hotel - Commonwealth Room
Boston, Massachusetts USA

- 1) Call to Order**
- 2) Minutes** – Approval of Minutes from March 28, 2017 Meeting in Rosemont, Illinois, USA
- 3) Membership**
 - a) Review current panel membership
- 4) Existing tests/categories**
 - a) Review of status of carry-over engine tests that support API CK-4, FA-4 and legacy categories (Sean Moyer, TMC)
 - b) CAT Oil Aeration Test (Hind Abi-Akar, CAT)
 - c) Daimler Surveillance Panel - build workshop update (Patrick Joyce, Lubrizol)
- 5) Old Business**
 - a) Replacement of TMC 1006 reference oil (Brent Calcut, Afton)
- 6) New Business**
- 7) HDEOCP Adjournment (transition to DEOAP)**

HDEOCP Attendance: June 27, 2017

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HDEOCP Attendance: June 27, 2017

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HDEOCP Attendance: June 27, 2017

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D02.B0.02.1 HDEOCP

Shawn Whitacre

Chairman

Heavy-Duty Engine Oil Classification Panel

June 27, 2017

Boston, MA USA



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- **For a complete list of standards see**
<http://www.astm.org/COMMIT/SUBCOMMIT/D02B0.htm>



ASTM-HDEOCP Membership

Oil and Additive Companies		OEMs	
1	Shawn Whitacre - Chevron	1	Greg Shank – Volvo Power Train
2	Mike Alessi- ExxonMobil*	2	Ryan Denton - Cummins Inc.
3	Dan Arcy - Shell	3	Mesfin Belay - Detroit Diesel
4	Corey Taylor - BP Castrol	4	Hind Abi-Akar - Caterpillar Inc.
5	Josh Frederick - Valvoline	5	Heather DeBaun – Navistar
6	Mary Dery- BASF	6	Ken Chao - John Deere
7	Don Smolenski - Evonik	7	Eric Johnson- GM Powertrain
8	Cory Koglin – Afton	8	Jason Andersen- Paccar
9	Robert Stockwell - Oronite	9	Ron Romano - Ford
10	Gail Evans – Lubrizol**		
11	Robert Salgueiro - Infineum U.S.A.		
12	David Taber - Phillips 66 Lubricants		
13	<i>Rodney Walker, Safety-Kleen (?)</i>		

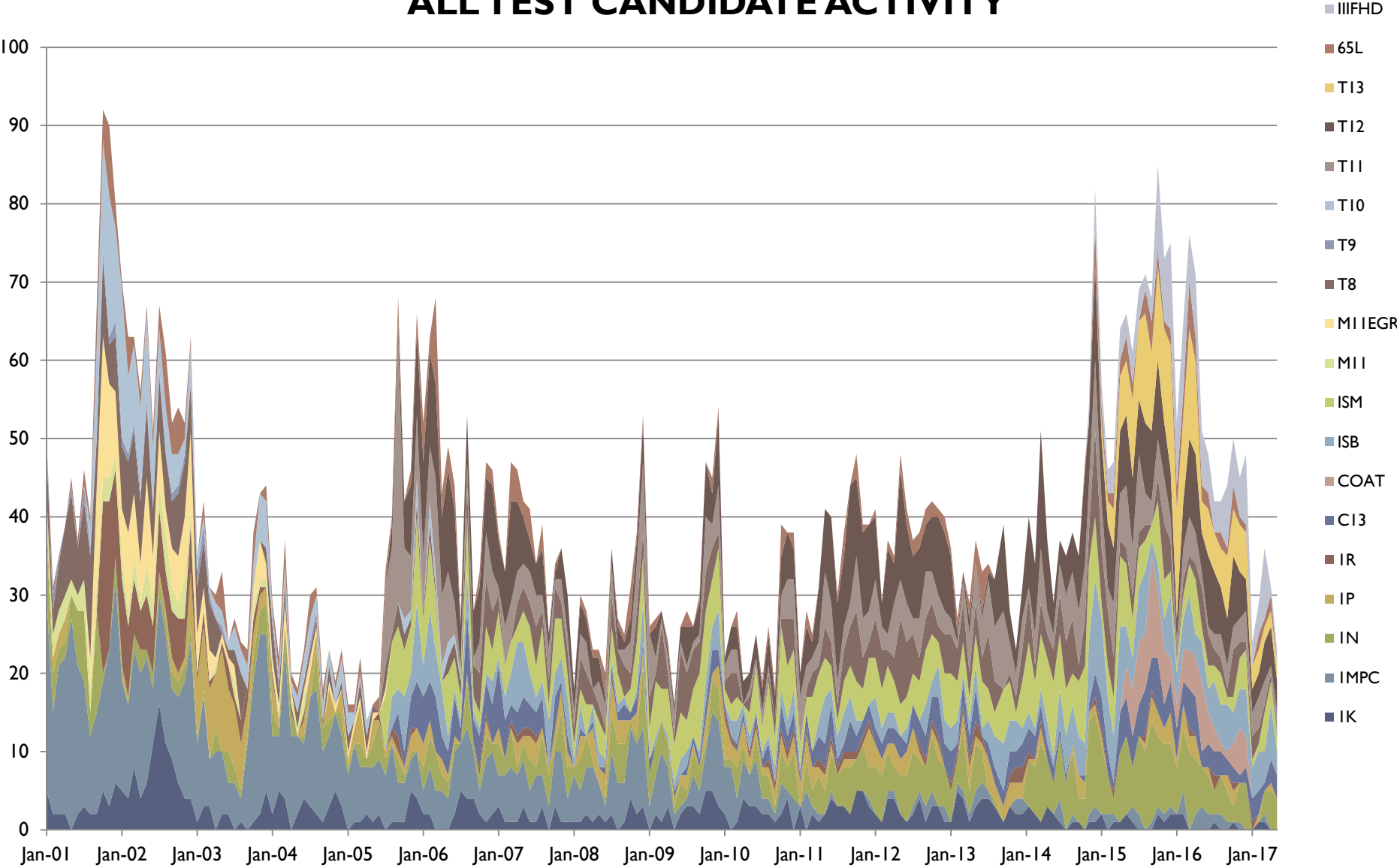
* Gordon Lee (EM) has proxy

** Dave Duncan (LZ) has proxy

D02.B0.02 Maintenance Report

June 2017

ALL TEST CANDIDATE ACTIVITY



Calibrated Labs and Stands*

Test	Labs	Stands
IK	1	1
IN	4	5
IM-PC	1	1
IP	1	1
IR	0	0
C13	4	4
ISB	3	5
ISM	5	5
EOAT	1	1
RFWT	2	2
T-8/E	2	3
T-11	4	5
T-12/T-12A	4/4	6/6
T-13	5	7
COAT	0	0
DD13	3	4

*As of 03/31/2017

Availability of API CH-4 through CJ-4 Tests for PC-11

Test	Hardware Issues	Availability Through 2020	Notes
Cat IK/IN	Auxiliary components	Likely	1980's vintage engine. Ongoing resolution of issues with auxiliary stand and miscellaneous components.
Cat IP/IR	Crankshaft	Likely	1990's vintage engine. Crankshaft can be ordered with a 6-8 week lead time.
Cat C13	New liners	Likely	<p>Engine block, injectors, turbos only available through reman.</p> <p>Liners with new material and processing but same specs will be shipped late summer 2017. Coordinated references anticipated fall 2017.</p>



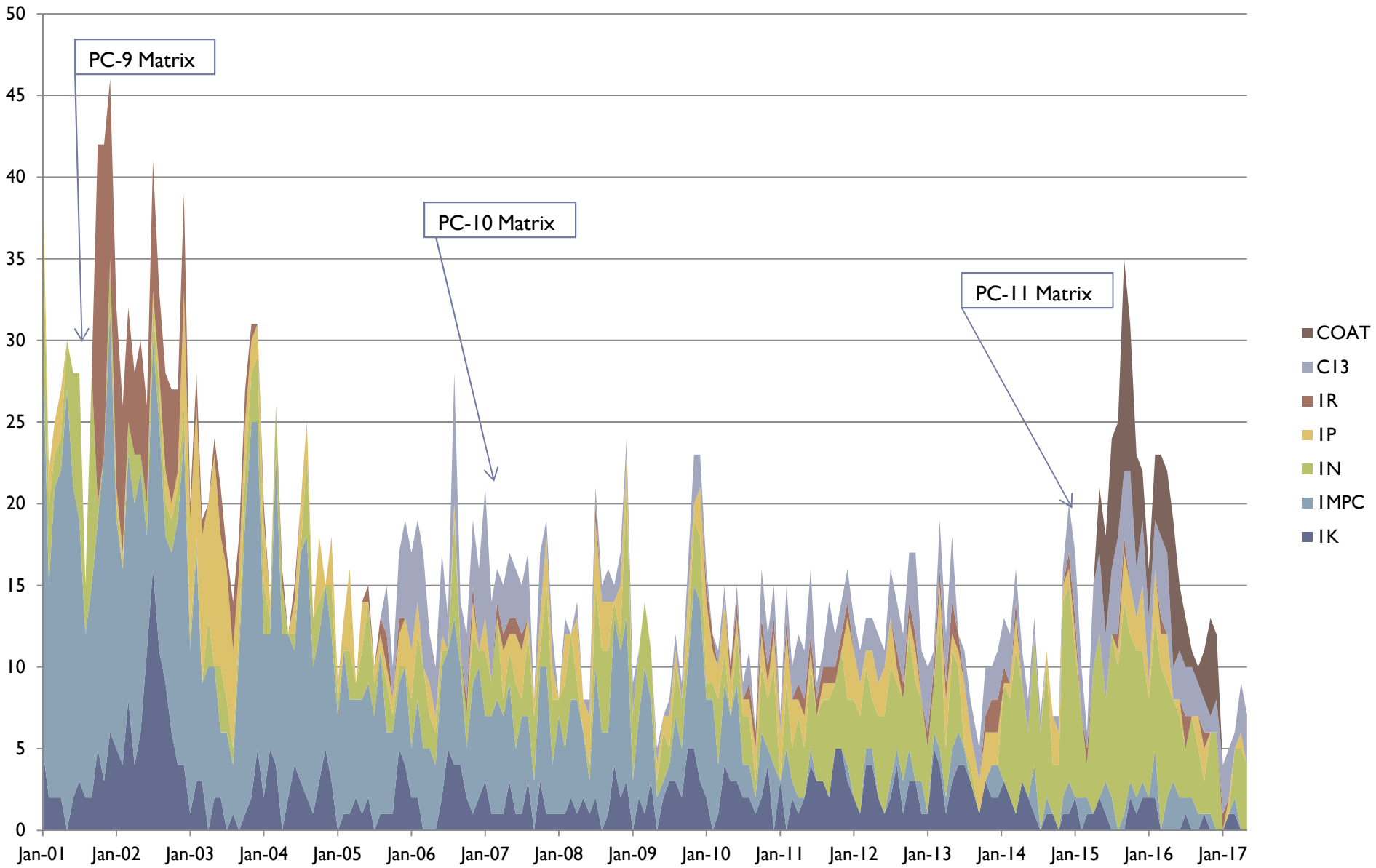
Additional Caterpillar Test Issues

➤ **Caterpillar Oil Aeration Test**

- Test is available for candidate testing. New batched oil filters introduced. Ongoing work to refine procedure for flow meter calibration.



CATERPILLAR CANDIDATE ACTIVITY

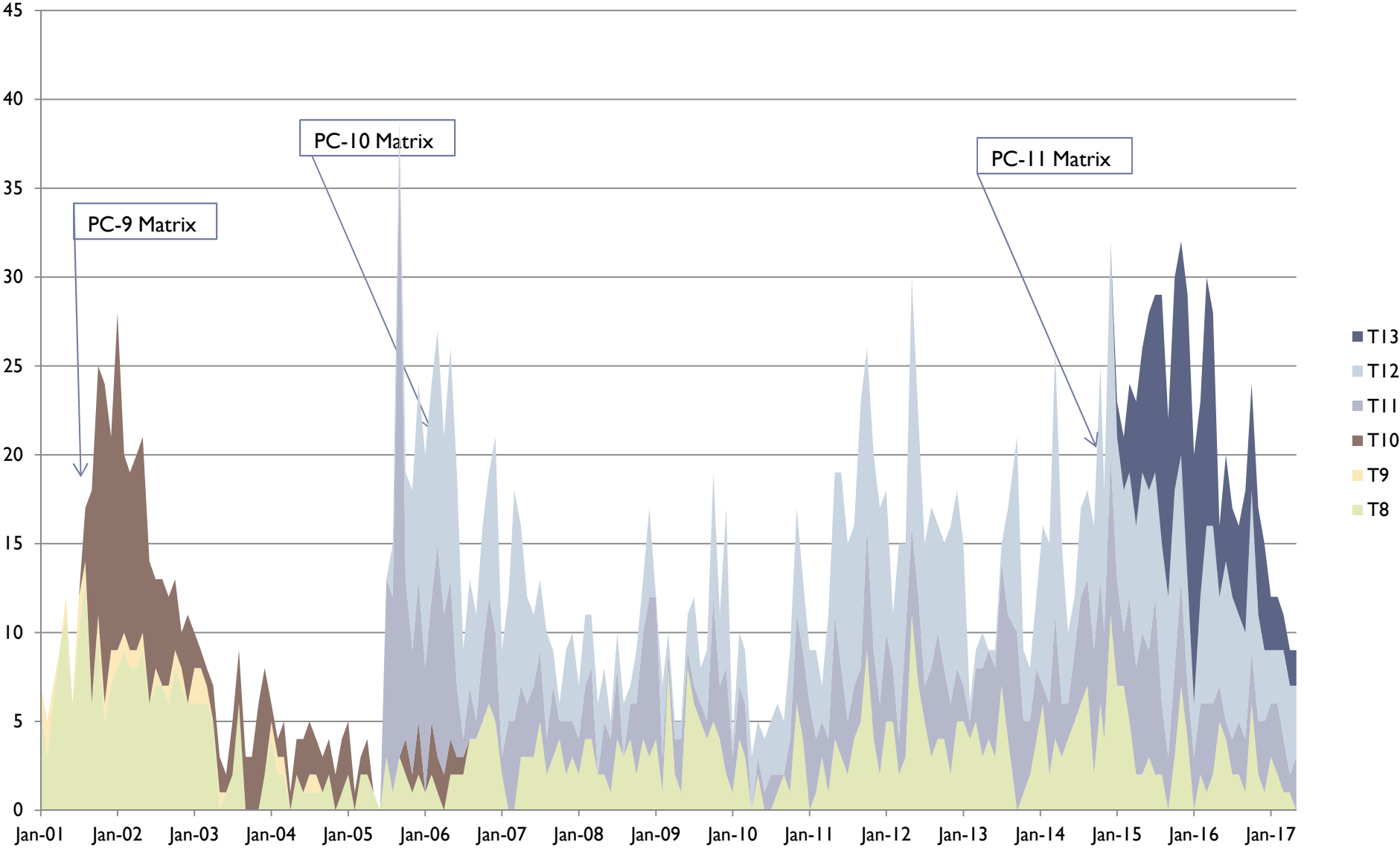


Availability of API CH-4 through CJ-4 Tests for PC-11

Test	Hardware Issues	Availability Through 2020	Notes
Mack T-11	Oil Consumption	Likely	<p>Engine production ended 2006. Finite number of engine blocks.</p> <p>Engine build life issues with oil consumption.</p>
Mack T-12	Oil Consumption, head gasket	Likely	<p>Engine production ended 2006. New ring batch introduced February 2017 and updated correction factor. Low demand.</p>



MACK CANDIDATE ACTIVITY

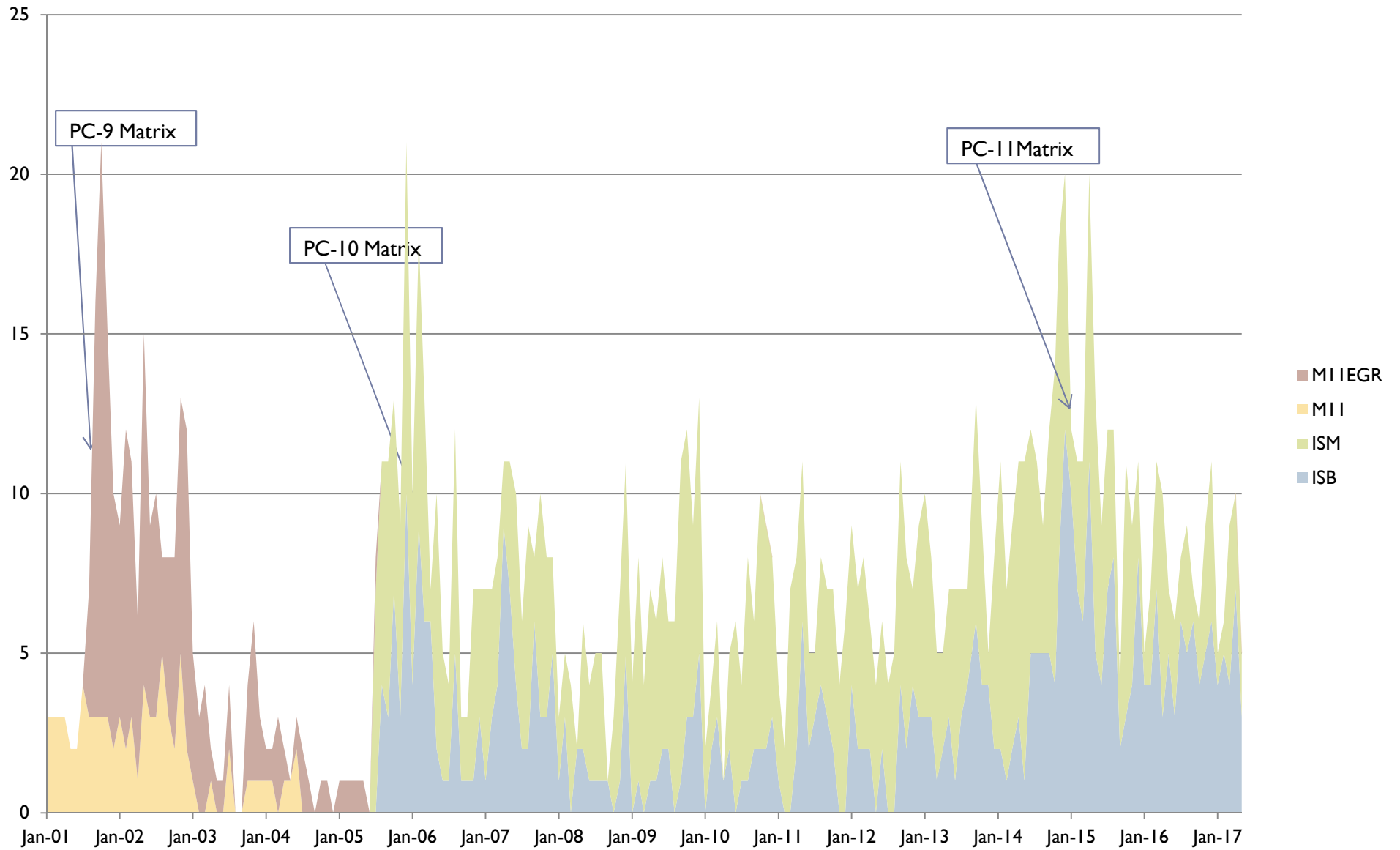


Availability of API CH-4 through CJ-4 Tests for PC-11

Test	Hardware Issues	Availability Through 2020	Notes
Cummins ISM	No current issues	Likely	Cummins is looking at backwards-compatible development using ISX. New batch of reference oil to be introduced fall of 2017.
Cummins ISB	No current issues	Likely	Surveillance panel currently examining tappet weight loss severity, pushrod socket end variability and LTMS updates.



CUMMINS CANDIDATE ACTIVITY



Availability of API CH-4 through CJ-4 Tests for PC-11

Test	Hardware Issues	Availability Through 2020	Notes
RFWT	No current issues	Likely	<p>Long term supply of test parts at CPD.</p> <p>6.5 L engine no longer in production at AM General, but available through supply network. More runs on existing blocks. Injection pump still available.</p>
Seq IIIF/IIIG	Hardware depletion Dec 2016	No	<p>Hardware depletion projected 4Q 2017. IIIH to IIIG limits have been defined by industry. Possible 3Q 2017 IIIH to IIIF.</p>
EOAT	Using last known hardware	No	<p>Oil temperature runs higher with last known EOAT engine. No official EOAT to COAT correlation defined.</p>

B2 Action Items

- **No Action Items**
- **Comments**



COAT Update HDEOCP

HIND ABI-AKAR

CATERPILLAR INC

BOSTON, JUNE 27, 2017

COAT Reinstated for Candidate Oil Testing

Surveillance Panel Chair sent an electronic letter to Joseph Franklin, ASTM D02.B0 Chairman:

On May 31, 2017 the Caterpillar Surveillance Panel voted to reinstate “Candidate Oil” testing in the COAT (Caterpillar C13 Oil Aeration Test) after reviewing the results and operational data from an 11 test matrix run on the reference oils TMC832 and TMC833 by the 3 engine test labs.

The following changes were implemented prior to running the 11 reference oil tests:

- A procedure to calibrate the MicroMotion density output signal has been written and will be added to the COAT procedure.
- The engine oil filter (Caterpillar part number 1R-1808) is now a batch controlled item.
 - Caterpillar had 285 oil filters manufactured from the same roll of material and sent to TEI.
 - These filters are laser etched with the designation “COAT TEST Filter TEI Batch A-001 thru A-285”.

Sensor Calibration

As reported in March HDEOCP meeting:

- Test labs calibrated their flow meters
- TMC: additions to data dictionary (Form 6) and to the Test Summary page (Form 4):
 - FDM RTD temperature of the last valid reference test – value is useful for candidate tests to verify that the RTD temperature of the current test is consistent with the reference test.
- A calibration occurs during each Reference Test
 - Guidelines on various parameters (density, DAQ's gain and offset, alarms, etc) were developed.

Introducing New Filters

Batch controlled oil filters, Cat 1R-1808, designation “COAT TEST Filter TEI Batch A-001 thru A-285”.

Matrix for introduction of the new filters:

	Lab		
Run #	A	B	G
1	833	832	832
2	832	833	833
3	832	833	833
Additional	833	832	

Operational parameters of the tests were reviewed.

Statisticians Report to SP, May 25, 2017

Statisticians met to discuss COAT correction factors and standard deviation calculations for LTMS

- Elisa Santos, Jim Rutherford, Martin Chadwick, Kevin OMalley, Sean Moyer, Abaigeal Ritzenhaler, Todd Dvorak, Travis Kostan

Conclusion based on analysis and statistical models of the test matrix was:
No changes to the current standard deviations were required

40 – 50 hour Average Aeration, Percent		
Reference Oil	Mean	Standard deviation
832	10.67	0.203
833	11.94	0.285

THANK YOU



RO-1006 Replacement

Brent Calcut
June 2017

Passion for Solutions™

Background

- ▶ TMC Reference Oil 1006 was originally introduced in 1997 as an ILSAC GF-2 category reference oil
- ▶ Two subsequent batches were made to support industry reference testing, RO 1006-1 and RO 1006-2
- ▶ RO 1006 cannot be reblended because the Group I basestock used in the formulation is no longer in production



Current Status

1006-2 Status

- ▶ TMC Inventory of 1006-2 is at 1800 gallons
 - It can not be re-blended (Group I basestock not available)
- ▶ 1.0-year usage
 - SF105 238 gallons
 - Specified in ASTM D471 & GM Standards
 - EOEC/LDEOC 264 gallons
 - IVA/VG/VIII 60 gallons
 - Total 562 gallons
- ▶ Estimated Life >24 months

Test Monitoring Center
<http://www.tmc.com>



Project Scope

Replacement for RO 1006-2 needed for the following:

- ▲ Heavy Duty Engine Oil Elastomer Compatibility
- ▲ Light Duty Engine Oil Elastomer Compatibility
- ▲ ASTM D471 – Service Liquid 105
- ▲ SAE J2643 – Service Liquid 105
- ▲ Several OEM elastomer specifications

Other stakeholder notification and agreement

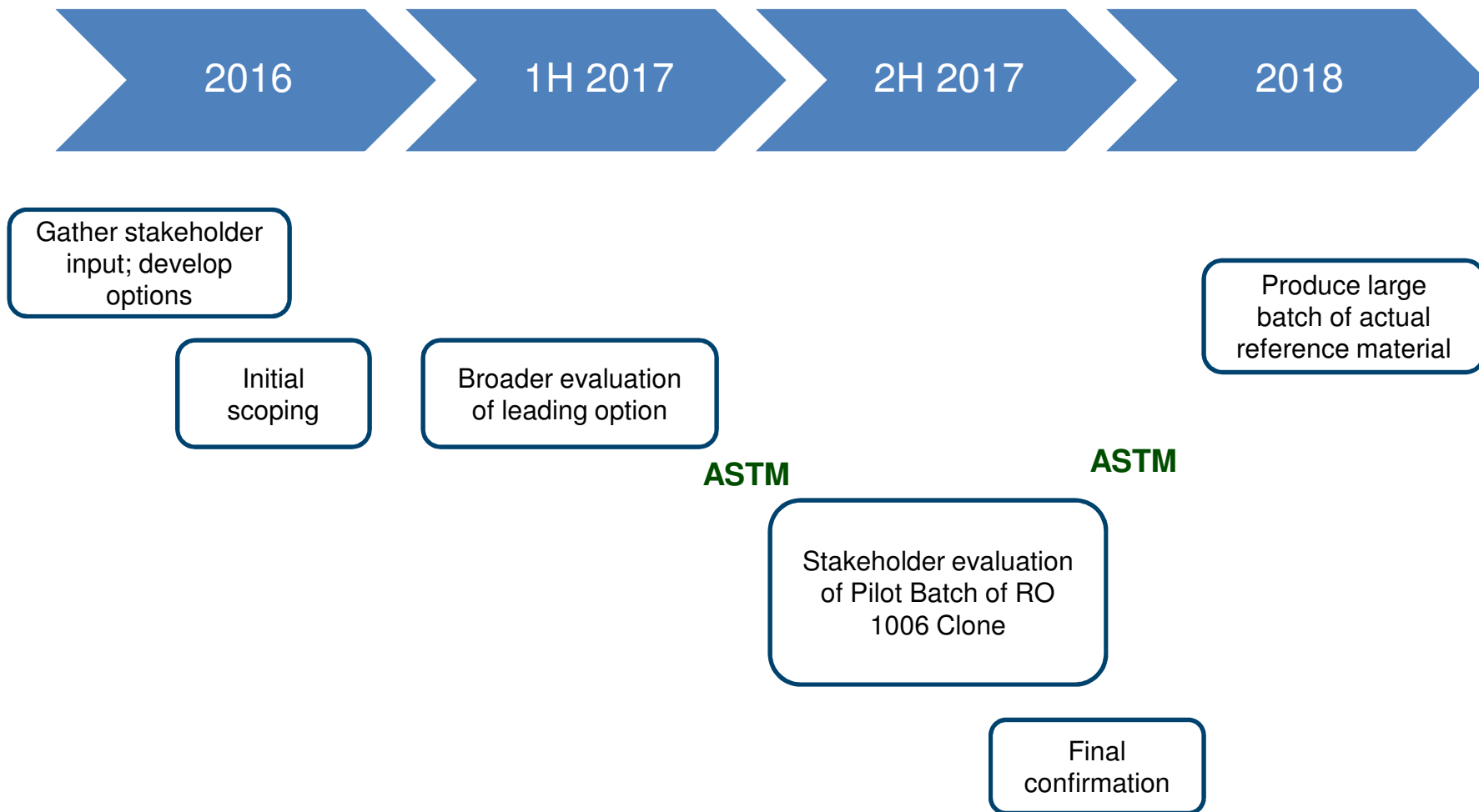
- ▲ OEM, elastomer experts, SAE USCAR and ASTM D11
- ▲ Replacing SF 105 is a fairly disruptive event
- ▲ SF 105 is the only engine oil in many elastomer standards
- ▲ Some performance requirements are set relative to SF 105

Progress Summary

- ▲ Replacements were scoped and a candidate selected
- ▲ Two drum pilot batch available through TMC
 - ▲ Contact Amanda Darcy (412-365-1022) and request “SFPILOT”
 - ▲ 44 gallons remaining
- ▲ Stakeholder decision requested by end of 2017
- ▲ RO 1006-2 usage is slowing – no major urgency
- ▲ Large batch blend expected in 2018



Timeline



Final Thoughts

- ▲ The selected Group I replacement basestock is expected to be available for the foreseeable future
- ▲ RO 1006 Clone will be assigned a new TMC code
- ▲ Several specifications will require updating
 - ▲ ASTM D11 will need to update D471 and assign a new SF#
 - ▲ SAE USCAR will need to update J2643
 - ▲ OEMs will need to update their specifications
- ▲ Separate efforts continue to improve r&R
- ▲ Task Force will continue efforts to set fixed limits in HDEOEC





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