Meeting Minutes
Sequence III Surveillance Panel

March 28, 2012
09:00 – 15:00 CDT
Omni Corpus Christi Hotel
Corpus Christi, TX

Agenda

1.0) Roll Call

1.1) George Szappanos replaces Greg Seman of Lubrizol who has accepted another position within company.
1.2) Tracy King is no longer Chrysler's representative. She has been replaced by Haiying Tang.
1.3) Karin Haumann has joined Southwest Research as their Seq. IIIF project engineer.
1.4) The attendance is included as **Attachment 1.**

2.0) Approval of minutes

2.1) The minutes of the November 3, 2011 teleconference were approved without objection.

3.0) Action Item Review

3.1) 03/17/11 – Panel members solicit oil suppliers for potential replacement reference oil for IIIF test (PVIS~275%). Dave Glaenzer reported that no one has come forward with a proposed oil.

3.2) Maximum hours for parts washer soap use. Charlie Leverett reported under Old Business.

4.) Old Business

4.1) Parts Washer Soap Analysis, Charlie Leverett.
Charlie's presentation is shown in **Attachment 2**. After discussion, ***Charlie moved, Altmann seconded, labs be required to change the soap after no more than 25 hours of use. The motion passed unanimously.*** Rich Grundza will issue the appropriate build manual and/or test method revisions. It was noted that this change is for both the IIIG and IIIF.
4.2) ACC PAPTG response to data request (from 11/03/2011 teleconference), David Glaenzer.
Dave reported that ACC repsonded (**Attachment 3**) to, but denied the panel's request.

5.) Semi-Annual Reports

5.1) Test Monitoring Center Report

Rich Grundza's report is included as **Attachment 4**. Rich's report was accepted unanimously.

5.2) Test Sponsor Report

Bruce Matthews of GM reported that good progress is being made on the IIIH and expects that the San Antonio test labs will be running in the very near future.

5.3) Chevy Performance Report

Scott Stapp gave the report (**Attachment 5**), noting that their name has changed to Chevy Performance. At current usage rates, Scott estimates that current inventory is at 3+ years. Dave Glaenzer will poll the labs as to their inventories so that he can give the industry a complete view of expected test life.

The crankshaft part number has been updated (with a "C" appended) to indicate that the crankshafts have re-chamfered oil holes. These crankshafts have been shipping since January 11, 2012. Discussion moved to how to introduce the crankshafts for testing. ***Charlie Leverett moved, Jason Bowden second, to add the Chevy Performance crankshaft part number to the test report for Seq. IIIF and IIIG, effective with the release of the new report package.*** The motion passed unanimously. The TMC will produce the new packets and send to the industry for beta test and eventual release.

5.4) CPD Report

Jason Bowden's report is attached as **Attachment 6**; Technical Memos 21 and 22 are **Attachments 7 and 8**. The report was accepted unanimously.

5.5) Fuel Supplier Report

Mark Overaker gave the report for Haltermann (**Attachment 9**). It was noted that for the first time RVP has been adjusted for a batch of the EEE fuel at the Nixon facility (tank 63).

6.) New Business

5.1) Application of Sequence IIIG Information Letter 11-5 (FIFO parts usage) to Sequence IIIF (D6984) test.

It was noted that ACC has encouraged application of FIFO to the Seq. IIIF. ***A motion by Ed Altmann, Jason Bowden second, was made to incorporate the same FIFO scheme for the IIIF that was implemented for the IIIG. Expected implementation is June 1, 2012. The motion passed unanimously.*** The TMC will issue the appropriate report form / test method / build manual changes.

5.2) Targets for RO 435-2, Richard Grundza, Attachment 10.
Rich presented the results to date. After discussion, it was agreed to continue judging 435-2 against the original test targets.

5.3) Reporting of test hardware on Form 12, Rich Grundza and Jason Bowden, Attachment 11.
Jason explained that the Lifter Engine Set Number should be reported by the labs with only the numerical digits; no letters should be included.

5.4) Sequence IIIG PVIS Severity Analysis, Todd Dvorak/David Glaenzer, Attachment 12.
Todd's conclusion is that no single root cause can be identified as corresponding to higher PVIS results. As such, their is no recommendation at this time to take any action. During follow upd discussion, the reference oil supplier agreed to used oil FTIR data for both 434 and 434-1 being analyzed where the data is available. Pat Lang will collect the data and forward to Doyle Boese for statistical analysis.

5.5) Annual calibration of Sunnen honing machine load measurement. A TMC poll of test labs indicated that some labs are adhering to the requirement, some aren't. Labs were reminded to adhere to the requirement and the requirement is subject to ISO audit and TMC inspection. Charlie Leverett and Bruce Matthews will dialog with Sunnen in an effort to make the calibration process easier for the labs.

5.6) Notification by lab to SP of delayed stand calibration, Pat Lang, Attachment 13.
Per a possible interpretation of the LTMS, SwRI notified the panel of a stand that wasn't skipped in the stand rotation but was delayed in re-calibrating. The panel saw no issue with this, and the general interpretation was that the wording in the LTMS (**Attachment 14**) doesn't apply since the within lab stand order did not change. For the future, similarly situated stands/labs, need not consult the SP. The TMC will review the section of the LTMS and propose a revision that simpifies the wording.

6.) Review Scope and Objectives

6.1) Included as **Attachment 15**.

7.) Next Meeting

7.1) Call of chairman

8.) Meeting Adjourned

8.1) The meeting adjourned at noon.

9.) Motions and Action Items

9.1) Included as **Attachment 16**.

Attachment 1

ASTM Sequence III Surveillance Panel (17 Voting members) date: 03/28/2012

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
Art Andrews ExxonMobil Products Research 600 Billingsport Rd. Paulsboro, NJ 08066 USA	856-224-3013 arthur.t.andrews@exxonmobil.com	Non-Voting Member	Present
~~Zack Bishop~~ Clayton Knight Test Engineering, Inc. 12718 Cimarron Path San Antonio, TX 78249-3423 USA	210-877-0228 210-690-1959 ~~zbishop@tei-net.com~~ cknight@tei-net.com	Non-Voting Member	Present
Doyle Boese Infineum 1900 E. Linden Avenue Linden, NJ 07036 USA	908-474-3176 908-474-3637 doyle.boese@infineum.com	Non-Voting Member	Present
Adam Bowden OH Technologies, Inc. 9300 Progress Parkway P.O. Box 5039 Mentor, OH 44061-5039 USA	440-354-7007 440-354-7080 adbowden@ohtech.com	Non-Voting Member	Present
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	Present
Dwight H. Bowden OH Technologies, Inc. 9300 Progress Parkway P.O. Box 5039 Mentor, OH 44061-5039 USA	440-354-7007 440-354-7080 dhbowden@ohtech.com	Non-Voting Member	Present

ASTM Sequence III Surveillance Panel (17 Voting members) date:

Name/Address	Phone/Fax/Email		Signature
Matt Bowden OH Technologies, Inc. 9300 Progress Parkway P.O. Box 5039 Mentor, OH 44061-5039 USA	440-354-7007 440-354-7080 mjbowden@ohtech.com	Non-Voting Member	Present
Jerome A. Brys Lubrizol Corp. 29400 Lakeland Blvd. Wickliffe, Ohio 44092 USA	440 347-2631 jerome.brys@lubrizol.com	Non-Voting Member	Present
Bill Buscher III Southwest Research Institute 6220 Culebra Road P.O. Box 28510 San Antonio, TX 78228 USA	210-522-6802 210-684-7523 william.buscher@swri.org	Non-Voting Member	Present WAB
Bob Campbell Afton Chemical Corporation 500 Spring Street Richmond, VA 23219 USA	804-788-5340 804-788-6358 bob.campbell@aftonchemical.com	Non-Voting Member	Present
James Carter Haltermann Solutions 2296 Hulett Rd. Okemos, MI 48864 USA	517-347-3021 517-347-1024 jecarter@jhaltermann.com Cell: 517-896-0897	Voting Member	Present
Chris Castanien The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, OH 44092 USA	440-347-2973 440-944-8112 cca@lubrizol.com	Non-Voting Member	Present
Timothy L. Caudill Ashland Oil Inc. 22nd & Front Streets Ashland, KY 41101 USA	606-329-1960 x5708 606-329-2044 tlcaudill@ashland.com	Voting Member	Present
Martin Chadwick Intertek Automotive Research 5404 Bandera Road San Antonio, TX 78238 USA	210-706-1543 210-684-6074 martin.chadwick@intertek.com	Non-Voting Member	Present

ASTM Sequence III Surveillance Panel (17 Voting members) date:

Name/Address	Phone/Fax/Email		Signature
Jeff Clark Sequence III Secretary ASTM Test Monitoring Center 6555 Penn Avenue Pittsburgh, PA 15206 USA	412-365-1032 412-365-1047 jac@atc-erc.org	Non-Voting Member	Present JAC
Sid Clark Southwest Research 50481 Peggy Lane Chesterfiled, MI 48047 USA	586-873-1255 Sidney.L.Clark@sbcglobal.net	Non-Voting Member	Present
Todd Dvorak Afton Chemical Corporation P.O. Box 2158 Richmond, VA 23218-2158 USA	804-788- 6367 804-788- 6388 todd.dvorak@aftonchemical.com	Non-Voting Member	Present Phone
Frank Farber ASTM Test Monitoring Center 6555 Penn Avenue Pittsburgh, PA 15206 USA	412-365-1030 412-365-1047 fmf@astmtmc.cmu.edu	Non-Voting Member	Present
Gordon R. Farnsworth Infineum RR # 5 Box 211 Montrose, PA 18801 USA	570-934-2776 570-934-0141 gordon.farnsworth@infineum.com	Non-Voting Member	Present
Joe Franklin Intertek Automotive Research 5404 Bandera Road San Antonio, TX 78238 USA	210-523-4671 210-523-4607 joe.franklin@intertek.com	Non-Voting Member	Present
David L. Glaenzer Afton Chemical Corporation 500 Spring Street P.O. Box 2158 Richmond, VA 23218-2158 USA	804-788-5214 804-788-6358 dave.glaenzer@aftonchemical.com **Surveillance Panel Chairman**	Non-Voting Member	Present

ASTM Sequence III Surveillance Panel (17 Voting members) date:

Name/Address	Phone/Fax/Email		Signature
Richard Grundza ASTM Test Monitoring Center 6555 Penn Avenue Pittsburgh, PA 15206 USA	412-365-1031 412-365-1047 reg@astmtmc.cmu.edu	Voting Member	Present RCG
Jeff Kettman ~~GM Racing~~ Chevy Performance 5388 Hill 23 Drive Flint, MI 48507 USA	313-667-0493 313-319-0139 – cell jeff.kettman@gm.com	Non-Voting Member	Present JK
Tracey King Chrysler LLC 800 Chrysler Drive CIMS 482-00-13 Auburn Hills, MI 48326-2757 USA	248-576-7500 248-576-7490 tek1@chrysler.com	Voting Member	Present
Clayton Knight Test Engineering, Inc. 12718 Cimarron Path San Antonio, TX 78249-3423 USA	210-690-1958 210-690-1959 cknight@tei-net.com	Voting Member	Present
Teri Kowalski Toyota Motor North America, Inc. 1555 Woodridge Ann Arbor, MI 48105	734-995-4032 734-995-9049 teri.kowalski@tema.toyota.com	Non-Voting Member	Present
Patrick Lang Southwest Research Institute 6220 Culebra Road P.O. Box 28510 San Antonio, TX 78228 USA	210-522-2820 210-684-7523 plang@swri.edu	Voting Member	Present
Charlie Leverett Intertek Automotive Research 5404 Bandera Road San Antonio, TX 78238 USA	210-647-9422 210-523-4607 charlie.leverett@intertek.com	Voting Member	Present
Josephine G. Martinez Chevron Oronite Company LLC 100 Chevron Way Richmond, CA 94802 USA	510-242-5563 510-242-3173 jogm@chevrontexaco.com	Non-Voting Member	Present

ASTM Sequence III Surveillance Panel (17 Voting members) date:

Name/Address	Phone/Fax/Email		Signature
Bruce Matthews GM Powertrain Mail Code 483-730-472 823 Jocyln Avenue Pontiac, MI 48340 USA	248-830-9197 248-857-4441 bruce.matthews@gm.com **Test Sponsor Representative**	Voting Member	Present
Mike McMillan	mmcmillan123@comcast.net	Non-Voting Member	Present
Timothy Miranda BP Castrol Lubricants USA 1500 Valley Road Wayne, NJ 07470 USA	973-305-3334 973-686-4039 Timothy.Miranda@bp.com	Voting Member	Present
Mark Mosher ExxonMobil Technology Co. Billingsport Road Paulsboro, NJ 08066 USA	856-224-2132 856-224-3628 mark.r.mosher@exxonmobil.com	Voting Member	Present
Siamak Moshiri Cad Railway Industries Ltd. 155 Montreal – Toronto Highway H8S 1B4 Montreal, QC, CANADA	1-634-3131, ext. 412 smoshiri@cadrail.ca	Non-Voting Member	Present
Bob Olree GM Racing 5388 Hill 23 Drive Flint, MI 48507 USA	248-689-3078 olree@netzero.net	Non-Voting Member	Present Phone
Christian Porter Afton Chemical Corp. 500 Spring Street Richmond, VA 23219 USA	804-788-5837 804-788-6358 christian.porter@aftonchemical.com	Non-Voting Member	Present
Phil Rabbat BASF Corporation 500 White Plains Road Tarrytown, NY 10591-9005 USA	914-785-2217 914-785-3681 phil.rabbat@basf.com	Non-Voting Member	Present

ASTM Sequence III Surveillance Panel (17 Voting members) date:

Name/Address	Phone/Fax/Email		Signature
Allison Rajakumar The Lubrizol Corporation Drop 152A 29400 Lakeland Blvd. Wickliffe, OH 44092 USA	440-347-4679 440-347-2014 Allison.Rajakumar@Lubrizol.com	Non-Voting Member	Present
Scott Rajala Idemitsu Lubricants America Corp.	srajala@ilacorp.com	Non-Voting Member	Present
Andrew Ritchie Infineum 1900 East Linden Avenue P.O. Box 735 Linden, NJ 07036 USA	908-474-2097 908-474-3637 Andrew.Ritchie@Infineum.com	Voting Member	Present By Phone
Ron Romano Ford Motor Company Diagnostic Service Center II Room 410. 1800 Fairlane Drive Allen Park, MI 48101 USA	313-845-4068 313-32-38042 rromano@ford.com	Voting Member	Present
Jim Rutherford Chevron Oronite Company LLC 100 Chevron Way Richmond, CA 94802 USA	510-242-3410 510-242-3173 jaru@chevrontexaco.com	Non-Voting Member	Present
Philip R. Scinto The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, OH 44092 USA	440-347-2161 440-347-9031 prs@lubrizol.com	Non-Voting Member	Present
~~Greg Seman~~ ~~The Lubrizol Corporation~~ ~~29400 Lakeland Boulevard~~ ~~Wickliffe, OH 44092~~ ~~USA~~	440-347-2153 440-347-4096 greg.seman@lubrizol.com	~~Voting Member~~	Present
George Szappanos		voting member	

ASTM Sequence III Surveillance Panel (17 Voting members) date:

Name/Address	Phone/Fax/Email		Signature
Matt J. Snider GM Powertrain General Motors Corporation MC - 483-730-322 823 Joclyn Rd. Pontiac, MI 48090-9055 USA	248-672-3563 248-857-4441 mathew.j.snider@gm.com	Non-Voting Member	Present Phone
Thomas Smith Valvoline P.O. Box 14000 Lexington, KY 40512-1400 USA	859-357-2766 859-357-7084 trsmith@ashland.com PCEOCP Chair	Voting Member	Present
Don Smolenski GM	248-255-7892 donald.j.smolenski@gm.com	Non-Voting Member	Present
Mark Sutherland Chevron Oronite Company LLC 4502 Centerview Drive Suite 210 San Antonio, TX 78228 USA	210-731-5621 210-731-5699 msut@chevrontexaco.com	Voting Member	Present
Joe Vujica The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, OH 44092 USA	440-347-2057 440-347-4096 jsvu@lubrizol.com	Non-Voting Member	Present
Ben O. Weber Southwest Research Institute 6220 Culebra Road P.O. Box 28510 San Antonio, TX 78228 USA	210-522-5911 210-684-7530 bweber@swri.edu **Sub-Committee D02.B01 Chair**	Non-Voting Member	Present
Tom Wingfield Chevron Phillips Chemical Co.	wingftm@cpchem.com	Non-Voting Member	Present

A. Lopez
INTERTEK

Jim Linden
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Karin Hausmann SwRI Karin.hausmann@swri.org

02/01/11

Present

Scott Stapp Chevy Performance Scott Stapp

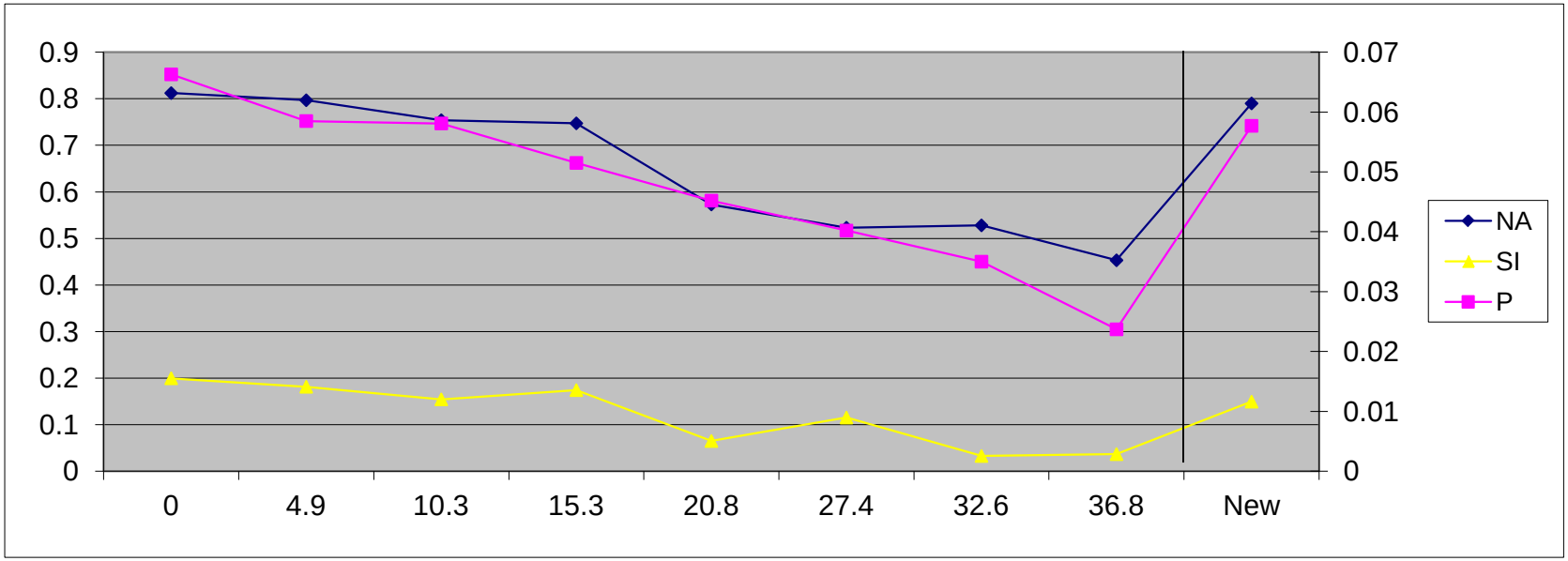
Robert Stockwell GM Powertrain RTS

Attachment 2

Parts Washer Soap Analysis

	Lab Code	1D0507MA1	1D0508MA1	OS1423MUC	OS1423MA1	2J0359MU1	2J0790MU1	2J1227MU1	2F0940MU1	2F0940MUA
	Hours	111.2	116.1	121.5	126.5	132	138.6	143.8	148	148.3
	In-Use	**0**	**4.9**	**10.3**	**15.3**	**20.8**	**27.4**	**32.6**	**36.8**	**New**
	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Sodium	NA	0.8122	0.7968	0.754	0.7472	0.5729	0.523	0.528	0.453	0.79
Phophorus	P	0.0663	0.0585	0.0581	0.0515	0.0452	0.0402	0.035	0.0237	0.0577
*Silicon	SI	0.1995	0.1813	0.1542	0.1741	0.0648	0.1151	0.0326	0.0366	0.1493
		0.66%	0.65%	0.61%	0.61%	0.46%	0.42%	0.43%	0.37%	0.62%
Ratio	**NA/P**	**12.3**	**13.6**	**13.0**	**14.5**	**12.7**	**13.0**	**15.1**	**19.1**	**13.7**

* Silcon is suspected to be antifoam additive



Attachment 3

Sent via Email
February 7, 2012

David L. Glaenzer
Sequence III Surveillance Panel Chairman
c/o Afton Chemical Corporation

Dear Mr. Glaenzer,

The ACC PAPTG appreciates the proactive approach being taken by the Sequence III Surveillance Panel in their efforts to ensure hardware for the Sequence IIIG test is assigned in a manner consistent with the 'First in First Out (FIFO)' principles established for the old Sequence IIIE test. We are absolutely dedicated to helping you and the panel in these efforts.

We have given careful consideration to your request to look at the hardware batch records for the historical candidate datasets for the IIIG and IIIF tests. After consultation with staff from the TMC the ACC PAPTG group has decided that the effort involved is not warranted at this time. We recognize that the 1991 Information Letter 60 for the now obsolete Sequence IID and IIIE tests embodies the principles of FIFO and support its formal reintroduction through the passing of a new Information Letter 11-5.

We do feel that we must take a more deliberate approach to monitoring the requirements of Information Letter 11-5 and thus support the request for the TMC to work to introduce database coding to implement this at some point in the near future. We encourage the Surveillance Panel to liaise with the TMC to assist them in setting this up. Once this is implemented by the TMC, the Panel should consider adopting a new test objective for monitoring compliance of registered Sequence IIIG tests with Information Letter 11-5 (Principles of FIFO) for the Sequence III test hardware. We note that the current action only covers the Sequence IIIG test and advise that consideration is given to expand it to include the Sequence IIIF test.

Thank you and the Sequence III Surveillance Panel for your support of high quality testing to our industry.

Sincerely,

Jerry Wang

Jerry Wang
PAPTG Chair

Doug Anderson

Doug Anderson
PAPTG Manager

Attachment 4

ASTM D02.B1 Semi-Annual Report Passenger Car Reference Oil Testing

April 2012

Passenger Car Engine Oil Testing Executive Summary

- IIIF
  - No significant monitoring issues.
- IIIG/A/B
  - Ten tests obtained on reference oil 435-2. Potential target update to be discussed at March meeting.
- IVA
  - Reference oil 1006-2 reintroduced February 2, 2012. Calibration periods with 1006-2 reduced to generate additional data for targets.

Passenger Car Engine Oil Testing Executive Summary

- VIB
  - No test activity this period.
- VID
  - Targets Updated in December for reference oil 1010.
  - Results reported on new blend of 541
- VIII
  - No significant monitoring issues.

Calibrated Labs and Stands*

Test	Labs	Stands
IIIF	4	4
IIIG/A/B	6	16
IVA	3	4
VG	4	8
VIB	0	0
VID	6	12
VIII	2	3

*As of 3/23/2012

Test Activity Levels

- October 1, 2011 – March 31, 2012

Sequence Tests

Test Status	Validity Code	IIIF	IIIG	IVA
Acceptable Calibration Test	AC	7	11	7
Failed Calibration Test	OC	1	2	1
Operationally Invalid	LC	0	0	1
Aborted	XC	1	1	0
Abandon Stand/Eng	MC	0	0	3
Decoded/Donated	NN/AG	0	0	7
Assigned, not reported		1	1	1
Total		**10**	**15**	**21**

Sequence Tests (cont.)

Test Status	Validity Code	VG	VID	VIII
Acceptable Calibration Test	AC	8	25	4
Failed Calibration Test	OC	0	1	3
Operationally Invalid	LC	0	1	0
Aborted	XC	0	0	0
Abandon Stand/Eng	MC	0	2	0
Decoded/Donated	NN/AG	1	10	0
Assigned, not completed		0	1	1
Total		**9**	**40**	**8**

Failed Tests

Test Status	Test	Number of Tests
Screened ACLW >20µm	IIIF	1
Severe Viscosity Increase	IIIG	1
Severe Viscosity Increase and WPD	IIIG	1
Mild Average Cam Wear	IVA	4
Stand EWMA Precision Alarm, FEI2	VID	1
Severe Stripped Viscosity Result	VIII	2
Severe Stripped Viscosity, BWL Precision Alarm	VIII	1
Total		10

Lost Tests*

*Invalid and aborted tests

Test Status	Cause	IIIF	IIIG	IVA	VG	VID	VIII
Aborted	Oil Temperature Control	1	0	0	0	0	0
Aborted	Blown Head Gasket	0	1	0	0	0	0
Invalid	Engine Oil Thermocouple Failed	0	0	1	0	0	0
Invalid	Knock Sensor Wiring Issue	0	0	0	0	1	0
Total		1	1	1	0	1	0

Test Severity

- October 1, 2011 – March 31, 2012

Test Severity

- IIIF
  - PVIS and WPD are in control.
  - APV
    - In mild action alarm
    - Long-term mild trend continuing (Since April 2006)
  - PV60
    - In severe warning alarm
    - Long-term severe trend continuing (Since April 2007)

- Charts shown in Appendix 1.a.

Test Severity (cont.)

- IIIG
  - PHOS and MRV are in control.
  - WPD is in control
    - Long-term severe trend continuing (Since late 2004)
  - PVIS in severity precision alarm
  - ACLW in severity alarm

    Long-term mild trend

- Charts shown in Appendix 1.b.

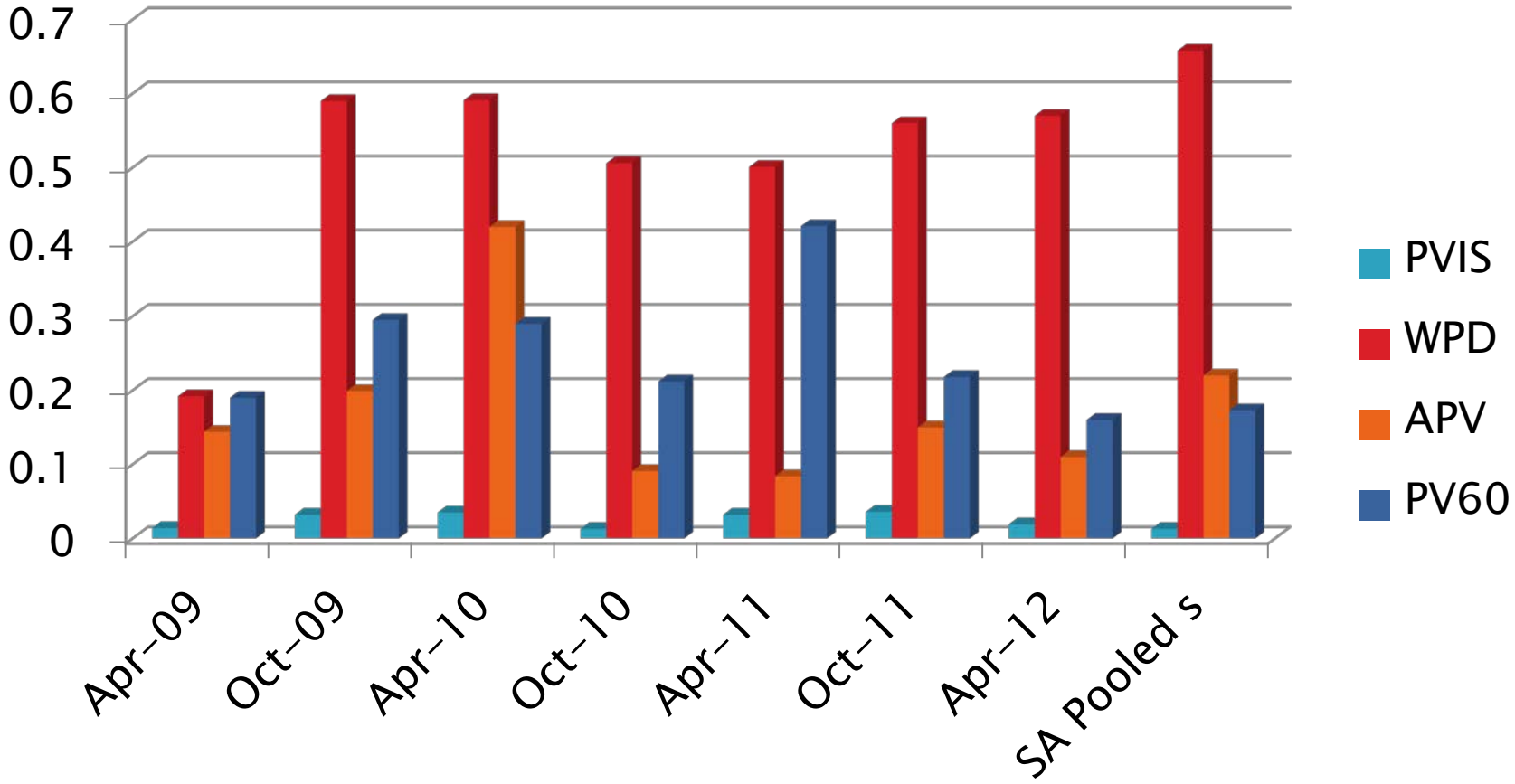
Test Precision

- October 1, 2011 – March 31, 2012

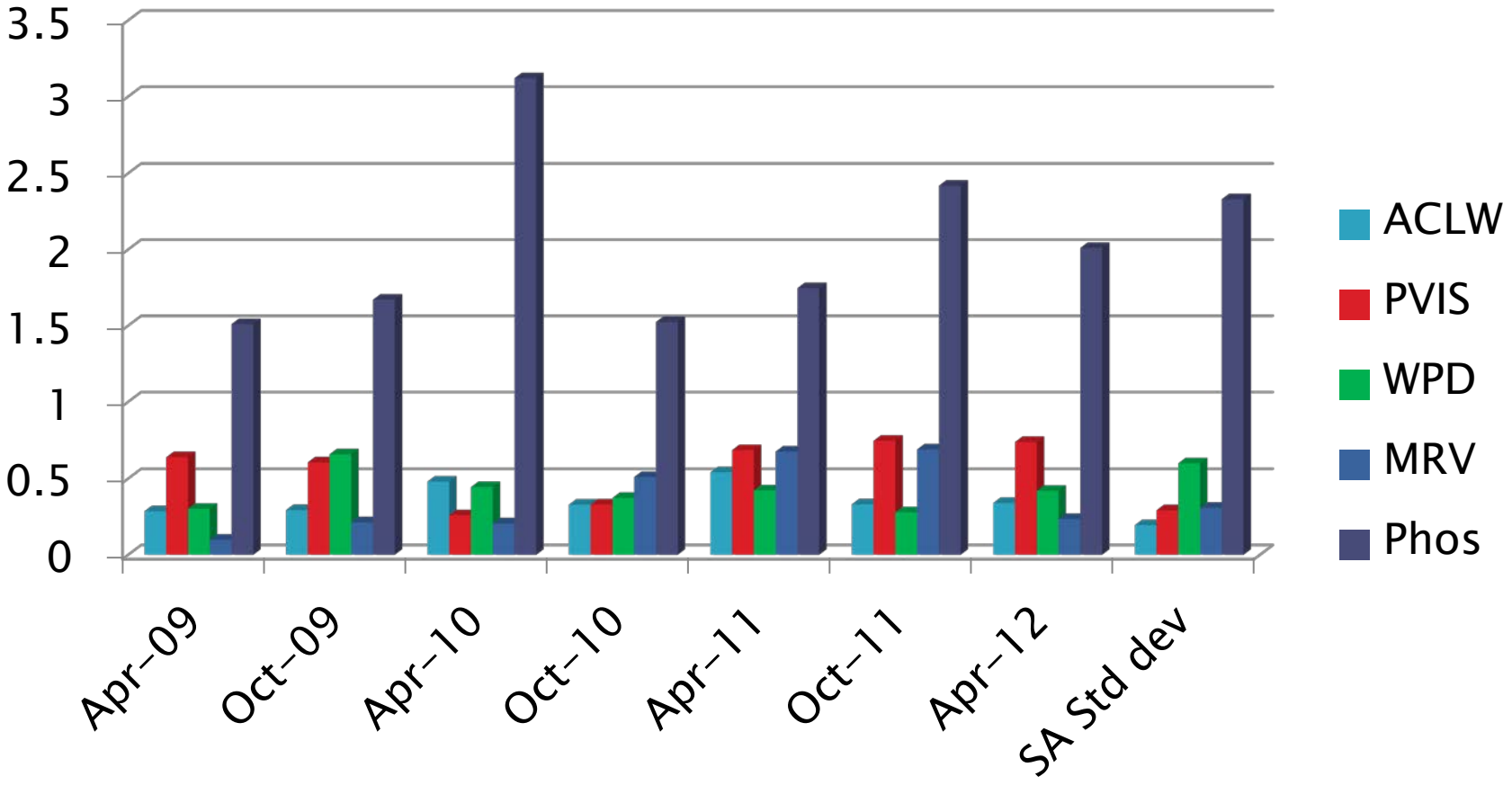
Test Precision Estimates

- Presented on an six month basis.
- Data presented for past four years.

IIIF Precision Estimates



IIIG Precision Estimates



Information Letters

- October 1, 2011 – March 31, 2012

Information Letters*

Test	Date	IL	Topic
IIIG	November 29 , 2011	11-4, Seq. 34	Added provisions for strainers in coolant system Updated tolerances for cam and lifter measurement devices
IIIG	December 12, 2011	11-5, Seq. 35	Added First-in, First-out criteria for specific hardware and corrected harmonic balancer p/n
VID	January 11, 2012	12-1, Seq. 9	Clarified procedure for oil additions during new engine break-in

*Available from TMC Website

Reference Oil Inventory

- Actions, Re-blends, Inventories and Estimated Life

Reference Oil Re-blends

- Oils with ~ 2 years or less supply
  - Re-blends no longer available
  - Oils Affected
    - 925-3 and 1007
    - A replacement oil for 925-3 is being pursued and will be addressed during next meeting
    - 1007 to be replaced with 1006-2 in IVA

Reference Oil Re-blends

- Oils with ~ 2 years or less supply
  - Re-blends available
  - Oils Affected
    - 541-1 and 435-2
    - Both Test areas actively working on introducing these reblends.
    - 435-2 targets to be reviewed at next meeting

Reference Oil Inventory Estimated Life

Oil	Tests	Original Blend Amount	Quantity Shipped in last 6 months	TMC Inventory	Lab Inventory	Estimated Life
433-1	IIIF	1045	40	198	48	2.5 years
434	IIIG	550	0	5	12	<1 year
434-1	IIIG	660	0	254	24	5+ years
435	IIIG	550	0	2	4	<1 year
435-2	IIIG	550	37	437	28	5+ years
438	IIIG	990	24	712	32	5+ years
540	VID	1100	25	463	40	5+ years
541	VID	550	35	5	45	<1 year

Reference Oil Inventory Estimated Life

Oil	Tests	Original Blend Amount	Quantity Shipped in last 6 months	TMC Inventory	Lab Inventory	Estimated Life
541-1	VID	550	25	515	20	5+ years
542	VID	1100	85	358	65	5+ years
704-1	VIII	897	12	206	10	5+ years
925-3	VG	975	0	10	6	<1 year
1006-2	IVA, VG, VIII	5500	91	3772	63	5+ years
1007	IVA, VG	1968	40	21	41	<1 year
1009	IVA, VG	1100	34	379	33	5+ years
1010	IIIG, VID	1100	55	712	60	5+ years

LTMS Deviations

- October 1, 2011 – March 31, 2012

LTMS Deviations

- One IVA LTMS Deviation in Current Period
  - Test sounded a stand precision EWMA Alarm, cleared after one test
  - Alarm due to change in hardware and oil selection
  - Stand calibrated with out additional tests

Historical Count of PCEO LTMS Deviations

Test	LTMS Deviations
IIIF	5
IIIG	5
IVA	6
VG	8
VID	1
VIII	3

Quality Index Deviations

- October 1, 2011 –
  March 31, 2012

Quality Index Deviations

- One PCEO Quality Index Deviations this period
  IIIG Deviation issued for EBP and Load Control problem.

Historical Count of PCEO Quality Index Deviations

Test	Quality Index Deviations
IIIF	25
IIIG	11
IVA	27
VG	38

TMC Laboratory Visits

- October 1, 2011 –
  March 31, 2012

TMC Lab Visits

- Two III lab visits this period.

  No issues at one lab, identified discrepancies in fuel injector flow measurements

- Two VID lab visits this period.

  No issues identified during visits.

Test Area Timelines

- October 1, 2011 – March 31, 2012

Test Area Timeline Additions

Test	Date	Topic	IL
IIIG	20111129	Added provisions for strainers in coolant system Updated tolerances for cam and lifter measurement devices	11-3
IIIG	20111212	Added First-in, First-out criteria for specific hardware and corrected harmonic balancer p/n	11-4
VID	20120111	Clarified procedure for oil additions during new engine break-in	12-1
IVA	20120204	Reintroduced reference oil 1006-2, targets with N = 4	
IVA	20120209	Updated standard deviation for severity adjustments	

*As of 3/31/2012

Additonal Information

- October 1, 2011 – March 31, 2012

Additional Information

- Available on TMC Website:
  - Live Reference Test Data Bases
  - Surveillance Panel Meeting Minutes
  - Test Area Alarm Logs
  - Complete Test Area Timelines
  - LTMS Manual

- www.astmtmc.cmu.edu

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Appendix 1
PCMO Reference Oil Testing Control Charts

April 2012

Appendix 1.a
IIIF Control Charts

- Severity, Precision, and CuSum

SEQUENCE IIIF INDUSTRY OPERATIONALLY VALID DATA

AVERAGE PISTON SKIRT VARNISH FINAL ORIG UNIT RES

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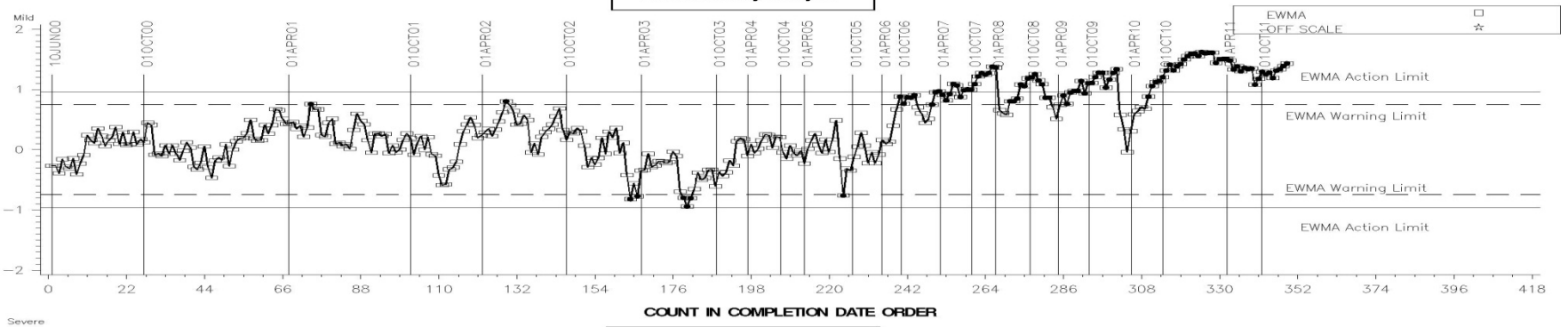
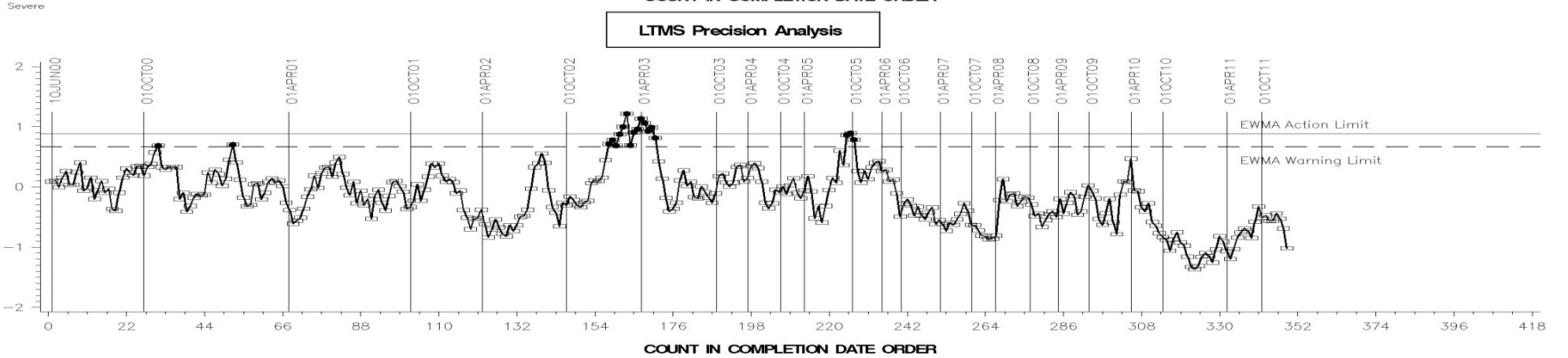
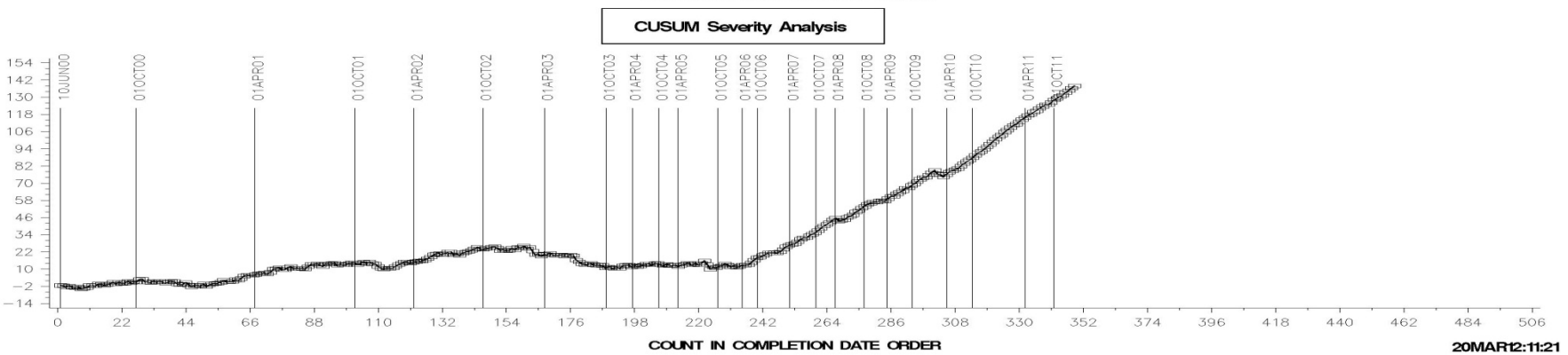
LTMS Severity Analysis



LTMS Precision Analysis



CUSUM Severity Analysis



20MAR12:11:21

SEQUENCE IIIF INDUSTRY OPERATIONALLY VALID DATA

% VISCOSITY INCREASE

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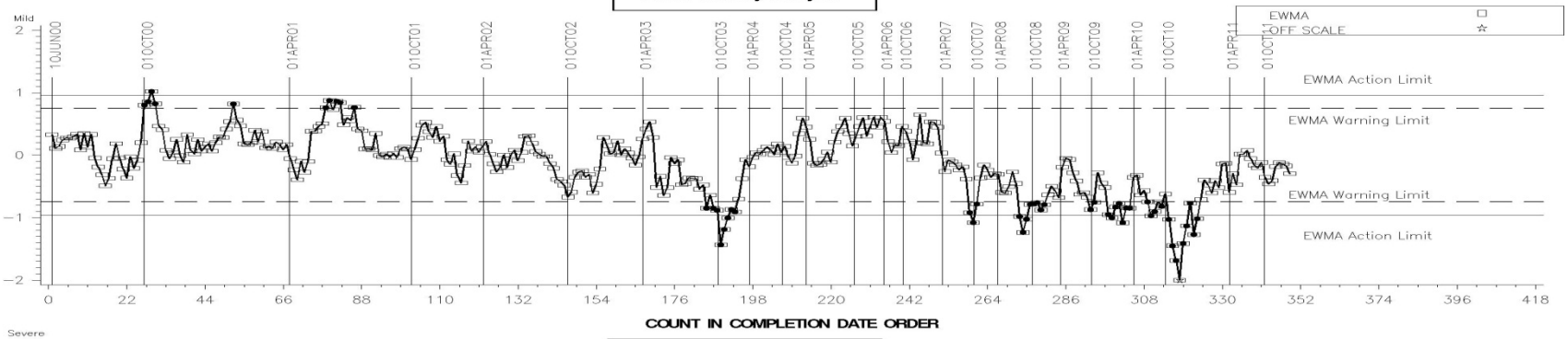
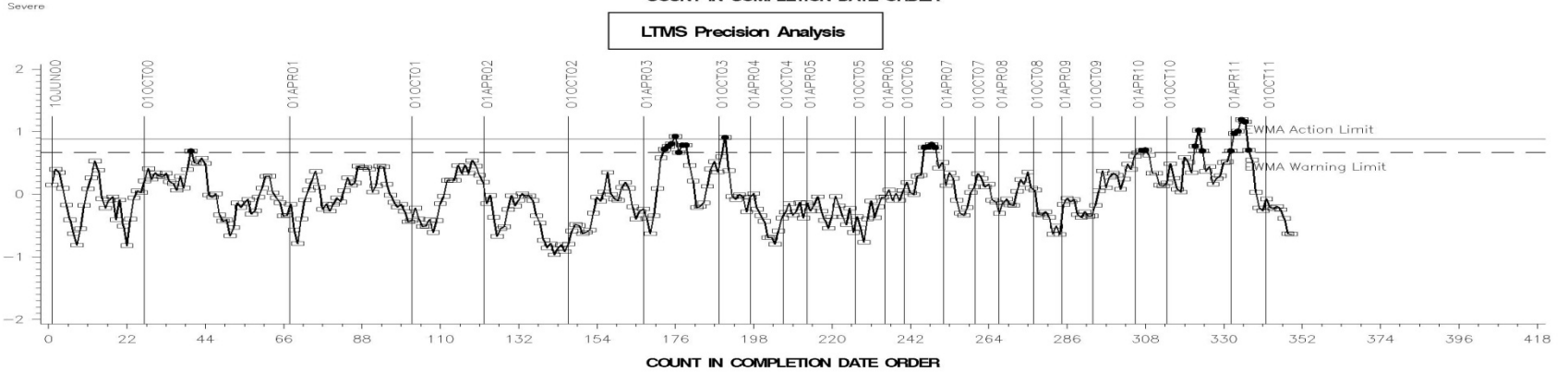
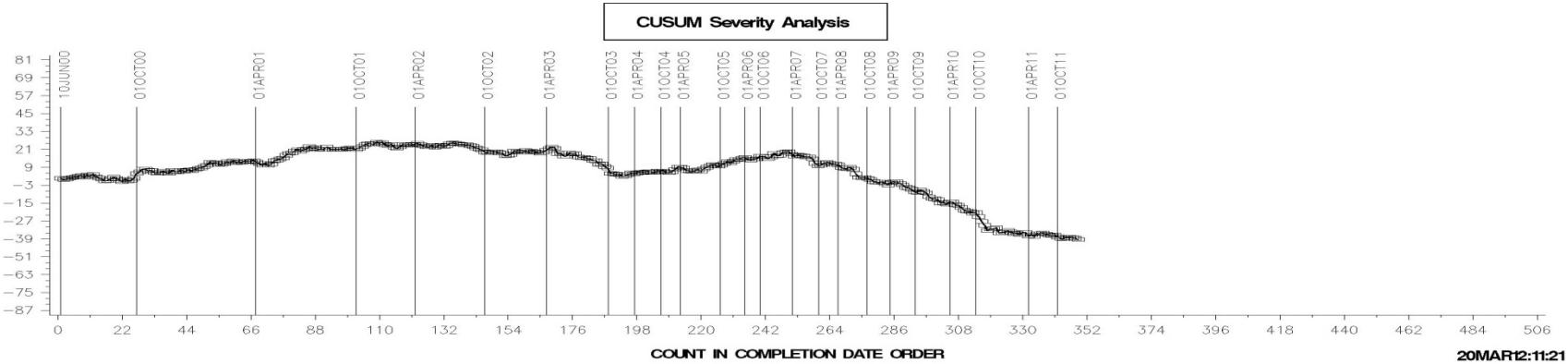
LTMS Severity Analysis



LTMS Precision Analysis



CUSUM Severity Analysis



20MAR12:11:21

Test Monitoring Center

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SEQUENCE IIIF INDUSTRY OPERATIONALLY VALID DATA

AVERAGE WEIGHTED PISTON DEPOSITS FNL ORIG UNIT RES

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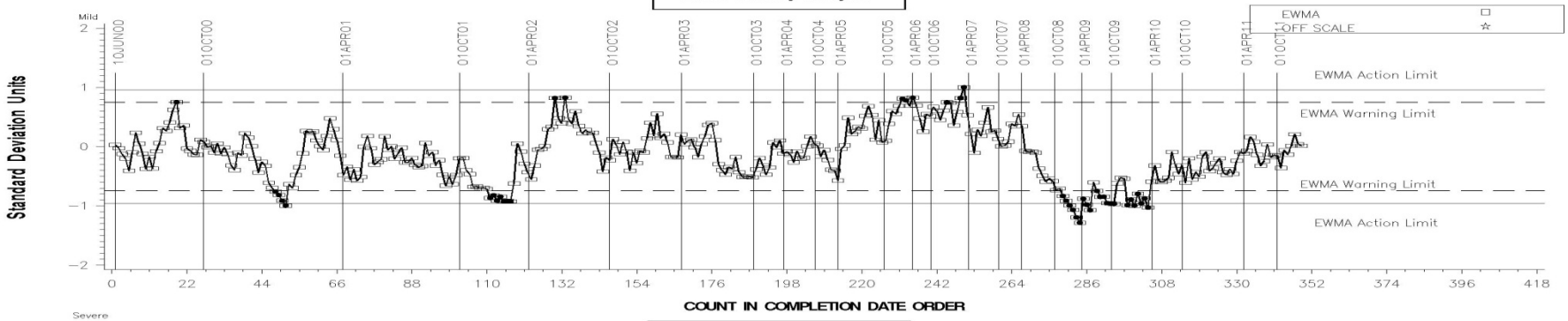
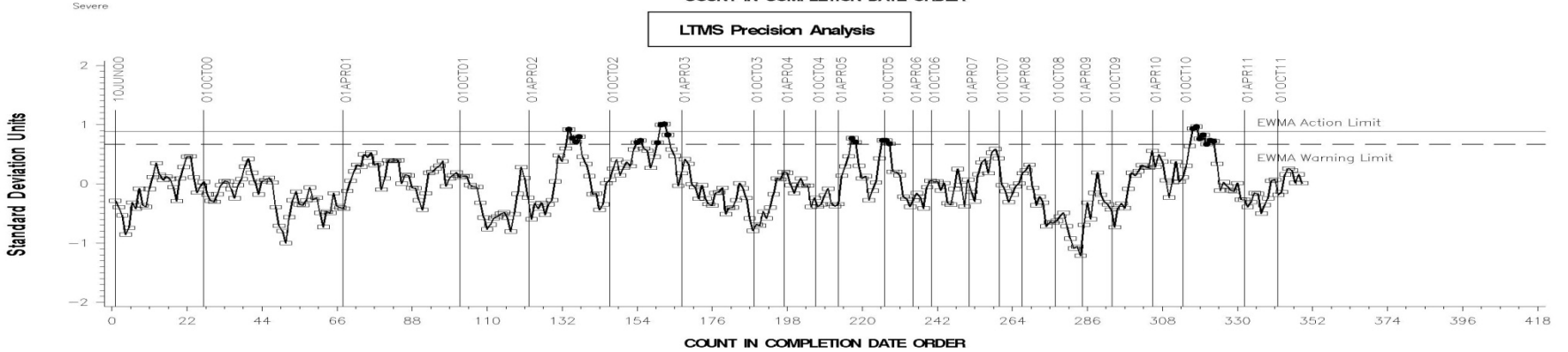
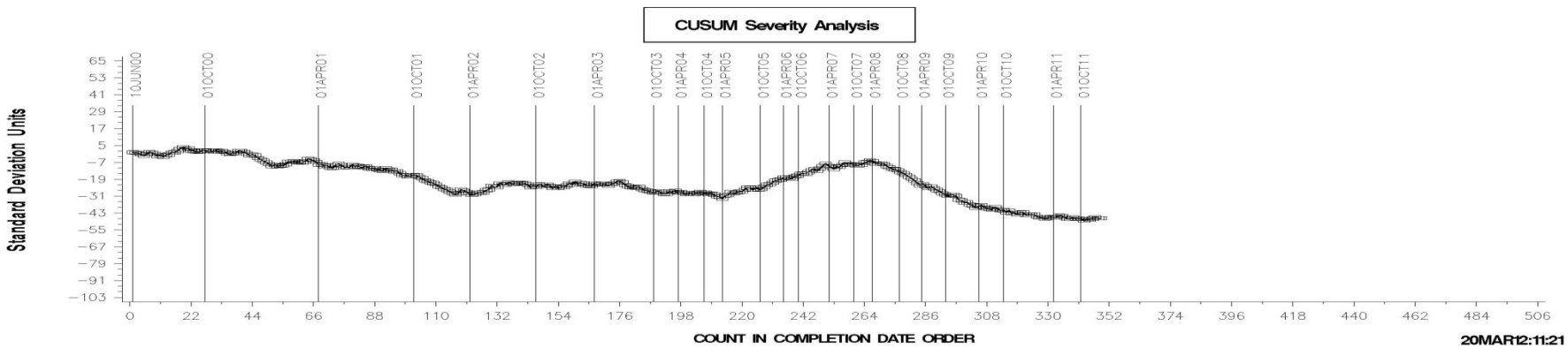
LTMS Severity Analysis



LTMS Precision Analysis



CUSUM Severity Analysis



20MAR12:11:21

SEQUENCE IIIF INDUSTRY OPERATIONALLY VALID DATA

% VISCOSITY INCREASE @ 060 HOURS

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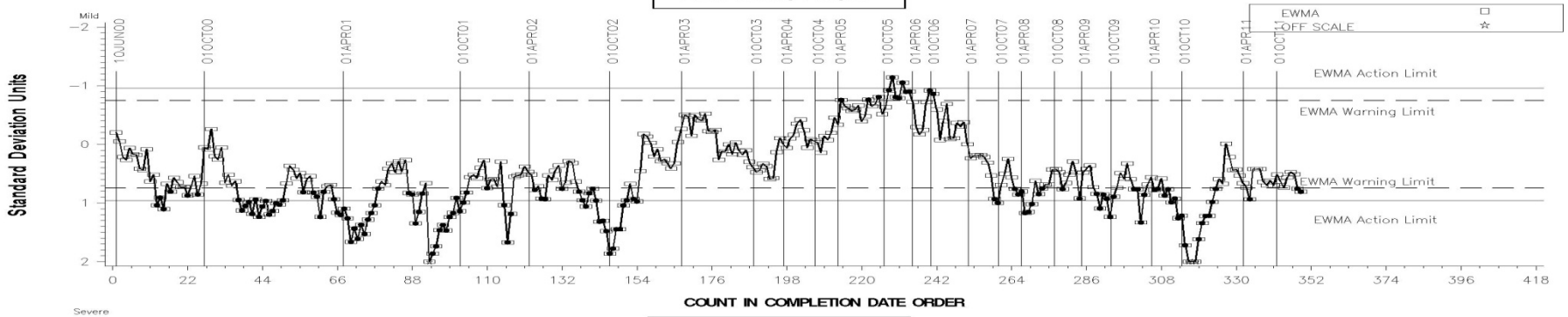
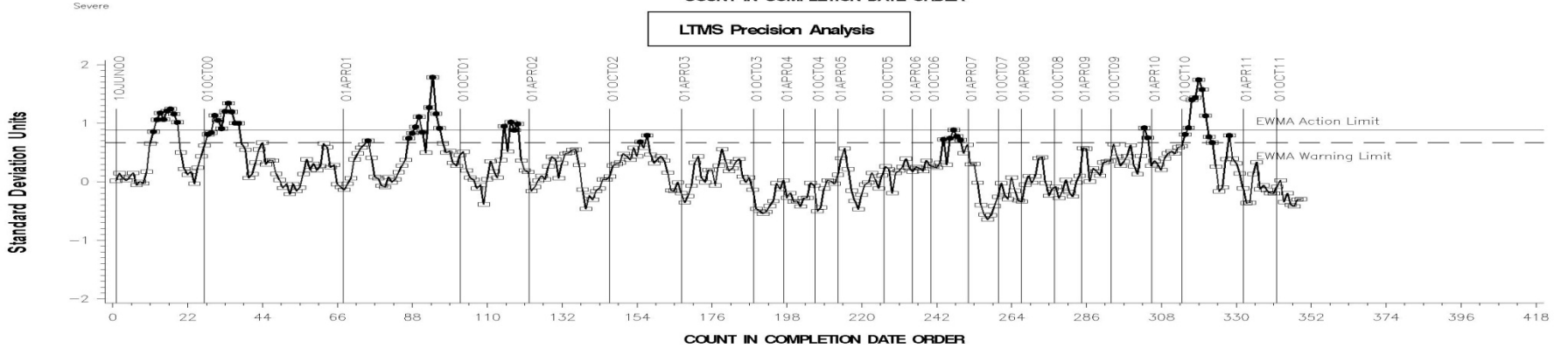
LTMS Severity Analysis



LTMS Precision Analysis



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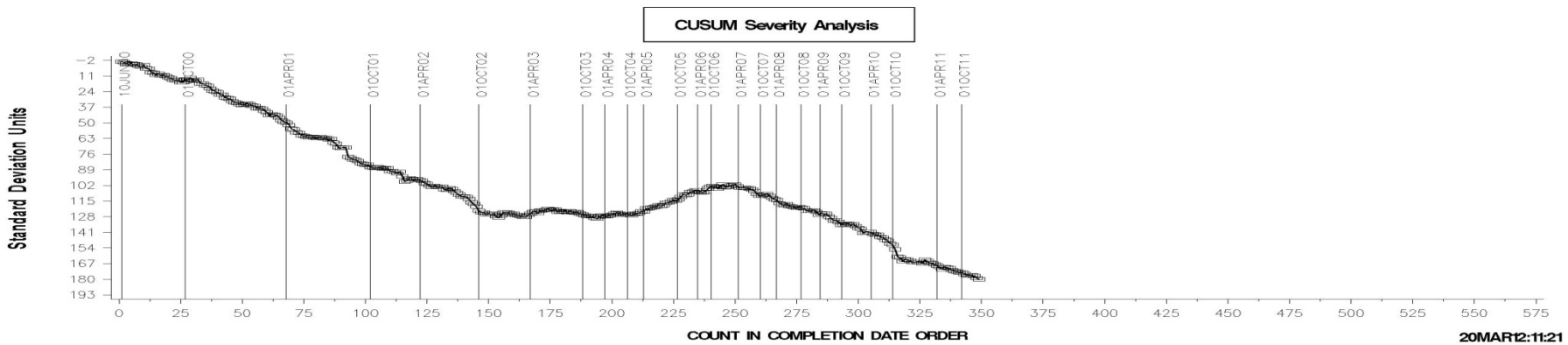

20MAR12:11:21

Test Monitoring Center

http://astmtmc.cmu.edu

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Appendix 1.b
IIIG/A/B Control Charts

- Severity, Precision, and CuSum

SEQUENCE IIIG INDUSTRY OPERATIONALLY VALID DATA

AVERAGE CAM + LIFTER WEAR

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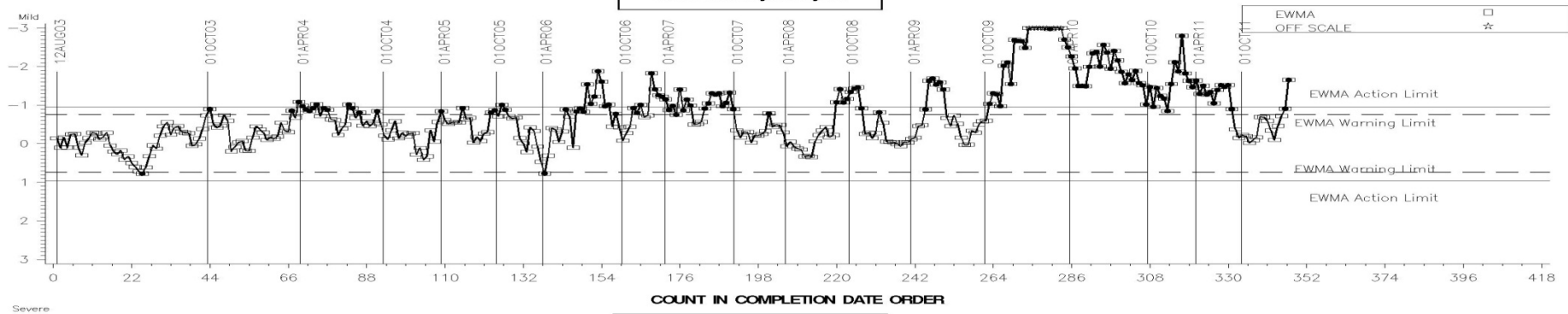
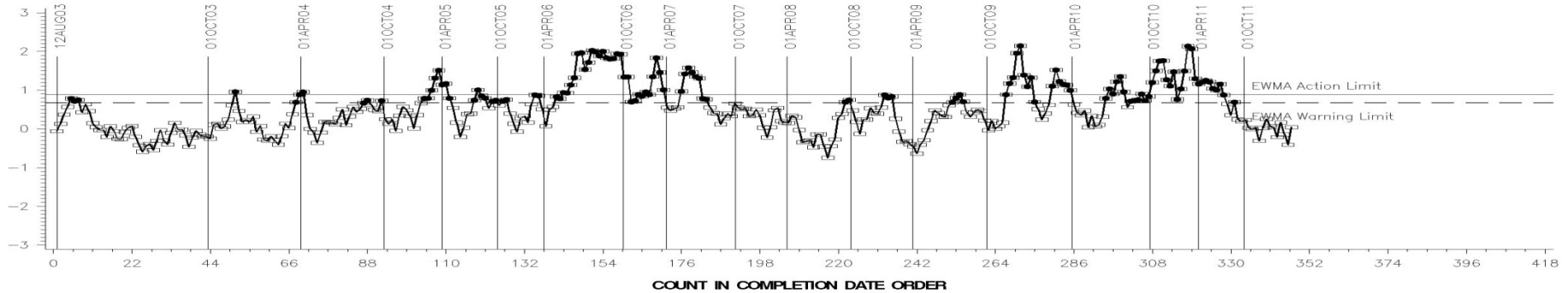
LTMS Severity Analysis



Standard Deviation Units

COUNT IN COMPLETION DATE ORDER

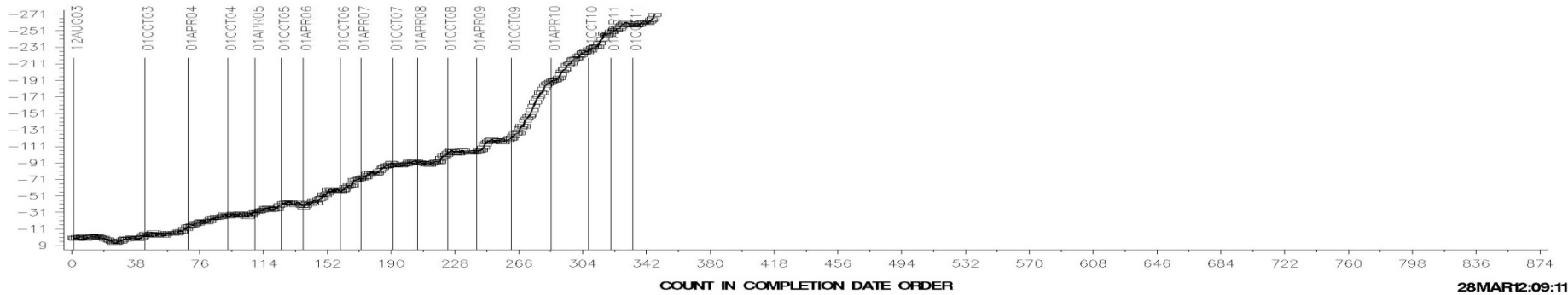
LTMS Precision Analysis



Standard Deviation Units

COUNT IN COMPLETION DATE ORDER

CUSUM Severity Analysis



Standard Deviation Units

COUNT IN COMPLETION DATE ORDER

28MAR12:09:11

SEQUENCE IIIG INDUSTRY OPERATIONALLY VALID DATA

VISCOSITY INCREASE

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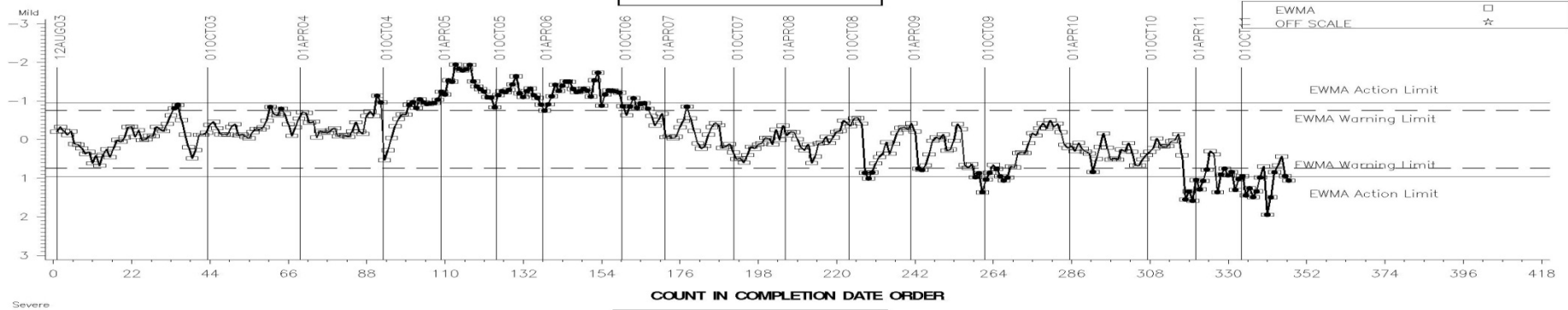
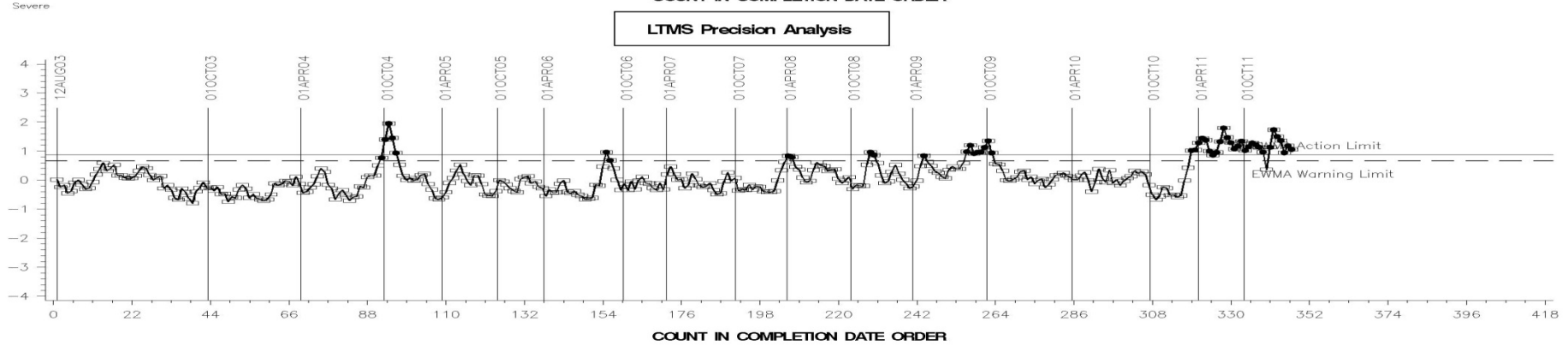
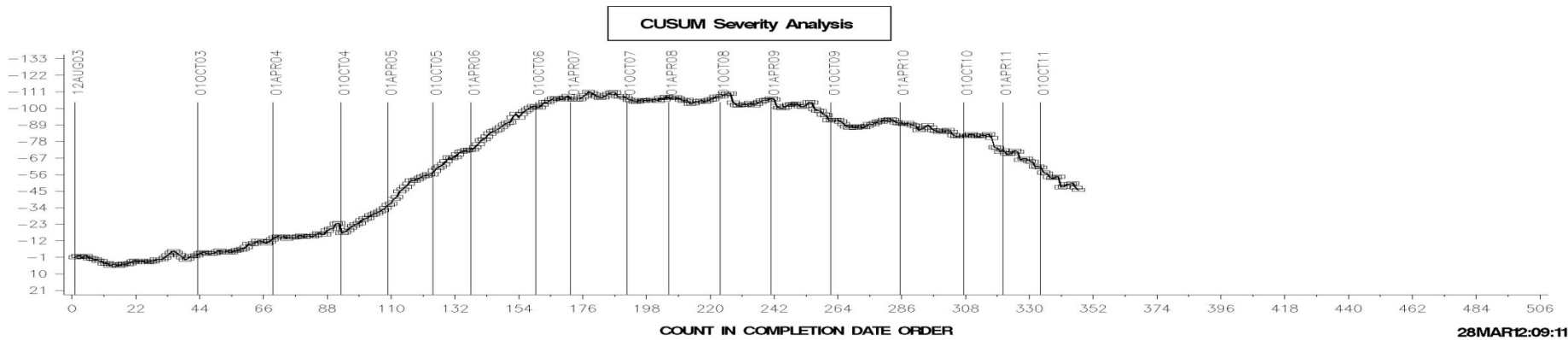
LTMS Severity Analysis



LTMS Precision Analysis



CUSUM Severity Analysis



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SEQUENCE IIIG INDUSTRY OPERATIONALLY VALID DATA

AVERAGE WEIGHTED PISTON DEPOSITS

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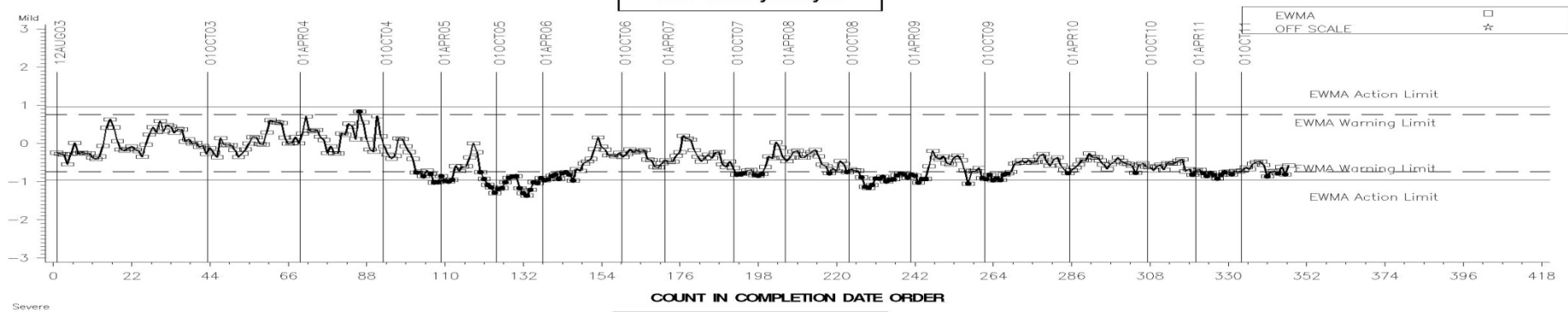
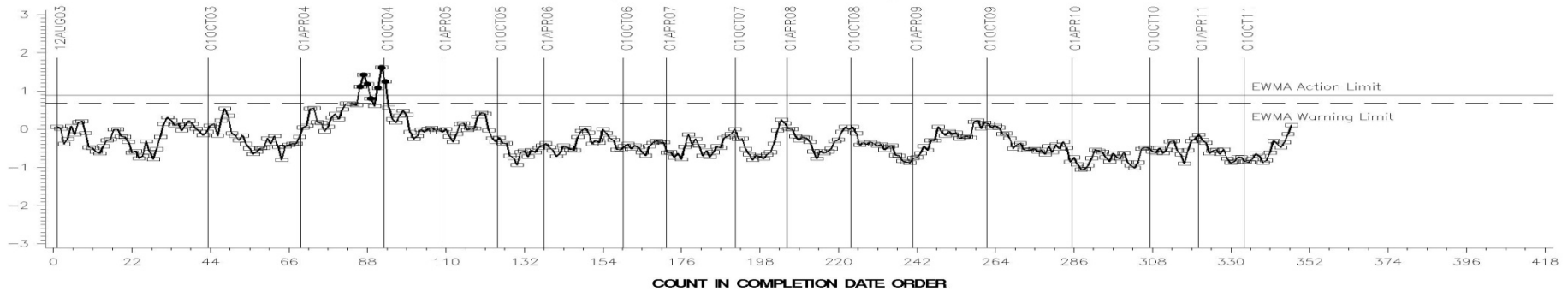
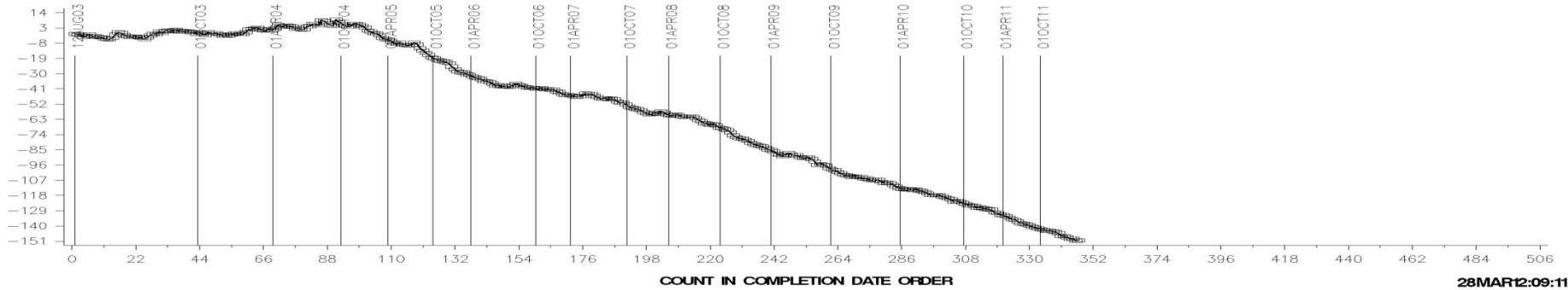
LTMS Severity Analysis



LTMS Precision Analysis



CUSUM Severity Analysis



28MAR12:09:11

SEQUENCE IIIGA INDUSTRY OPERATIONALLY VALID DATA

MRV VISCOSITY RESULT

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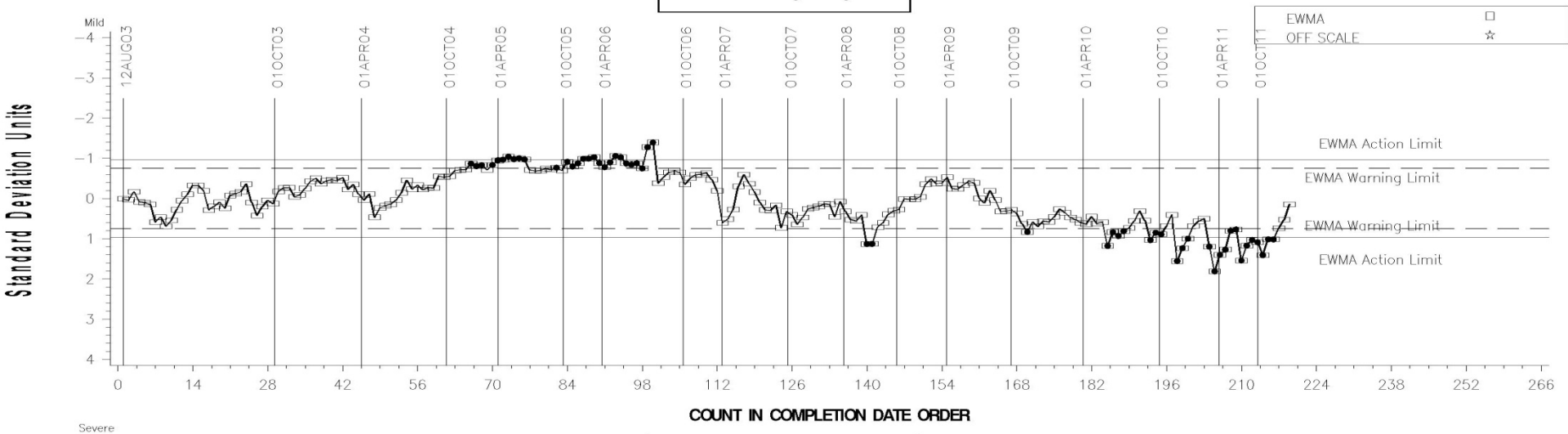
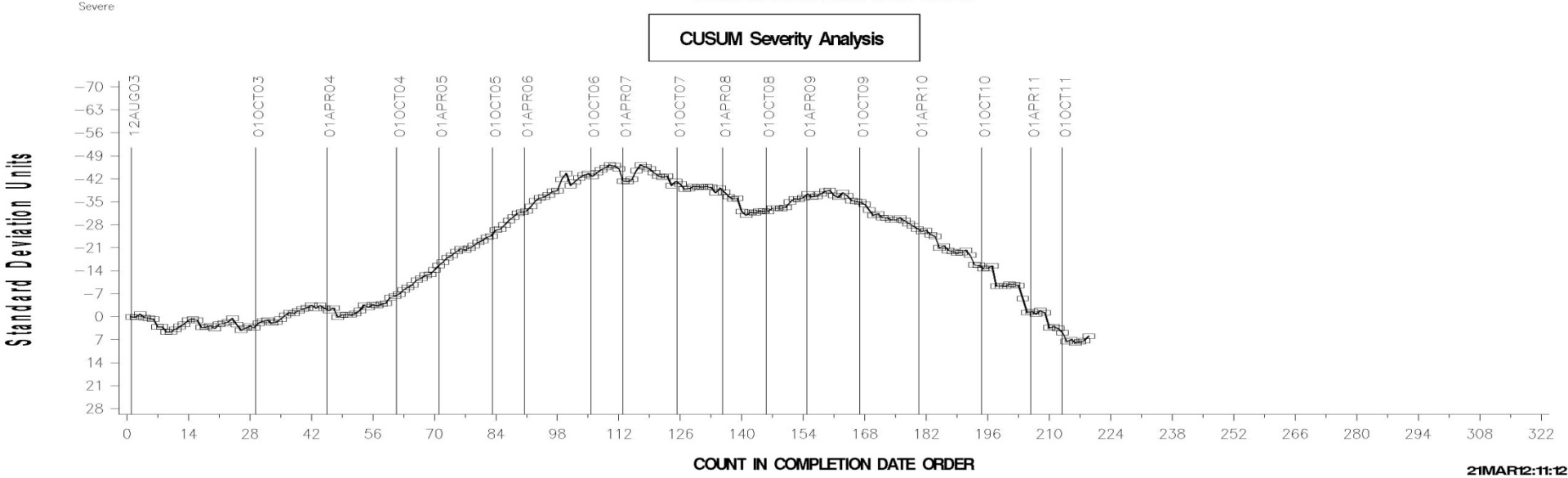
LTMS Severity Analysis



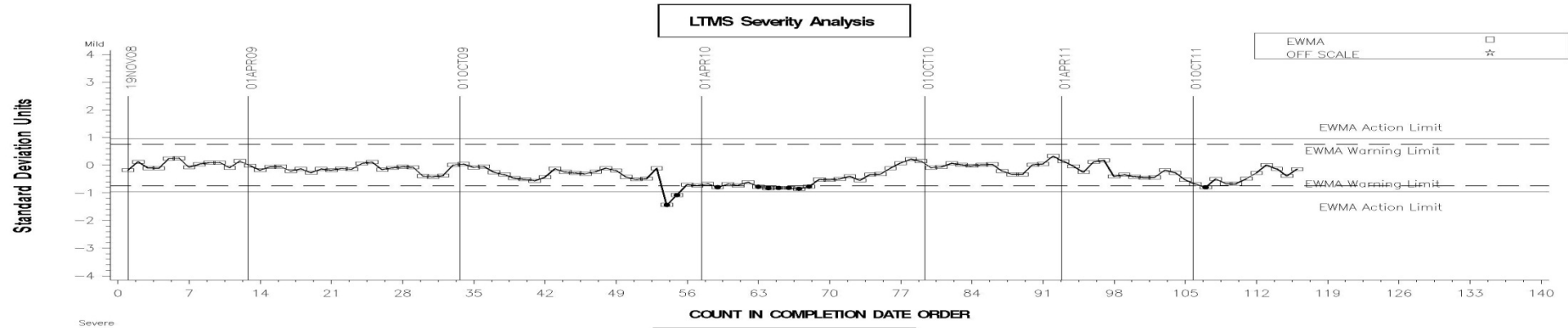
CUSUM Severity Analysis

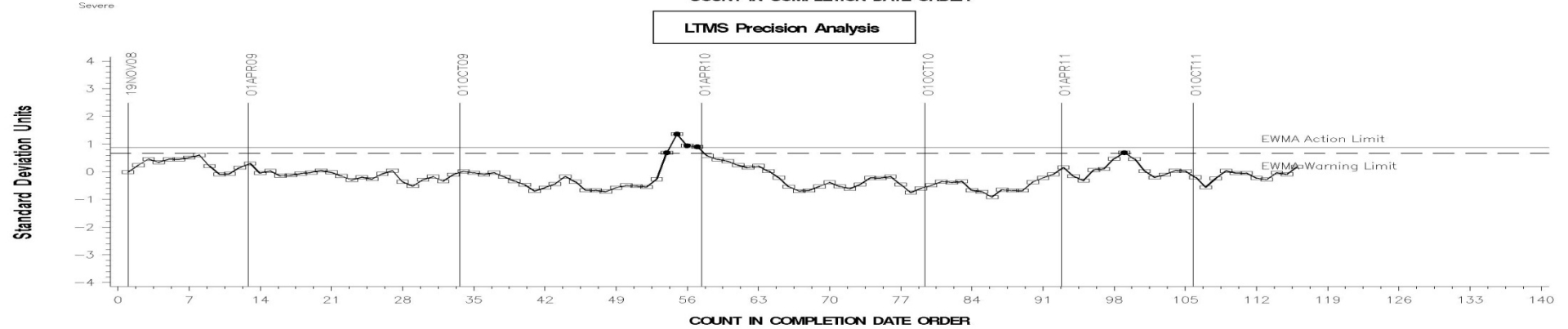


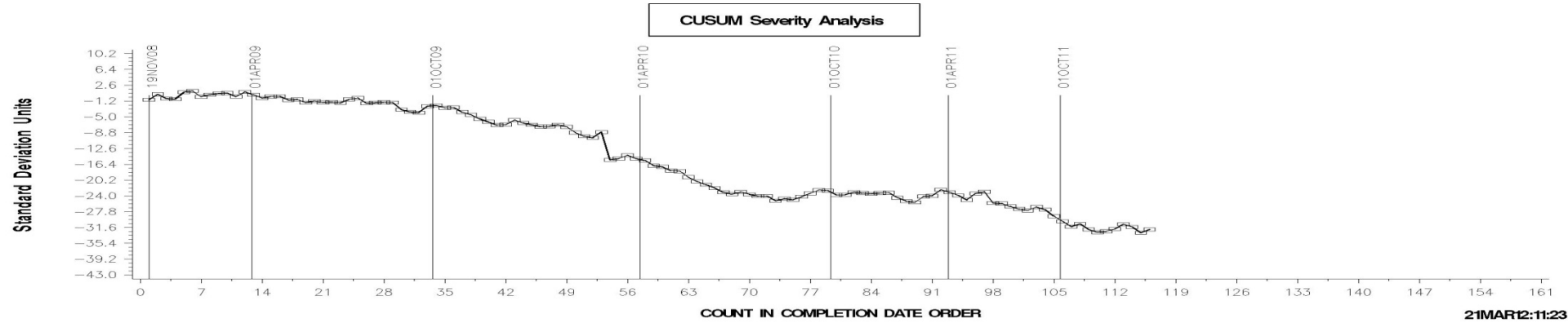
21MAR12:11:12

SEQUENCE IIIGB INDUSTRY OPERATIONALLY VALID DATA

PHOS RETENTION







21MAR12:11:23

Attachment 5

PERFORMANCE
VEHICLES • PARTS • RACING

GMR Oil Test Components

Compiled March 22th 2012

Current Inventory

		In Stock	At Storage	In Process	Total	1 year ago
12593374	Connecting Rods	360	13075	0	13435	16554
24502168	Crankshaft	202	130	0	332	406
24502286	Cylinder Block	36	252	0	288	373
24502260B	Cylinder Heads	194	3078	90	3362	4439

- **At current usage rates, enough parts for 3+ years of testing**
- **Oil Test heads shipping serial# 2A12**
- **Blocks shipping serial# 2H11-020**
- **Connecting shipping batch code 9-3-3**
- **Crankshafts shipping batch code 11307**

24502260B Heads

- Cylinder heads are in stock at this time.
- Currently receiving an average of 50 heads every 10 days from the machine shop.
- Will continue receiving heads at this rate until inventory is restored to sufficient levels.

24502168C Crankshafts

- Crankshafts with re-chamfered oil holes are in stock at this time.
- “C” crankshafts have been shipping since 1/11/12

Attachment 6

CENTRAL PARTS DISTRIBUTOR REPORT
OH Technologies, Inc.

Sequence III Surveillance Panel Meeting
Omni Hotel, Corpus Christi, TX
March 28, 2012

1) Technical Memos Issued (6/01/11-3/23/12)

Technical Memo 21(10/20/11) - OHT3F-008-8 Thrust Face Run Out

Technical Memo 22 (3/15/12) – OHT3F-008-8, Camshaft Box Labels

2) Rejection Report

REPORTING PERIOD: 10 Months (6/01/11 - 3/23/12)

ITEM	DESCRIPTION	REASON REJECTED	QTY	REPLACED	DATE REPLACED
OHT3F-030-2	OIL COOLER	INADEQUATE PLATING	2	YES	6/7/2011
OHT3F-030-2	OIL COOLER	INADEQUATE PLATING	2	YES	6/14/2011
OHT3G-088-1	COVER, REAR	MACHINING DEFECT	4	YES	8/29/2011
OHT3F-008-8	IIIG CAMSHAFT	UST RUNOUT INSPECT	2	YES	8/30/2011
OHT3F-008-8	IIIG CAMSHAFT	UST RUNOUT INSPECT	6	YES	9/23/2011
OHT3F-008-8	IIIG CAMSHAFT	SCRATCH ON LOBE	1	YES	9/13/2011
OHT3G052-RN6-1	IIIG RUN 6 RING	BENT RING	1	YES	1/4/2012
3F028-09	CAM BEARING	NICK ON EDGE	1	YES	2/13/2012
OHT3F-030-2	OIL COOLER	INADEQUATE PLATING	1	YES	2/14/2012
OHT3F-030-2	OIL COOLER	RUST	1	YES	2/14/2012
OHT3F-030-2	OIL COOLER	RUST	1	YES	3/6/2012
OHT3G-091-1	REAR SEAL	MISSING SPRING	1	YES	3/6/2012

3) Batch Code Changes

IIIF	Batch Code	Date Introduced
IIIF Camshaft	PC 17	9/30/11
Piston Grade 12	BC 26	12/27/11
Piston Grade 34	BC 25	12/27/11
Piston Grade 56	BC 27	1/27/11
Rocker Arms	BC 17	12/06/11
Piston Grade 12	BC 26	12/27/11

IIIG	Batch Code	Date Introduced
Piston Grade 12	BC 26	12/16/12
Piston Grade 34	BC 26	12/16/12
Piston Grade 56	BC 27	1/17/12
Rocker Arms	BC 17	11/30/11
Spring Valve	BC 12	7/11/11

Attachment 7

Date: October 20, 2011

To: ASTM Sequence III Testing Laboratories

From: Jason Bowden / OH Technologies, Inc.

Re: Seq. III CPD Technical Memo 21
OHT3F-008-8 camshafts

Cc: Mr. Bruce Matthews / General Motors Powertrain
Mr. Rich Grundza/ Test Monitoring Center

This Technical Memo is intended to notify users of the Sequence III test methods that we have confirmed several camshafts are out of specification up to .002 inch, with regards to the thrust face run out. This may cause a reduction in end play. OH Technologies will be notifying individual labs of specific camshaft serial numbers in their inventory to be returned to OH Technologies for inspection. OH Technologies, Inc. has taken corrective action with the vendor and has eliminated the possibility of these camshafts being shipped in the future.

If there are any questions or comments regarding the aforementioned item please do not hesitate to call.

Jason H. Bowden
OH Technologies, Inc.

Attachment 8

Date: March 15, 2012

To: ASTM Sequence III Testing Laboratories

From: Jason Bowden / OH Technologies, Inc.

Re: Seq. III CPD Technical Memo 22
OHT3F-008-8 IIIG, Camshaft Box Labels

Cc: Mr. Bruce Matthews / General Motors Powertrain
Mr. Rich Grundza/ Test Monitoring Center

This Technical Memo is intended to notify users of the Sequence III test methods that we have confirmed several labels of the OHT3F-008-8, IIIG Camshaft Box Labels were printed incorrectly. Specifically, IIIG camshaft serial numbers beginning with the letter "J" were incorrectly labeled as Pour Code 15. The correct Pour Code number for serial numbers beginning with the letter "J" is Pour Code 16. All other labels appear to be correct.

The **Pour Code letter** designation is engraved onto each camshaft along with the serial number. This letter designation is what is used by OH Technologies, Inc. for traceability of the Pour Code. No Pour Code traceability was lost by this labeling error. The **Pour Code number** designation is used only to reference how many pours of camshafts have been made, as there are letters in the alphabet that are not used for Pour Code designating purposes.

Once again, No Pour Code traceability was lost by this labeling error.

Please note the correct number designations for all camshaft Pour Codes in the field for both Seq. IIIF and Seq. IIIG as of today are:

Serial numbers beginning with the letter J = Pour Code 16
Serial numbers beginning with the letter K= Pour Code 17

Below is a sample of the correct OHT3F-008-8, IIIG Camshaft label for "J" camshafts:

We apologize for any inconvenience this may cause and have taken immediate corrective action to prevent this occurrence in the future.

If there are any questions or comments regarding the aforementioned item please do not hesitate to call.

Jason H. Bowden
OH Technologies, Inc.

Attachment 9

PRODUCT: **EEE-Lube Cert Gasoline**
HALTERMANN
PRODUCT CODE: **HF0003**
Seq. III & VI

Batch No.:	AB1521LT40	ZL0121LT20	ZK1521LT10	ZI1321LT10	ZG2221NX10
	MTS	MTS	MTS		
Tank No.:	110	110	110	110	63
Analysis Date:	2/17/2012	12/5/2011	11/16/2011	9/14/2011	9/12/2011

TEST	METHOD	UNITS	HALTERMANN Specs			RESULTS	RESULTS	RESULTS	RESULTS	RESULTS
			MIN	TARGET	MAX					
Distillation - IBP	ASTM D86	°C	23.9		35.0	31.0	30.1	30.1	29.8	30.1
5%		°C				44.3	41.7	41.7	41.5	42.5
10%		°C	48.9		57.2	53.1	49.9	49.9	50.5	51.0
20%		°C				65.8	62.0	62.0	63.9	63.6
30%		°C				79.8	76.0	76.0	78.8	77.8
40%		°C				95.3	93.2	93.2	95.9	95.1
50%		°C	93.3		110.0	105.7	106.1	106.1	106.4	107.0
60%		°C				111.6	113.1	113.1	112.2	113.7
70%		°C				117.6	119.8	119.8	117.9	120.6
80%		°C				128.6	131.8	131.8	128.5	133.0
90%		°C	151.7		162.8	158.1	160.7	160.7	157.6	161.0
95%		°C				168.4	171.8	171.8	170.1	172.2
Distillation - EP		°C			212.8	199.8	199.9	199.9	200.6	199.2
Recovery		vol %		Report		96.9	96.8	96.8	96.7	96.9
Residue		vol %		Report		1.1	1.2	1.2	0.8	0.9
Loss		vol %		Report		2.0	2.0	2.0	2.5	2.2
Gravity @ 60°F/60°F	ASTM D4052	°API	58.7		61.2	58.9	59.2	59.1	59.0	59.1
Density @ 15° C	ASTM D4052	kg/l	0.734		0.744	0.743	0.742	0.742	0.743	0.742
Reid Vapor Pressure	ASTM D5191	kPa	60.1		63.4	62.8	62.9	62.7	62.2	62.2
Carbon	ASTM D3343	wt fraction		Report		0.8663	0.8647	0.8648	0.8648	0.8647
Carbon	ASTM E191	wt fraction		Report		0.8618	0.8619	0.8619	0.8626	0.8612
Hydrogen	ASTM E191	wt fraction		Report		0.1337	0.1355	0.1355	0.1357	0.1347
Hydrogen/Carbon ratio	ASTM E191	mole/mole		Report		1.848	1.873	1.873	1.874	1.864
Oxygen	ASTM D4815	wt %			0.05	<0.01	<0.01	<0.01	<0.01	<0.01
Sulfur	ASTM D5453	mg/kg	3		15	6	4	4	4	3
Lead	ASTM D3237	mg/l			2.6	<1	<1	<1	<1	<1
Phosphorous	ASTM D3231	mg/l			1.3	<0.05	<0.05	<0.05	<0.05	<0.05
Composition, aromatics	ASTM D1319	vol %	26.0		32.5	30.4	27.9	27.9	27.6	27.9
Composition, olefins	ASTM D1319	vol %			10.0	0.6	1.0	1.0	0.6	0.9
Composition, saturates	ASTM D1319	vol %		Report		69.0	71.1	71.1	71.8	71.2
Particulate matter	ASTM D5452	mg/l			1	0.6	0.7	0.7	1.0	0.4
Oxidation Stability	ASTM D525	minutes	1000			1000+	1000+	1000+	1000+	1000+
Copper Corrosion	ASTM D130				1	1a	1a	1a	1a	1a
Gum content, washed	ASTM D381	mg/100mls			5.0	1.0	<0.5	<0.5	<0.5	<0.5
Fuel Economy Numerator/C Density	ASTM E191		2401		2441	2431	2422	2423	2425	2425
C Factor	ASTM E191			Report		1.0031	1.0005	1.0007	1.0045	1.0014
Research Octane Number	ASTM D2699		96.0			97.6	97.0	97.0	97.0	96.8
Motor Octane Number	ASTM D2700			Report		88.8	88.1	88.1	88.6	88.4
Sensitivity			7.5			8.8	8.9	8.9	8.4	8.4

Net Heating Value, btu/lb	ASTM D3338	btu/lb	Report	18451	18490	18488	18487	18491
Net Heating Value, btu/lb	ASTM D240	btu/lb	Report	18334	18395	18395	18314	18351
Color	VISUAL	1.75 ptb	Red	Red	Red	Red	Red	Red

Attachment 10

Sequence IIIG 435-2 Results

Sequence III Surveillance Panel

March 28, 2012

Summary of Results

- 10 tests reported from six labs
- Summary in next few slides

Target Values

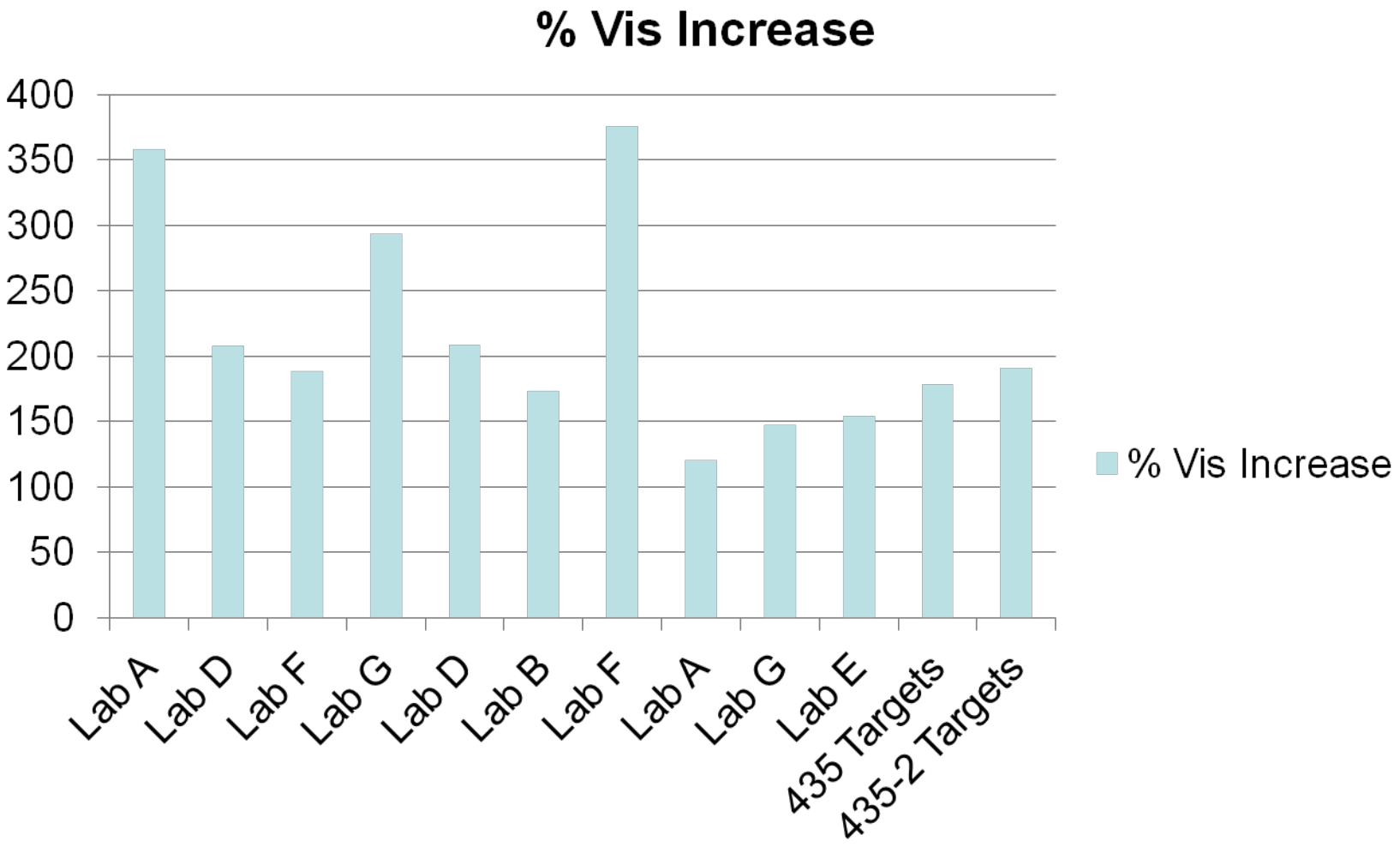
Parameter	Mean	Standard Deviation
ACLW	3.6381	0.3121
PVIS	5.2576	0.3286
WPD	3.51	0.28
PHOS	81.8	1.30

Means and standard deviations in transformed units for ACLW and PVIS

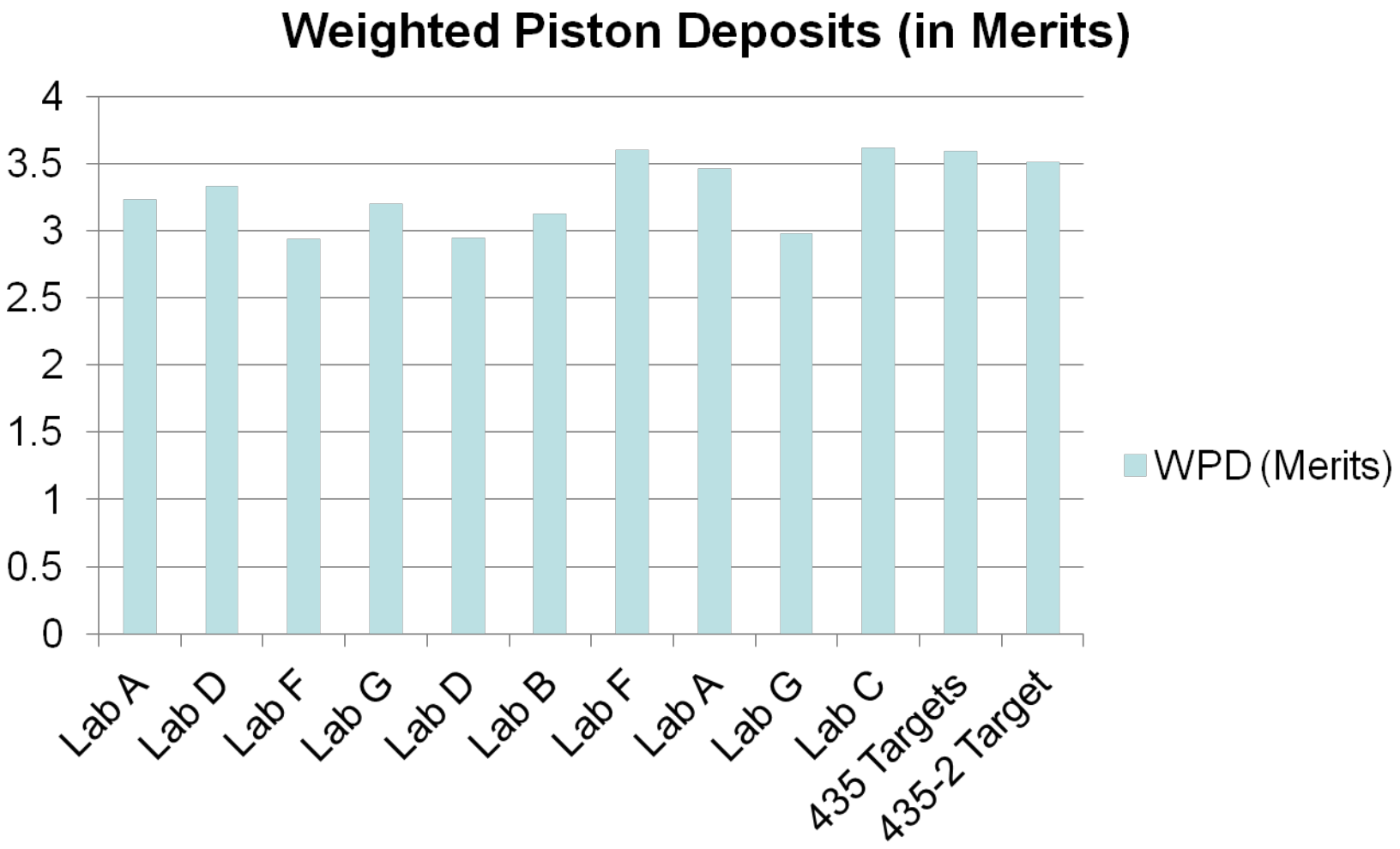
Summary of Test Results

LTMSLAB	TESTKEY	PVIS	PVISti	SA	Adjusted	ACLWti	SA	Adjusted	WPDti	SA	Adjusted
D	80559-IIIG	208.4	5.339459	0	5.339459	3.2958	0.3647	3.6605	3.33	0	3.33
A	80562-IIIG	358.4	5.88165	-0.28715	5.5945	3.5205	0.3874	3.9079	3.23	0.337	3.567
F	80561-IIIG	188.8	5.240688	0	5.240688	2.9497	0.1771	3.1268	2.94	0	2.94
G	81512-IIIG	293.7	5.682559	-0.27444	5.408121	3.1001	0.4048	3.5049	3.2	0.4164	3.6164
D	80560-IIIG	208.8	5.341377	-0.24998	5.091393	3.8754	0.1767	4.0521	2.95	0.4446	3.3946
B	80564-IIIG	173	5.153292	0	5.153292	3.6763	0.219	3.8953	3.13	0.4268	3.5568
F	82083-IIIG	376.2	5.930121	0	5.930121	3.4078	0.1908	3.5986	3.6	0.337	3.937
A	81940-IIIG	162	5.087596	-0.29715	4.790451	3.6533	0.2947	3.948	3.46	0.335	3.795
G	82617-IIIG	176.3	5.172187	-0.17878	4.993409	3.0493	0.3817	3.431	2.98	0.3734	3.3534
E	80552-IIIG	153.7	5.035003	0	5.035003	3.0865	0.1693	3.2558	3.62	0	3.62

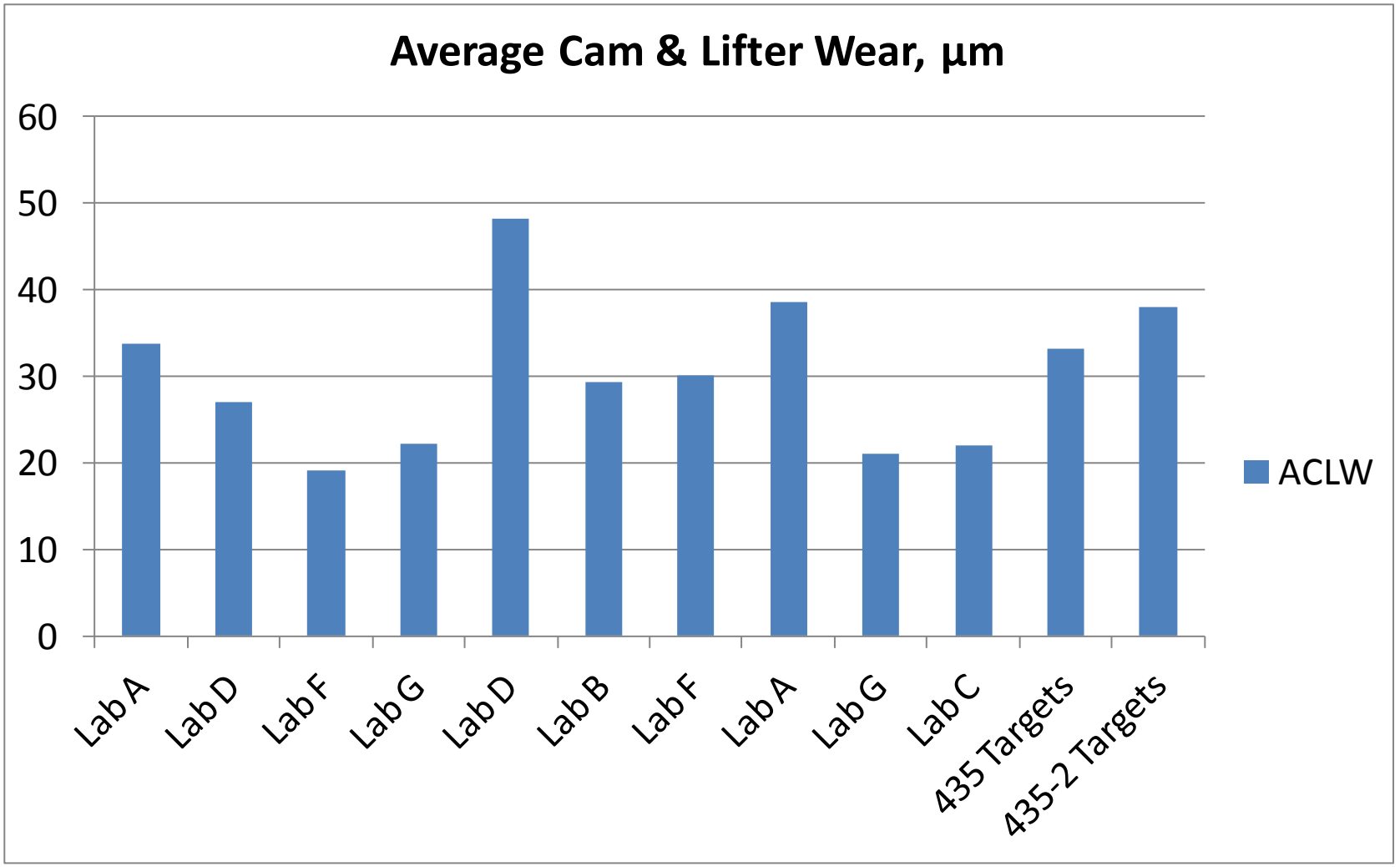
RO 435-2 Results for PVIS



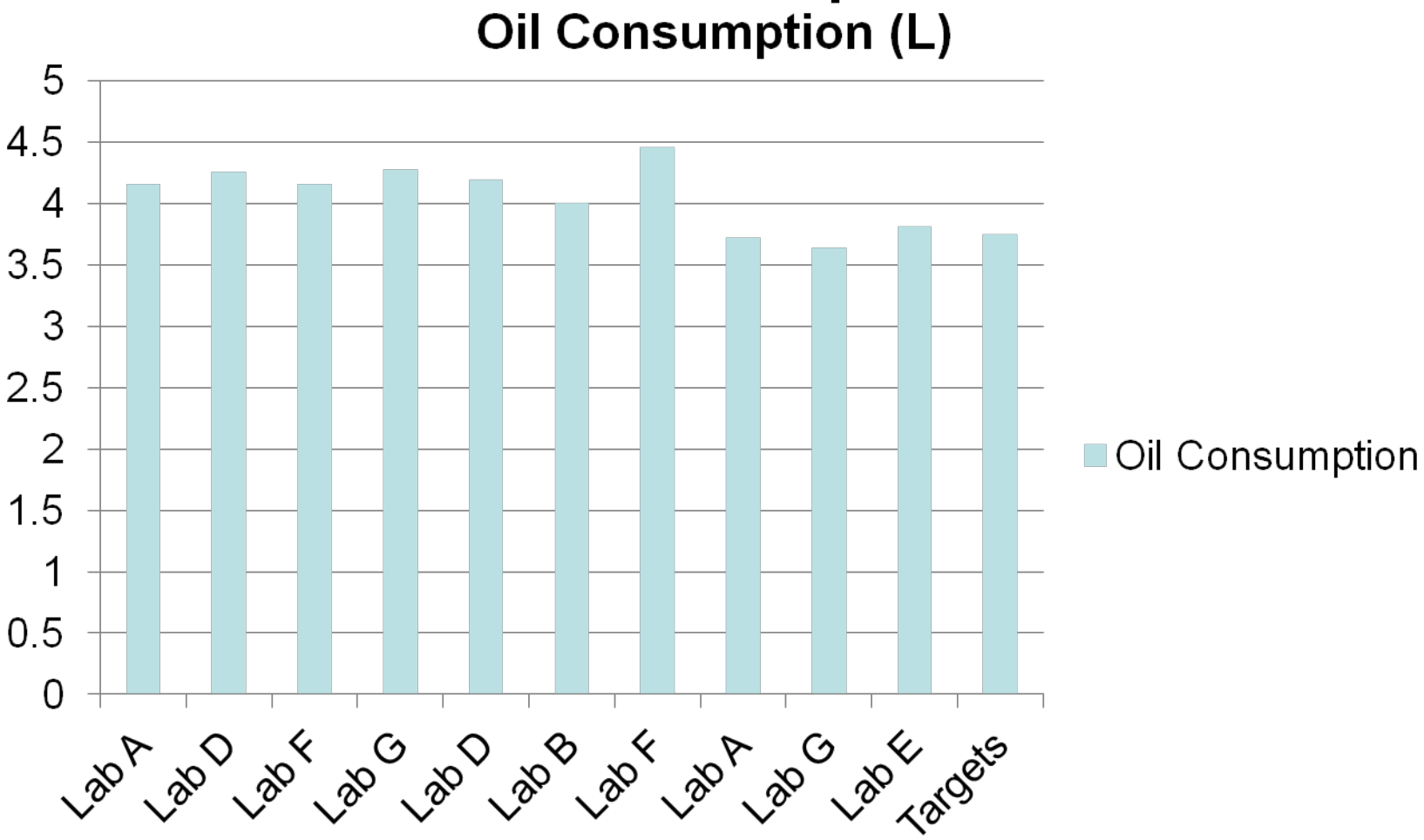
RO 435-2 Results for WPD



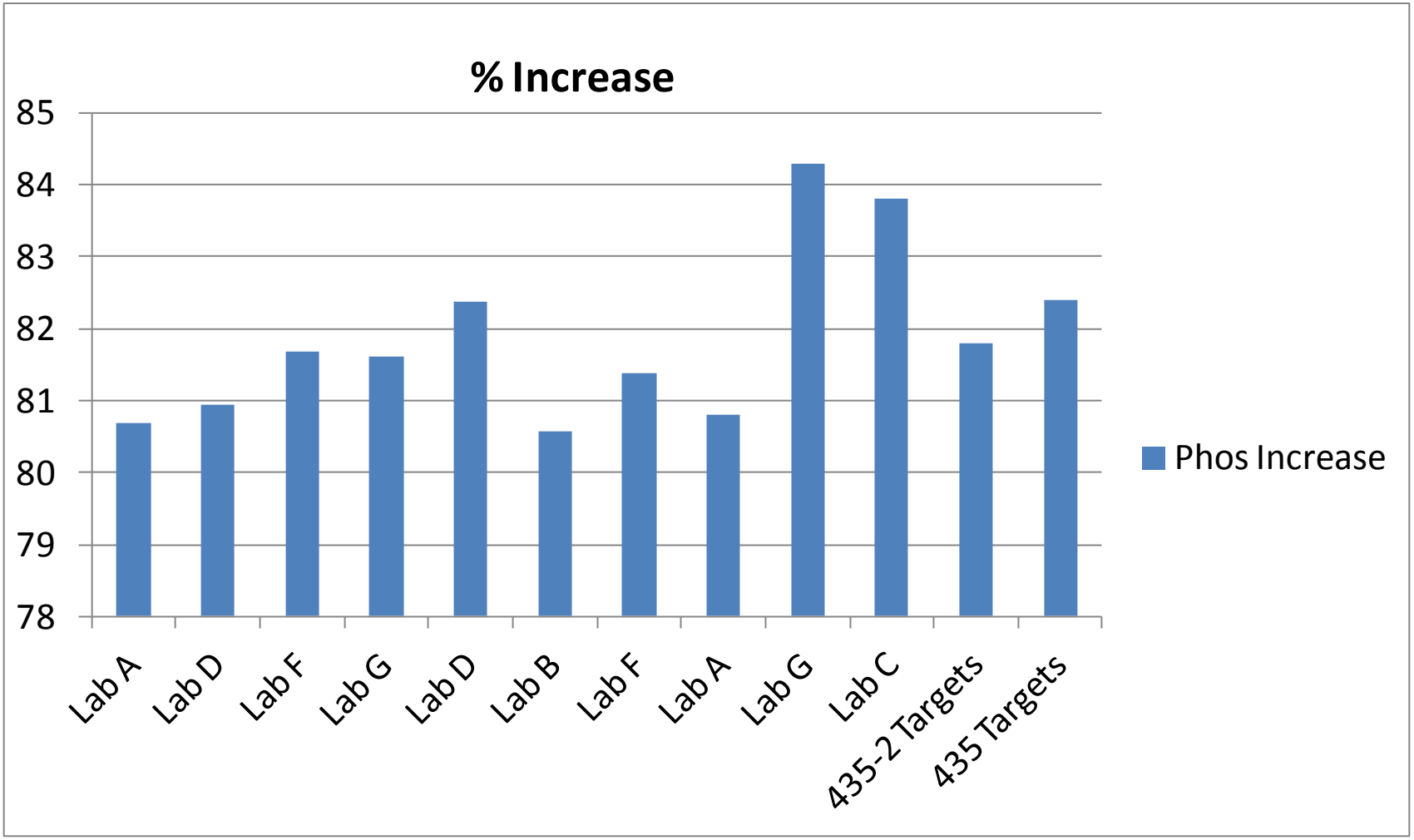
RO 435-2 Results for ACLW



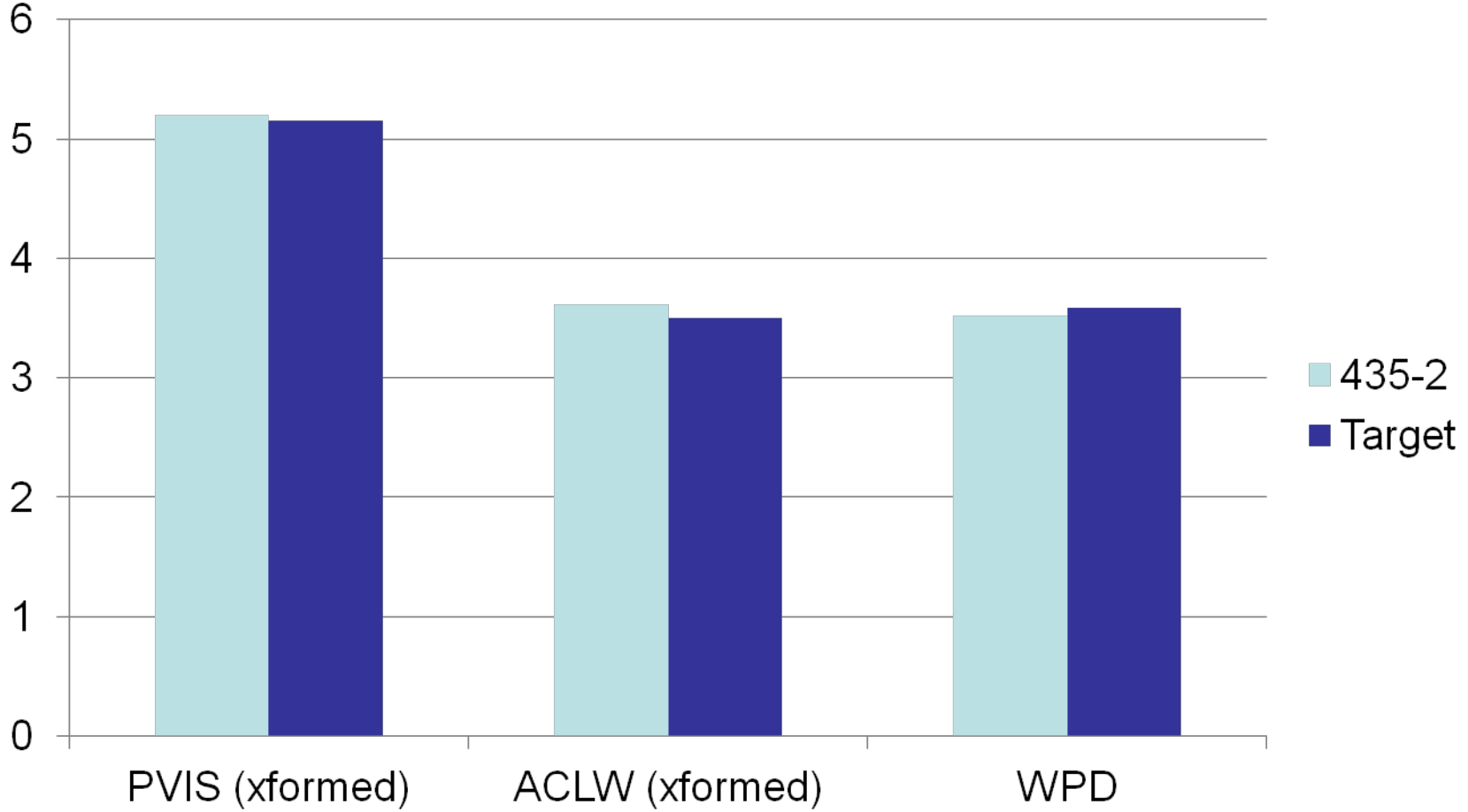
RO 435-2 Results for Oil Consumption



RO 435-2 Results for Phos Retention

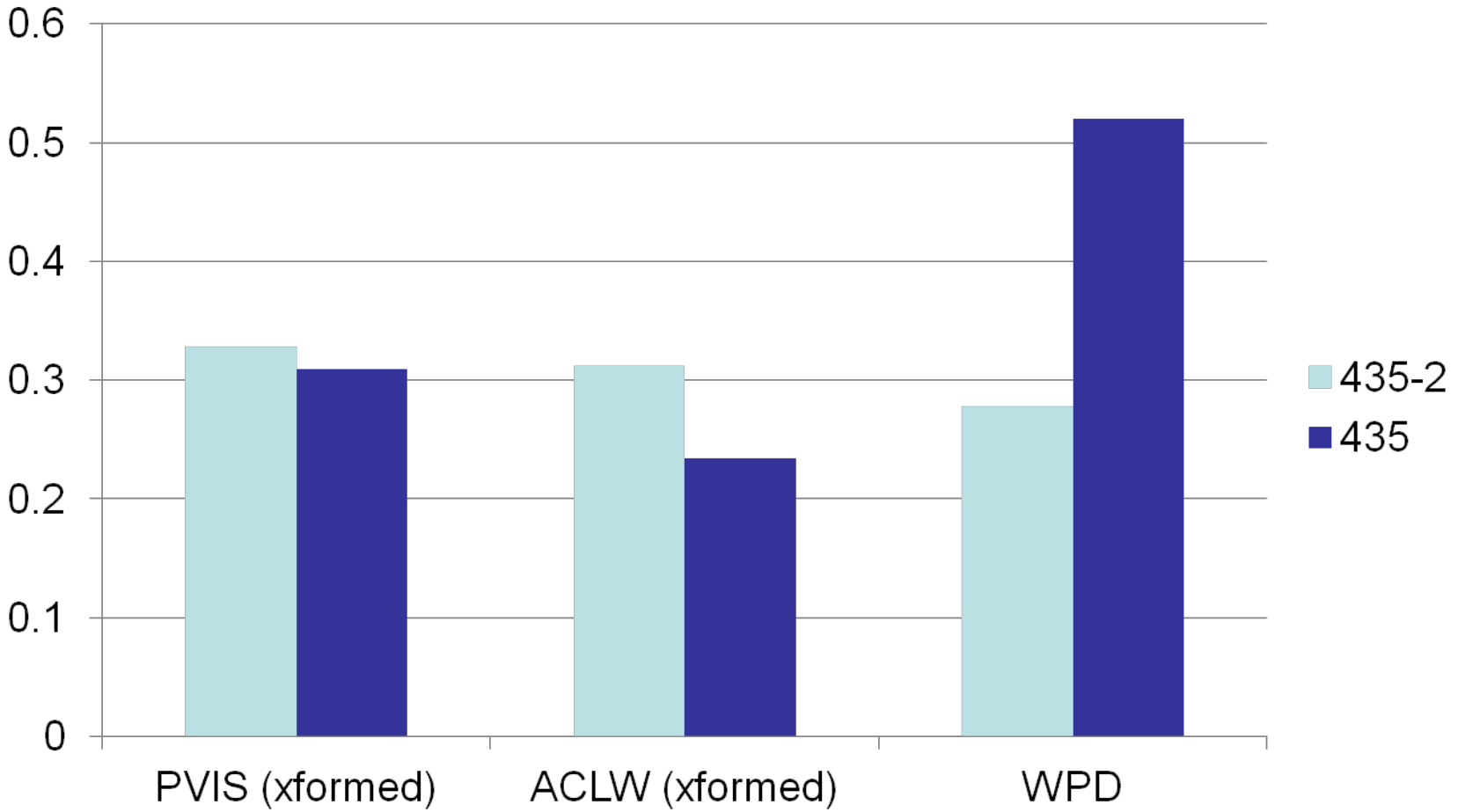


Comparison of Mean Performance of 435-2 (n= 10) with 435 targets



All 435-2 results severity adjusted using candidate model, where appropriate.

Comparison of Standard Deviations of 435-2 (n= 10) with 435 targets



All 435-2 results severity adjusted using candidate model, where appropriate.

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Attachment 11

SAMPLE ENTRIES

Sequence IIIG
Form 12
Hardware Information

Laboratory:		**Oil Code:**	
Test Stand No.:		**Test No.:**	
Laboratory Oil Code:			
Formulation / Stand Code:			

	Build Completion Date	20111025
	Block Serial Number	5E10025
	Crankshaft Serial Number	
	Camshaft Serial Number	J281107
FIFO	Camshaft Pour Code	PC 16
	Camshaft Phosphate Batch Code	111026 (YYMMDD)
	Cylinder Head Serial Number, Left	20H11021
	Cylinder Head Serial Number, Right	20H11022
	Bearing Kit Serial Number	9536
FIFO	Main Bearings (M) Batch Code	19
FIFO	Connecting Rod Bearings (CR) Batch Code	18
FIFO	Camshaft Bushing (CB) Batch Code	21
FIFO	Intake Valve Seals Batch Code	4
FIFO	Exhaust Valve Seals Batch Code	3
FIFO	Lifter Engine Set Number (ESET)	9130

FIFO	Oil Filter Batch Code	6
FIFO	Oil Cooler Batch Code (C/SP)	111026 (YYMMDD)
FIFO	Piston Batch (Code)	26
FIFO	Piston Size (Grade)	12 or 34 or 56
FIFO	Piston Ring Batch Code	8
FIFO	Oil Control Ring (OC) Batch Code	15
FIFO	Expander Ring (EXP) Batch Code	15
	Top Ring Gap, mils	25
	Bottom Ring Gap, mils	42
FIFO	Rocker Arm Batch Code	16
FIFO	Valve Springs Batch Code	10

Attachment 12

IIIG PVIS Analysis

By: Todd Dvorak

03/27/12

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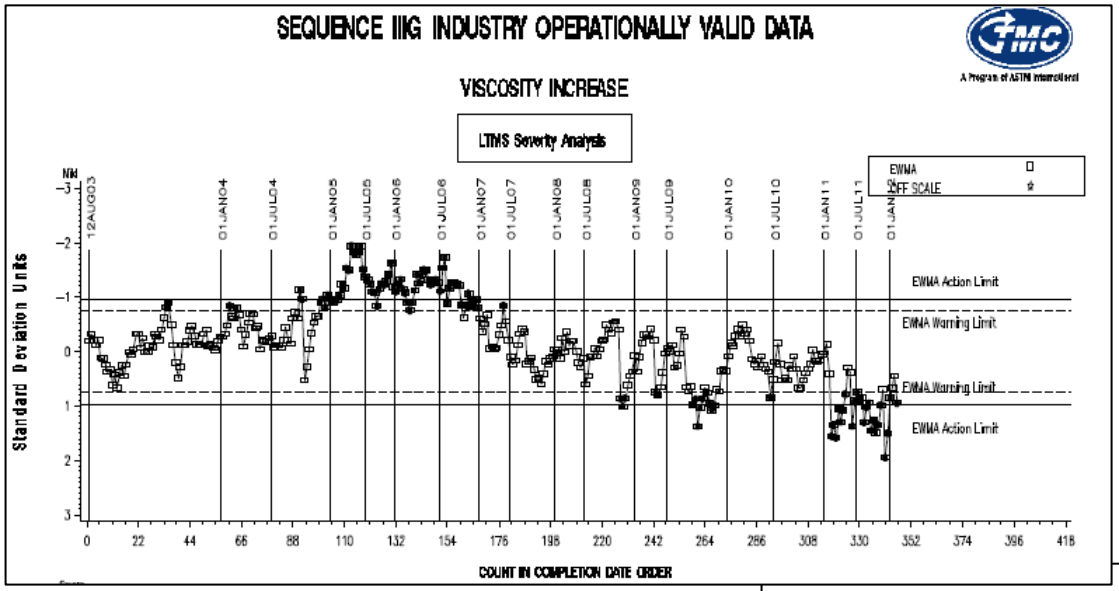
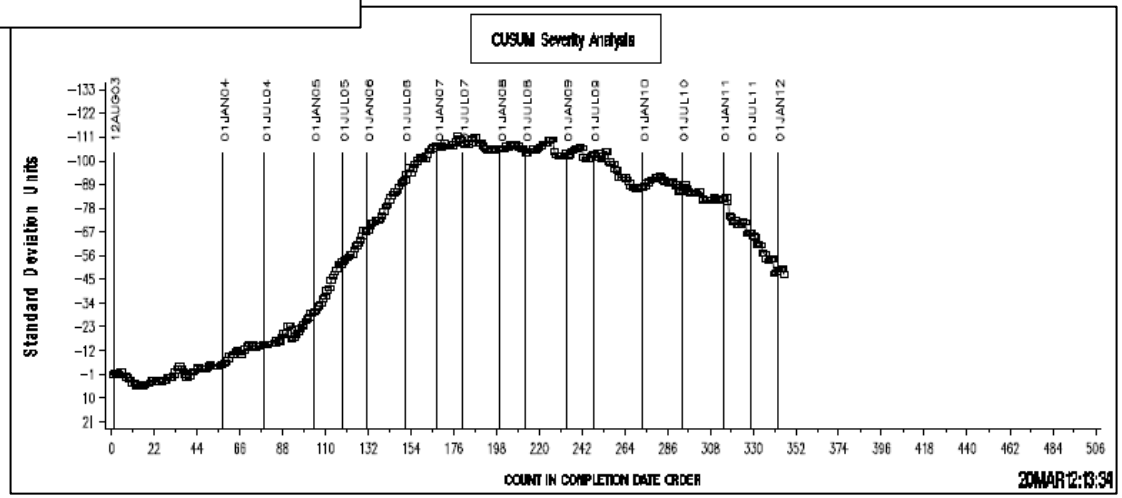
IIIG PVIS Analysis

- TMC charts suggest that the PVIS parameter has been trending severe of target since 2009
- Sequence III SP Chair requested to investigate possible causes that may be related to the test severity
- A preliminary analysis of focused on fuel property data for possible correlations with the PVIS severity
- With a more complete fuel property and reference oil test data, the emphasis of the analysis transition to viscosity related factors
- The following slides outline the details of the analysis

IIIG PVIS Analysis

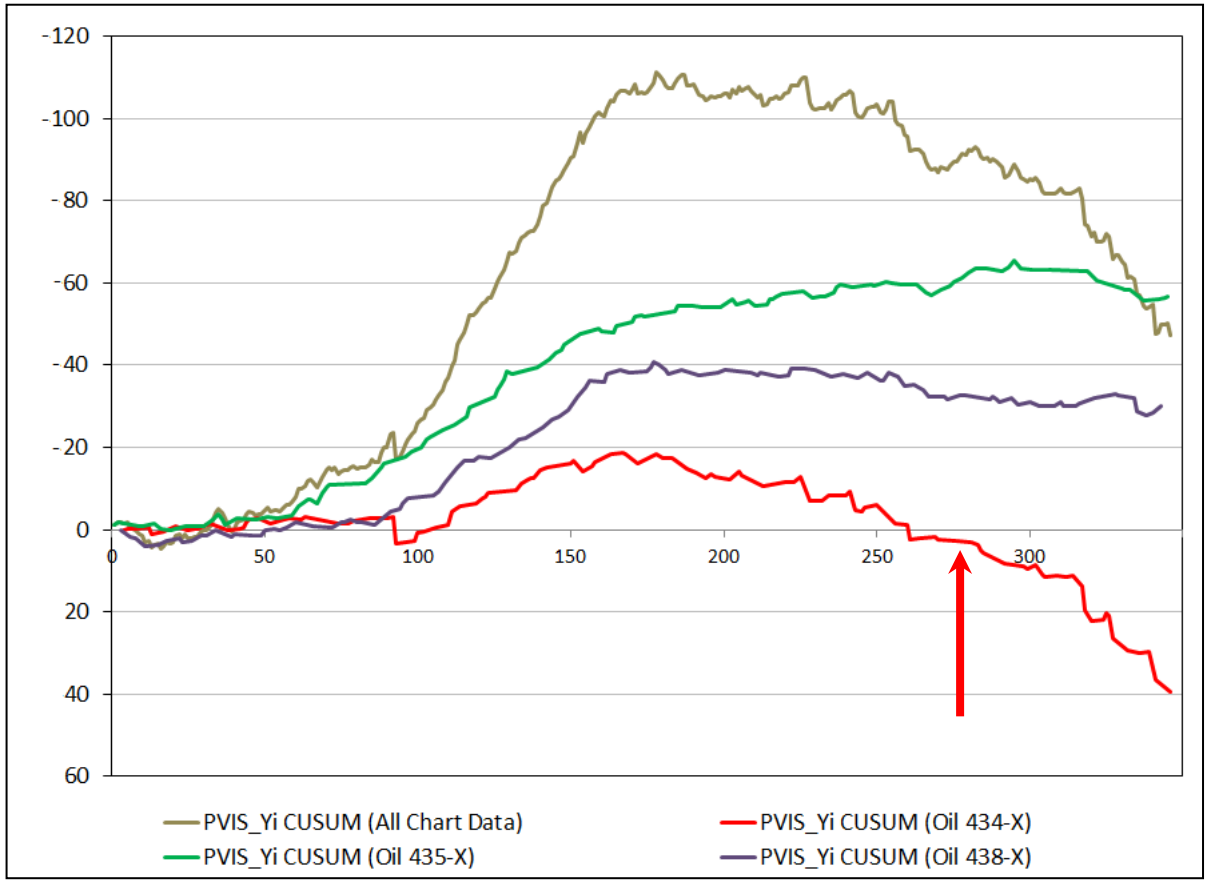
- **Industry IIIG EWMA and CUSUM Chart suggests that the PVIS parameter has been trending severe - since the first quarter of 2011.**





IIIG PVIS Analysis

- **Plot of Chartable IIIG PVIS Industry Yi CUSUM Chart by reference oil suggests that reference oil 434/434-1 has been more severe of target as compared to the other reference oils.**



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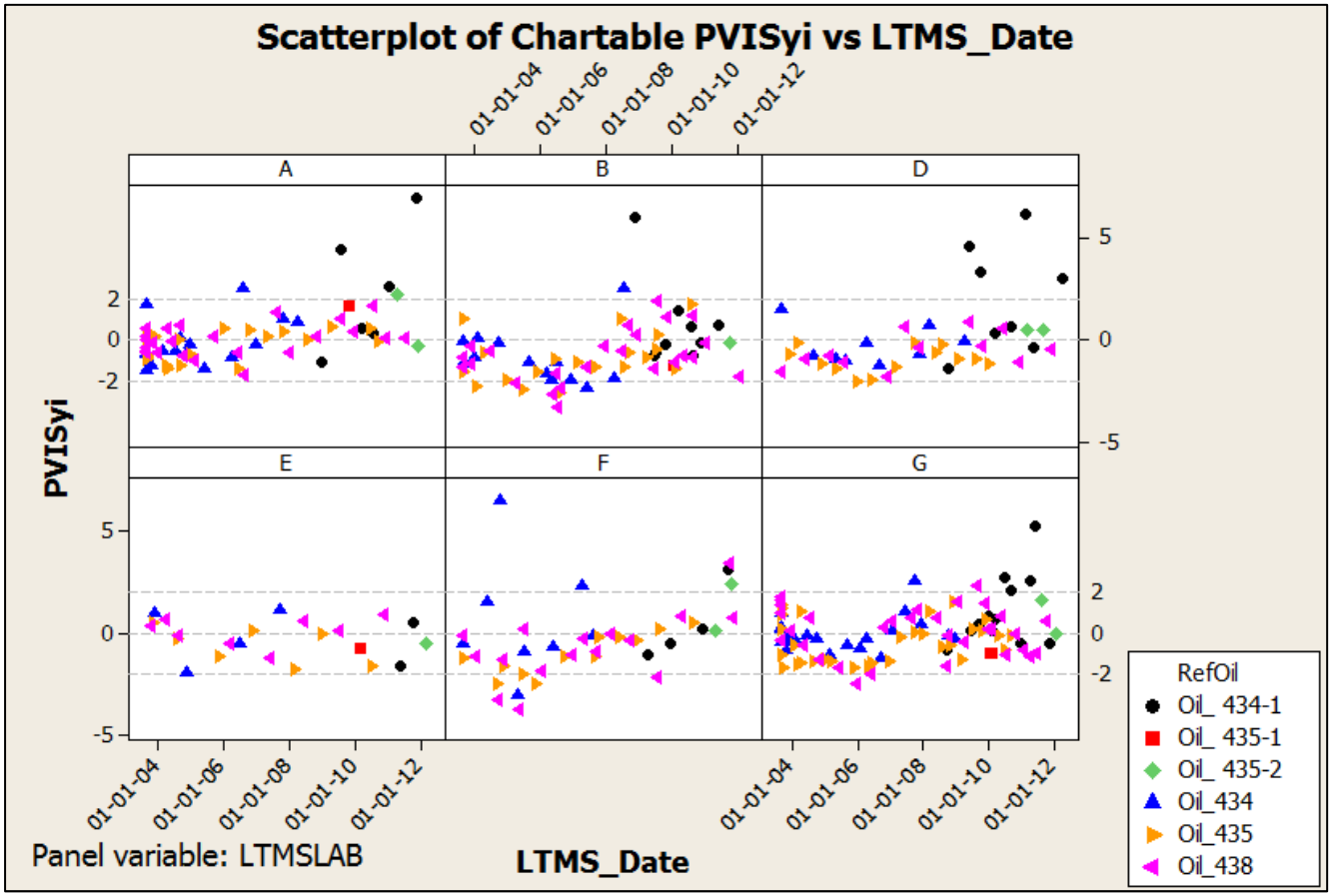
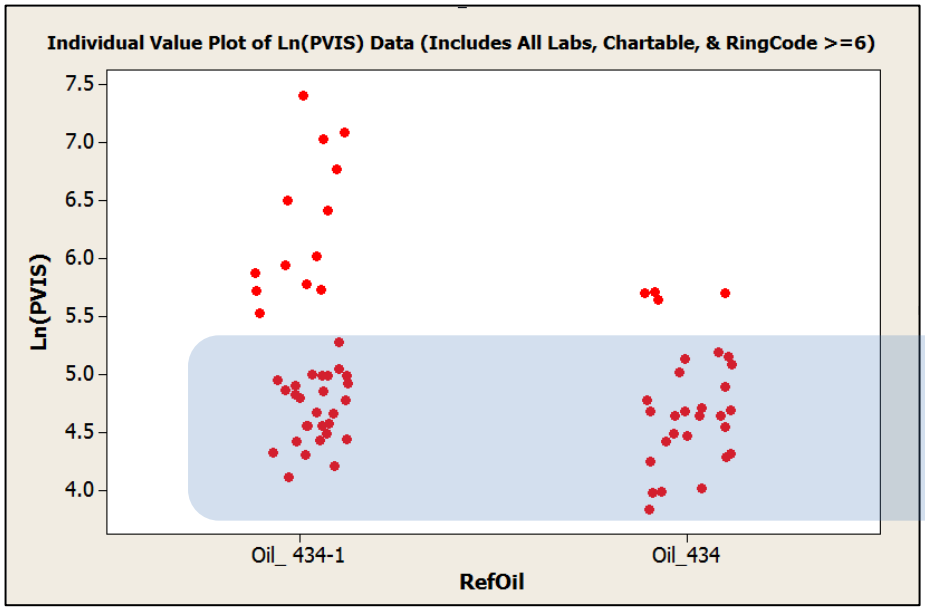
IIIG PVIS Analysis

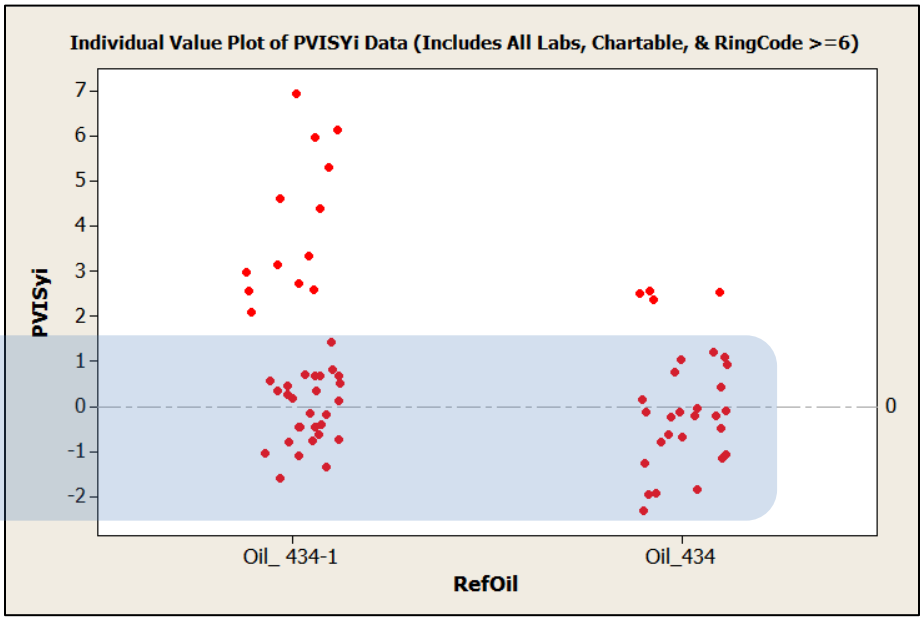
- **Plot of Chartable & Chartable IIIG PVIS Y_i data suggests that a greater proportion of high PVIS results correspond with reference oil 434-1**



IIIG PVIS Analysis

- **Plot of Chartable & Chartable IIIG PVIS data also suggests that a proportion of the test 434 & 434-1 test results have similar performance**





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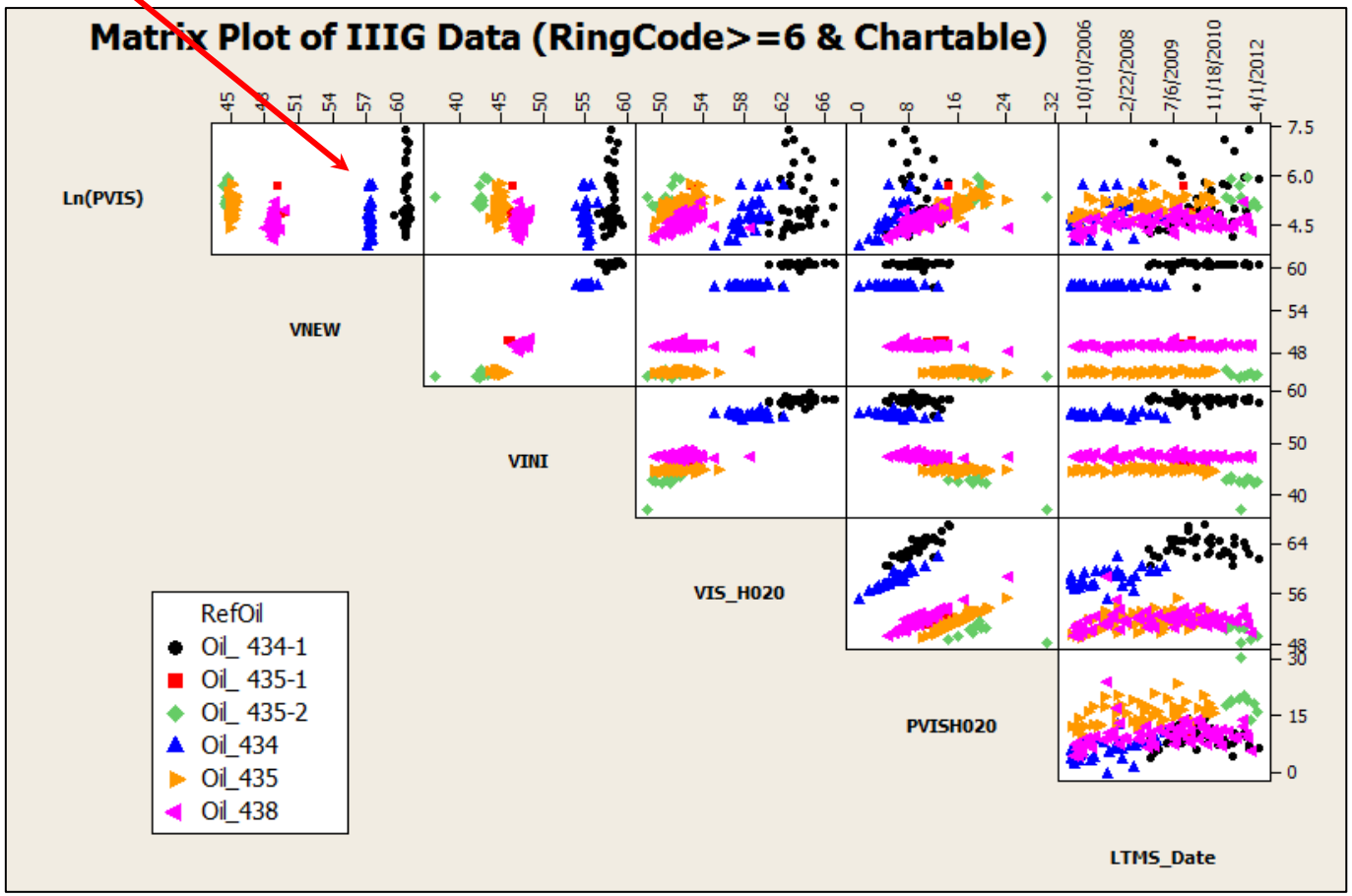
IIIG PVIS Analysis

- **Viscosity related measurement data suggests a possible viscosity difference with the re-blend 434-1 reference oil.**



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IIIG PVIS Analysis

- **Analysis of chartable result data (w/Ring Batch ≥ 6 data ~ March 2006) suggests a difference in the means for reference oil 434-1 and 434.**

General Linear Model: Ln(PVIS) versus LTMSLAB, RefOil

Factor	Type	Levels	Values
LTMSLAB	fixed	6	A, B, D, E, F, G
RefOil	fixed	6	Oil_434-1, Oil_435-1, Oil_435-2, Oil_434, Oil_435, Oil_438

Analysis of Variance for Ln(PVIS), using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
LTMSLAB	5	3.4861	2.8215	0.5643	2.59	0.027
RefOil	5	16.2405	16.2405	3.2481	14.89	0.000
Error	199	43.4241	43.4241	0.2182		
Total	209	63.1506				

S = 0.467131 R-Sq = 31.24% R-Sq(adj) = 27.78%

Term	Coef	SE Coef	T	P
Constant	4.98810	0.05472	91.16	0.000
LTMSLAB				
A	0.20826	0.07673	2.71	0.007
B	-0.15519	0.06677	-2.32	0.021
D	0.02282	0.07790	0.29	0.770
E	-0.1299	0.1120	-1.16	0.247
F	0.01945	0.08471	0.23	0.819
RefOil				
Oil_434-1	0.20700	0.07909	2.62	0.010
Oil_435-1	0.0606	0.1988	0.31	0.761
Oil_435-2	0.3698	0.1321	2.80	0.006
Oil_434	-0.26654	0.08778	-3.04	0.003
Oil_435	0.06429	0.07269	0.88	0.378

Least Squares Means for Ln(PVIS)

LTMSLAB	Mean	SE Mean
A	5.196	0.09033
B	4.833	0.08035
D	5.011	0.09432
E	4.858	0.13649
F	5.008	0.10296
G	5.023	0.07112
RefOil		
Oil_434-1	**5.195**	**0.07535**
Oil_ 435-1	5.049	0.23654
Oil_ 435-2	5.358	0.14814
Oil_434	**4.722**	**0.08816**
Oil_435	5.052	0.06443
Oil_438	4.553	0.05882

Tukey Simultaneous Tests - Response Variable Ln(PVIS)
All Pairwise Comparisons among Levels of RefOil

RefOil = **Oil_434-1** subtracted from:

RefOil	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
Oil_435-1	-0.1464	0.24598	-0.595	0.9913
Oil_435-2	0.1628	0.16553	0.983	0.9228
Oil_434	**-0.4735**	**0.11342**	**-4.175**	**0.0006**
Oil_435	-0.1427	0.09620	-1.484	0.6752
Oil_438	-0.6422	0.09221	-6.964	0.0000

RefOil = Oil_435-1 subtracted from:

RefOil	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
Oil_435-2	0.3091	0.2786	1.109	0.8770
Oil_434	-0.3272	0.2504	-1.307	0.7811
Oil_435	0.0036	0.2430	0.015	1.0000
Oil_438	-0.4958	0.2412	-2.055	0.3152

RefOil = Oil_435-2 subtracted from:

RefOil	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
Oil_434	-0.6363	0.1718	-3.703	0.0037
Oil_435	-0.3055	0.1610	-1.897	0.4069
Oil_438	-0.8050	0.1589	-5.066	0.0000

RefOil = Oil_434 subtracted from:

RefOil	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
Oil_435	0.3308	0.1070	3.093	0.0271
Oil_438	-0.1686	0.1034	-1.631	0.5792

RefOil = Oil_435 subtracted from:

RefOil	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
Oil_438	-0.4995	0.08386	-5.956	0.0000

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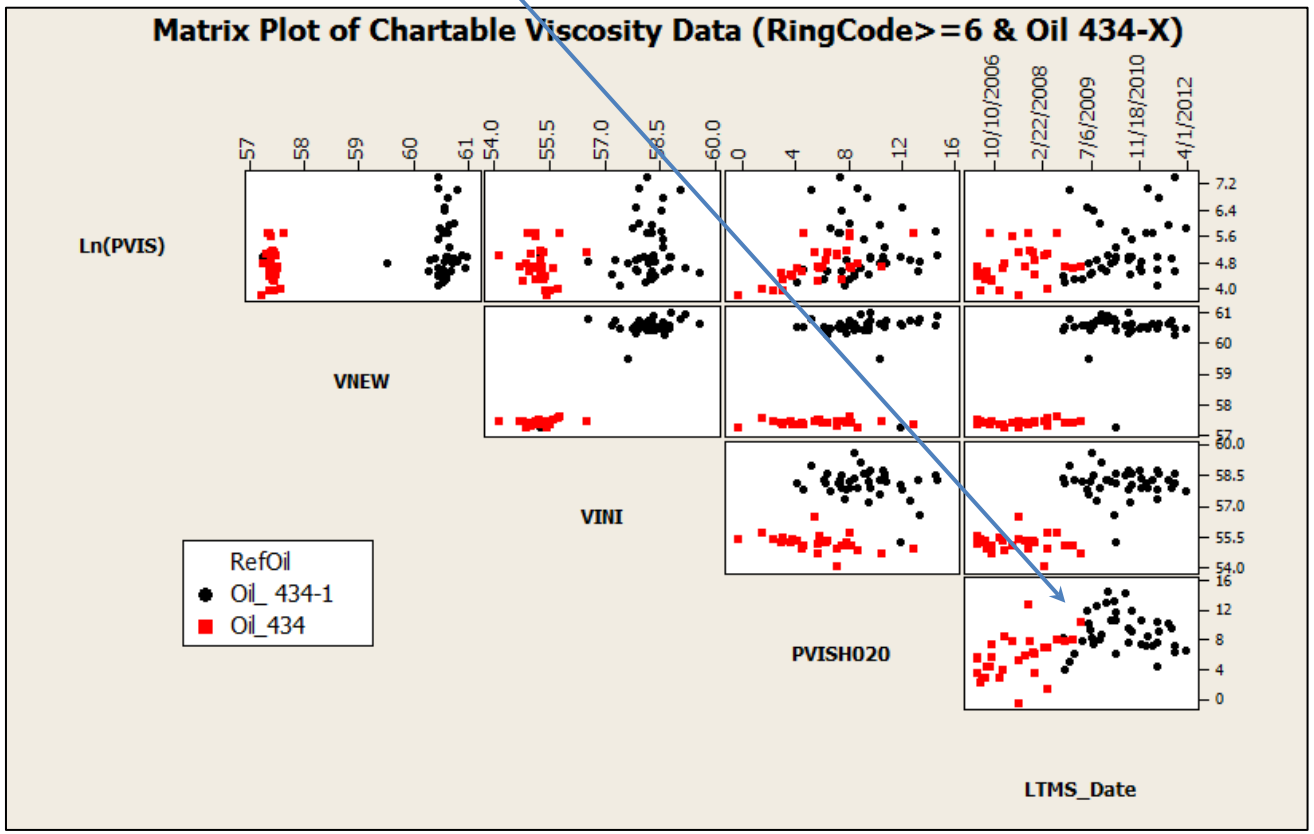
IIIG PVIS Analysis

- **PVIS at hour 20 (PVISH020) tends to be higher with re-blend 434-1 reference oil**
  - Viscosity related confidence intervals on the next slide



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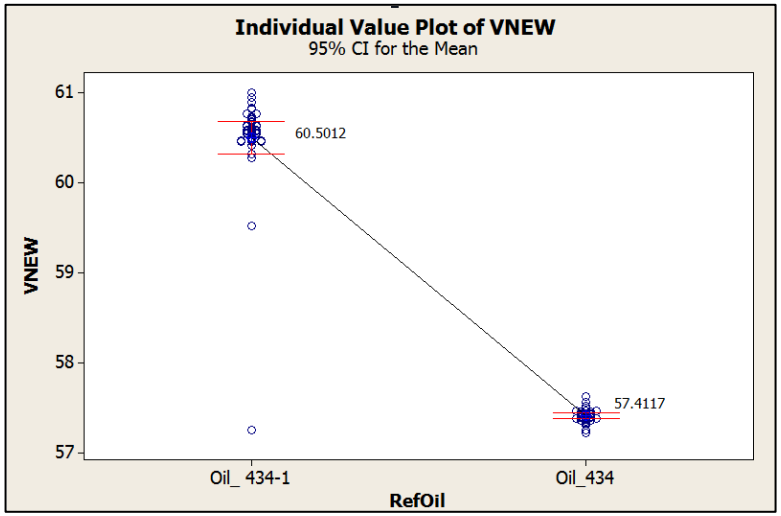
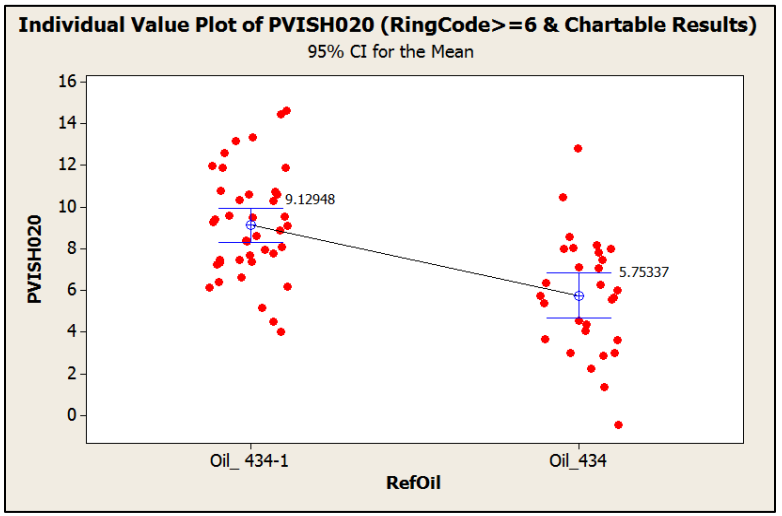
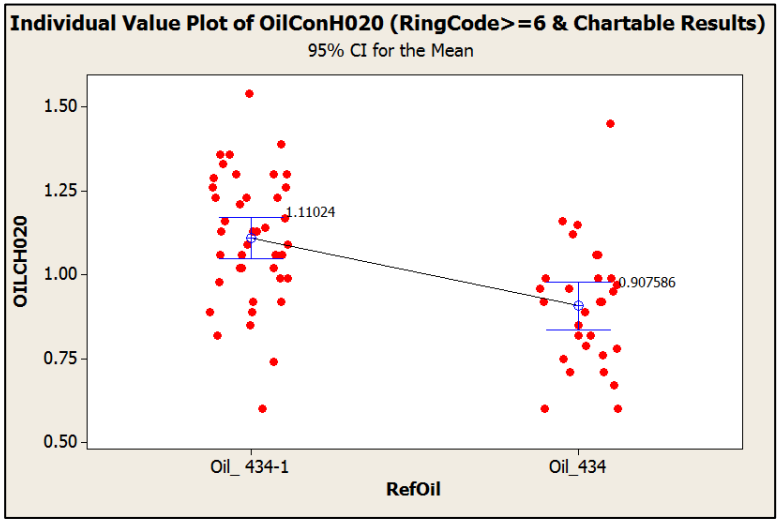
IIIG PVIS Analysis

- **Individual value plot of VNEW, 20Hr Oil Consumption, 20Hr PVIS tends to be higher with oil 434-1 as compared to oil 434 (includes all lab data)**







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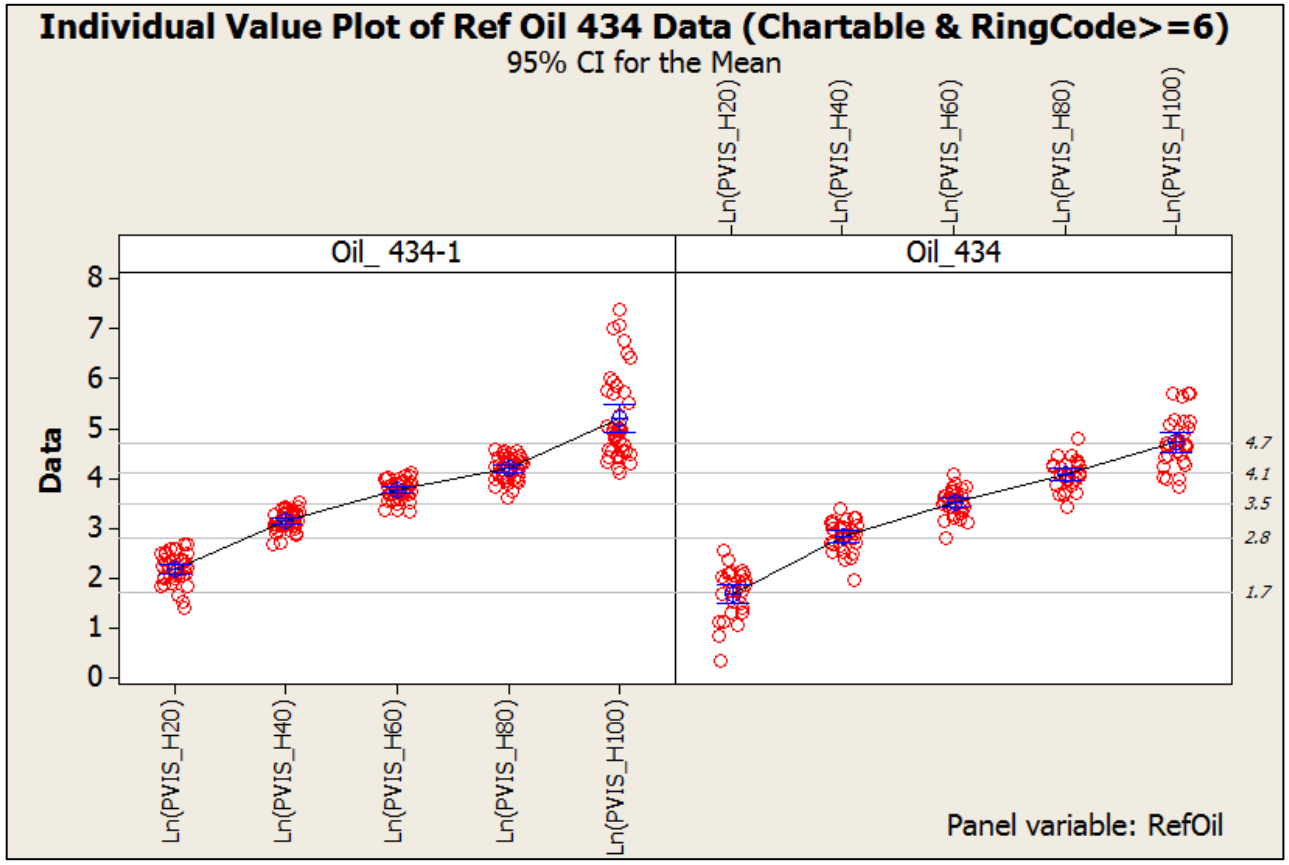
IIIG PVIS Analysis

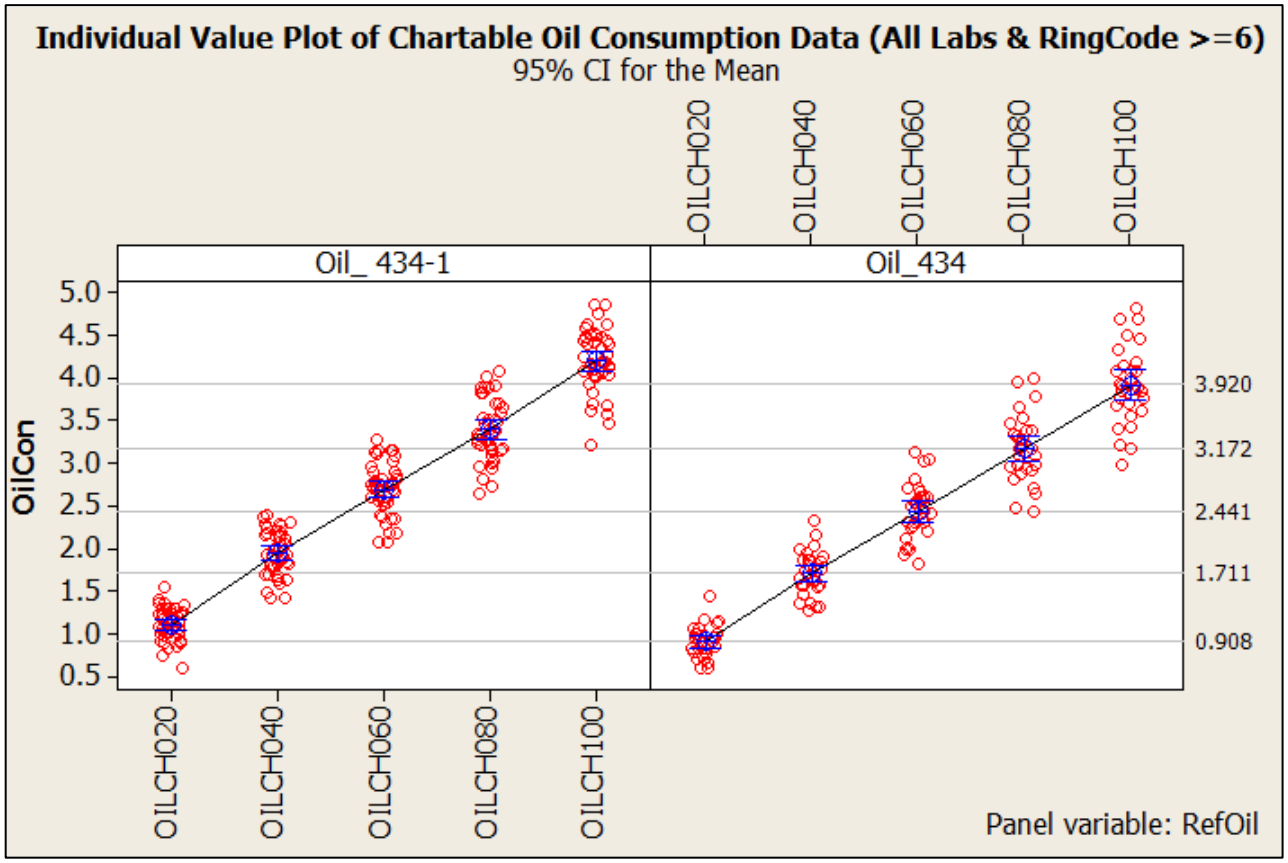
- **Ln(PVIS) Plot by reference oil 434 & 434-1 (includes all lab data)**
  - Plot suggests some performance differences in viscosity increase at the 20 hour intervals



Variable	RefOil	Mean	StDev
PVIS_H20	Oil_ 434-1	9.129	2.576
	Oil_434	5.753	2.808
PVIS_H40	Oil_ 434-1	23.838	4.773
	Oil_434	17.736	5.070
PVIS_H60	Oil_ 434-1	43.78	8.49
	Oil_434	34.74	9.27
PVIS_H80	Oil_ 434-1	68.14	15.69
	Oil_434	61.52	18.36
PVIS_H100	Oil_ 434-1	288.6	352.6
	Oil_434	130.7	76.3

IIIG PVIS Analysis

- **Similar plot of Oil Consumption by reference oil 434 & 434-1 (includes all lab data)**
  - Plot suggests some differences in oil consumption at the 20 hour intervals

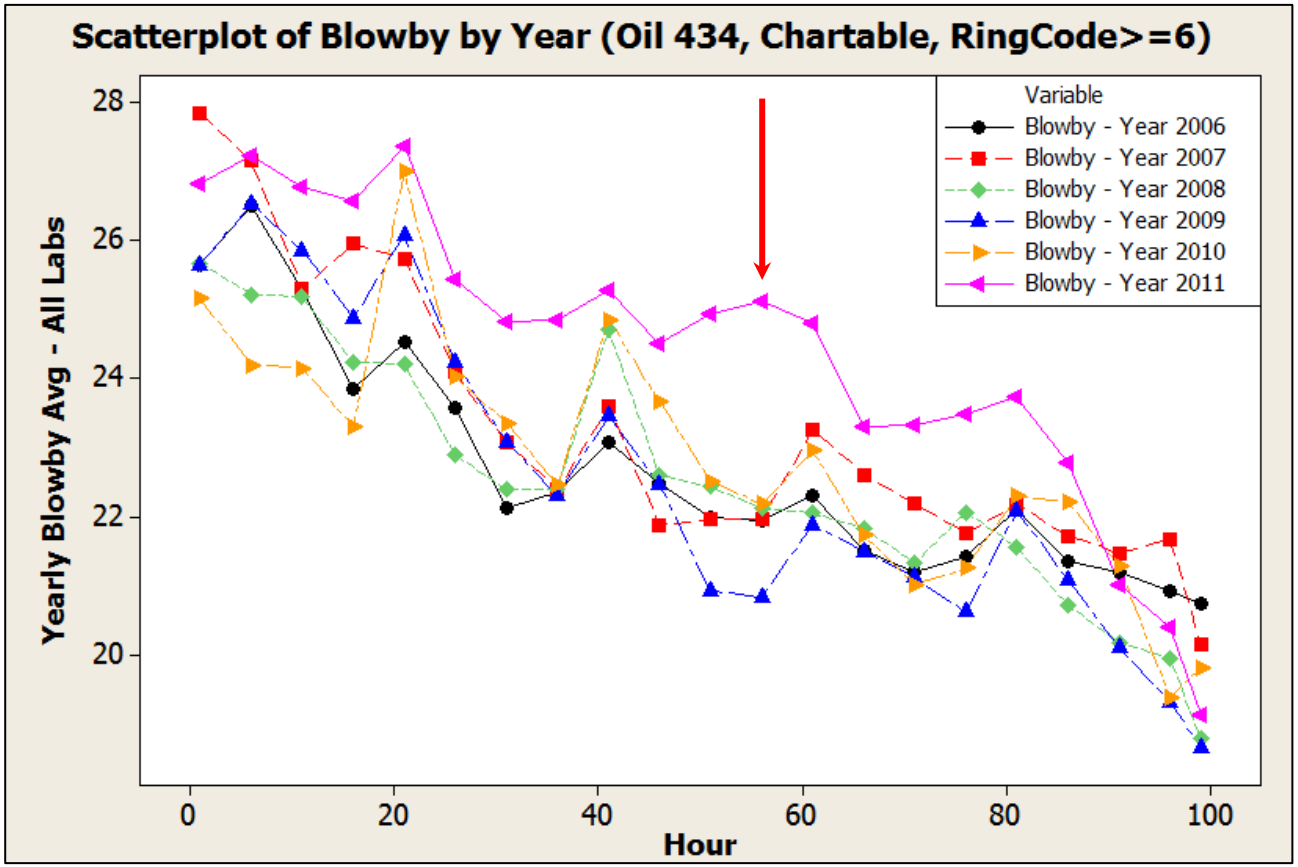


Variable	RefOil	Mean	StDev
OILCH020	Oil_ 434-1	1.1102	0.1925
	Oil_434	0.9076	0.1851
OILCH040	Oil_ 434-1	1.9456	0.2583
	Oil_434	1.7114	0.2614
OILCH060	Oil_ 434-1	2.6924	0.3138
	Oil_434	2.4407	0.3355
OILCH080	Oil_ 434-1	3.4005	0.3565
	Oil_434	3.1717	0.3919
OILCH100	Oil_ 434-1	4.2020	0.3718
	Oil_434	3.9203	0.4581

IIIG PVIS Analysis

Other "coincidental" factors related to PVIS(?)

- Hourly blow-by average (for all labs) may be higher during hours 20 – 90 for 2011 data *(Reference oil 434-1 introduced in 2009)*



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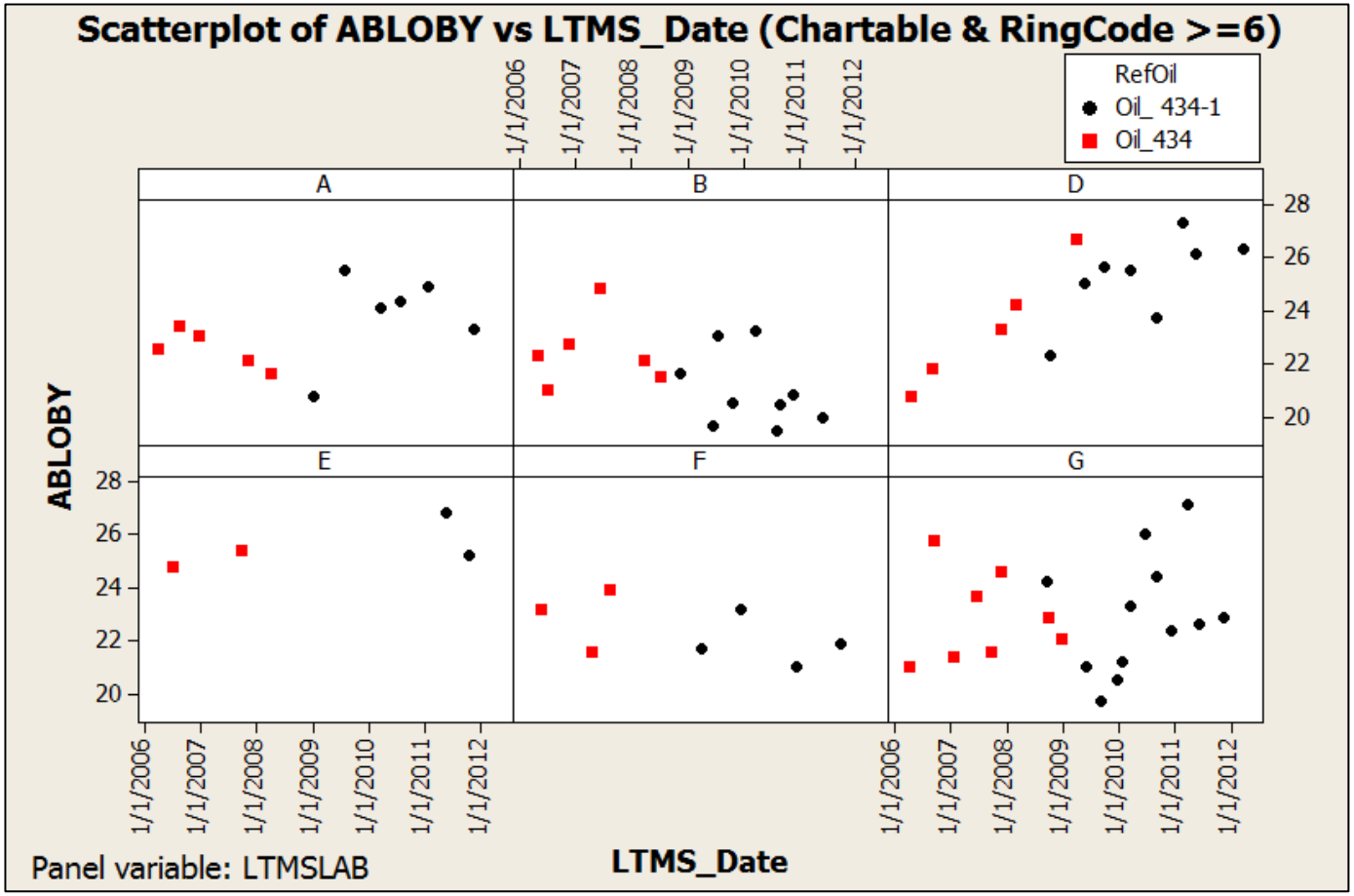
IIIG PVIS Analysis

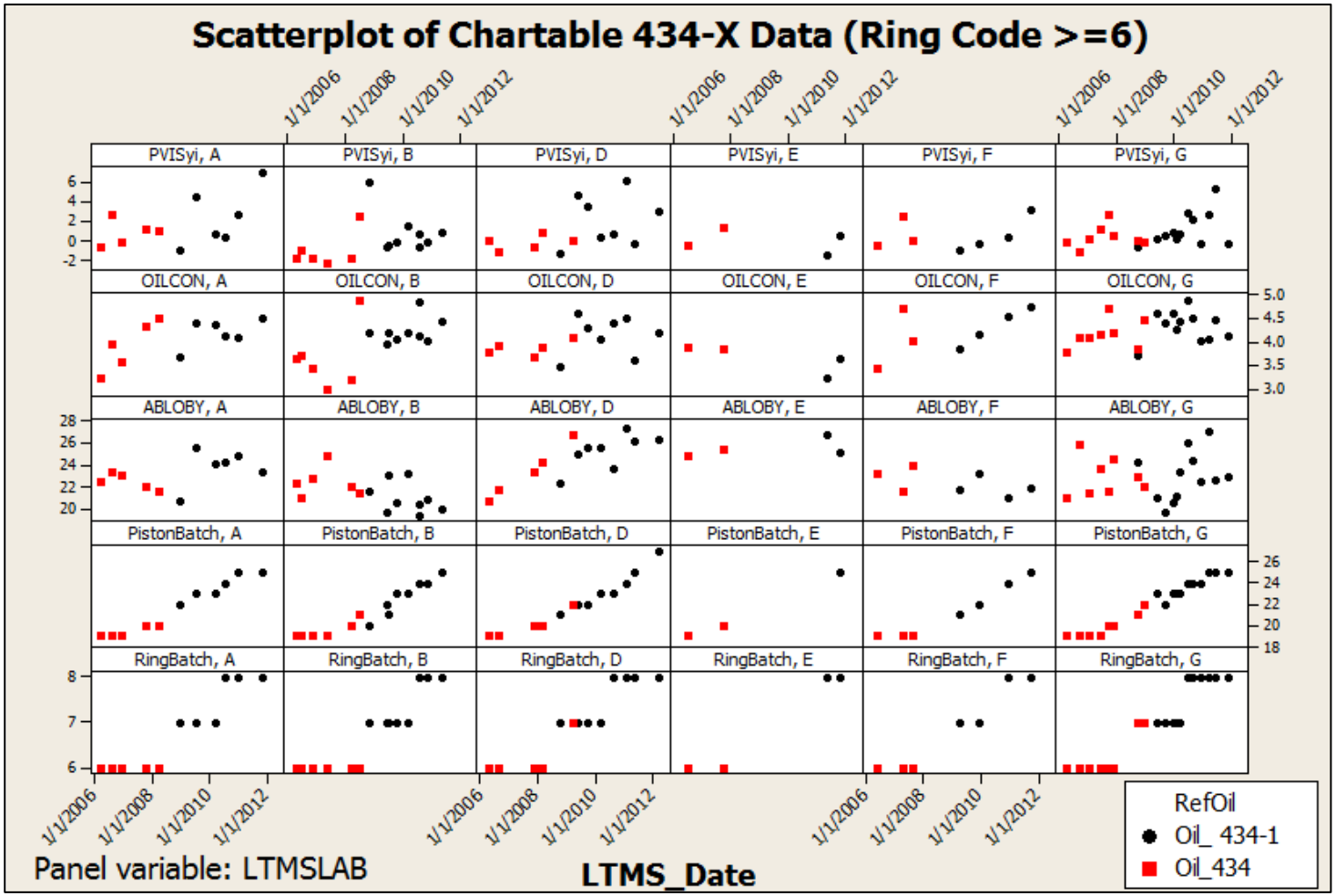
- **Other "coincidental" factors related to PVIS increase (?)**
  - Plot of data by test date and lab indicates no discernable increase in blow-by for reference oils 434 & 434-1



IIIG PVIS Analysis

Other “coincidental” factors related to PVIS increase(?)

- Plots of PVIS Yi, Oil Consumption, Ring Batch, Piston Batch, ABlowby factors by lab & calendar date are summarized below
  - No single root cause can be identified that corresponds to higher PVIS Yi results



IIIG PVIS Analysis Summary

- **TMC charts suggest that the PVIS parameter is trending severe of target**
- **CUSUM plots suggest that reference oil 434 has been trending more severe of target - as compared to reference oils 435 & 438**
- **Analysis of Ln(PVIS) reference oil data suggests that there may be a difference in the means - for the 434 and 434-1 contrast.**
- **Shift in severity may be coincidental with other variance sources**
  - Average blow-by suggests that it may have increased in 2011
  - Oil Consumption tends to be higher with 434-1
  - The IIIG is a complex test to and has exhibited mild & severe trends – without assignable root cause(s).
    - Other known and/or unknown factors may also be contributing to the test severity
- **No recommendation given at this time to take any action**

Attachment 13

Test Type: Sequence IIIG

Subject: Annual Test Stand Calibration Test Requirement

Lab: Southwest Research Institute

Per the recommendation of the Test Monitoring Center, SwRI would like to inform the Sequence IIIG Surveillance Panel that the annual calibration on test stand 56 has been delayed from January 24, 2012 to April 8, 2012 to coincide with the laboratory reference period.

Attachment 14

The following industry issues are handled by the TMC and do not require individual laboratory action.

- Exceed EWMA industry chart limits for severity
  - TMC to notify test developer, surveillance panel chairman, and ACC Monitoring Agency.
- Exceed EWMA industry chart limits for precision
  - TMC to notify test developer, surveillance panel chairman, and ACC Monitoring Agency

5. Removal of Test Stands from the System

The laboratory must notify the TMC and the ACC Monitoring Agency when removing a stand from the system. No reference oil data shall be removed from the control charts from test stands that have been used for registered candidate oil testing. Reintroduction of a stand into the system requires completion of new stand acceptance requirements; however, previously calibrated stands that are removed from the system following a failed calibration test must generate two (2) operationally valid calibration tests, with no Shewhart severity alarms (all parameters). If a calibrated stand is removed from the system, or skipped in the laboratory stand rotation, and the laboratory wishes to bring the stand back into the system within 90 days of its removal, the surveillance panel shall be consulted. In all instances of stand removal, stand renumbering can occur only if the stand undergoes a significant rebuild, as agreed upon by the laboratory and the TMC.

6. Introduction of New Reference Oils

When a new reference oil is introduced, Severity Adjustments shall not be calculated using results on a new reference oil until the test targets are based on at least eight (8) data points.

Attachment 15

ASTM SEQUENCE III SURVEILLANCE PANEL

SCOPE & OBJECTIVES

SCOPE

The Sequence III Surveillance Panel is responsible for the surveillance and continual improvement of the Sequence IIIF and IIIFHD tests documented in ASTM Standard D6984 as update by the Information Letter System. The Sequence III Surveillance Panel is also responsible for the surveillance and continual improvement of the Sequence IIIG, IIIGA and IIIGB tests documented in ASTM Standard D7320 as updated by the Information Letter System. Data on test precision will be solicited and evaluated at least every six (6) months for Sequence III test procedures. The Surveillance Panel is to provide continual improvement of rating techniques, test operation, test monitoring and test validation through communication with the Test Sponsor, ASTM Test Monitoring Center, the Central Parts Distributor, Fuel Supplier, ASTM B0.01 Passenger Car Engine Oil Classification Panel, ASTM Committee B0.01, ACC Monitoring Agency and ASTM Deposit/Distress Workshop. Actions to improve the process will be recommended when appropriate based on input to the Surveillance Panel from one or more of the previously stated groups. This process will provide the best possible Sequence III Type Test Procedure for evaluating engine oil performance with respect to it's ability to prevent oil thickening, varnish formation, oil consumption and engine wear.

OBJECTIVES	TARGET DATE
Monitor industry hardware inventory	Ongoing

David L. Glaenzer, Chairman
Sequence III Surveillance Panel

Updated 03/28/2012
Corpus Christi, TX USA

Attachment 16

Sequence IIIF/G Surveillance Panel
March 28, 2012
9:00AM – 3:00PM
Omni Corpus Christi Hotel, Bayfront Tower
Corpus Christi, TX

Motions and Action Items
As Recorded at the Meeting by Bill Buscher

1. Motion – Parts washer water/soap mixture is to be replaced at no more than 25 hours of use. IIIF and IIIG test procedures and engine assembly manuals will be updated accordingly.

   Charlie Leverett / Ed Altman / Passed Unanimously 11-0-0

2. Motion – Add "Chevrolet Performance" crankshaft part number to the IIIF and IIIG test reports. Effective with the release of the new test report packages.

   Charlie Leverett / Jason Bowden / Passed Unanimously 11-0-0

3. Motion – Apply FIFO changes that were implemented for the IIIG (IIIG Information Letter 11-5) to the IIIF.

   Ed Altman / Jason Bowden / Passed Unanimously 11-0-0

4. Action Item – Continue to use RO 435 targets for RO 435-2 until the next review.

5. Action Item – Labs to only report the 4 or 5 digit numeric characters for the Lifter Engine Set Number. Do not report the alpha characters.

6. Action Item – SwRI to review their FTIR data on RO 434 and RO 434-1 used oil samples for any differences between the two blends. SwRI to also forward this data to Doyle Boese for statistical review.

7. Action Item – Labs to report their Sunnen honing machine load measurement calibration results to the TMC during their annual lab audits.

8. Action Item – Charlie Leverett and Bruce Matthews to participate in a conference call with Sunnen to discuss the future of calibrating the labs' Sunnen CV-616 honing machines.

9. Action Item – TMC to review IIIG LTMS wording for potential improvements to section 5.