HEAVY-DUTY ENGINE OIL CLASSIFICATION PANEL

OF

ASTM D02.B0.02

June 21, 2005

Pittsburgh Hilton Hotel – Pittsburgh, PA

ACTION ITEMS

1. Request "B" ballot of D4485 for using ISM results as an alternative to M-11EGR.	**McGeehan**
2. Request "B" ballot of D4485 for using T-10 results in lieu of T-9 results.	**McGeehan**
3. Send letter to API requesting input on the T-10 for T-6 issue.	**McGeehan**
4. Form Sulfated Ash Task Force.	**HDEOCP**

MINUTES

1.0 Call to Order

1.1 The Heavy Duty Engine Oil Classification Panel (HDEOCP) was called to order by Chairman Jim McGeehan at 1:10 p.m. on Tuesday, June 21, 2005, in Grand Ballroom 4 of the Pittsburgh Hilton Hotel. There were 20 members present or represented and approximately 56 guests present. The attendance list is shown as Attachment **2**.

2.0 Agenda

2.1 The published agenda (see Attachment **1**) was reviewed. Review of the ISM was requested during the matrix test status reports and agreed upon.

3.0 Minutes

3.1 The minutes of the March 31, 2005 meeting were approved as issued.

4.0 Membership

4.1 There were no membership changes.

5.0 C13 1st Round Results

5.1 Tom Franklin and Abdul Cassim presented the results from the first six C13 matrix tests. See Attachment **3**.

5.2 Jim Rutherford presented his statistical analysis of the C13 testing thus far. See Attachment **4**. At this time, there is statistically significant discrimination between oils of interest, on oil consumption, but not on piston deposits.

5.3 Abdul Cassim moved that C13 matrix testing continue, seconded by Greg Shank. The motion passed with 18 for, 0 against, 0 abstain

6.0 PC-10 Matrix Status

6.1 John Zalar reported on the status of PC-10 matrix tests, along with projected matrix completion dates. See Attachment **5**. There have been aborted tests in each of the test types, delaying their projected matrix completion dates. Of most significance overall, the C13 abort occurred in a proposed 4 run matrix stand at a lab that has both a 4 run stand and a 3 run stand. If that stand could be switched to the 3 run designation, then no overall matrix completion time would be lost. The C13 Surveillance Panel and statisticians should consider this possibility.

7.0 ISM Merit System

7.1 Jim Rutherford presented a proposed "merit" system for use with the ISM in PC-10. See Attachment **6**. The "anchor" points shown were arrived at in consultation with Cummins and are intended as initial proposals.

8.0 PC-10 Program Timeline

8.1 Bill Runkle presented the current PC-10 timeline (Attachment **7**) which shows API first licensing occurring in early 2007. The ACC analysis of time required after matrix completion is shown as Attachment **8**.

9.0 Sulfated Ash

9.1 Bill Kleiser presented concerns with method D874 and sulfated ash limits for PC-10. See Attachment **9**. Discussion from the floor indicated this matter was already thoroughly discussed by the Chemical Limits Task Force and no better solution found, but Sub-Committee 3 has not yet been asked to refine D874. Jim McGeehan showed D874 results he had obtained from 3 labs on the same oil. See Attachment **10**.

9.2 Bill Kleiser moved and Greg Shank seconded that a task force be formed to develop an improved procedure for obtaining "bias free" D874 sulfated ash results. The motion passed with 16 for, 1 against and 1 abstain.

10.0 Exit Ballot Review

10.1 Jim McGeehan displayed the ISM for M-11 EGR exit ballot results. See Attachment **11**.

10.1.1 Lew Williams and Phil Scinto presented the reasons for their negative vote on the proposed ISM limits for demonstrating M-11 EGR equivalency. See Attachment **12**. Lubrizol and Cummins feel the balloted crosshead wear limits would let oil 1004 pass most of the time and are thus, too mild. Lew indicated Lubrizol would drop their negative if the crosshead wear limits were revised to values which oil 1004 would not likely pass. Lew moved and Dave Stehouwer seconded a proposal that the ISM crosshead wear limits, to qualify an oil as passing the M-11 EGR, be established at 6.7 for one test, 7.37 for two tests and 7.67 for three tests. After much discussion those 1, 2 & 3 test limits were revised to 7.5, 7.8 & 7.9. The revised motion passed with 18 for, 0 against, 0 abstain.

10.2 Jim McGeehan displayed the 13% Noack exit ballot results. See Attachment **13**.

10.2.1 Although there were no negatives, there was some discussion on why the 10W-30 grade is allowed up to 15% and not all 10W-X grades.

10.3 The T-10 for T-6 exit ballot results were shown, see Attachment **14**.

10.3.1 Bill Kleiser stated that since there is no direct data available for the same oil in both tests, there is no technical justification for establishing a correlation. He then moved that we do not have an established correlation between the T-10 and T-6. Robert Stockwell seconded the motion, which failed with a 2 for, 4 against,

12 abstention vote. A letter will be sent to API, requesting their position on the T-10 for T-6 issue.

10.4 The T-10 for T-9 exit ballot results were shown, see Attachment **15**. There was no discussion.

10.5 Exit Ballots, General

10.5.1 Tom Cousineau raised the issue of significant digits used in the ISM exit ballot limits. Charlie Passut moved and Dave Stehouwer seconded that oil filter delta pressure (OFDP) and sludge rating limits be rounded as follows: OFDP to 55, 67, 74 for 1, 2 & 3 tests; Sludge to 8.1, 8.0, 8.0 for 1, 2 & 3 tests. The motion passed unanimously, via voice vote.

10.5.2 Tom Cousineau has requested that all exit ballot tally sheets and comments be incorporated in future HDEOCP minutes.

10.5.3 ISM limits will be balloted in Sub-Committee B, for inclusion in D4485 as an alternative to the M-11 EGR.

10.5.4 For completeness, Exit ballot results for the ISB and T-12 matrix readiness are included as Attachments **18** and **19**.

11.0 Valve Train Wear Task Force

11.1 Heather Kelly reported on the VTWTF efforts to date. See Attachment **16**.

12.0 Oxidation Test

12.1 Jim McGeehan reviewed a chart of potential PC-10 tests (see Attachment **17**) and in particular the Sequence IIIF & IIIG tests. EMA agreed to not consider the IIIF test for PC-10 and they may be able to decide on the oxidation requirements by the September meeting.

13.0 Other Business

13.1 Patrick Lai announced that the 6V92 test may soon become unavailable and thus put the CF-2 category in jeopardy.

13.2 Doug King of Dupont was introduced as the new “Vamac” contact.

14.0 Next Meeting

14.1 The next meeting will likely be held toward the end of September, probably in Chicago.

15.0 Adjournment

15.1 The meeting was adjourned at 4:29 p.m.

Submitted by:

Jim Wells
Secretary to the HDEOCP

ATTACHMENT 1

Final Agenda
ASTMSECTION D.02.BO.02
HEAVY-DUTY ENGINE OIL CLASSIFICATION PANELS

Hilton Pittsburgh & Tower; Pittsburgh, PA
Tuesday June 21 2005
1:00pm-5:00 pm

Chairman/ Secretary: **Jim Mc Geehan/Jim Wells**
Purpose: **PC-10**

Desired Outcomes: **Complete PC-10 on time**

TOPIC	PROCESS	WHO	TIME
Agenda Review	• Desired Outcomes & Agenda	Group	1:00-1:10
Minutes Approval	• March 31st 2005	Group	1:10-1:20
Membership	• Changes: Additions	Jim Mc Geehan	1:20-1:30
Caterpillar C13 Task-Force report	• Results of first seven tests in C13 as required by HDMO panel	Tom Frankline	1:30-2:00
Matrix Status	• Cummins ISB; Mack T-12; Caterpillar C13. • Results to date • Timing of completion	John Zalar (Program Manager)	2:00-2:30
Program Timing	• Technology Demonstration and limits; Minimum Product Qualification Interval and API Licensing.	Bill Runkle	2:30-3:00
Sulfated Ash	• Precision of ASTM D 874: issues	Bill Kleiser	3:00-3:15
Exit Criteria Ballots	• Mack T-10 to Mack T-9 limits (20 affirmative and 0 negatives) • Mack T-10 to Mack T-6 limits (19 affirmative and one negative: Oronite Orointe negative) • Cummins M11 EGR to Cummins ISM limits (19 affirmative and 2 negative: Cummins and Lubrizol negative votes) • Results of SAE 10W-30 Noack volatility	Jim Mc Geehan Bill Kleiser Lewis Williams David Stehouwer Jim Mc Geehan	3:15-4:15
Status of Cummins M11 EGR test	• Labs position on testing in M11 EGR or ISM	Group	4:15-4:30
VTW Task Force Report	• Report Status	Heather DeBaun	4:30-4:45
PC-10 Test Summary	• List tests: • IIIF/IIIG or Mack T-12	Jim Mc Geehan	4:45-5:00

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Caterpillar C13 Test Matrix Update

Phase 1 Tests: 7 Tests authorized

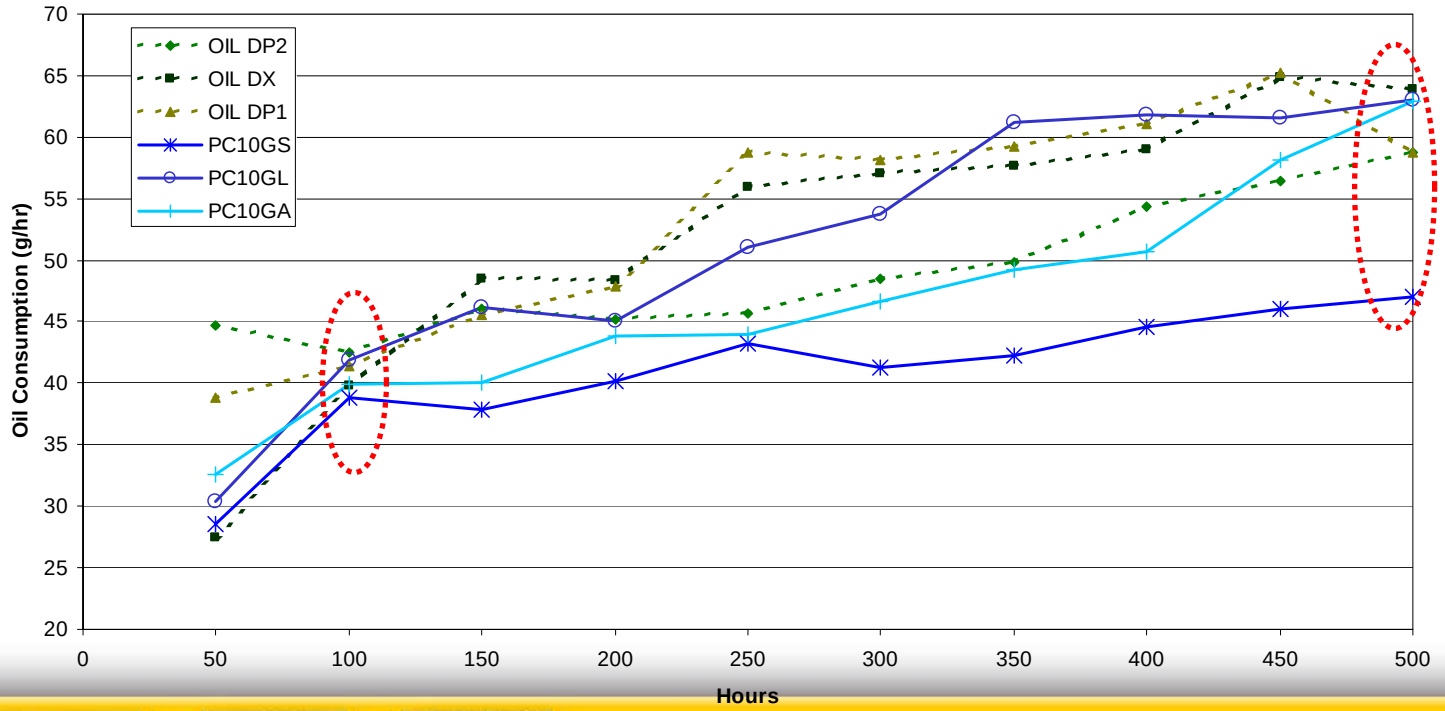
1. 8 Tests started
2. 1 Test Aborted
3. 6 Completed
4. First round completed by June 22.

ATTACHMENT 3, 1 OF 9




C13 Test Status

1. Oil PC10G - 3 tests included in Matrix Completed
2. Oil PC10G Oil consumption repeats with Oil D tests
3. Averages of Oil Cons of Oil D and Oil G runs similar



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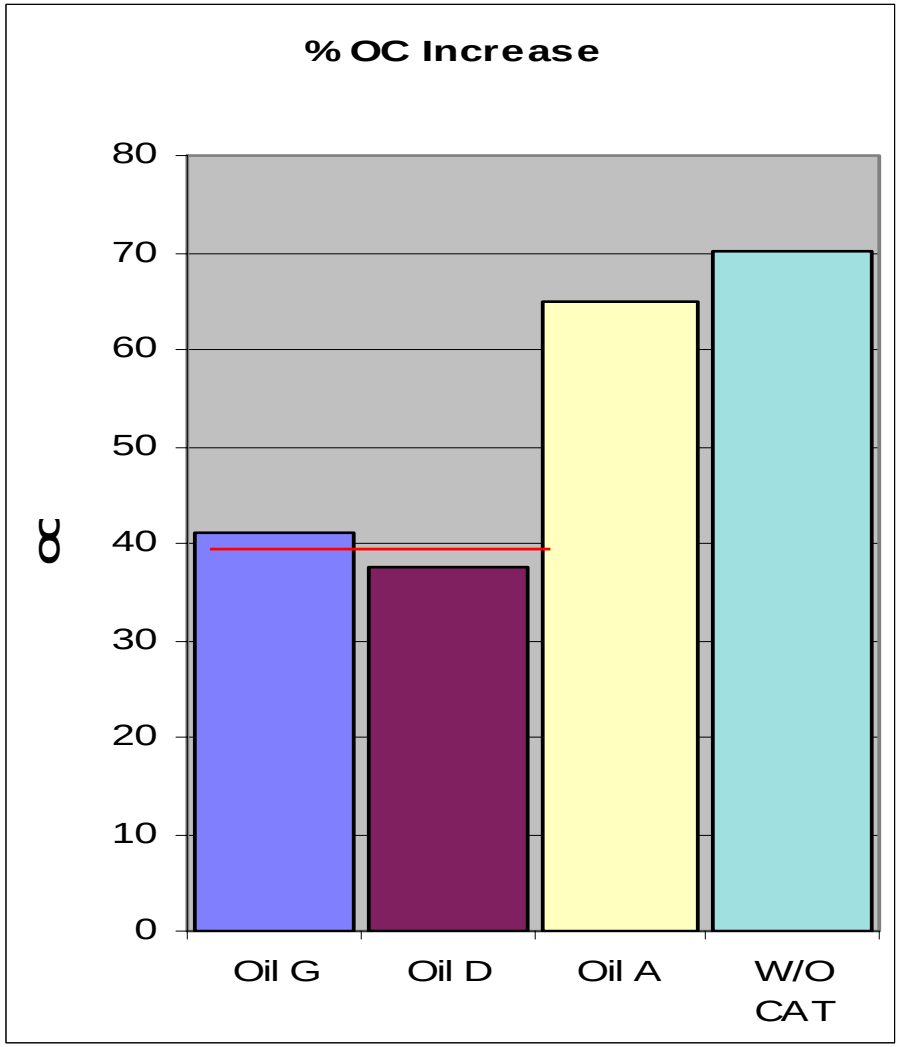
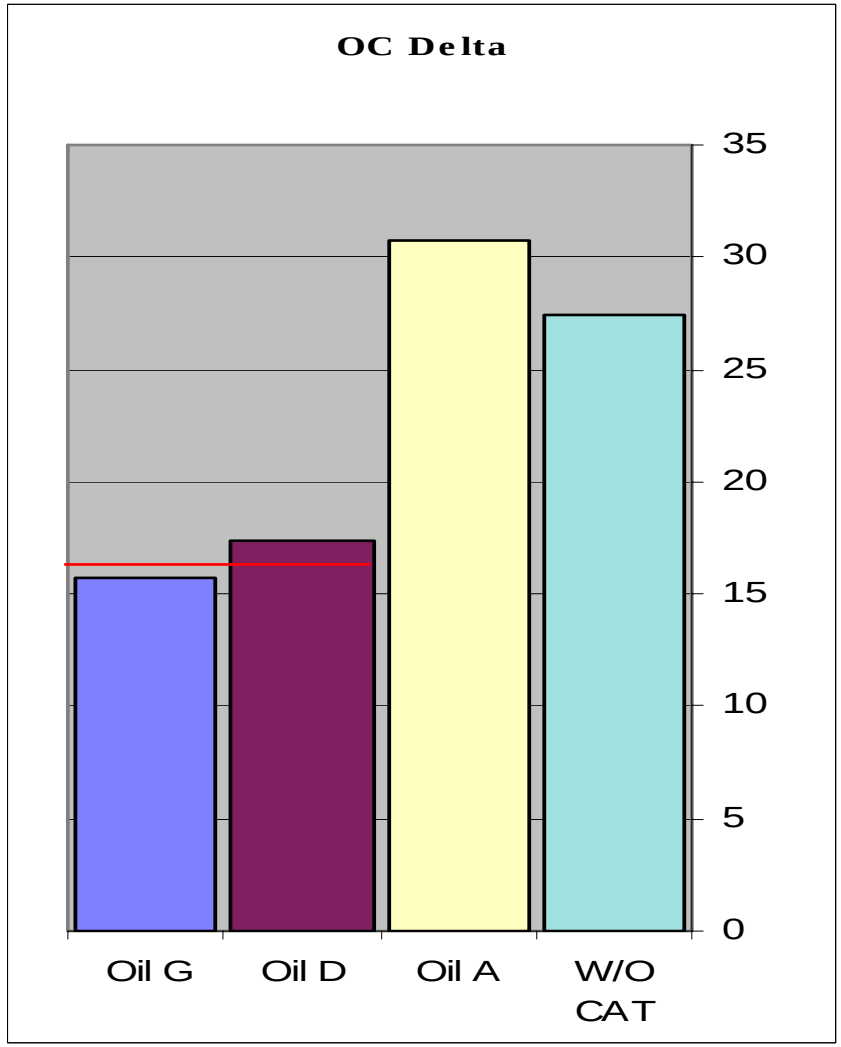
C13 Test Status





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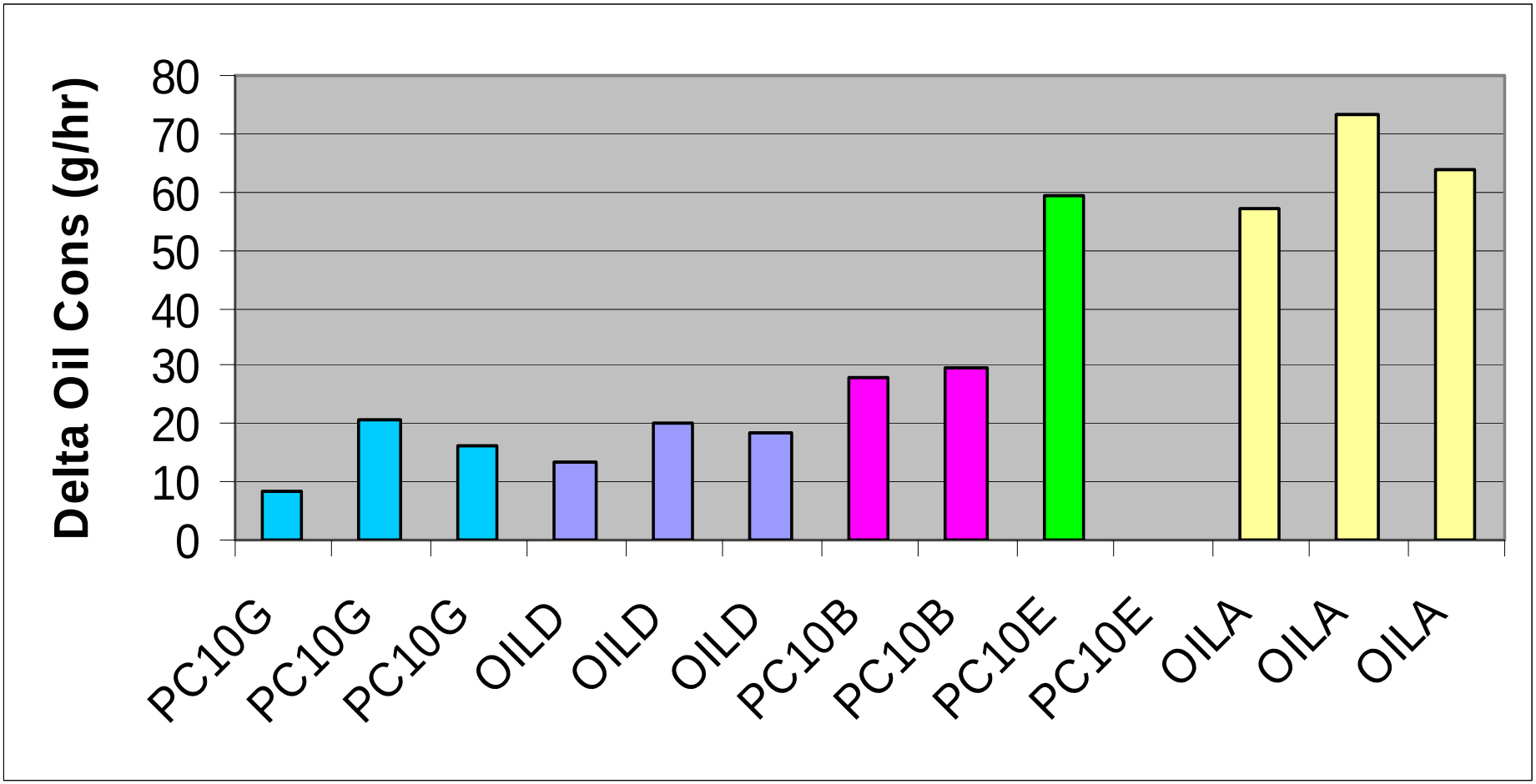
C13 Test Status



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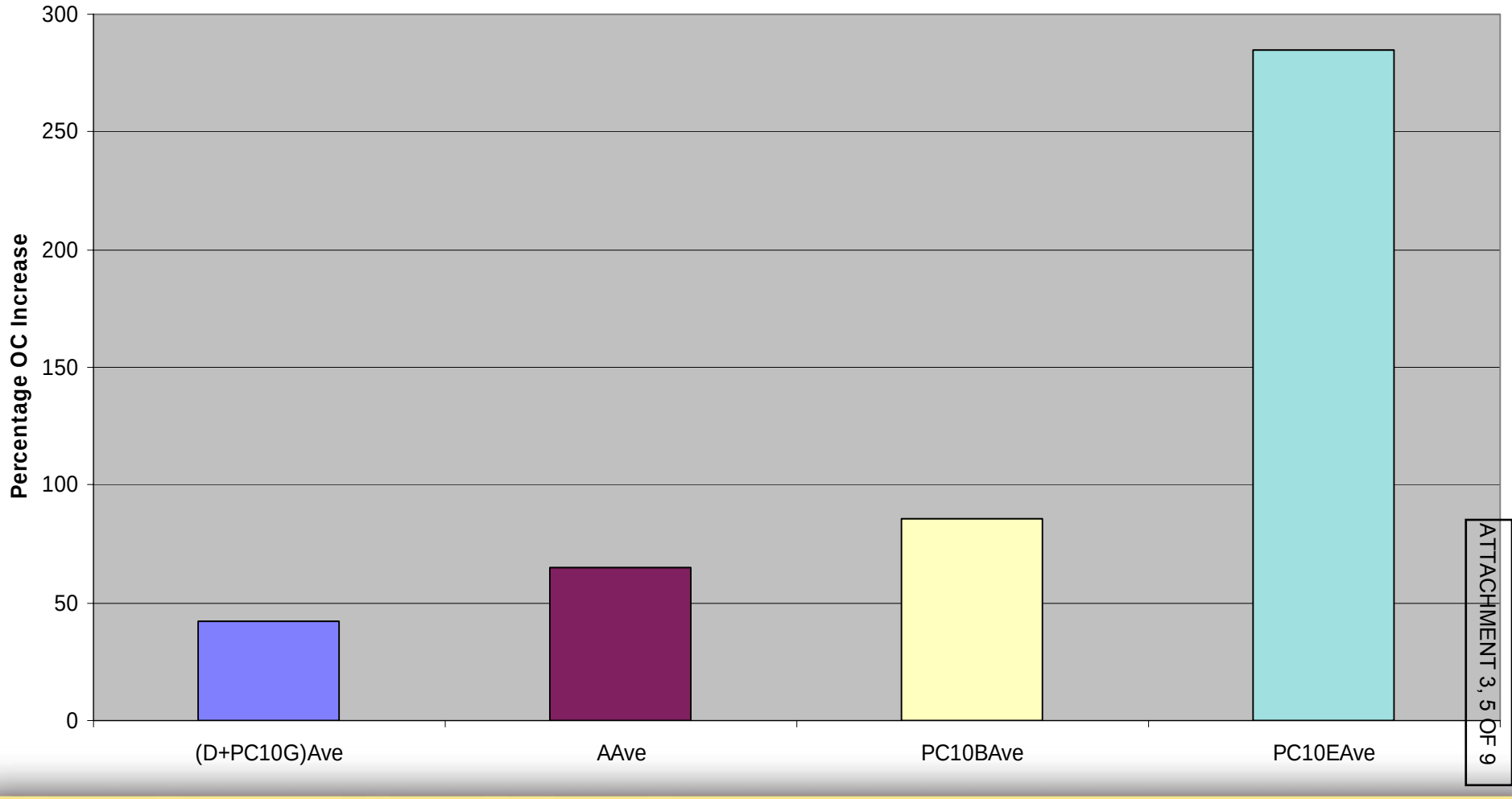
C13 Test Status

C13 Percentage Oil Cons Increase



ATTACHMENT 3, 5 OF 9

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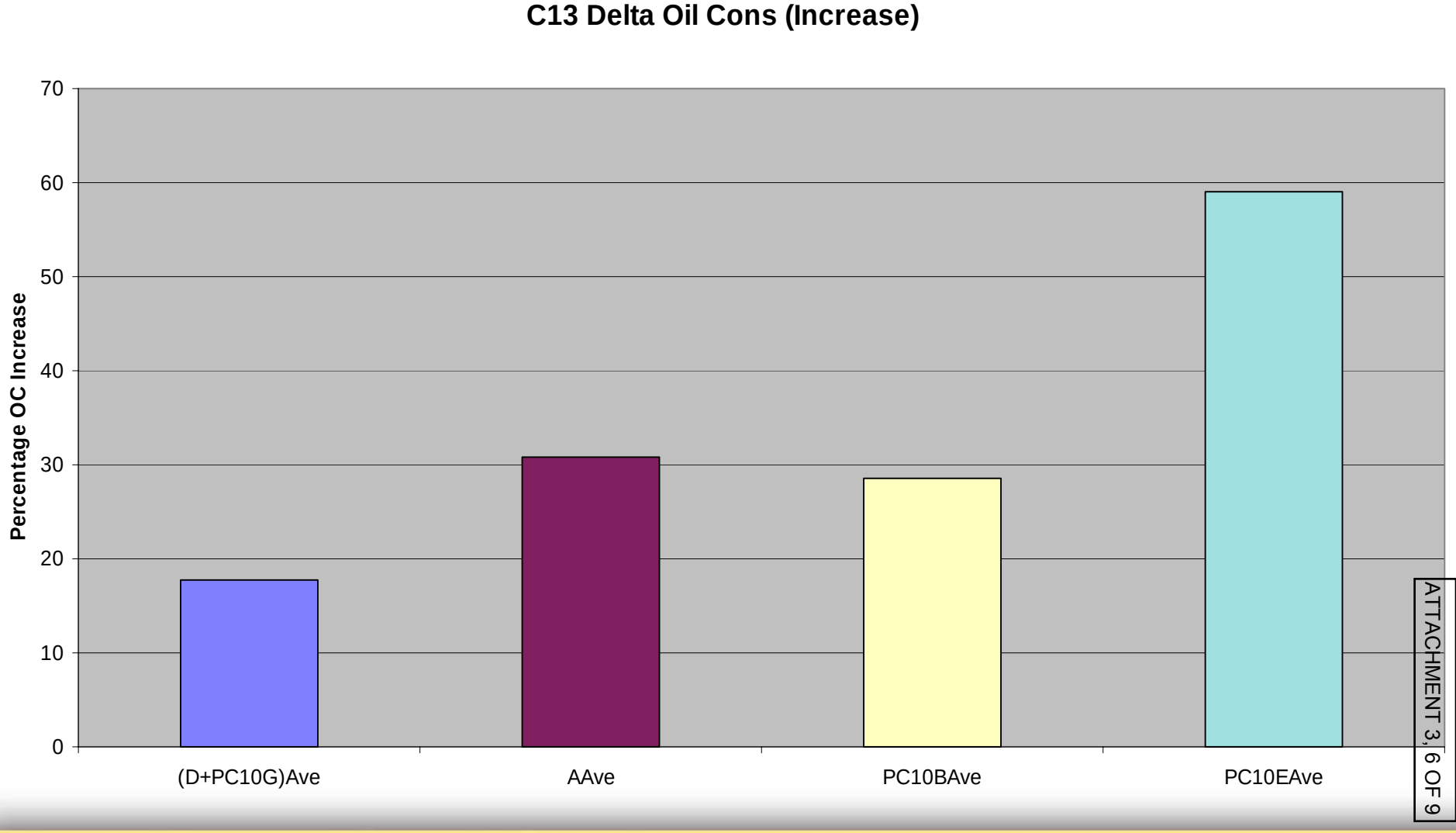


ATTACHMENT 3, 6 OF 9




CATERPILLAR®

C13 Test Status

1. Oil G and Oil D piston deposits appear similar with good repeatability/reproducibility.
2. Wait for full data package to be delivered to TMC before final conclusions can be made.
3. Need to consider PC-10 matrix oil performance




C13 Test Way Forward

1. Repeatability/Reproducibility of Oil D with PC10G with OC
2. Discrimination between Oil A and PC10G, D.
3. Discrimination between PC10G and PC10B
4. PC10B and PC10E Similar to Oil A




C13 Test Status

	Possible	Oils			
	Pass Limit	A	D, PC10G	PC10B	PC10E
Delta OC	25	F	P	F	F
OCONPINC	50	F	P	F	F
ATGC	50	F	P	P	P
ATLC	30	F	P	P	P
TGFAVG	48	F	P	P	F
ATLHC	10	F	P	P	P




Chevron ORONITE

Cat C13
First Six Tests Data Analyses

Presented to C13 Task Force
June 20, 2005

Jim Rutherford
(510) 242-3410
jaru@chevrontexaco.com

TEAM ORONITE
EMPOWERED TO EXCEL.

Summary

- **If we had to decide whether to go forward with the Precision/BOI matrix based on the first six tests plus pre-matrix tests, we would say there is significant discrimination among uncollapsed oils for Delta Oil Consumption.**

All Oils

	Discrimination p-value
ATGC	0.49
ATLC	0.24
TGFAVG	0.65
ATLHC	0.30
OCPCINC	0.01
OCDelta	0.03

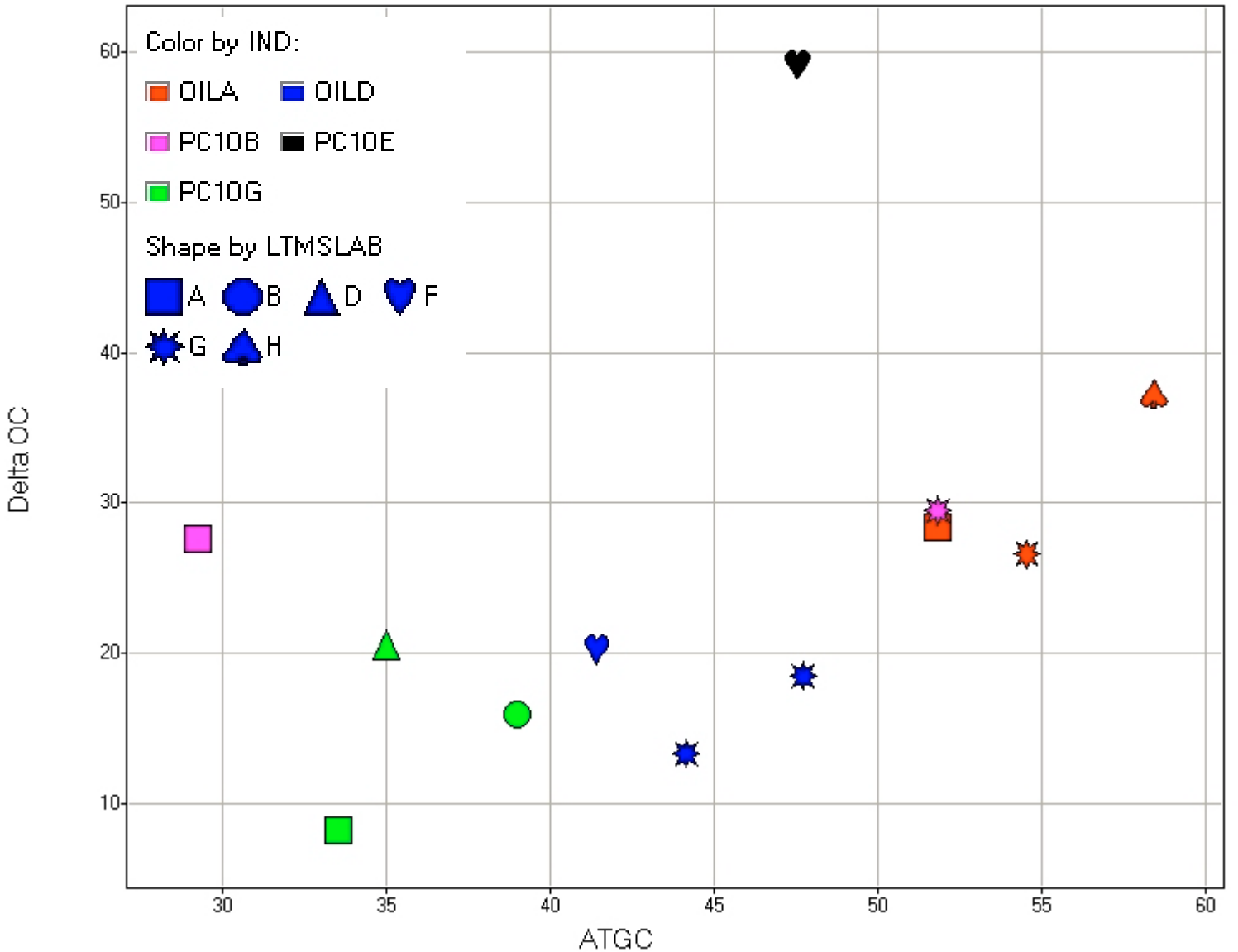
	OCPCINC	OC Delta
R^2 OC to ATGC	0.23	0.44
R^2 OC to ATLC	-0.03	0.23
R^2 OC to ATGF	0.37	0.57
R^2 OC to ATLHC	-0.19	-0.21

Collapsed Oil D and PC10G

	Discrimination p-value
ATGC	0.57
ATLC	0.36
TGFAVG	0.64
ATLHC	0.51
OCPCINC	0.01
OCDelta	0.14

Non significant: $p>0.10$
Marginally significant: $0.05<p<0.10$
Significant: $p<0.05$

ATTACHMENT 4, 3 OF 11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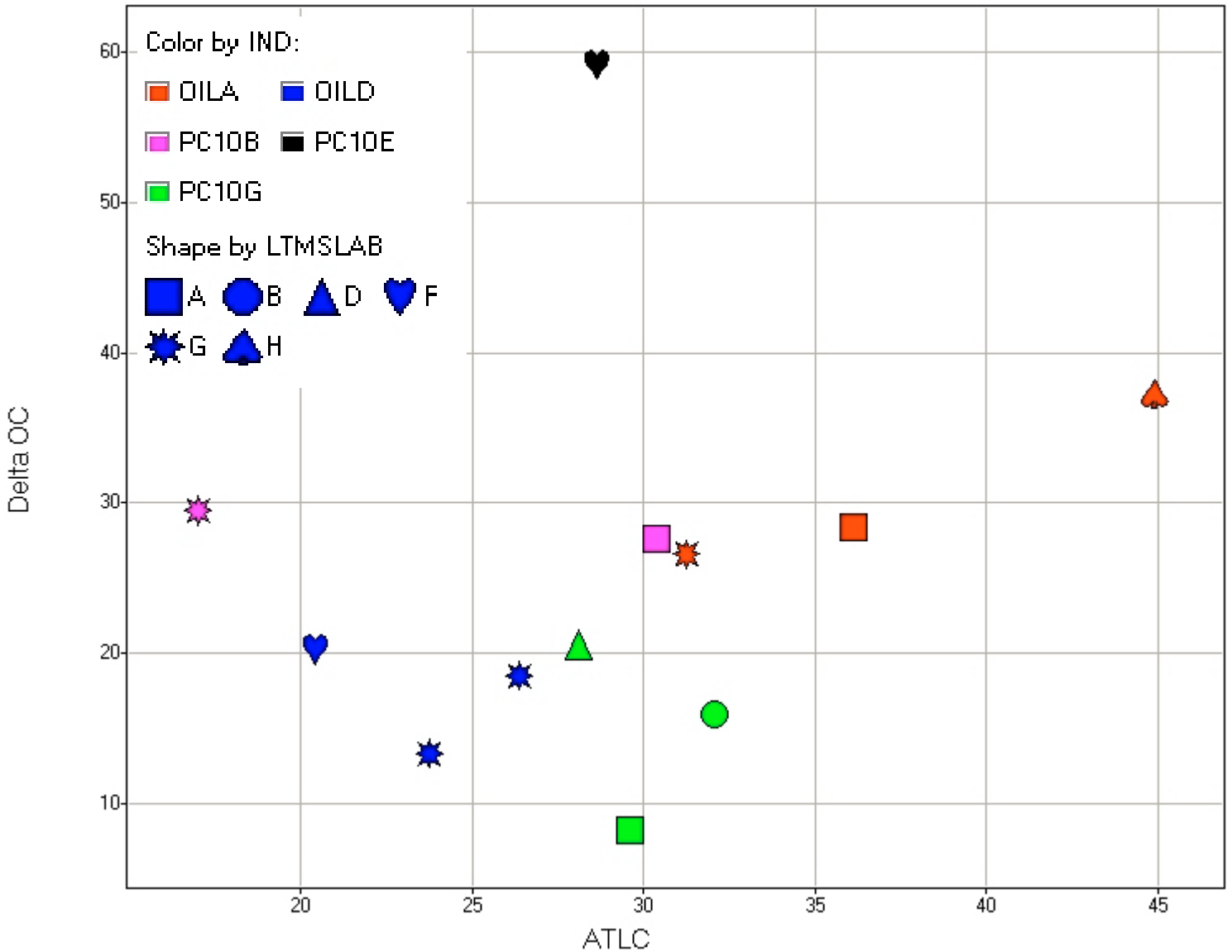
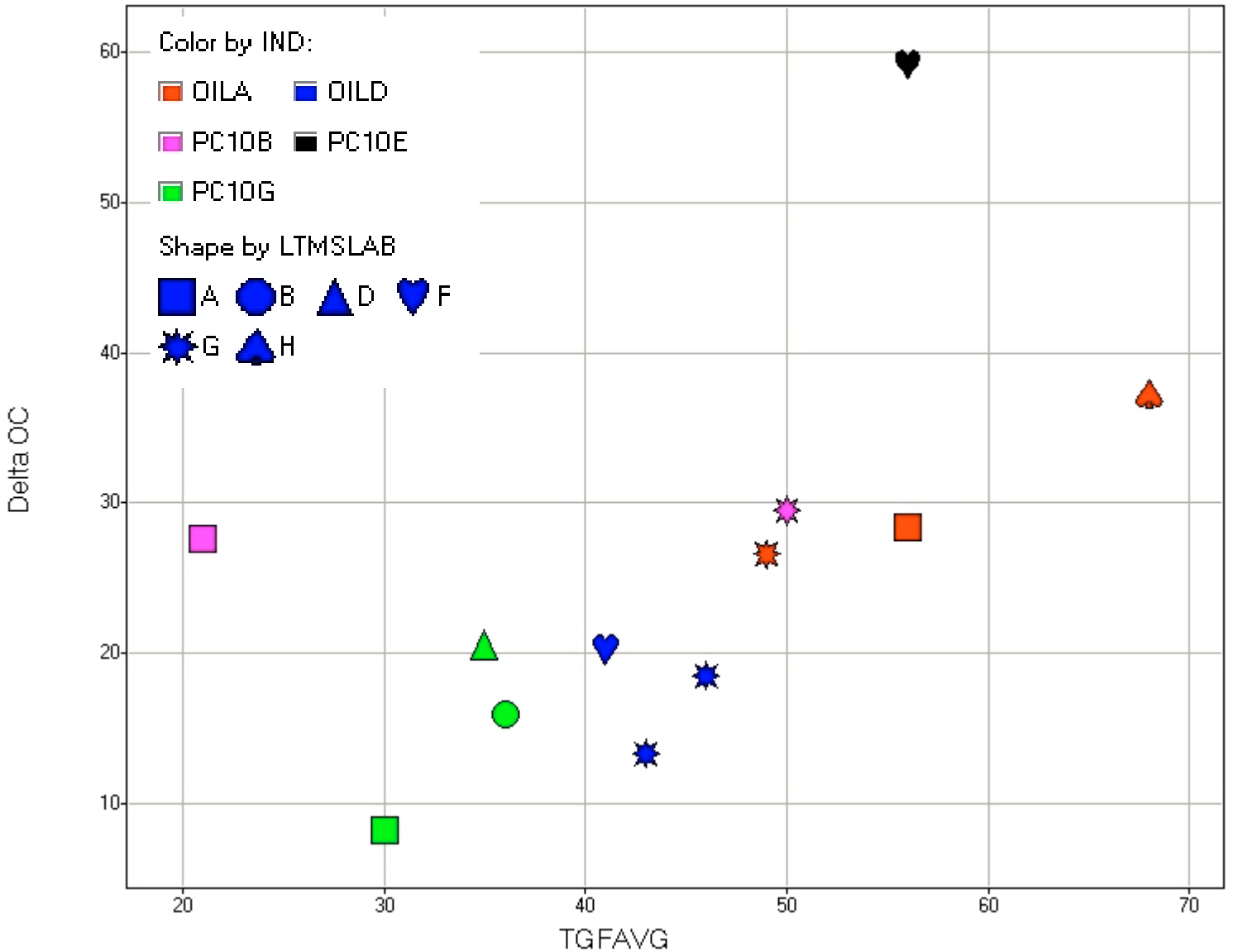
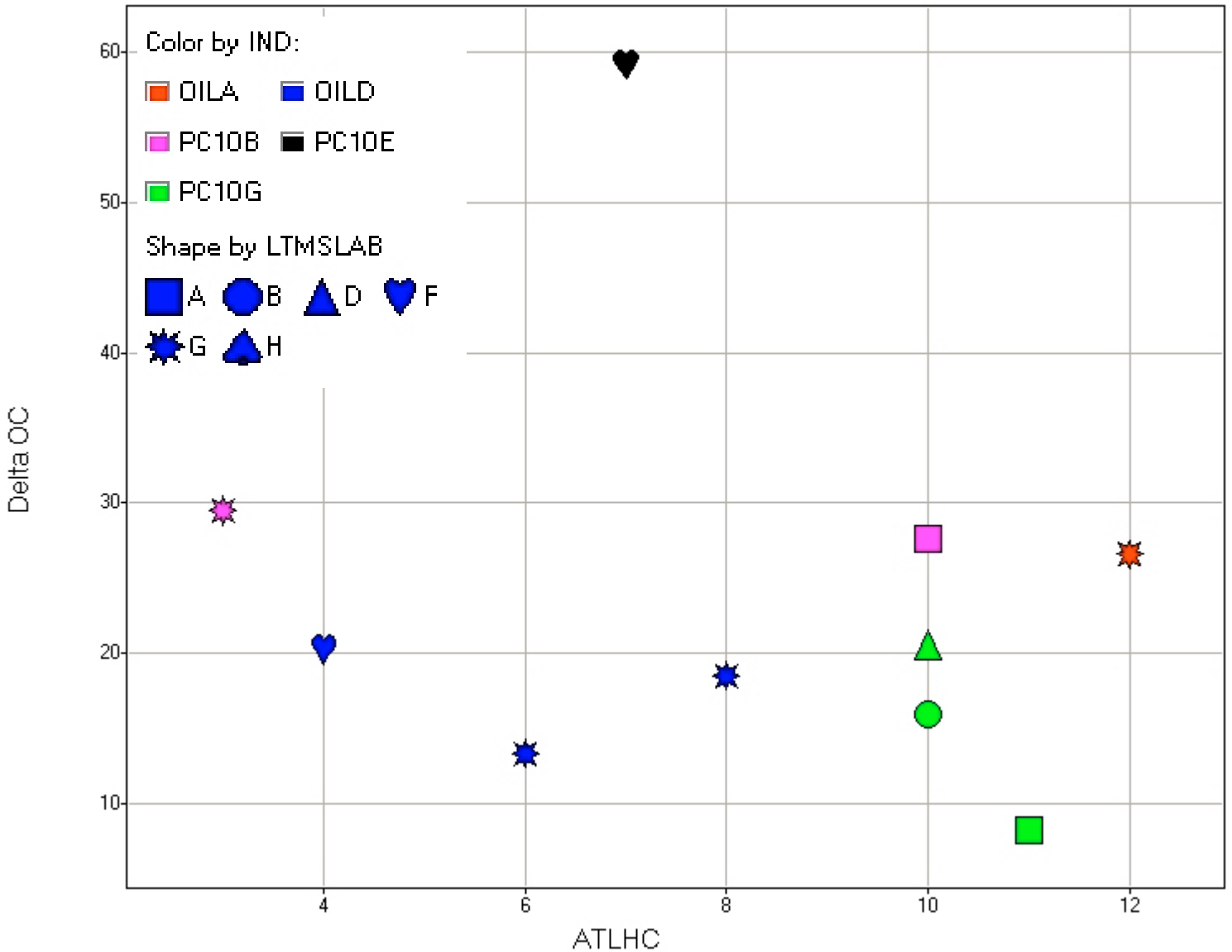
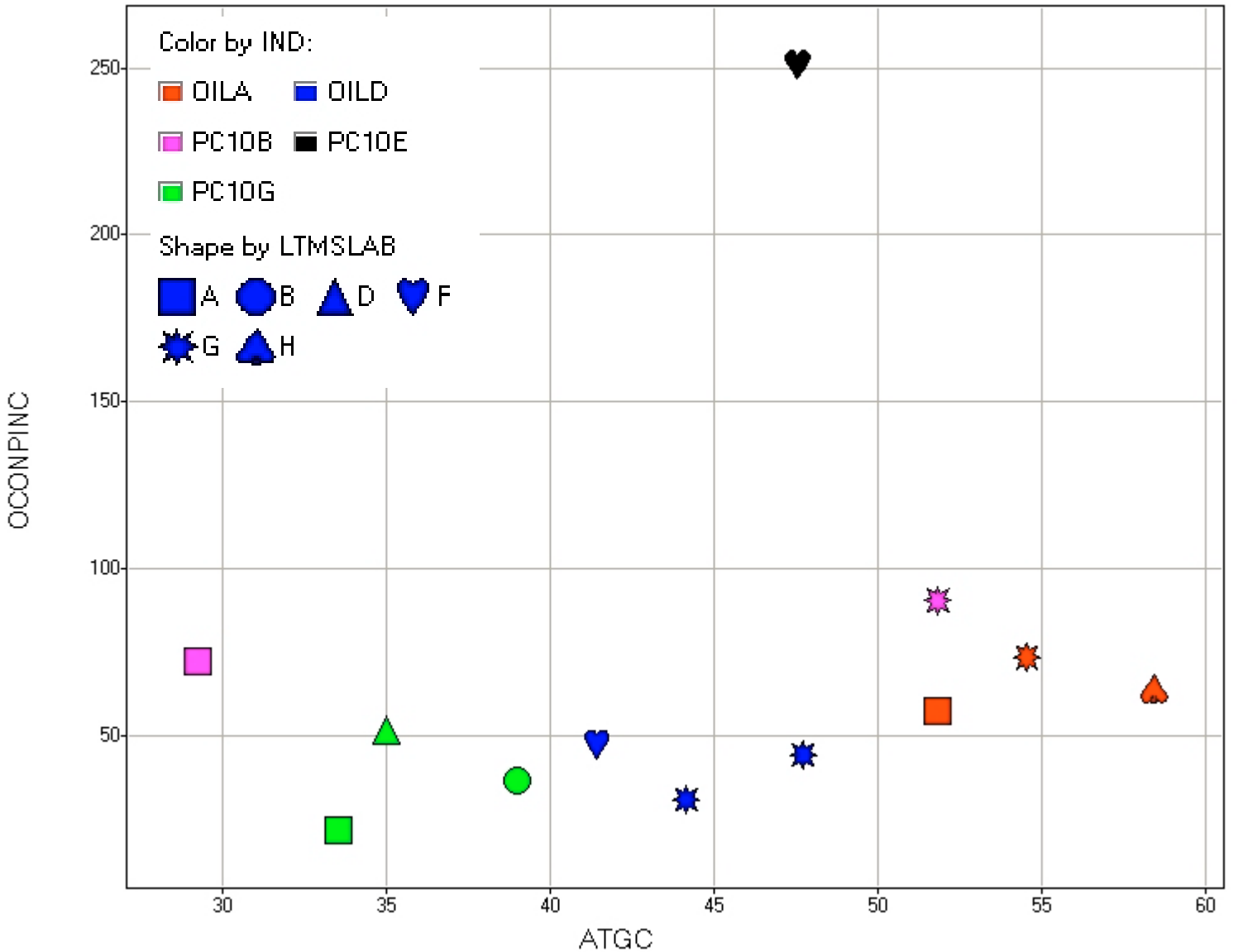


ATTACHMENT 4, 5 OF 11



ATTACHMENT 4, 6 OF 11

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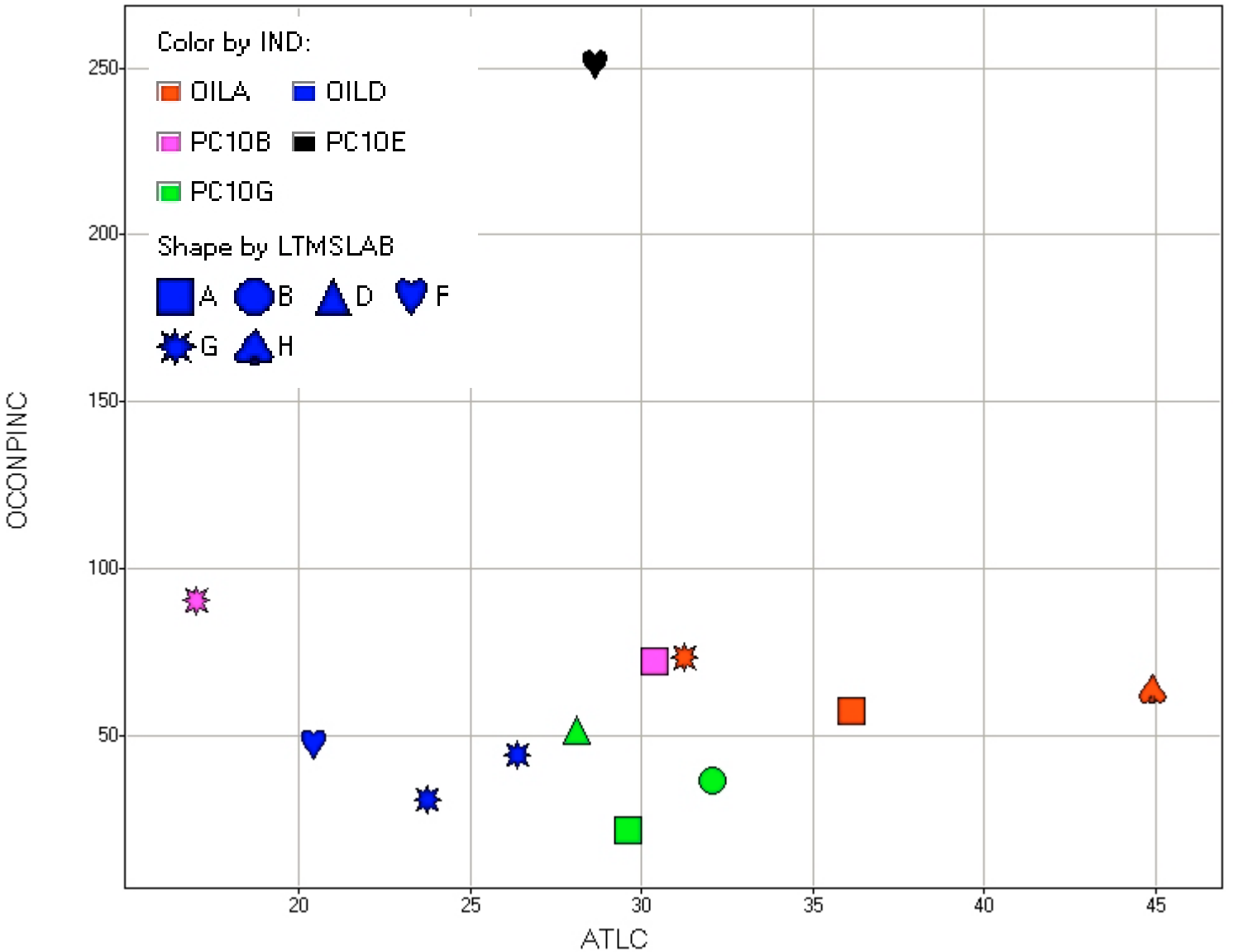
ATGC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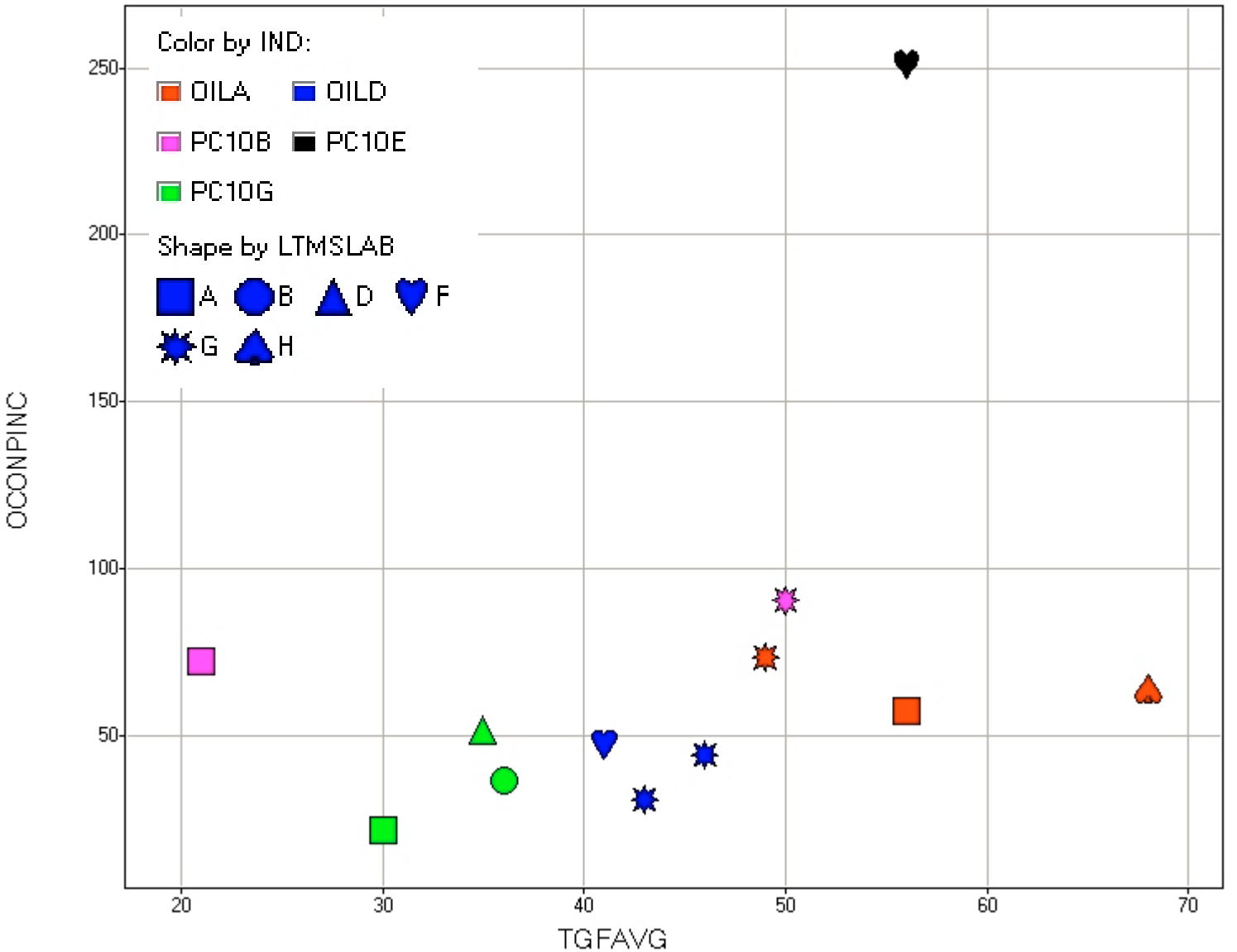
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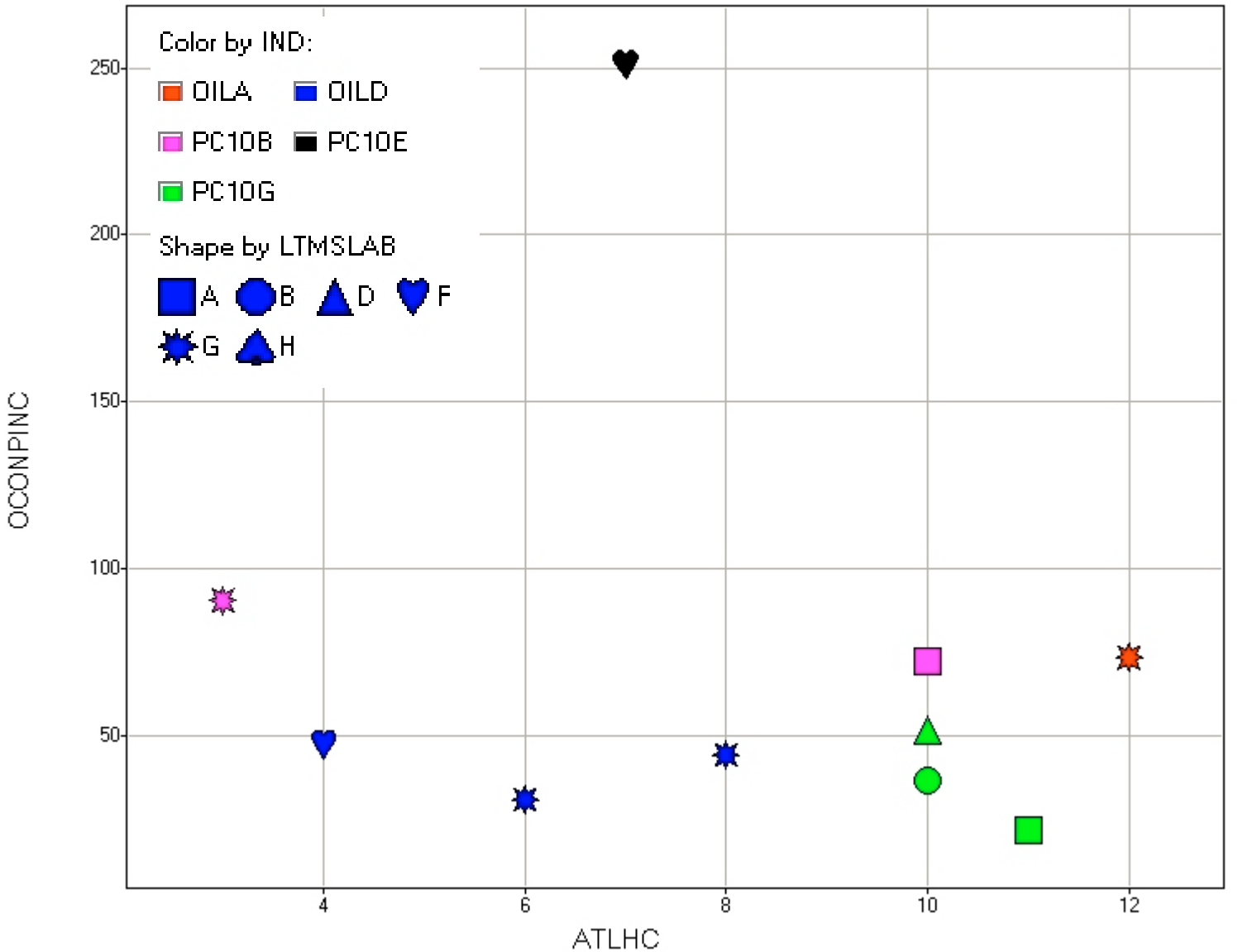
TGFAVG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OCONPINC
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6
8
10
12
ATLHC

T-12 Matrix

	Lab A	Lab B	Lab D	Lab G	Timeline
Run #1	PC10B	PC10E	Invalid 820-2	PC10B	25-May
Run #2	PC10E	Running	Running	820-2	*27-Jun*
Run #3					*18-Jul*
Run #4					*8-Aug*
Run #5					*22-Aug*

J. L. Zalar
6/20/05

ATTACHMENT 5, 1 OF 3

ISB Matrix

	Lab A	Lab B	Lab G	Lab G	Timeline
Run #1	PC10B	Aborted	PC10B		6-Jun
Run #2	Running	Aborted	Running	Running	*27-Jun*
Run #3					*18-Jul*
Run #4					*8-Aug*
Run #5					*24-Aug*
Run #6					*14-Sep*

J. L. Zalar
6/20/05

C13 Matrix

	Lab A	Lab A	Lab B	Lab D	Lab F	Lab G	Lab G	Timeline
Run #1	PC10G	PC10B	PC10G	PC10G	PC10E	PC10B	Aborted	11-Jun
Run #2								*28-Jul*
Run #3								*25-Aug*
Run #4								*22-Sep*
Run #5								*13-Oct*

J. L. Zalar
6/20/05

ATTACHMENT 5, 3 OF 3

Proposed Cummins ISM Merit Rating System

presented to

Cummins Surveillance Panel

Merit Rating System Terms

- Anchor – if an oil averaged exactly at the anchor for each criterion, it would be a borderline oil
- Maximum – limit of acceptable performance for an individual criterion
- Minimum – best possible performance for an individual criterion, or better number gives no better performance
- Weight -- relative contribution of individual criterion to total merit

Proposed Merit Rating System

- A result at or below the anchors for all five criteria would pass the test.

- If any of the five criteria results is above the maximum, the test fails.

- If results are below the maximums for all five criteria but one or more results is above the anchors, a mathematical system determines whether marginal numbers above the anchors are compensated by better than anchor results on other criteria.

Straw Man Parameters

Criterion	Crosshead Weight Loss	Top Ring Weight Loss	Oil Filter Delta P	Adjusting Screw Weight Loss	Sludge
Weight	225	150	250	225	150
Maximum	6.5	90	25	45	8.6
Anchor	5.0	65	12	30	9.0
Minimum	3.5	40	5	15	9.5

Multiple Test Acceptance Procedure

- Multiple test evaluation would consist of averaging the five individual criteria across multiple tests. The Cummins ISM Merit Rating System would be applied to the averages for the criteria.

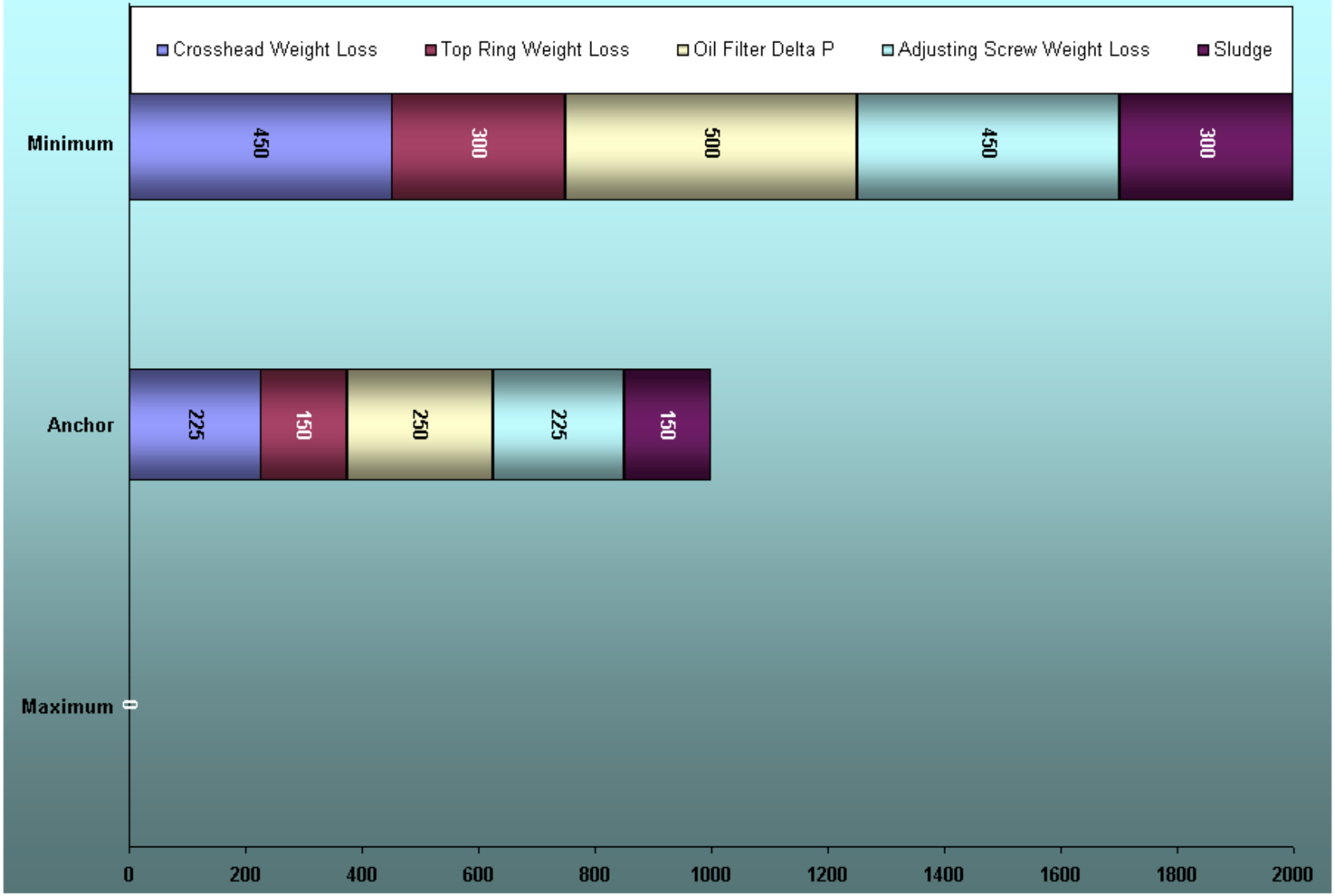
Examples Using Hypothetical Test Results

	Crosshead Weight Loss	Top Ring Weight Loss	Oil Filter Delta P	Adjusting Screw Weight Loss	Sludge	Calculated Merit	**Final Merit**
On the border	5.0	65	12	30	9.0	1000	**1000**
Borderline Failures	**6.6**	65	12	30	9.0	760	**Fail**
	5.0	**91**	12	30	9.0	844	**Fail**
	5.0	65	**26**	30	9.0	731	**Fail**
	5.0	65	12	**46**	9.0	760	**Fail**
	5.0	65	12	30	**8.5**	813	**Fail**
One parameter can make up for another	**6.0**	**40**	12	30	9.0	1000	**1000**
	5.0	**70**	**10**	30	9.0	1041	**1041**
	5.0	65	**15**	**20**	9.0	1092	**1092**
	5.0	65	12	**35**	**9.3**	1015	**1015**
	4.0	65	12	30	**8.8**	1075	**1075**
Beyond Limit Failure	**6.6**	40	5	15	9.5	1535	**Fail**
	3.5	**91**	5	15	9.5	1694	**Fail**
	3.5	40	**26**	15	9.5	1481	**Fail**
	3.5	40	5	**46**	9.5	1535	**Fail**
	3.5	40	5	15	**8.5**	1663	**Fail**

Values for Matrix Oil Tests

	Crosshead Weight Loss	Top Ring Weight Loss	Oil Filter Delta P	Adjusting Screw Weight Loss	Sludge	Calculated Merit	**Final Merit**
28402 1004-3	8.3	61	35	139	9.0	-1558	**Fail**
30048 1004-3	7.4	72	238	155	9.0	-5618	**Fail**
35313 1004-3	9.4	62	24	138	9.0	-1483	**Fail**
43672 1004-3	7.8	64	110	59	8.9	-1764	**Fail**
50254 1004-3	8.0	53	126	191	9.1	-3952	**Fail**
51225 1004-3	8.5	46	75	44	7.9	-1242	**Fail**
47644 830-2	5.7	57	9	20	9.2	1253	**1253**
50224 830-2	4.6	44	10	38	9.0	1134	**1134**
51799 830-2	4.4	56	12	34	9.1	1123	**1123**
52996 830-2	2.4	68	7	24	9.0	1470	**1470**
52997 830-2	**7.0**	34	11	25	9.1	988	**Fail**
54195 830-2	4.7	40	13	27	9.1	1245	**1245**
54204 830-2	4.9	78	**27**	41	8.8	397	**Fail**
50769 ISMA	5.9	76	10	**137**	8.6	-874	**Fail**
51224 ISMA	5.9	44	3	43	9.1	1087	**1087**

Potential Criteria Contributions



Benefits of Merit System

- More cost effective testing
- Consistent with reducing the time between ASTM acceptance and first date of API licensing
- Allows test developer to weight individual criteria
- Adds incentive for improved performance
- Flexibility in setting up system
- Easier to gain consensus on limits

PC-10 NCDT STATUS REPORT

ASTM HDEOCP

Pittsburgh, PA

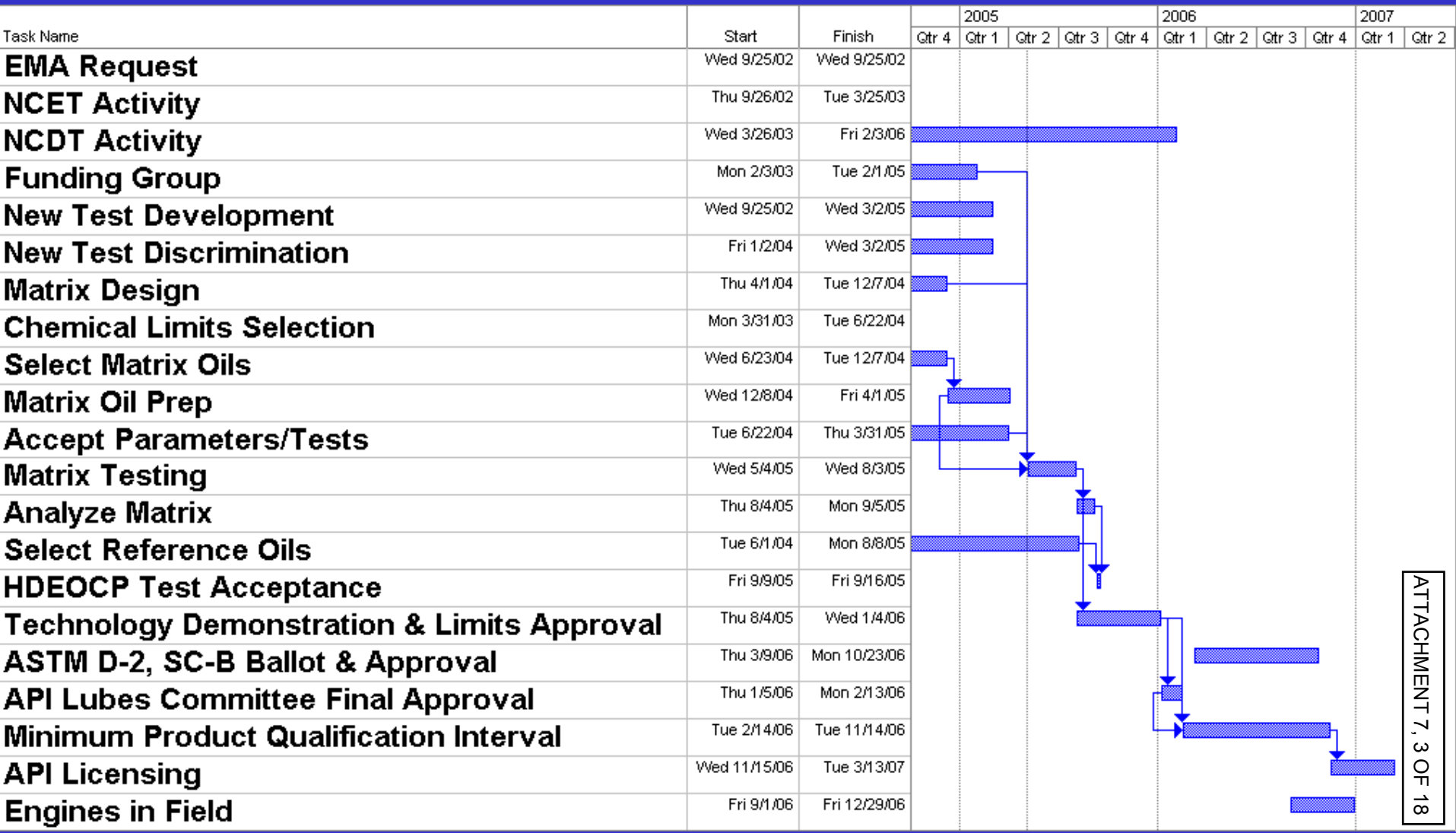
June 21, 2005

Category Timing

NCDT Conference Call

May 4, 2005

16 Week Matrix Timeline



Task Name	Start	Finish
EMA Request	Wed 9/25/02	Wed 9/25/02
NCET Activity	Thu 9/26/02	Tue 3/25/03
NCDT Activity	Wed 3/26/03	Fri 2/3/06
Funding Group	Mon 2/3/03	Tue 2/1/05
New Test Development	Wed 9/25/02	Wed 3/2/05
New Test Discrimination	Fri 1/2/04	Wed 3/2/05
Matrix Design	Thu 4/1/04	Tue 12/7/04
Chemical Limits Selection	Mon 3/31/03	Tue 6/22/04
Select Matrix Oils	Wed 6/23/04	Tue 12/7/04
Matrix Oil Prep	Wed 12/8/04	Fri 4/1/05
Accept Parameters/Tests	Tue 6/22/04	Thu 3/31/05
Matrix Testing	Wed 5/4/05	Wed 8/3/05
Analyze Matrix	Thu 8/4/05	Mon 9/5/05
Select Reference Oils	Tue 6/1/04	Mon 8/8/05
HDEOCP Test Acceptance	Fri 9/9/05	Fri 9/16/05
Technology Demonstration & Limits Approval	Thu 8/4/05	Wed 1/4/06
ASTM D-2, SC-B Ballot & Approval	Thu 3/9/06	Mon 10/23/06
API Lubes Committee Final Approval	Thu 1/5/06	Mon 2/13/06
Minimum Product Qualification Interval	Tue 2/14/06	Tue 11/14/06
API Licensing	Wed 11/15/06	Tue 3/13/07
Engines in Field	Fri 9/1/06	Fri 12/29/06

ATTACHMENT 7, 3 OF 18

Request to ACC

- Define Set of Assumptions for Technology Demonstration & Product Qualification Periods
  - Likely number of required tests
  - Estimated stand availability
  - Other factors
- Estimate Minimum and Maximum Time Requirements for Each Period

NCDT ACTION

- Review ACC Estimates
- Monitor Matrix Process
- Recommend Revised First License Date Based on These Criteria

PC-10 NCDT STATUS REPORT

API LUBRICANTS COMMITTEE

Houston, TX

May 10, 2005

PC-10 TEST MATRIX

PC-10 Tests	Total Test Runs	Sponsored Test Runs
Caterpillar C13	26	14
Cummins ISB	15	8
Mack T-12	16	8

	Caterpillar C13		Cummins ISB		Mack T-12	
Lab	**Lab Financed Runs**	**ACC/API/EMA Financed Runs**	**Lab Financed Runs**	**ACC/API/EMA Financed Runs**	**Lab Financed Runs**	**ACC/API/EMA Financed Runs**
PerkinElmer	3	4	3	4	2	2
SwRI	3	4	2	2	2	2
Afton Chemical	2	2	0	0	2	2
ExxonMobil	2	2	0	0	0	0
Lubrizol	2	2	2	2	2	2
Totals	**12**	**14**	**7**	**8**	**8**	**8**
	26		**15**		**16**	

ATTACHMENT 7, 7 OF 18

Attachment 1: PC-10 Matrix Summary

Test	Cummins ISB	Mack T-12	Cat C13
MDTF Design	B-1	C-1	D-1
Number of Stands	4	4	7
Number of Labs	3	4	5
Number of Oils	3	3	7
Oil Codes	TMC 830 PC-10B PC-10E	TMC 820 PC-10B PC-10E	PC-10A to F Oil D
Total Number of Tests	15	16	26
Calibration Tests	7	8	12
Sponsored tests	8	8	14
Number of Tests / Stand	4,3,4,4	4,4,4,4	4,3,4,3,4,4,4
Number of Tests / Oil	5,5,5	5,5,6	6,6,3,3,3,2 +3 on Oil D

PC-10 Timeline - 16 Week Matrix

Task Name	Start	Finish
EMA Request	Wed 9/25/02	Wed 9/25/02
NCET Activity	Thu 9/26/02	Tue 3/25/03
NCDT Activity	Wed 3/26/03	Fri 2/3/06
Funding Group	Mon 2/3/03	Tue 2/1/05
New Test Development	Wed 9/25/02	Wed 3/2/05
New Test Discrimination	Fri 1/2/04	Wed 3/2/05
Matrix Design	Thu 4/1/04	Tue 12/7/04
Chemical Limits Selection	Mon 3/31/03	Tue 6/22/04
Select Matrix Oils	Wed 6/23/04	Tue 12/7/04
Matrix Oil Prep	Wed 12/8/04	Fri 4/1/05
Accept Parameters/Tests	Tue 6/22/04	Thu 3/31/05
Matrix Testing	Wed 5/4/05	Wed 8/3/05
Analyze Matrix	Thu 8/4/05	Mon 9/5/05
Select Reference Oils	Tue 6/1/04	Mon 8/8/05
HDEOCP Test Acceptance	Fri 9/9/05	Fri 9/16/05
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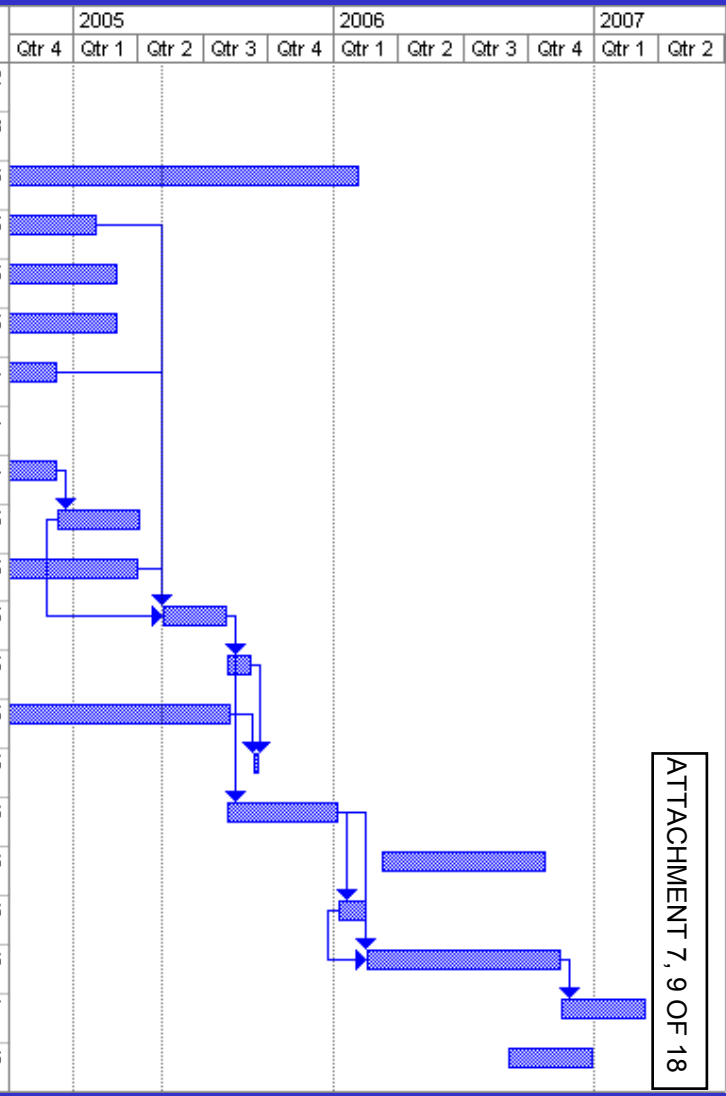
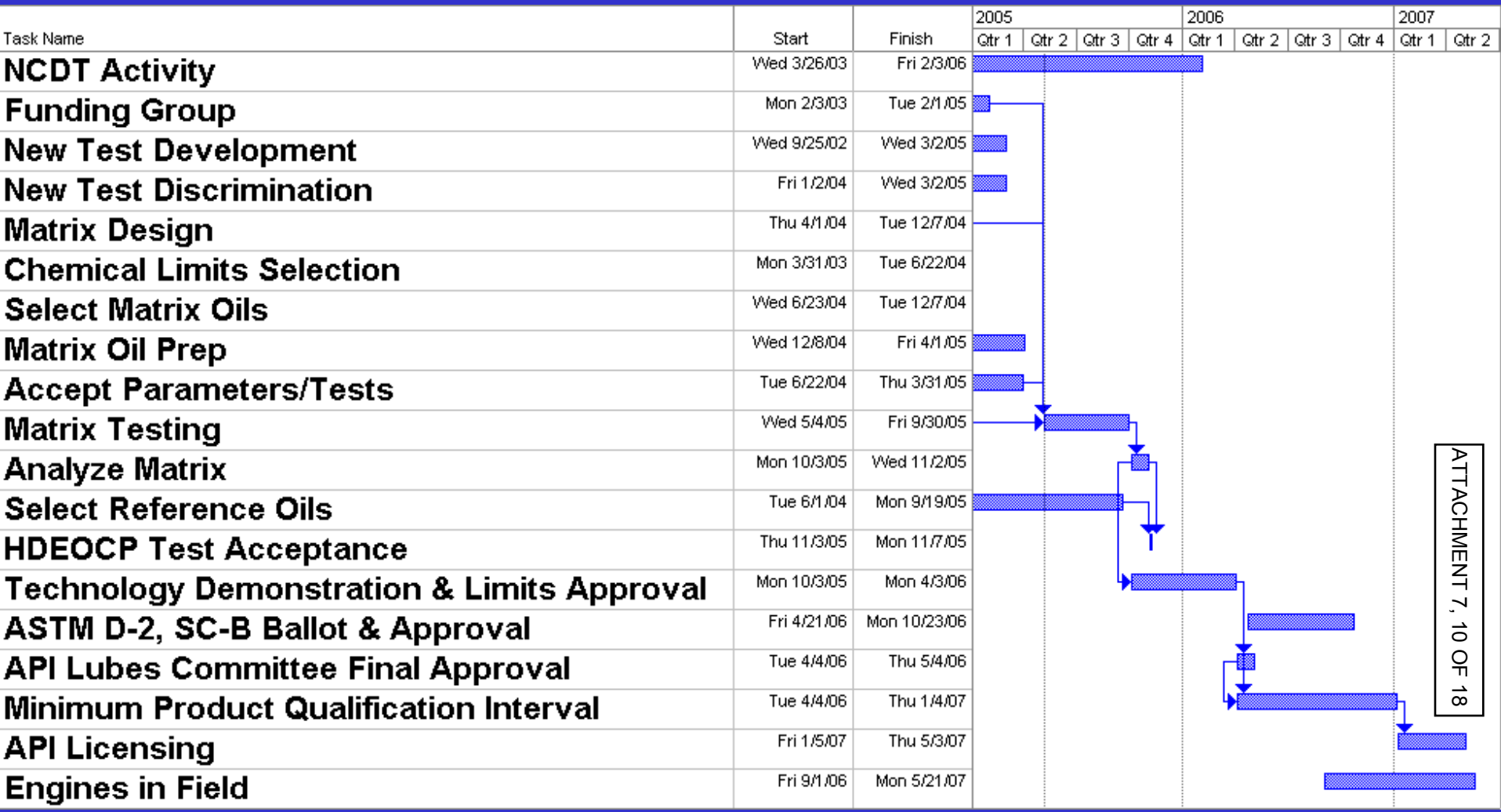


ATTACHMENT 7, 9 OF 18

19 Week Matrix Timeline



ATTACHMENT 7, 10 OF 18

Category Timing

NCDT Conference Call

June 16, 2005

Current Estimated Timeline

Task Name	Start	Finish
NCDT Activity	Wed 3/26/03	Fri 2/3/06
Funding Group	Mon 2/3/03	Tue 2/1/05
New Test Development	Wed 9/25/02	Wed 3/2/05
New Test Discrimination	Fri 1/2/04	Wed 3/2/05
Matrix Design	Thu 4/1/04	Tue 12/7/04
Chemical Limits Selection	Mon 3/31/03	Tue 6/22/04
Select Matrix Oils	Wed 6/23/04	Tue 12/7/04
Matrix Oil Prep	Wed 12/8/04	Fri 4/1/05
Accept Parameters/Tests	Tue 6/22/04	Thu 3/31/05
Matrix Testing	Wed 5/4/05	Fri 10/14/05
Analyze Matrix	Mon 10/17/05	Wed 11/16/05
Select Reference Oils	Tue 6/1/04	Fri 10/14/05
HDEOCP Test Acceptance	Thu 11/17/05	Mon 11/21/05
Technology Demonstration & Limits Approval	Mon 10/17/05	Mon 4/17/06
ASTM D-2, SC-B Ballot & Approval	Fri 4/21/06	Mon 10/23/06
API Lubes Committee Final Approval	Tue 4/18/06	Thu 5/18/06
Minimum Product Qualification Interval	Tue 4/18/06	Thu 1/18/07
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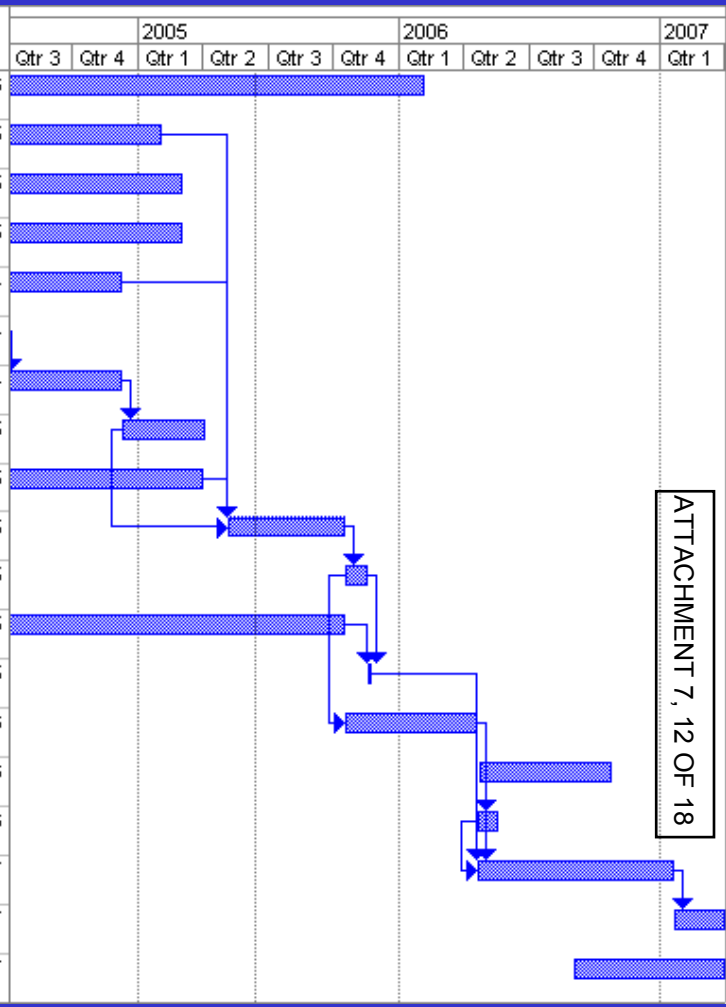


ATTACHMENT 7, 12 OF 18

From: Doug_Anderson@americanchemistry.com
Sent: Monday, June 13, 2005 9:33 AM
To: alex@chevrontexaco.com
Cc: wrunkle@ashland.com; greg.shank@macktrucks.com; jiam@chevrontexaco.com; Kevin Ferrick; lawm@lubrizol.com; christy_milstead@americanchemistry.com
Subject: PC-10 Technology Demonstration

Importance: High

June 13, 2005

To: West Alexander, Chairman API LC,

Dear West,

At the May 10, 2005 API LC meeting in Houston you requested that the ACC PAPTG provide an estimate of the time ACC needs for the technology demonstration and candidate approval period for our PC-10 programs. The basis for your request is the fact that industry is 5 months behind on the original PC-10 timeline due to delays in engine test development, and the NCDT and API LC need to determine if remaining steps in the PC-10 process can be shortened to allow first licensing on October 1, 2006 to meet the EMA's request. API LC requested the estimate of the time ACC needed to complete our testing programs so a revised PC-10 timeline and first licensing date can be established that is realistic and fair to all stakeholders. ACC PAPTG discussed the API LC request at our May 18, 2005 meeting and has agreed to respond in two phases.

Phase one, ACC PAPTG will estimate the total time required for the technology demonstration and candidate approval periods based on two recent past categories; CH-4 and CI-4. The estimated total time required is the time needed from the completion of the PC-10 precision and BOI matrix until first licensing by API of PC-10 oils. We will not estimate a date of first licensing but rather the time period needed from the completion of the matrix which is unknown at this time to first API licensing.

Phase two, ACC PAPTG will attempt to develop a methodology which can be used to estimate the time required for the technology demonstration and candidate testing period based on engine test availability, test length, pass/fail estimates, number of stands, and number of programs needed to cover all classes of oil marketers. To accomplish this, an ACC PAPTG statistical group will meet early this week to develop a common methodology all additive companies can use to estimate the time required. After the consensus methodology is developed, each individual PAPTG member will estimate the time needed. The PAPTG manager will consolidate the confidential individual estimates and prepare a draft ACC PAPTG consensus estimate. (The process set out in Phase two is necessary to protect the highly confidential information needed to estimate approval times. ACC PAPTG members cannot share information on the number or timing of our

individual programs.)

We will attempt to have the Phase one estimate done prior to the June 14 NCDT conference call on PC-10 timing. We are not in a position to respond to you on the timing of Phase two at this time, but will do so as soon
as this is possible.

Please be assured that the ACC PAPTG is seriously considering the API LC request for this information and will attempt to respond in a timely way. However, to address the request we need to do so with appropriate procedural steps to manage and protect the underlying confidential business information. Please direct any comments and questions to the PAPTG manager, Doug Anderson at 703-741-5616 or by email at Doug_Anderson@americanchemistry.com.

Regards,

Lew Williams Joan Evans
PAPTG Vice Chair PAPTG Chair

###

W.D. (Doug) Anderson
Petroleum Additives Panel Manager/
Product Approval Protocol Task Group (PAPTG) Manager
American Chemistry Council
1300 Wilson Boulevard
Arlington, VA 22209
Office: 73-741-5616
Fax: 703-741-6091
Email: Doug_Anderson@americanchemistry.com

Critical Considerations

- The CI-4 process was not satisfactory and resulted in CI-4 Plus
- There is higher complexity/greater uncertainty in PC-10
- Test capacity, pass/fail ratio, and invalid test frequency is unknown
- One more test in PC-10 than in CI-4
  - PC-10: Cummins ISM and ISB, Mack T-11 and T-12, Caterpillar C-13
  - CI-4: Cummins M-11 EGR, Mack T-8E and T-10, Caterpillar 1R
- Advent of PC-10 chemical box requires establishment of new core technology and limits formulating flexibility

Test Capacity Concerns

- Caterpillar 1R
  - 504 hours, two-day turnaround (ca. 23 days total)
  - Very high passing rate (>75%?)
  - 137 tests run in first 15 months, about 9/month
    - 75% passing rate, about 103 passes
- Caterpillar C-13
  - 500 hours, six-day turnaround (ca. 27 days total)
  - Passing rate unknown
    - With a 50% passing rate, 200 tests are needed
  - Assuming there are 10-13 C-13 stands in the industry, each runs about one test/month, about 15-20 months is required

ACC Viewpoint

- PC-10 is revolutionary (more challenging, more uncertainty), while API CH-4 and CI-4 were evolutionary (less challenging)
- API CI-4 required fifteen months
- Historical data and test differences for PC-10 indicate the current PC-10 process can not be compressed below that of API CI-4
- **PC-10 will take fifteen months from end of matrix**

NCDT ACTION

- Meeting June 30 – Embassy Suites, ORD
- Seek Way to Move First License Date
- Increase Test Capacity?
- Reduce Number of Tests Required?
- Interchange Requirements?
- Blanket Approvals for Chemistries?
- Other Ideas?

Analysis of API CH-4 and CI-4 Testing Levels

ACC PAPTG

June 2005

American Chemistry Council Good Chemistry Makes it Possible

Introduction

- ACC has analyzed the RSI database to determine the testing activity levels for the major API CH-4 and CI-4 engine tests
- Quarterly analysis was conducted, rather than monthly analysis, to reduce clutter

American Chemistry Council Good Chemistry Makes it Possible

Details

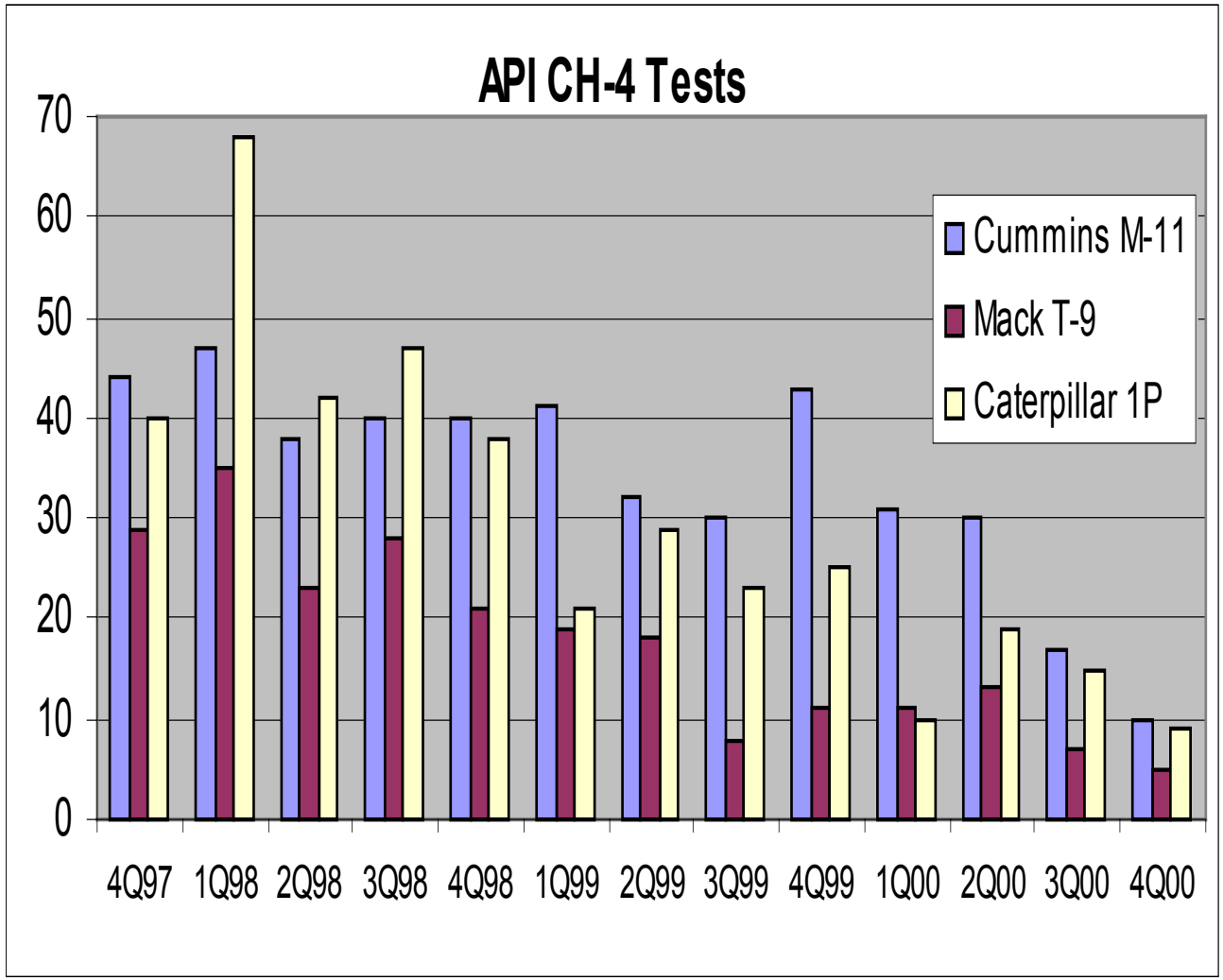
- API CH-4 Specification
  - The high level of testing activity is protracted, probably due to evolving OEM specs
  - Difficult to draw any conclusions
  - Commencement of RSI registrations occurred in mid-October 1997 (almost a full quarter)

Details

- API CI-4 Specification
  - The high level of testing activity is clear-cut
  - Duration is 15-18 months
  - Commencement of RSI registrations
    - Cummins M-11 EGR and Mack T-10, August 2001 (partial quarter)
    - Caterpillar 1R, October 2001 (full quarter)
      - Delay was due to the Caterpillar 1Q/1R matrix

American Chemistry Council Good Chemistry Makes it Possible

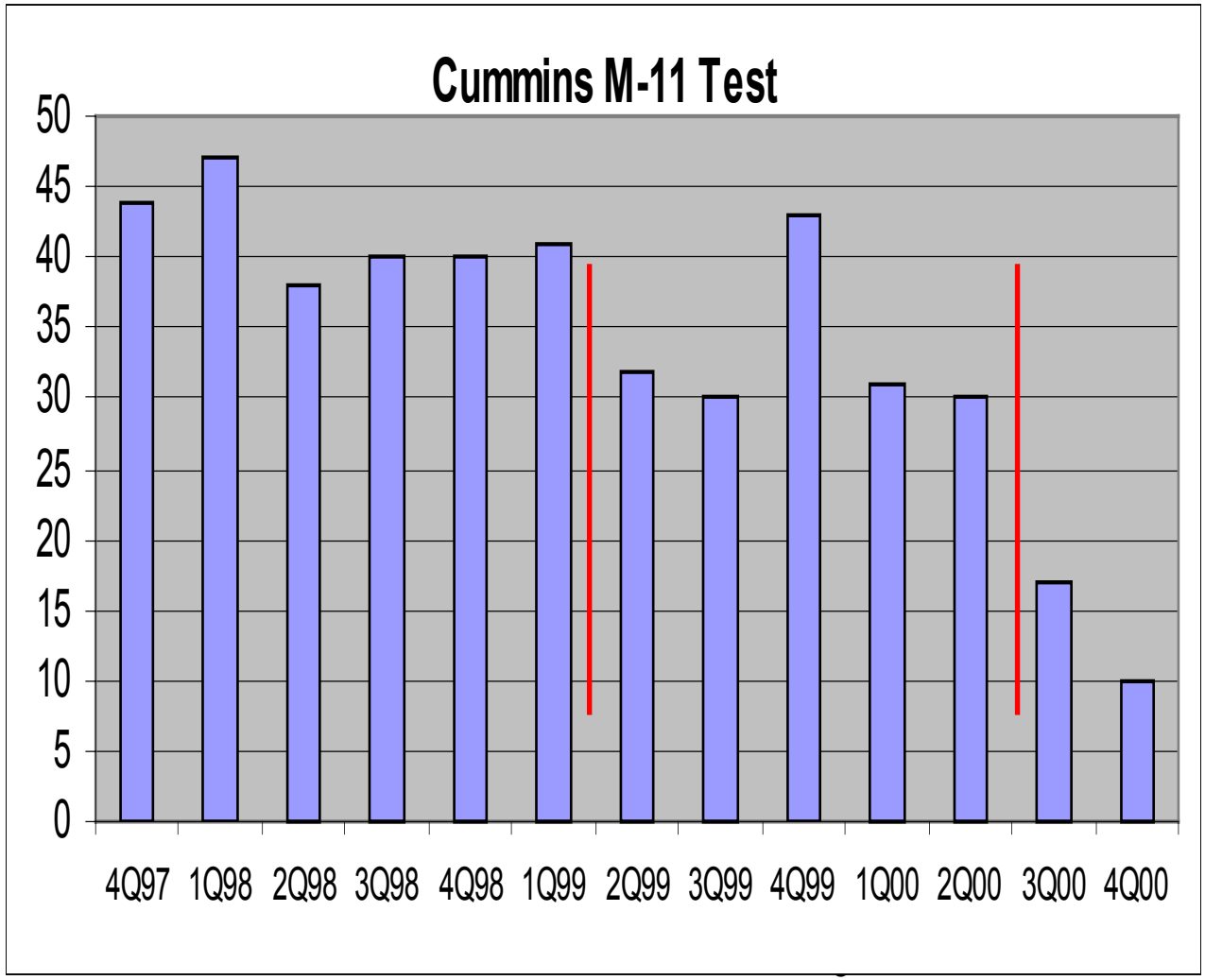
API CH-4 Tests – Composite



- Protracted, elongated testing period, almost three years
- Difficult to draw any conclusions
- Examine individual tests for more information

American Chemistry Council Good Chemistry Makes it Possible

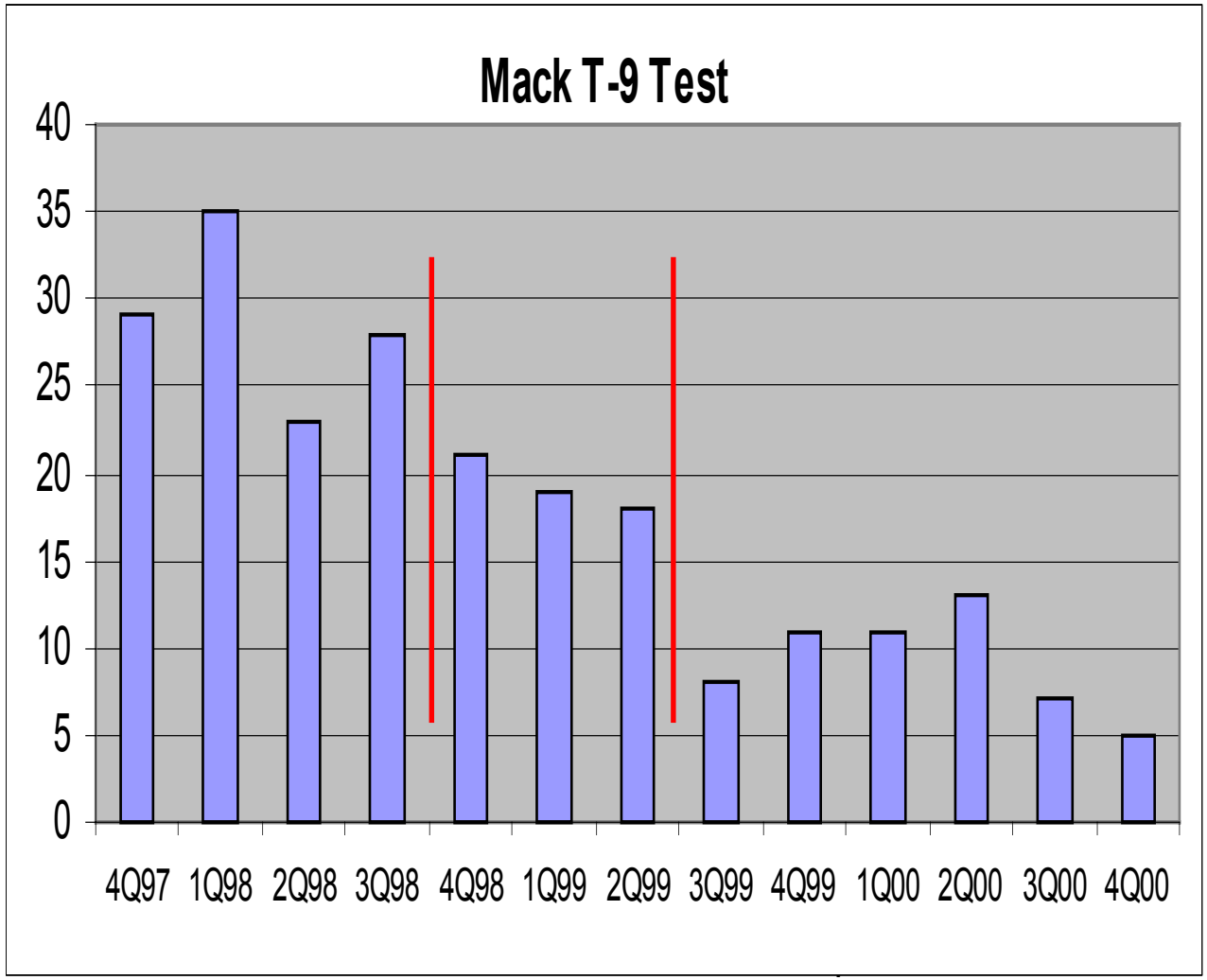
Cummins M-11 Test



- 200-hour test
- Six quarters, ~42 tests/quarter
- Five quarters, ~33 tests/quarter
- Likely due to Cummins CES 20076 spec (300-hour test)
- Thereafter, less than 10 tests/ quarter

American Chemistry Council
Good Chemistry Makes it Possible

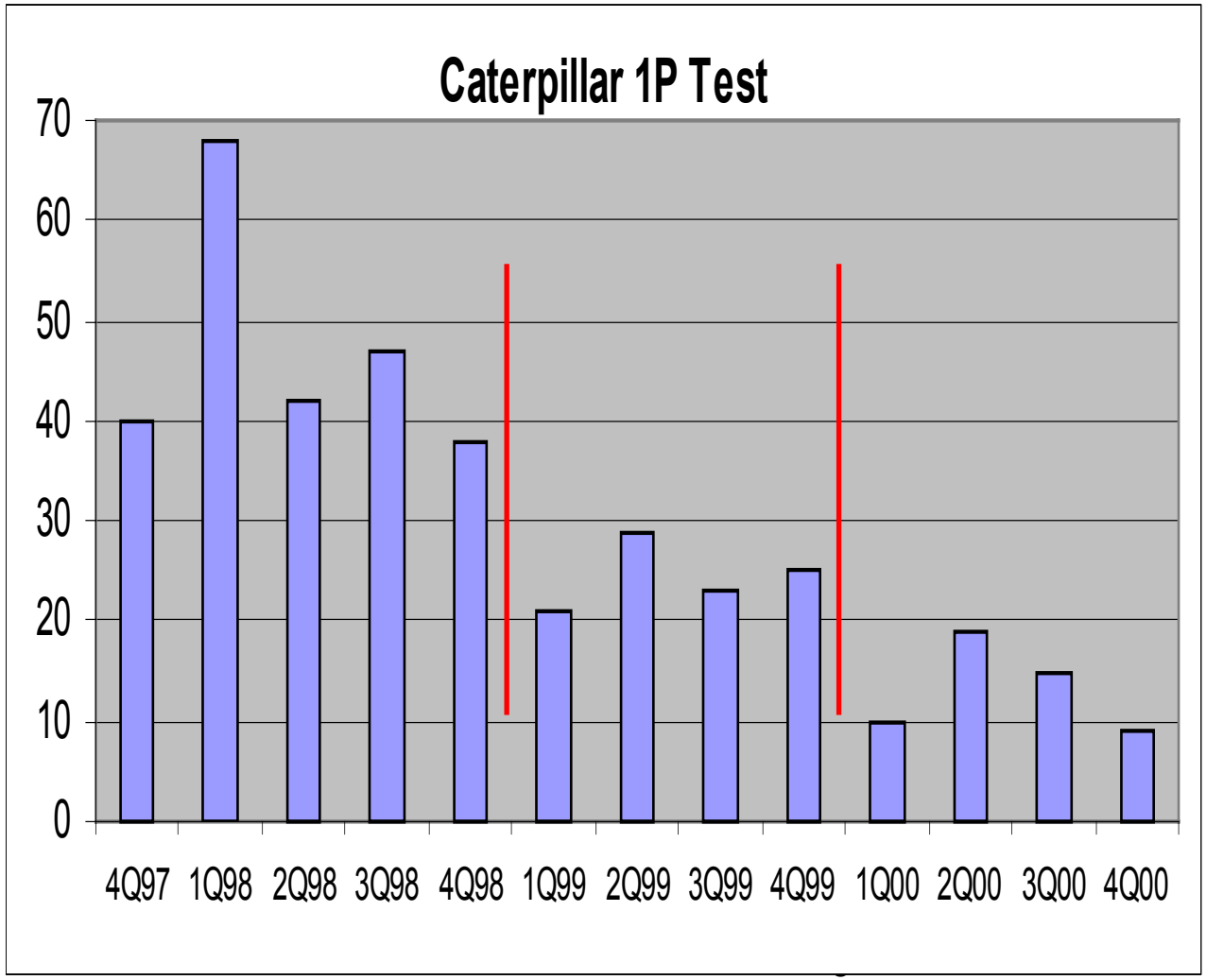
Mack T-9 Test



- 500-hour test
- Four quarters, ~29 tests/quarter
- Three quarters, ~19 tests/quarter
- Thereafter, less than 10 tests/ quarter

American Chemistry Council
Good Chemistry Makes it Possible

Caterpillar 1P Test



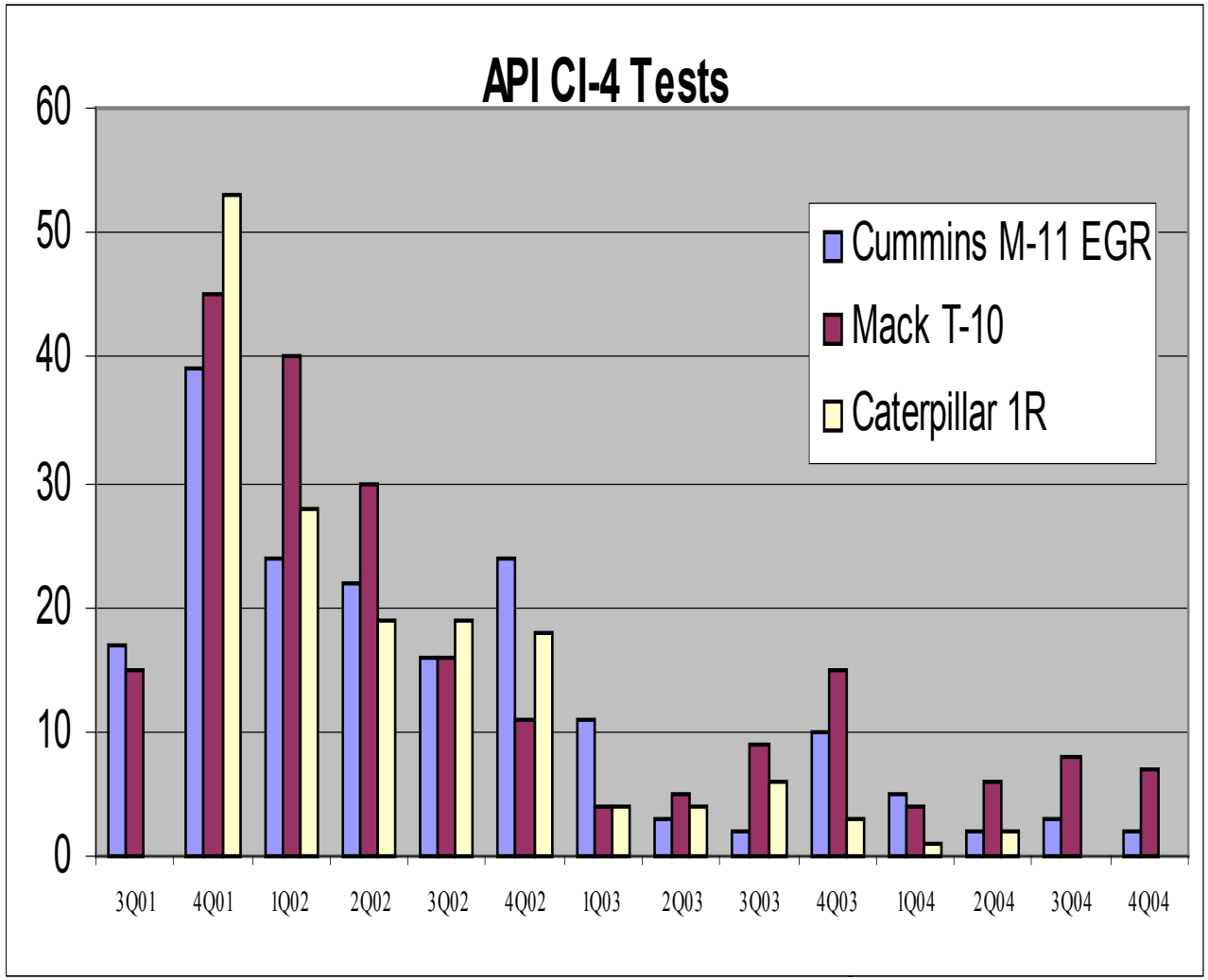
- 360-hour test
- Many tests terminated
- Low passing rate
- Five quarters, ~47 tests/quarter
- Four quarters, ~25 tests/quarter
- Thereafter, less than 15 tests/ quarter

American Chemistry Council
Good Chemistry Makes it Possible

API CH-4 Testing Summary

- An extended duration of high engine testing activity levels occurred for API CH-4 plus subsequent OEM approvals
- Best estimate is five to eleven quarters, or about 15 to 33 months
- Difficult to draw any conclusions, except that the lower limit is about 15 months (based on the 1P)

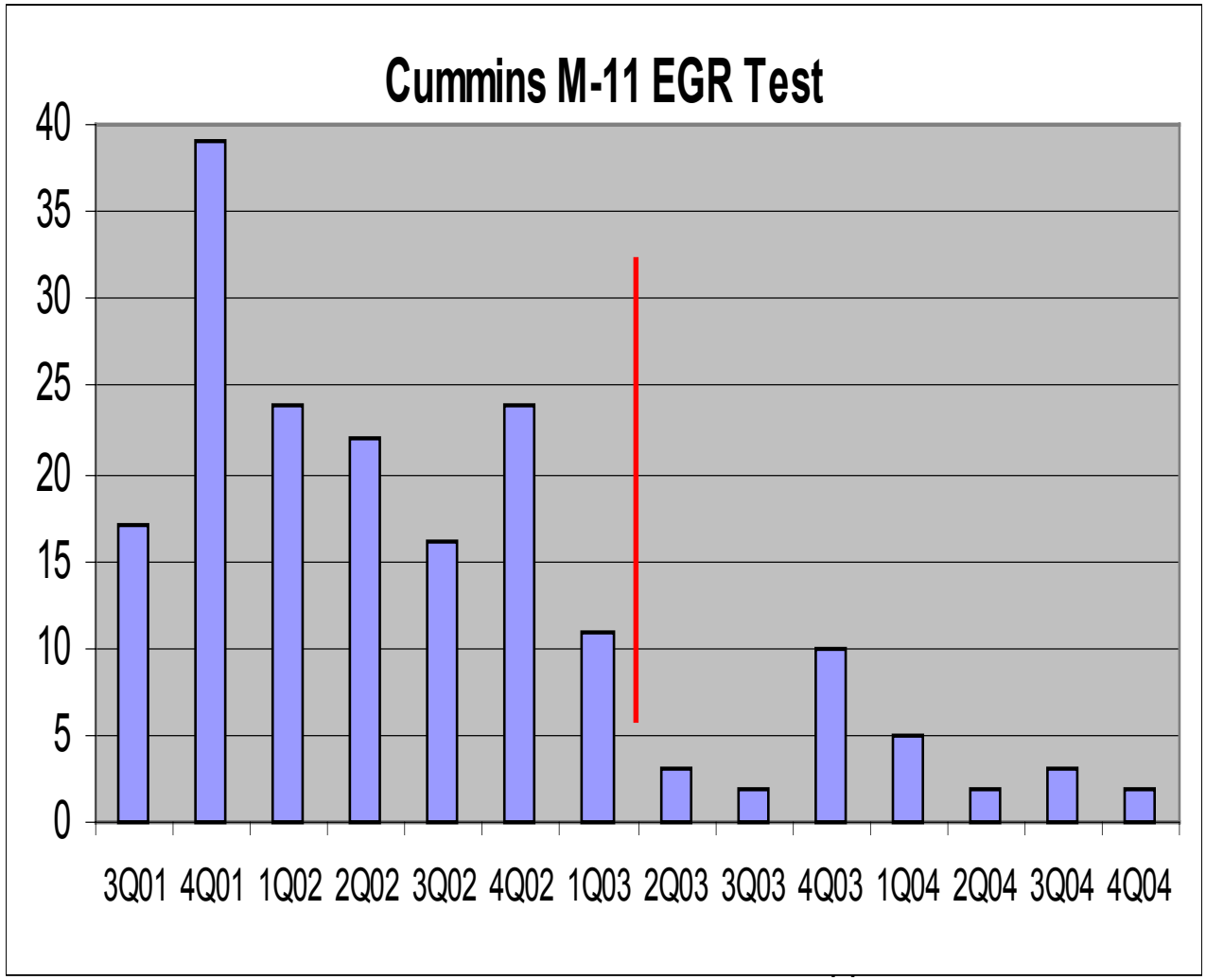
API CI-4 Tests – Composite



- Shorter testing period, about 18 months
- Easier to draw conclusions
- Examine individual tests for more information

American Chemistry Council Good Chemistry Makes it Possible

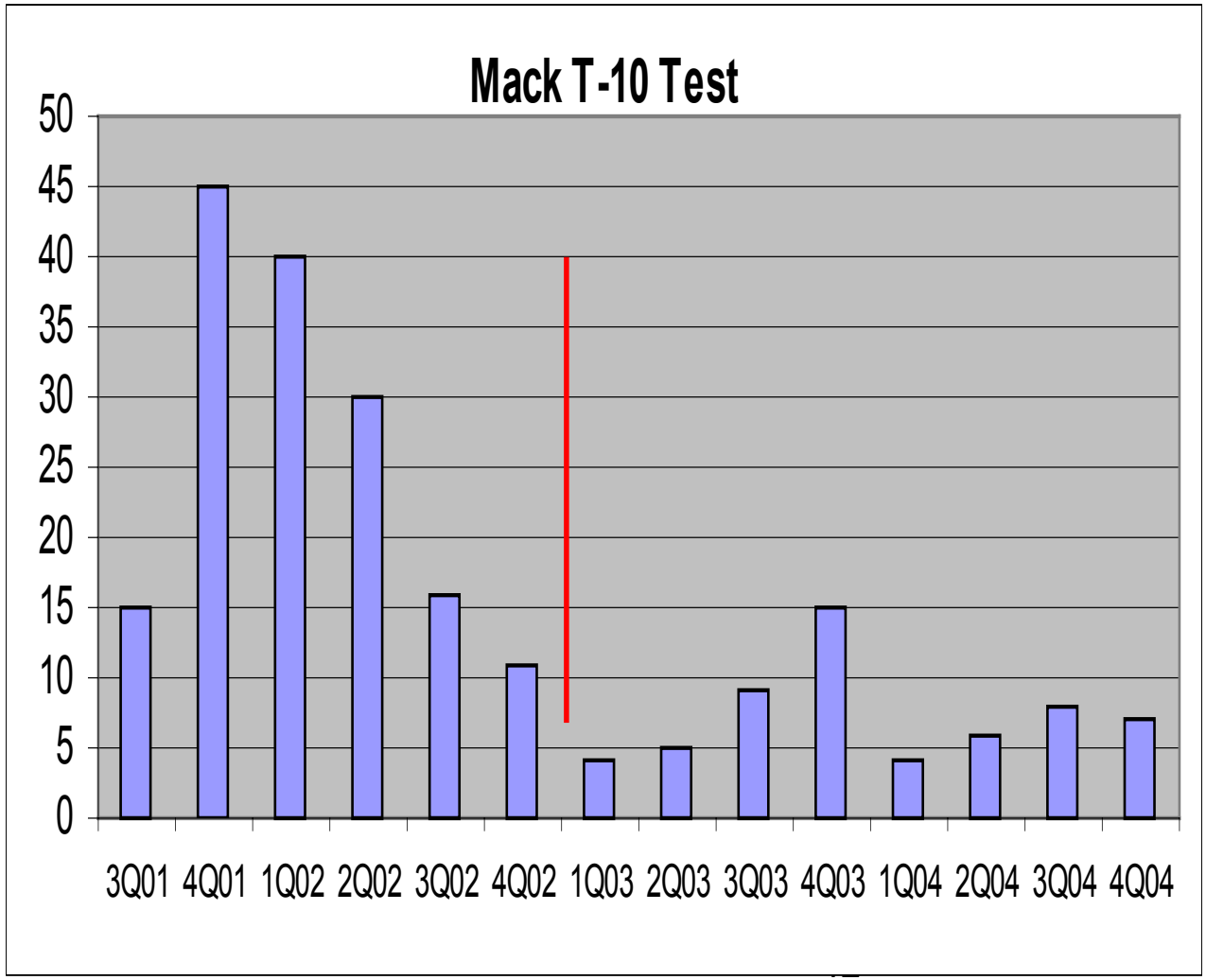
Cummins M-11 EGR Test



- 300-hour test
- Seven quarters, ~22 tests/quarter
- (perhaps a bit less, 19 months)
- Middle five quarters, 25 tests/ month
- Thereafter, less than 5 tests/ quarter

American Chemistry Council Good Chemistry Makes it Possible

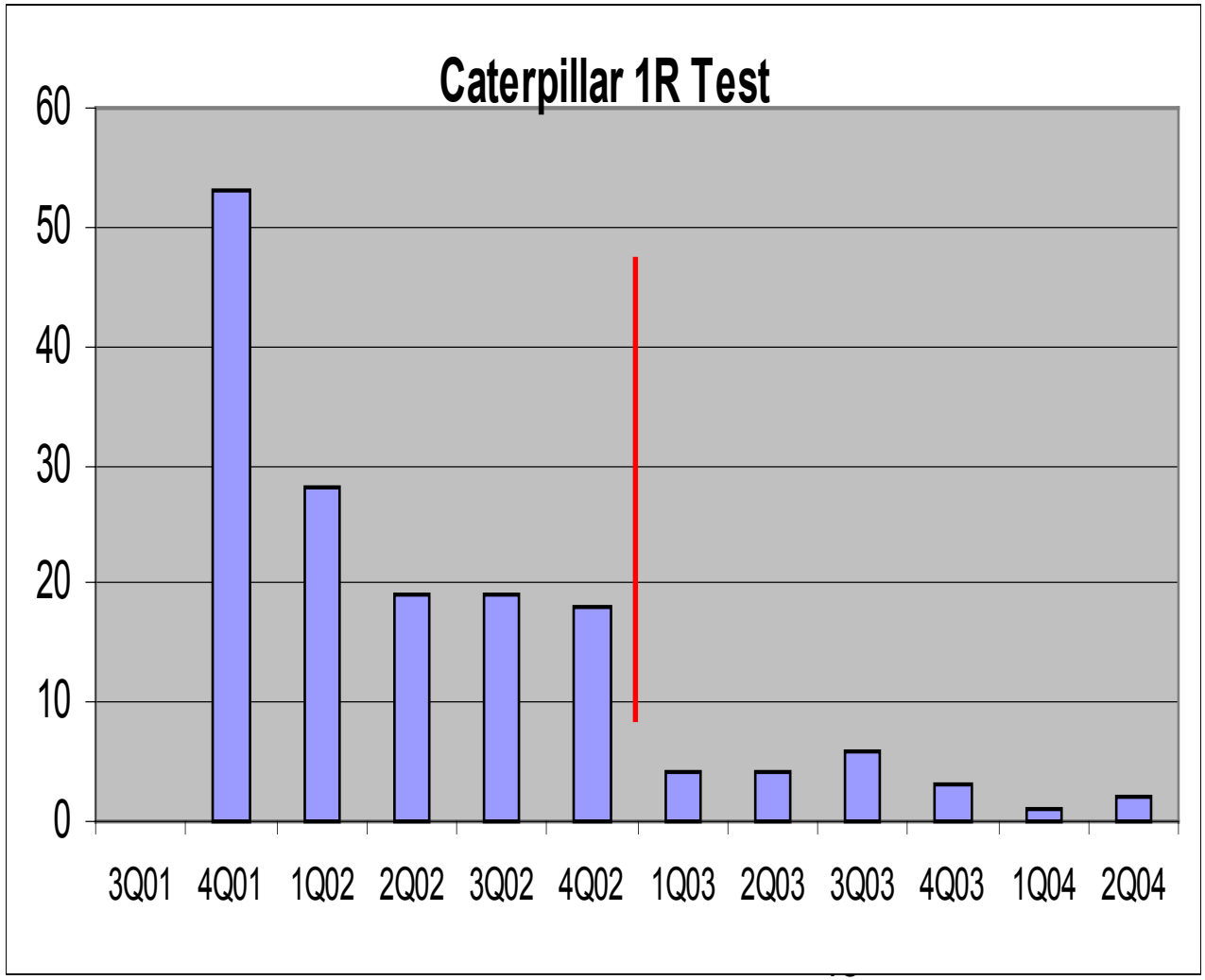
Mack T-10 Test



- 300-hour test
- Six quarters, ~26 tests/quarter (perhaps a bit less, 16 months)
- Thereafter, less than 10 tests/ quarter

American Chemistry Council
Good Chemistry Makes it Possible

Caterpillar 1R Test



- 504-hour test
- Very high passing rate
- Registration delayed
- Five quarters, ~27 tests/ quarter
- Thereafter, less than 5 tests/ quarter

American Chemistry Council Good Chemistry Makes it Possible

API CI-4 Testing Summary

- A shorter duration of high engine testing activity levels occurred for API CI-4 than for API CH-4
- For each test, five-seven quarters was required
- Overall conclusion, fifteen months was required

American Chemistry Council Good Chemistry Makes it Possible

Critical Considerations

- The CI-4 process was not satisfactory and resulted in CI-4 Plus
- There is higher complexity/greater uncertainty in PC-10
- Test capacity, pass/fail ratio, and invalid test frequency is unknown
- One more test in PC-10 than in CI-4
  - PC-10: Cummins ISM and ISB, Mack T-11 and T-12, Caterpillar C-13
  - CI-4: Cummins M-11 EGR, Mack T-8E and T-10, Caterpillar 1R
- Advent of PC-10 chemical box requires establishment of new core technology and limits formulating flexibility

American Chemistry Council Good Chemistry Makes it Possible

Test Capacity Concerns

- Caterpillar 1R
  - 504 hours, two-day turnaround (ca. 23 days total)
  - Very high passing rate (>75%?)
  - 137 tests run in first 15 months, about 9/month
    - 75% passing rate, about 103 passes
- Caterpillar C-13
  - 500 hours, six-day turnaround (ca. 27 days total)
  - Passing rate unknown
    - With a 50% passing rate, 200 tests are needed
  - Assuming there are 10-13 C-13 stands in the industry, each runs about one test/month, about 15-20 months is required

American Chemistry Council Good Chemistry Makes it Possible

ACC Viewpoint

- PC-10 is revolutionary (more challenging, more uncertainty), while API CH-4 and CI-4 were evolutionary (less challenging)
- API CI-4 required fifteen months
- Historical data and test differences for PC-10 indicate the current PC-10 process can not be compressed below that of API CI-4
- **PC-10 will take fifteen months from end of matrix**

American Chemistry Council Good Chemistry Makes it Possible

OBJECTIVE: Improve compliance with the PC10 D874 ash specification

June 21, 2005
R.E. Olsen/W.M. Kleiser

Concern

- Poor precision of D874 creates significant problems
- Current definition of compliance does not account for test reproducibility
- Need to define a method to determine SAsh that accounts for test reproducibility problems

D874 Precision

average of determinations	repeatibility	reproducibility
0.1	0.01	0.03
0.2	0.02	0.04
0.3	0.02	0.06
0.4	0.03	0.07
0.5	0.04	0.08
0.6	0.04	0.10
0.7	0.05	0.11
0.8	0.05	**0.12**
0.9	0.06	**0.13**
1.0	0.06	**0.14**
1.1	0.06	**0.15**
1.2	0.07	**0.16**
1.3	0.07	0.17
1.4	0.08	0.18
1.5	0.08	0.19
1.6	0.09	0.20
1.7	0.09	0.21
1.8	0.09	0.22
1.9	0.10	0.23
2.0	0.10	0.24

Limitations of D874 method

5.2 Because of above inter-element interferences, experimentally obtained sulfated ash values may differ from sulfated ash values calculated from elemental analysis. The formation of such non-sulfated species is dependent on the temperature of ashing, time ashed, and the composition of metal compounds present in oils. Hence, sulfated ash requirement generally should not be used in product specifications without a clear understanding between a buyer and a seller of the unreliability of an ash value as an indicator of the total metallic compound content.[6]

Consequences of Poor D874 Precision

- To ensure compliance with 1.0% maximum ash per ASTM D3244:
  - a blend plant would need to set their maximum specification to ~ 0.86% ash, resulting in serious compromise to TBN retention and drain interval performance
- Heightens risk resulting from bias among labs

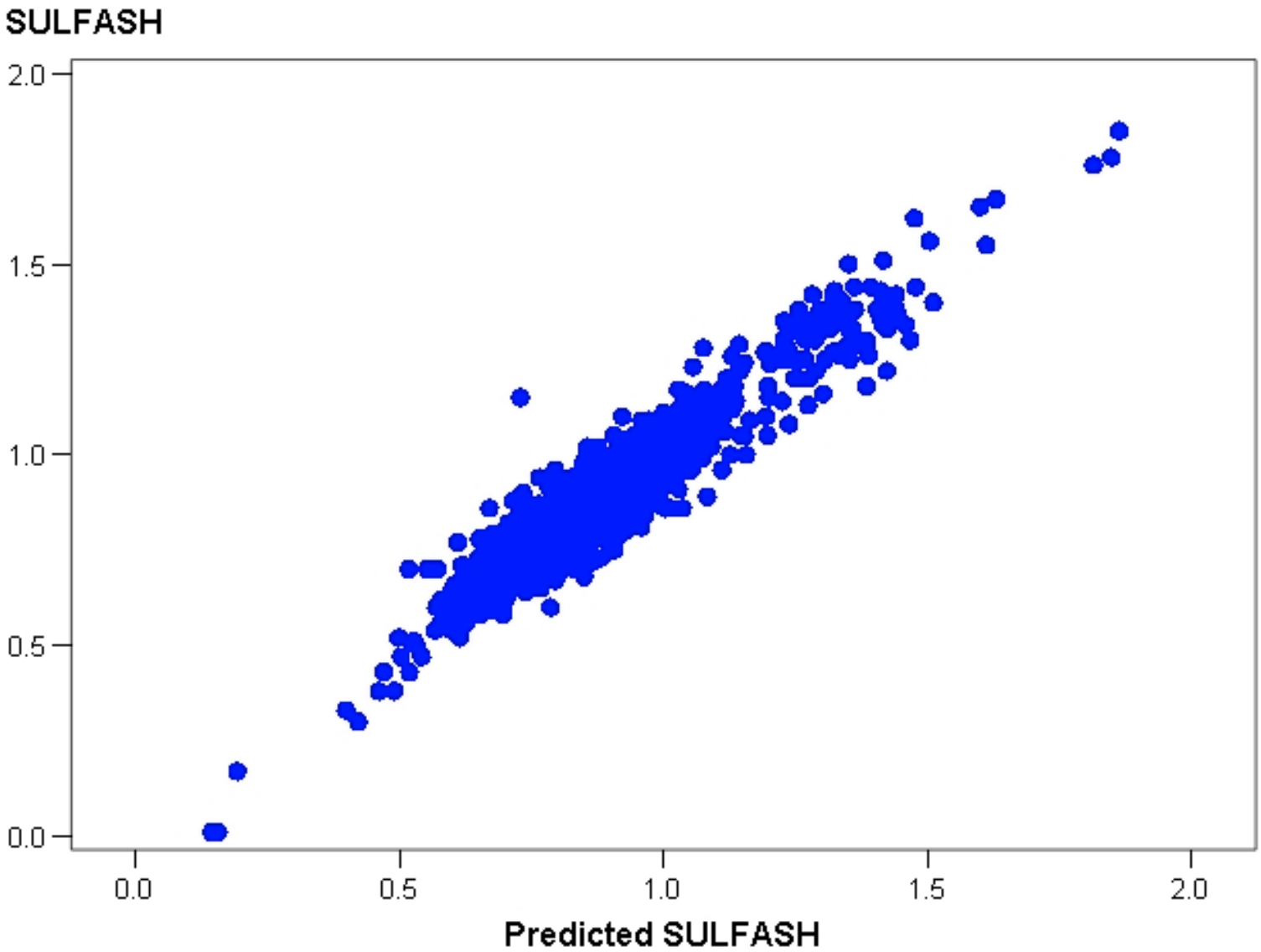
PROPOSAL:

Establish ASTM work group to develop and validate technical basis and procedures for:

1) Robust qualification of DI pack ash level (not to exceed 1.0) using replicated "bias-free" D874 ash determination

2) Use of ICP-AA metals (D5185) as metric for finished oil compliance.

R^2 = 0.92



June 21, 2005
R.E. Olsen/W.M. Kleiser

Sulfated Ash Measurements in Three Different Labs

Lab A	Run 1	1.44
	Run 2	1.44
	Run 3	1.44
	Run 4	1.44
Lab A Average		1.44
Lab B	Run 1	1.38
	Run 2	1.38
	Run 3	1.38
	Run 4	1.40
Lab B Average		1.39
Lab C	Run 1	1.38
	Run 2	1.315
	Run 3	1.32
	Run 4	1.3
	Run 5	1.31
	Run 6	1.29
Lab C Average		1.32

4/27/05

ASTM-HDEOCP EXIT CRITERIA BALLOT:

Proposed acceptance of the correlation between the Cummins M11 EGR to the Cummins ISM

Company	Name	Affirmative	Negative
Afton Chemical	Charles Passut	X	
BP	Mike Lynskey	X	
Caterpillar Inc	Abdul Cassim	X	
Chevron Oronite LLC	Wm. Kleiser	X	
ChevronTexaco	Jim Mc Geehan	X	
Ciba Specialty Chemicals	Scott Harold	X	
ConocoPhillips	David E. Taber	X	
Cummins	David M. Stehouwer		X*
DDC	Mesfin Belay	X	
Dana Corporation	Howard Robins	X	
Deere & Co	Ken Chao	X	
EMA	Roger Gault	X	
ExxonMobil	Steven Kennedy	X*	
GM	Robert Stockwell	X	
Infineum	Pat Fetterman	X	
Int'l Truck & Engine	Heather DeBaun	X	
Lubrizol	Lewis Williams		X*
Mack Division-Volvo Powertrain	Greg Shank	X	
PerkinElmer	Thomas M. Franklin	X	
RohMax USA	Steven Herzog		
Shell	Matthew Urbanak	X	
Valvoline	Wm. Runkle Jr.	X	
	Totals	19	2

* SEE COMMENTS BELOW:

Separate e-mail from: Cousineau, Tom [Tom.Cousineau@AftonChemical.com]

Jim and Pat,

Charlie Passut has previously submitted Exit Criteria ballots for Afton Chemical for all four tests listed below. Charlie is currently on vacation, and I wanted to send this note before the May 2nd deadline listed below.

I realize the deadline has passed for the Cummins ISM Exit Criteria ballot. Afton Chemical voted Affirmative with no comments. But I would now like to comment on the significant digits for the Cummins ISM limits proposed in the ballot. I believe we should apply significant digits uniformly across the one-test, two-test and three-test limits. Thus, the corrected limits, using the proper significant digits, should be those listed in parentheses below.

Crosshead Weight Loss at 3.9% Average Soot
1 Test = 7.5
2 Test = 8.17 (8.2)
3 Test = 8.47 (8.5)

Oil Filter Delta Pressure
1 Test = 55
2 Test = 67.43 (67)
3 Test = 73.79 (74)

Average Sludge
1 Test = 8.1 (8.10)
2 Test = 8.00
3 Test = 7.96

I suggest that the Class Panel review this proposal before the Cummins ISM limits go to Subcommittee B ballot.

Thanks and regards,
Tom

FROM: Lewis Milliams

Lubrizol votes negative on the ISM limits when the ISM is used to replace the M11 EGR. A requirement of using a new test to replace an old test in a previous category is to make sure that the pass/fail criteria of the previous category does not change. The proposed CWL limits of 7.5/8.17/8.47 in the ISM would allow the failing ref oil 1004 to pass 26% of the time within the 3 test limits. The mean for ref oil 1004 in the ISM is 8.33 and it's lowest result to date is 7.8. The proposed limits would result in a clearly failing oil having too high a chance of passing when the ISM is used to replace the M11 EGR. If the ISM limits to replace the M11 EGR were changed to 6.7/7.37/7.67 then the chances of the failing ref oil 1004 passing CWL for CI-4 is less than 2%. Lubrizol would change our negative vote to affirmative if the limits are adjusted as we propose.

Lubrizol votes negative on the ISM limits when the ISM is used to replace the M11 EGR. There is

---

FROM: David Stehouwer

After careful consideration, Cummins feels that we must vote negative on the 3 test limits as presented in this ballot. We appreciate and support the work done by the task group and the HDEOCP in establishing a correlation between the ISM and the M11 EGR. We feel that the key requirement of test limits to correlate a replacement test with an older one is that the severity of

the pass fail limit not change. The data supporting 7.5 mg CHWL as a pass / fail limit is strong. However, in considering MTAC, a 3 test average should be closer to the true mean than a single test.

As these limits stand, the poor oil (1004) would have too great a chance of passing.

If the three test limit were set at 7.5 mg and the two test and one test limits proportionally lower (I estimate: 2 test 7.2 mg, 1 test 6.5 mg. I would accept the limits that the statisticians calculate using 7.5 mg as the 3 test average.)

FROM: Steven Kennedy

ExxonMobil votes to accept the limits, but suggests that limits should be shown using a consistent number of decimal places (1 or 2) for each parameter.

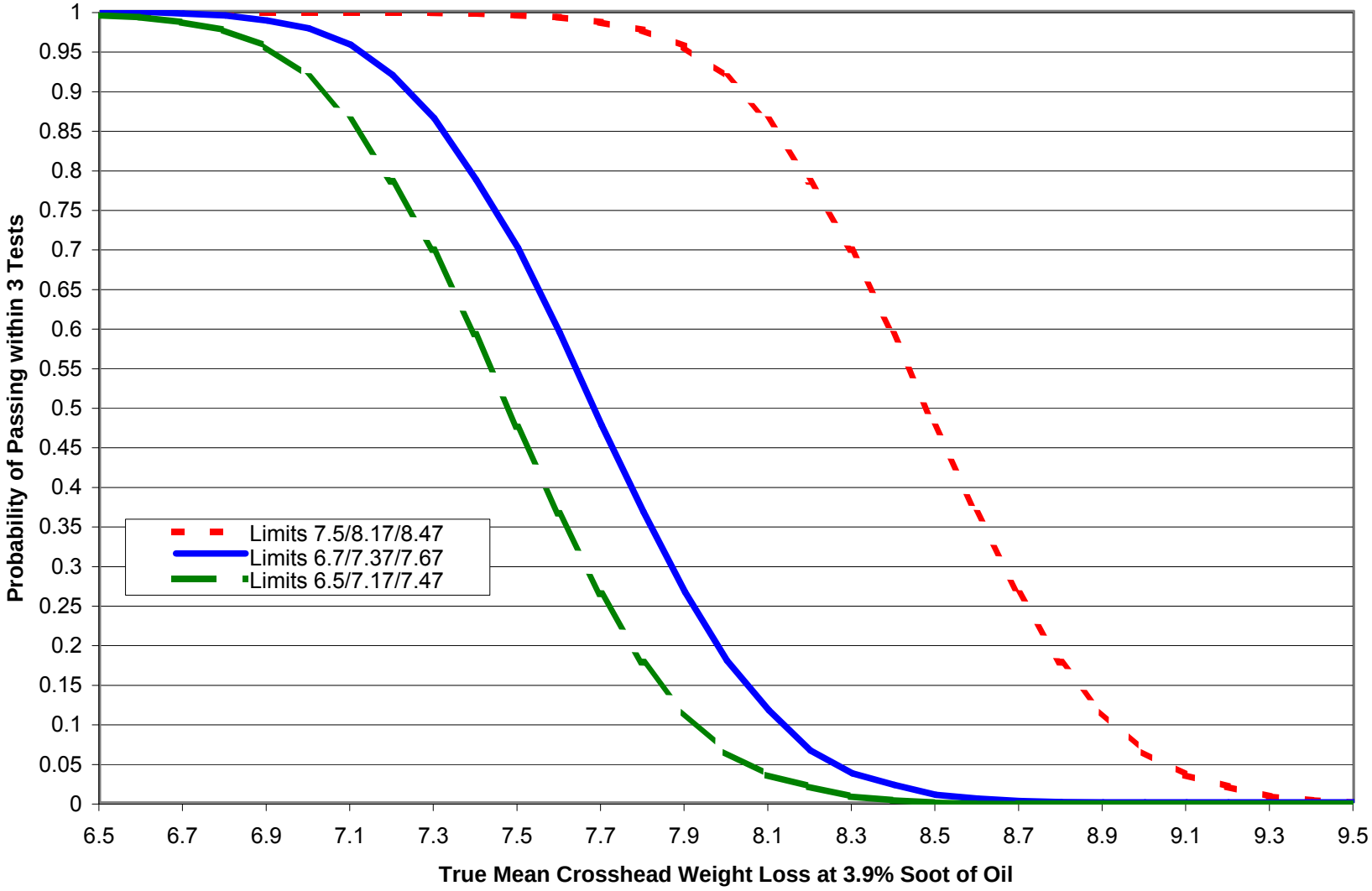
EXIT CRITERIA BALLOT

ASTM-HDEOCP BALLOT FOR VOTING MEMBERS ONLY Reference: Jim Mc Geehan, Chairman	Issue Date: April 4th 2005 Receipt Deadline: April 15th , 2005

RETURN BALLOT TO: Pat Connelly via email (preferred): patconnelly@chevrontexaco.com or via Fax: 510-242-3758	Name: _____ Organization: _____ Date: _____ Phone No.: _____

Motion	Affirmative	Negative
The following motion was made at the HDEOCP and passed 18 for, 0 negative, and 1 abstain. **MOTION** **Proposed acceptance of the correlation between the Cummins M11 EGR to the Cummins ISM, including the tiered limits shown below.** **Crosshead Weight Loss at 3.9% Average Soot** **1 Test = 7.5** **2 Test = 8.17** **3 Test = 8.47** **Oil Filter Delta Pressure** **1 Test = 55** **2 Test = 67.43** **3 Test = 73.79** **Average Sludge** **1 Test = 8.1** **2 Test = 8.00** **3 Test = 7.96** ISM RPT 3_05.ppt **(Phil Scinto and Jim Rutherford agreed to these tiered limits)**	☐	☐

Probability of Oil Pass in Cummins ISM Crosshead Weight Loss
Calculated Using Simulation and an Oil 1004 Standard Deviation=0.6



ATTACHMENT 12

ATTACHMENT 13

6-15-05

ASTM-HDEOCP EXIT CRITERIA BALLOT:

13% Noack volatility for all viscosity grades except SAE 10W-30 which would remain 15% Noack for PC-10

Company	Name	Affirmative	Negative
Afton Chemical	Charles Passut	X	
BP	Mike Lynskey	X	
Caterpillar Inc	Abdul Cassim	X	
Chevron Oronite LLC	Wm. Kleiser	X	
ChevronTexaco	Jim Mc Geehan	X	
Ciba Specialty Chemicals	Scott Harold	X	
ConocoPhillips	David E. Taber	X	
Cummins	David M. Stehouwer	X	
DDC	Mesfin Belay	X	
Dana Corporation	Howard Robins	X	
Deere & Co	Ken Chao	X	
EMA	Roger Gault	X	
ExxonMobil	Steven Kennedy	X	
GM	Robert Stockwell	X	
Infineum	Pat Fetterman	X	
Int'l Truck & Engine	Heather DeBaun	X	
Lubrizol	Lewis Williams	X	
Mack Division-Volvo Powertrain	Greg Shank	X	
PerkinElmer	Thomas M. Franklin	X	
Shell	Matthew Urbanak	X	
Valvoline	Wm. Runkle Jr.	X	
	Totals	21	0

4/27/05

ASTM-HDEOCP EXIT CRITERIA BALLOT:

Proposed Mack T-10 to Mack T-6 Limits

Company	Name	Affirmative	Negative
Afton Chemical	Charles Passut	X*	
BP	Mike Lynskey	X	
Caterpillar Inc	Abdul Cassim	X	
Chevron Oronite LLC	Wm. Kleiser		X *
ChevronTexaco	Jim Mc Geehan	X	
Ciba Specialty Chemicals	Scott Harold	X	
ConocoPhillips	David E. Taber	X	
Cummins	David M. Stehouwer		
DDC	Mesfin Belay	X	
Dana Corporation	Howard Robins	X	
Deere & Co	Ken Chao	X	
EMA	Roger Gault	X	
ExxonMobil	Steven Kennedy	X	
GM	Robert Stockwell	X	
Infineum	Pat Fetterman	X	
Int'l Truck & Engine	Heather DeBaun	X	
Lubrizol	Lewis Williams	X*	
Mack Division-Volvo Powertrain	Greg Shank	X	
PerkinElmer	Thomas M. Franklin	X	
RohMax USA	Steven Herzog		
Shell	Matthew Urbanak	X	
Valvoline	Wm. Runkle Jr.	X	
	Totals	19	1

* SEE COMMENTS BELOW

FROM: Lewis Williams
Lubrizol votes affirmative conditional on the limits for the T-9 when a T-10 test is run passes as balloted on the Exit Ballot dated 4/15/05

ATTACHMENT 14, 2 OF 3

FROM: Wm. Kleiser

Chevron Oronite has concerns about extending a correlation across two generations of engine tests. The correlation between the T10 and T9 is based on limited data, none of which appear to be CF-4 quality oils. We feel that a set of data on CF-4 oils run in the T10 would be required before accepting a 'double' read across.

EXIT CRITERIA BALLOT

ASTM-HDEOCP BALLOT FOR VOTING MEMBERS ONLY Reference: Jim Mc Geehan, Chairman	Issue Date: April 4th 2005 Receipt Deadline: April 15th , 2005

RETURN BALLOT TO: Pat Connelly via email (preferred): patconnelly@chevrontexaco.com or via Fax: 510-242-3758	Name: _____ Organization: _____ Date: _____ Phone No.: _____

Motion	Affirmative	Negative
The following motion was made at the HDEOCP and passed unanimously. MOTION Proposed Mack T-10 to Mack T-6 limits. Liner Wear: 47 μm Top Ring Weight Loss: 180 mg	☐	☐

Comments:

4/27/05

ASTM-HDEOCP EXIT CRITERIA BALLOT:

Proposed Mack T-10 to Mack T-9 Limits

Company	Name	Affirmative	Negative
Afton Chemical	Charles Passut	X	
BP	Mike Lynskey	X	
Caterpillar Inc	Abdul Cassim	X	
Chevron Oronite LLC	Wm. Kleiser	X	
ChevronTexaco	Jim Mc Geehan	X	
Ciba Specialty Chemicals	Scott Harold	X	
ConocoPhillips	David E. Taber	X	
Cummins	David M. Stehouwer		
DDC	Mesfin Belay	X	
Dana Corporation	Howard Robins	X	
Deere & Co	Ken Chao	X	
EMA	Roger Gault	X	
ExxonMobil	Steven Kennedy	X	
GM	Robert Stockwell	X	
Infineum	Pat Fetterman	X	
Int'l Truck & Engine	Heather DeBaun	X	
Lubrizol	Lewis Williams	X	
Mack Division-Volvo Powertrain	Greg Shank	X	
PerkinElmer	Thomas M. Franklin	X	
RohMax USA	Steven Herzog		
Shell	Matthew Urbanak	X	
Valvoline	Wm. Runkle Jr.	X	
	Totals	20	0

EXIT CRITERIA BALLOT

ASTM-HDEOCP BALLOT FOR VOTING MEMBERS ONLY Reference: Jim Mc Geehan, Chairman	Issue Date: April 4th 2005 Receipt Deadline: April 15th , 2005

RETURN BALLOT TO: Pat Connelly via email (preferred): patconnelly@chevrontexaco.com or via Fax: 510-242-3758	Name: _____ Organization: _____ Date: _____ Phone No.: _____

Motion	Affirmative	Negative
The following motion was made at the HDEOCP and passed unanimously. MOTION Proposed Mack T-10 to Mack T-9 limits.  T9 vs T10 Mar31-old.ppt	☐	☐

Comments:

- Action plan from 6/20/05 meeting
  - Wait for matrix testing results
  - Compare oils run in the ISM, ISB and RFWT
  - SWRI will run one matrix oil in the RFWT
    - Oil will be selected by task force at end of matrix
  - Review PC-10 candidate oil data upon approval of data sharing
  - Additional comments would be appreciated

ATTACHMENT 16

PC-10 Performance Requirement

Performance Criteria	Fuel Sulfur, Wt % / ppm	Test	PC-10 2006
Engine Tests			
Aluminum Piston Deposits, Oil Consumption	0.05	Caterpillar 1N	1
Forged Steel Piston Oil Consumption / Deposits	0.05	Caterpillar 1P	2
Oil Consumption and Piston Deposit	15 ppm	Caterpillar C-13	3
Viscosity Increase Due to Soot at 6.0%*	0.05	Mack T-11	4
Ring, Liner Bearing Wear & Oil Consumption	15 ppm	MackT-12	5
Valve Train Wear, Filter ΔP and Sludge	.05	Cummins ISM	6
Valve Train Wear	15 ppm	Cummins ISB	7
Roller-Follower Valve Train Wear	0.05	GM 6.5-Liter PC – Diesel	8
Aeration	0.05	Navistar HEUI 7.3-Liter EOAT	9
Oil Oxidation	0.10	See III G or IIIF or Neither	10
Bench Tests			
Foam	–	Bench Test Sequence I, II, III	1
Volatility	–	Noack D 5800 ASTM D 892	2
Elastomer Compatibility		D-471, Ref. Oils	3
High Temperature/High Shear		Viscosity After Shear D 4683	4
Corrosion		HTCBT 135°C D 6594	5
Shear Stability – 90 Cycles	–	Bosch Injector ASTM D 3945	6
Total Number of Engine and Bench Tests			*16*

Yet to Be Decided

*MRV TP-1 and 90 Cycles Shear

Jim Mc Geehan • Chairman HDEOCP

ATTACHMENT 17

4/26/05

ASTM-HDEOCP EXIT CRITERIA BALLOT:

Recommend that the ISB test procedure be moved forward to matrix

Company	Name	Affirmative	Negative
Afton Chemical	Charles Passut	X	
BP	Mike Lynskey		
Caterpillar Inc	Abdul Cassim		
Chevron Oronite LLC	Wm. Kleiser	X*	
ChevronTexaco	Jim Mc Geehan	X	
Ciba Specialty Chemicals	Scott Harold	X	
ConocoPhillips	David E. Taber		
Cummins	David M. Stehouwer	X	
DDC	Mesfin Belay	X	
Dana Corporation	Howard Robins	X	
Deere & Co	Ken Chao	X	
EMA	Roger Gault	X	
ExxonMobil	Steven Kennedy	X	
GM	Robert Stockwell	X	
Infineum	Pat Fetterman		
Int'l Truck & Engine	Heather DeBaun	X	
Lubrizol	Lewis Williams	X	
Mack Division-Volvo Powertrain	Greg Shank	X	
PerkinElmer	Thomas M. Franklin	X	
RohMax USA	Steven Herzog		
Shell	Matthew Urbanak	X	
Valvoline	Wm. Runkle Jr.	X	
	Totals	17	0

* See Comments

From William Kleiser

Chevron Oronite supports moving ahead with the ISB matrix incorporating use of a snap gauge cam wear measurement in place of the former Adcole measurement. The snap gauge cam measurement removes the unacceptable delays encountered due to the attempted use of the Adcole measurements.

From: Steven Kennedy
ExxonMobil is voting affirmative to move ahead with the ISB matrix, however, we still have some concerns with this test. In addition to the measurement and operational issue that need to be addressed, we believe it is important to evaluate the need for 3 soot-related valve train wear tests in PC-10.

ATTACHMENT 19

4/12/05

ASTM-HDEOCP EXIT CRITERIA BALLOT:

Accept the Mack T-12 is ready for matrix testing

Company	Name	Affirmative	Negative
Afton Chemical	Charles Passut	X	
BP	Mike Lynskey	X	
Caterpillar Inc	Abdul Cassim		
Chevron Oronite LLC	Wm. Kleiser	X	
ChevronTexaco	Jim Mc Geehan	X	
Ciba Specialty Chemicals	Scott Harold	X	
ConocoPhillips	David E. Taber	X	
Cummins	David M. Stehouwer	X	
DDC	Mesfin Belay	X	
Dana Corporation	Howard Robins	X	
Deere & Co	Ken Chao	X	
EMA	Roger Gault	X	
ExxonMobil	Steven Kennedy	X	
GM	Robert Stockwell	X	
Infineum	Pat Fetterman	X	
Int'l Truck & Engine	Heather DeBaun	X	
Lubrizol	Lewis Williams	X	
Mack Division-Volvo Powertrain	Greg Shank	X	
PerkinElmer	Thomas M. Franklin	X	
RohMax USA	Steven Herzog		
Shell	Matthew Urbanak	X	
Valvoline	Wm. Runkle Jr.	X	
	Totals	20	