ASTM INTERNATIONAL
Helping our world work better

Meeting Minutes
D02.B0.07 on Development and Surveillance of Bench Tests Methods

SECTION CHAIR: Gaal, Dennis
Date: June 27, 2022 **Time:** 10:00 AM PST
Place: Hyatt Regency Seattle, Seattle, Washington
Attendance: 30 attendees

1. The meeting was called to order, attendees were reminded that electronic recording of ASTM meetings is prohibited.
2. The ASTM Antitrust Statement was read.
3. The minutes of last meeting were approved as posted.
4. There were no Membership Updates as this is noted at the Subcommittee B level
5. Ballot Results (since last meeting)
   a) Main/Concurrent Items: NONE
   b) Subcommittee Items: NONE
6. Standards Requiring Review
   - D7563-2010(2016) Test Method for Evaluation of the Ability of Engine Oil to Emulsify Water and Simulated Ed85 Fuel
     Status: Overdue. Yong-Li McFarland is in process of creating ballot for changes agreed upon by working group.
   - D4682-2018 Specification for Miscibility with Gasoline and Fluidity of Two-Stroke-Cycle Gasoline Engine Lubricants
     Status: Review for Ballot. No activity at this time, but will be discussed at the December meeting.
7. New Standard and Reinstatement Work Items (Not Currently on Ballot): NONE
8. Revision and Withdrawal Work Items (Not Currently on Ballot)
   - WK77986 D7563-2010(2016) Evaluation of the Ability of Engine Oil to Emulsify Water and Simulated Ed85 Fuel (Technical Contact: McFarland, Yong Li)
   - WK80389 D7216-2020A Determining Automotive Engine Oil Compatibility with Typical Seal Elastomers (Technical Contact: Birke, Mike)
   - WK80390 D7528-2021 Bench Oxidation of Engine Oils by ROBO Apparatus (Technical Contact: Mills, Justin)
9. Surveillance Panel Reports (reports saved as Attachments)
   - Section chair summarized the status of the methods monitored by B.07 or under the jurisdiction on B.07 in Attachment 1.
   - D5133 Scanning Brookfield (Matt Schlaff – Attachment 2): Fail rates within historic values, precision is more precise than previous period, and test is slightly mild. Round robin is in progress for new potential reference oil GIC18 that is expected to have a result closer to12 to replace oil 58. Sufficient reference oil volumes. SP expects to have a meeting to add GIC18 as a reference oil pending the RR outcome.
   - D5800 Noack (Amy Ross – Attachment 3): Test continues to be severe and test precision is better than target. There are 2 less stands calibrated from previous period. CUSUM shows long term severity trend and warrants meeting about how to address this. Added to the report for translated unadjusted results.

- D6417 Volatility by GC (Amy Ross – Attachment 3): Test in maintenance mode with slightly worse precision and slightly mild this period.

- D5967 CBT (Mike Lopez – Attachment 4): No activity in last few periods, as labs unable to reference and no requests for candidate testing. Motion was made to declare the test as no longer available with no attempt to revive and passed unanimously. It was noted that the test is not in any active API specifications. Section chair will bring motion to Sub B for a vote.
- D6594 HTCBT (Mike Lopez – Attachment 4): Copper and lead change are both trending severe and precision for copper is slightly better, while lead precision is slightly worse than last period. SP to have a meeting to introduce oil 44-5 with limited volume (under 1 year remaining) of oil 44-4 and to add test to LTMS.
- D6082 High Temperature Foam (Matt Schlaff – Attachment 5): Test precision is similar to last period and running mild. Reference oil 1007 has been depleted and Oil FOAMB18 is in use. D02.06 will need to review as method is up for reapproval in 2022. SP will need to meet to determine final FOAMB8 limits as results have been mild of target for multiple periods and target was set based on a relatively limited number of results.
- D6335 TEOST 33C (Bridget Brassell – Attachment 6): Test precision is slightly worse than target. Test is running slightly severe with an improved 7% fail rate. All rods and catalysts are available.
- D7097 TEOST MHT (Bridget Brassell – Attachment 6): Test in maintenance mode with worse precision and on target performance. There are sufficient reference oils, Rods Batch M or N, and 3 catalyst batches (19AB, 19BA-1, and 20AB). SP will need to meet to confirm final reference oil 434-3 limits.
- D6557 Ball Rust Test (Mike Lopez presented on behalf of Jessica Hawkins – Attachment 7): Test in maintenance mode with result on target and plenty of reference oil volume. Tests can continue to be run, but labs are transitioning to the GEN3 hybrid system as the current GEN2 system is not compatible with Windows 10 operating system. The SP is waiting for a quote on the GEN3 Hybrid system to determine cost and funding needed to evaluate the GEN3 system..
- D6794 EOWT (Yong-Li McFarland – Attachment 8): Test in maintenance mode with slightly severe trend and improved precision. Sufficient reference oils.
- D6795 EOFT (Yong-Li McFarland – Attachment 8): Test in maintenance mode with slightly severe trend and improved precision. Sufficient reference oils.
- D7216 EOEC and LDEOC (Mike Birke – Attachment 9): EOEC (Engine oil elastomer compatibility) test is in maintenance mode and mixed severity and precision across the 5 elastomers. LDEOC (Light Duty Engine Oil Compatibility) test is in maintenance mode and mixed severity and precision across the 5 elastomers. No Information Letters issued this period.
- D7528 ROBO (Justin Mills – Attachment 10): Test precision is slightly worse than target and ran with a slight mild bias. Dilute NO2 delivery option added to the method with data dictionary and report forms updated. LTMS document regarding reference oils cleaned up and data dictionary update to allow TVTM for MRVEOT field. All reference oils in good supply.
- D874 Sulfated Ash (Matt Schlaff – Attachment 11): Test precision is in line with historical limits, performance is slightly mild. There is a new oil, 92, that potentially could replace oil 90 as QC oil. SP will need to meet to initiate a RR to evaluate oil 92.

10. Liaison Reports: NONE
11. Old Business: WK77986 (D7563) is working on submitting ballot.

12. New Business/Committee Correspondence: None.
13. Administrative Deadlines
14. Future Meetings: December 5, 2022 at Renaissance Orlando at SeaWorld, Orlando, FL
15. Meeting Adjournment

For a complete list of standards see
https://www.astm.org/COMMIT/SUBCOMMIT/D02B007.htm

D02.B0.07 Bench Test Surveillance Panels - Status June 2022

Surveillance Panel	Chairperson	Test Method	Reapproval Date	Jurisdiction
TEOST (33C)	Bridget Brassell	D6335	2024	D02.09.0G.2
TEOST (MHT)	Bridget Brassell	D7097	2024	D02.09.0G.2
Elastomer Compatibility (EOEC)	Mike Birke	D7216	**2027**	D02.B0.07
EO Water Tolerance (EOWT)	Yong-Li McFarland	D6794	2025	D02.B0
EO Filterability Test (EOFT)	Yong-Li McFarland	D6795	2024	D02.B0
Corrosion (CBT)	Mike Lopez	D5968	2024	D02.B0.02
Corrosion (HTCBT)	Mike Lopez	D6594	2025	D02.B0.02
Volatility by GC	Amy Ross	D6417	2024	D02.04.0H
Volatility by Noack	Amy Ross	D5800	2026	D02.06
High Temperature Foam	Matt Schlaff	D6082	**2022**	D02.06
Scanning Brookfield	Matt Schlaff	D5133	2025	D02.07
Sulfated Ash	Matt Schlaff	D874	2023	D02.03
Ball Rust Test	Jessica Hawkins	D6557	2023	D02.B0.01
ROBO	Justin Mills	D7528	**2027**	D02.B0.07
Homogeneity and Miscibility	Standing Item in B07	D6922	2023	D02.B0
Emulsion Test	Standing Item in B07	D7563	**2021**	D02.B0.07
Diesel Fuel Dilution by GC	Standing Item in B07	D3524	2025	D02.B0
Gasoline Fuel Dilution by GC	Standing Item in B07	D3525	2025	D02.B0
Miscibility of Two-Stroke Lubricants	Standing Item in B07	D4682	2023	D02.B0.07

Surveillance Panel	Need	TMC Monitored?	Reference Oils	Present Operating Status
TEOST (33C)	PCEO Class. Panel	Yes	435-2, 75-1	**WK34866**
TEOST (MHT)	PCEO Class. Panel	Yes	432, 434-3	**WK34867**
Elastomer Compatibility (EOEC)	HDEO/PCEO Class. Panel	Yes	SL107	**WK80389**
EO Water Tolerance (EOWT)	PCEO Class. Panel	Yes	77-3, 79	Maintenance
EO Filterability Test (EOFT)	PCEO Class. Panel	Yes	79	Maintenance
Corrosion (CBT)	HDEO Class. Panel	Yes	43	Maintenance
Corrosion (HTCBT)	HDEO Class. Panel	Yes	1005-5, **44-4**	Maintenance; **Oil 44-4 with less than 1 year remaining**
Volatility by GC	HDEO/PCEO Class. Panel	Yes	52, 55, 58	**WK45365**
Volatility by Noack	HDEO/PCEO Class. Panel	Yes	VOLC12, VOLD12, VOLE12	Maintenance
High Temperature Foam	HDEO/PCEO Class. Panel	Yes	FOAMB18, 66	**WK80329;WK81857**
Scanning Brookfield	PCEO Class. Panel	Yes	GIA17, **GIC18**, 1009	Maintenance
Sulfated Ash	HDEO Class. Panel	Yes	90, 91, 820-2	Maintenance
Ball Rust Test	PCEO Class. Panel	Yes	82-1, 86, 87, 1006	Maintenance
ROBO	PCEO Class. Panel	Yes	**434-3**, 435-1, 436	**WK80390**
Homogeneity and Miscibility	PCEO Class. Panel	No	HMA-HMF	Maintenance
Emulsion Test	PCEO Class. Panel	No	EM2, EM2-1, EM5, EM5-1	**WK77986**
Diesel Fuel Dilution by GC	HDEO Class. Panel	No	None	Maintenance
Gasoline Fuel Dilution by GC	PCMO Class. Panel	No	None	Maintenance
Miscibility of Two-Stroke Lubricants	2T Engine Oils	No	None	Maintenance

D5133 SCANNING BROOKFIELD SURVEILLANCE PANEL REPORT

ASTM Subcommittee D02.B0.07

June 2022

Seattle WA

Matt Schlaff

OVERVIEW

Test Status	Validity Code	No. Tests
Acceptable Calibration Test	AC	54
Failed Calibration Test	OC	7
Operationally Invalidated by Lab	LC, LS, XC, XS	7
Operationally Invalidated After Initially Reported as Valid	RC/RS	10
Acceptable Discrimination Tests	AS	48
Failed Discrimination Tests	OS	1
Total		**95**

Number of Labs Reporting Data: 9
(only 8 labs with chartable results this period)
Fail Rate of Operationally Valid Calibration Tests: 12.3%
Fail Rate of Operationally Valid Discrimination Tests: 2.1%

UNACCEPTABLE TESTS

Statistically Unacceptable Calibration Tests (OC)	No. Of Tests
Gelation Index Mild	6
Gelation Index Severe	1

- There were also 1 severe failing discrimination runs this period, out of 48 reported as operationally valid.

- Of the 7 OC tests:
  - Two were < 2 s from targets (-1.9786)
  - Four were between ±2-3 s from targets
  - One between ±4-5 s from targets

PRECISION AND SEVERITY

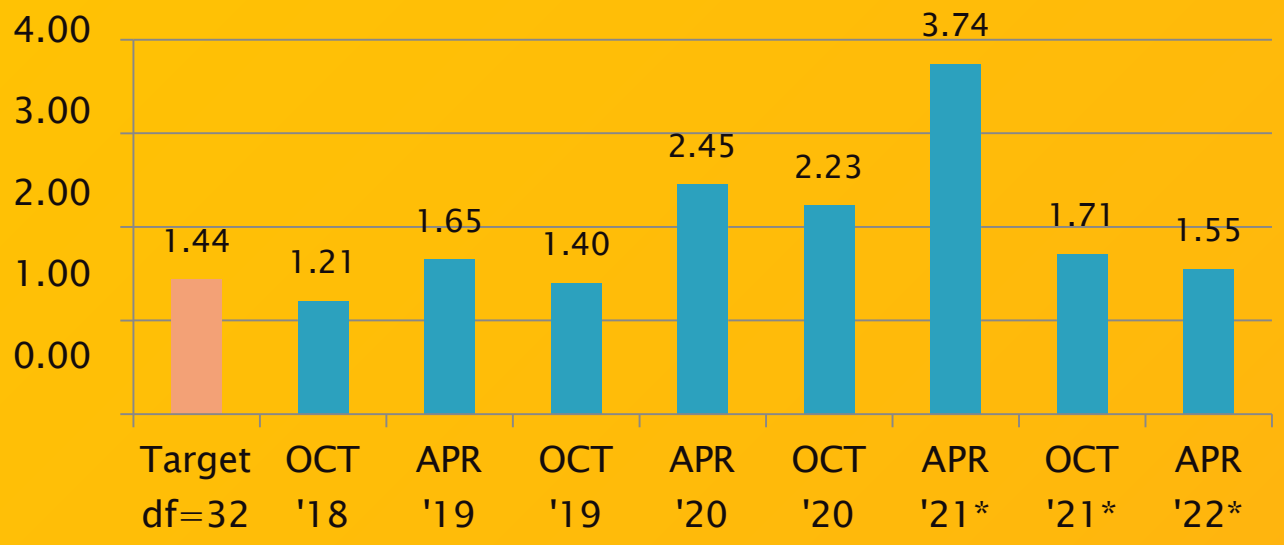
Period Precision and Severity Estimates

Gelation Index	n	df	Pooled s	Mean Δ/s
Targets Updated 20201001[1]	34	32	1.44	-----
10/1/18 through 3/31/19	27	24	1.65	0.13
4/1/19 through 9/30/19	47	44	1.40	-0.25
10/1/19 through 3/31/20	41	37	2.45	-0.24
4/1/20 through 9/30/20	52	48	2.23	-0.11
10/1/20 through 3/31/21[2]	116	113	3.74	-0.86
4/1/21 through 9/30/21[2]	75	73	1.71	-0.20
10/1/21 through 3/31/22[2]	61	59	1.55	-0.84

[1]Target precision updated to current reference oils GIA17 and 1009 only
[2]Changed from bath to head based monitoring scheme 10/1/20

GELATION INDEX POOLED S

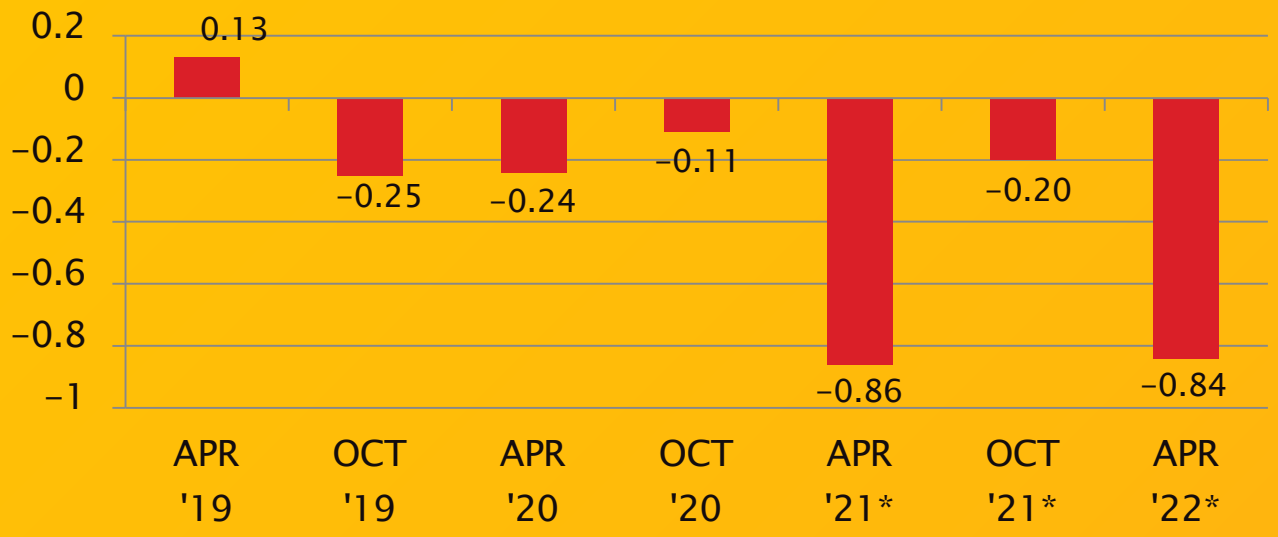
D5133 Precision Estimates



*Changed from bath to head based monitoring scheme

GELATION INDEX MEAN Δ/S

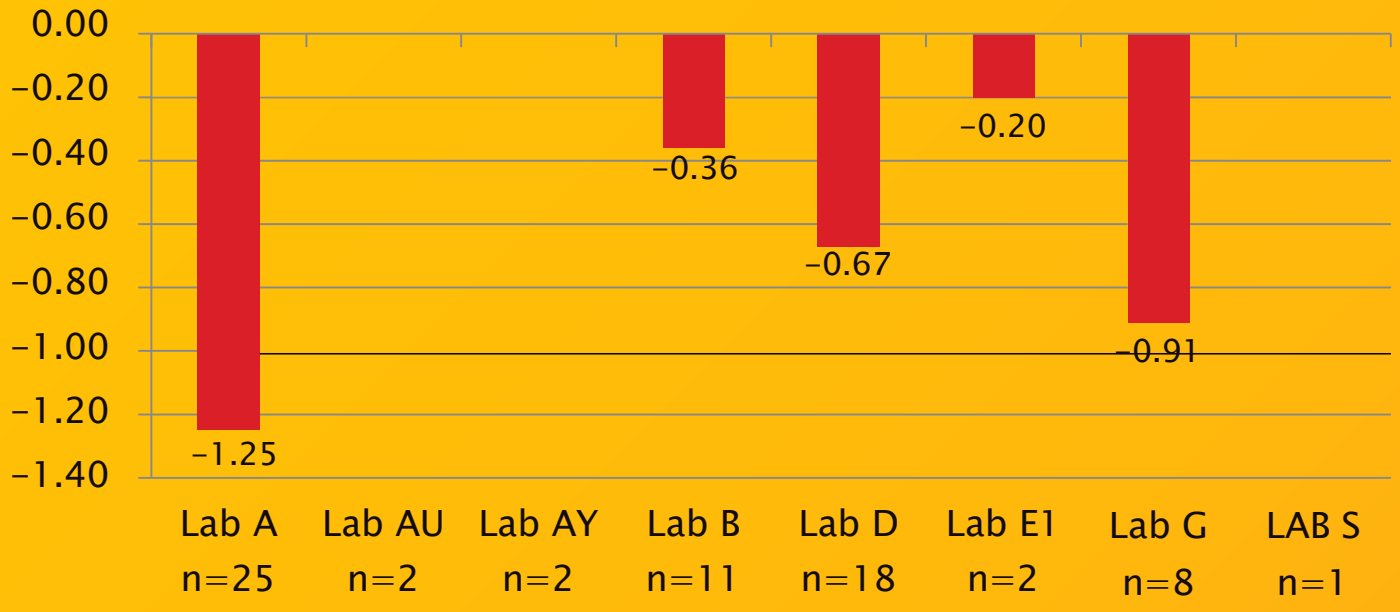
D5133 Severity Estimates



*Changed from bath to head based monitoring scheme

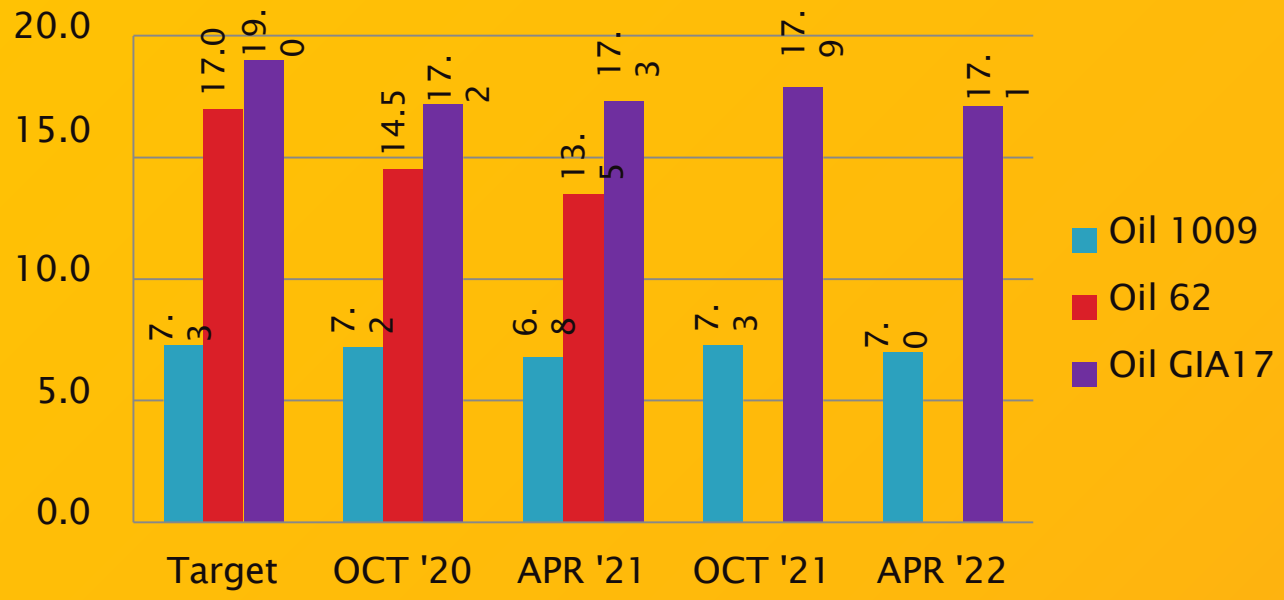
GELATION INDEX MEAN Δ/S BY LAB

D5133 Lab Severity Estimates



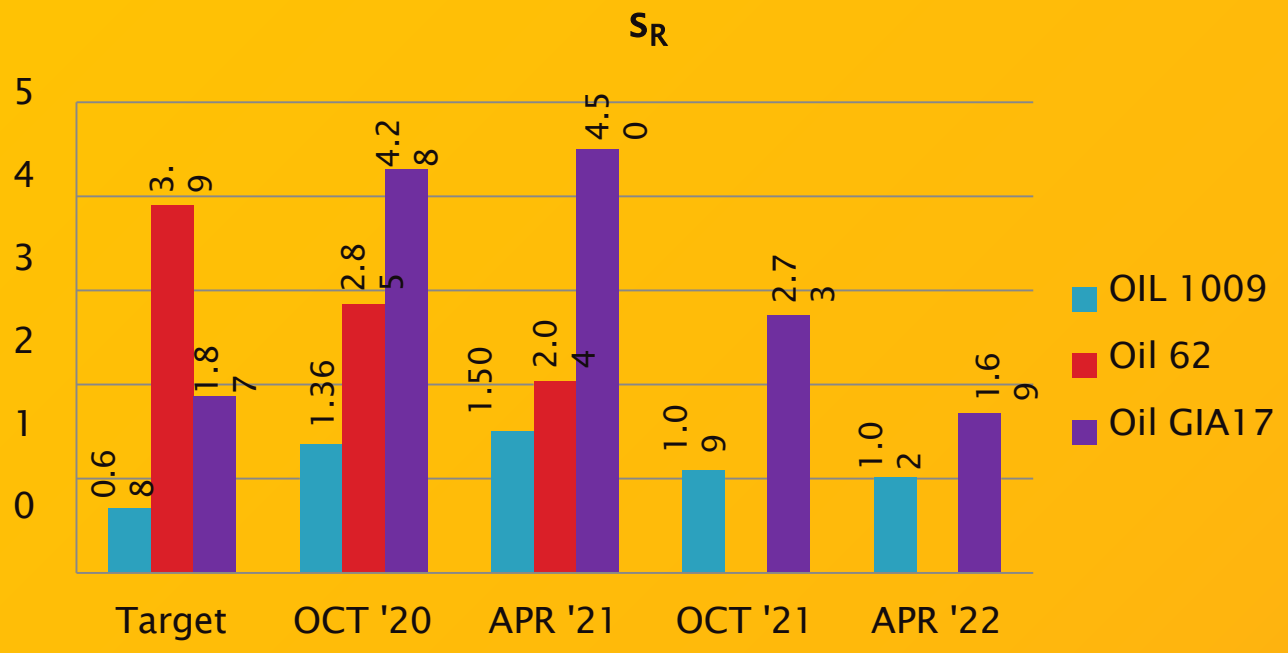
GELATION INDEX MEAN

D5133 Performance by Oil



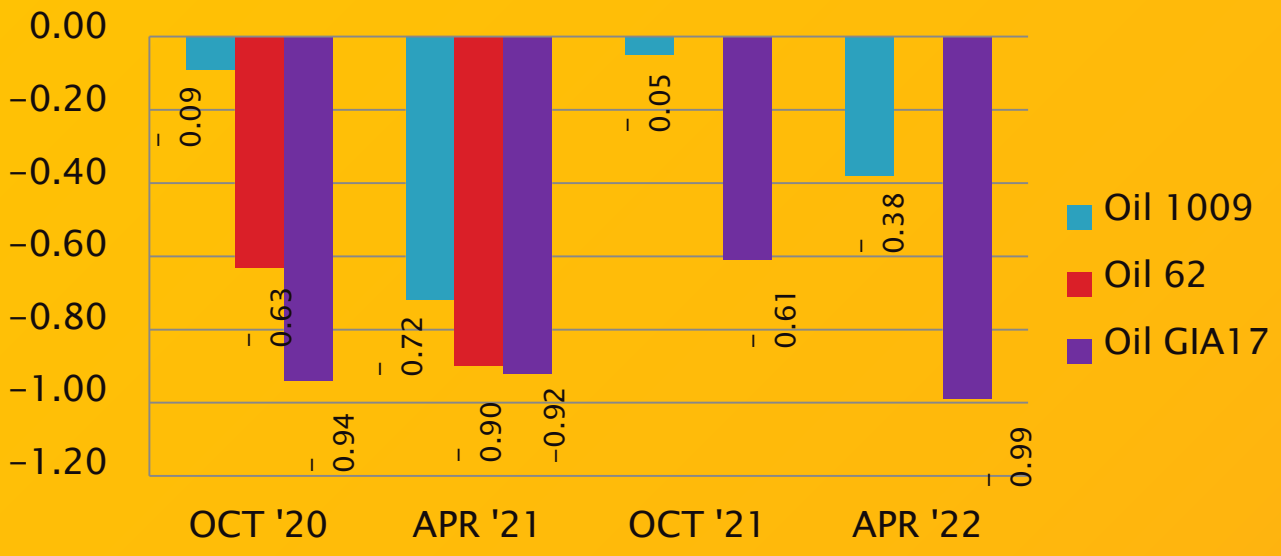
GELATION INDEX

D5133 Performance by Oil

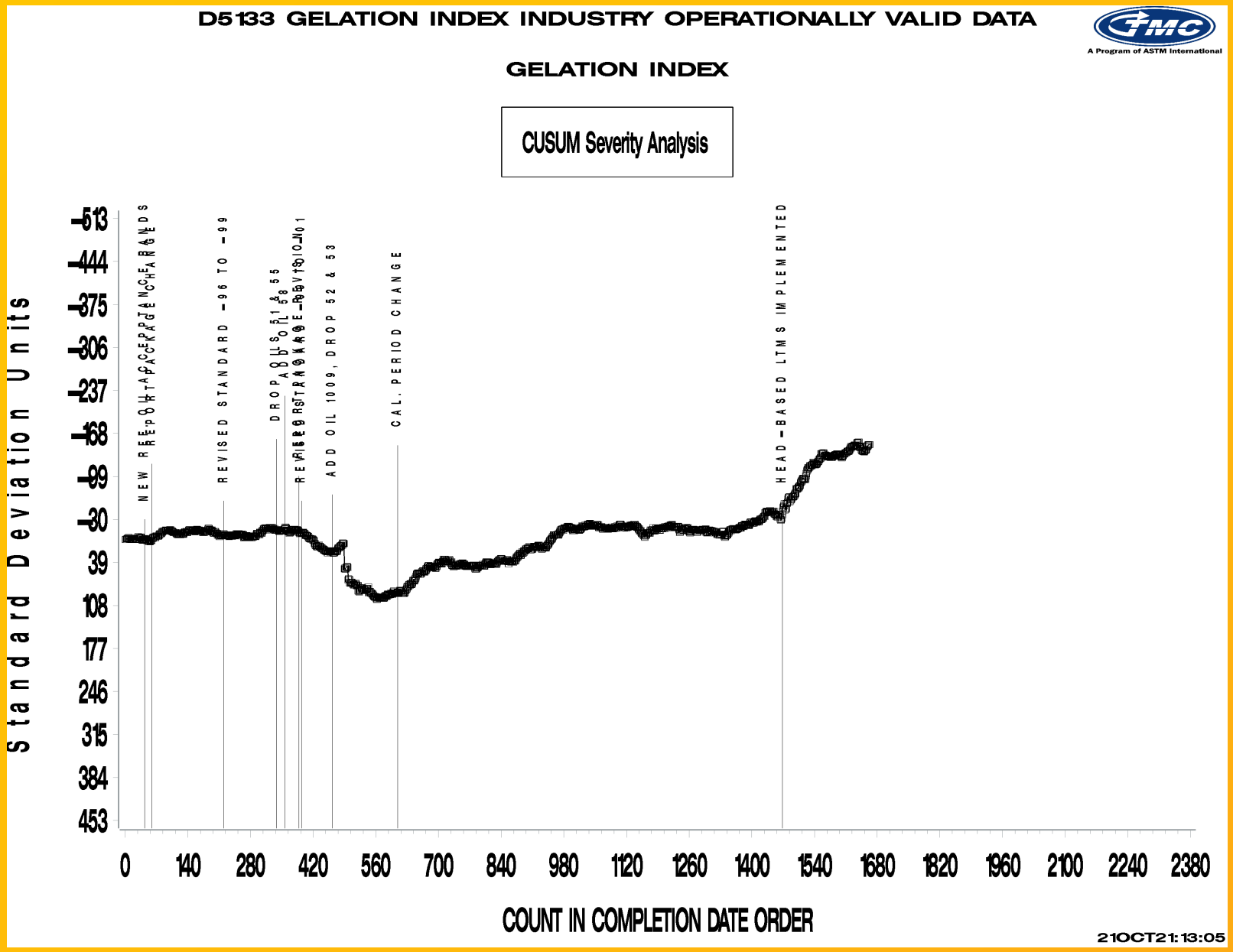


GELATION INDEX

D5133 Performance by Oil



CUSUM PLOT


D5133 GELATION INDEX INDUSTRY OPERATIONALLY VALID DATA
A Program of ASTM International
GELATION INDEX
CUSUM Severity Analysis
REVISED STANDARD -96 TO -99
ADD OIL 1009, DROP 52 & 53
CAL. PERIOD CHANGE
HEAD-BASED LTMS IMPLEMENTED
Standard Deviation Units
-513
-444
-375
-306
-237
-168
-99
-30
39
108
177
246
315
384
453
0
140
280
420
560
700
840
980
1120
1260
1400
1540
1680
1820
1960
2100
2240
2380
COUNT IN COMPLETION DATE ORDER
21OCT21:13:05

OIL INVENTORY

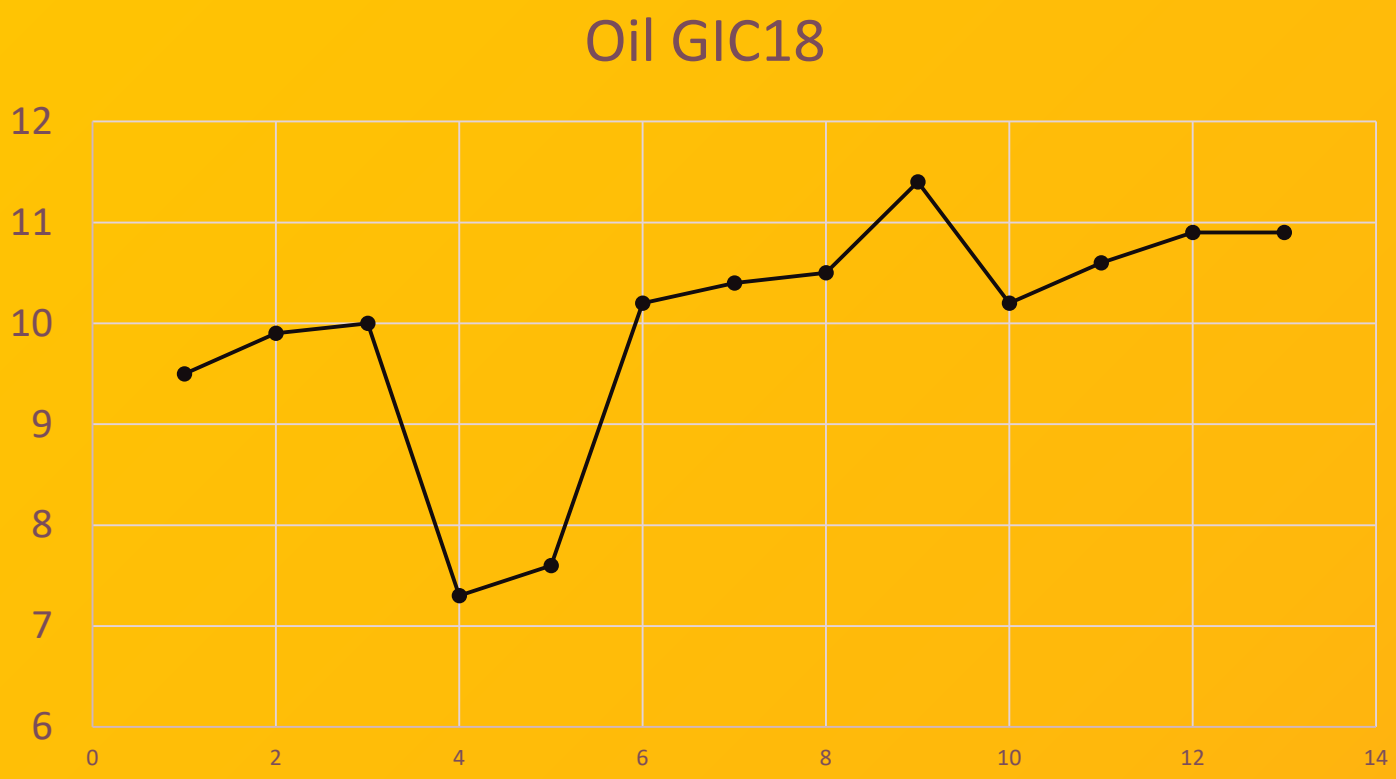
Oil	Year Rec'd By TMC[A]	Tests	TMC Inventory, gallons	Gallons Shipped last 12 months
58	1998	D6417, D6417QC, GI	111.5	0.84
GIA17	2017	GI	8.3	2.5
GIC18	2018	GI	9.8	0.6
1009	2002	GI	35.9	0.7

25 mL per sample aliquot

D5133: GELATION INDEX

- Fail rate of operationally valid tests is 12.3% this period
  - Compared to 12% fail rate last period
  - Fail rate of (new) discrimination runs reported as operationally valid was also 2%
  - Historic period fail rates have ranged between 6% and 26%
- Precision (Pooled s) is slightly more precise than last period
  - Comparable to updated target precision
- Performance (Mean Δ/s) is -0.84 s mild
  - ALL Five labs reporting data were mild of target
- A round robin is underway to evaluate a calibration oil that performs closer to the GF-5/6 pass/fail limit of 12 GI
  - To replace oil 58 that was reclassified as a discrimination oil

OIL GIC18 ROUND ROBIN STATUS



n	13
Average	10.0
Standard Deviation	1.2

D5133: GELATION INDEX MONITORING CHANGE SUMMARY

- Test monitoring changed from a bath-based calibration scheme to a head-based calibration effective 10/1/2020 (where ‘stand’ was redefined from bath to the head/rotor/stator combination).

- Low/non-gelling oil 58 was reclassified as a mild performing discrimination oil (non-chartable) with only a maximum performance limit.

- Stand calibration period changed from 60 days to 180 days, with a coinciding discrimination run required with every other calibration.

B07 Volatility Surveillance Panel Update

ASTM June 2022 Amy Ross

Members List – Updated 20220418

Ricardo Affinito	affinito@chevron.com
Alexandre Romanov	Alexandre.Romanov@petrocanadalsp.com
Alfis Babajide	alfis.babajide@shell.com
Becky Grinfield	bgrinfield@swri.org
Brittany Pfleegor	bjp@astmtmc.org
BTGN@chevron.com	BTGN@chevron.com
Charles Baker	charles.l.baker@exxonmobil.com
Chris Taylor	chris.taylor@vpracingfuels.com
Cindy Klager	cklager@koehlerinstrument.com
Damian Beardmore	Damian.beardmore@bp.com
David Lee	David.Lee@chevron.com
Dennis Gaal	dennis.a.gaal@exxonmobil.com
Gang Hu	Gang.Hu@infineum.com
Gordon Cox	gcox@savantgroup.com
Greg Miiller	gmiiller@savantgroup.com
Greg Lentz	greg.lentz@lubrizol.com
Janet Barker	jbarker@swri.org
Jeff Clark	jac@astmtmc.org
Jo Martinez	JoMartinez@chevron.com
Joe Franklin	joe.franklin@intertek.com
John Bucci	jbucci@savantgroup.com
Joe Sullivan	Joseph.r.sullivan@exxonmobil.com
John Griffin	john.m.griffin@exxonmobil.com
Johnny Garza	johnny.garza@shell.com
Josh Frederick	jrfrederick@valvoline.com
JPZG@chevron.com	JPZG@chevron.com
Kafayat Amusa	Kafayat.Amusa@bp.com
knadkarni@aol.com	knadkarni@aol.com
Larry Spino	Larry.Spino@paclp.com
LFNQ@chevron.com	LFNQ@chevron.com
luwt.ripp@sinopec.com	luwt.ripp@sinopec.com

ManHonTsang@chevron.com	ManHonTsang@chevron.com
Mark Round	Mark.Round@AftonChemical.com
Martin Chadwick	martin.chadwick@intertek.com
Matt Schlaff	matt.schlaff@intertek.com
Mekalah Cofell	mekalah.l.cofell@exxonmobil.com
Mike Birke	mbirke@swri.org
Mike Lopez	mike.lopez@intertek.com
Maggie Smerdon	msmerdon@savantgroup.com
Phuoc Pham	phuoc.pham@exxonmobil.com
Prashant.chandarana	prashant.chandarana@paclp.com
Rafji Jalkian	Rafi.Jalkian@exxonmobil.com
Rich Grundza	reg@astmtmc.org
Rich Ochenkowski	raochenkowski@valvoline.com
Robert Stockwell	robert.stockwell@chevron.com
Rosina Rainey	rosina.rainey@aftonchemical.com
Raj Shah	rshah@koehlerinstrument.com
Sarah Nuss-Warren	snuss-warren@savantgroup.com
Shawn Dubecky	Shawn.Dubecky@lubrizol.com
Shelia Thompson	shelia.thompson@aftonchemical.com
Stefan Lukawiecki	stefan.lukawiecki@safety-kleen.com
Tara Kirchner-Jean	tara.kirchner-jean@lubrizol.com
Ted Selby	tselby@savantgroup.com
Thomas Herold	thomas.herold@paclp.com
Vincent Colantuoni	vcolantuoni@koehlerinstrument.com
Vince Donndelinger	vince.donndelinger@lubrizol.com
Peng Wang	wangpengly_rhy@petrochina.com.cn
Xiao-Hu Fan	xiao-hu.fan@lubrizol.com
Yong Li McFarland	yongli.mcfarland@swri.org
Zach Adams	Zachary.Adams@aftonchemical.com

Volatility Surveillance Panel Activity

- Panel convened on May 19, 2022
  - Meeting Minutes shown on next slide
- PDSC Analyses of reference fluids indicate minimal/no change in oxidative stability
- Annual stats review by Elisa Santos indicated virtually no change in test performance
  - Comment from B0.07 Executive summary slide: "Long term severity trend [severe] as evidenced in the Cusum plots may indicate that targets may not be correct."
- Panel voted to modify the D5800 test report form to include translated results which have ***not*** been severity-adjusted
  - TMC representation (Richard Grundza) indicated that a formal meeting would not be necessary to submit changes which were voted upon and approved by the panel
  - Beta testing has commenced; targeted implementation in mid-July

Optional Translation Between Procedures A and B	
Translation to Procedure	TRPRCDR
Translation Factor	TRFACTOR
Translated Sample Evaporation Loss, Unadjusted, mass %	TRSAMVAL
Translated Sample Evaporation Loss, Severity Adjusted, mass %	TRSAMADJ

[B] Natural Log transformation; see LTMS manual.
[C] Severity adjustments are only applicable to fully formulated engine oils.

Meeting Minutes May 19, 2022

- Review Antitrust Statement
- Membership List Review
- Review and Approve meeting minutes from June 23, 2021 meeting
  - Motion by Denny Gaal, Second by Becky Grinfield
- Statisticians' review
  - No comments from panel
- PDSC Analyses of reference fluids
  - No comments from panel
- TMC Report form discussion
  - Motion to modify TMC report form to accommodate non-adjusted and translated results; unanimously accepted via straw ballot
  - Motion to modify TMC report form fields as shown below; unanimously accepted via straw ballot

Optional Translation Between Procedures A and B	
Translation to Procedure	
Translation Factor	
Translated Sample Evaporation Loss, Severity-adjusted, mass%	
Translated Sample Evaporation Loss, non-adjusted, mass%	

  - Panel will convene again with TMC representation to formally approve changes and provide a timeline for such

B0.07 Bench Testing Executive Summary – D6417

- D6417 (Volatility by GC)

- 7 labs, 9 stands calibrated (same as last two periods)
- Precision (Pooled s) is slightly worse than prior periods and target (0.51 vs. 0.39*)
  - There were two failing results which were greater than +/-3S, one in lab G (-3s) and one in lab A (5s)
- Performance (Mean Δ/s) is 0.13s, close to target; disrupting mild trend over last four periods
- CUSUM plot leveling off after sharp increase/mild trend last three periods

D6417: Estimation of Engine Oil Volatility by Capillary GC

Test Status	Validity Code	No. Tests
Acceptable Calibration Test	AC	18
Failed Calibration Test	OC	2
Total		**20**

Number of Labs Reporting Data: 7
Fail Rate of Operationally Valid Tests: 10%

Last Period Notes: 17 AC results; 0 OC results (mild); 0% fail rate

D6417: Estimation of Engine Oil Volatility by Capillary GC

Statistically Unacceptable Tests (OC)	No. Of Tests
Volatility Loss Mild	1
Volatility Loss Severe	1

- There were no operationally invalid tests reported this period
  - lab G (-3s); lab A (5s)

- No D6417 TMC technical updates were issued this report period.

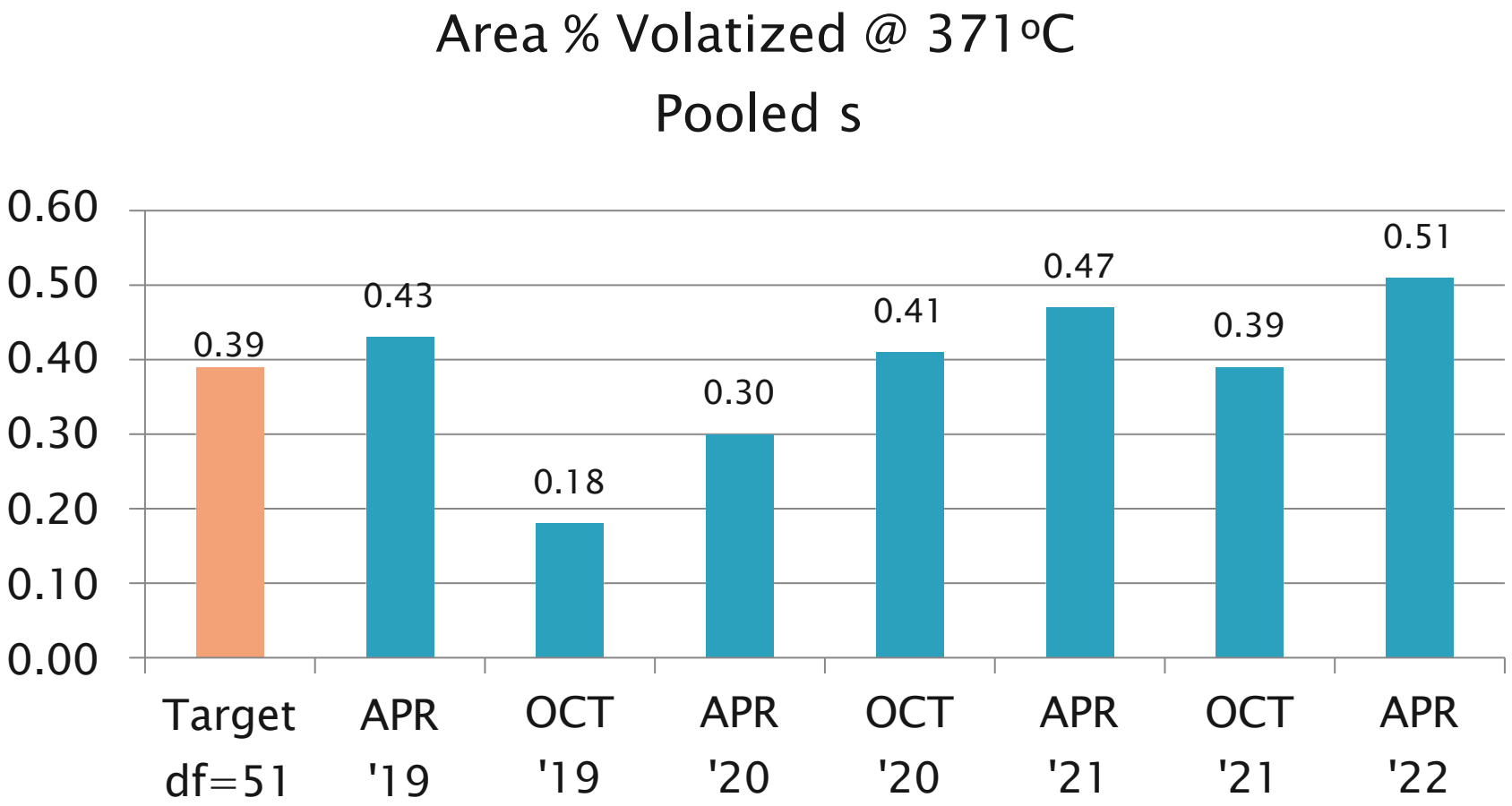
D6417: Estimation of Engine Oil Volatility by Capillary GC

Period Precision and Severity Estimates

Area % Volatized @ 371ºC	n	df	Pooled s	Mean Δ/s
Initial Selected Oils from RR	54	51	0.39	-----
4/1/19 through 9/30/19	19	16	0.18	0.10
10/1/19 through 3/31/20	17	14	0.30	0.09
4/1/20 through 9/30/20*	16	13	0.41	-0.34
4/1/20 through 9/30/20*	14	11	0.31	0.01
10/1/20 through 3/31/21*	21	18	0.47	-0.81
10/1/20 through 3/31/21*	19	16	0.37	-0.43
4/1/21 through 9/30/21	17	14	0.39	-0.28
10/1/21 through 3/31/22	20	17	0.51	0.13

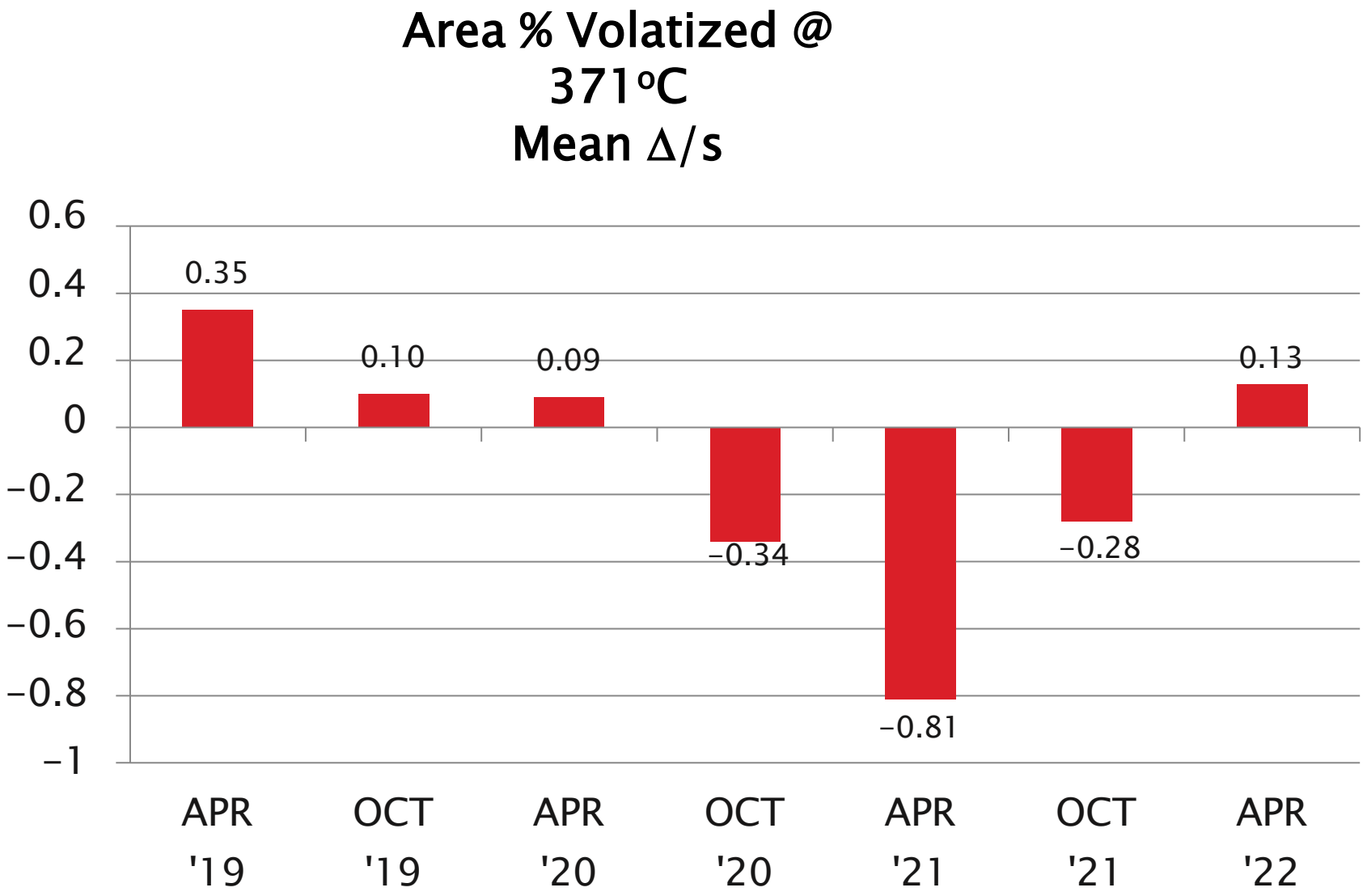
*Period statistics with two mild results from rigs D5/D6 included and excluded (operational problem suspected but lab never confirmed)

D6417 Precision Estimates

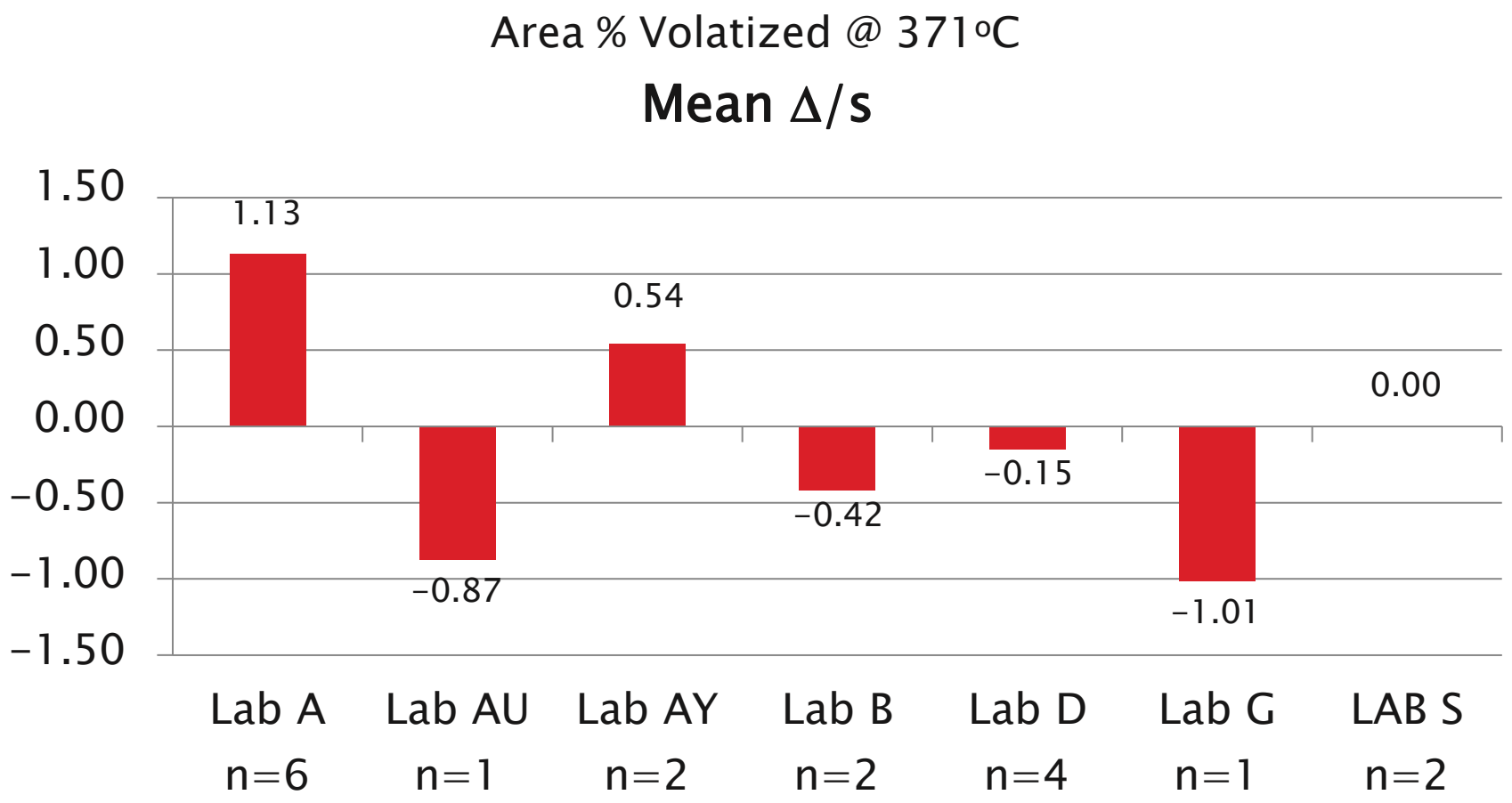


Note: steady increase since OCT'19

D6417 Performance



D6417 Performance by Lab



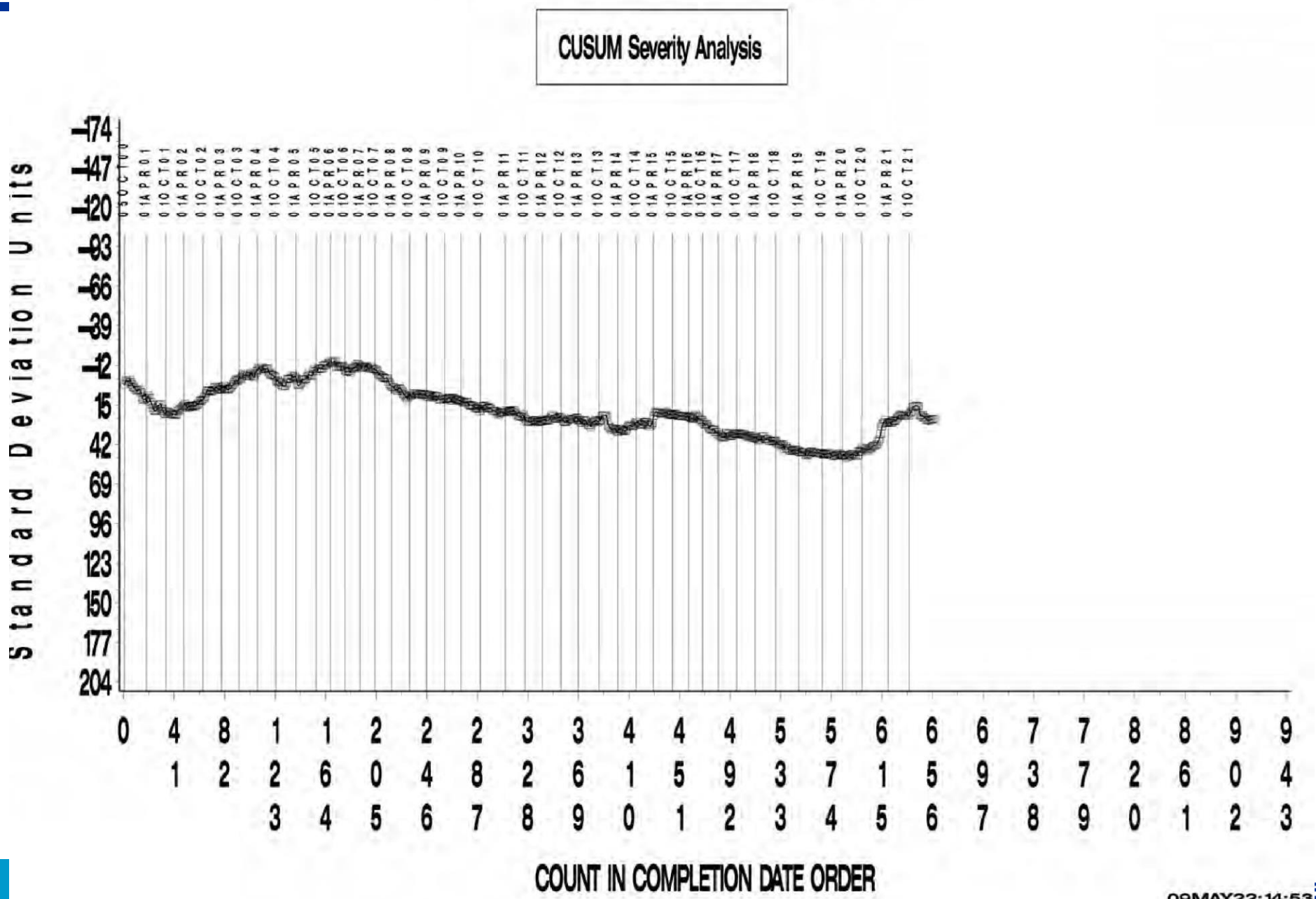
Relative Last Period Notes: Labs B, D, G and S closer to target this period (same bias direction); Labs A, AU, significantly further off target in same bias direction this period; lab AY further off target this period (severe); no changes from mild/severe performance

D6417: Estimation of Engine Oil Volatility by Capillary GC

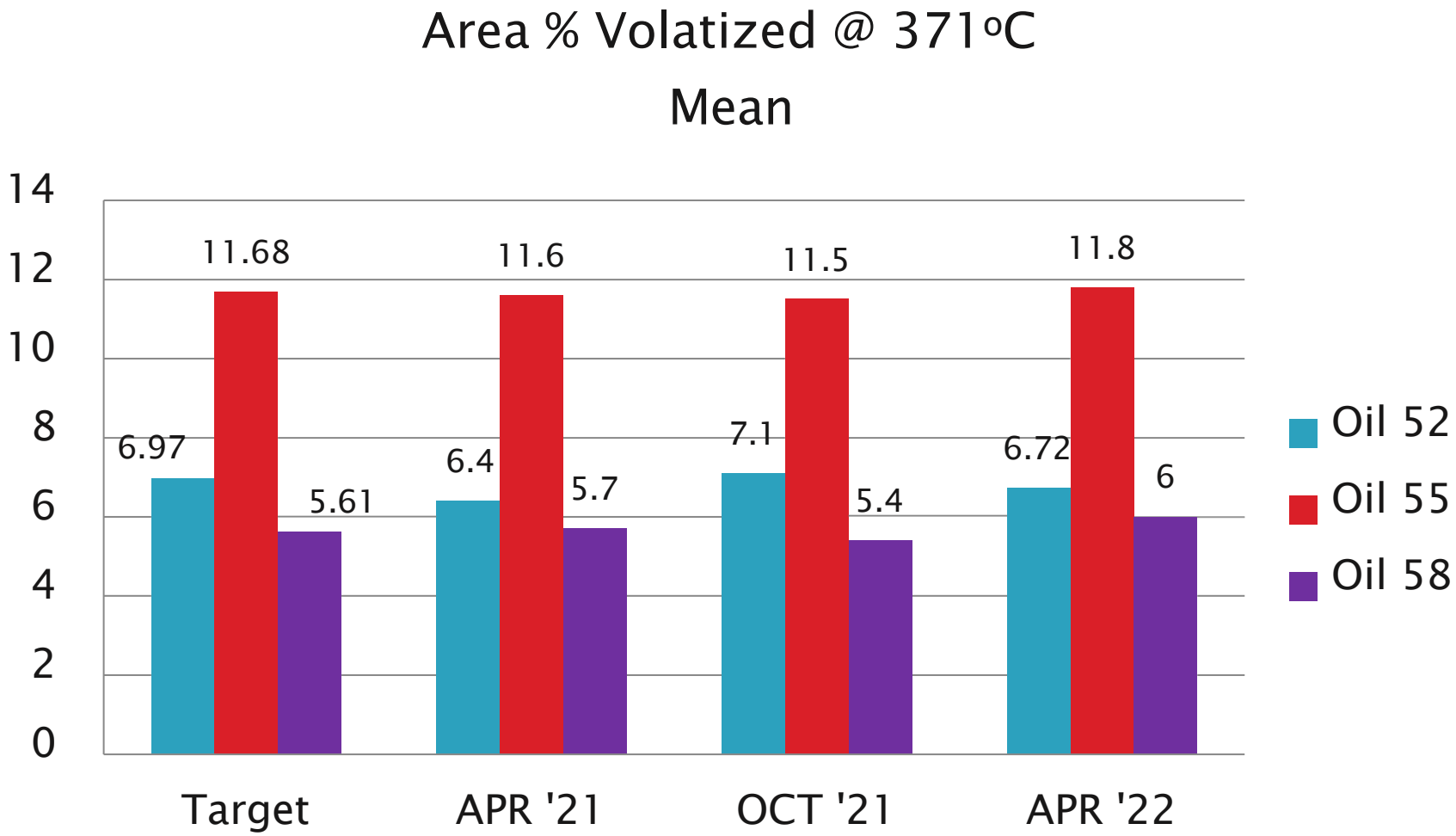
- Precision (Pooled s) has degraded this period relative to previous period and historical rates.
- Performance (Mean Δ/s) is 0.13 s, close to target.
- CUSUM severity plot shows a mild trend over last three periods, with this period closer to target.

D6417 VOLATILITY BY GC INDUSTRY OPERATIONALLY VALID DATA

SAMPLE AREA % VOLATIZED

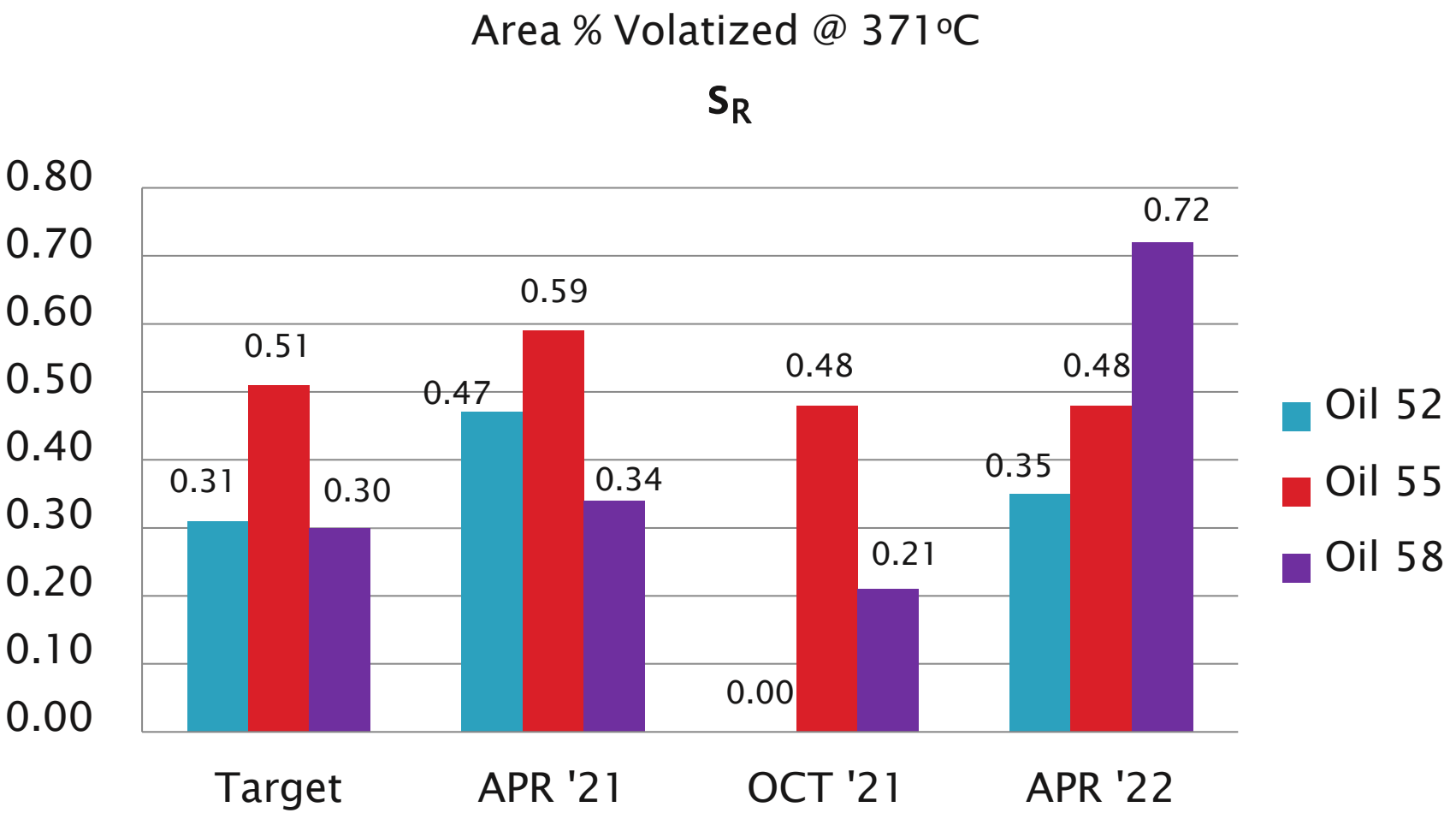


D6417 Mean Values by Oil



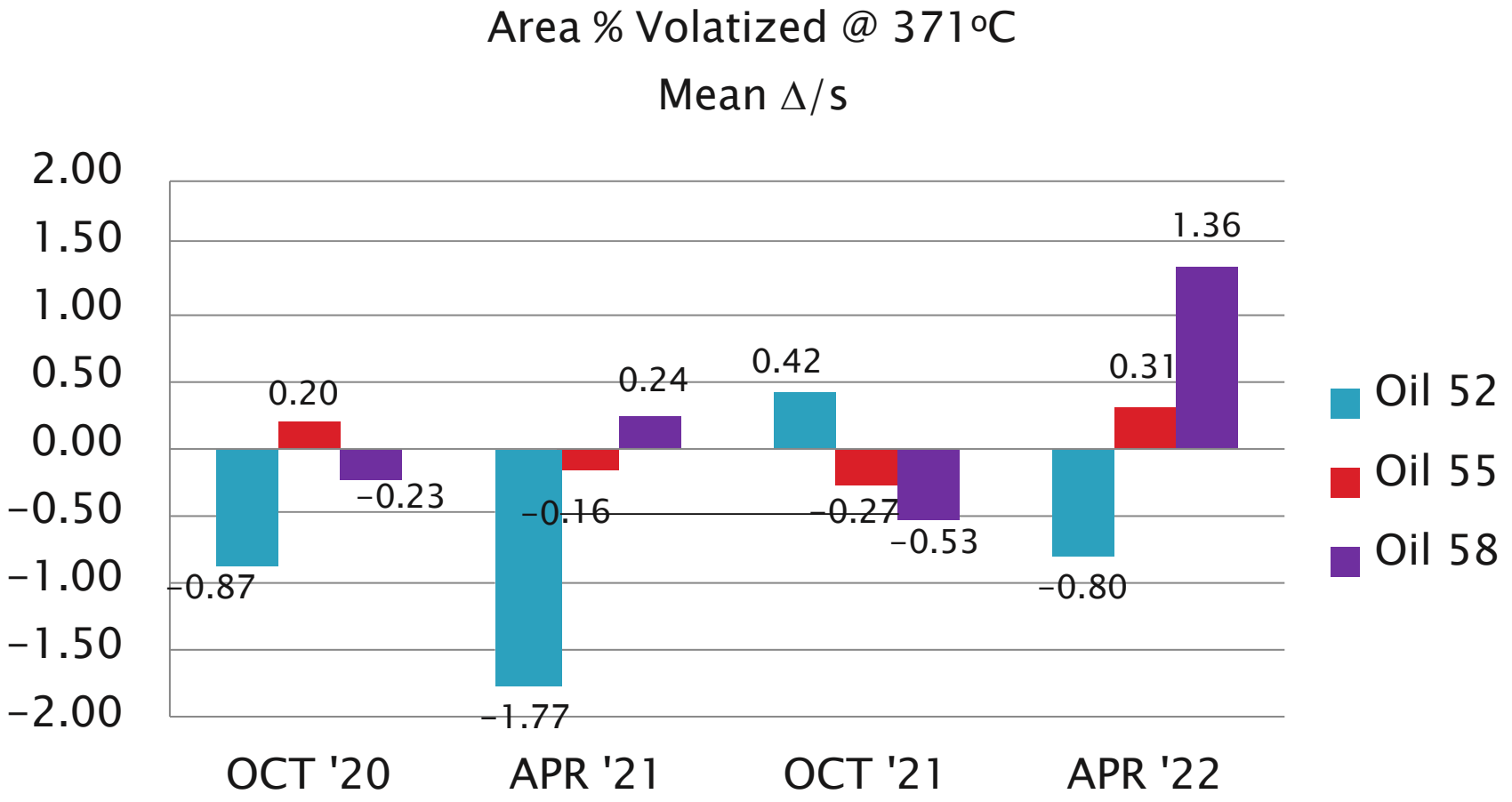
Notes: Oil 52 slightly below target/last period; Oils 55 and 58 sightly above target/last period

D6417 Precision by Oil



Notes: Oil 52 slightly above target; Oil 55 comparable precision than target/last; Oil 58 shows significant precision degradation this period

D6417 Performance by Oil



Notes: Oil 52 returned to mild bias; Oil 55 nice balance about axis with similar magnitude; Oil 58 previously showed nice balance but much greater magnitude of severe performance this period

B0.07 Bench Testing Executive Summary – D5800

- D5800 (Volatility by Noack)

- 9 Labs, 21 stands calibrated (-2 stands from last period)
- Precision (Pooled s) is greater than target and last period
- Performance (Mean Δ/s) is 0.24s severe, much less severe than prior periods
  - Procedure B rigs 0.50s severe (improved); Procedure D rigs -0.15s mild (flat)
- CUSUM plot shows a continuing overall severe trend with some leveling off this period
  - Procedure B rigs CUSUM plot conforms to overall D5800 plot with overall severe trend and some leveling off this period; Procedure D rigs show slightly mild trend continuation but leveling off this quarter

D5800: Evaporation Loss of Lubricating Oil by Noack Method

Test Status	Validity Code	No. Tests
Acceptable Calibration Test	AC	134
Failed Calibration Test	OC	5
Operationally Invalidated by Lab	LC, XC	1
Operationally Invalidated After Initially Reported as Valid	RC	1
Rig Shakedown Runs	AN, ON	1
Total		**142**

Number of Labs Reporting Data: 9
Fail Rate of Operationally Valid Tests: 4%

Last Period Notes: 129 AC results; 7 OC results; 5% fail rate; comparable to last period; 10 labs reporting data

D5800: Evaporation Loss of Lubricating Oil by Noack Method

Statistically Unacceptable Tests (OC)	No. Of Tests
Ei Level 3 Alarm Mild	1
Ei Level 3 Alarm Severe	2
Zi Level 2 Severity Alarm Severe (same lab/instrument)	2

- The 5 OC tests were on four different rigs at three labs.
  - Two Zi L2 alarms (both severe) on rig A8
  - Two rigs (rig A17 and D6) triggered both Ei Level 3 alarm in the severe direction
  - Rig G5 sounded an Ei Level 3 alarm in the mild direction.
- No operationally valid tests exceed ±3s this period.
- Two operationally invalid calibration runs were reported this period:
  - One test invalidated by TMC due to no QC result performed on the day of calibration (RC)
  - One test where the test sample was not removed from the oven within specified time (XC)
- No D5800 technical memos were issued by the TMC this period.

D5800: Evaporation Loss of Lubricating Oil by Noack Method

Period Precision and Severity Estimates

Sample Evaporation Loss, mass %	n	df	Pooled s	Mean Δ/s
Targets Effective 02/07/20[1]	78	75	0.0465	-----
10/1/18 through 3/31/19	151	148	0.81	0.51
4/1/19 through 9/30/19	164	161	0.81	0.65
10/1/19 through 3/31/20[1]	146	143	0.0503	0.54
4/1/20 through 9/30/20[1]	136	133	0.0659	0.35
10/1/20 through 3/31/21[1]	140	137	0.0495	0.53
4/1/21 through 9/30/21[1]	136	133	0.0510	0.45
10/1/21 through 3/31/22	139	136	0.0463	0.24

[1]Began monitoring natural log transformed test results on 20200207 making logarithmic scale changes for target and period precision estimates starting April 2020 report period.

D5800: Evaporation Loss of Lubricating Oil by Noack Method

Performance Comparison by Procedure & Model

Sample Evaporation Loss, Mass %

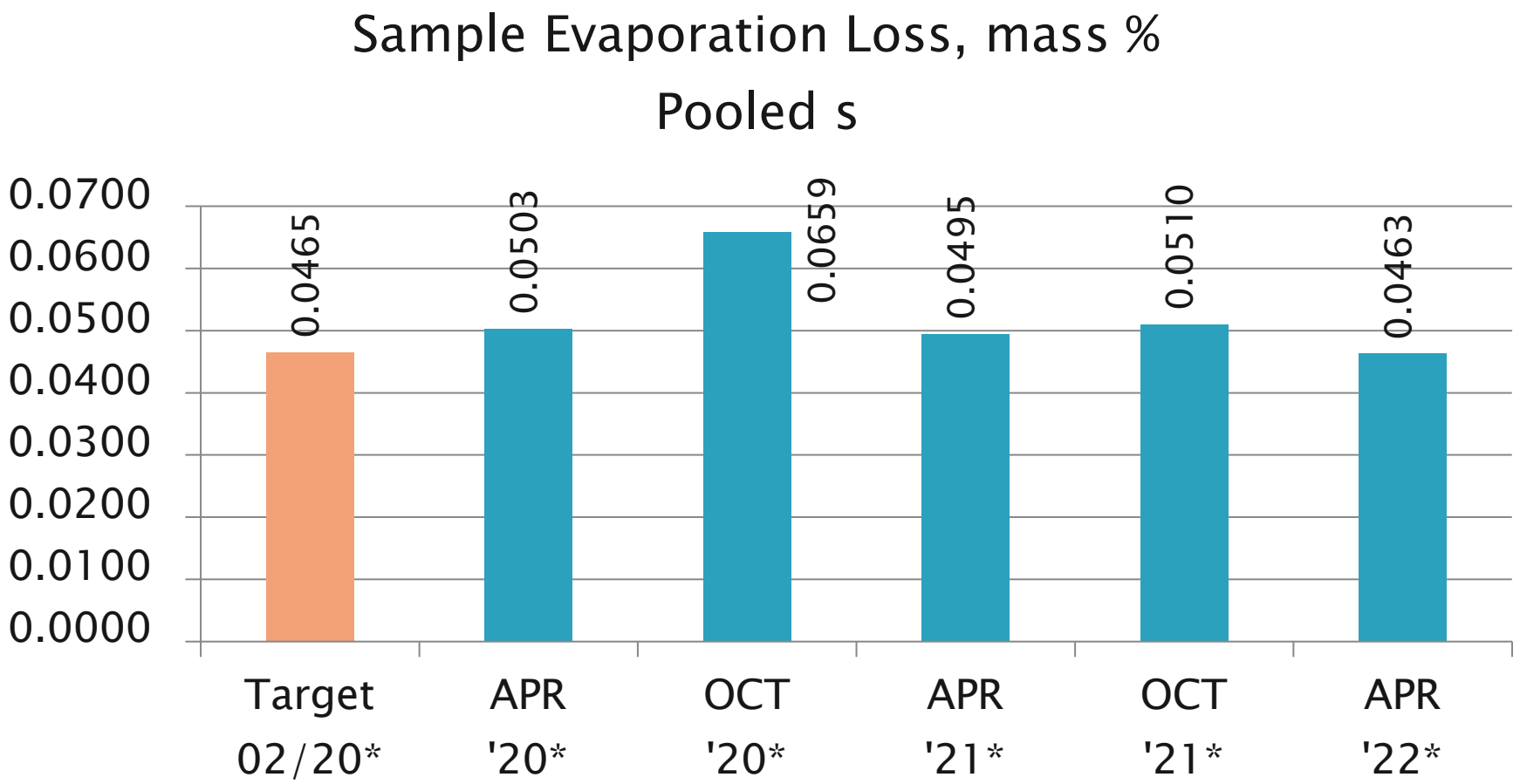
Procedure	n	df	Pooled s	Mean Δ/s
Procedure B	85	82	0.0403	0.50
Procedure C	No Procedure C tests reported this period.			
Procedure D	54	51	0.0474	-0.15

Model	n	df	Pooled s	Mean Δ/s
NCK2	5	2	0.0115	-0.22
NCK25G	79	77	0.0404	0.54
NS2	54	51	0.0474	-0.15

1 Procedure B NCK2 Rig
17 Procedure B NCK25G Rigs
9 Procedure D NS2 Rigs

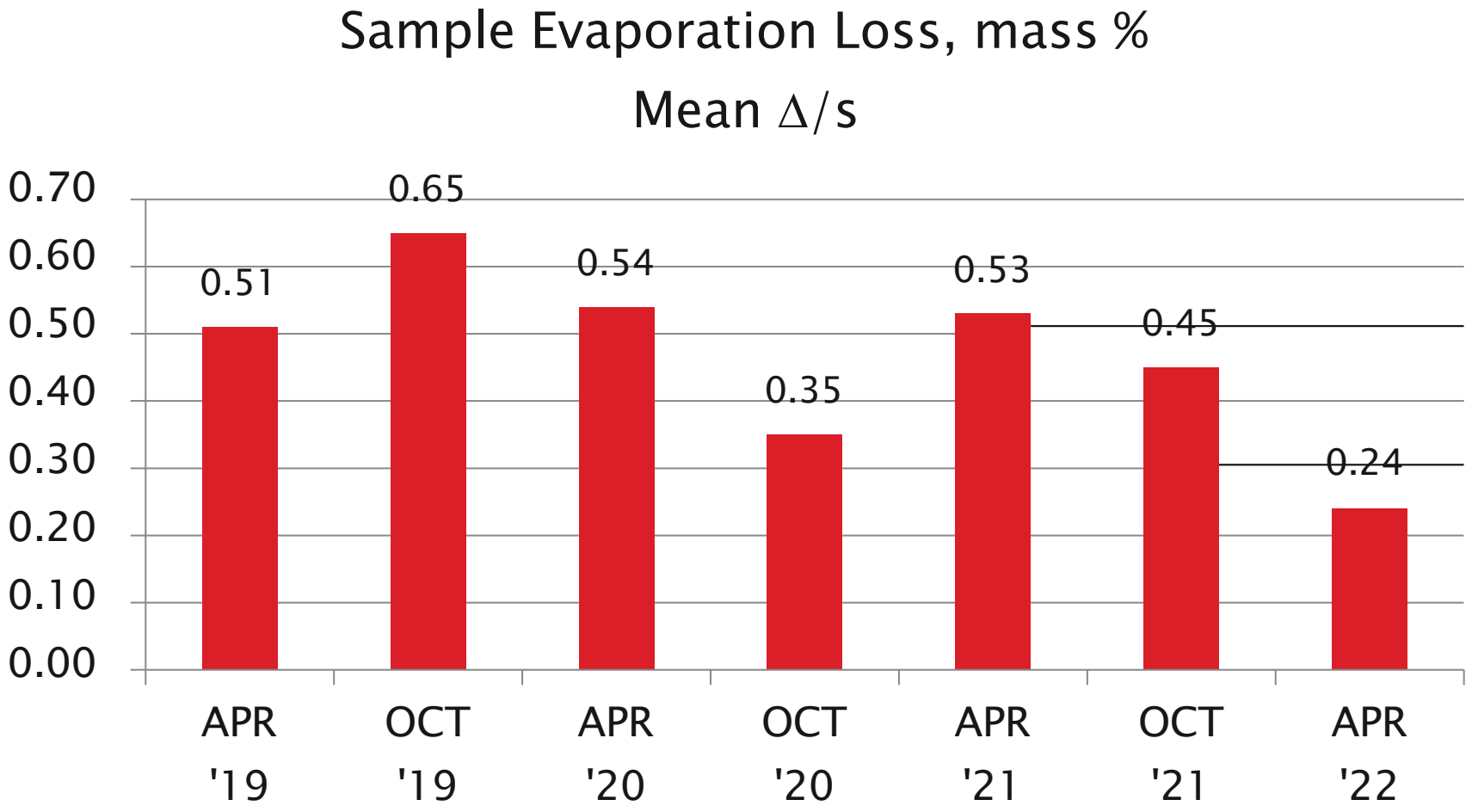
Last Period Notes: ProcB better precision (better than target) and performance than last period; ProcD worse precision than last period (comparable to target), and comparable performance;
Population of procedure/rig counts: NC NCK2; +1 NCK25G; +2 NS2

D5800 Precision Estimates

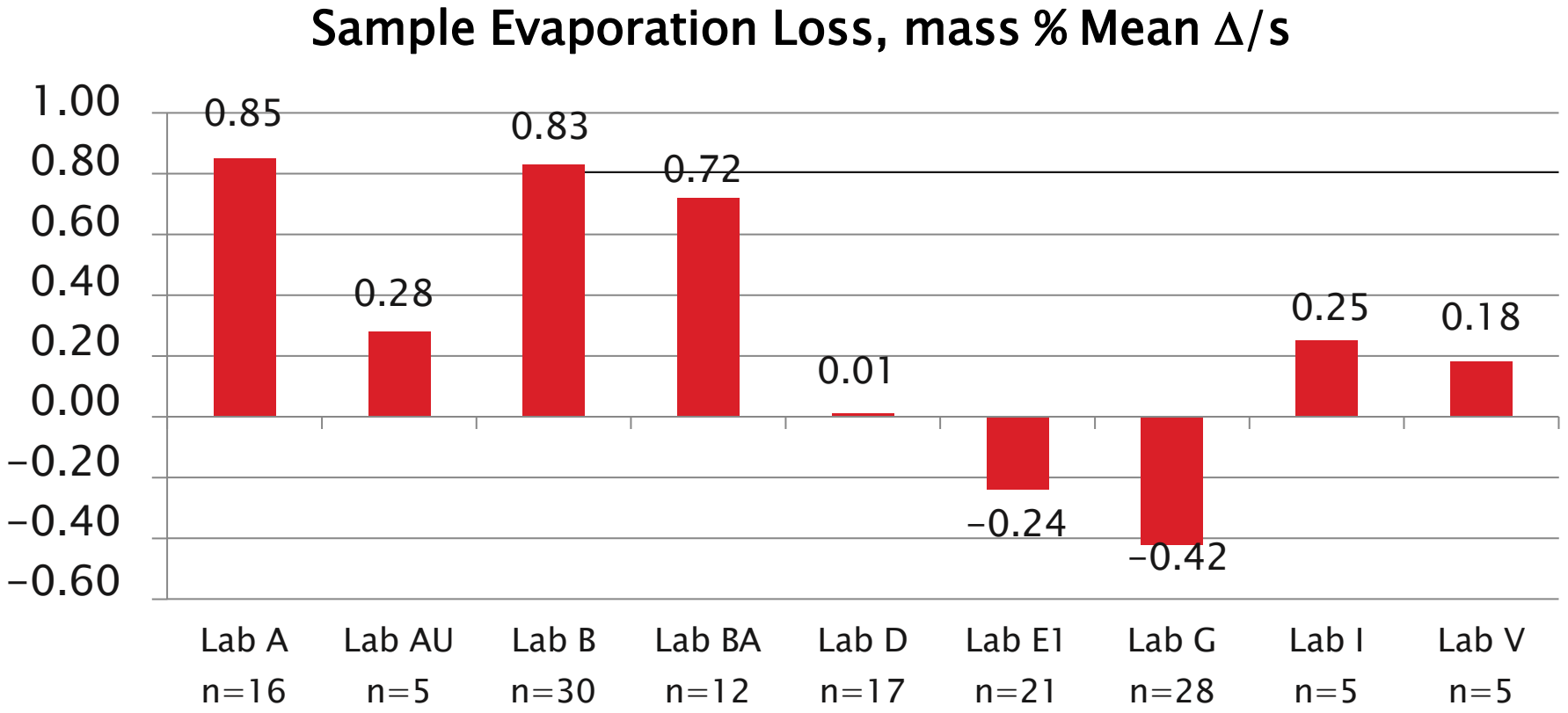


*Began monitoring natural log transformed test results on 20200207 making logarithmic scale changes for target and period precision estimates starting April 2020 report period.

D5800 Severity Estimates



D5800 Lab Severity Estimates



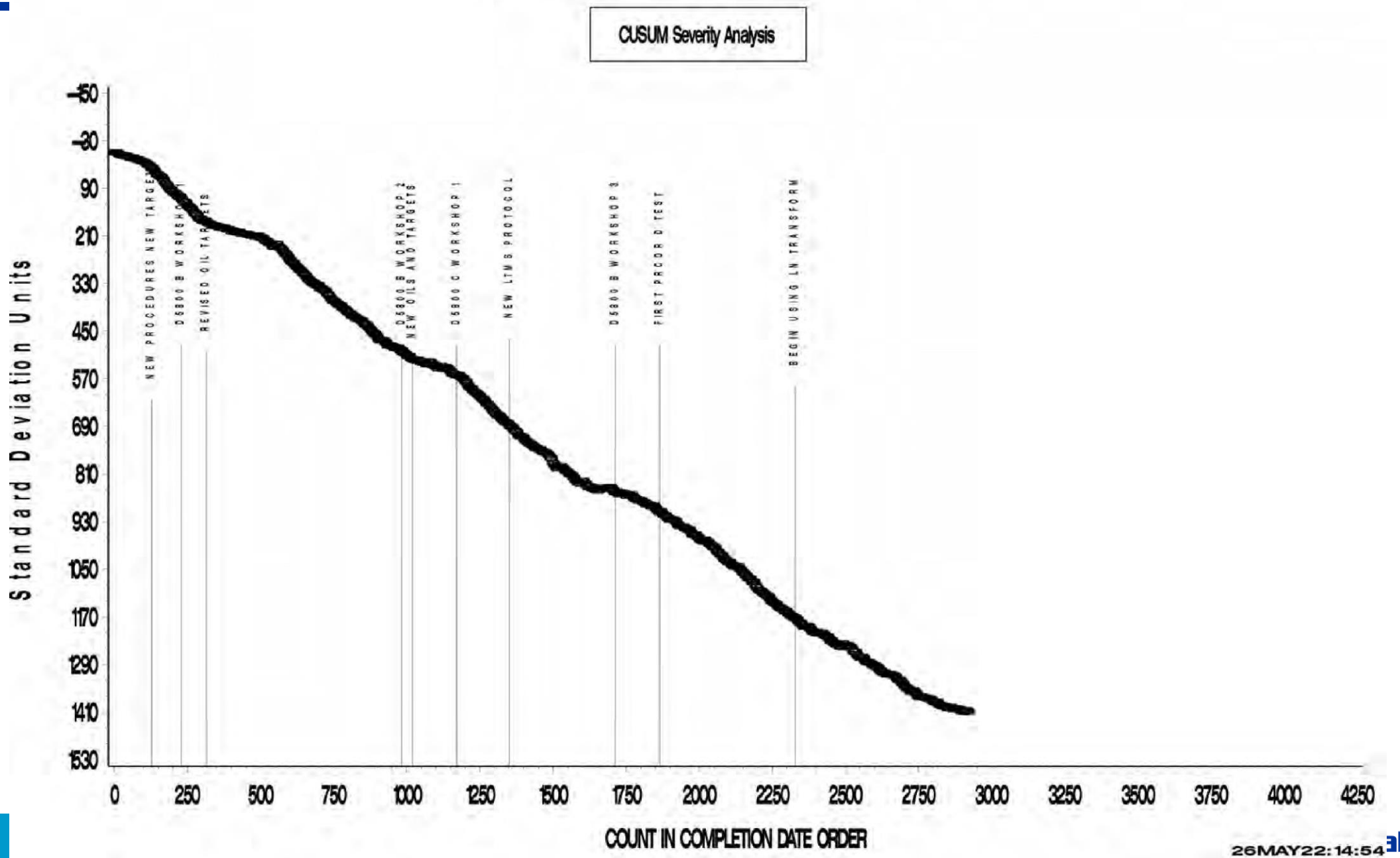
Last Period Notes: Lab AY (historically severe) not included in this period;
Labs A and B* more severe than last period(s*); Lab G was severe (1.09) last period but now mild;
Labs BA, E1, and I were closer to target than last period;
Labs AU, BA, and D showed comparable performance;
Lab V continuing to show performance balance about axis for multiple periods

D5800 Severity Estimates

- Precision (Pooled s) is comparable to target precision (in natural log transformed units).
  - Directionally better than prior period
  - Little difference in precision between Procedure B rigs and Procedure D rigs.
- Performance (Mean Δ/s) is 0.24 s severe.
  - Procedure B rigs are trending 0.72 s severe while Procedure D rigs are trending −0.14 s mild.
- CUSUM severity plots shows a continuing overall severe trend with reference testing, completely attributable (this period) to procedure B tests. Procedure D tests have been trending mild for the past few periods. The industry EWMA Control chart is currently in control
  - *Long term severity trend (mild) as evidenced in the Cusum plots may indicate that targets may not be correct*

D5800 VOLATILITY BY NOACK INDUSTRY OPERATIONALLY VALID DATA

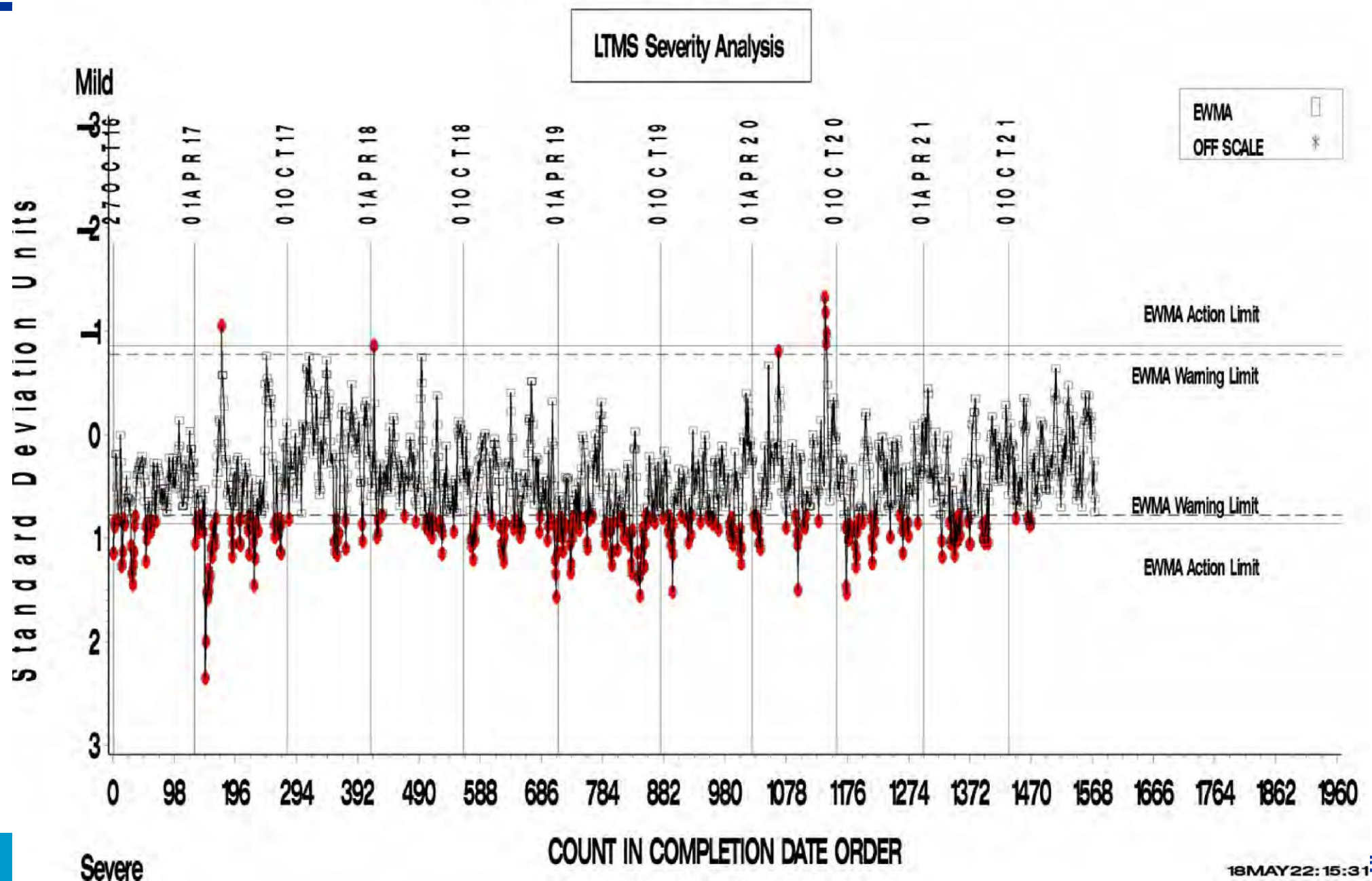
EVAPORATION LOSS, MASS%



D5800 VOLATILITY BY NOACK INDUSTRY OPERATIONALLY VALID DATA

All tests Completed after 10/19/2016

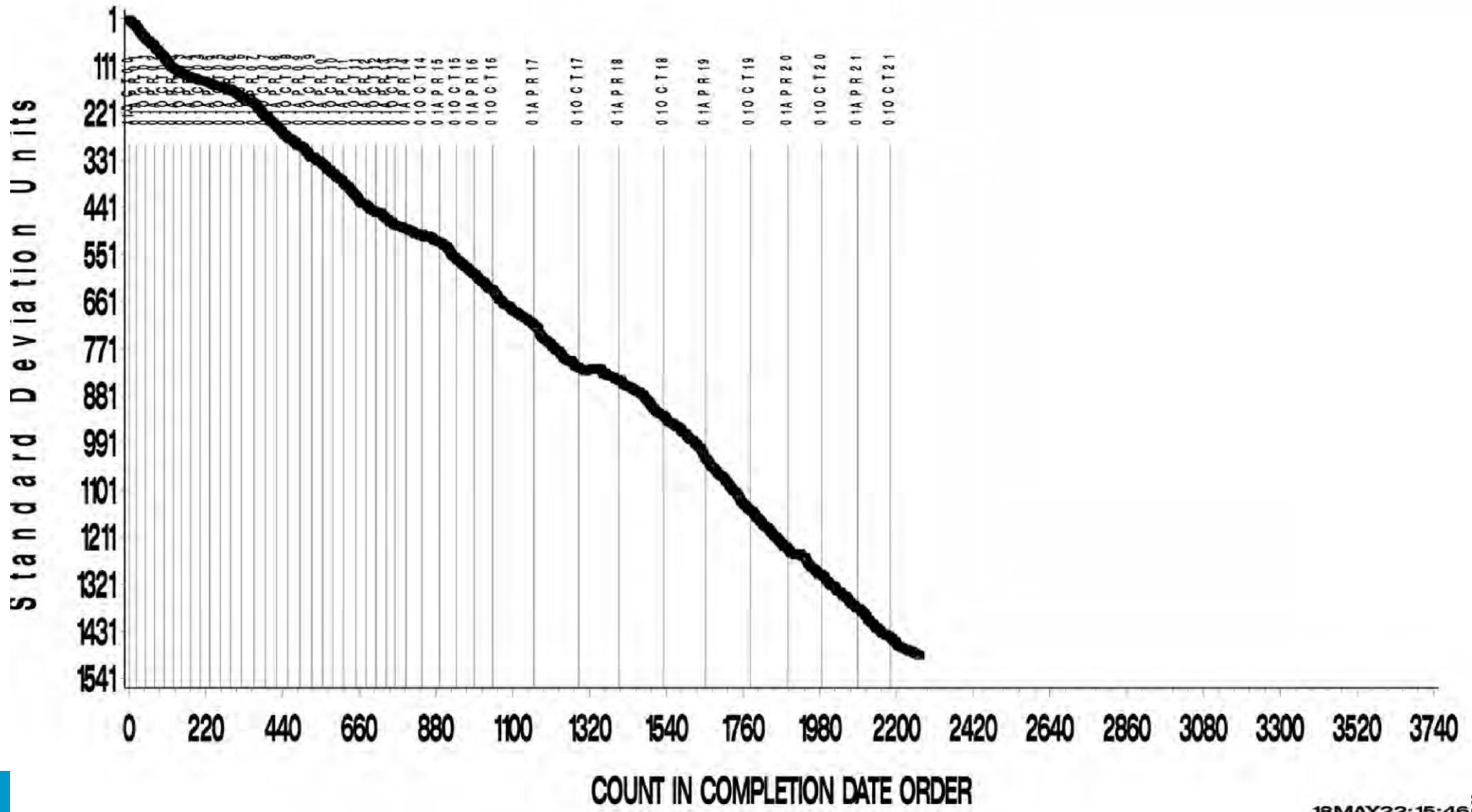
EVAPORATION LOSS, MASS%



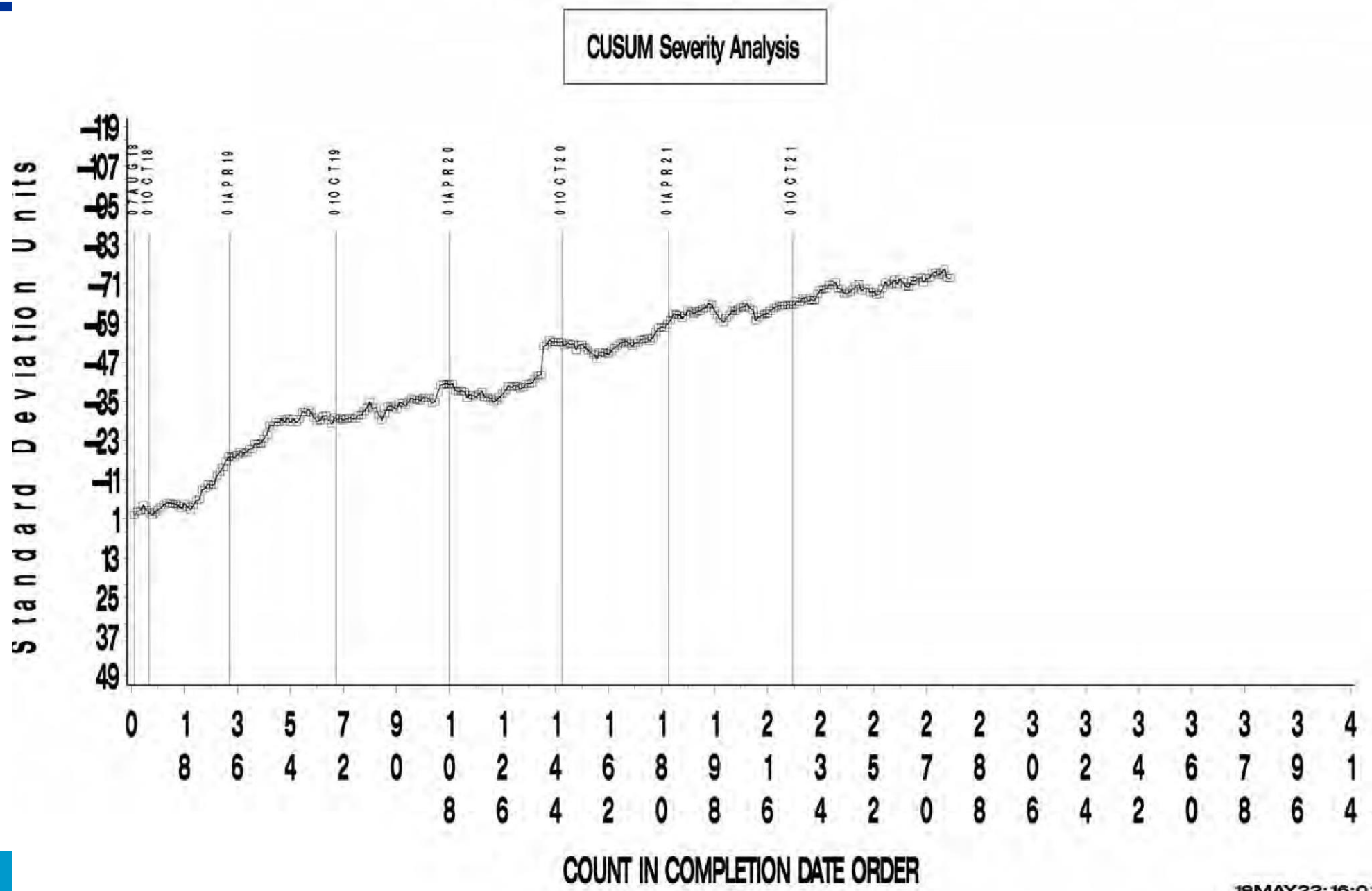
18MAY22:15:31

D5800 VOLATILITY BY NOACK INDUSTRY OPERATIONALLY VALID DATA
Procedure B
EVAPORATION LOSS, MASS%

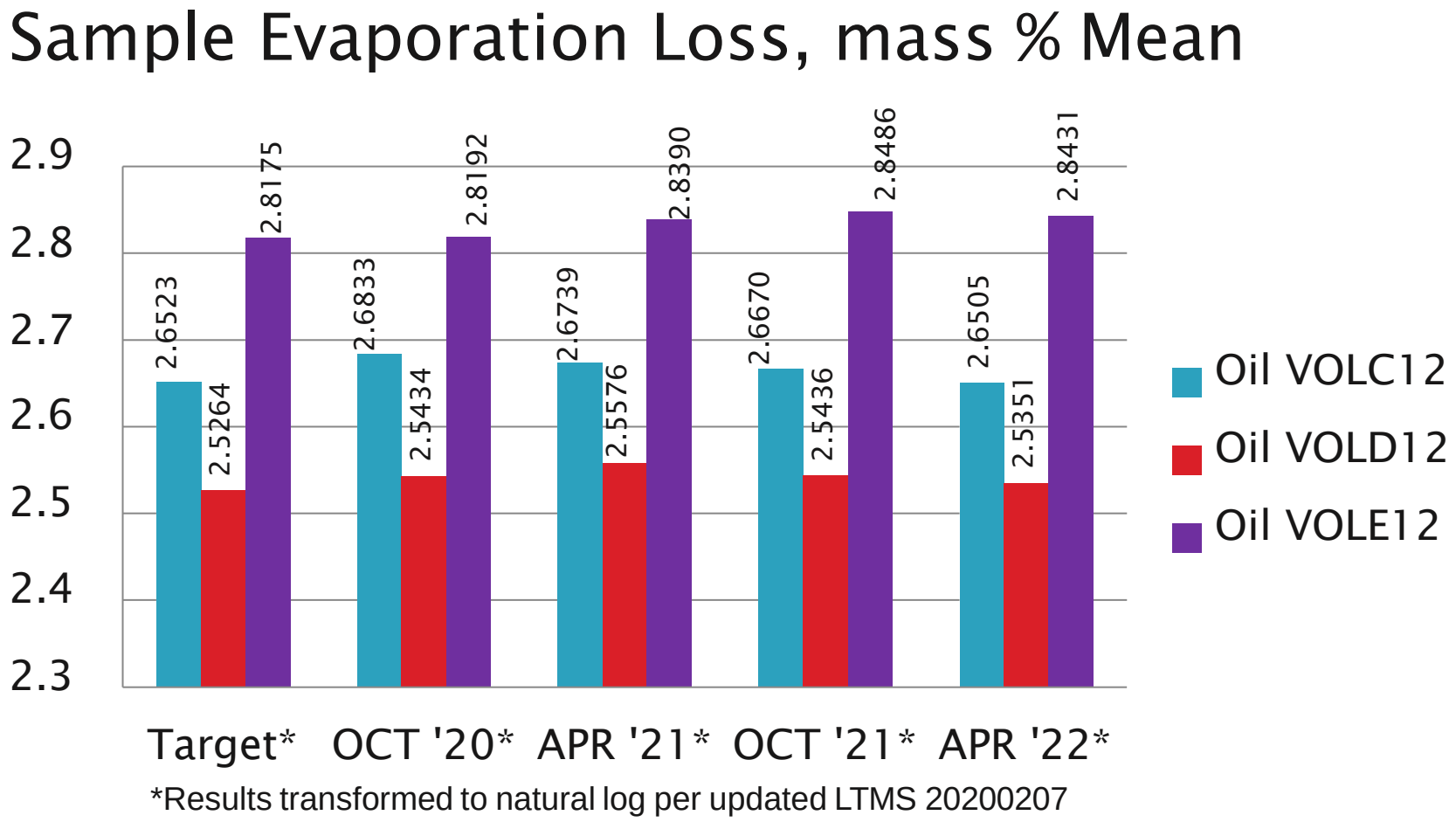
CUSUM Severity Analysis



D5800 VOLATILITY BY NOACK INDUSTRY OPERATIONALLY VALID DATA
Procedure D
EVAPORATION LOSS, MASS%

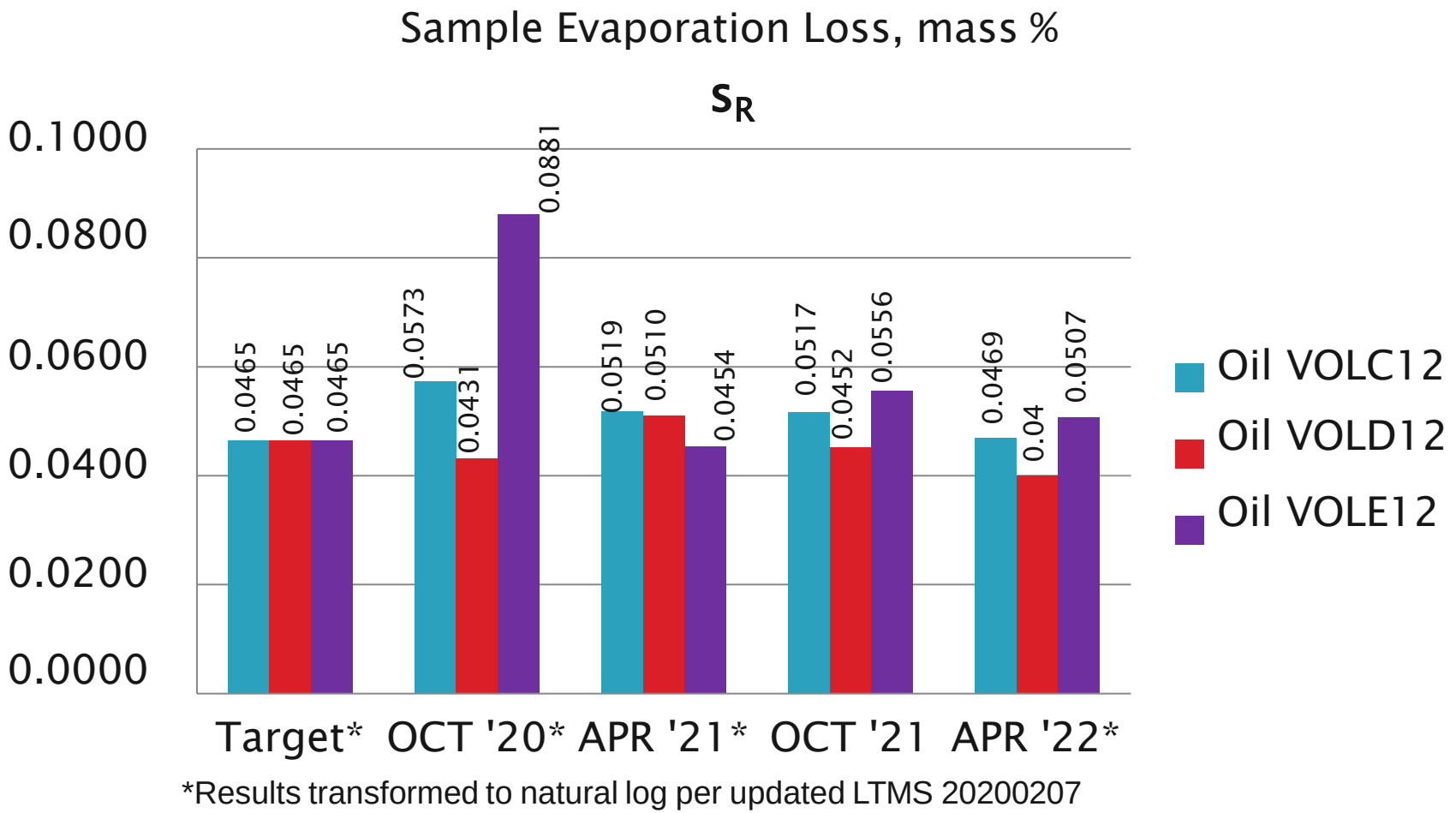


D5800 Mean Value by Oil



Notes: VOLC12 comparable to target and last period
VOLD12 comparable to target, less than last period
VOLE12 greater than target, comparable to last period

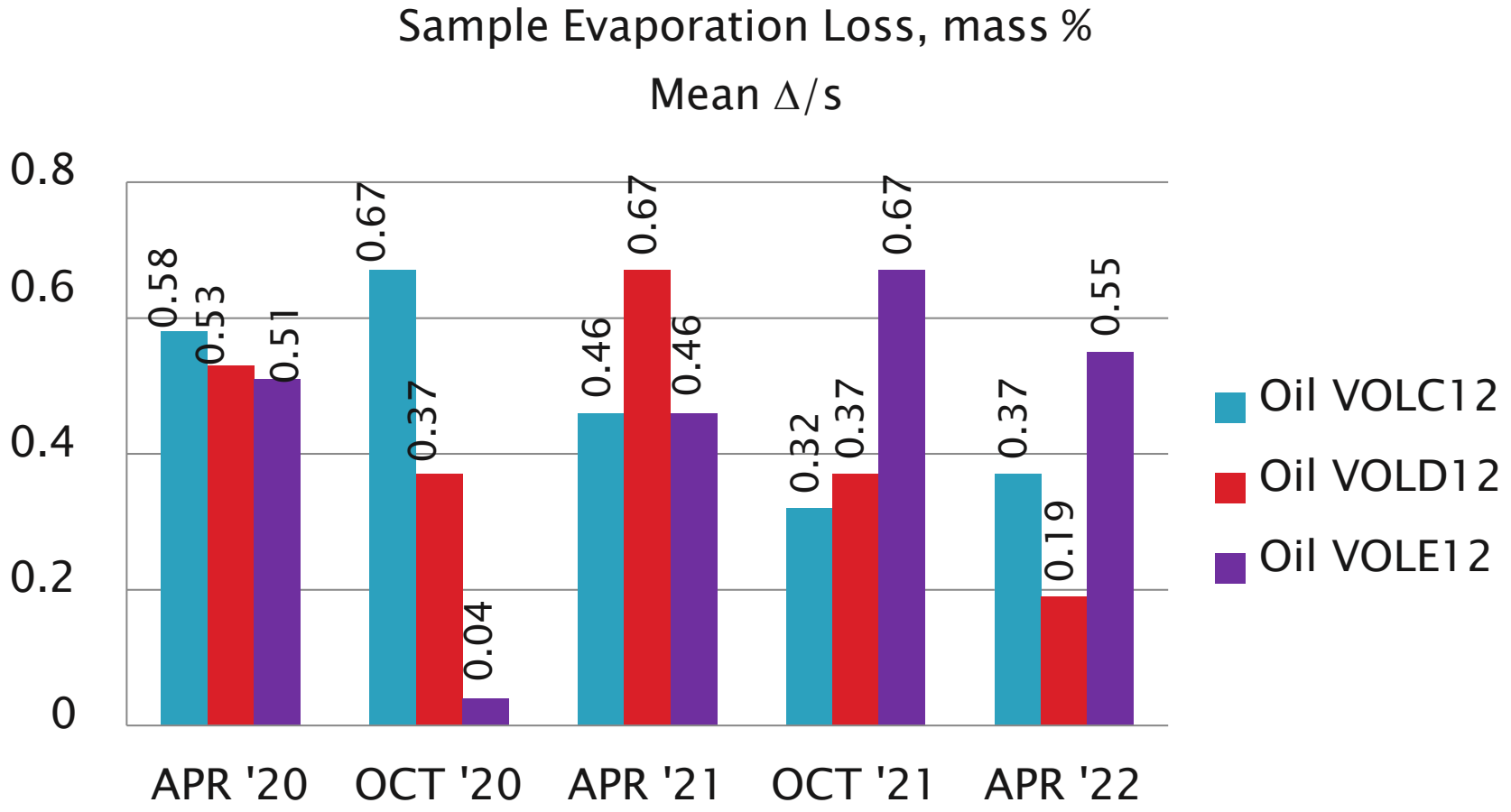
D5800 Precision by Oil



*Results transformed to natural log per updated LTMS 20200207

Notes: VOLC12 comparable to target, better than last period
VOLD12 much better than target and last period
VOLE12 worse than target but better than last period

D5800 Performance by Oil



Notes: all fluids consistently severe;
VOLC12 comparable to last period but overall decreasing
VOLD12 significantly improved performance from last period
VOLE12 variable performance by quarter

Reference Oil Inventory

D5800

Oil	Year Rec'd By TMC[A]	Tests	TMC Inventory, gallons	Gallons Shipped last 12 months
VOLC12	2013	D5800	26.8	2.5
VOLD12	2013	D5800	25.2	2.6
VOLE12	2013	D5800	22.8	2.6
VOLD18	2018	D5800QC	832	82

[A] The integrity of TMC reference oils is confirmed annually by analytical QC testing of chemical and physical properties.

PDSC Analyses of Reference Fluids:

Induction or 'Break' times were not significantly different with respect to the precision statements of the standard

- Throughout this study, the maximum differences in induction times were ***positive*** values which would indicate no change in oxidative stability
- When comparing fluids from start of study (2014) to the last dataset (Dec2021), the ***highest observed difference was -2 minutes*** (VOLD12, VOLE12) in induction time which is within the calculated precision bands of the D6186 standard for the given values
- When plotted, the ***highest observed slope*** of the linear trendlines was +0.0833 (VOLC12 and VOLE12); VOLD12 had a negative slope of -0.05

Thank you to SwRI for donating this data and thank you to Matt Schlaff for the original request!

Reference Oil Inventory

D6417

Oil	Year Rec'd By TMC[A]	Tests	TMC Inventory, gallons	Gallons Shipped last 12 months
52	1995	D6417	59.4	0.01
55	1995	D6417	65.9	0.10
58	1998	D6417, D6417QC, GI	111.5	0.84

[A] The integrity of TMC reference oils is confirmed annually by analytical QC testing of chemical and physical properties.

CBT/HTCBT Surveillance Panel Report

June 2022

Seattle, WA

D02.B0.07

Mike Lopez presenting

CBT/ HTCBT Surveillance Panel Membership:

- Infineum
- Chevron
- Savant
- OH Tech
- TMC
- ISP Institute
- SwRI
- Afton Chemical
- Lubrizol
- Intertek
- TEI

CBT(D5968)

There was minimal CBT testing during this period. All testing is based on April 2020

- Currently using Batch N coupons which are all at the labs. Batch O still needs to be referenced.
- Test period April 1, 2021 – October 30, 2021
- 2 labs reporting data.
- Copper concentration trending mild, No Change
- Lead concentration trending mild, No Change
- No precision estimates due to the low activity.
- There no information letters have been sent out.

Test Status	Validity Code	Number of Tests
Acceptable Calibration Test	AC	1
Failed Shakedown Run	MN	2
Total		3

Oil	TMC Inventory (gallons)	Quantity Shipped in last 6 months (gallons)	Lab Inventory (samples)	Estimated Life
43	32.1	0	35	5+ years

HTCBT(D6594)

Current Status

- Currently on Batch O
- Test period October 1, 2021 – March 31, 2022
- 9 labs reporting data.
- Copper concentration trending severe
- Lead concentration trending severe
- Copper pooled s is at 0.31 for the period which is slightly better than the previous period.
- Lead pooled s is at 8.20 for the period which is worse than the previous period.
- There no information letters have been sent out.
- Need to meet to introduce the 44-5 which 44-4 is in short supply
- I was not able to coordinate with TMC to add HTCBT to the LTMS,
  but have it as my action item this Mid July.

Test Status	Validity Code	Number of Tests
Acceptable Calibration Test	AC	291
Failed Calibration Test	OC	14
Operationally Invalid, by lab	LC	1
Aborted Calibration Test	XC	4
Acceptable Shakedown Run	NN	3
Unacceptable Shakedown Run	MN	1
Total		314

Failed Parameter	Number of Tests
Severe Lead Concentration	7
Mild Copper Concentration	3
Severe Copper & Lead Concentration	4
Total	14

Failed Parameter	LTMS Lab							#
	A	E	G	I	V	BB	BC	
Severe Lead Concentration	1	0	4	2	0	0	0	7
Mild Copper Concentration	0	0	2	1	0	0	0	3
Severe Copper & Lead Concentration	0	0	1	0	0	1	2	4
Total	1	0	7	3	0	1	2	14

Lost Test due to invalid or aborted Calibration test

Status	Cause	#
Invalid	Temperature Controller Malfunction	2
Invalid	Airflow Control Problems	0
Invalid	Improper Coupon	0
Invalid	Power Outage	3
Invalid	Sample Contamination	0
Total		5

Cause	LTMS Lab						#
	A	B	G	I	P	V	
Temperature Controller Malfunction	0	0	0	1	0	1	2
Power Outage	0	0	2	0	1	0	3
Total	0	0	2	1	1	1	5

Oil	TMC Inventory (gallons)	Quantity Shipped in last 6 months (gallons)	Lab Inventory (samples)	Estimated Life
44-4	7.2	4.2	95	<1 year
1005-5	8.4 (remaining in reserved drum - Additional oil available at the TMC)	7.0	187	1.5 years

Statistical Review

- The Surveillance Panel requested review of acceptance bands for reference oil 1005-5
- The Industry Statistician Team completed a detailed review of the HTCBT data
- An adjustment to the acceptance bands was not recommended
- Suggestions were made to review and analyze lab and instrument variability

D6082 HIGH TEMPERATURE FOAM SURVEILLANCE PANEL REPORT

ASTM Subcommittee D02.B0.07

June 2022

Seattle WA

Matt Schlaff

OVERVIEW

Test Status	Validity Code	No. Tests
Acceptable Calibration Test	AC	13
Acceptable Discrimination Test	AS	6
Total		**9**

Number of Labs Reporting Data: 6

Fail Rate of Operationally Valid Calibration Tests: 0%

UNACCEPTABLE TESTS

Statistically Unacceptable Tests (OC, OS)	No. Of Tests
Foam Tendency Mild	0
Foam Tendency Severe	0

- All severe oil discrimination runs (on TMC oil 66) reported this period demonstrated acceptable discrimination.
  - Discrimination runs are not evaluated for overall period precision or severity due to poor test precision above 100 ml foam tendency.
- There were no operationally invalid or statistically unacceptable results this report period.

PRECISION AND SEVERITY

Period Precision and Severity Estimates Oil 1007

Foam Tendency, ml	n	df	Pooled s	Mean Δ/s
Targets updated 20201001[1]	18	17	9	-----
4/1/18 through 9/30/18	14	13	9	-0.07
10/1/18 through 3/31/19	14	13	12	-0.07
4/1/19 through 9/30/19	14	12	12	-0.18
10/1/19 through 3/31/20	15	13	10	-0.23
4/1/20 through 9/30/20	13	11	8	-0.85
10/1/20 through 3/31/21	12	10	7	-0.48
4/1/21 through 9/30/21	14	13	7	-0.48
10/1/21 through 3/31/22	13	12	7	-0.57

[1]Target precision updated to current reference oil FOAMB18

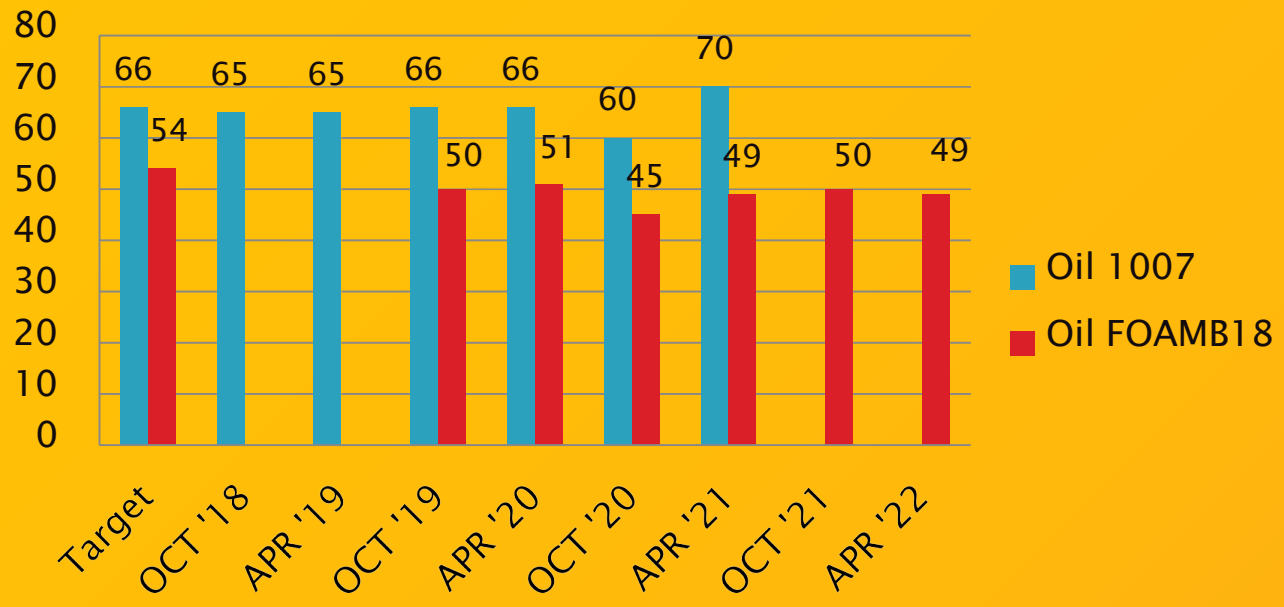
FOAM STABILITY @ 1 MIN: PRECISION AND SEVERITY

Period Precision and Severity Estimates Oil 1007

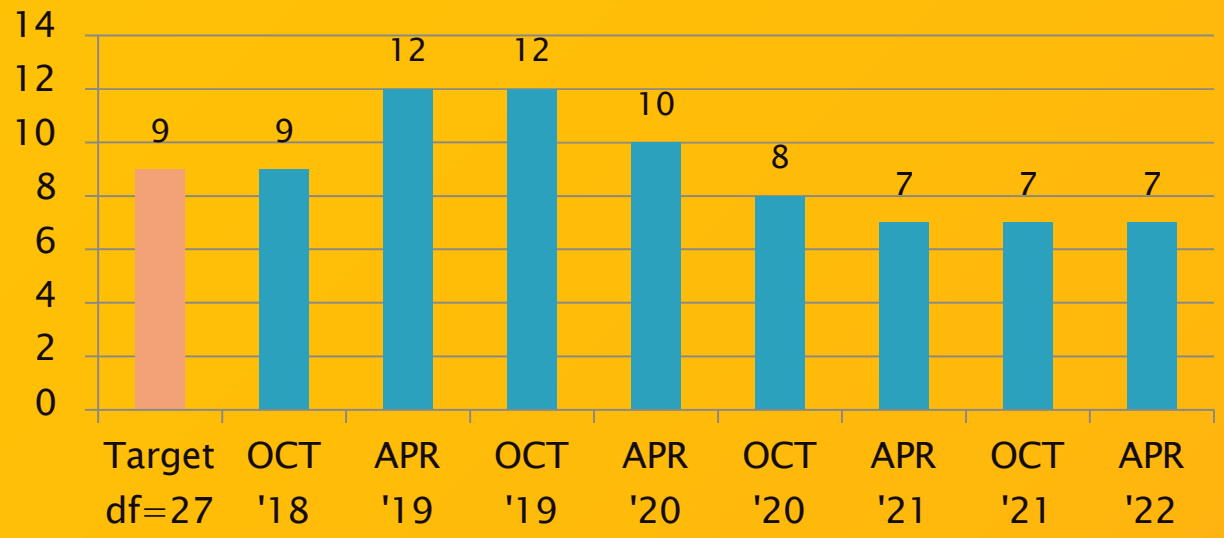
Foam Stability @ 1 min, ml	n	Mean	s
Current Targets	18	0.00	0.00
4/1/18 through 9/30/18	14	No non-zero occurrences	
10/1/18 through 3/31/19	14	No non-zero occurrences	
4/1/19 through 9/30/19	14	No non-zero occurrences	
10/1/19 through 3/31/20	15	No non-zero occurrences	
4/1/20 through 9/30/20	13	No non-zero occurrences	
10/1/20 through 3/31/21	12	No non-zero occurrences	
4/1/20 through 9/30/20	14	No non-zero occurrences	
10/1/21 through 3/31/22	13	No non-zero occurrences	

FOAM TENDENCY, ML MEAN

D6082 Performance by Oil

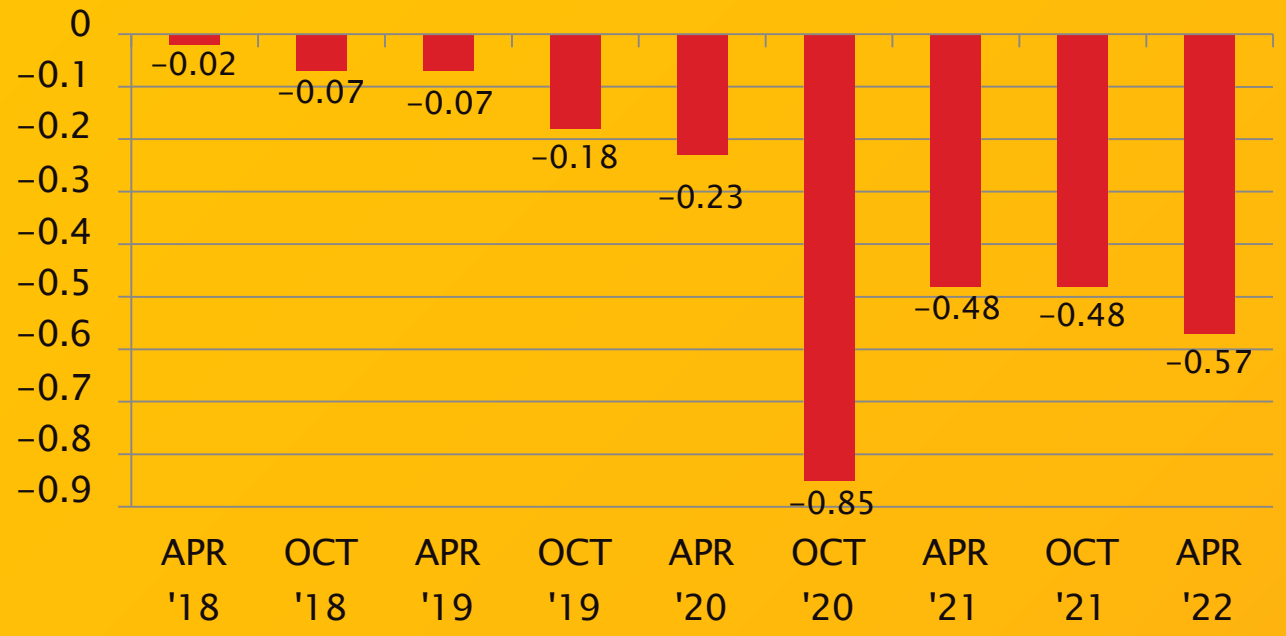


D6082: High Temperature Foam



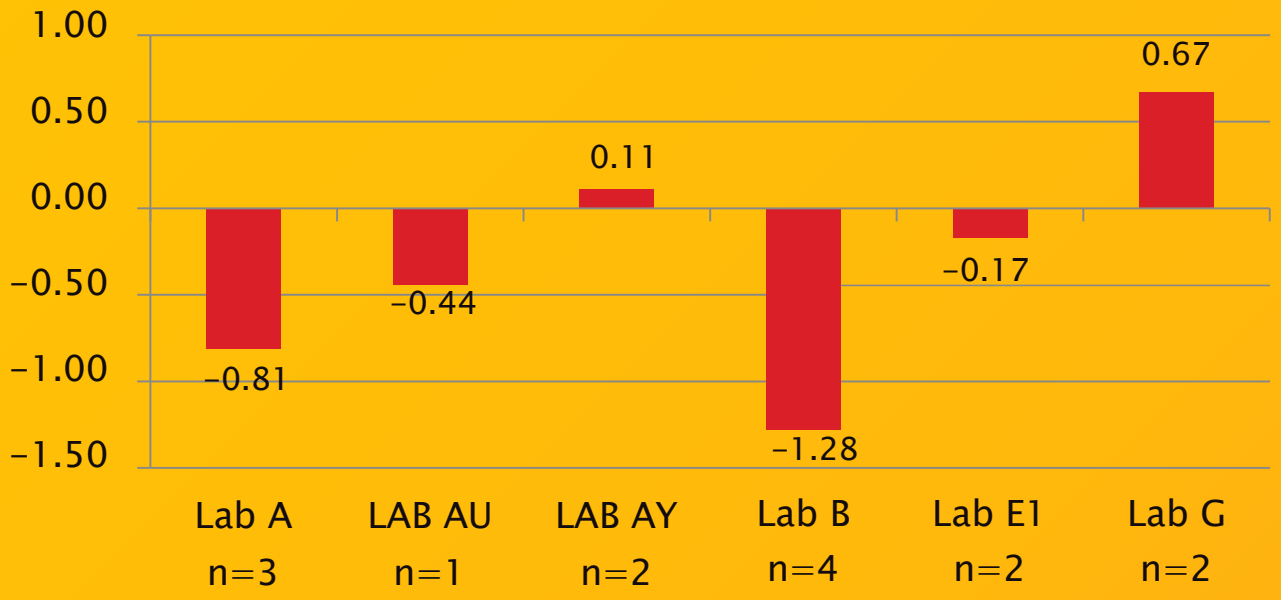
FOAM TENDENCY, ML MEAN Δ/S

D6082: High Temperature Foam

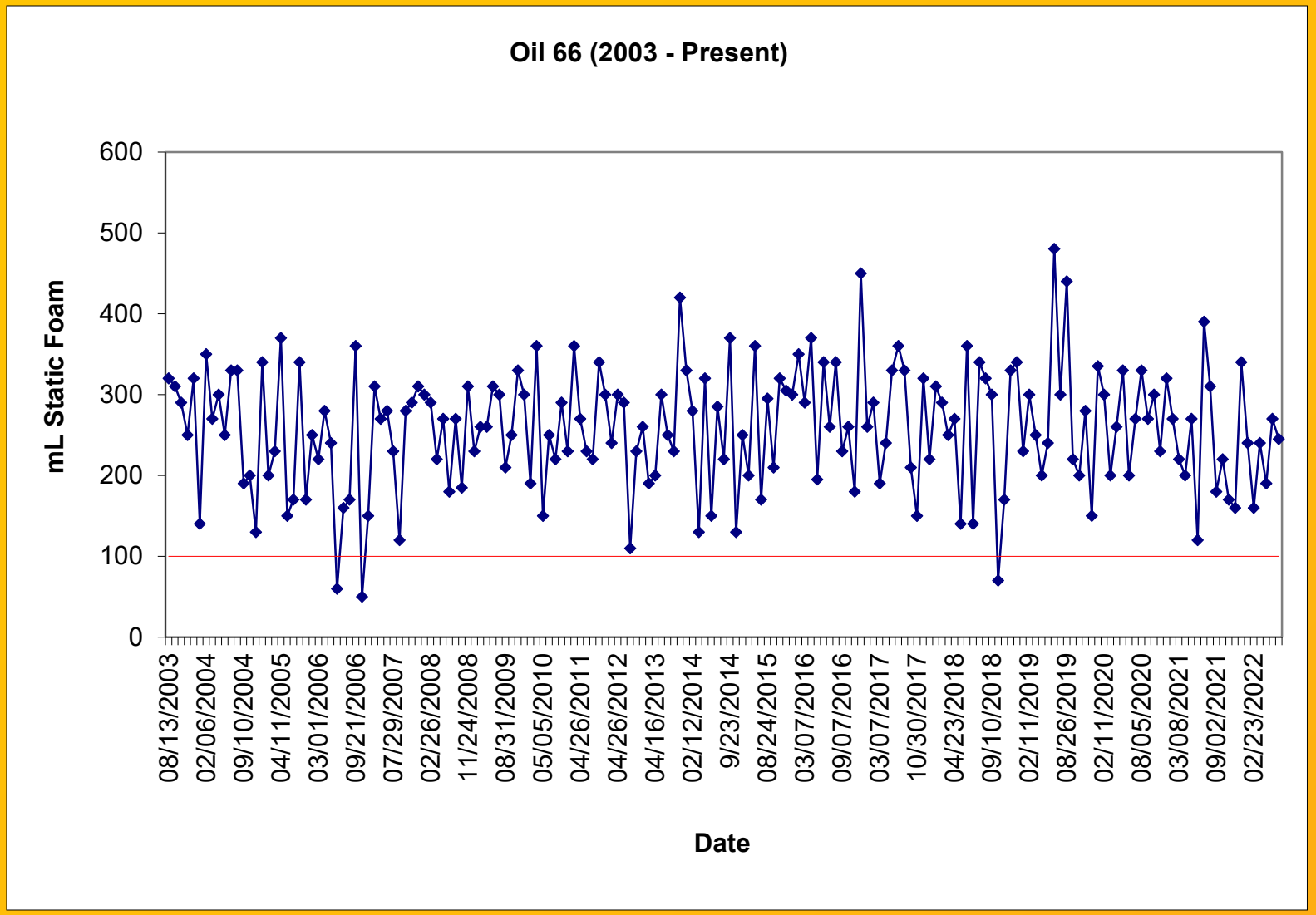


CURRENT PERIOD SEVERITY ESTIMATES BY LAB FOAM TENDENCY, ML

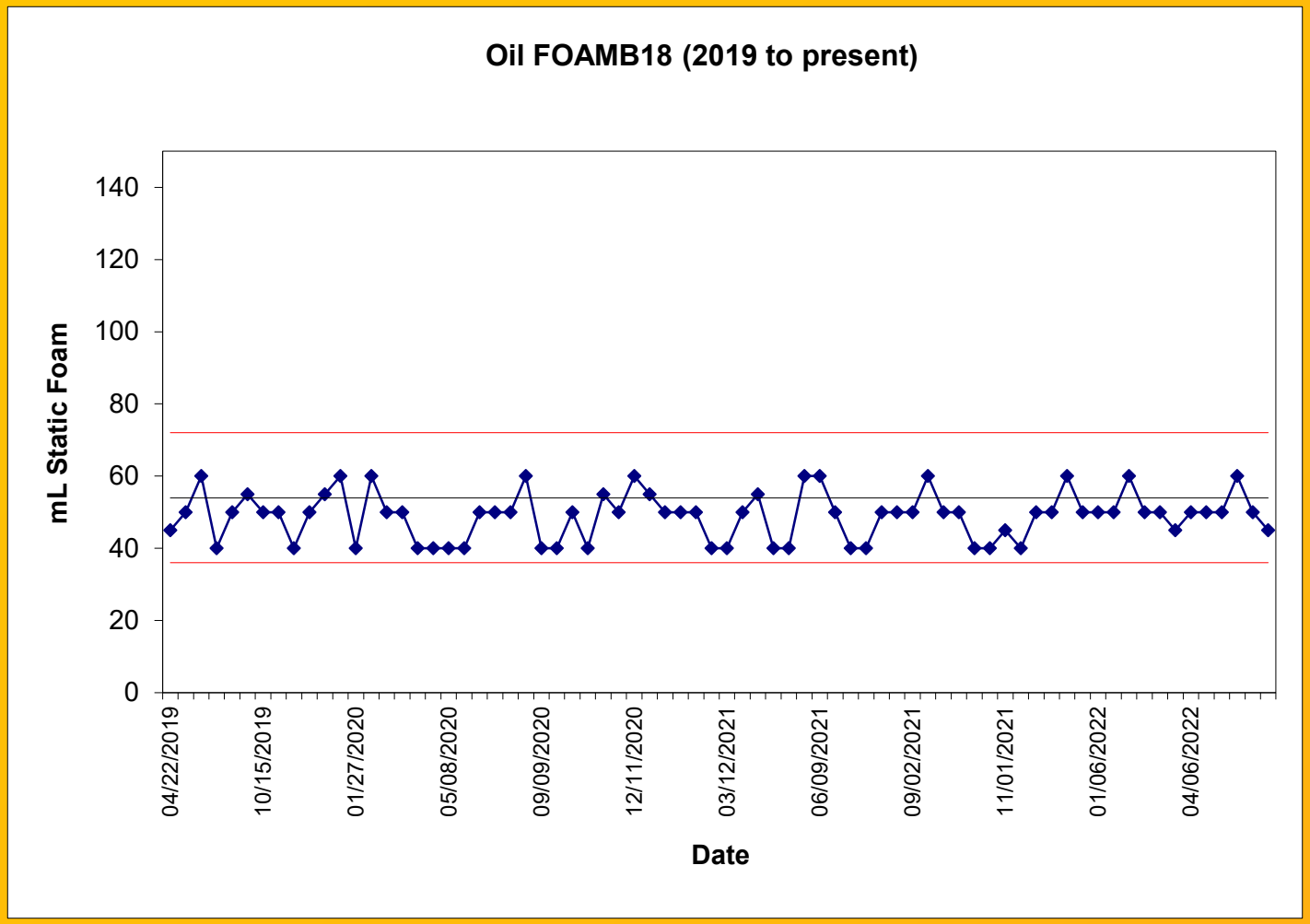
D6082: High Temperature Foam



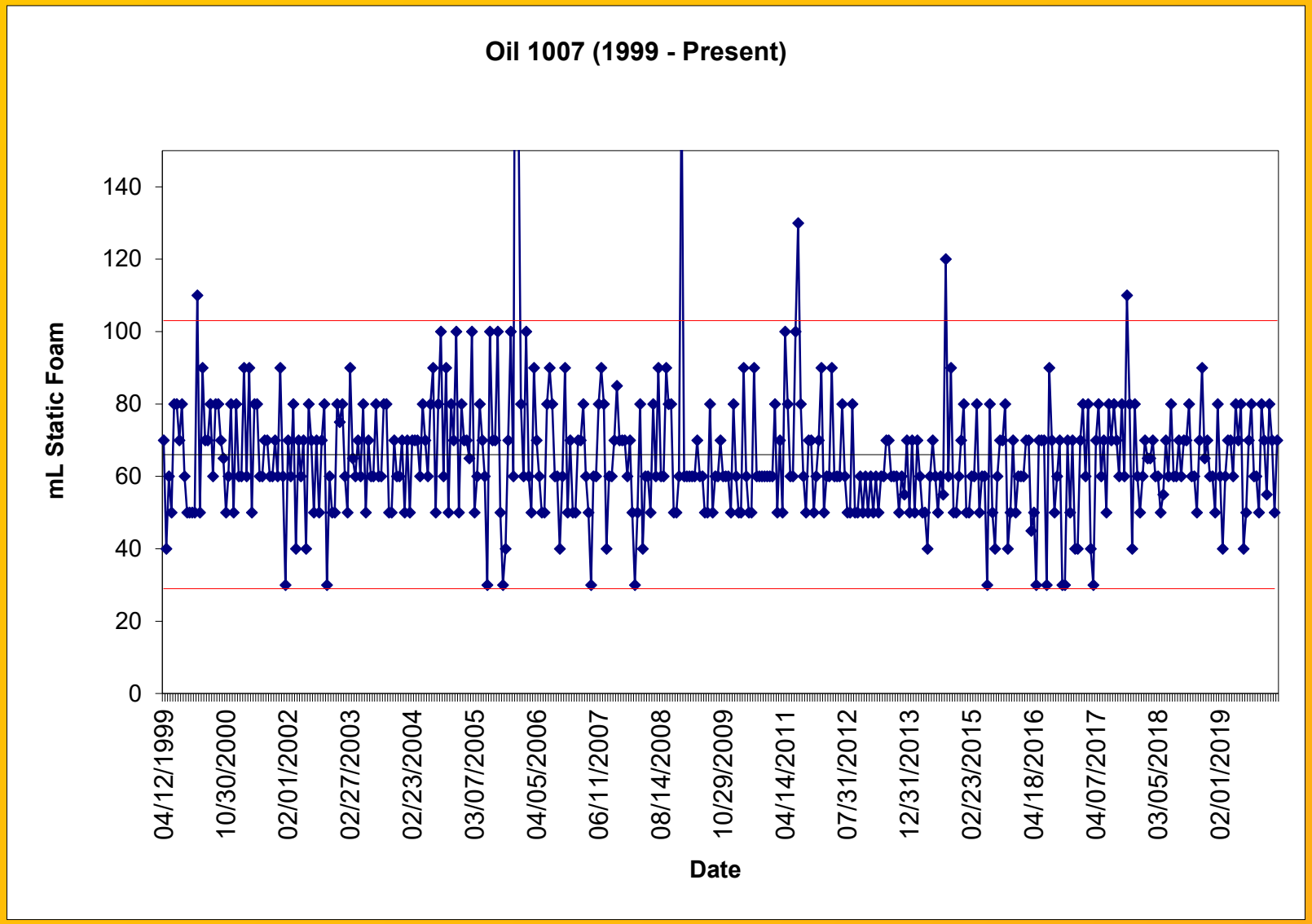
OIL 66: 2003 - PRESENT



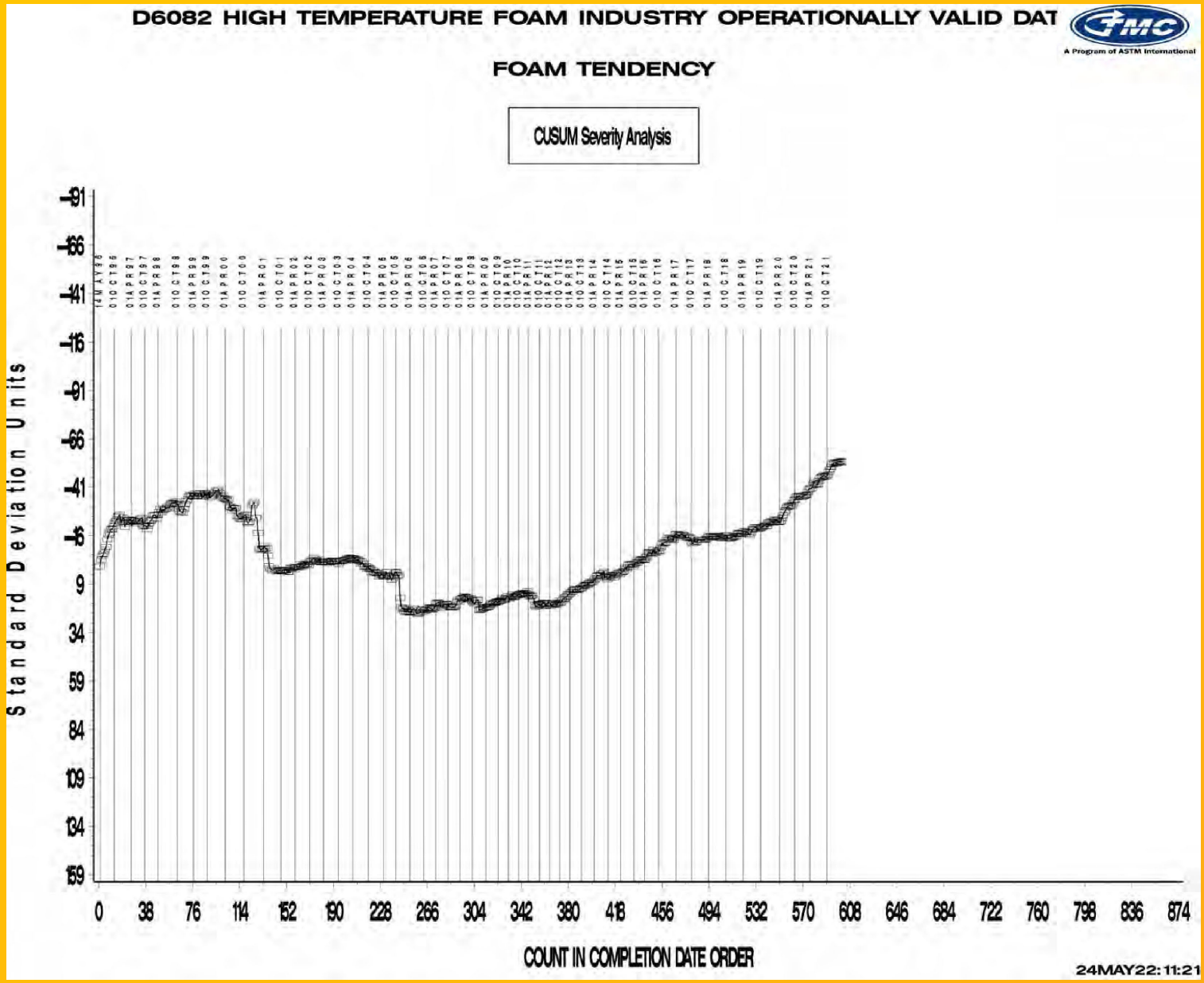
OIL FOAMB18: 2019 TO PRESENT



OIL 1007: 1999 – JAN 2021



CUSUM CHART


D6082 HIGH TEMPERATURE FOAM INDUSTRY OPERATIONALLY VALID DAT
A Program of ASTM International
FOAM TENDENCY
CUSUM Severity Analysis
Standard Deviation Units
-91
-66
-41
-16
-91
-66
-41
-16
9
34
59
84
109
134
159
0
38
76
114
152
190
228
266
304
342
380
418
456
494
532
570
608
646
684
722
760
798
836
874
COUNT IN COMPLETION DATE ORDER
24MAY22:11:21

OIL INVENTORY

Oil	Year Rec'd By TMC[A]	TMC Inventory, gallons	Gallons Shipped last 12 months
FOAMB18	2018	82.3	3
66	2002	72.9	2.2

525 mL per sample aliquot

D6082: HIGH TEMPERATURE FOAM

- Foam Tendency Precision (Pooled s) is the same as last period
  - More precise than oil FOAMB18 target precision
    - Oil 1007 is entirely used up, 2nd report period of all reference tests on replacement oil FOAMB18 only.
- Performance (Mean Δ/s) is -0.57s mild
  - Fifth consecutive period of mild performance on FOAMB18.
    - Target performance, set on 18 runs in a RR, may need revisited.
- No non-zero occurrences of Foam Stability
- All six severe oil discrimination runs (on TMC oil 66) demonstrated acceptable discrimination on foam tendency (>100 ml).

TEOST Surveillance Panel Report

D02.B0.07 Bench Tests Surveillance: Seattle, WA

Bridget Brassell, SP Chair

Monday, June 27, 2022

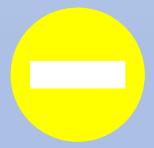
ASTM D6335: TEOST-33C

Summary for D02.B0.07

Status	Test Aspect	Comments
	Method	Test method is in good standing ▪ Monitored by D02.09 and the TMC
	Parts Availability	All TEOST-33C hardware and test materials are available ▪ All tests in period used Rod Batch M or N
	Reference Oils	435-2 and 75-1 reference oils in good supply at TMC • Nearly all of oil 75 is used up
	Test Availability	TEOST-33C test is available at 8+ labs – combination of independent and dependent labs
	Severity and Precision	▪ Precision this period was 6.22. Improvement from last period but worse than target (5.73) ▪ Test ran with slight severe bias (0.55 s) for performance this period ▪ Period had 2 failed calibrations a fail rate of 7%

ASTM D7097: TEOST-MHT

Summary for D02.B0.07

Status	Test Aspect	Comments
	Method	Test method is in good standing ▪ Monitored by D02.09 and the TMC
	Parts Availability	All TEOST-MHT hardware and test materials are available ▪ All tests in period used Rod Batch M or N ▪ Three catalyst batches are in use: 19AB (n=46), 19BA-1 (n=1) and 20AB (n=28)
	Reference Oils	432 and 434-3 reference oils in good supply at TMC ▪ Oil 434 will be used until inventory is gone ▪ Replacement oil 434-3 running 0.03s mild ▪ Permanent limit proposal
	Test Availability	TEOST-MHT test is available at 8+ labs – combination of independent and dependent labs
	Severity and Precision	▪ Precision worst recently (8.86) and off target of (4.96) ▪ Severity performance was good (0.18 s) this period ▪ Period had 9 failed calibrations – fail rate of 14% - most were severe – not oil or lab specific

ASTM D7097: TEOST-MHT

Proposed limits for 434-3

Current Data Set of Valid D7097 runs	
n	47
Average	26.56
Std. Dev	5.467

Current Limits	Proposed Limits
n=10	n=47
15.7 - 41.0	15.9 – 36.5

intertek
Total Quality. Assured.

BRT SURVEILLANCE PANEL

ASTM D02.B0.7

June 27th 2021

BRT TEST ACTIVITY

*October 1,2021 – March 31,2022

Test Status	Validity Code	Validity
Accepted Calibrations	AC	129
Failed Calibration Test	OC	13
Operationally Invalid, by TMC	RC	1
Aborted Test, by Lab	XC	2
Total	**145**	

- 5 labs reported data

BRT FAILED TESTS BY LAB

- 13 total tests failed this period
  -7 severe average gray value
  -6 mild average gray value

Failed Parameter	LTMS Lab					#
	A	B	D	G	L	
Severe Average Gray Value	0	0	4	3	0	7
Mild Average Gray Value	0	1	0	5	0	6
Total	0	1	4	8	0	13

BRT LOST TESTS

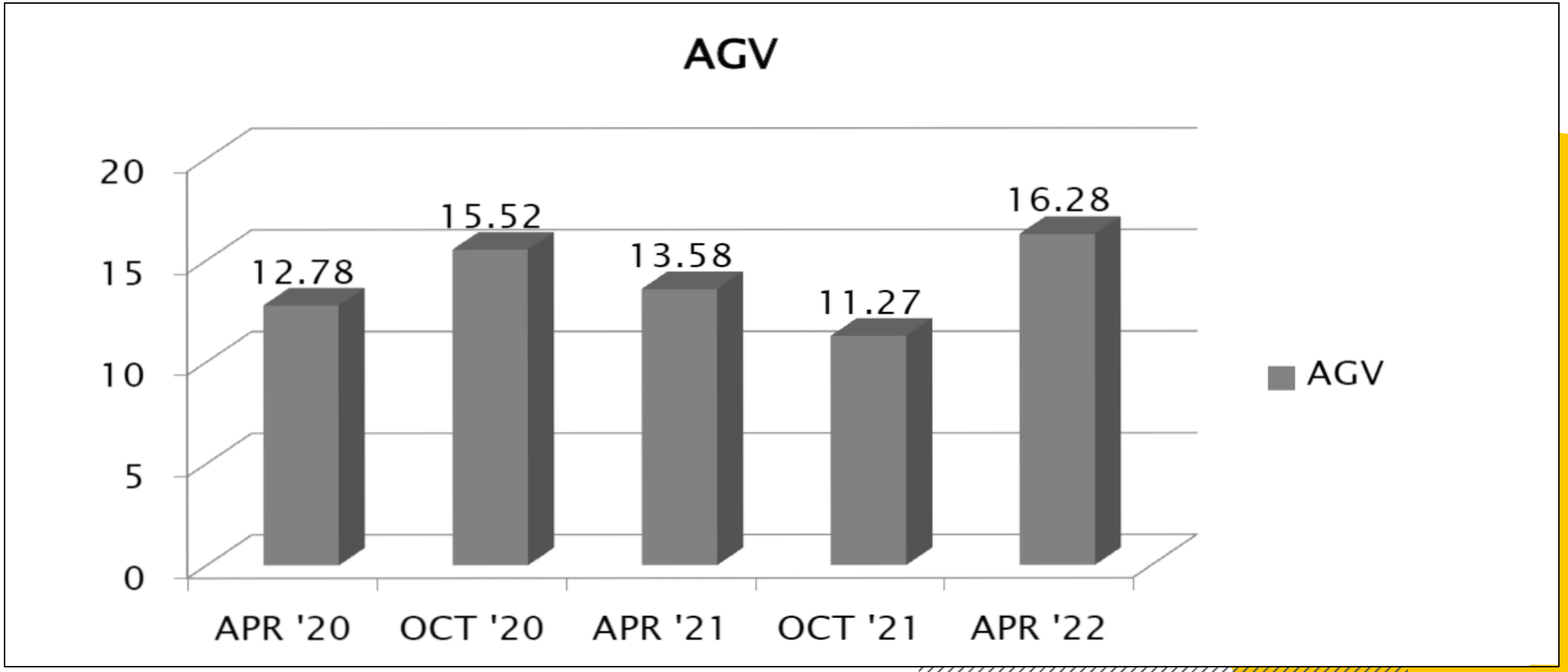
- 3 total tests lost this period
  -1 invalidated due to incorrect airflow conditions
  -1 aborted for shaker table malfunction
  -1 aborted due to incorrect test time

Cause	LTMS Lab					#
	A	B	D	G	L	
Airflow incorrect	0	0	0	1	0	1
Shaker table malfunction	1	0	0	0	0	1
Test time incorrect	0	0	0	1	0	1
Total	1	0	0	2	0	3

* Invalid and aborted calibration tests

SEVERITY AND PRECISON

- Over the course of this report, AGV severity as measured by CUSUM, is trending on target
- Precision for this period is 16.28, worse than previous period.



REFERENCE OIL SUPPLY

Oil	TMC Inventory (gallons)	Quantity Shipped in last 6 months	Lab Inventory (samples)	Estimated Life
1006	30.3	0.4	43	5+ years
82-1	2.8	0.4	42	3 years
86	50.6	0.4	41	5+ years
87	94.4	0.4	42	5+ years

STATUS

- In the process for development of the GEN3 Hybrid system due to program not being Windows 10 compatible
- We are pending final quote on GEN3 Hybrid System through Matt Bachelor on group funding for surveillance panel

ASTM D6795
Engine Oil Filterability Test (EOFT)
and
ASTM D6794
Engine Oil Water Tolerance Test (EOWTT)

June 27, 2022

Yong-Li McFarland
Chair

Surveillance Panel Membership

14 members

Ernest Morel, Afton Chemical
Man Hon Tsang, Chevron Oronite
Dennis Gaal, Exxonmobil
Joe Franklin, Intertek
Udo Boecker, ISP
Michael Johnscher, ISP
Litchi Xie, Lubrizol Additive (Zhuhai) Co., Ltd.
Megan Browning, Lubrizol
Jason Bowden, OH Technologies Inc
Greg Miiller, Savant Group
Becky Grinfield, SwRI
Yong-Li McFarland*, SwRI
Brittany Pfleegor, TMC
Frank Farber, TMC

*Chair

Scope and Objective

It is the responsibility of this panel to provide surveillance over Test Methods D6794 and D6795 bench tests used in the ILSAC and API passenger car oil categories. The surveillance panel will review data semi-annually supporting the precision for each bench test and when necessary, conduct workshops to bring the bench tests within accepted limits. The surveillance panel will function with the support of the ASTM Test Monitoring Center (TMC) in an effort to monitor the bench tests and maintain appropriate and adequate supplies of reference oils for the monitoring process. The panel will maintain a liaison with the "expert groups" in ASTM, which may help in the maintenance and improvement of the bench test methods used in support of the current ILSAC and API categories. The surveillance panel will make recommendations for appropriate action through Subcommittee D02.B, Section 7.

ASTM D6795 Engine Oil Filterability Test (EOFT)

Title: Standard Test Method For Measuring The Effect On Filterability Of Engine Oils After Treatment With Water And Dry Ice And A Short (30 min) Heating Time

Current Business

- 5 labs calibrated
- Improved 0 % fail rate of operational valid tests
- CIFA Severity, by CUSUM plotting, is severe
- Precision, by pooled standard deviation, has improved to 4.05 from 4.78 (last period)
- 1 reference oil, Oil 79, a reblend of oil 78-2. Estimated life of 3.5 yrs.

•Test in maintenance mode

Test Distribution	Oil 79
Accepted for Calibration (AC)	124
Failed Acceptance Criteria (OC)	0
Operationally Invalid, by Lab (LC)	0
Operationally Invalid, by TMC (RC)	0
Aborted Calibration Test (XC)	0
Total	124 (130*)

* Previous period total

Reference Oil Supply	Oil 79
Samples at Labs	84
Gallons shipped in last 6 months	37.6
Gallons at TMC	311

Period: October 1, 2021 – March 31, 2022

ASTM D6794 Engine Oil Water Tolerance Test (EOWTT)

Title: Standard Test Method For Measuring The Effect On Filterability Of Engine Oils After Treatment With Various Amounts Of Water And A Long (6 H) Heating Time

Current Business

- 5 labs calibrated
- Improved 0.8 % fail rate of operational valid tests. 83% of fails were for severe change.
- CIFA Severity, by CUSUM plotting, was severe for all treat rates
- Precision, by pooled standard deviation, is slightly better than previous periods
- 2 reference oils, Oil 79 and Oil 77-3. Estimated life is 3.5 yrs, 5+ yrs, respectively.

•Test in maintenance mode

Test Distribution	Oil 77-3	Oil 79	Total
Accepted for Calibration (AC)	358	358	716
Failed Acceptance Criteria (OC)	5	1	6
Aborted Calibration Test (XC)	2	2	4
Acceptable Shakedown (NN)	0	0	0
Unacceptable Shakedown (MN)	0	0	0
Total	365	361	716 (782*)

* Previous period total

Reference Oil Supply	Oil 77-3	Oil 79	Total
Samples at Labs	134	132	266
Gallons shipped in last 6 months	31.2	37.6	68.8
Gallons at TMC	510	311	821

Period: October 1, 2021 – March 31, 2022

Old EOFT & EOWTT Business

None

New EOFT & EOWTT Business

None

Thanks to TMC and Brittany Pfleegor!

ASTM D02.B07

ASTM D7216

ENGINE OIL ELASTOMER COMPATIBILITY (EOEC)
&
LIGHT DUTY ENGINE OIL COMPATIBILITY (LDEOC)

Seattle, Washington

Mike Birke

Southwest Research Institute

Petroleum Products Research Department

Surveillance Panel Membership

- Terry Bates, ASTM Facilitator
- Udo Boeker, ISP
- Jason Bowden, OHT
- Gail Evans, Lubrizol
- Joe Franklin, Intertek Automotive Research
- Adebeyo Gbolarumi, Cummins
- Becky Grinfield, SWRI
- Dylan Beck, TMC
- Greg Lytle, Solray
- Vince Donndelinger, Lubrizol
- Greg Miiller - Savant
- Kimberly Gutierrez , Intertek Automotive Research
- Doyle Boese, Infineum
- Man Hon Tsang , Chevron
- Gary Svidron, Navistar
- Gefei Wu, Ashland

Current Business (EOEC)

Test Status		Fluoroelast.	Nitrile	Polyacrylate	Silicone	VAMAC	Total
Acceptable Calibration Test	AC	54	64	54	50	52	**274**
Failed Calibration Test	OC	1	1	2	0	0	**4**
Operationally Invalid, by lab	LC	0	0	0	0	0	**0**
Operationally Invalid, by TMC	RC	0	0	0	0	0	**0**
Aborted	XC	0	0	0	0	0	**0**
Total		**55**	**65**	**56**	**50**	**52**	**278**

EOEC Lost Tests*

Validity	Cause	#
	No lost test this period.	0
	Total	**0**

EOEC Test Severity

- Fluoroelastomer (FKM)

Parameter	Period Mean Δ/s	Status
Volume Change	−0.07	On-target
Points Hardness Change	−0.12	Mild
Tensile Strength Change	0.52	Severe
Elongation Change	−0.54	Mild

EOEC Test Severity

- Nitrile (NBR)

Parameter	Period Mean Δ/s	Status
Volume Change	0.74	Severe
Points Hardness Change	0.38	Severe
Tensile Strength Change	-0.95	Mild
Elongation Change	0.07	On-Target

EOEC Test Severity

- Polyacrylate (ACM)

Parameter	Period Mean Δ/s	Status
Volume Change	2.36	Severe
Points Hardness Change	−1.07	Mild
Tensile Strength Change	−0.42	Mild
Elongation Change	0.59	Severe

EOEC Test Severity

- Silicone (VMQ-1)

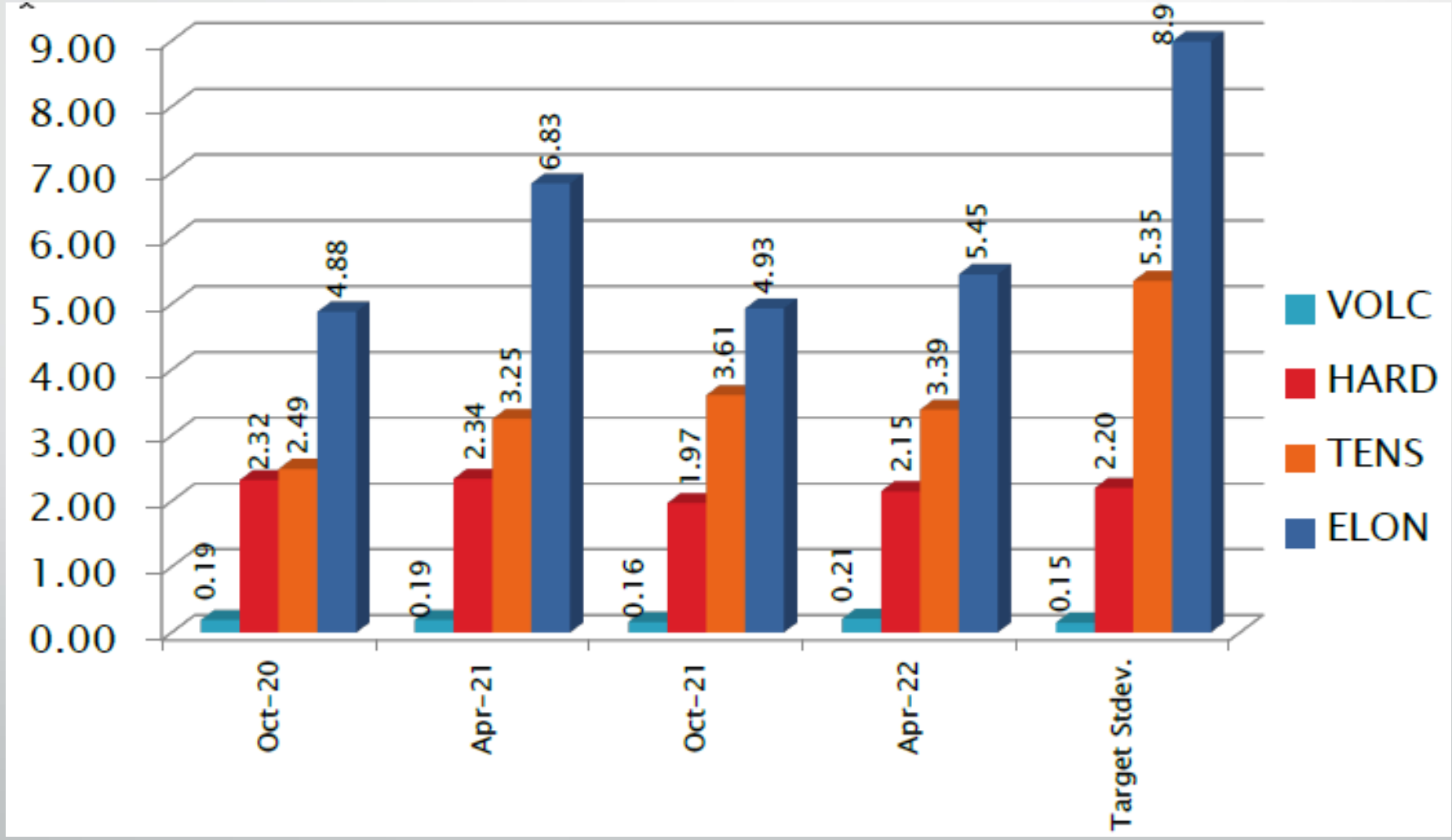
Parameter	Period Mean Δ/s	Status
Volume Change	0.64	Severe
Points Hardness Change	-1.02	Mild
Tensile Strength Change	-0.10	On-Target
Elongation Change	-0.52	Mild

EOEC Test Severity

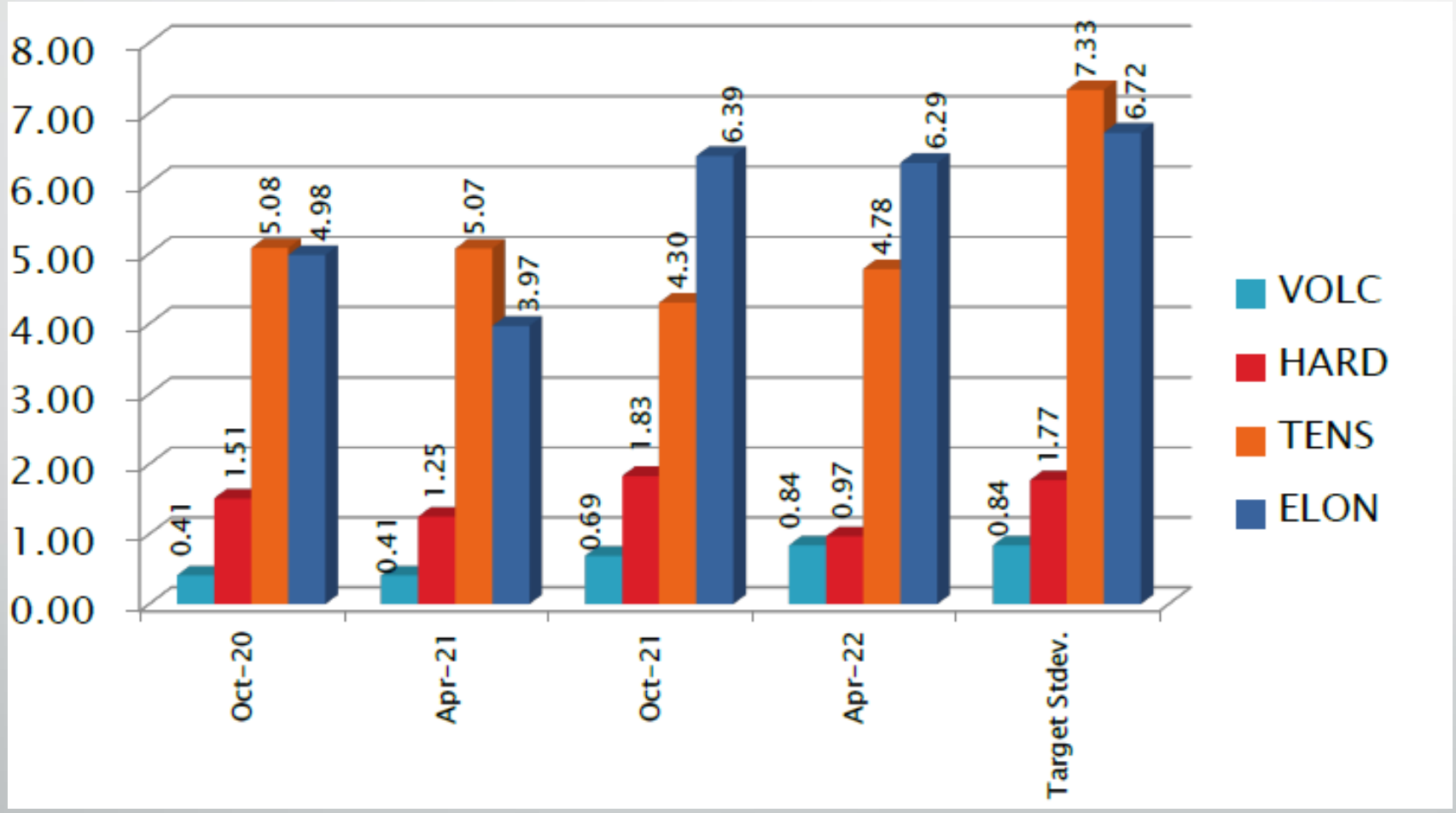
- VAMAC (MAC)

Parameter	Period Mean Δ/s	Status
Volume Change	0.31	Severe
Points Hardness Change	-1.05	Mild
Tensile Strength Change	0.29	Severe
Elongation Change	-0.10	Mild

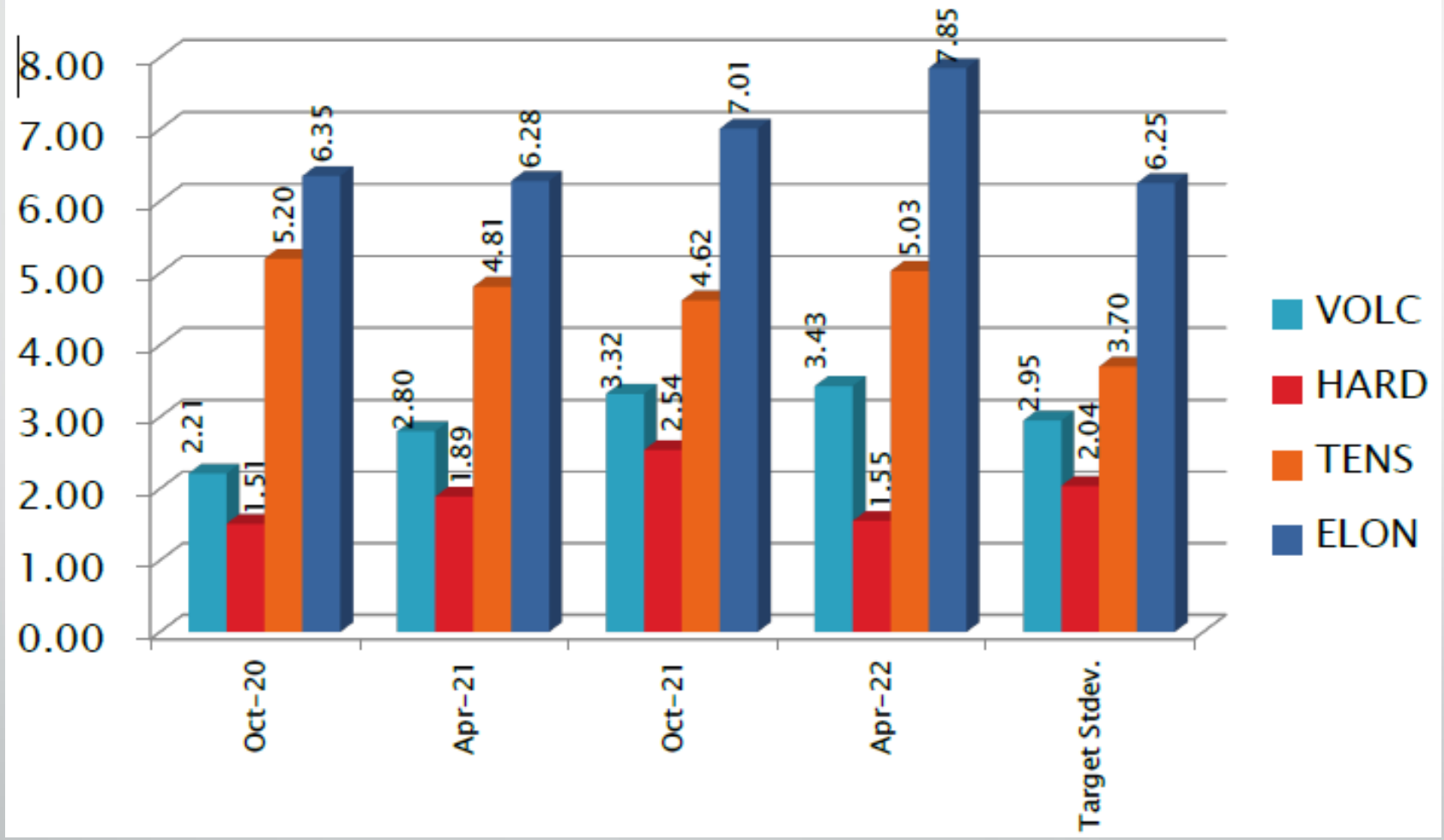
EOEC Precision Estimates - Fluoroelastomer



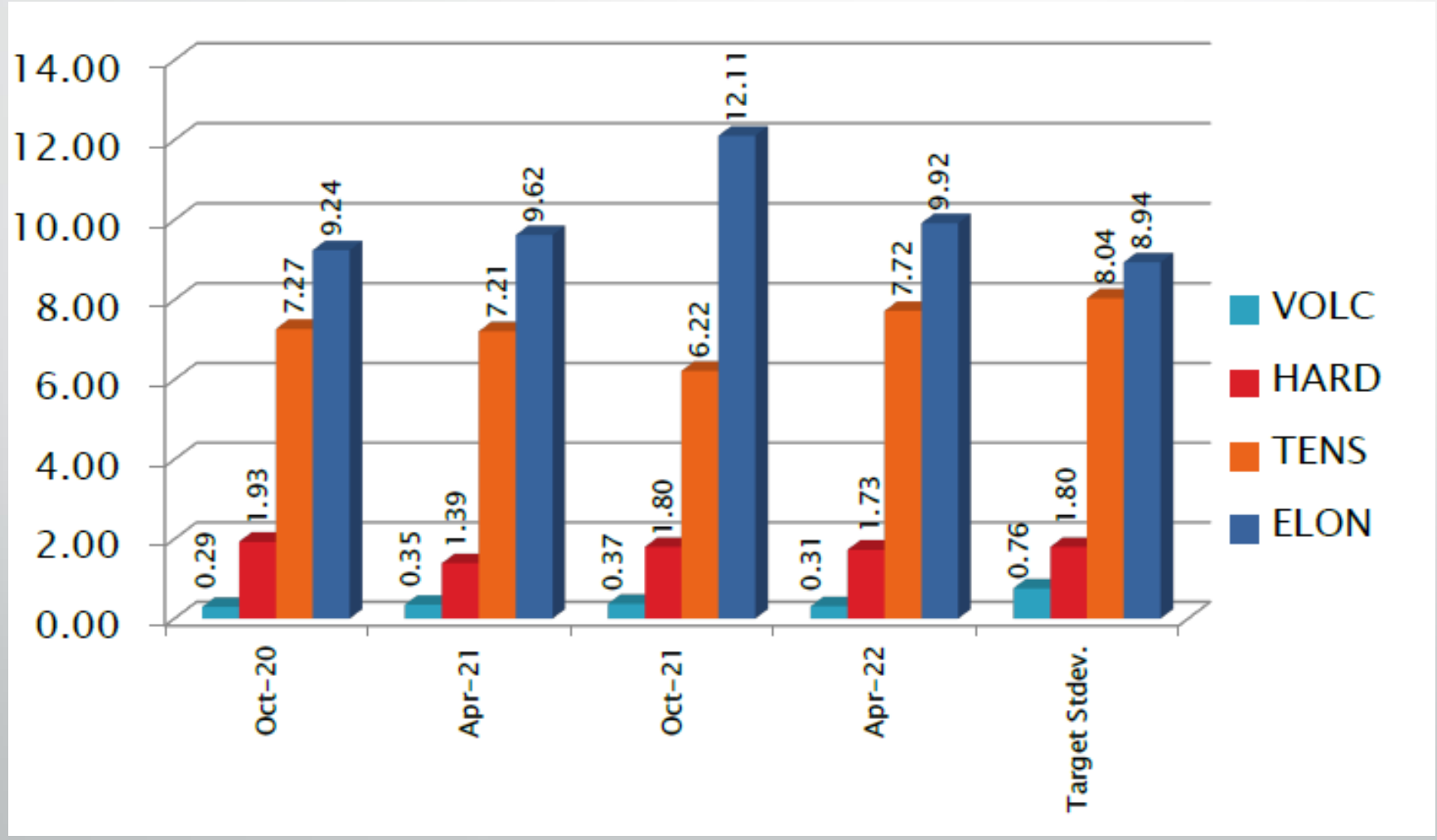
EOEC Precision Estimates - Nitrile



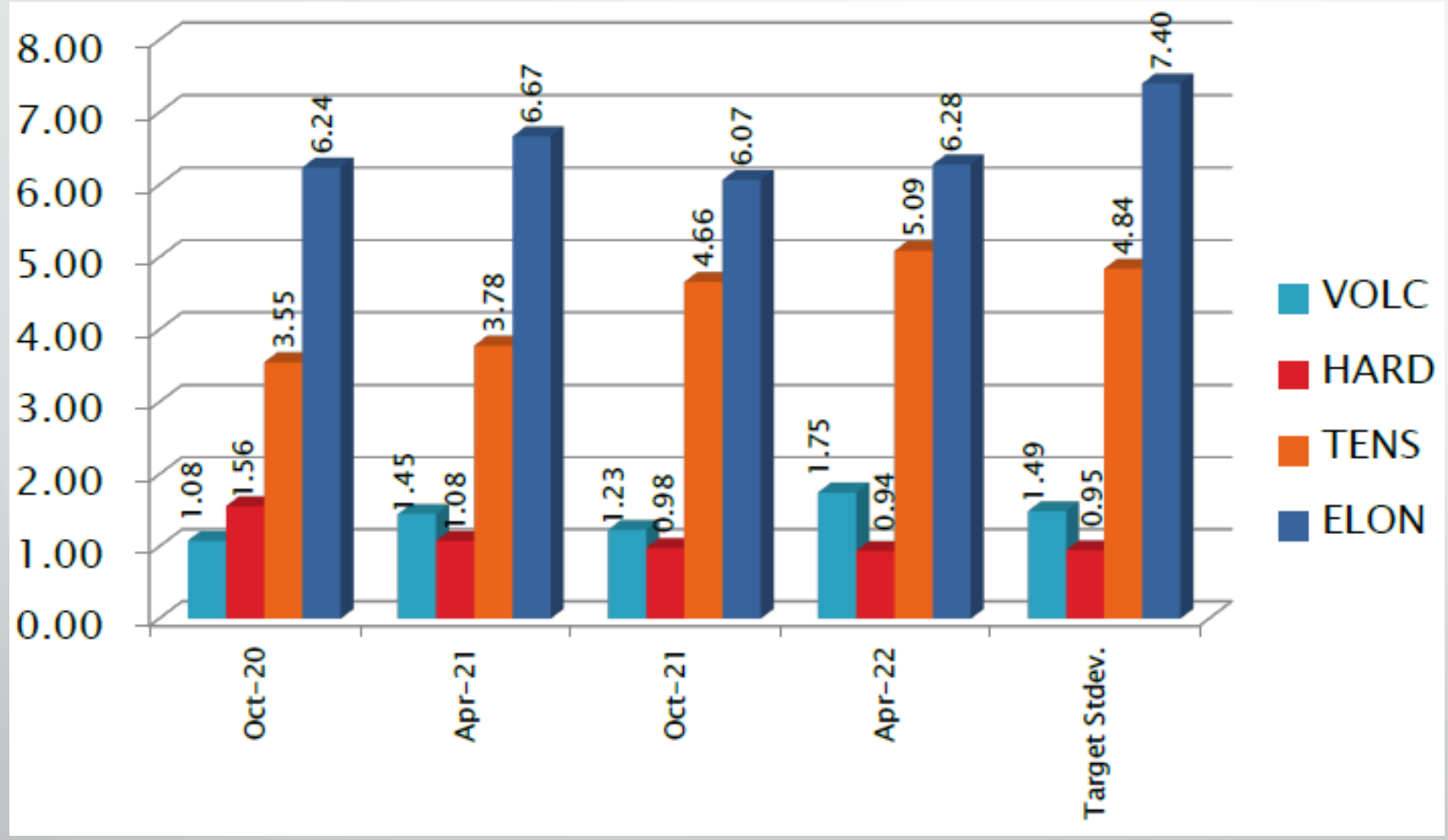
EOEC Precision Estimates - Silicone



EOEC Precision Estimates - Polyacrylate



EOEC Precision Estimates - VAMAC



Information Letters

Test	Date	IL or Memo Number	Topic
EOEC	20211021	IL 21-1 *	EOECP correction factor implemented for elastomer batch ACM1-25

Reference Oil Inventory Estimated Life

Oil	TMC Inventory Gallons	Gallons Shipped Past 12 Months	Estimated Life
SL107[A, B]	2561	284	4 years

[A]TMC Inventory is used across several test methods
[B]SL107 replaces oil 1006; still assigning existing lab inventories of 1006 batches where available.

LDEOC Test Activity*

Test Status		Ethylene Acrylate	Fluoroelast.	Nitrile	Polyacrylate	Silicone	Total
Acceptable Calibration Test	AC	69	72	75	76	84	**376**
Failed Calibration Test	OC	1	0	3	0	1	**5**
Operationally Invalid, by lab	LC	0	0	0	0	1	**1**
Operationally Invalid, by TMC	RC	0	0	1	0	0	**1**
Aborted	XC	0	0	1	0	1	**2**
Industry Information Runs	AG	0	0	0	0	0	**0**
Total		**70**	**72**	**80**	**76**	**87**	**385**

*October 1, 2021 - March 31, 2022

LDEOC Lost Tests*

Validity	Cause	#
XC	Bath temperature off-spec	2
RC	Bath temperature off-spec	1
LC	Tensile testing failure	1
	Total	**4**

*Invalid and aborted calibration tests

LDEOC Test Severity

- Ethylene Acrylate (AEM1)

Parameter	Period Mean Δ/s	Status
Volume Change	−0.05	Mild
Points Hardness Change	−0.65	Mild
Tensile Strength Change	0.11	Severe

LDEOC Test Severity

- Fluoroelastomer (FKM1)

Parameter	Period Mean Δ/s	Status
Volume Change	-0.34	Mild
Points Hardness Change	-0.17	Mild
Tensile Strength Change	0.52	Severe

LDEOC Test Severity

- Nitrile (NBR1)

Parameter	Period Mean Δ/s	Status
Volume Change	1.57	Severe
Points Hardness Change	-0.71	Mild
Tensile Strength Change	-0.87	Mild

LDEOC Test Severity

- Polyacrylate (ACM1)

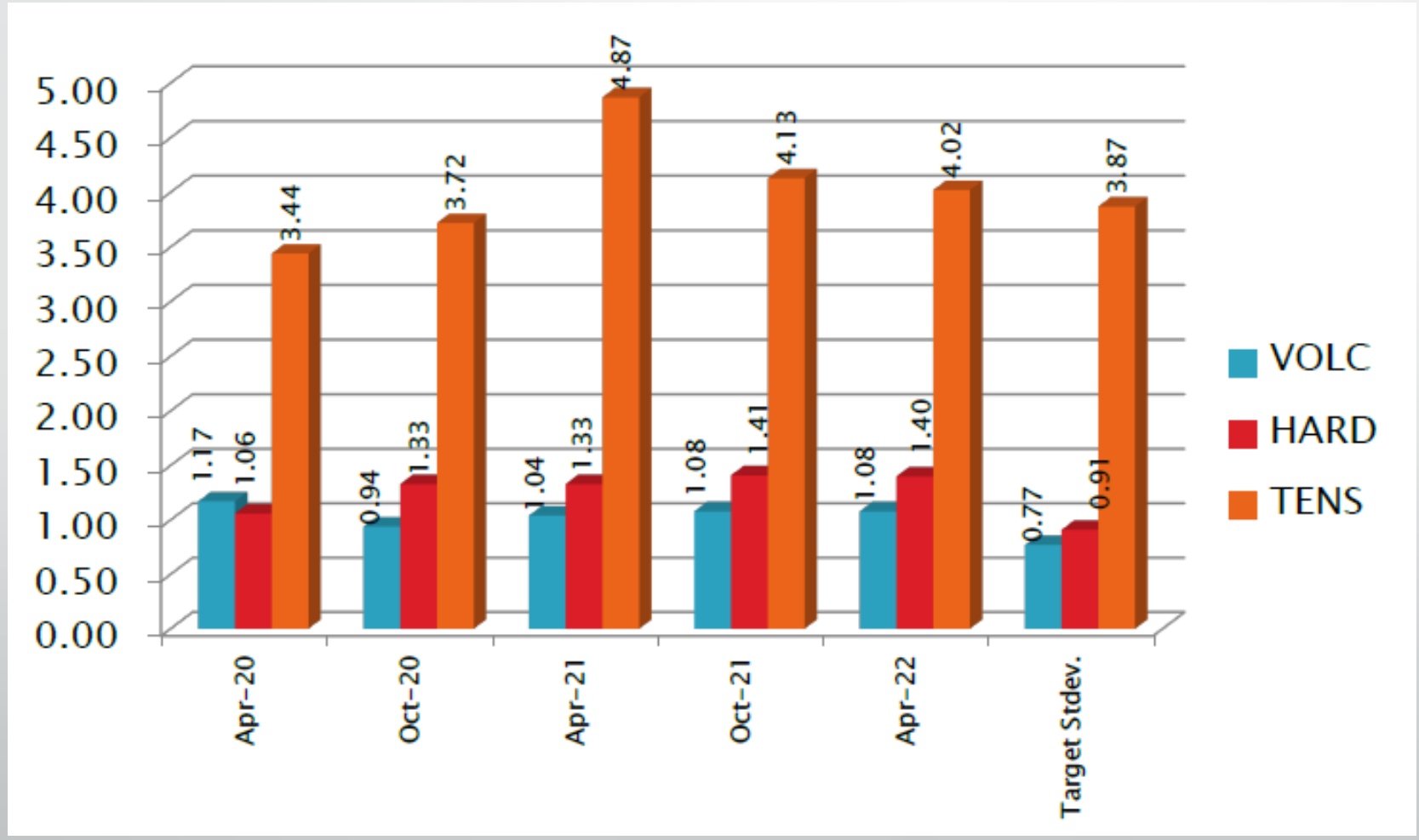
Parameter	Period Mean Δ/s	Status
Volume Change	−0.06	On-target
Points Hardness Change	−0.92	Mild
Tensile Strength Change	−0.48	Mild

LDEOC Test Severity

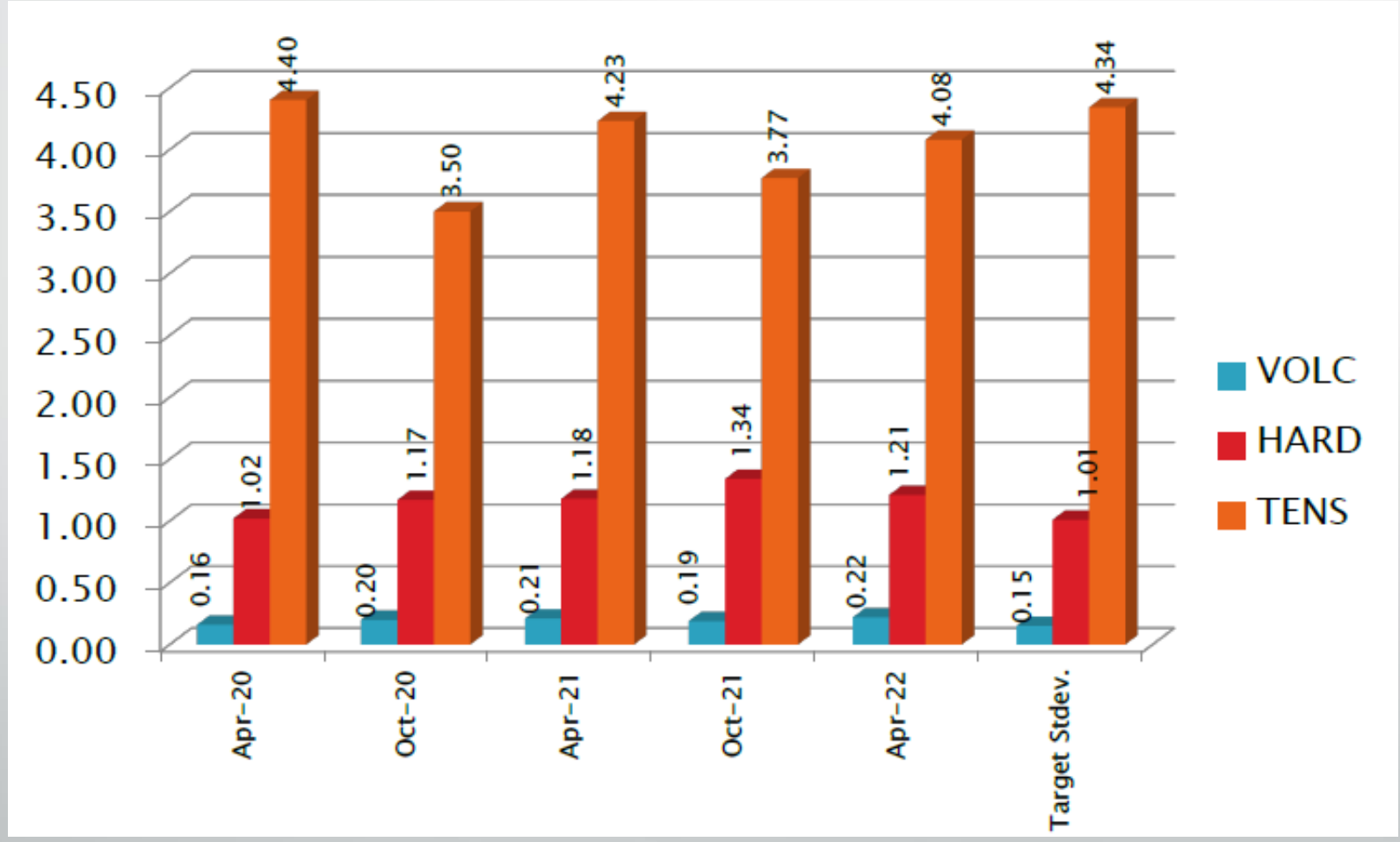
- Silicone (VMQ1)

Parameter	Period Mean Δ/s	Status
Volume Change	0.36	Severe
Points Hardness Change	−0.98	Mild
Tensile Strength Change	0.59	Severe

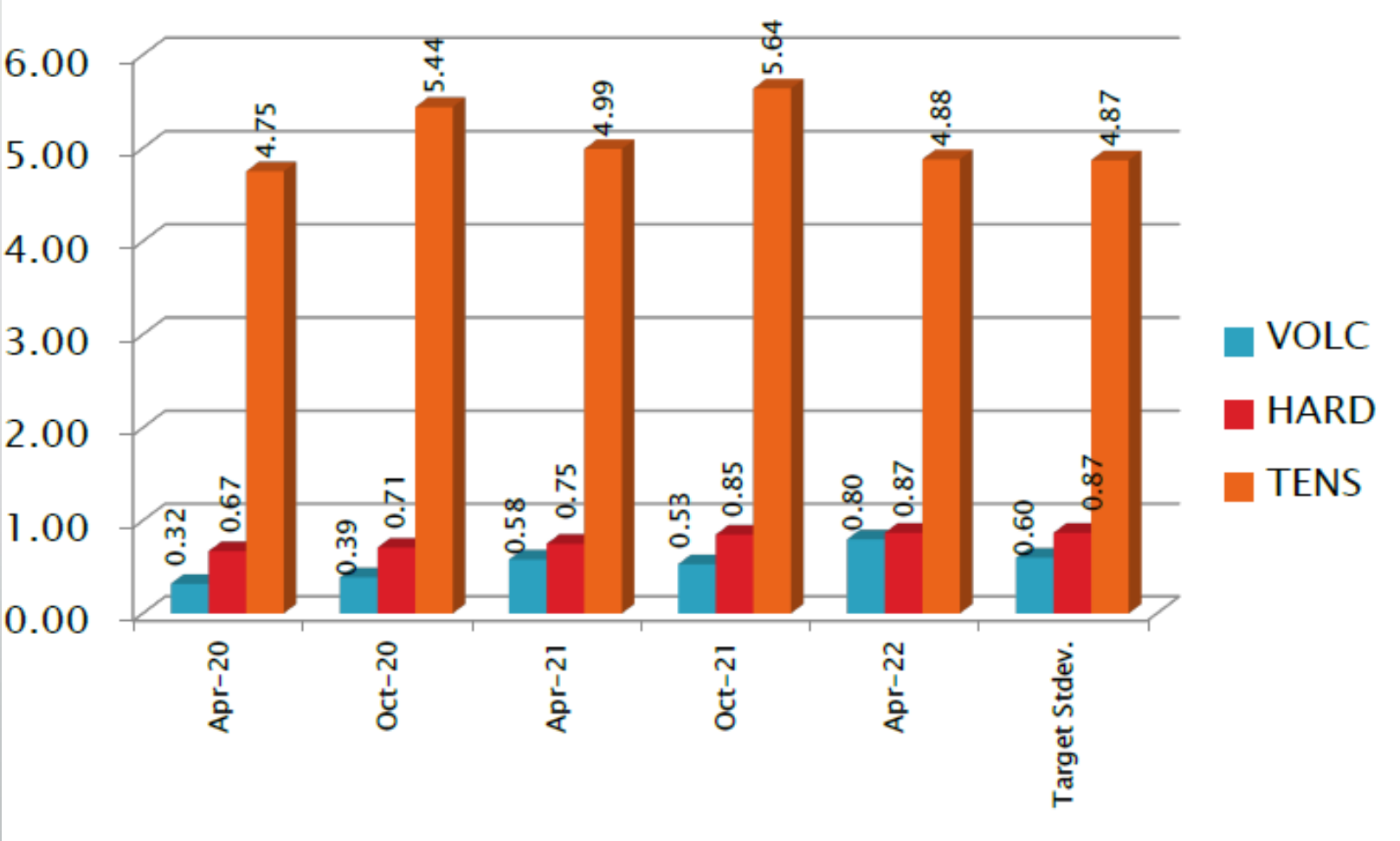
LDEOC Precision Estimates – Ethylene Acrylate



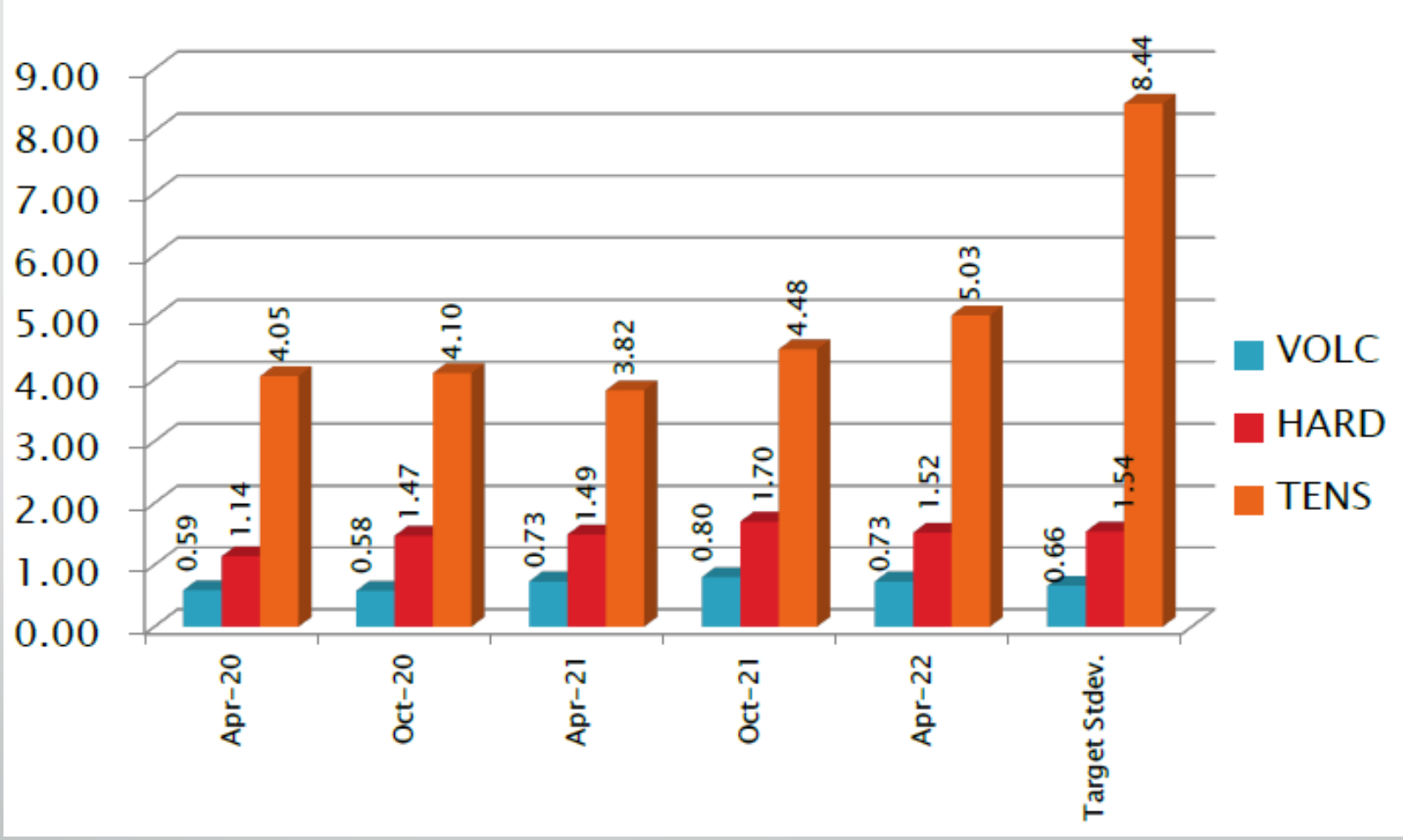
LDEOC Precision Estimates - Fluoroelastomer



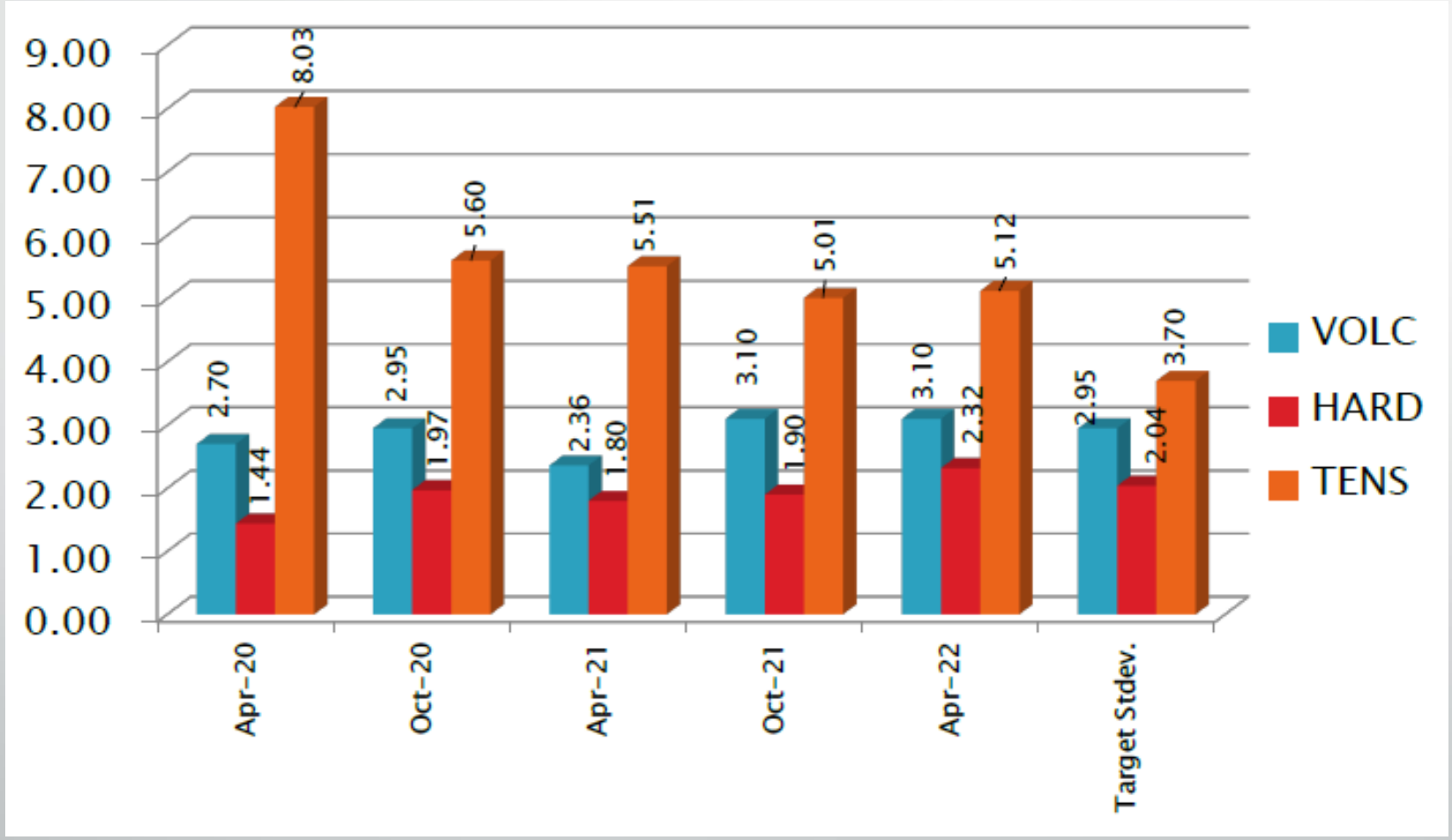
LDEOC Precision Estimates - Nitrile



LDEOC Precision Estimates - Polyacrylate



LDOEC Precision Estimates - Silicone



Information Letters

Test	Date	IL or Memo Number	Topic
LDEOC		None	Nothing issued this report period

Reference Oil Inventory Estimated Life

Oil	TMC Inventory Gallons	Gallons Shipped Past 12 Months	Estimated Life
SL107[A, B]	2845	182	5 years

[A]TMC Inventory is used across several test methods
[B]SL107 replaces oil 1006; still assigning existing lab inventories of 1006 batches where available.

Miscellaneous Information

- Available on TMC Website:
  - Oil Assignment Request and Test File Upload
  - Live Reference Test Data Bases
  - Surveillance Panel Meeting Minutes

- www.astmtmc.cmu.edu

ASTM D7528: ROBO
Surveillance Panel Update

ASTM D02.B0.07
Seattle, Washington

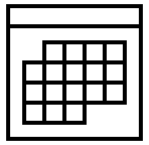
Justin Mills
June 27, 2022

Surveillance Panel Membership
Last updated May 12, 2022

ASTM TMC	Dylan Beck, Jeff Clark
Afton	Shelia Thompson, Jeff Yang, Todd Dvorak
BG Products	Madeleine Dellinger
Chevron Oronite	Robert Stockwell
Evonik Oil Additives	Justin Mills, Gabe Walkup, Justin Kontra
ExxonMobil	Dennis Gaal
Infineum	Andy Richie, Sapna Eticala
Intertek	Joe Franklin, Matt Schlaff, Rachel Stone
Lubrizol	Aimee Shinhearl, Jerimiah Westbrook
PetroChina	Li Shaohui , Sun Ruihua, Peng Wang, Xiaogang Li, Xu Li
SwRI	Becky Grinfield, Joe De La Cruz, Mike Birke, Yong-Li McFarland
Valvoline	Amol Savant, Amy Ross, Bruce Tonkel
Vanderbilt Chemicals	Al Filho, Christine Katrenya
Ace Glass	Dave Lawrence, Tom Petrocella,
Koehler Instruments	Raj Shah, Vincent Colantuini
Tannas/Savant	Greg Miller
General Interest	Alan Flamberg
Guests	

- Very active Surveillance Panel.
- Typical meeting has 15-20 participants representing ~10 different companies.
- Frequency of meetings expected to decrease now that dilute NO2 is approved.

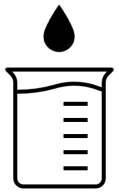
Surveillance Panel activities
Last and current semester



Meetings

- November 18, 2021
- February 3, 2022
- May 12, 2022
- July 28, 2022 (tentative)

→ Meeting frequency expected to decrease now that dilute NO2 approved all reference oils having multi-year supply



Dilute NO2

- Information Letter 21-1 was issued 11/3/21 with effective date of 12/1/2021 allowing option to use dilute nitrogen dioxide in air.
- 30-day ASTM ballot (Issued = 1/24/2022 / Closed =2/23/2022) closed with no negatives, but several editorial comments to implement.
- LTMS updated to require 2-test calibration when switching between dilute and concentrated NO2
- Data dictionary, report forms updated

Maintenance

- Final limits set for 436 and effective October 2021
- LTMS tables for reference oils cleaned up. Current and historic reference oils are now differentiated in two charts.
- Data dictionary was updated to add “TVTM” for “MRVVEOT”

ASTM D7528: ROBO
Summary for D02.B0.07 – June 27, 2022

Status	Test Aspect	Comments
	Method	**Test method is in good standing.** ▪ IL 21-01 effective December 1, allowing usage of dilute NO2. Subsequently went to ballot in January 2021. Approved with no negatives and several editorial comments.
	Parts Availability	**All ROBO hardware and test materials are available** ▪ Nitrogen dioxide, the primary catalyst for ROBO, is available from multiple suppliers ▪ Alternative procedure with dilute nitrogen dioxide effective December 1.
	Reference Oils	**All current reference oils are in good supply at TMC**: 5+ year supply of each oil ▪ Final limits set for 436 and effective October 2021.
	Test Availability	**Test is available with no significant queues to report.** ▪ 6 labs and 27 stands calibrated as of 3/31/2022 (up from 22 stands last semester) ▪ Less activity than prior semesters
	Severity and Precision	**In last semester (October 2021 – March 2022) precision slightly worse than target and test ran with a slight mild bias:** ▪ N = 106, Pooled s = 0.21 and Mean Δ/s = -0.35

Questions?

D874 SULFATED ASH SURVEILLANCE PANEL REPORT

ASTM Subcommittee D02.B0.07

June 2022

Seattle WA

Matt Schlaff

OVERVIEW

Test Status	Validity Code	No. Tests
Acceptable Calibration Test	AC	9
Total		**9**

Number of Labs Reporting Data: 4
Fail Rate of Operationally Valid Tests: 0%

UNACCEPTABLE TESTS

Statistically Unacceptable Tests (OC)	No. Of Tests
No Failed Tests	0

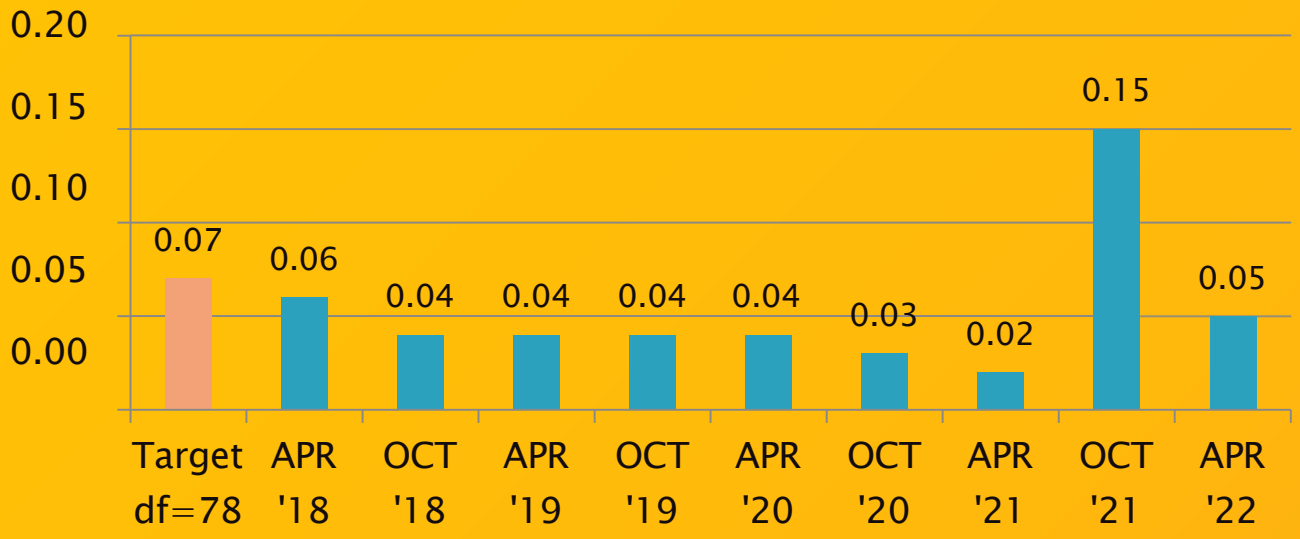
- No operationally invalid tests reported this period.
- No TMC technical updates issued this period

PRECISION AND SEVERITY

Total Deposits, mg	n	df	Pooled s	Mean Δ/s
Current Targets	81	78	0.07	-----
4/1/18 through 9/30/18	8	5	0.04	-0.22
10/1/18 through 3/31/19	8	5	0.04	-0.33
4/1/19 through 9/30/19	8	5	0.04	-0.18
10/1/19 through 3/31/20	7	4	0.04	-0.71
4/1/20 through 9/30/20	8	5	0.03	-0.30
10/1/20 through 3/31/21	8	5	0.02	-0.35
4/1/21 through 9/30/21	10	7	0.15	0.37
10/1/21 through 3/31/22	9	6	0.05	-0.07

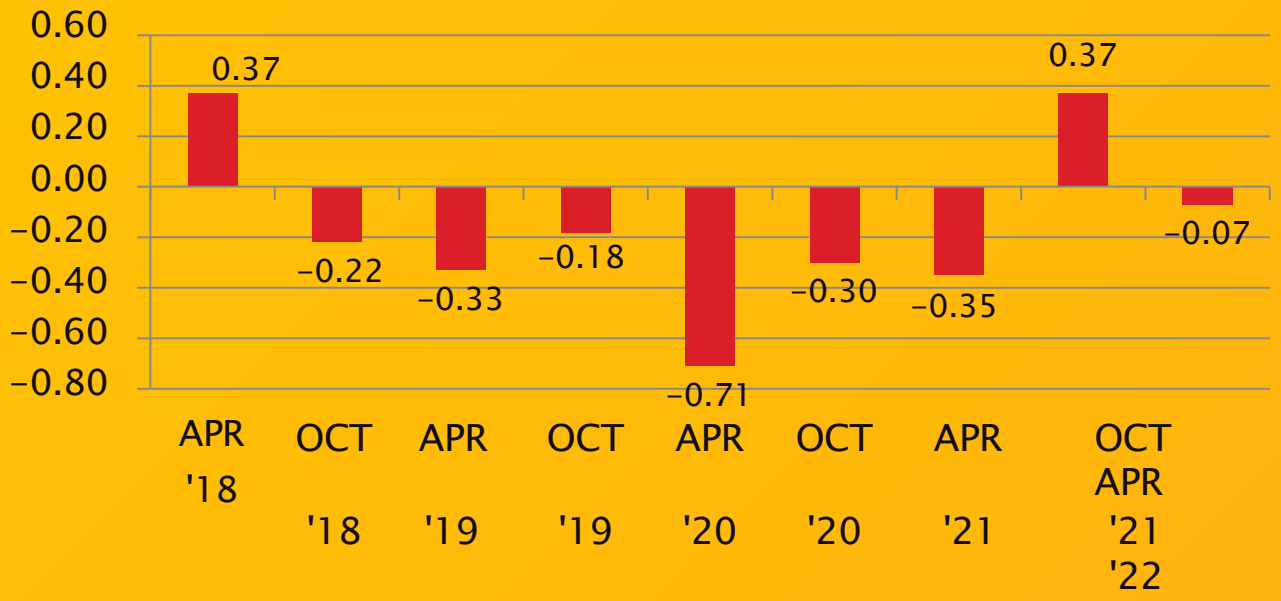
SULFATED ASH, MASS% POOLED S PRECISION

D874: Sulfated Ash



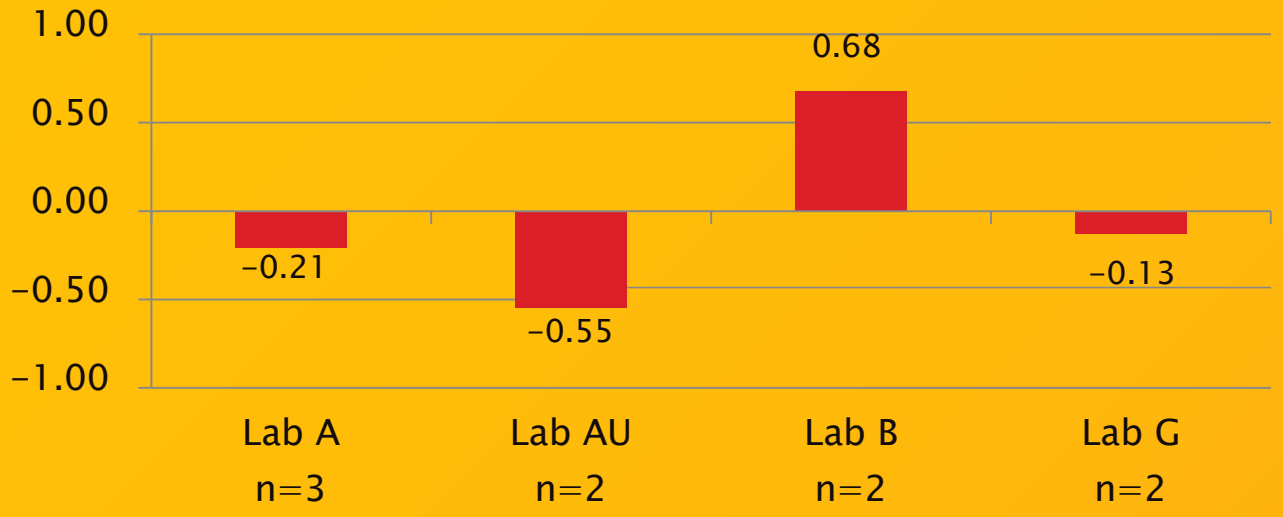
SULFATED ASH, MASS% MEAN Δ/S BIAS

D874: Sulfated Ash



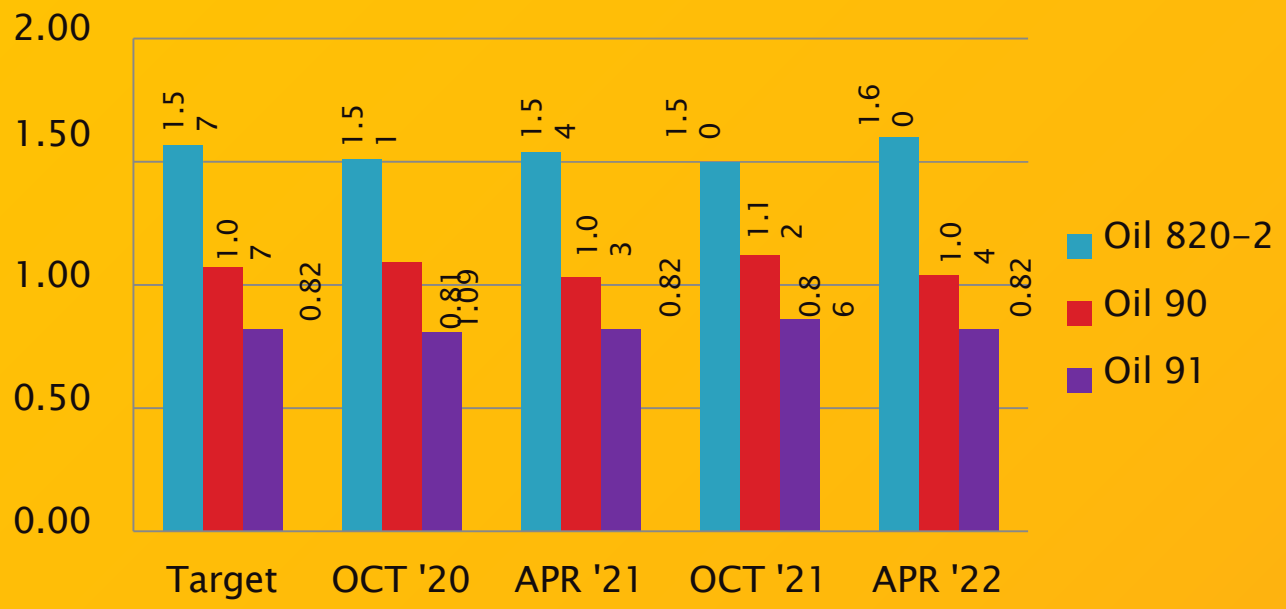
SULFATED ASH, MASS% MEAN Δ/S BIAS BY LAB

D874: Sulfated Ash



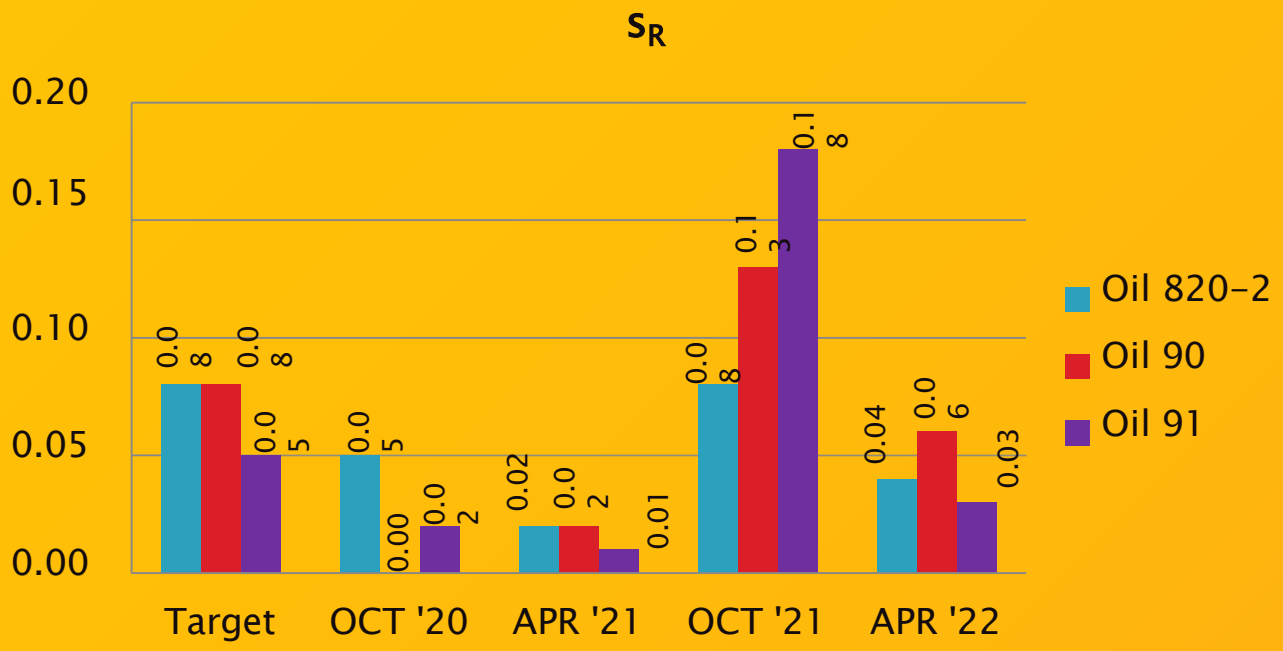
SULFATED ASH, MASS% MEAN BY OIL

D874: Sulfated Ash



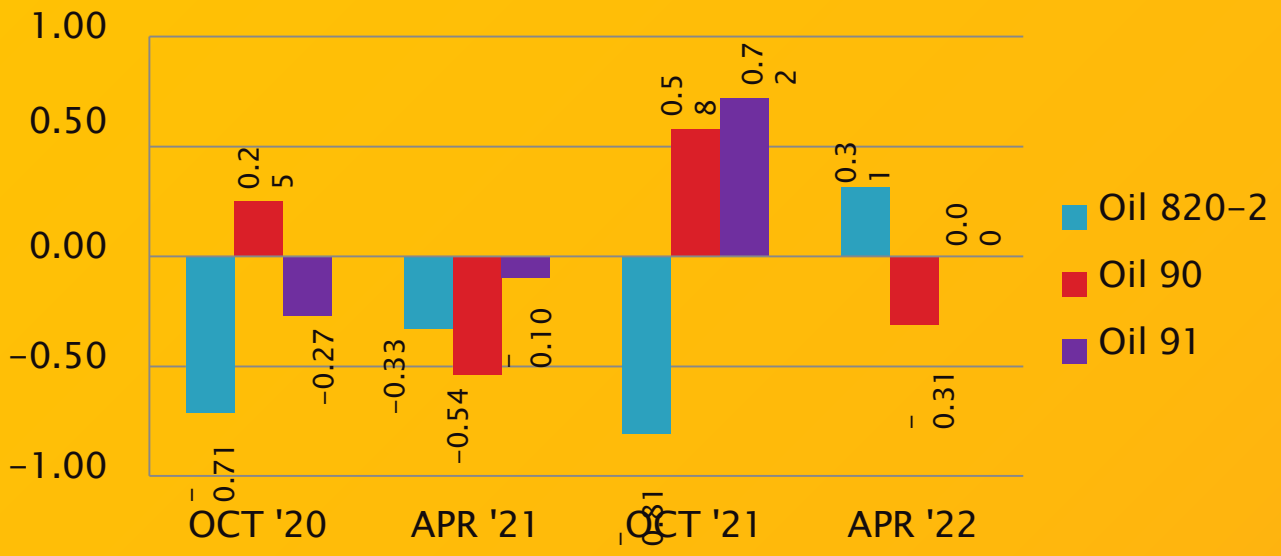
SULFATED ASH, MASS% POOLED S BY OIL

D874: Sulfated Ash



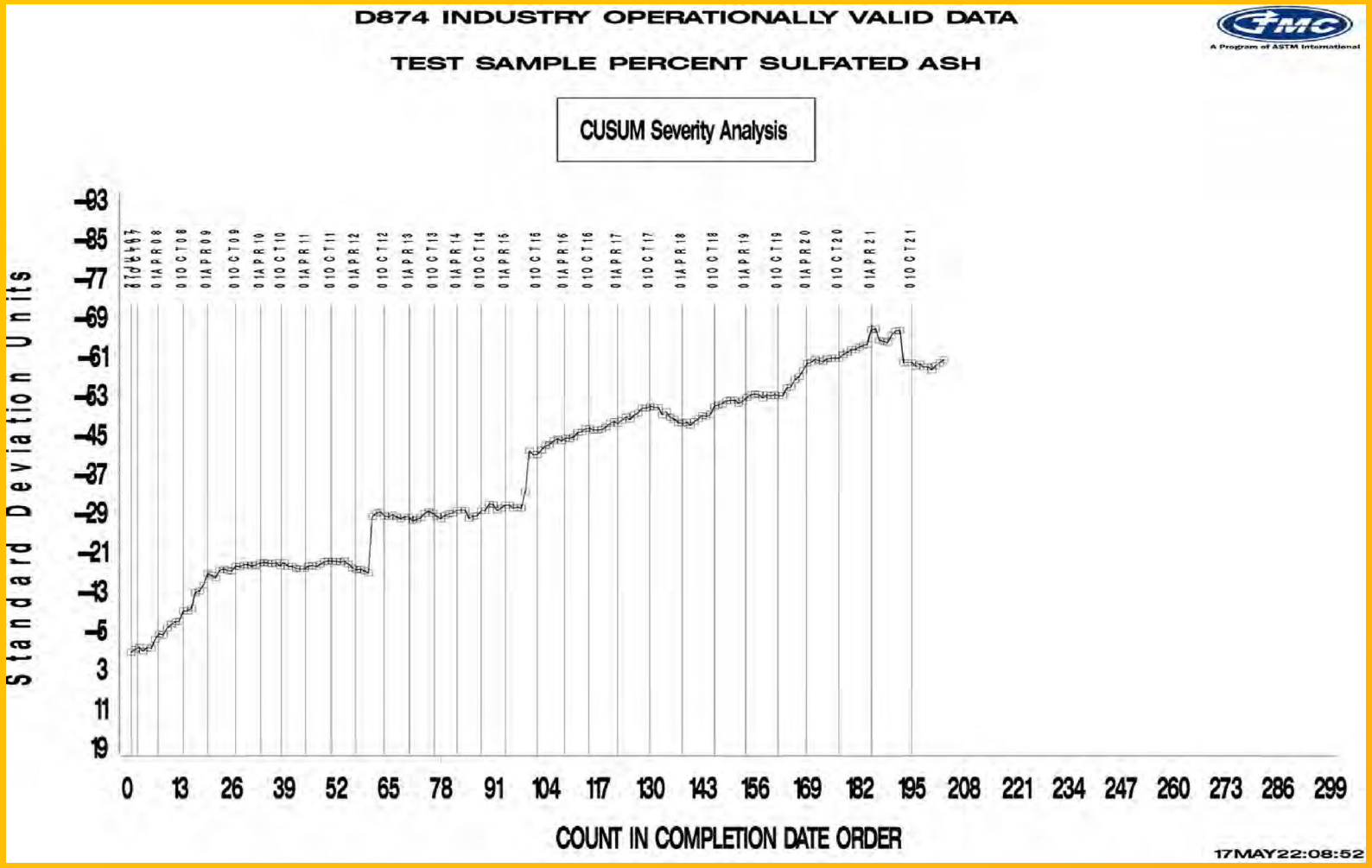
SULFATED ASH, MASS% MEAN Δ/S BY OIL

D874: Sulfated Ash



Return to Executive Summary

CUSUM PLOT


D874 INDUSTRY OPERATIONALLY VALID DATA
TEST SAMPLE PERCENT SULFATED ASH
CUSUM Severity Analysis
Standard Deviation Units
93
85
77
69
61
53
45
37
29
21
13
5
3
11
19
0 13 26 39 52 65 78 91 104 117 130 143 156 169 182 195 208 221 234 247 260 273 286 299
COUNT IN COMPLETION DATE ORDER
17MAY22:08:52

OIL INVENTORY

Oil	Year Rec'd By TMC	TMC Inventory, Gallons	Gallons Shipped last 12 Months
820-2	2001	8.4	0
90	2005	11.7	0
91	2006	3.1	0.3

- 32 mL per sample aliquot
- Oil 90 also used as QC Check Oil

D874: SULFATED ASH

- Precision (Pooled s) has improved with respect to the previous period and is in line with historical estimates

- Performance (Mean Δ/s) is -0.07 s which is on or near target
- New oil supplied as potential replacement for oil 90 (also used as QC) – oil 92
- SP to convene upcoming semester for potential RR