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Test Monitoring Center

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ASTM D02.B2 Semi-Annual Report Heavy Duty Reference Oil Testing

Spring 2019

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Heavy Duty Testing

Executive Summary

- ▶ Reference Oils
 - No reference oil issues to report
- ▶ Test Issues
 - COAT test improvements ongoing. Matrix testing completed and data analysis ongoing.
 - ISB camshaft supply issue is being worked by OEM and surveillance panel.

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Calibrated Labs and Stands*

Test	Labs	Stands
1K	1	1
1N	3	4
1M-PC	0	0
1P	2	2
1R	1	1
C13	2	2
ISB	0	0
ISM	4	4
EOAT	1	1
RFWT	1	1
T-8/E	2	2
T-11	3	4
T-12/T-12A	2/2	2/2
T-13	4	8
COAT	0	0
DD13	3	4

*As of 03/31/2019

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SCOTE 1K

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1 K Test Activity

Test Status	Validity Code	#
Acceptable Calibration Test	AC	1
Failed Calibration Test	OC	0
Operationally Invalid	LC	0
Aborted	XC	0
Total		1

1 K Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
Total	0

1 K Lost Tests*

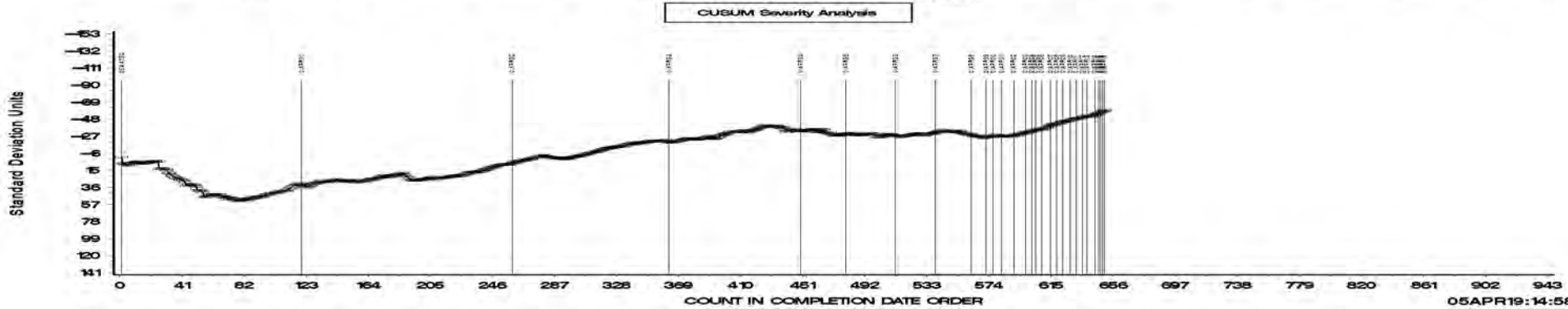
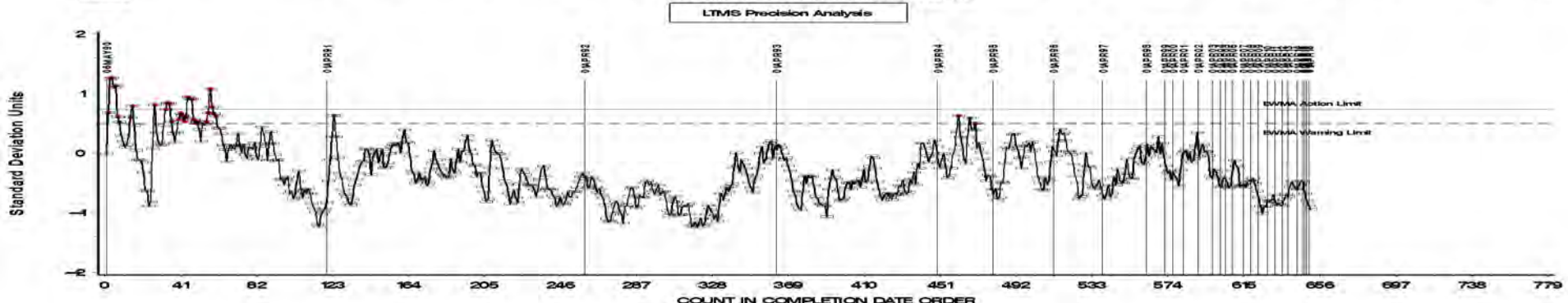
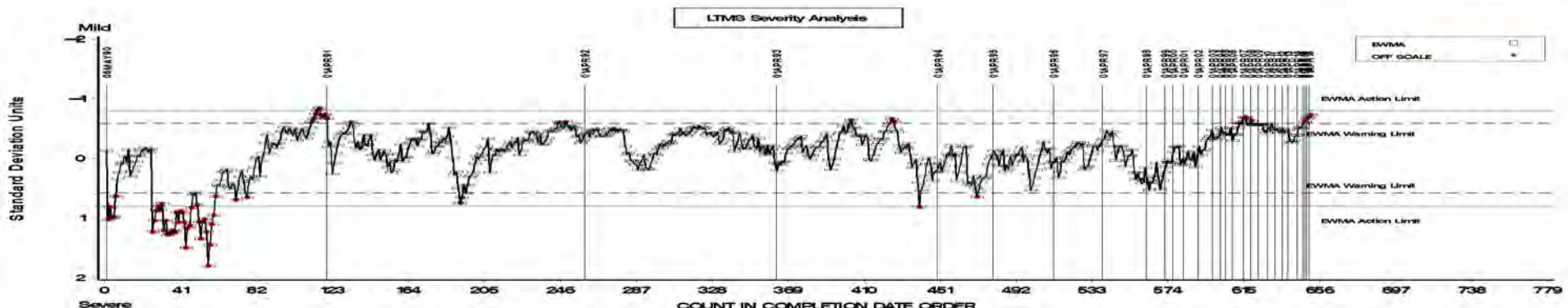
Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
Total		0

*Invalid and aborted tests

1 K Test Severity

- ▶ TGF is in warning alarm in the mild direction
- ▶ BSOC is in action alarm in the mild direction
- ▶ WDK, TLHC and EOTOC are in control

FINAL TGF



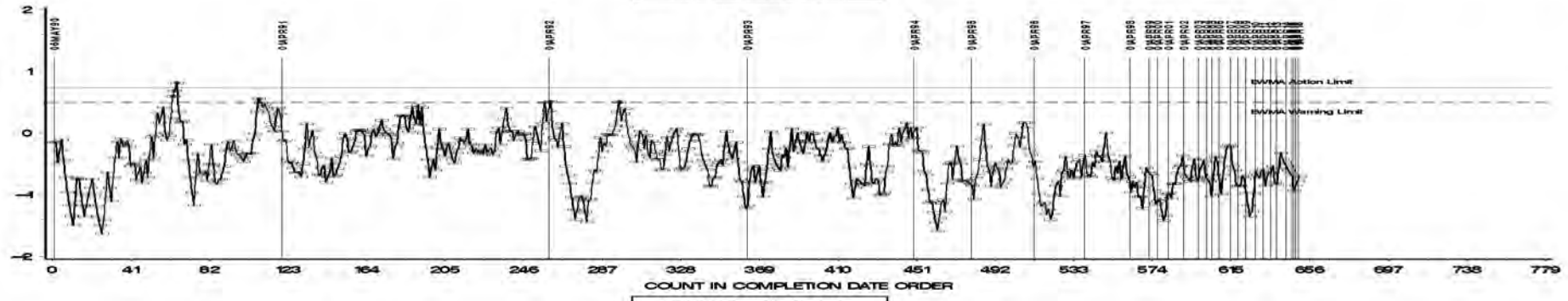
05APR19:14:58

FINAL TLHC

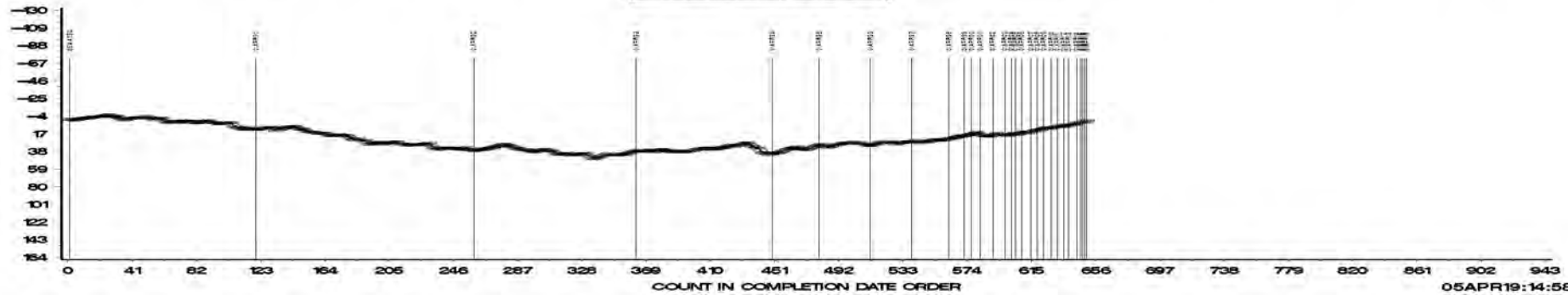
LTMS Severity Analysis



LTMS Precision Analysis

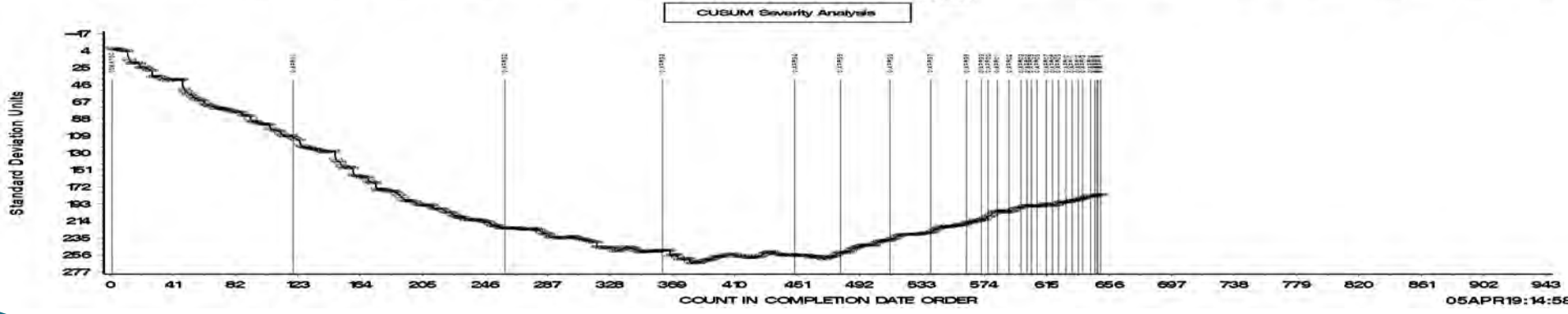
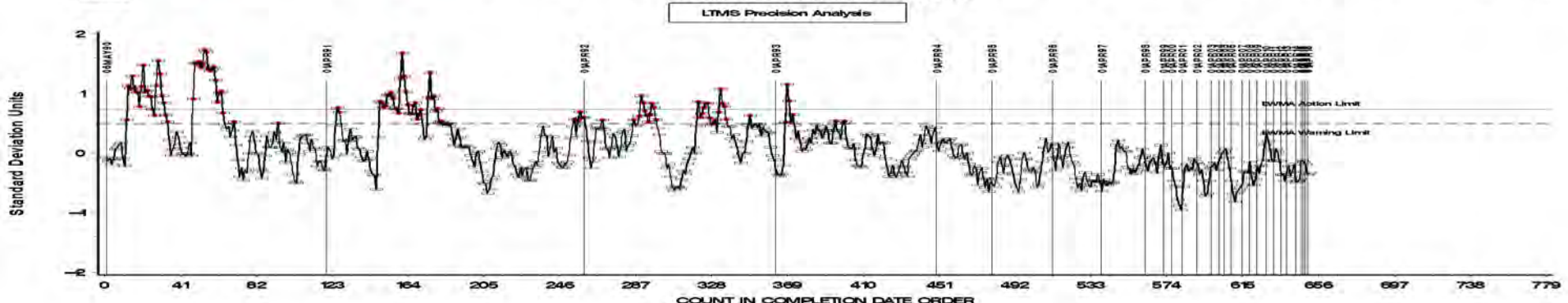
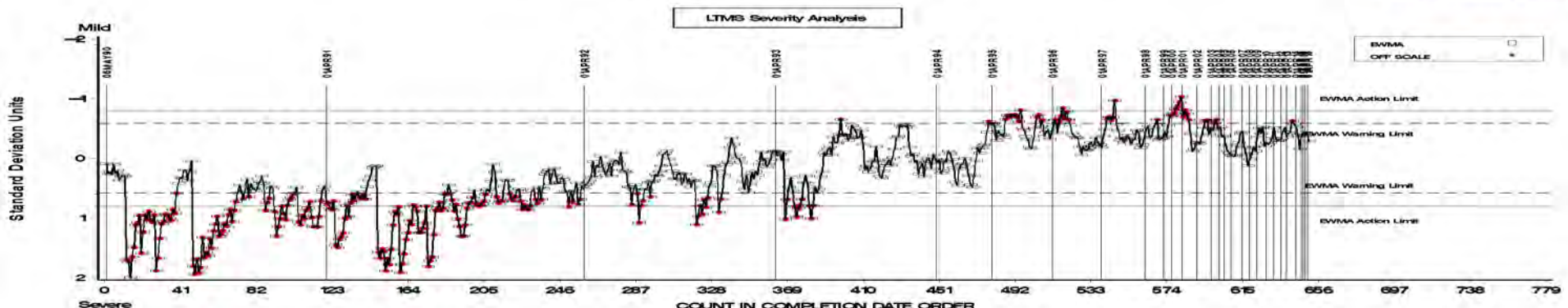


CUSUM Severity Analysis



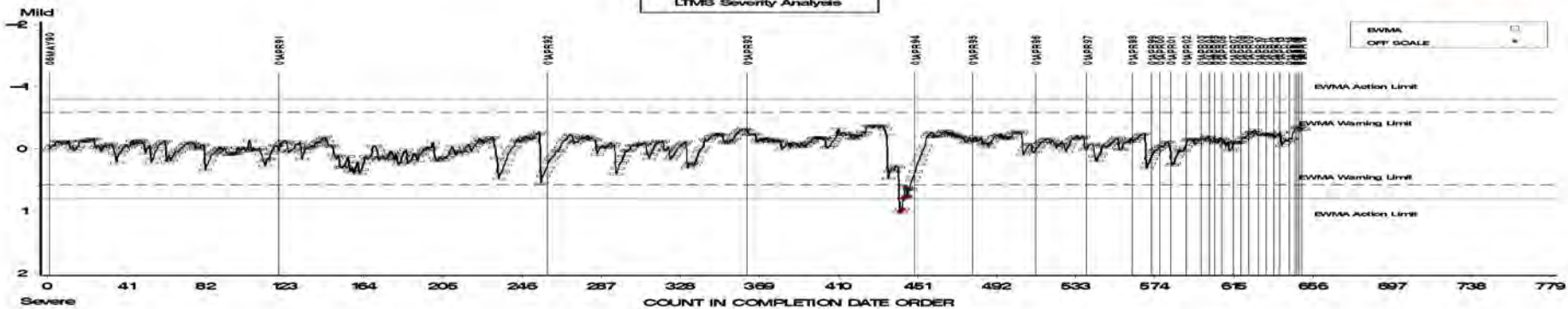
05APR19:14:58

FINAL Weighted Total Demerits

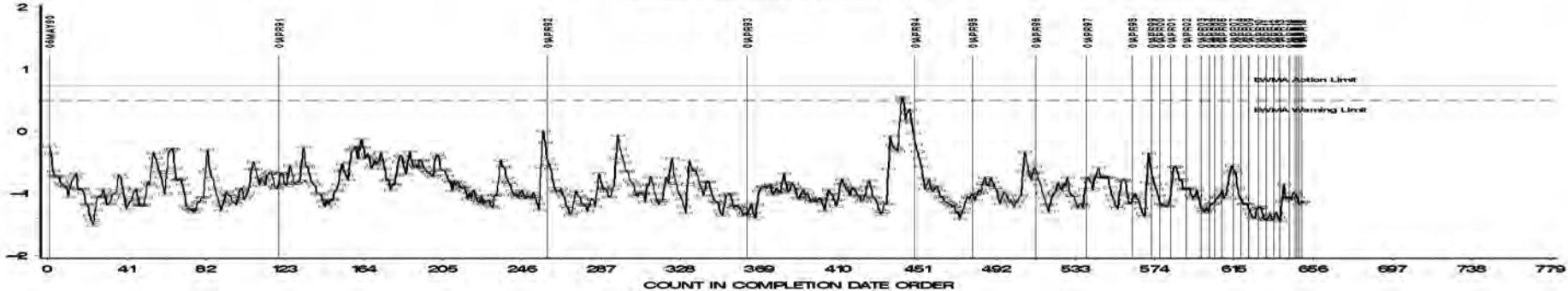


FINAL ETOC

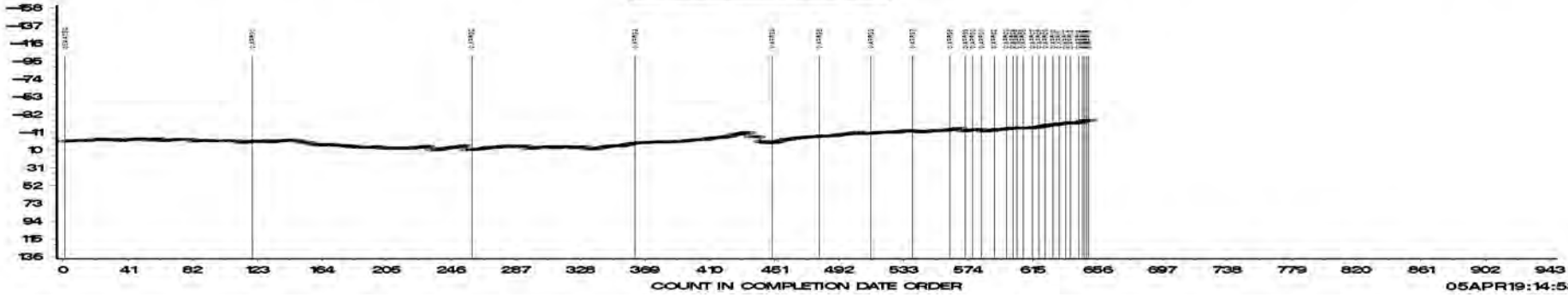
LTMS Severity Analysis



LTMS Precision Analysis

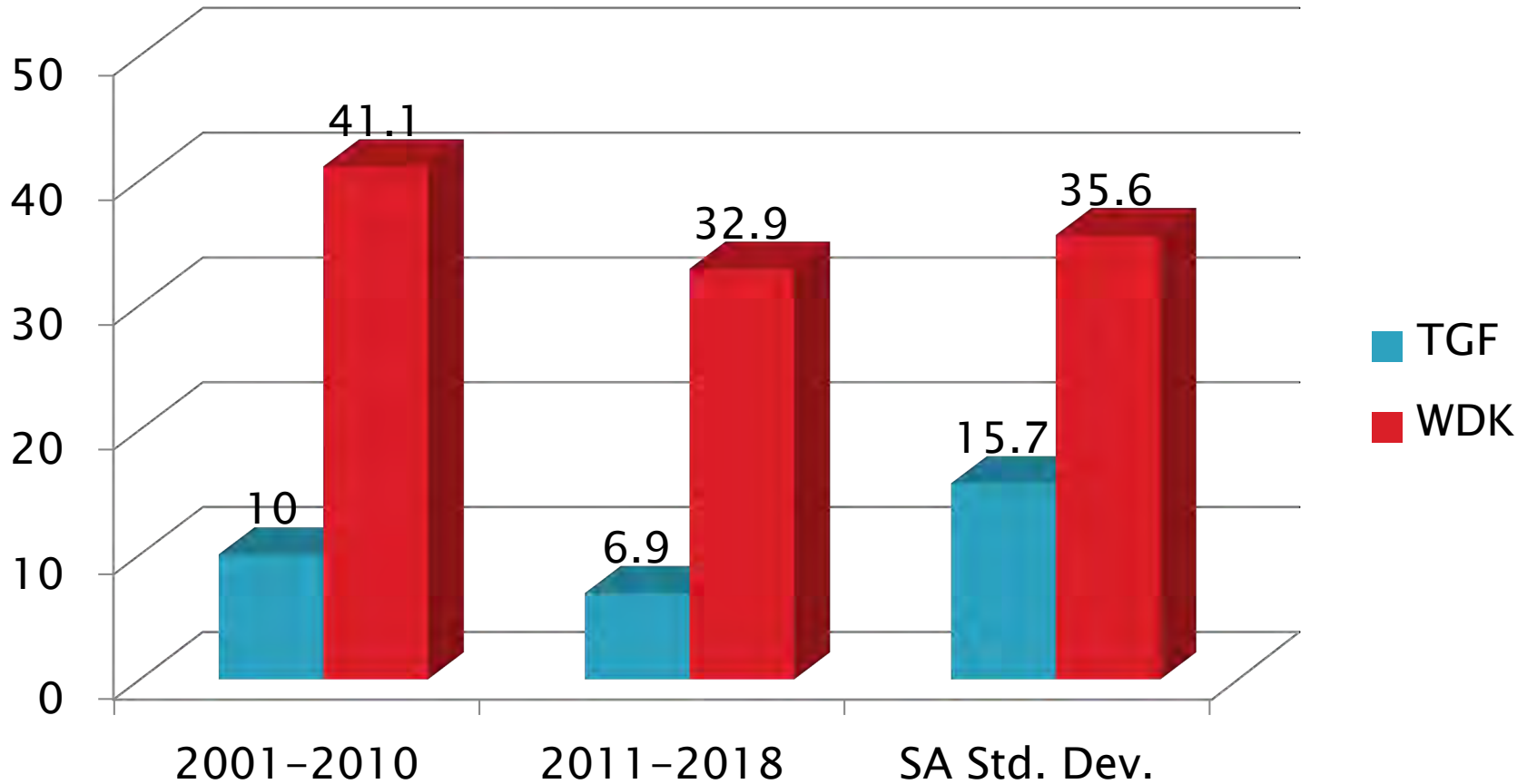


CUSUM Severity Analysis

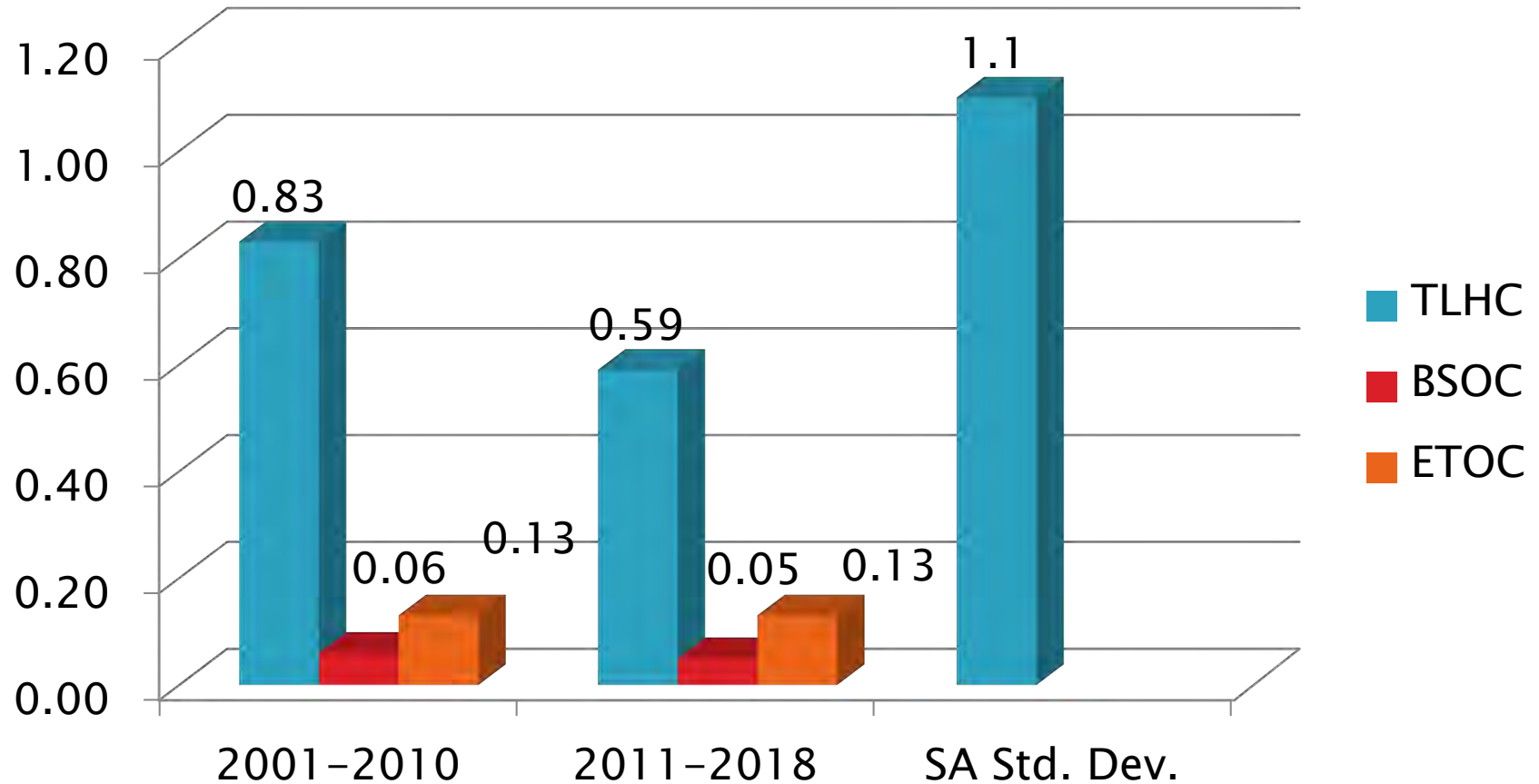


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1 K Precision Estimates



1 K Precision Estimates



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SCOTE 1N

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1 N Test Activity

Test Status	Validity Code	#
Acceptable Calibration Test	AC	2
Failed Calibration Test	OC	0
Operationally Invalid	LC	0
Aborted	XC	0
Informational	NN	0
Total		2

1 N Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
Total	0

1 N Lost Tests*

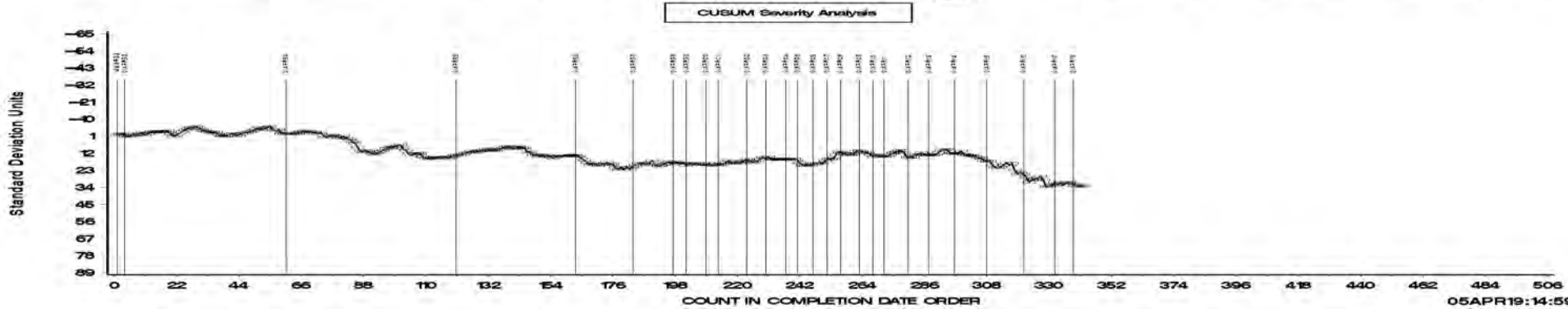
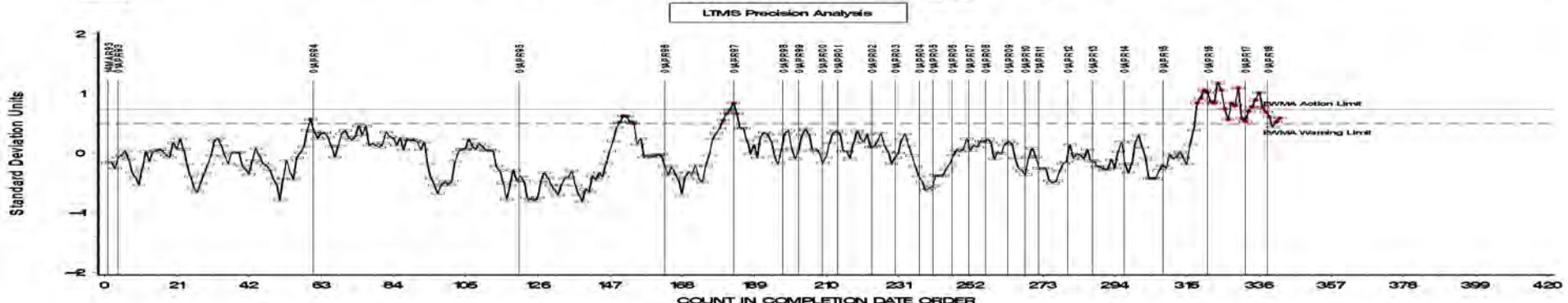
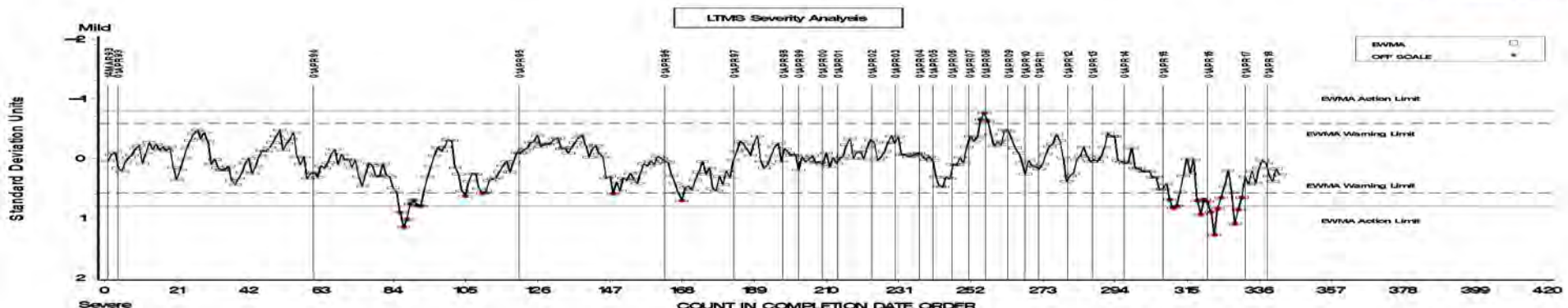
Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
Total		0

*Invalid and aborted tests

1 N Test Severity

- ▶ WDN and BSOC in severity warning alarm mild direction.
- ▶ TGF in precision warning alarm.
- ▶ TLHC in control
- ▶ Severity trends are being evaluated by surveillance panel

FINAL CORRECTED TGF

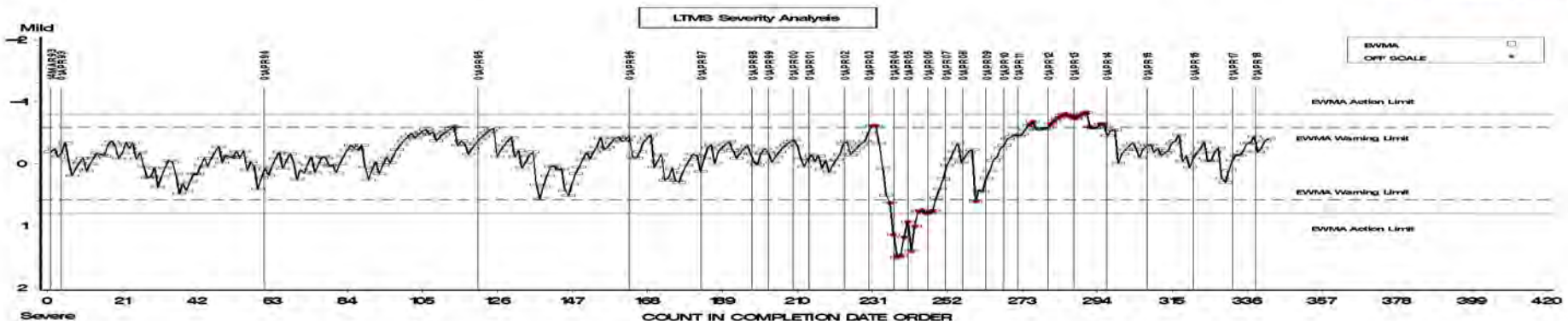


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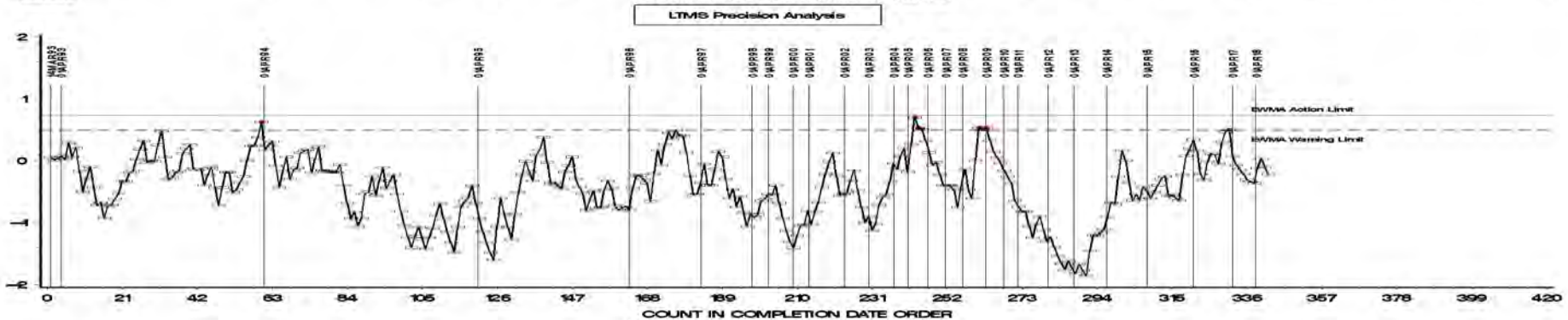
CATERPILLAR IN INDUSTRY OPERATIONAL VALIDATION DATA

Top Land Heavy Carbon

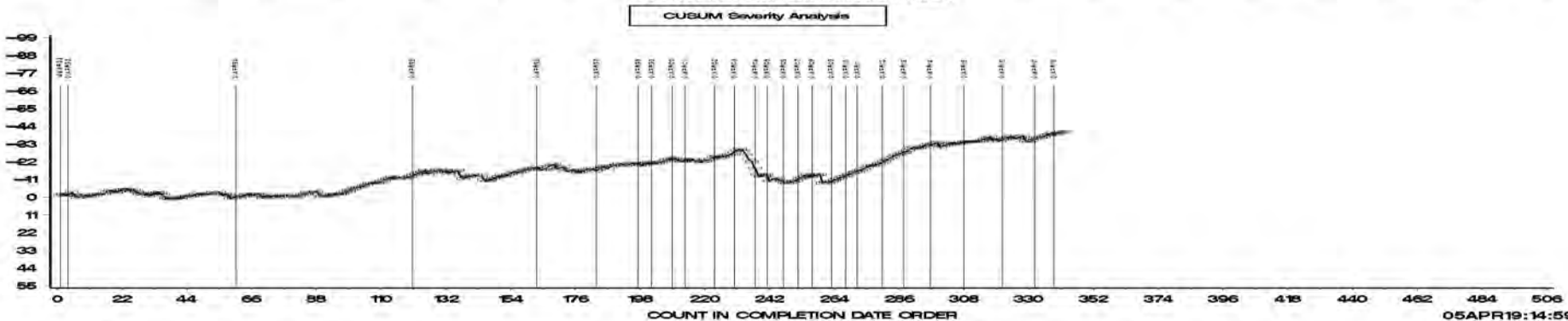
Standard Deviation Units



Standard Deviation Units



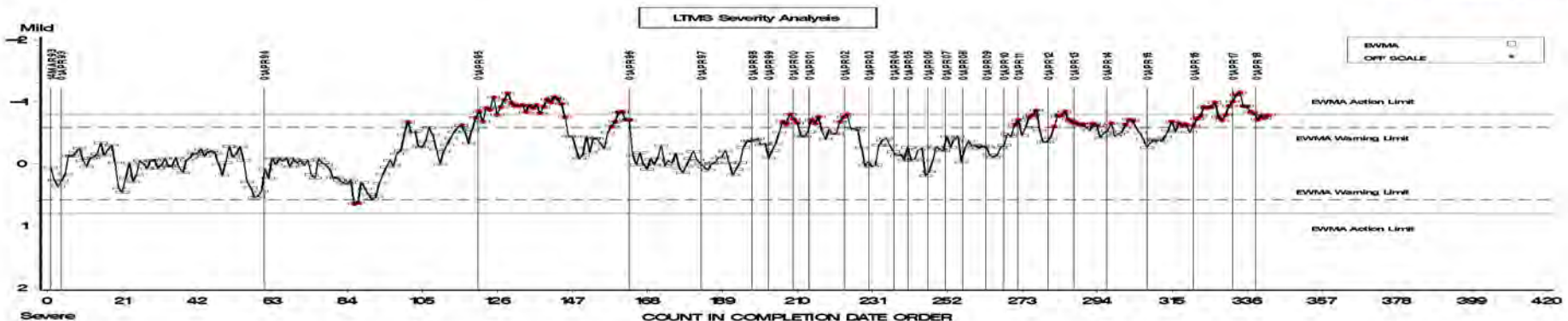
Standard Deviation Units



05APR19:14:59

Weighted Total Demerits

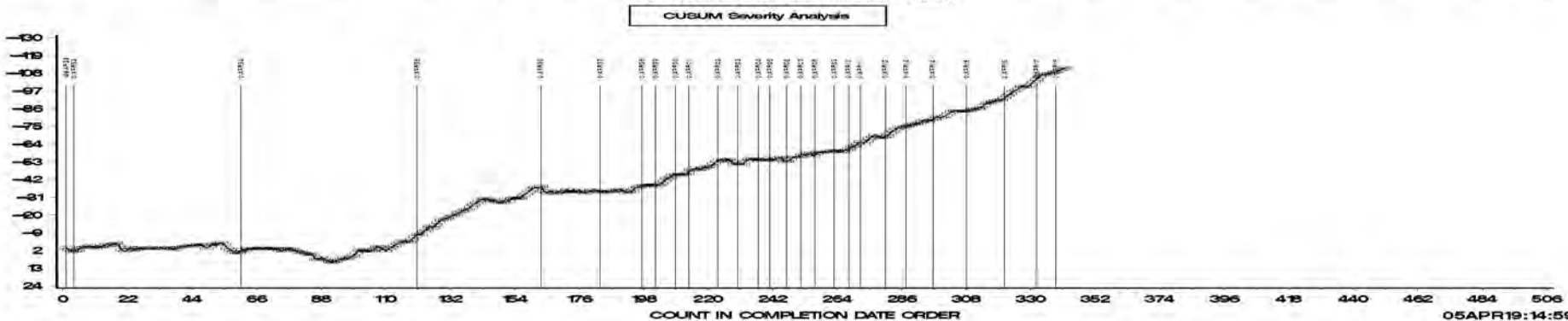
Standard Deviation Units



Standard Deviation Units



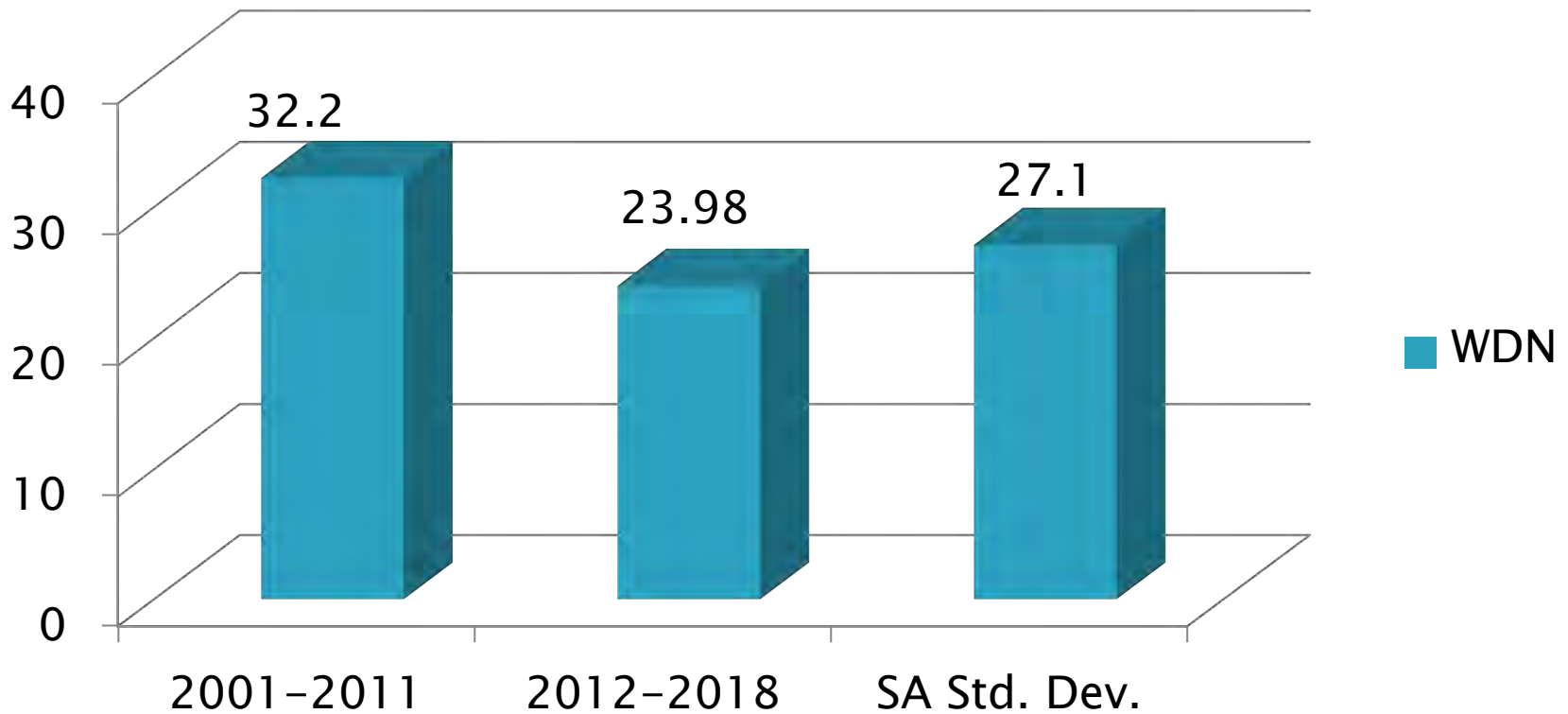
Standard Deviation Units



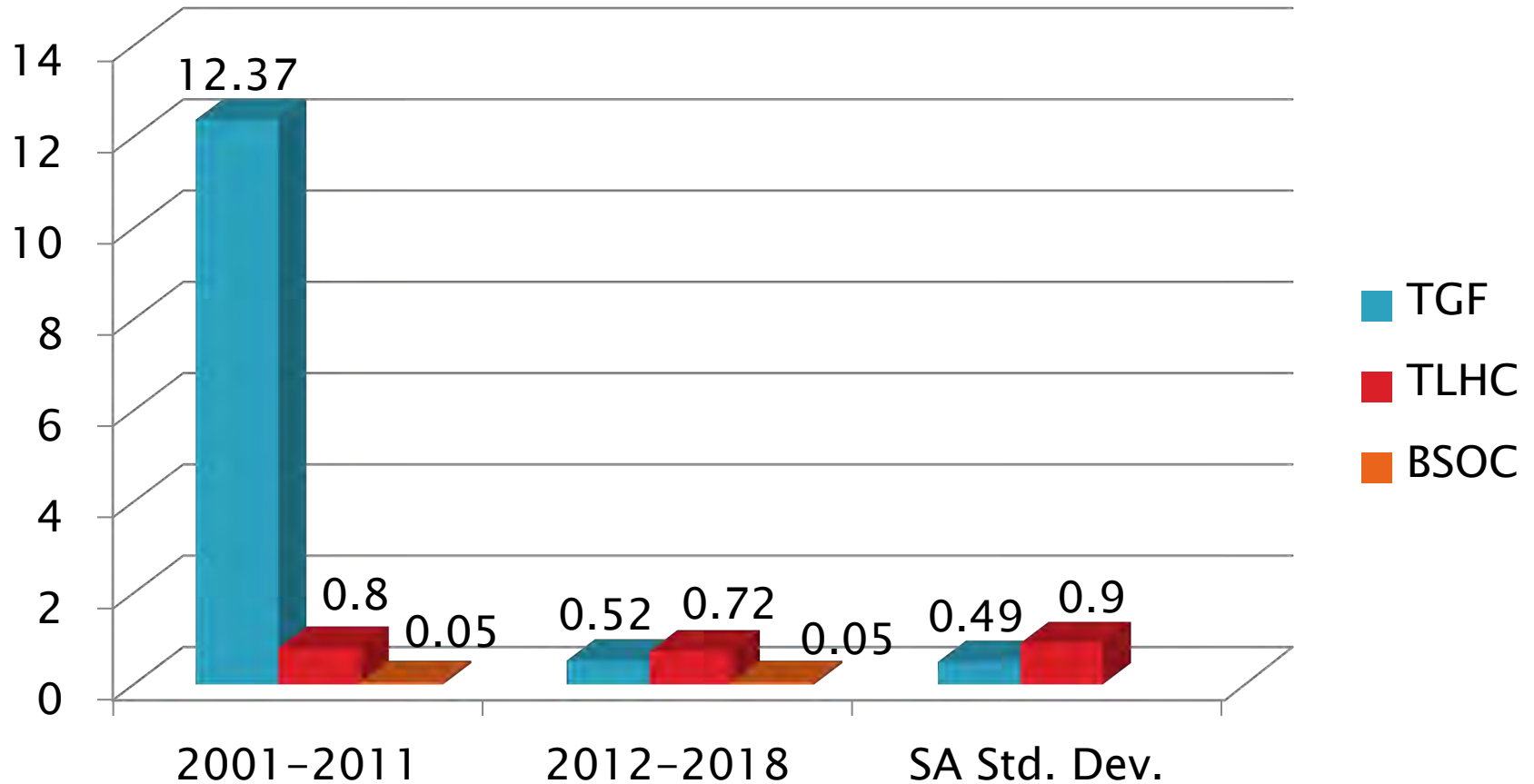
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1 N Precision Estimates

WDN



1N Precision Estimates



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SCOTE 1 M-PC

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1 M-PC Test Activity

Test Status	Validity Code	#
Acceptable Calibration Test	AC	1
Failed Calibration Test	OC	0
Operationally Invalid	LC	0
Total		1

1 M-PC Failed Tests

Failed Parameter	Number of Tests
No Failed Test	0
Total	0

1 M-PC Lost Tests*

Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
Total		0

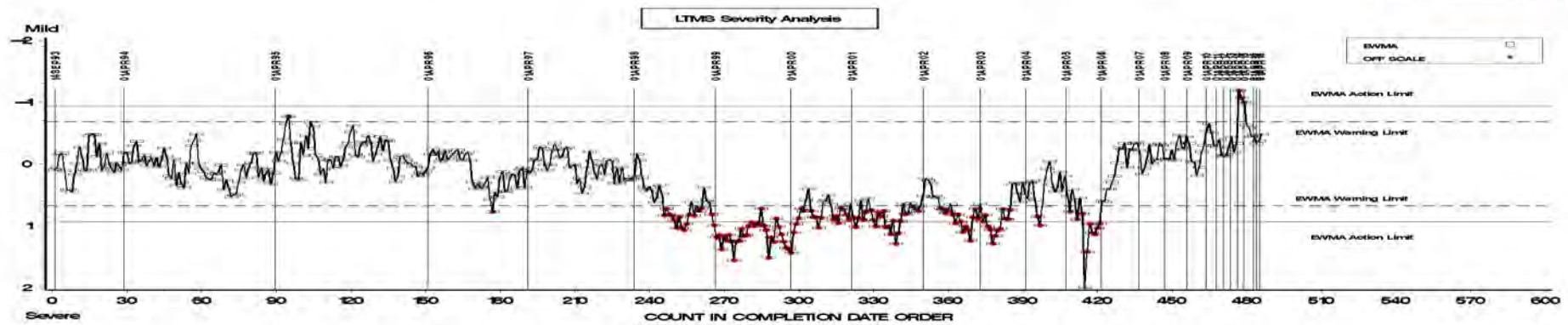
*Invalid and aborted tests

1 M-PC Test Severity

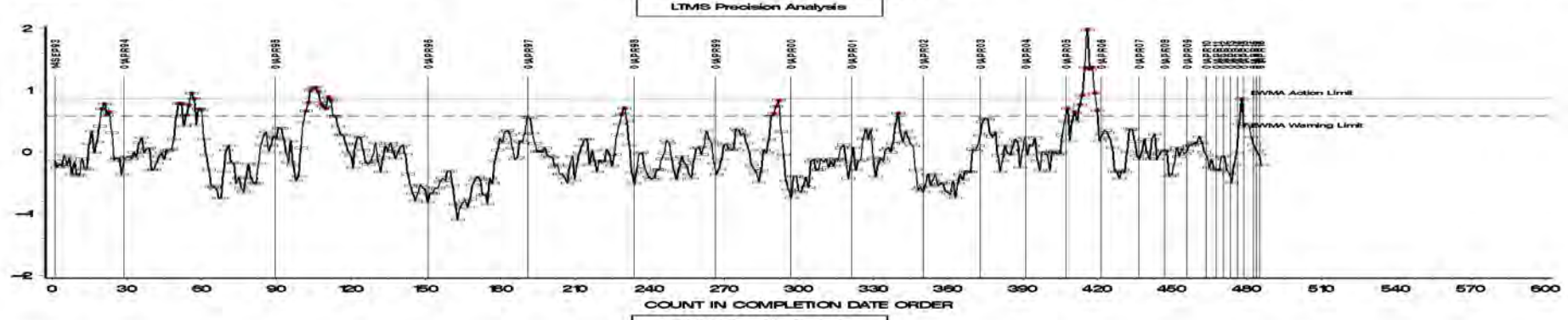
- ▶ TGF and WTD are in control.

Weighted Total Demerits

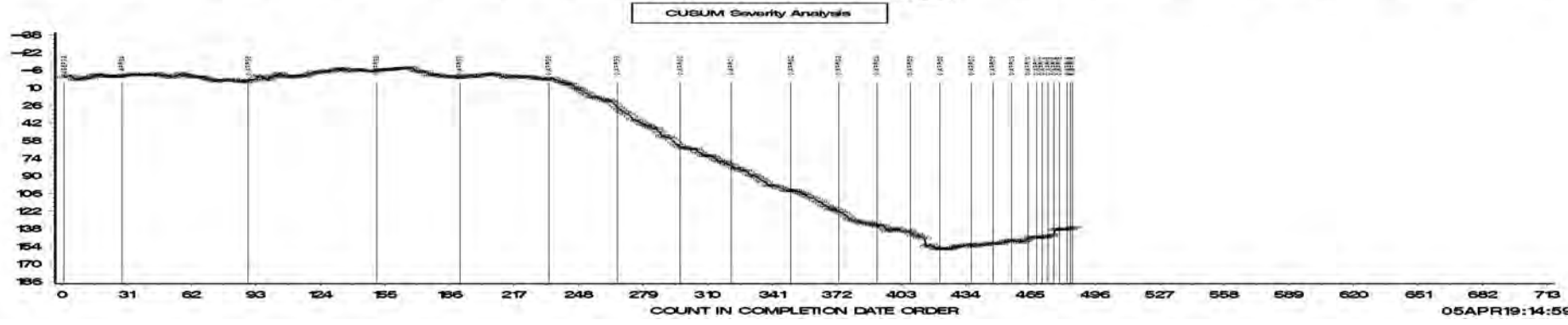
Standard Deviation Units



Standard Deviation Units

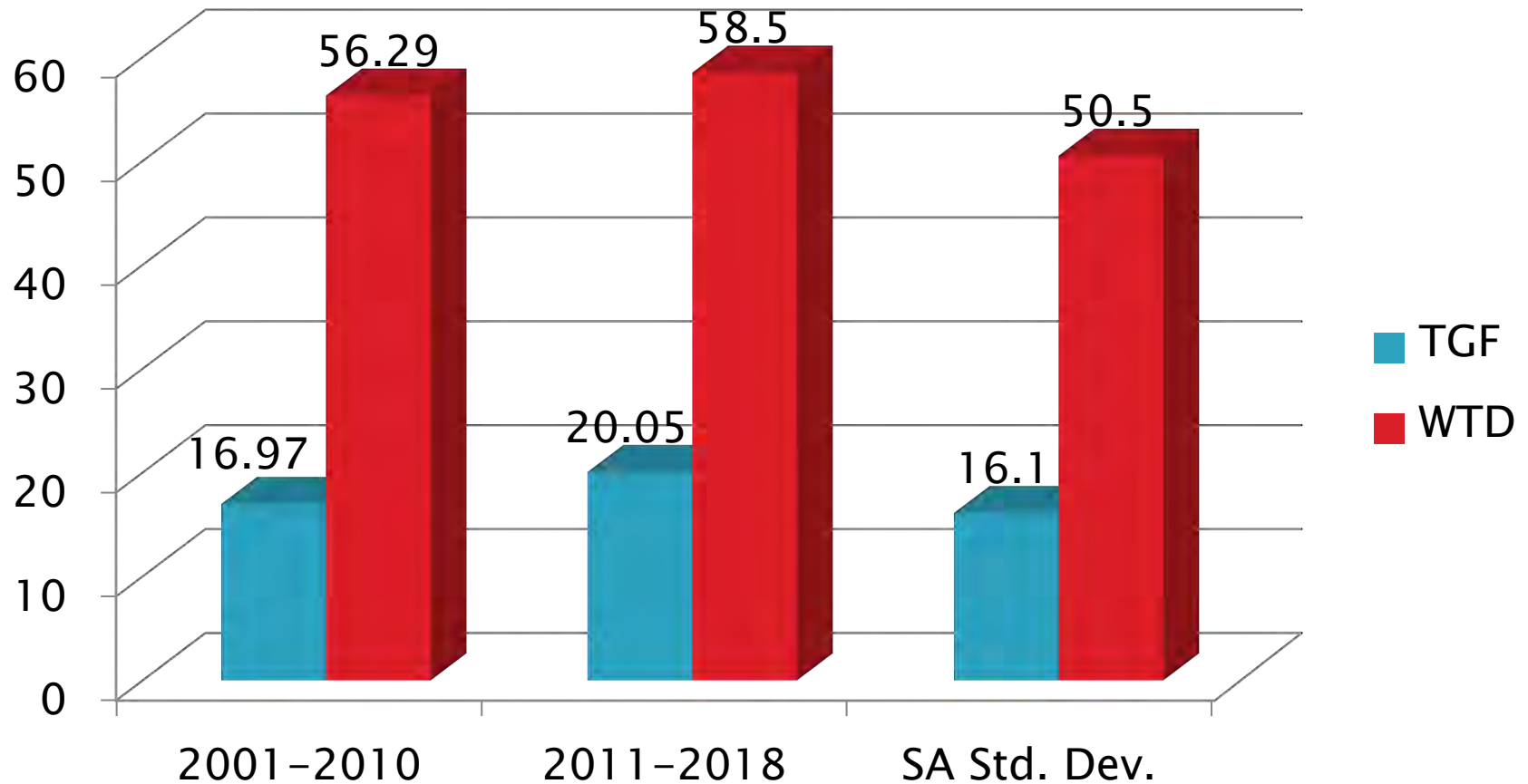


Standard Deviation Units



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1 MPC Precision Estimates



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SCOTE 1 P

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1P Test Activity

Test Status	Validity Code	#
Acceptable Calibration Test	AC	0
Failed Calibration Test	OC	0
Operationally Invalid	LC	0
Aborted	XC	0
Donated	AG	0
Total		0

1 P Failed Tests

Failed Parameter	Number of Tests
No Failed Tests	0
Total	0

1P Lost Tests*

Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
Total		0

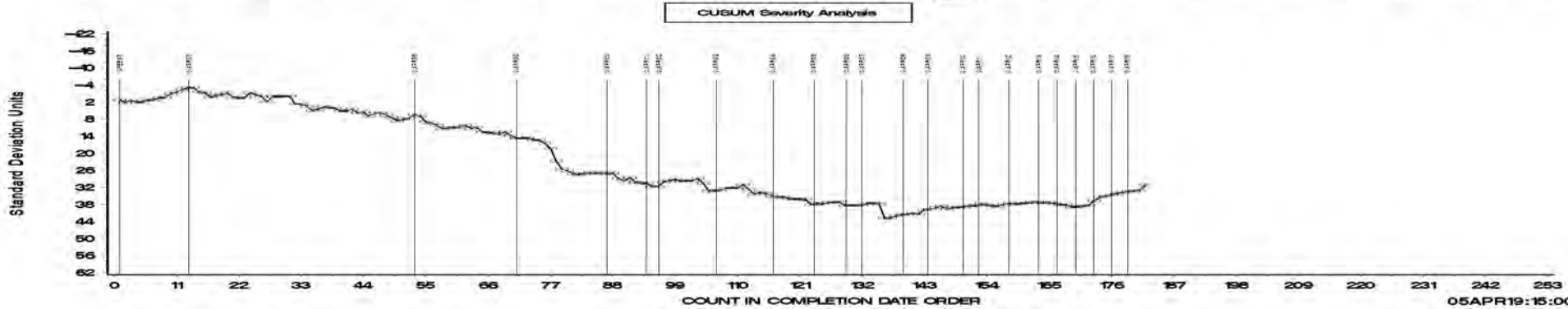
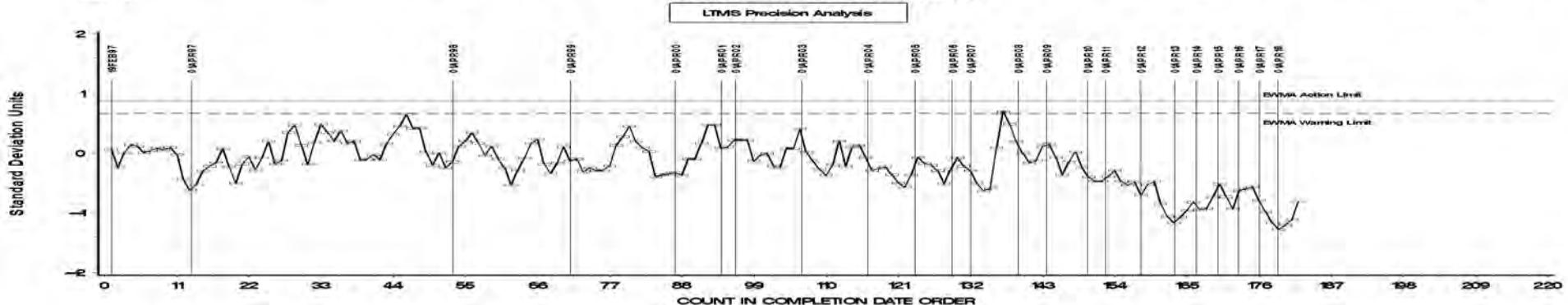
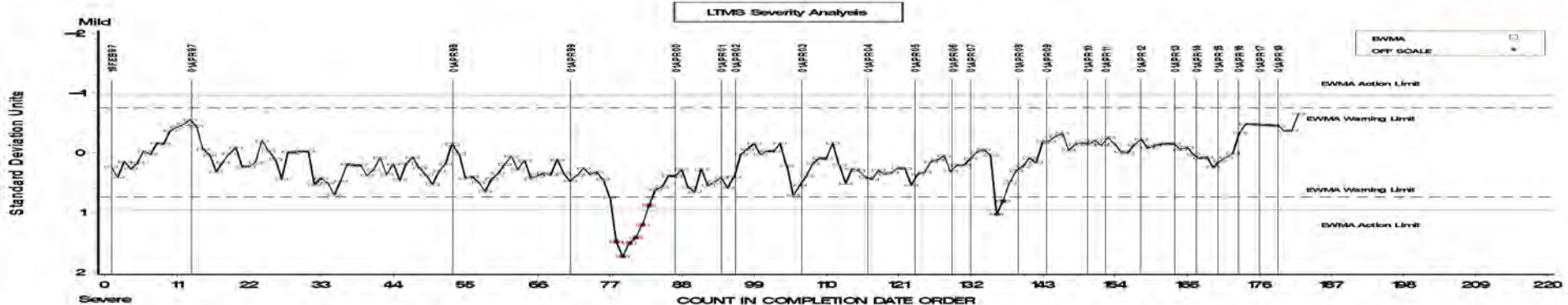
*Invalid and aborted tests

1 P Test Severity

- ▶ As no 1P tests were run during this period no statement about test severity can be made.

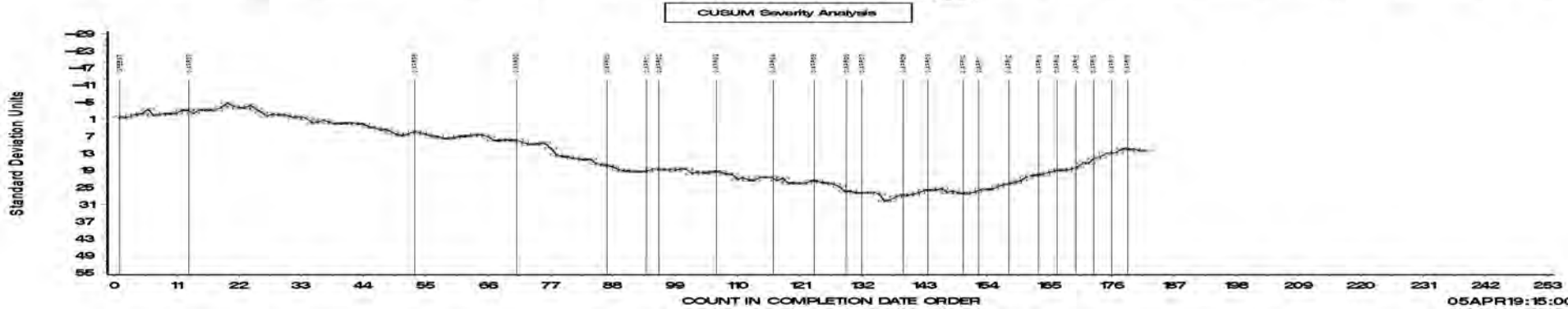
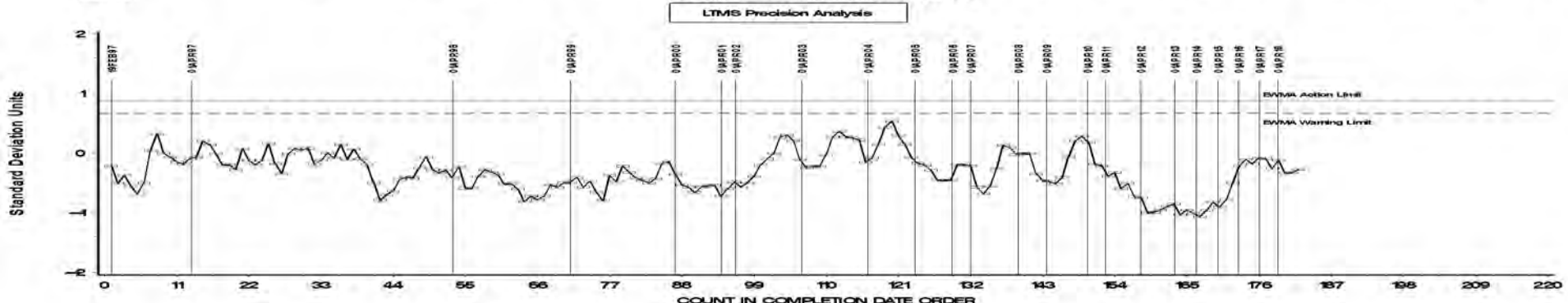
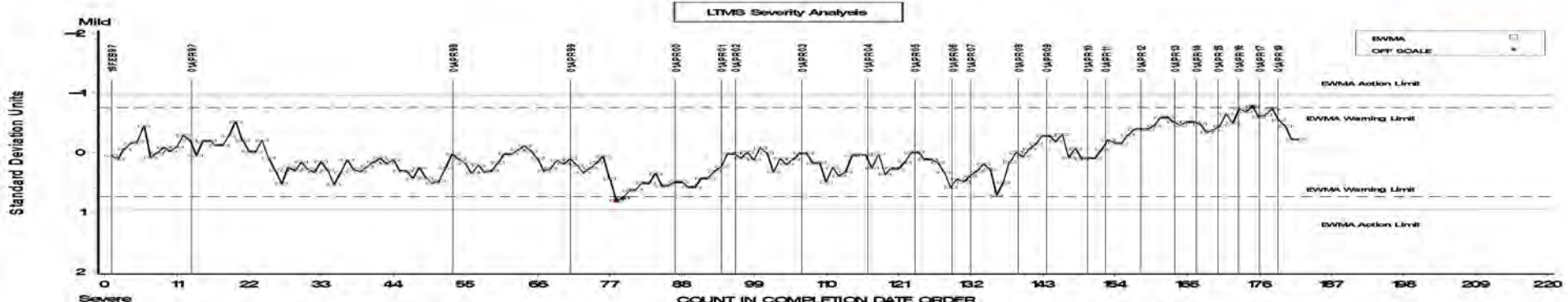
CATERPILLAR 1P INDUSTRY CYCLER OPERATIONAL VALID DATA

TOP GROOVE CARBON



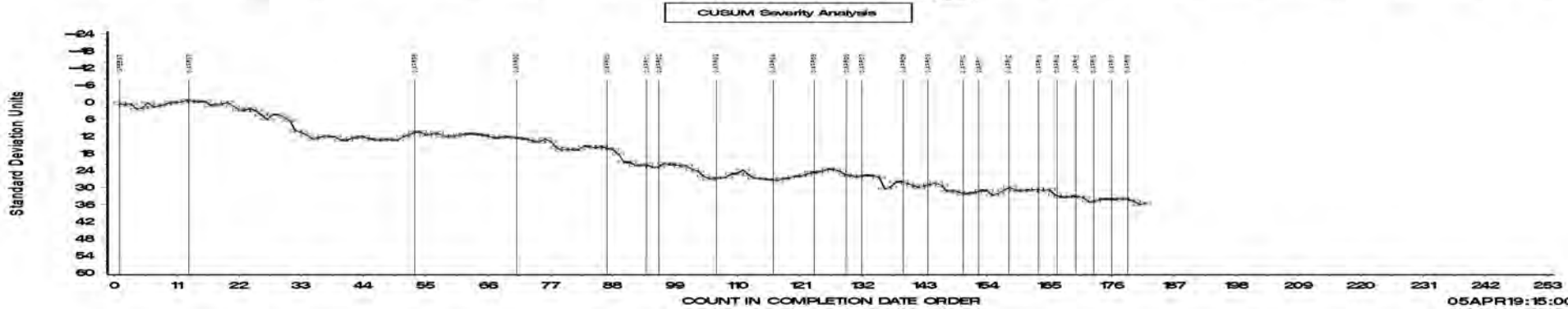
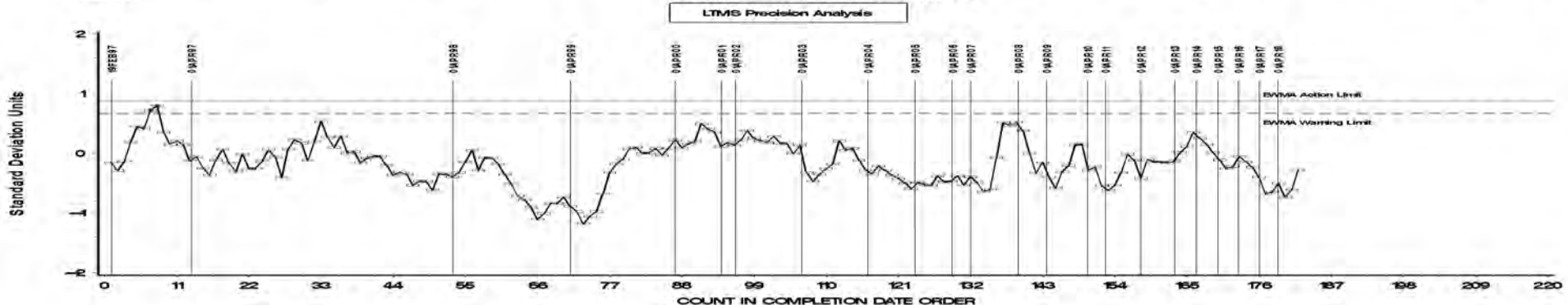
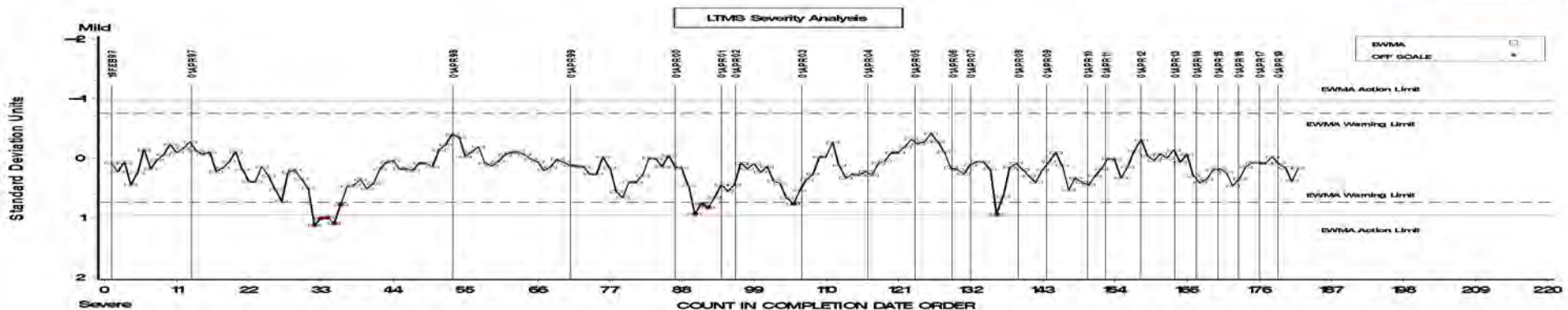
05APR19:15:00

TOP LAND CARBON



05APR19:15:00

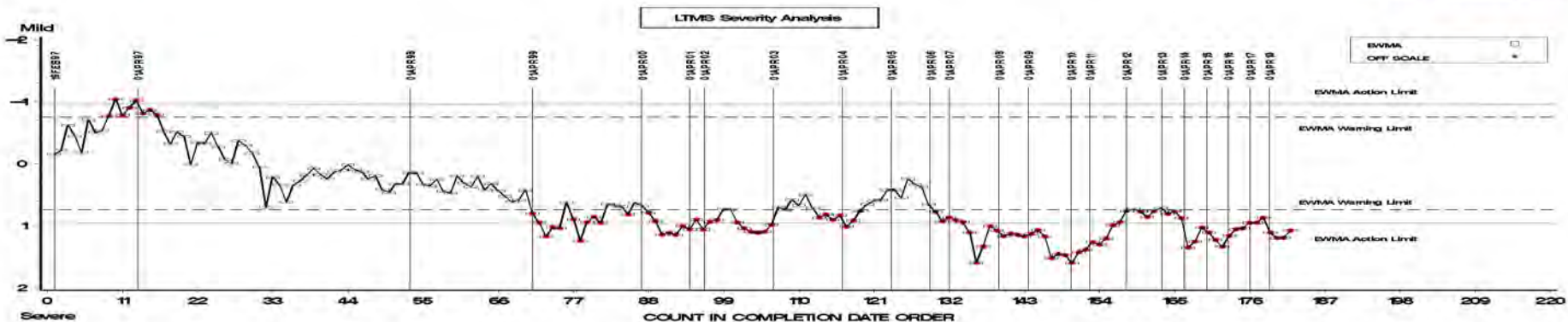
WEIGHTED TOTAL DEMERITS



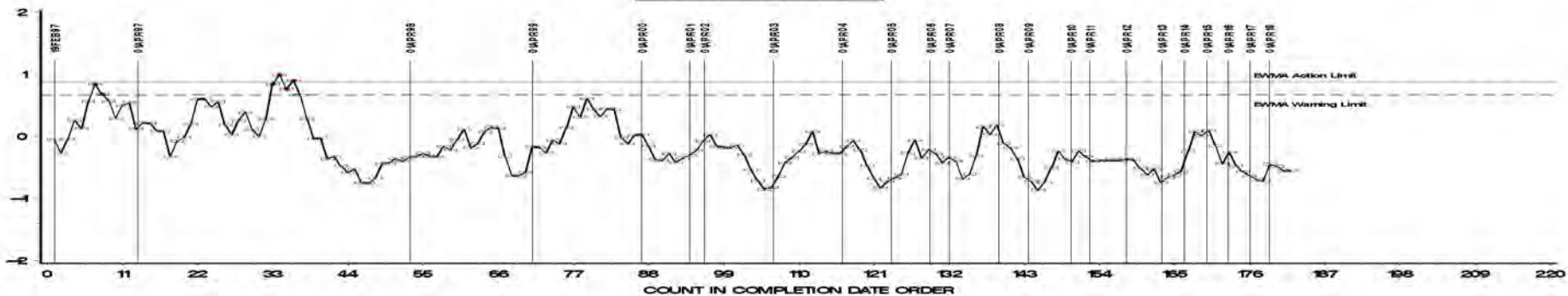
05APR19:15:00

EOTOC

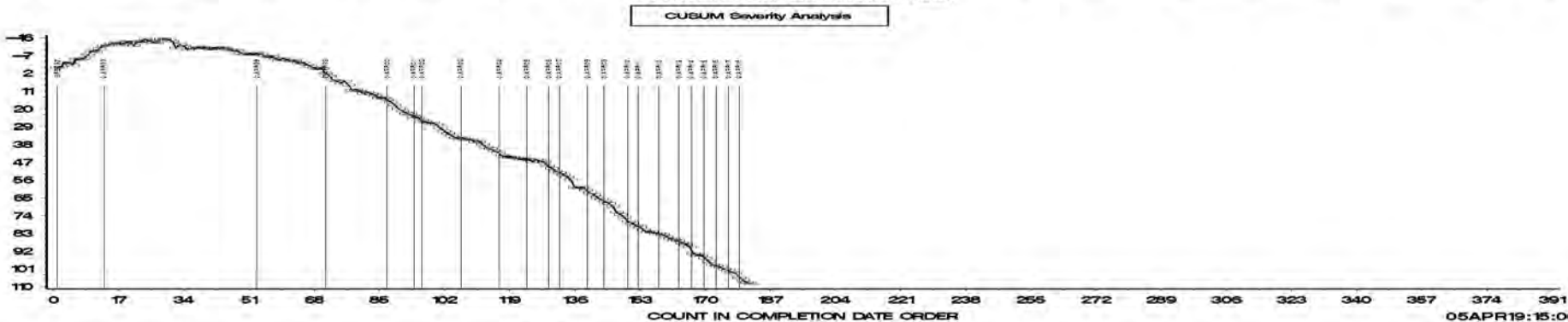
Standard Deviation Units



Standard Deviation Units

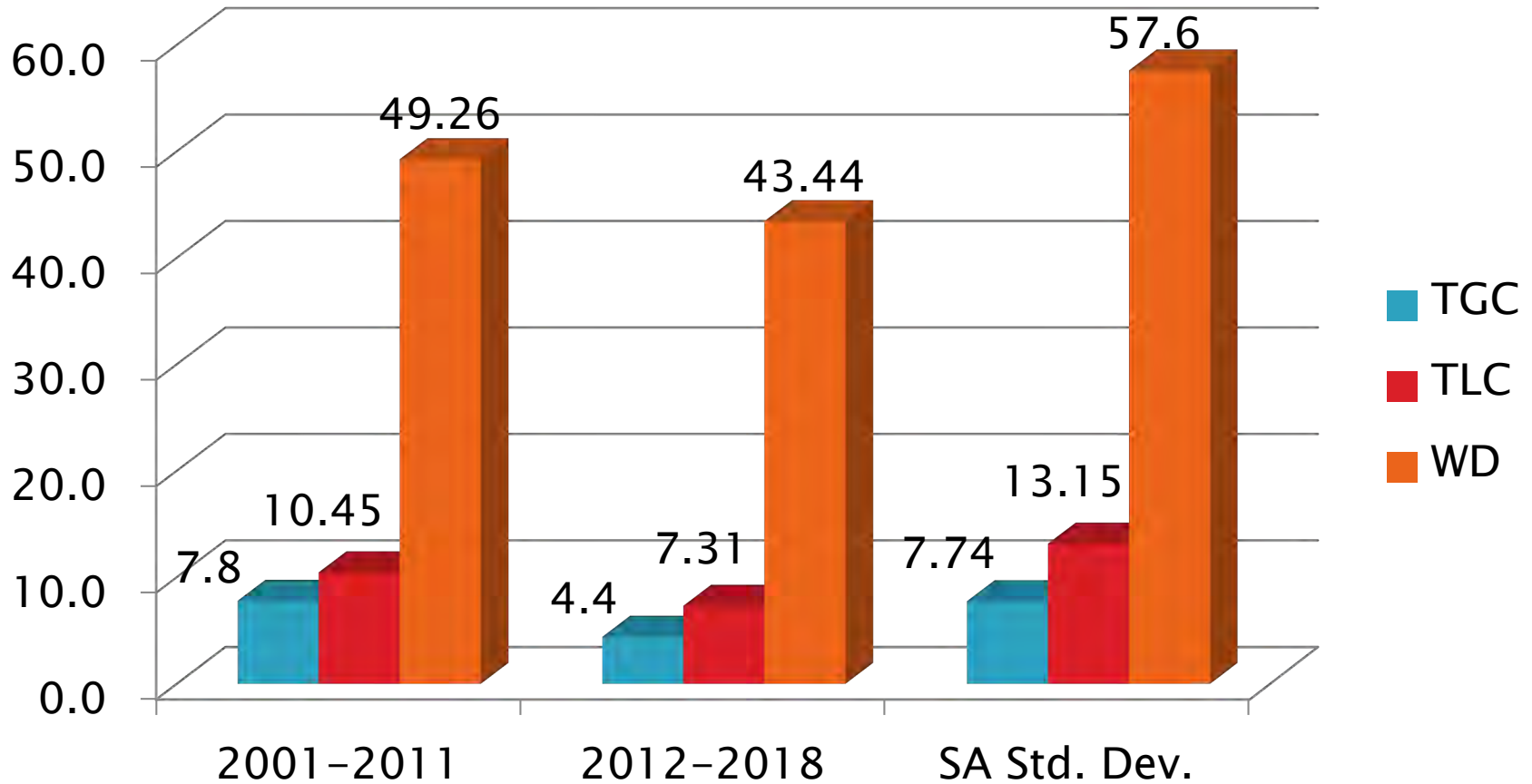


Standard Deviation Units

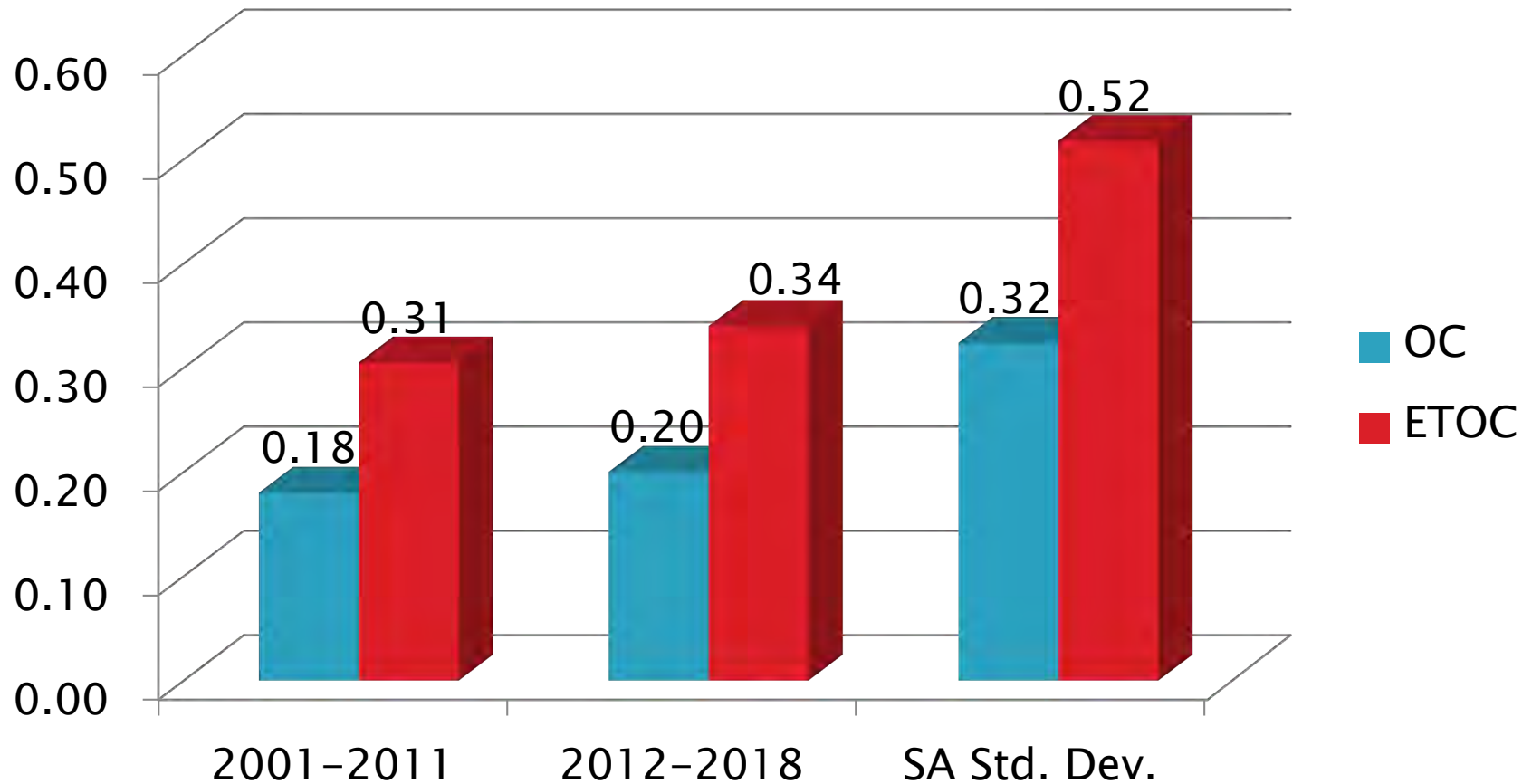


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1P Precision Estimates



1P Precision Estimates



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SCOTE 1 R

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1 R Test Activity

Test Status	Validity Code	#
Acceptable Calibration Test	AC	0
Failed Calibration Test	OC	0
Operationally Invalid	LC	0
Aborted	XC	0
Total		0

1 R Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
Total	0

1 R Lost Tests*

Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
Total		0

*Invalid and aborted tests

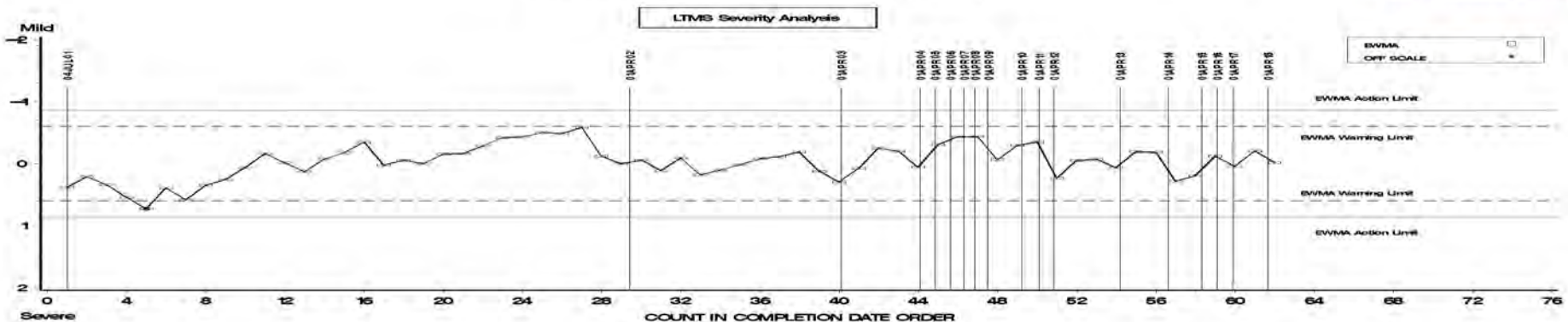
1R Test Severity

- ▶ As no 1R tests were run during this period no statement about test severity can be made.

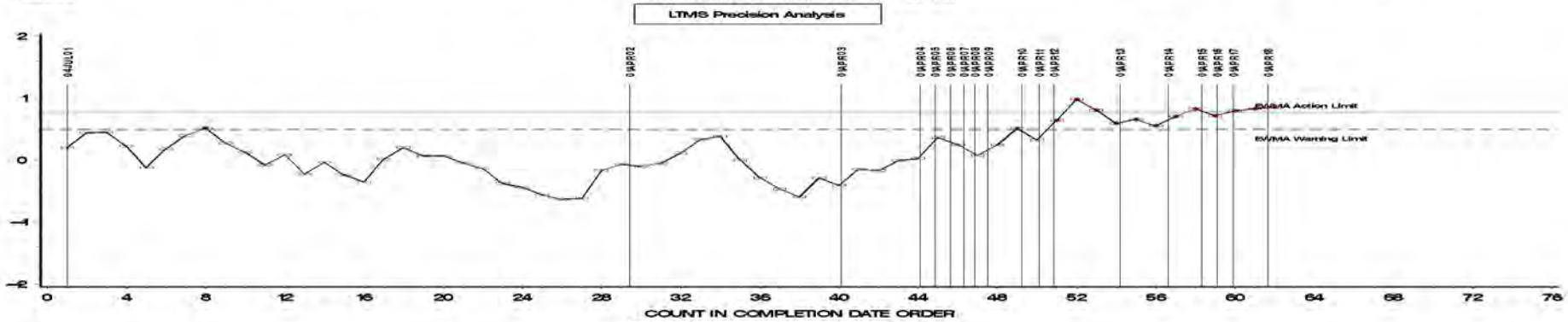
CATERPILLAR 1R INDUSTRY PARTIAL VALID DATA

FINAL TOP GROOVE CARBON (DEMERITS)

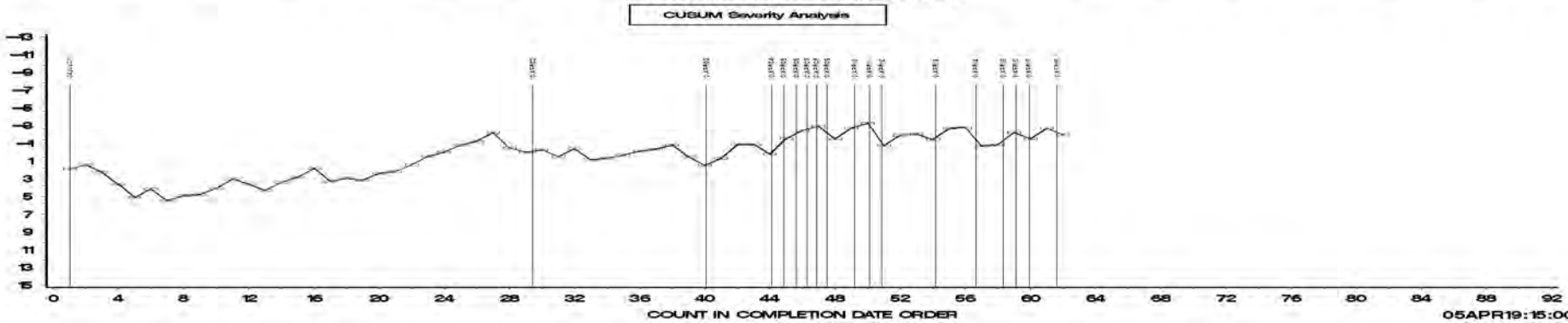
Standard Deviation Units



Standard Deviation Units

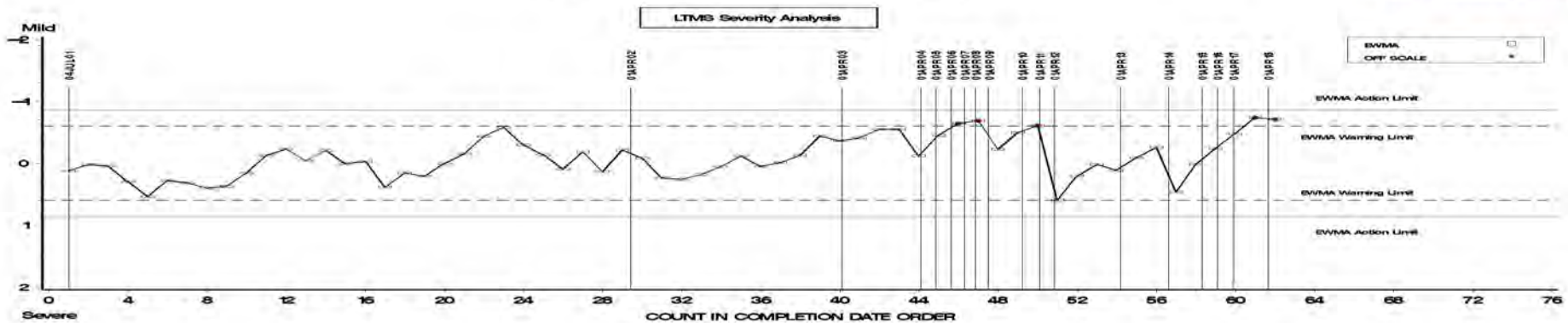


Standard Deviation Units

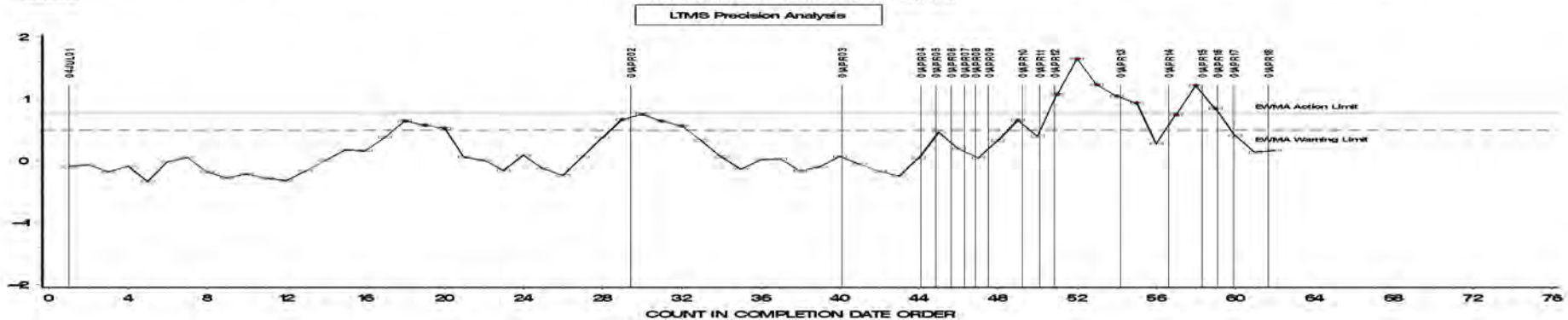


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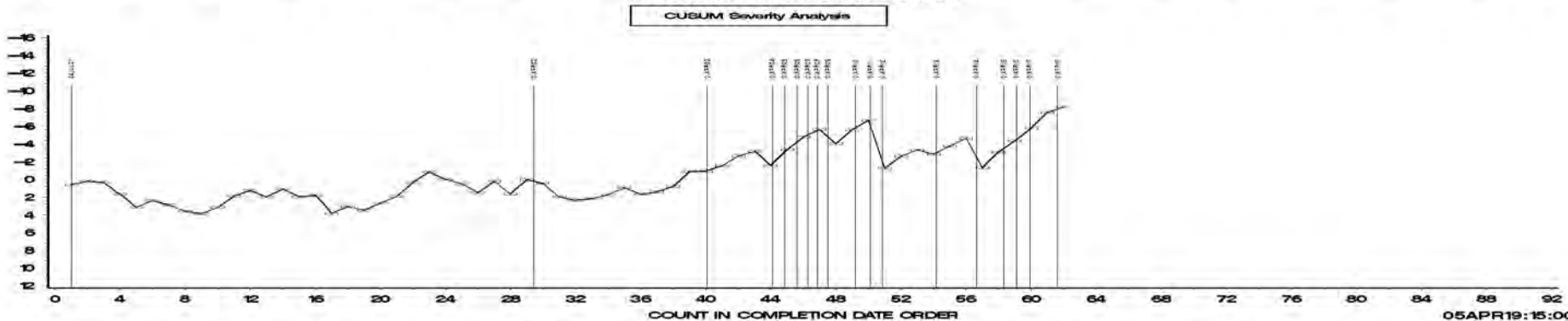
Standard Deviation Units



Standard Deviation Units



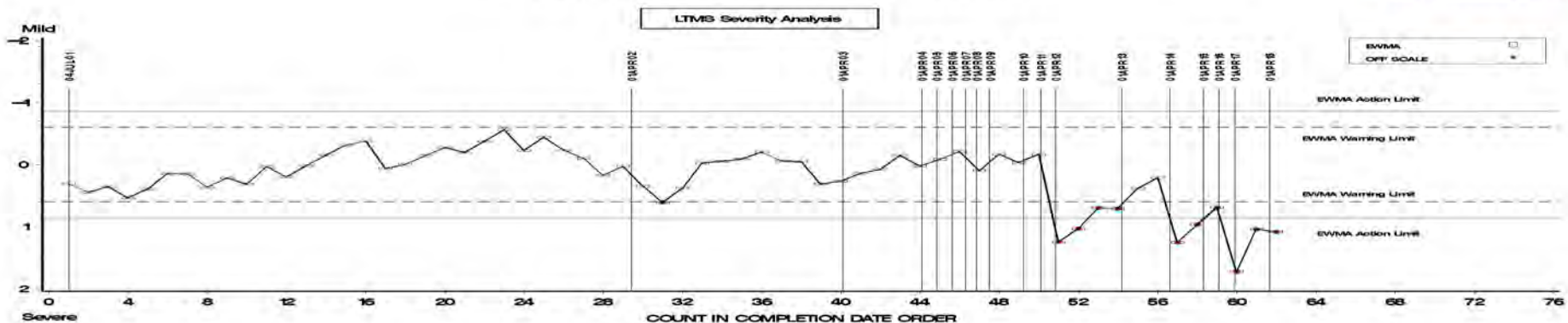
Standard Deviation Units



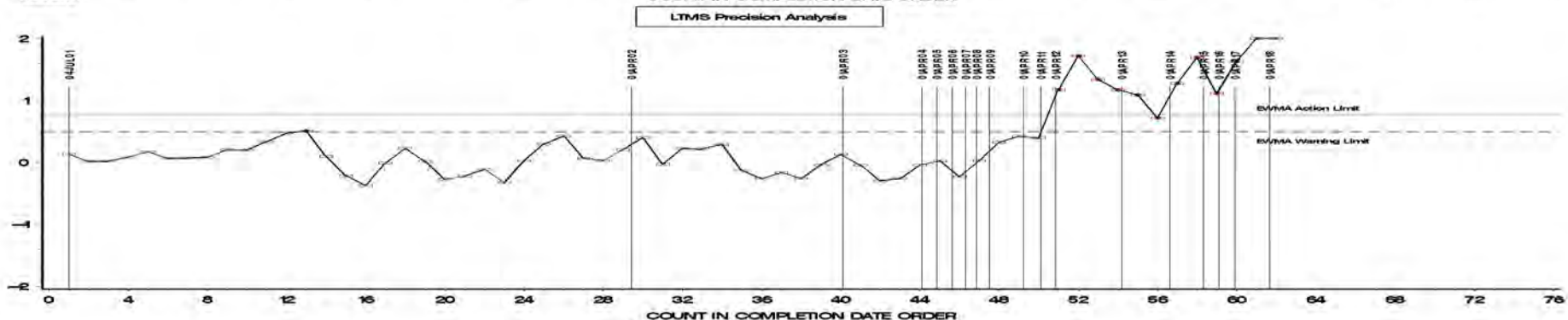
05APR19:15:00

FINAL WEIGHTED TOTAL DEMERITS (DEMERITS)

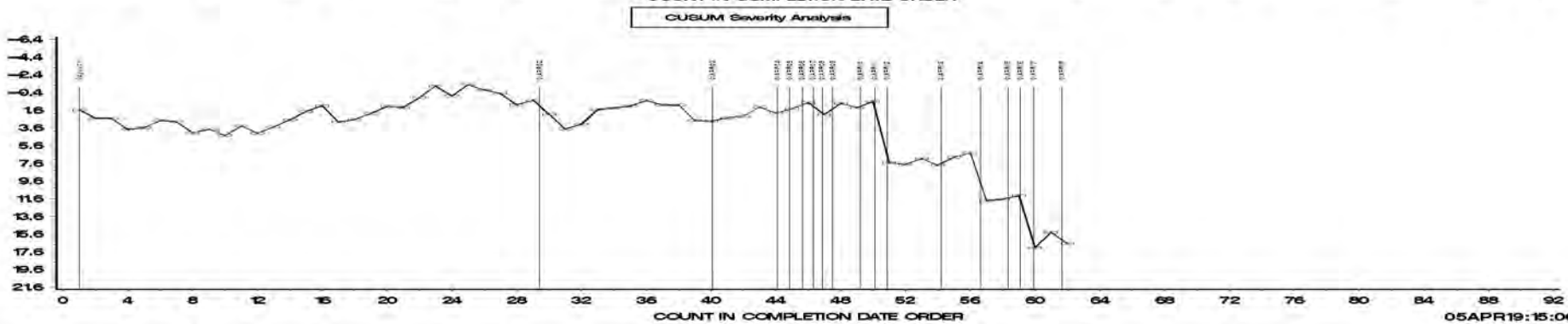
Standard Deviation Units



Standard Deviation Units



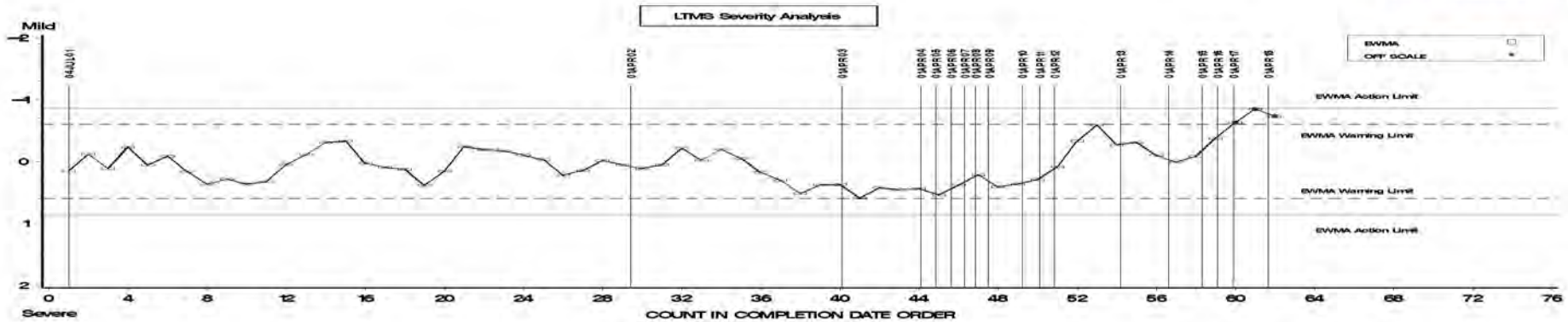
Standard Deviation Units



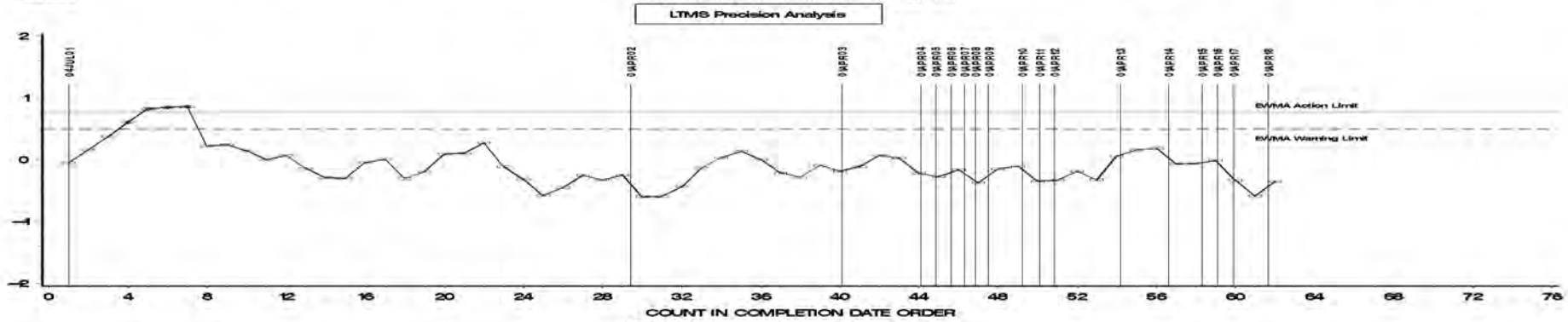
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FINAL BOTOC

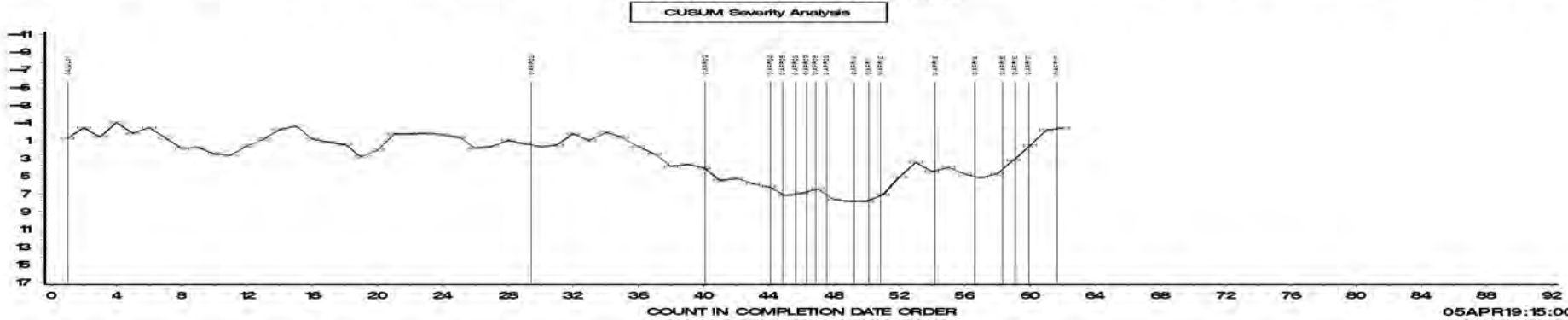
Standard Deviation Units



Standard Deviation Units

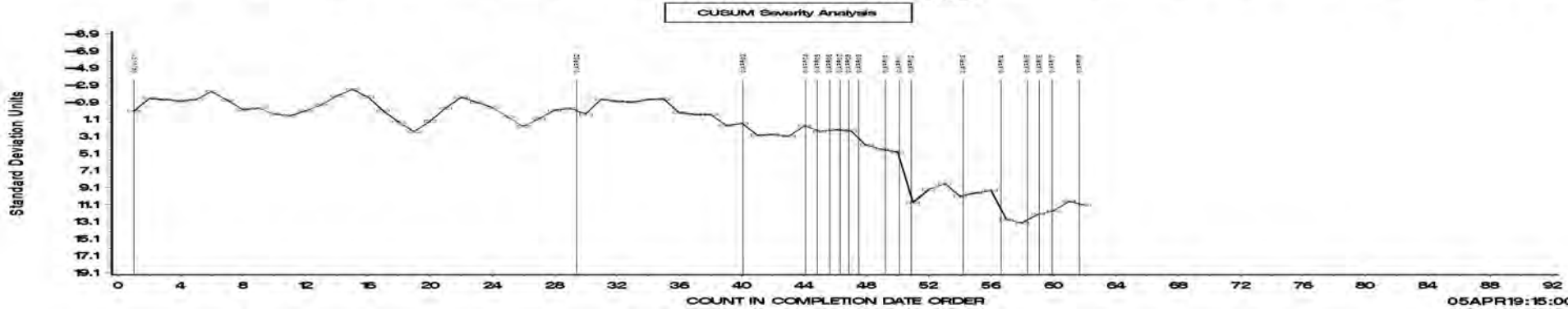
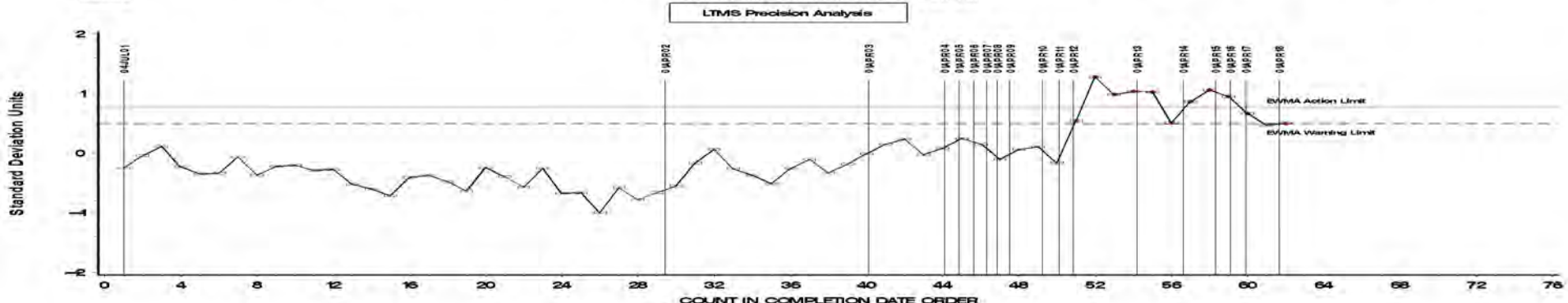
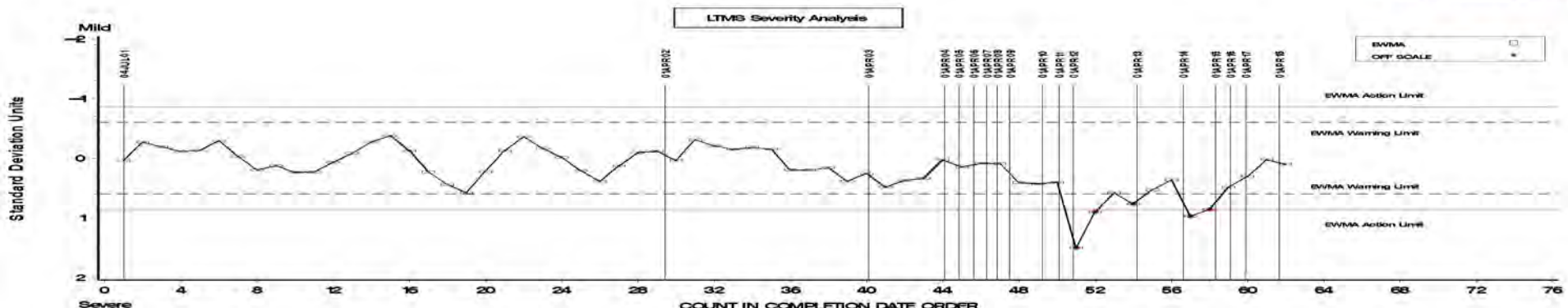


Standard Deviation Units



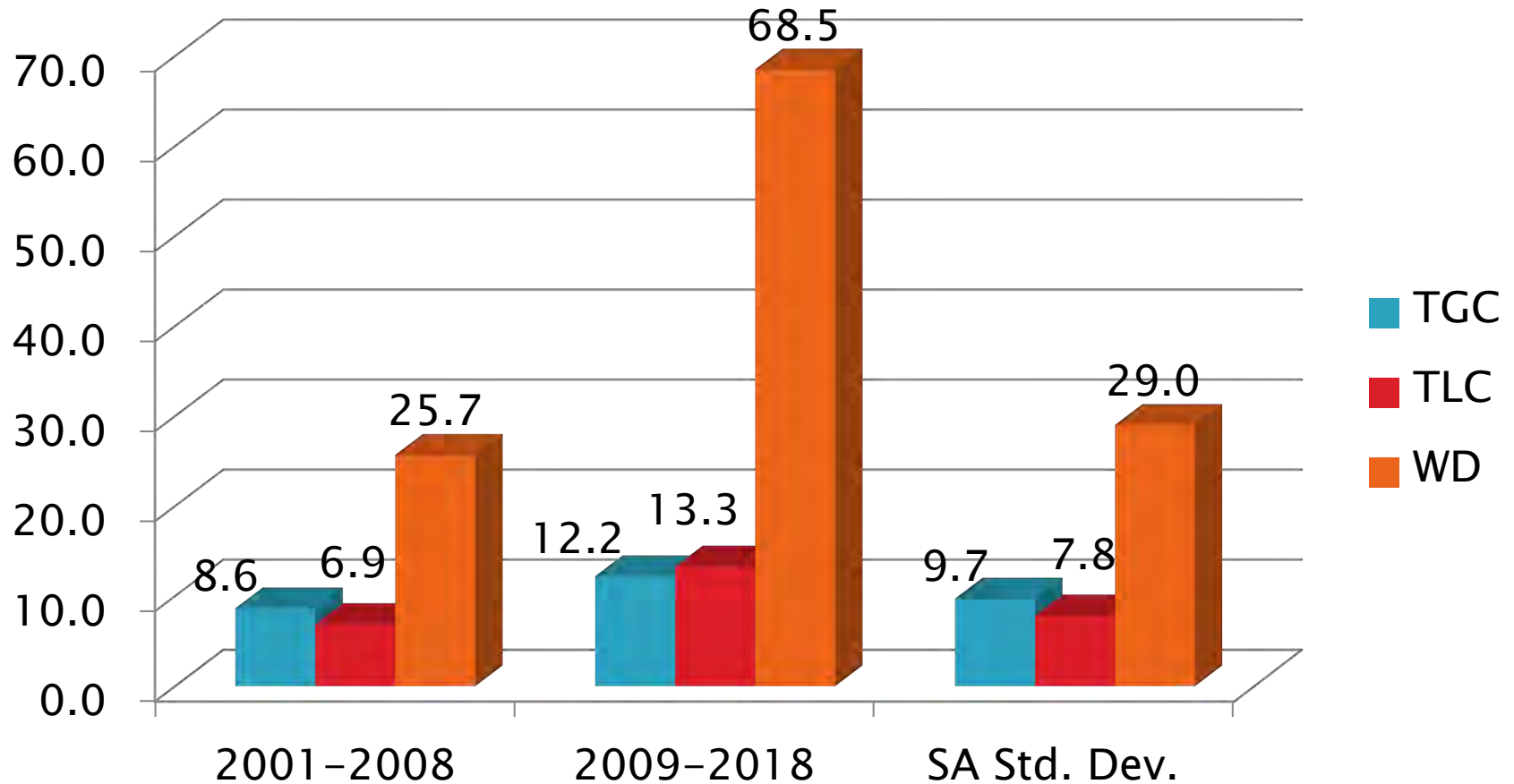
CATERPILLAR 1R INDUSTRY OPERATIONAL VALID DATA

FINAL EOTC (g/h)

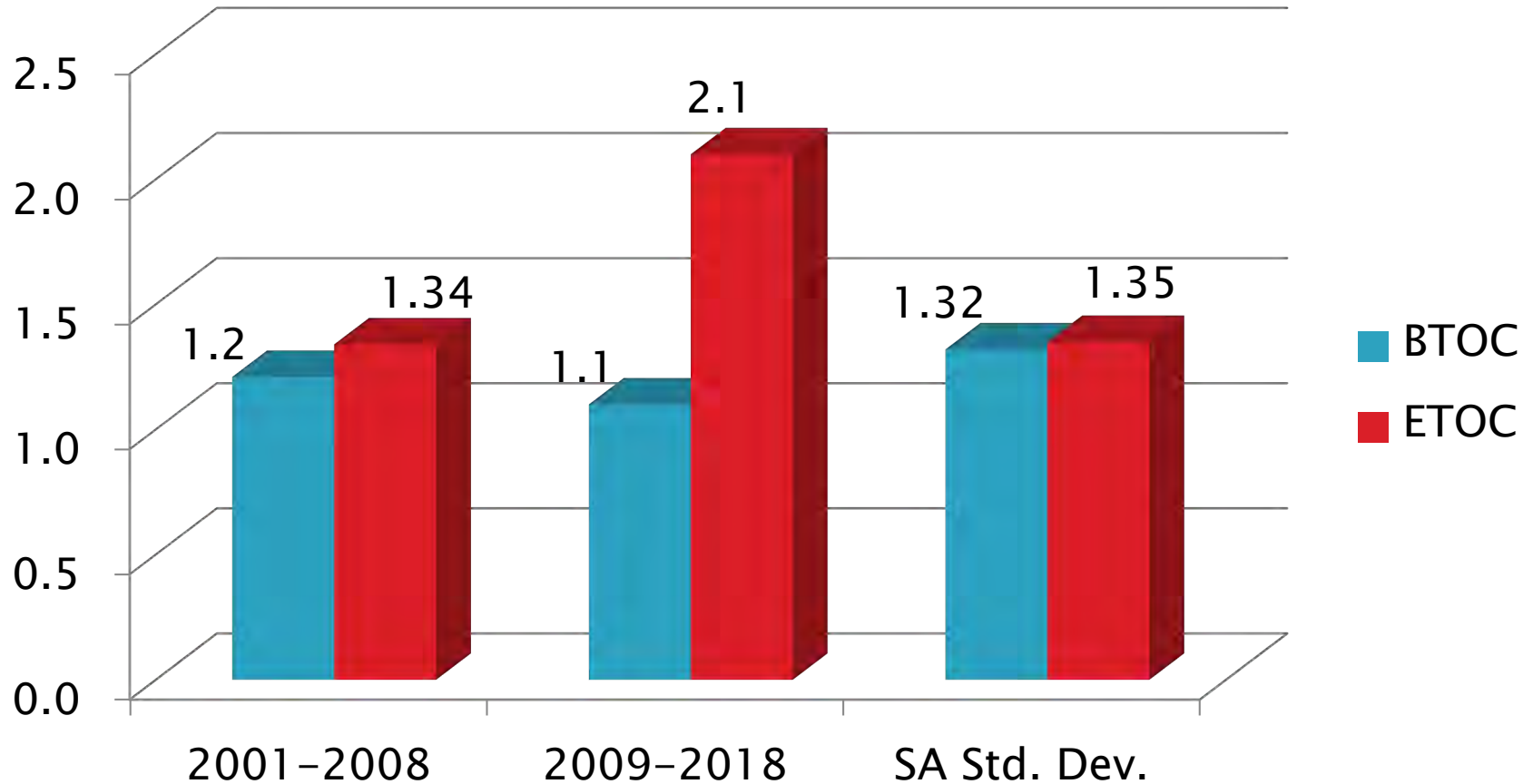


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1R Precision Estimates



1R Precision Estimates



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CAT C13

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C13 Test Activity

Test Status	Validity Code	C13
Acceptable Calibration Test	AC	1
Failed Calibration Test	OC	0
Operationally Invalid	LC	0
Aborted	XC	0
Total		1

C13 Failed Tests

Failed Parameter	Number of Tests
No Failed Tests	0
Total	0

C13 Lost Tests*

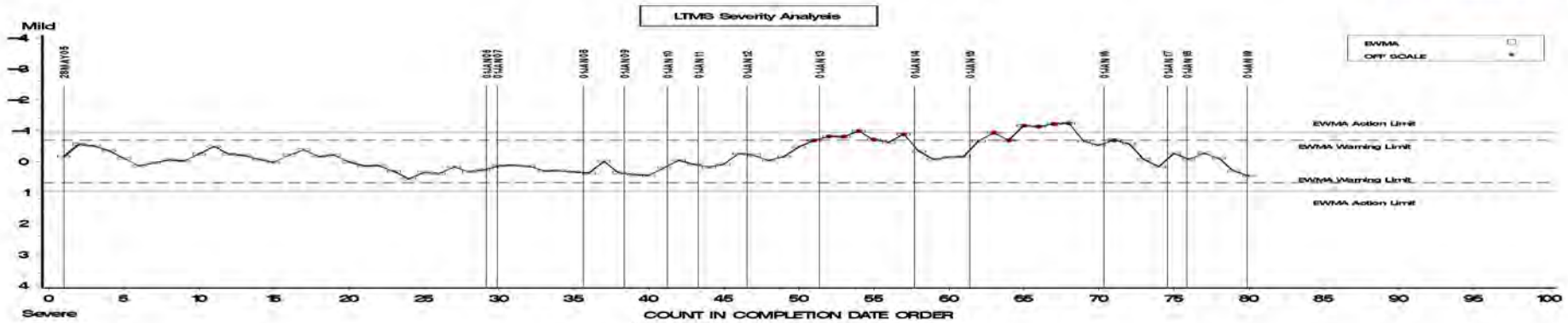
Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
Total		0

*Invalid and aborted tests

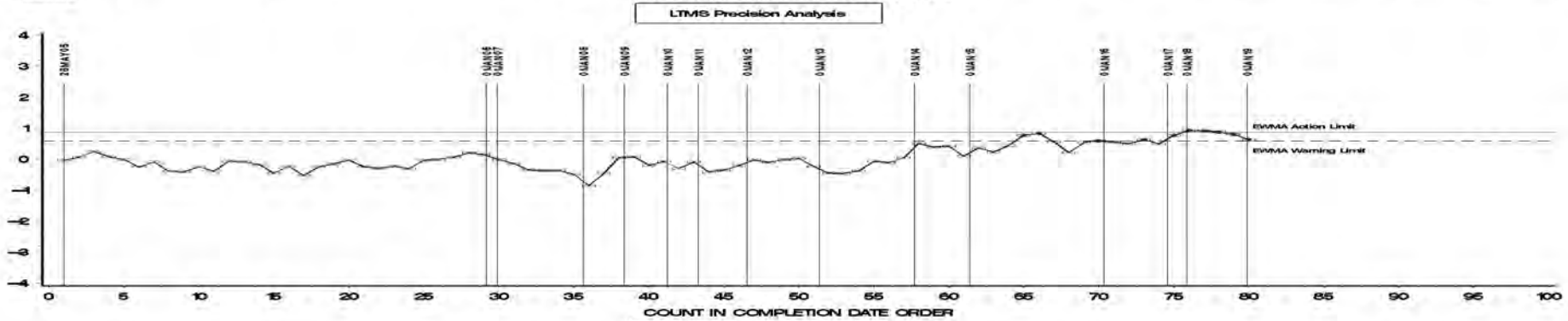
C13 Test Severity

- ▶ R2TC and OC are in control
- ▶ TLC in severity warning alarm in the mild direction
- ▶ TGC in precision warning alarm

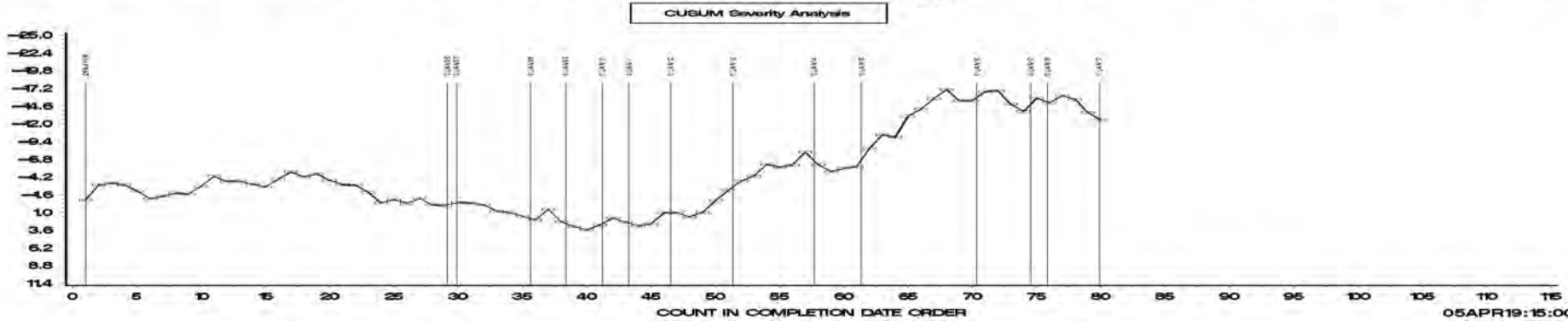
Standard Deviation Units



Standard Deviation Units

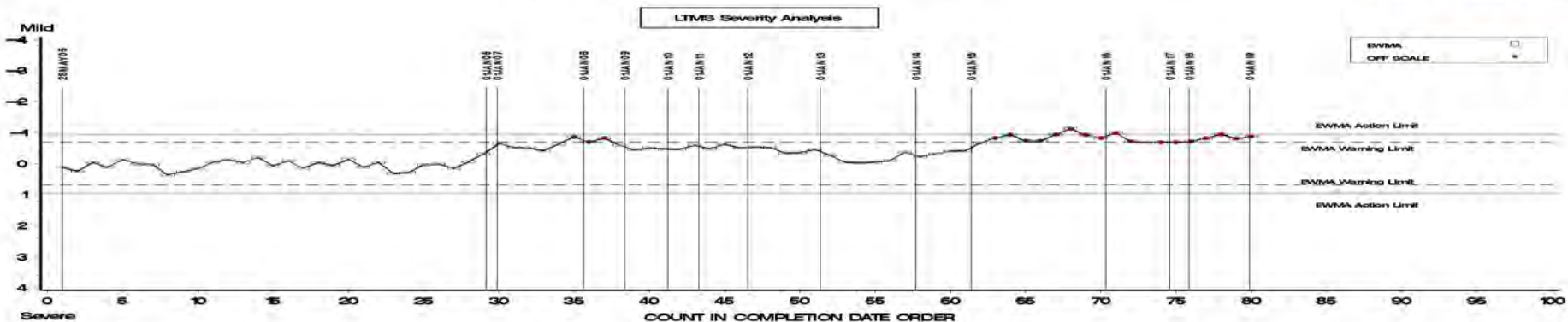


Standard Deviation Units

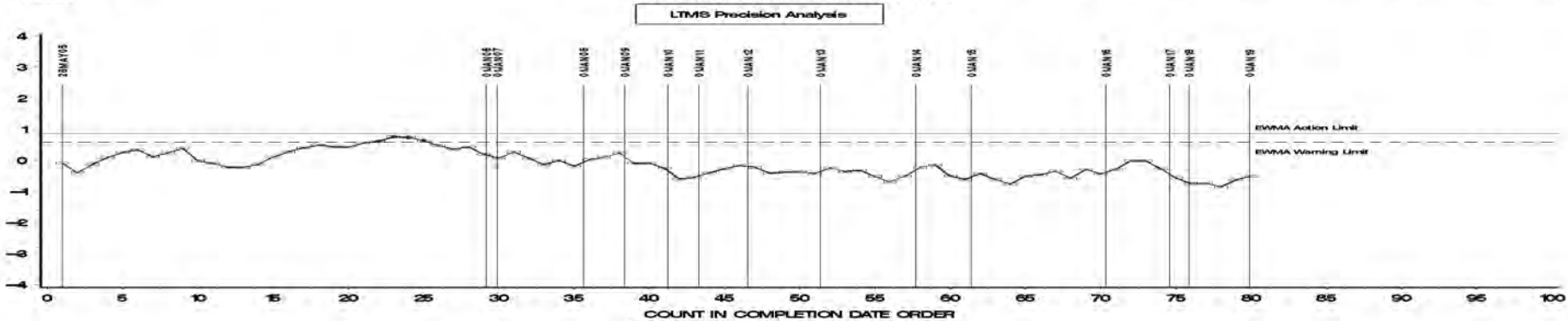


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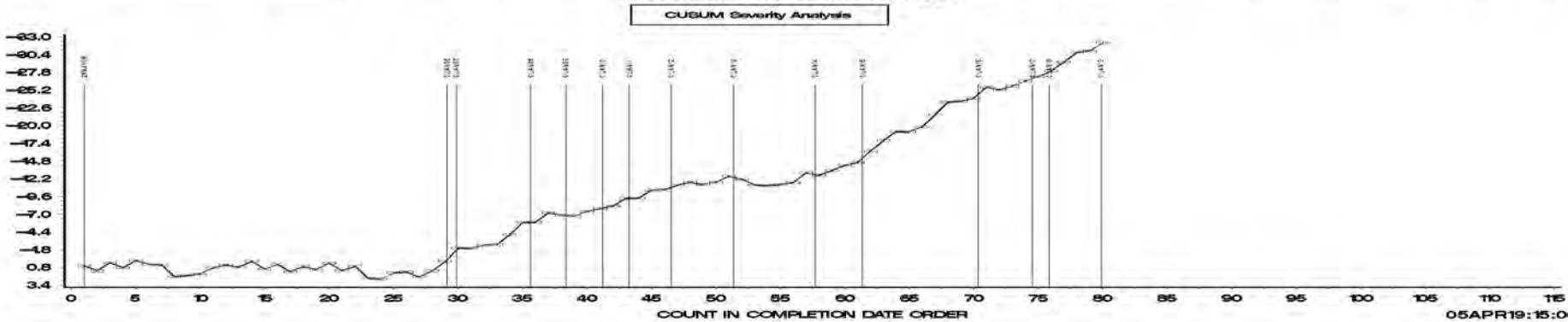
Standard Deviation Units



Standard Deviation Units



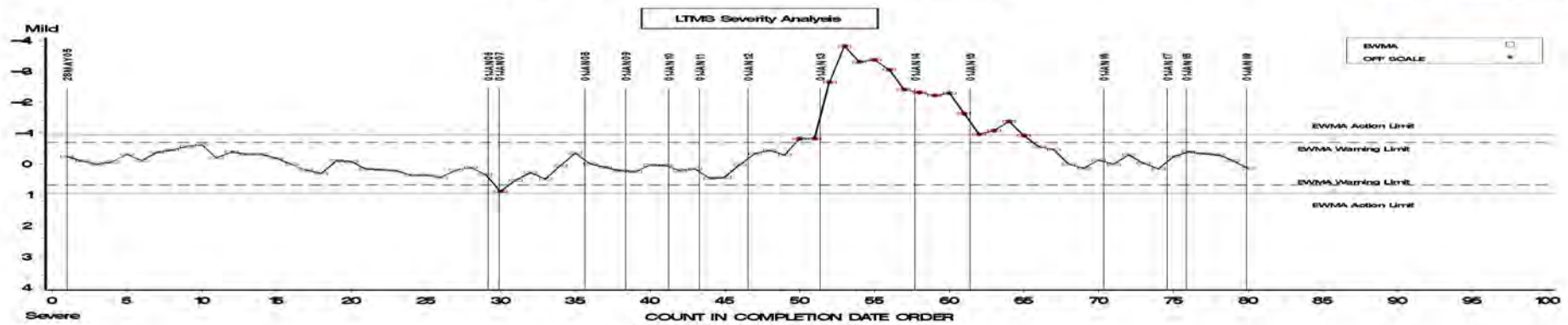
Standard Deviation Units



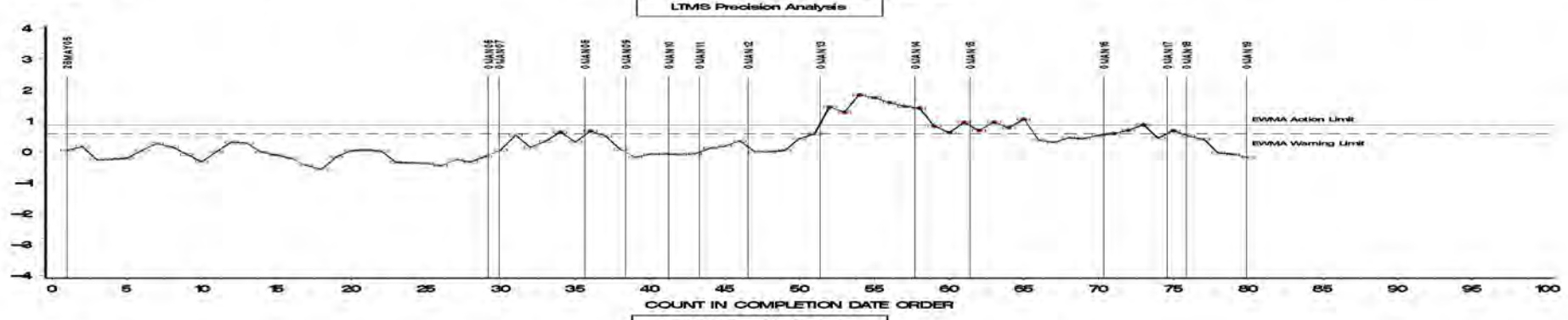
05APR19:15:00

C13 INDUSTRY OPERATIONAL VALID DATA
2ND RING TOP CARBON AVG. — FINAL RESULT

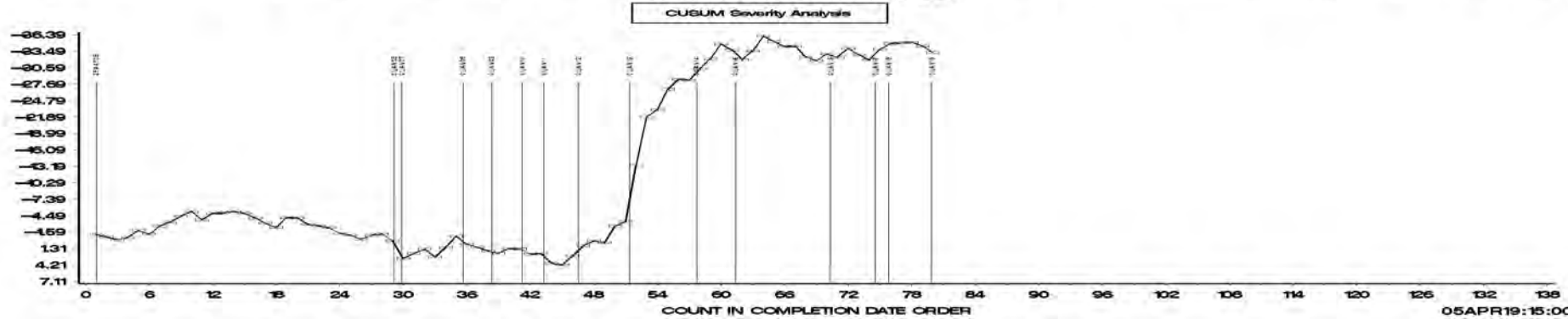
Standard Deviation Units



Standard Deviation Units

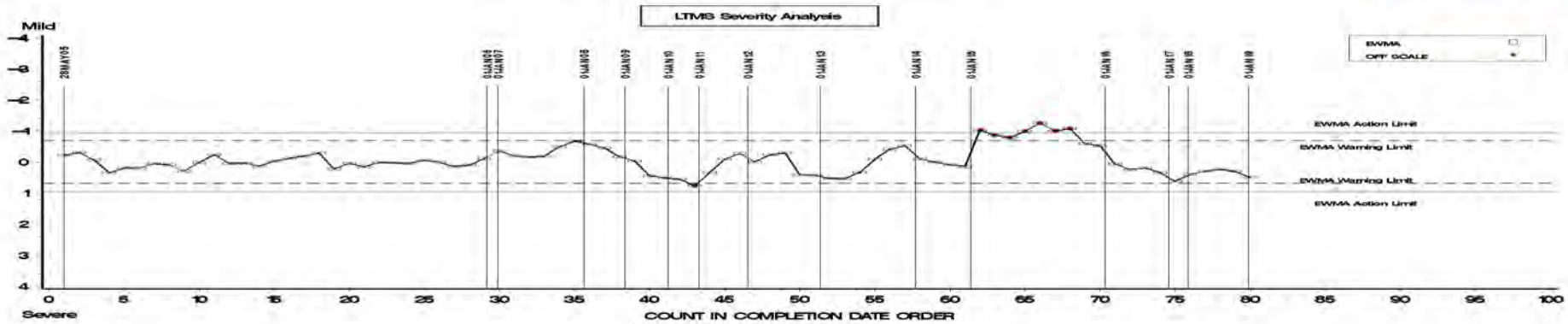


Standard Deviation Units

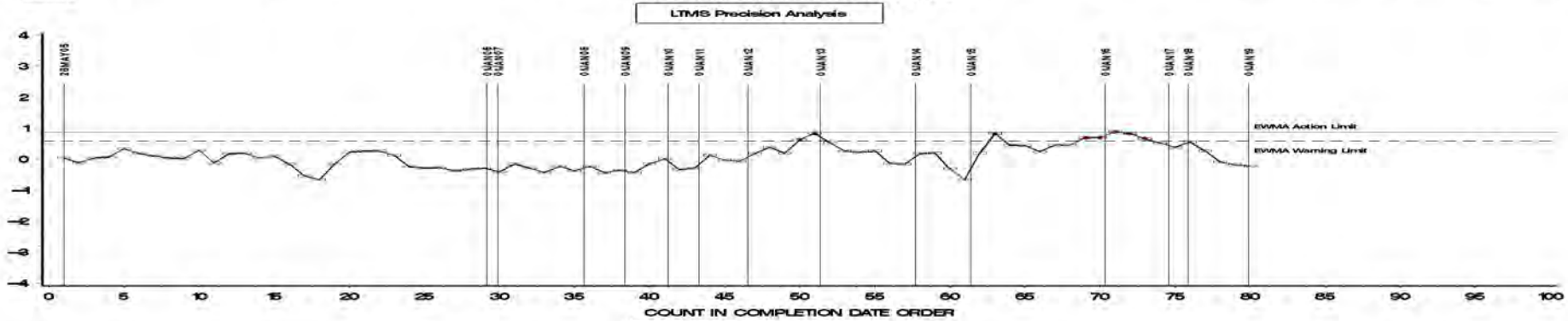


05APR19:15:00

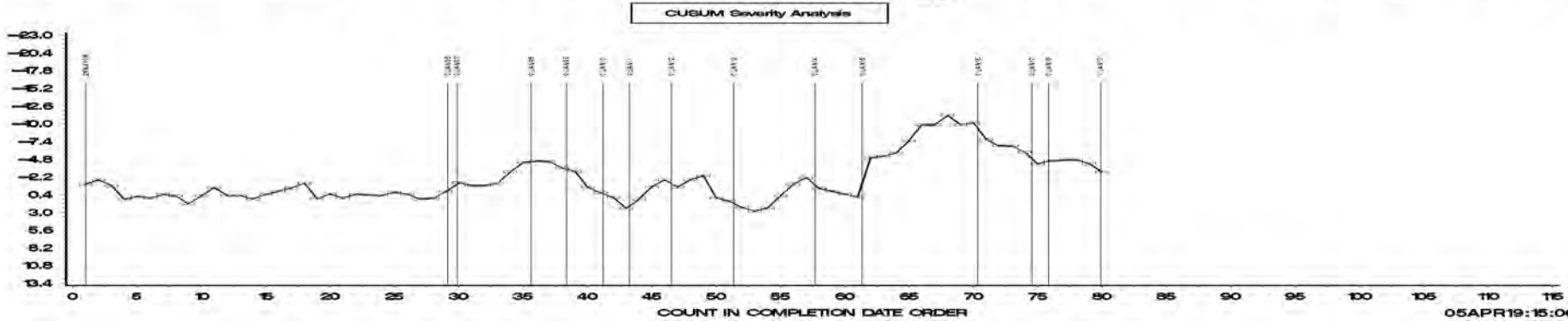
Standard Deviation Units



Standard Deviation Units

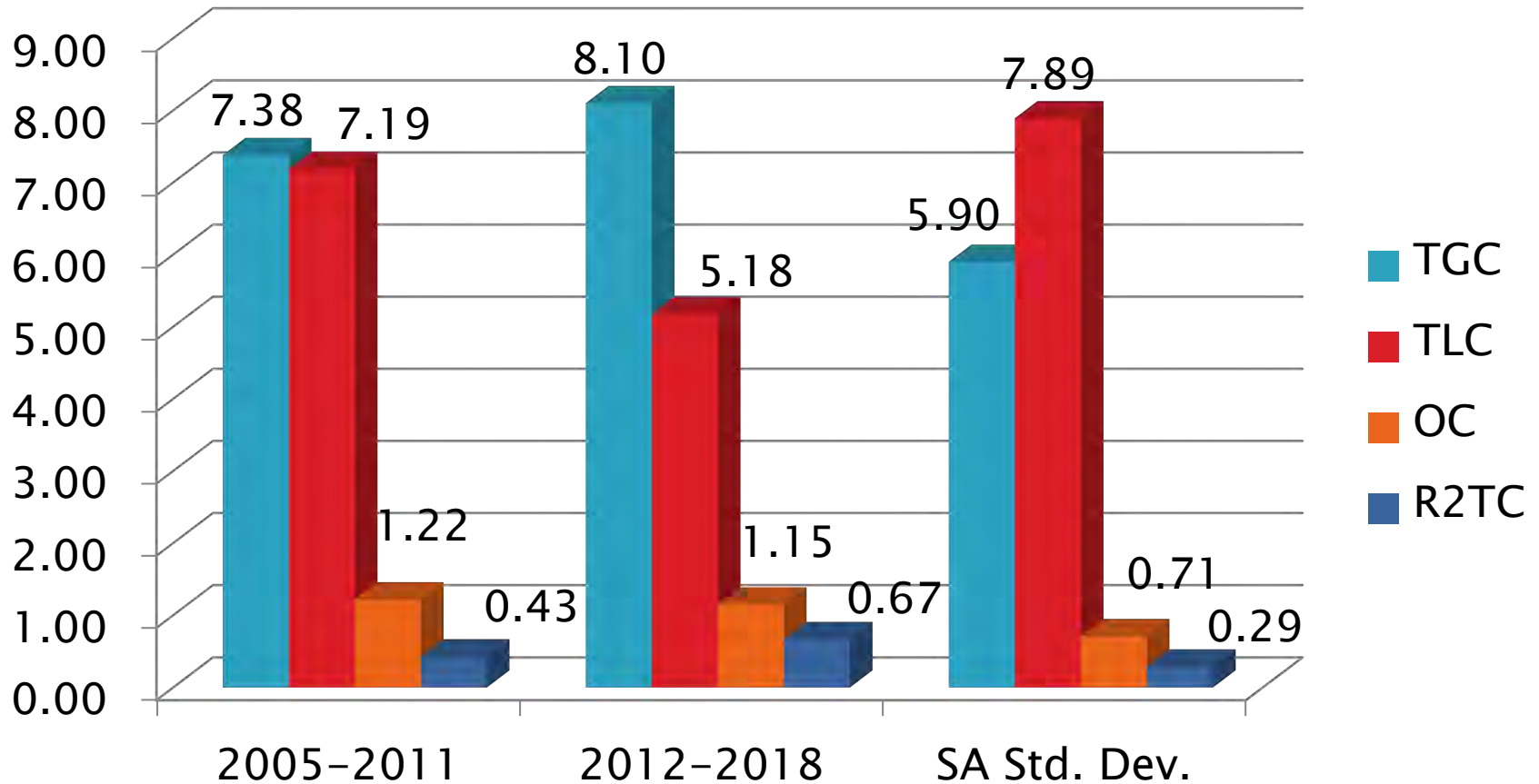


Standard Deviation Units



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C13 Precision Estimates



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Test Monitoring Center
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C13 Oil Aeration (COAT)

»» April 2019

Test Monitoring Center

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COAT Test Activity

Test Status	Validity Code	COAT
Acceptable Calibration Test	AC	0
Failed Calibration Test	OC	0
Operationally Invalid	LC	0
Aborted	XC	0
Informational Run	NN	22
Total		22

COAT Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
Total	0

COAT Lost Tests*

Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
Total		0

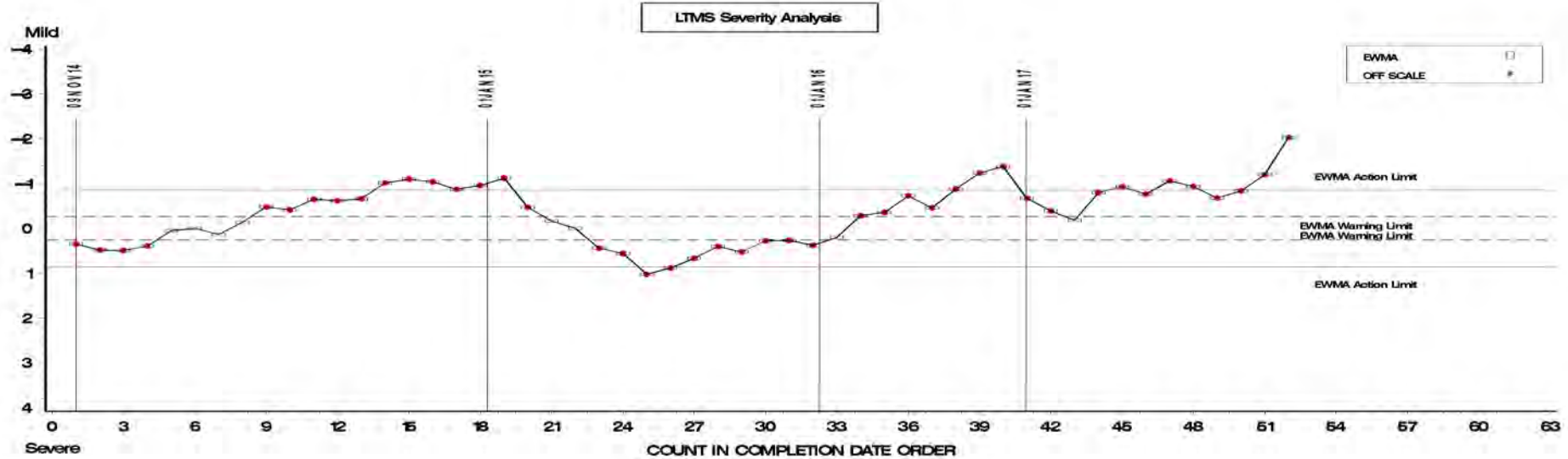
*Invalid and aborted tests

COAT Test Severity

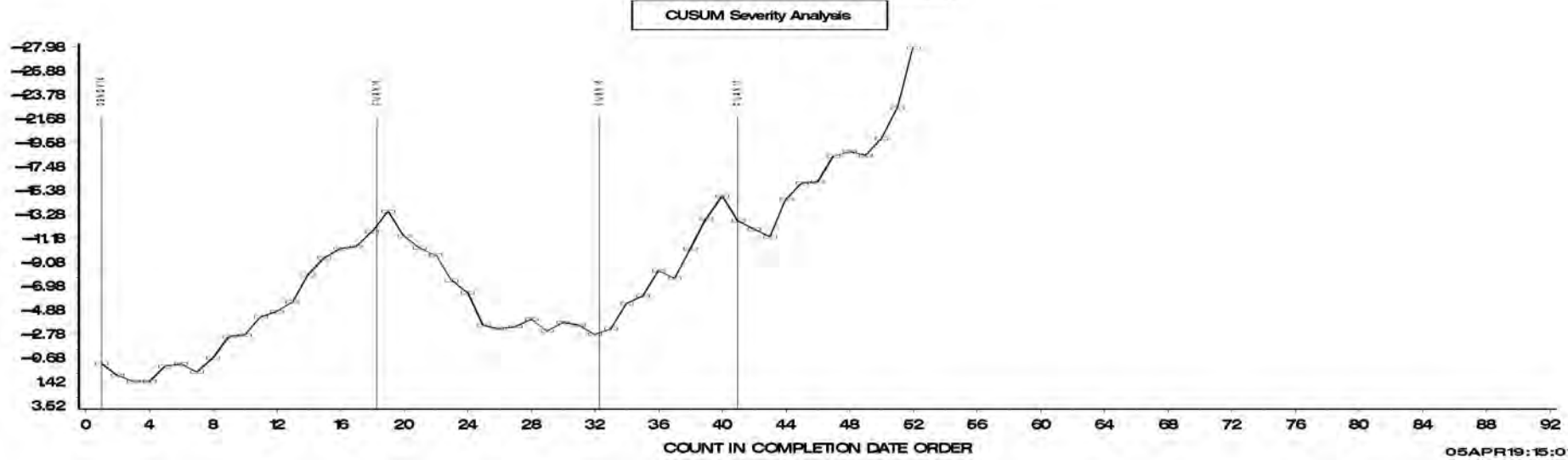
- ▶ As no chartable COAT tests were run during this period no statement about test severity can be made.

FINAL AVERAGE OIL AERATION OVER TEST HOURS 40-60

Standard Deviation Units



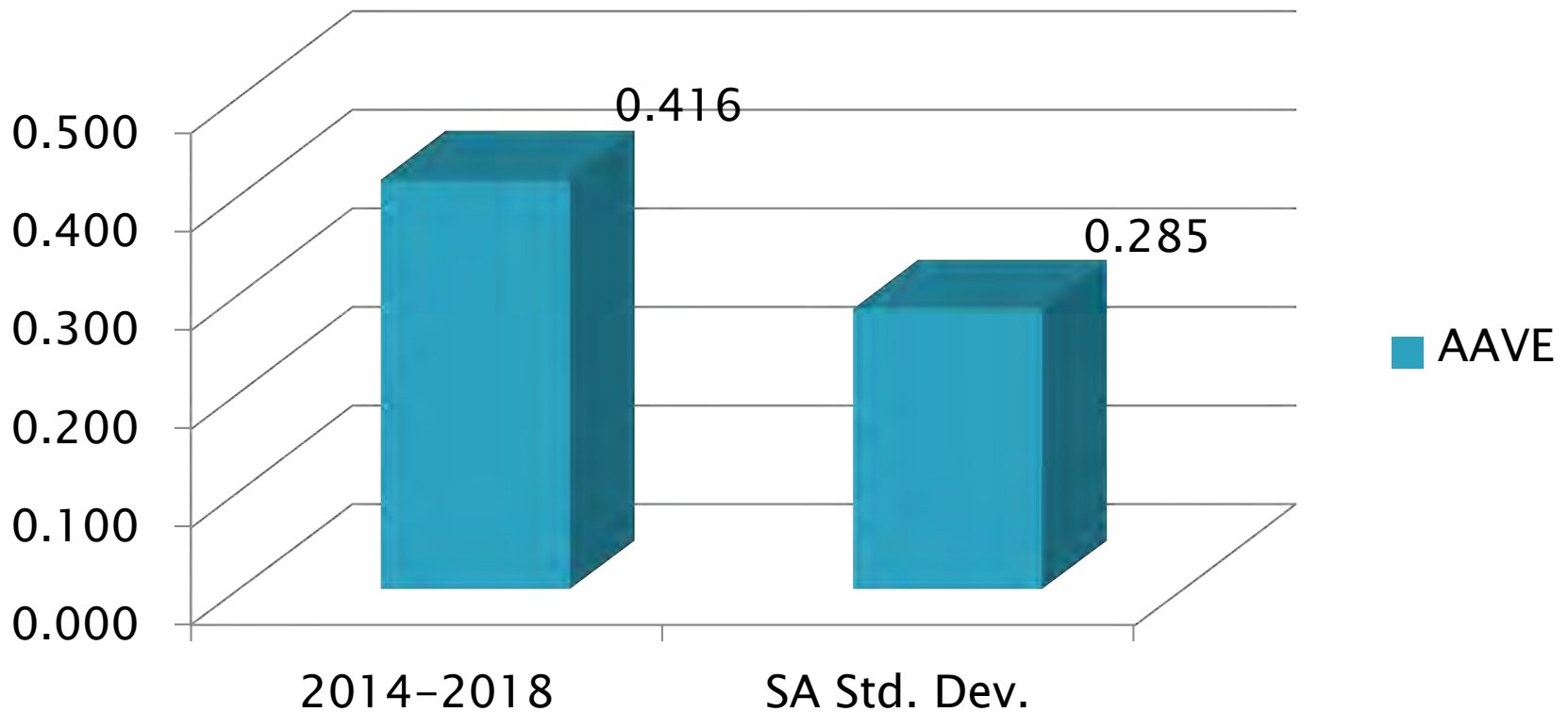
Standard Deviation Units



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COAT Precision Estimates

AAVE



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Test Monitoring Center

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Daimler DD13 Scuffing Test

»» April 2019

Test Monitoring Center

<http://astmtmc.cmu.edu>



A Program of ASTM International

DD13 Test Activity*

Test Status	Validity Code	COAT
Acceptable Calibration Test	AC	1
Failed Calibration Test	OC	0
Operationally Invalid	LC	1
Invalid Informational	LN	1
Informational	NN	1
Total		4

DD13 Failed Tests

Failed Parameter	Number of Tests
No Failed Tests	0
Total	0

DD13 Lost Tests*

Status	Cause	#
Invalid	Scuff before 30 hours	1
Invalid	Non standard informational test	1
Aborted	No aborted tests	0
Total		2

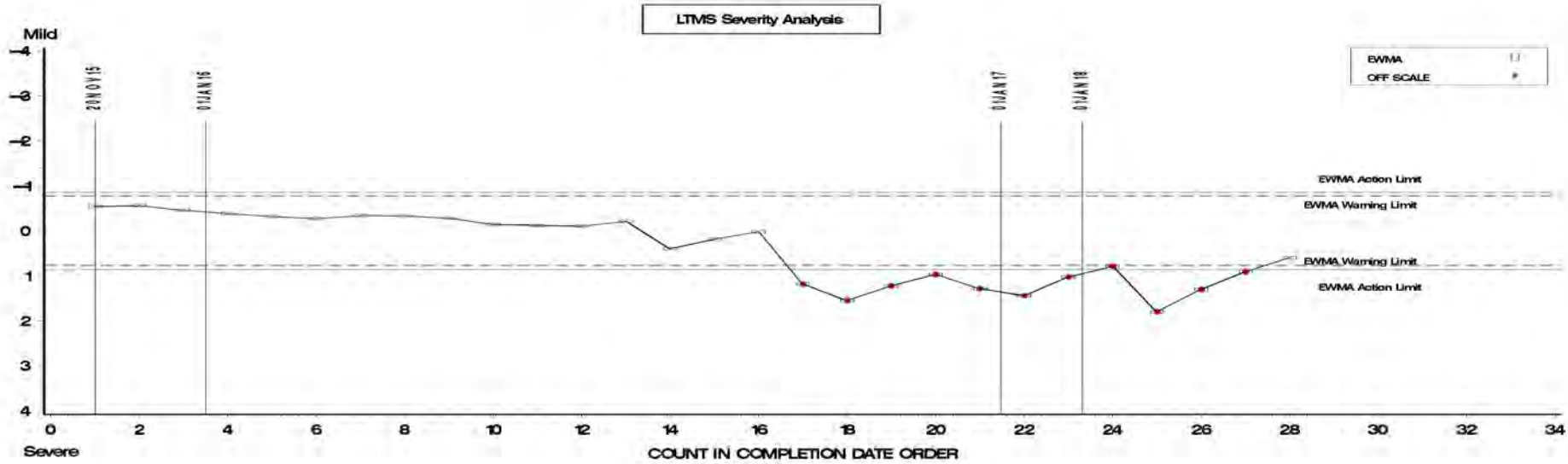
*Invalid and aborted tests

DD13 Test Severity

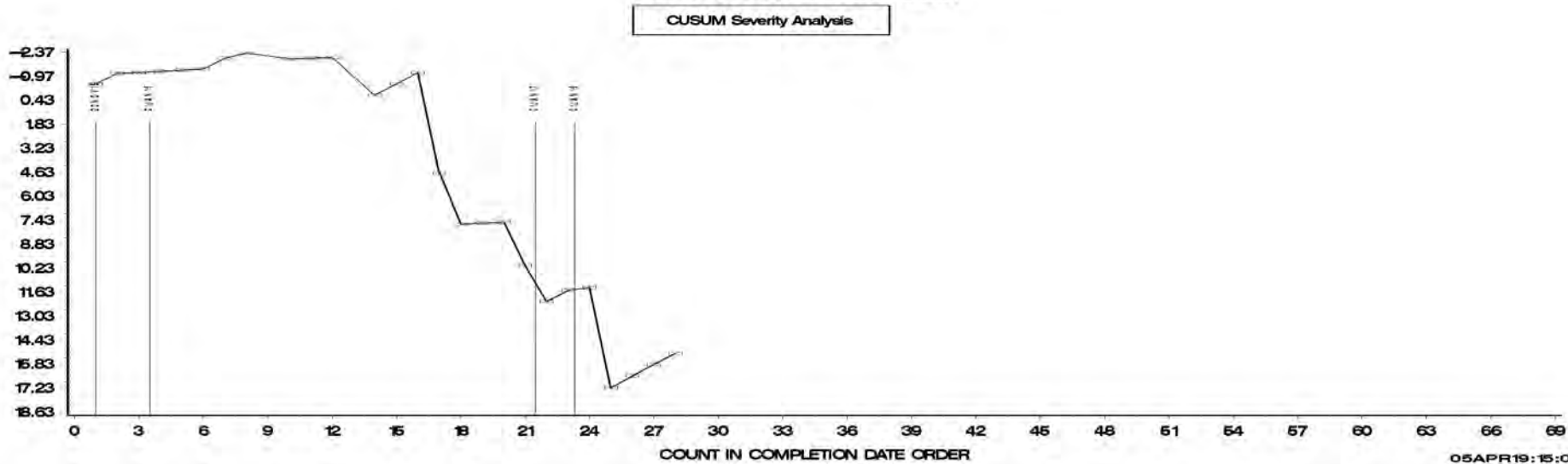
- ▶ HRS2 is in control

FNL. ORIG. UNIT HOURS TO SCUFF

Standard Deviation Units



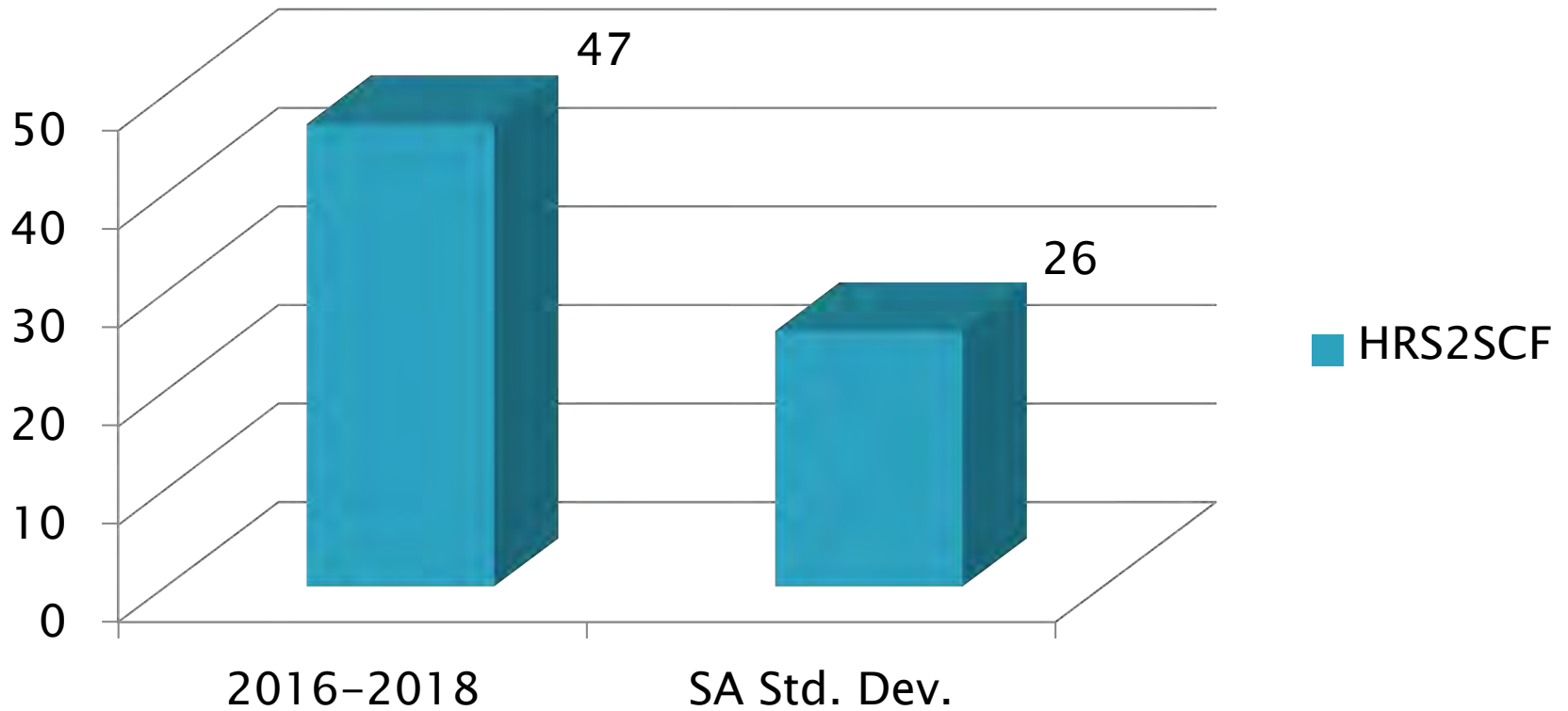
Standard Deviation Units



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DD13 Precision Estimates

HRS2SCF



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Cummins ISB

»» April 2019

Test Monitoring Center

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A Program of ASTM International

ISB Test Activity

Test Status	Validity Code	#
Acceptable Calibration Test	AC	0
Failed Calibration Test	OC	0
Operationally Invalid	LC	0
Aborted	XC	0
Total		0

ISB Failed Tests

Failed Parameter	Number of Tests
No Failed Tests	0
Total	0

ISB Lost Tests*

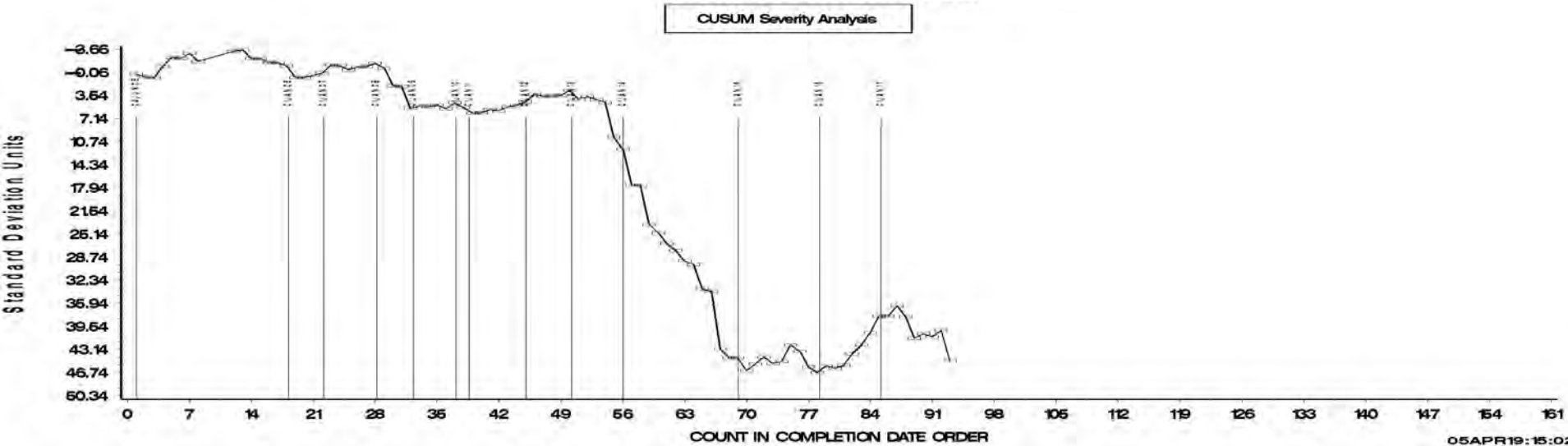
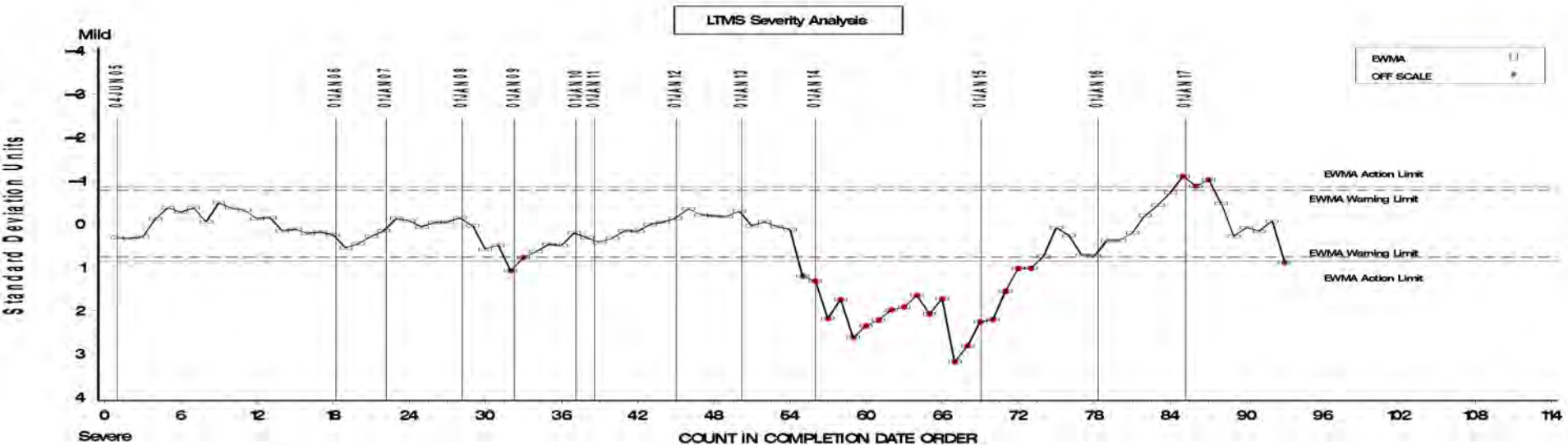
Status	Cause	#
Invalid	No Invalid Tests	0
Aborted	No Aborted Tests	0
Total		0

*Invalid and aborted tests

ISB Test Severity

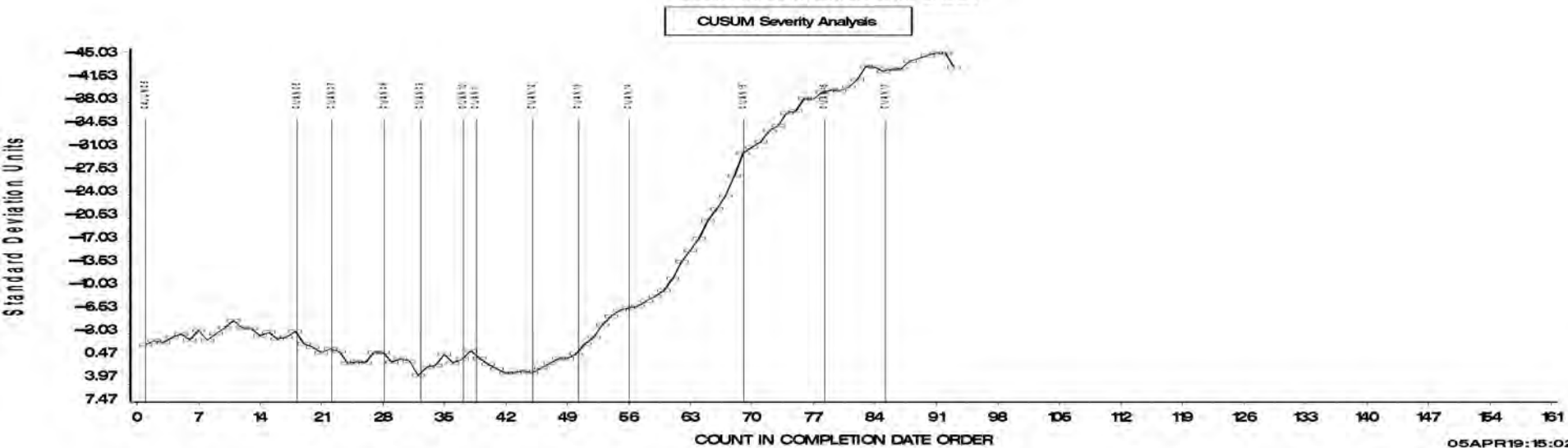
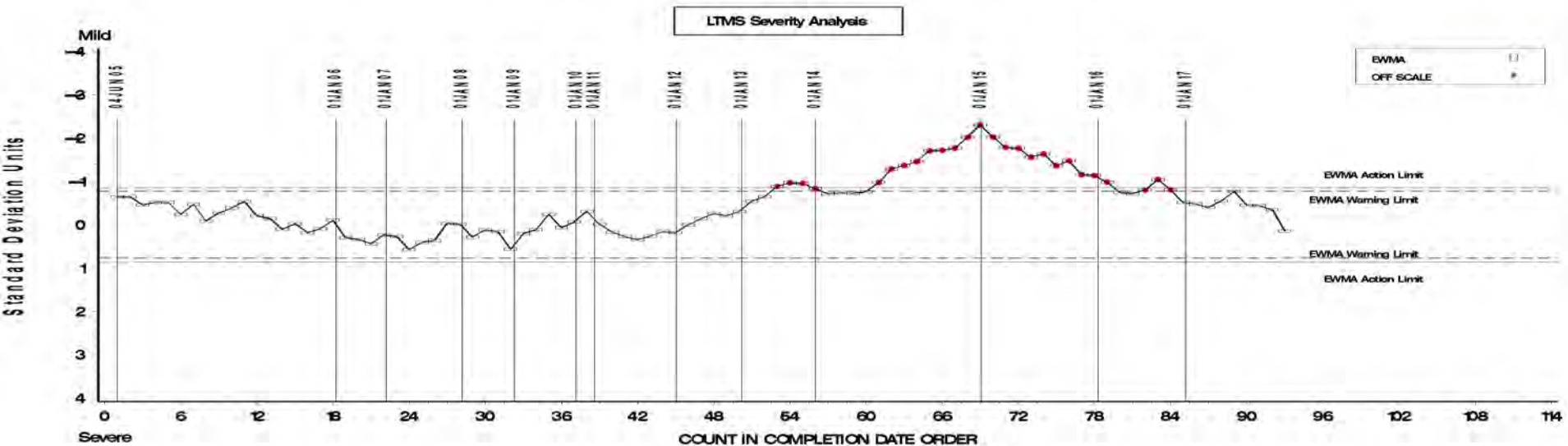
- ▶ As no ISB tests were run during this period no statement about test severity can be made.

AVERAGE CAMSHAFT WEAR



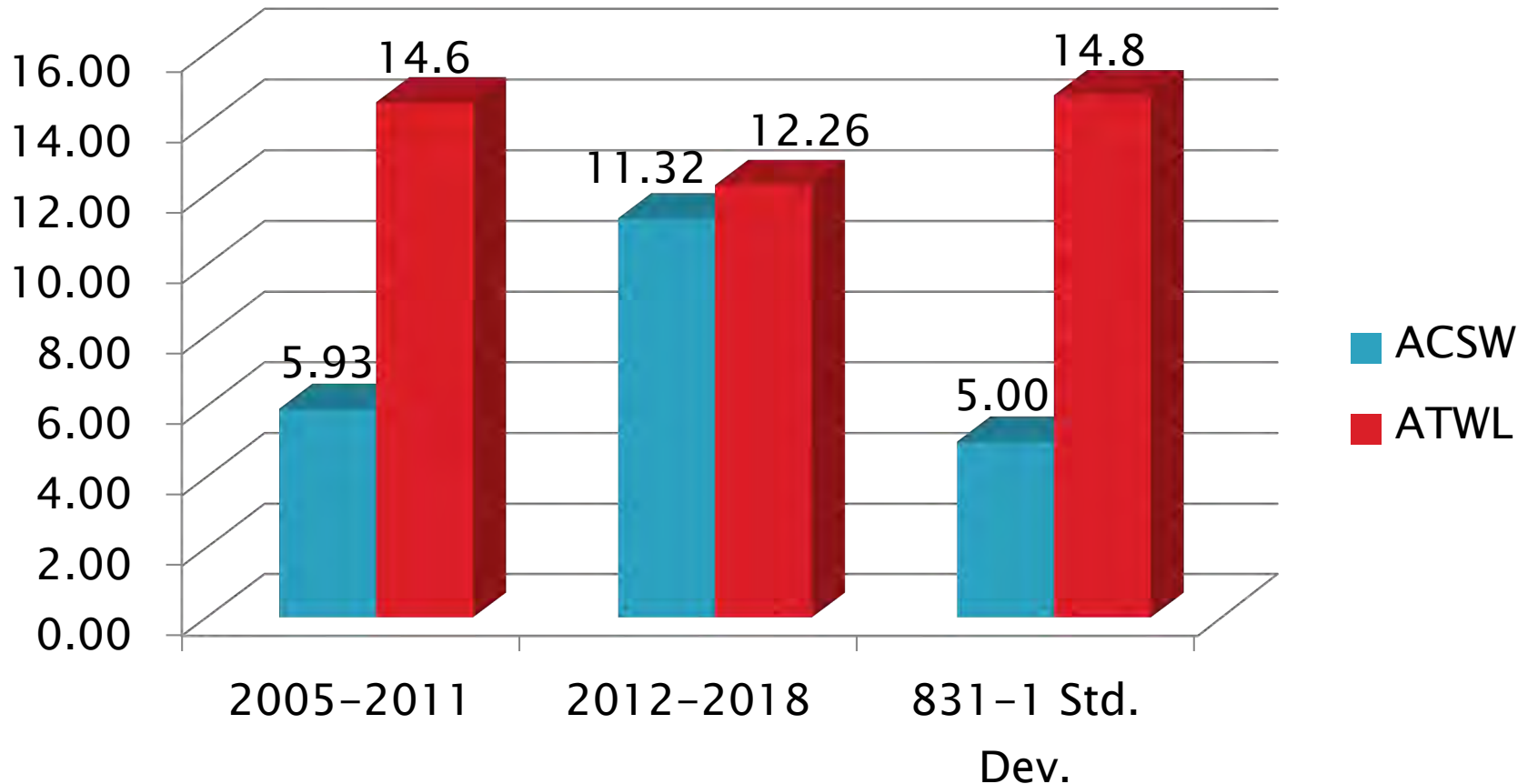
05APR19:15:02

AVERAGE TAPPET WEIGHT LOSS



05APR19:15:02

ISB Precision Estimates



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Cummins ISM

»» April 2019

Test Monitoring Center

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ISM Test Activity

Test Status	Validity Code	#
Acceptable Calibration	AC	3
Failed Calibration	OC	0
Operationally Invalid	LC	0
Aborted	XC	0
Donated	AG	1
Total		4

ISM Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
Total	0

ISM Lost Tests*

Status	Cause	#
Invalid	No Invalid Tests	0
Aborted	No Aborted Tests	0
Total		0

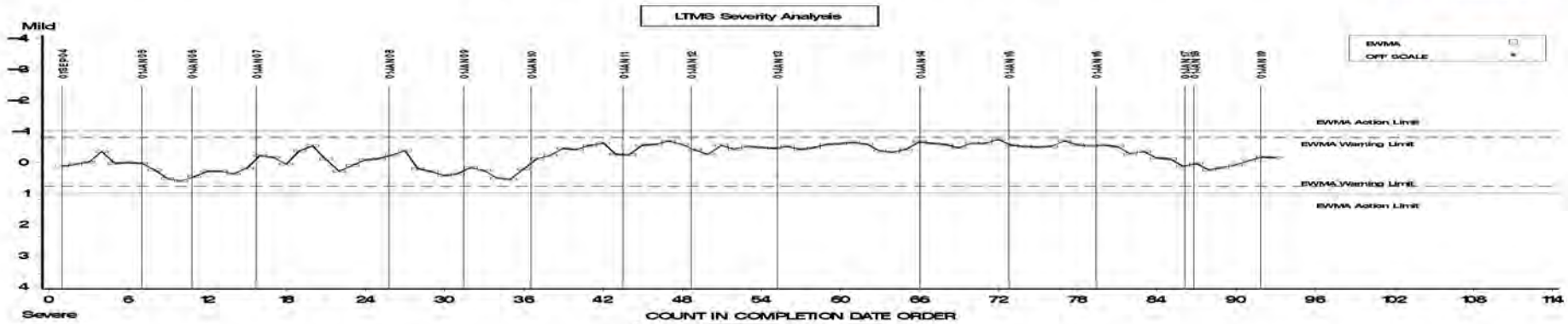
*Invalid and aborted tests

ISM Test Severity

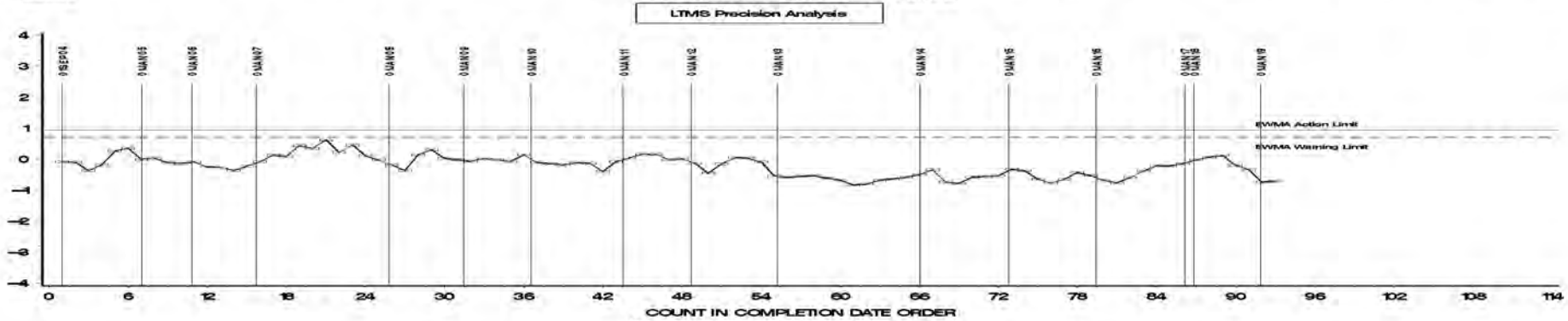
- ▶ FPD in severity warning alarm in the mild direction
- ▶ IAS in severity warning alarm in the severe direction
- ▶ CWL and ASR are in control

ISM INDUSTRY CYCLE OPERATIONAL VALID DATA
 CROSSHEAD WEIGHT LOSS ADJUSTED TO 3.9 % SOOT

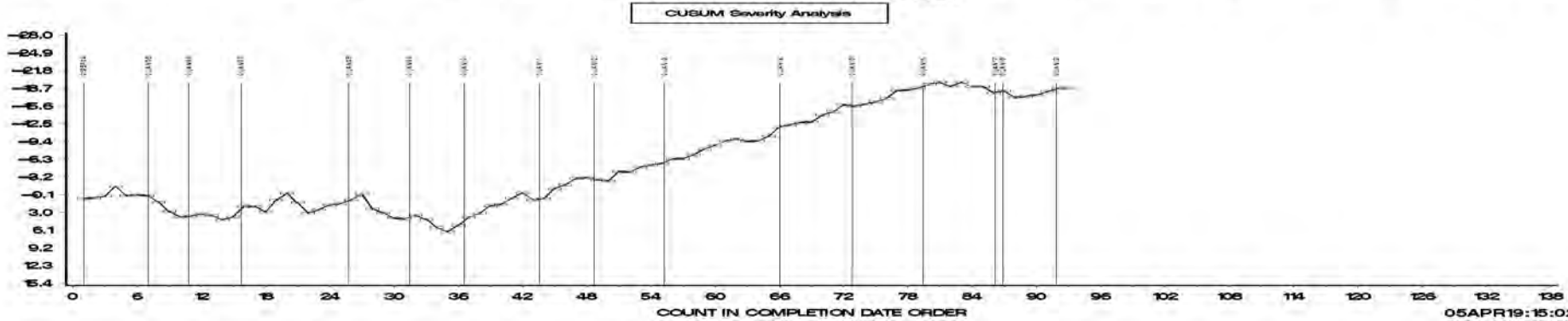
Standard Deviation Units



Standard Deviation Units



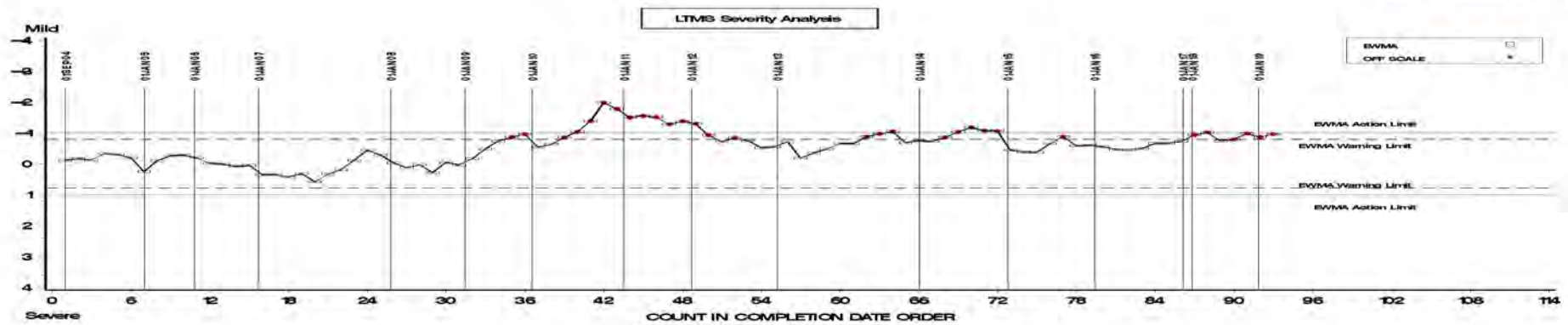
Standard Deviation Units



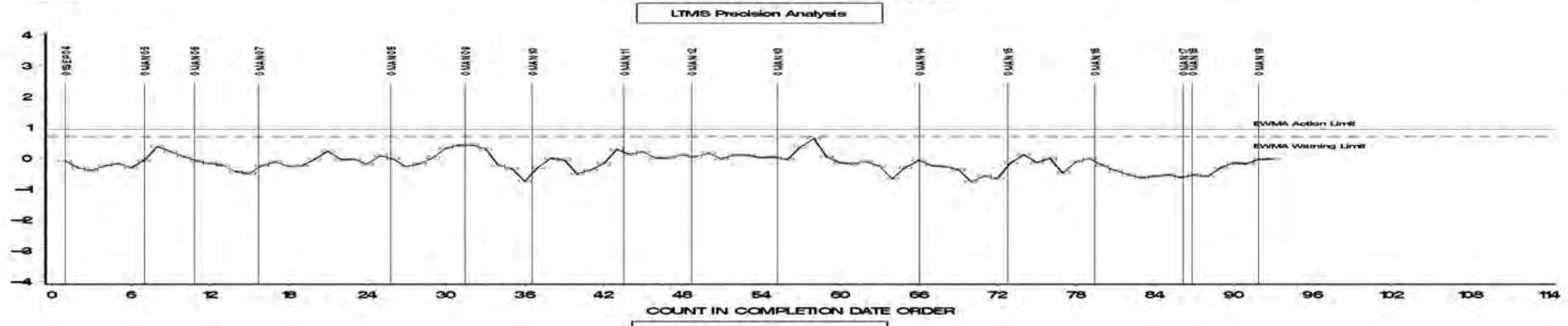
05APR19:15:02

FILTER PLUGGING DELTA P

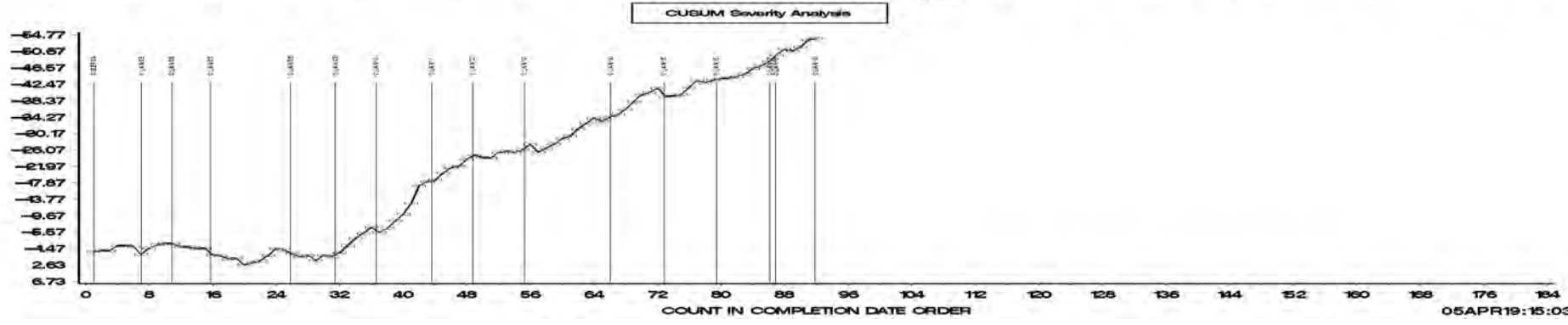
Standard Deviation Units



Standard Deviation Units



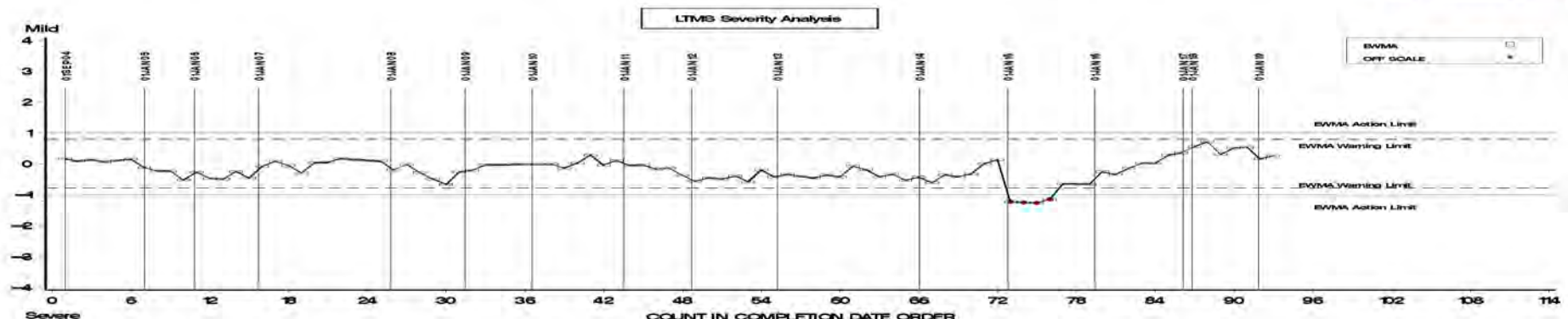
Standard Deviation Units



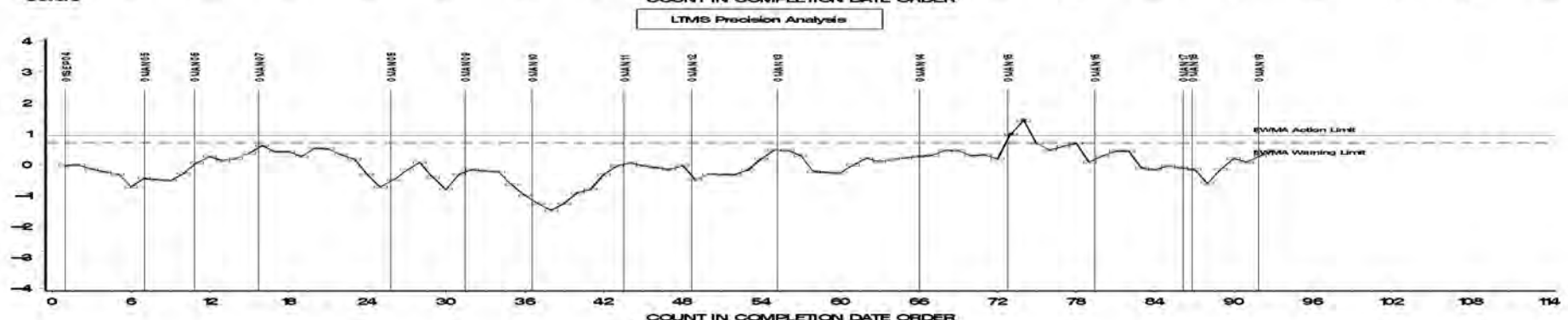
05APR19:15:03

AVERAGE SLUDGE RATING

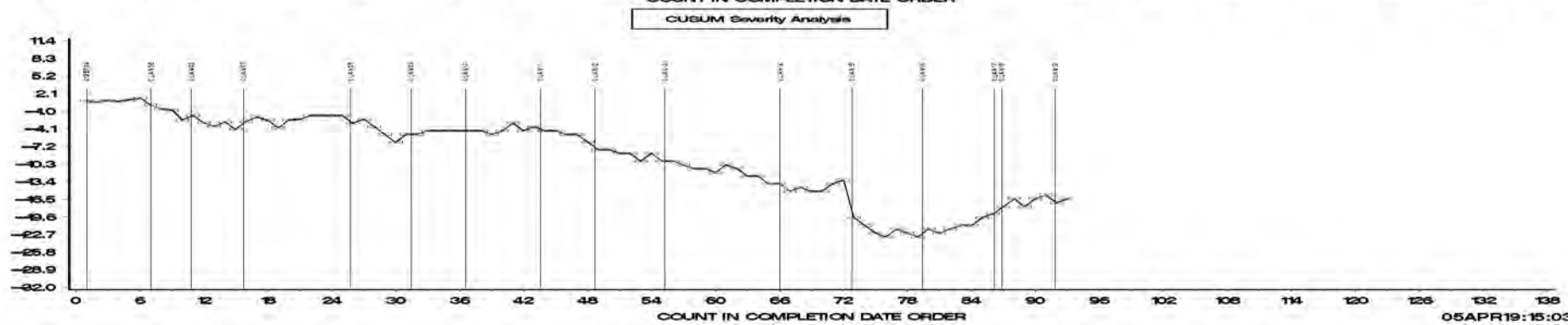
Standard Deviation Units



Standard Deviation Units

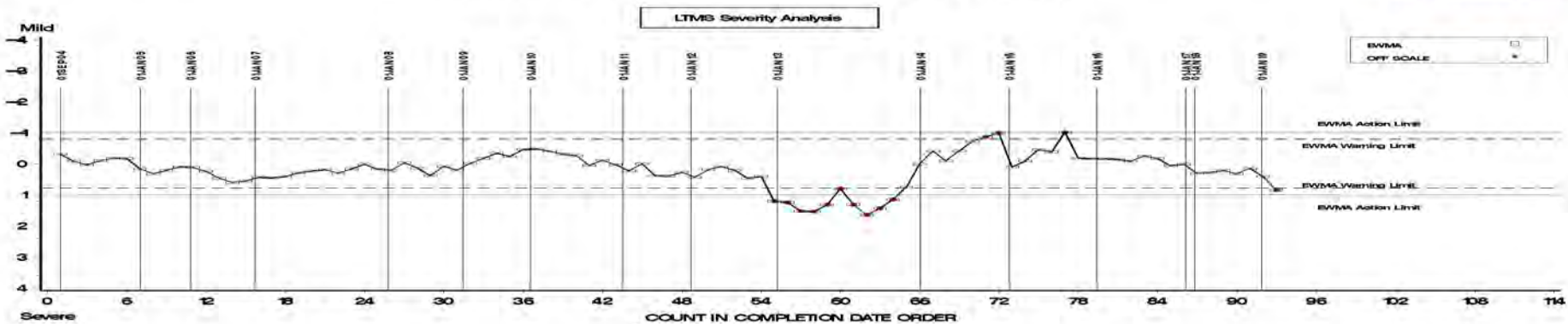


Standard Deviation Units

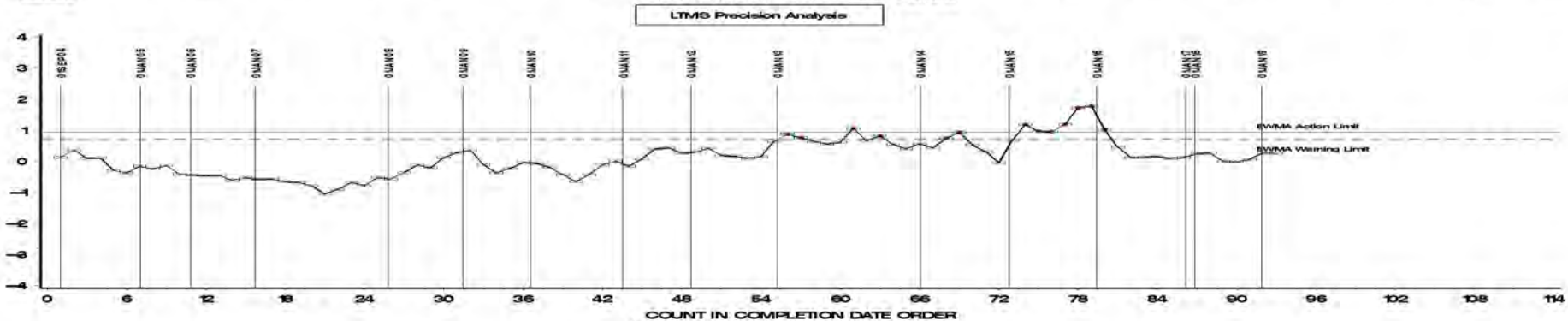


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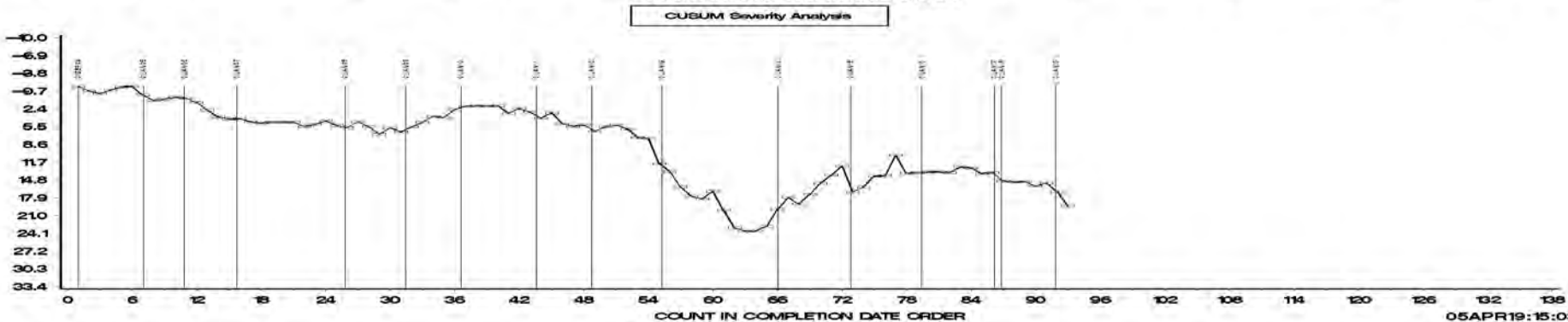
Standard Deviation Units



Standard Deviation Units

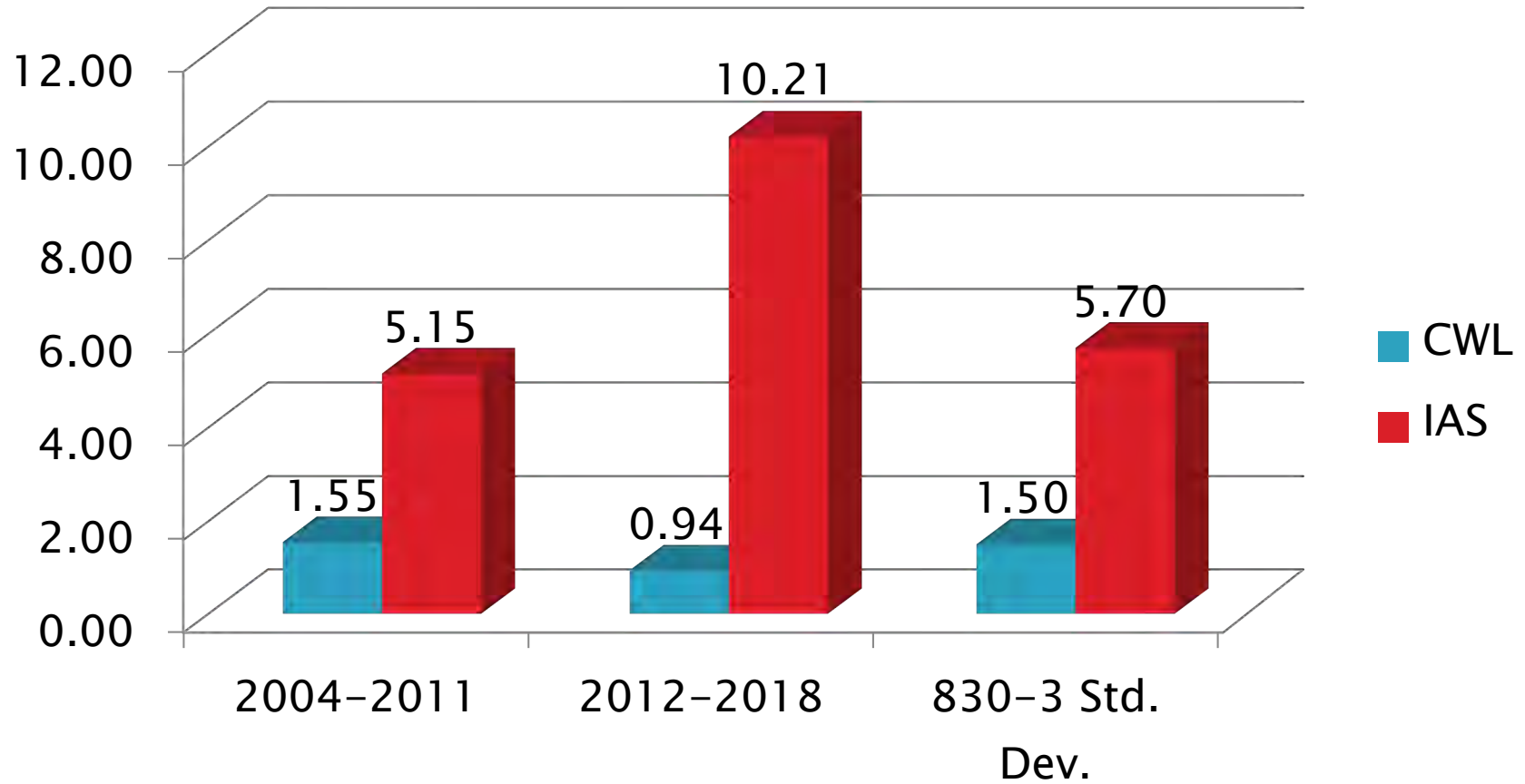


Standard Deviation Units

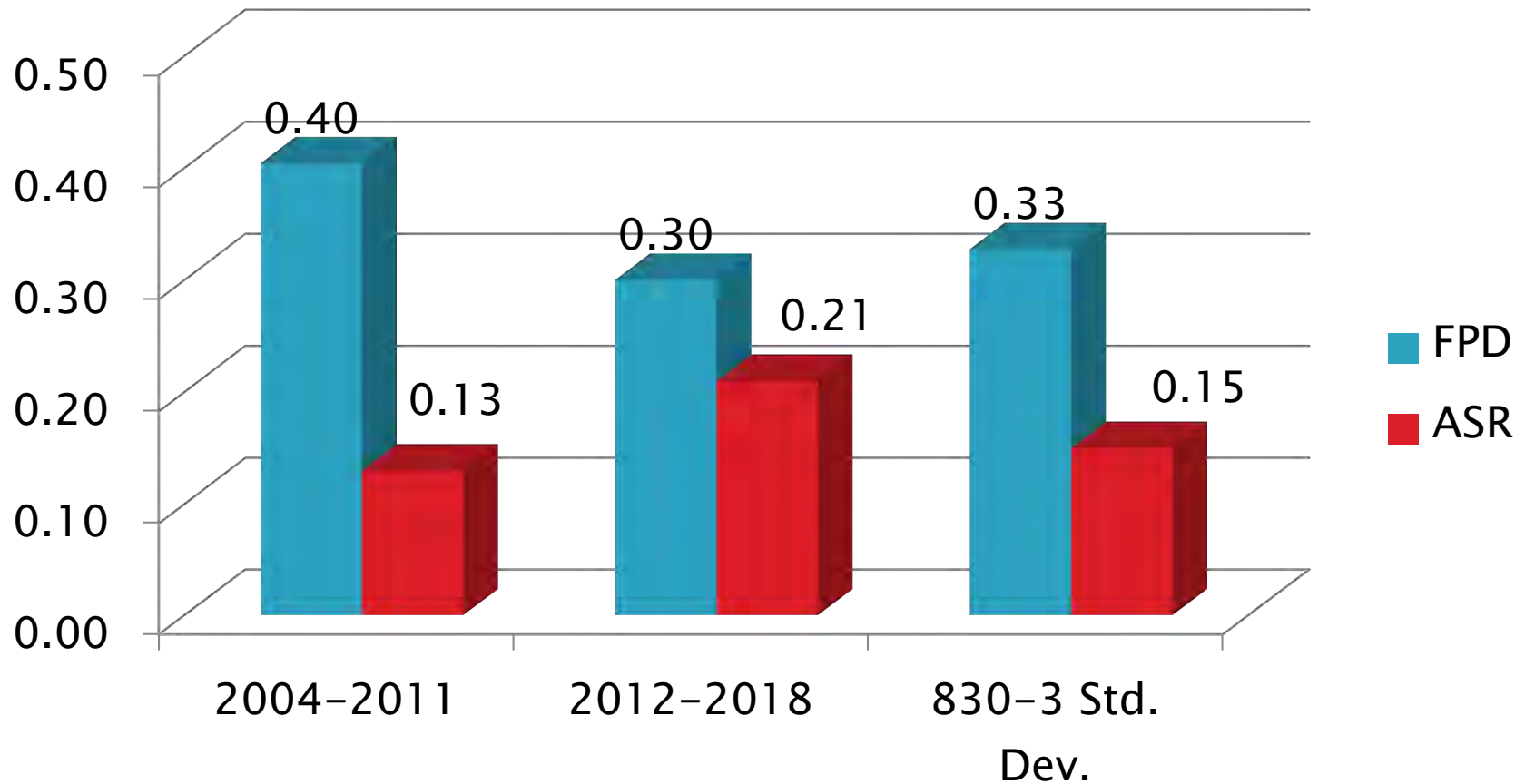


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ISM Precision Estimates



ISM Precision Estimates



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EOAT

»» April 2019

EOAT Test Activity

Test Status	Validity Code	#
Acceptable Calibration Test	AC	0
Failed Calibration Test	OC	0
Operationally Invalid	LC	0
Aborted	XC	0
Total		0

EOAT Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
Total	0

EOAT Lost Tests*

Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
Total		0

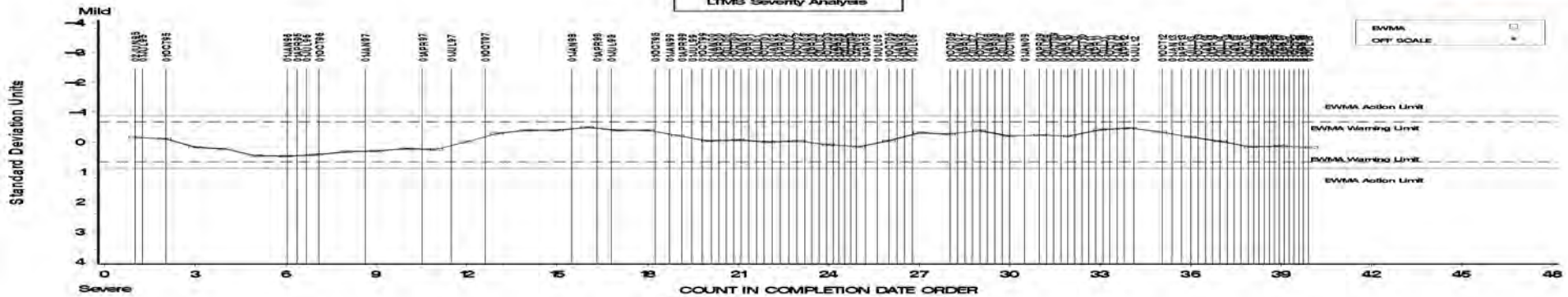
*Invalid and aborted tests

EOAT Test Severity

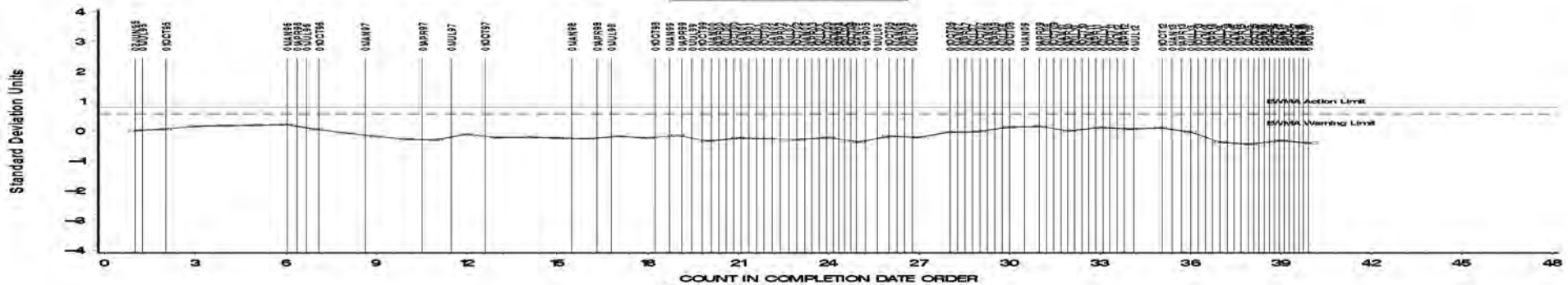
- ▶ As no EOAT tests were run during this period no statement about test severity can be made.

ENGINE OIL AERATION

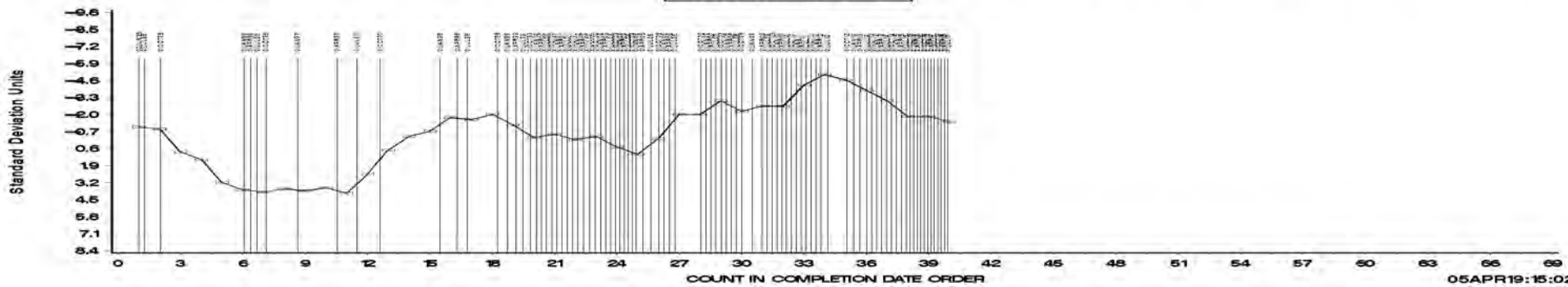
LTMS Severity Analysis



LTMS Precision Analysis



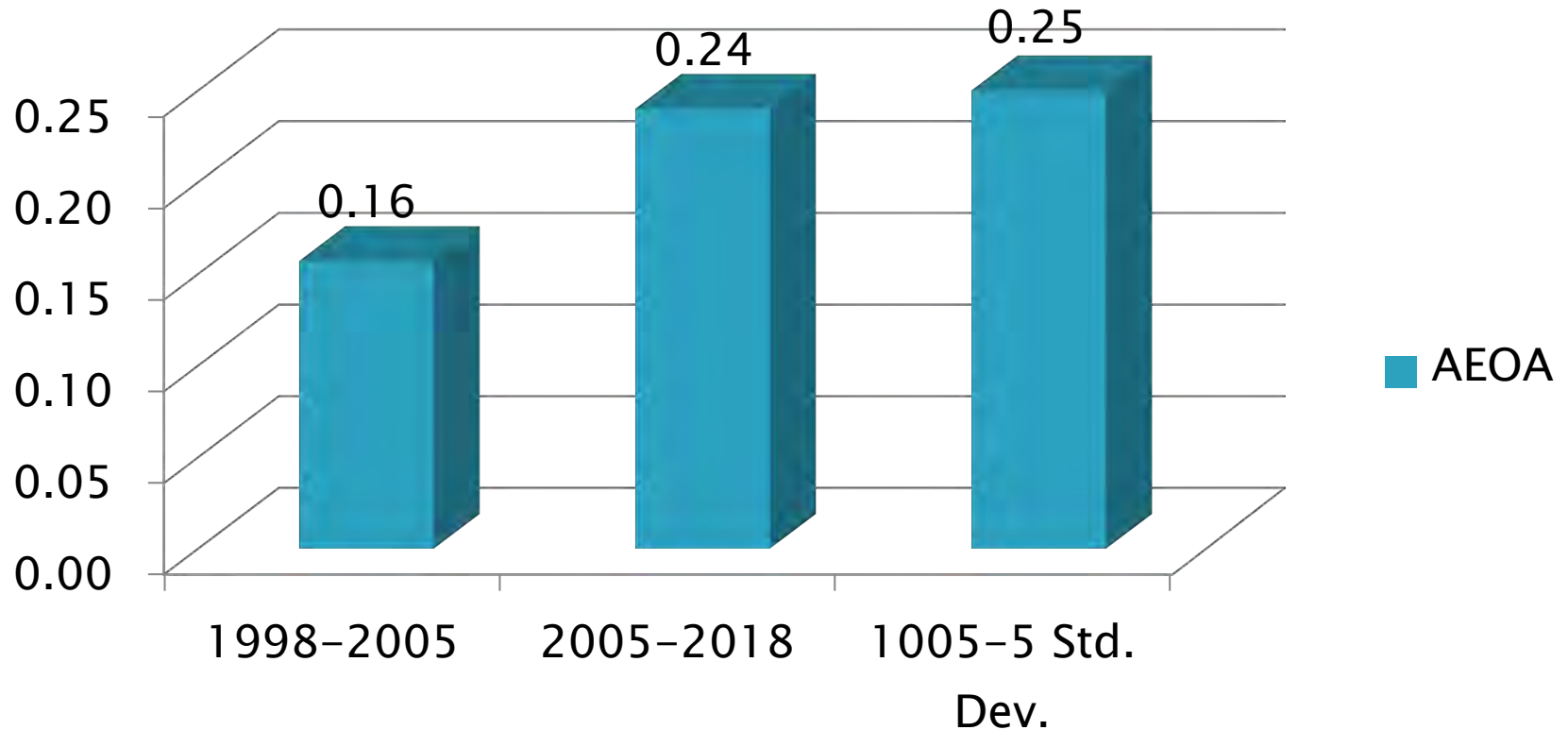
CUSUM Severity Analysis



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EOAT Precision Estimates

AEOA



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Test Monitoring Center

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RFWT

»» April 2019

RFWT Test Activity

Test Status	Validity Code	#
Acceptable Calibration Test	AC	1
Failed Calibration Test	OC	0
Operationally Invalid	LC	0
Aborted	XC	0
Total		1

RFWT Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
Total	0

RFWT Lost Tests*

Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
Total		0

*Invalid and aborted tests

Test Monitoring Center

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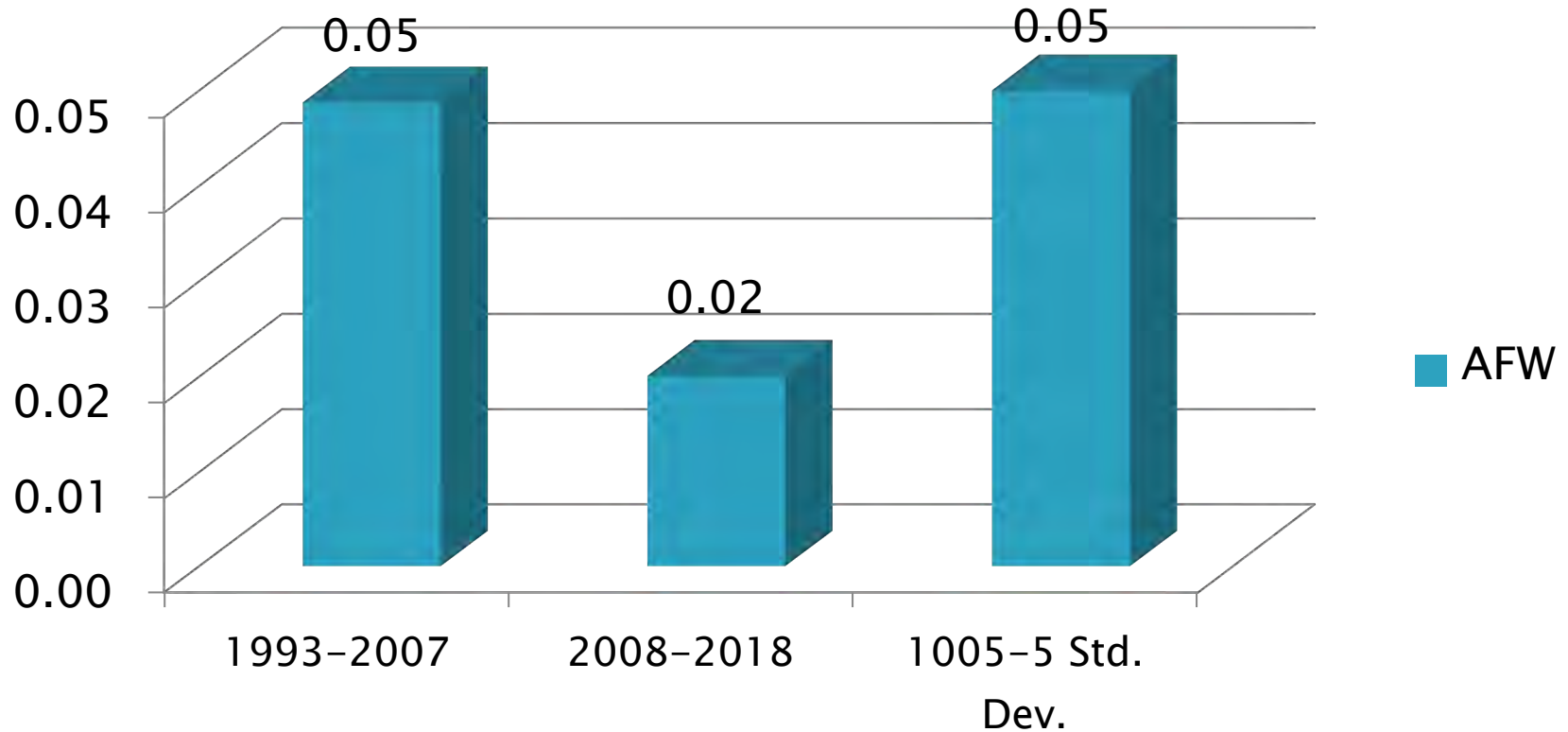
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RFWT Test Severity

- ▶ AFW is in control.

RFWT Precision Estimates

AFW



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Mack T-8/T-8E

»» April 2019

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T-8/T-8E Test Activity

Test Status	Validity Code	#
Acceptable Calibration Test	AC	2
Failed Calibration Test	OC	2
Operationally Invalid	LC	0
Aborted	XC	1
Total		5

T-8/T8-E Failed Tests

Failed Parameter	Number of Tests
RV48 and RV2 Severe	2
Total	2

T-8/T8-E Lost Tests*

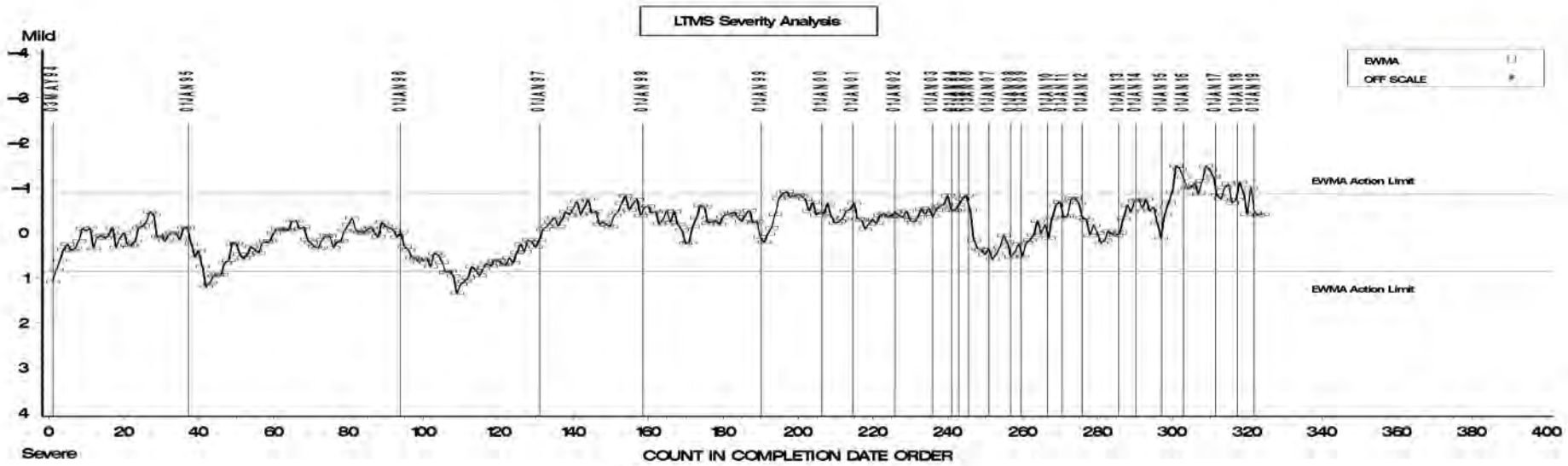
Status	Cause	#
Invalid	No invalid tests	0
Aborted	Aborted due to high oil consumption	1
Total		1

*Invalid and aborted tests

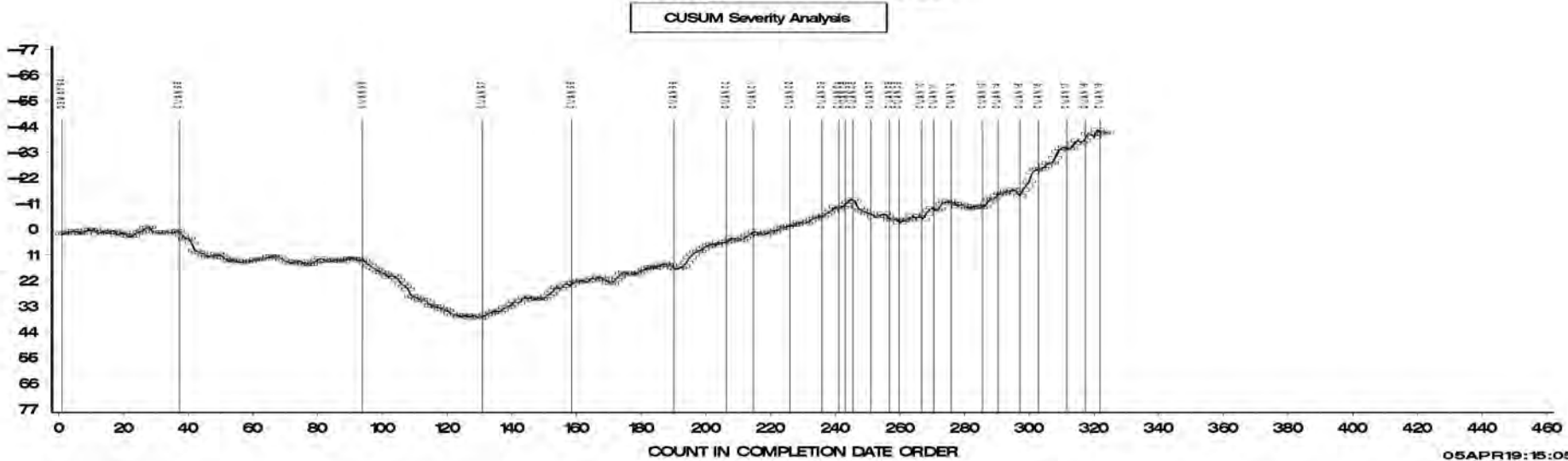
T-8/T-8E Test Severity

- ▶ VI38 is in control.
- ▶ RV48 and RV2 are in Level 2 Zi alarm in severe direction.

Standard Deviation Units

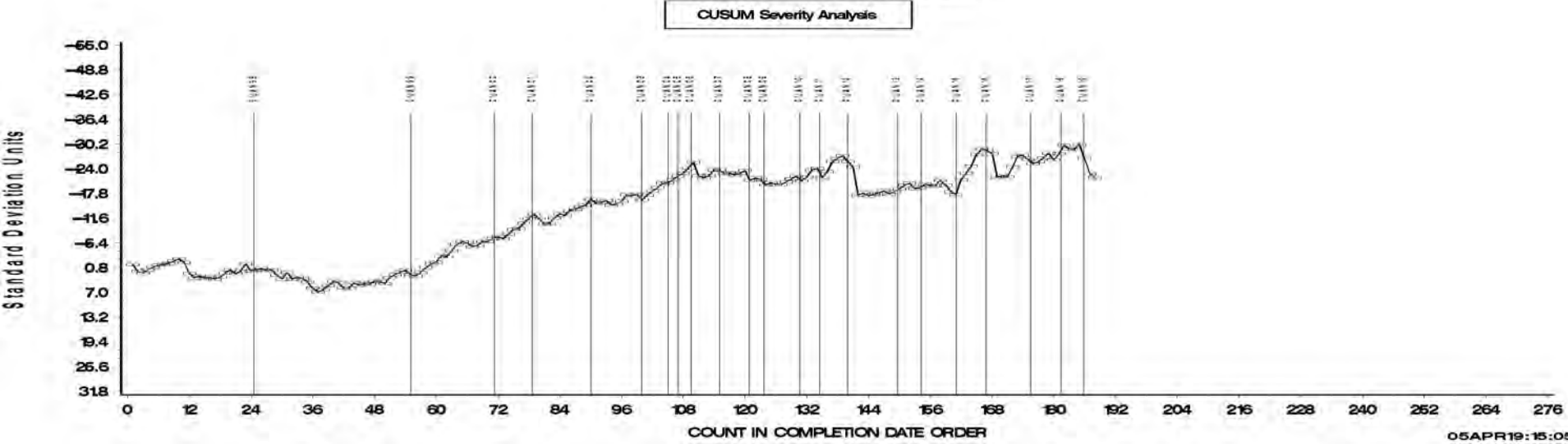
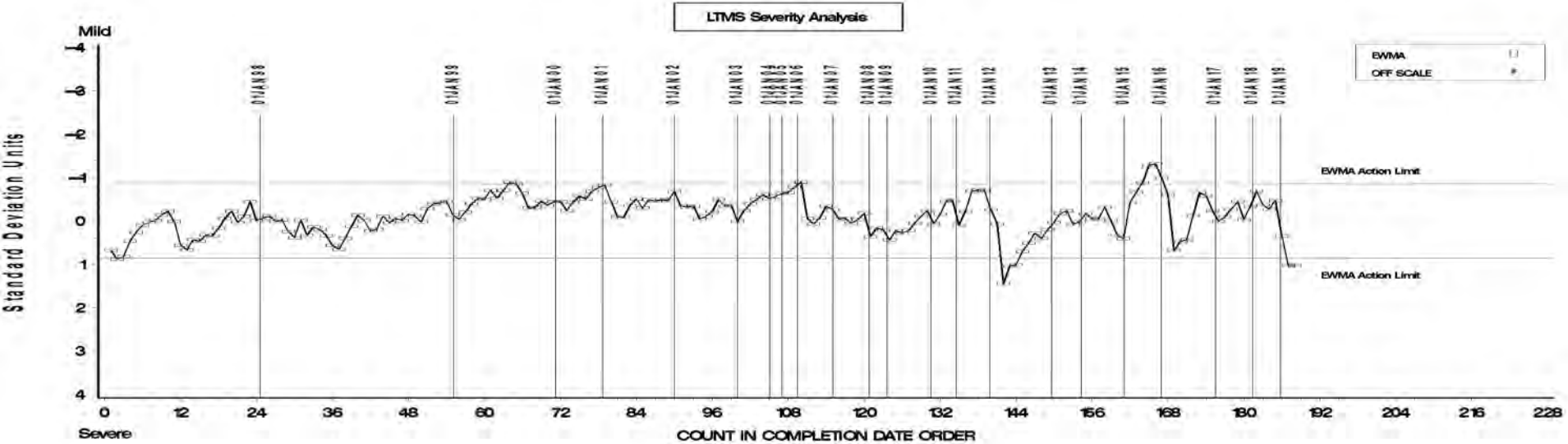


Standard Deviation Units

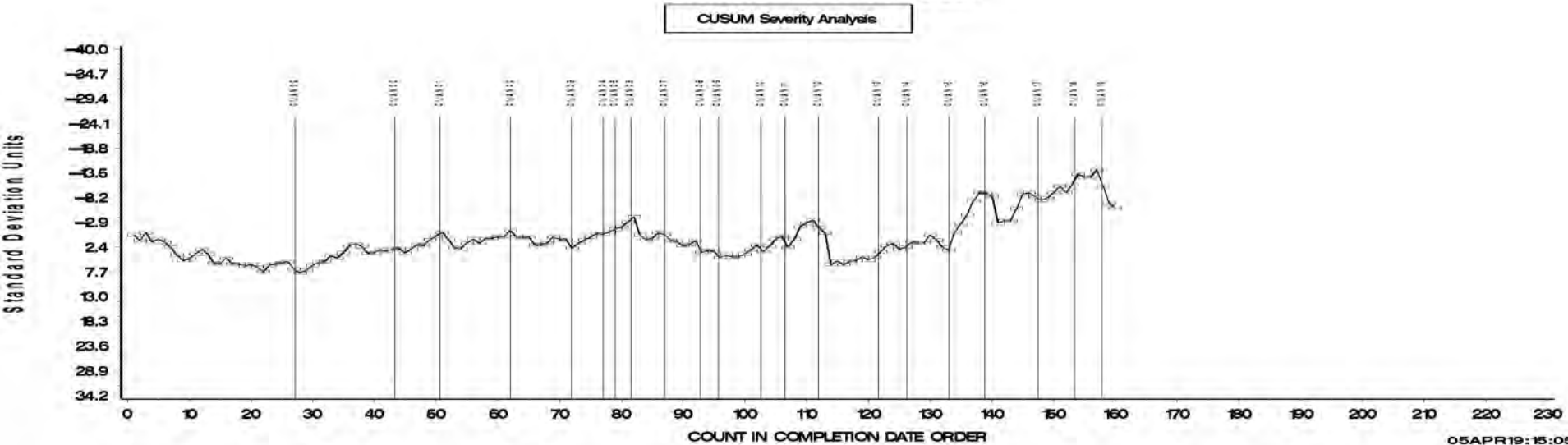
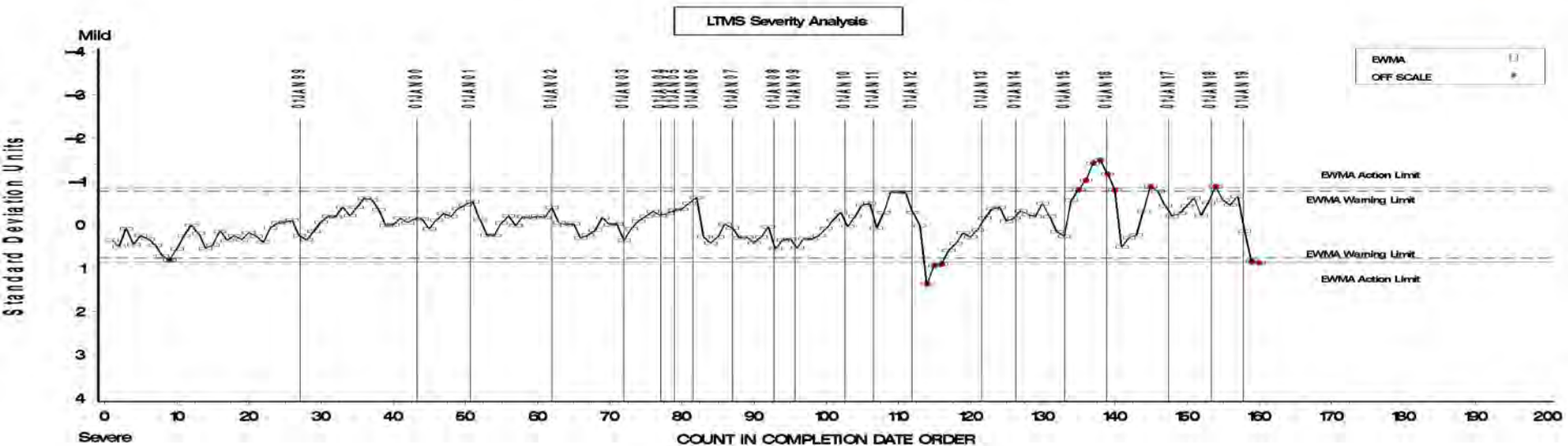


05APR19:15:05

RELATIVE VISCOSITY @ 4.8% (50% LOSS)

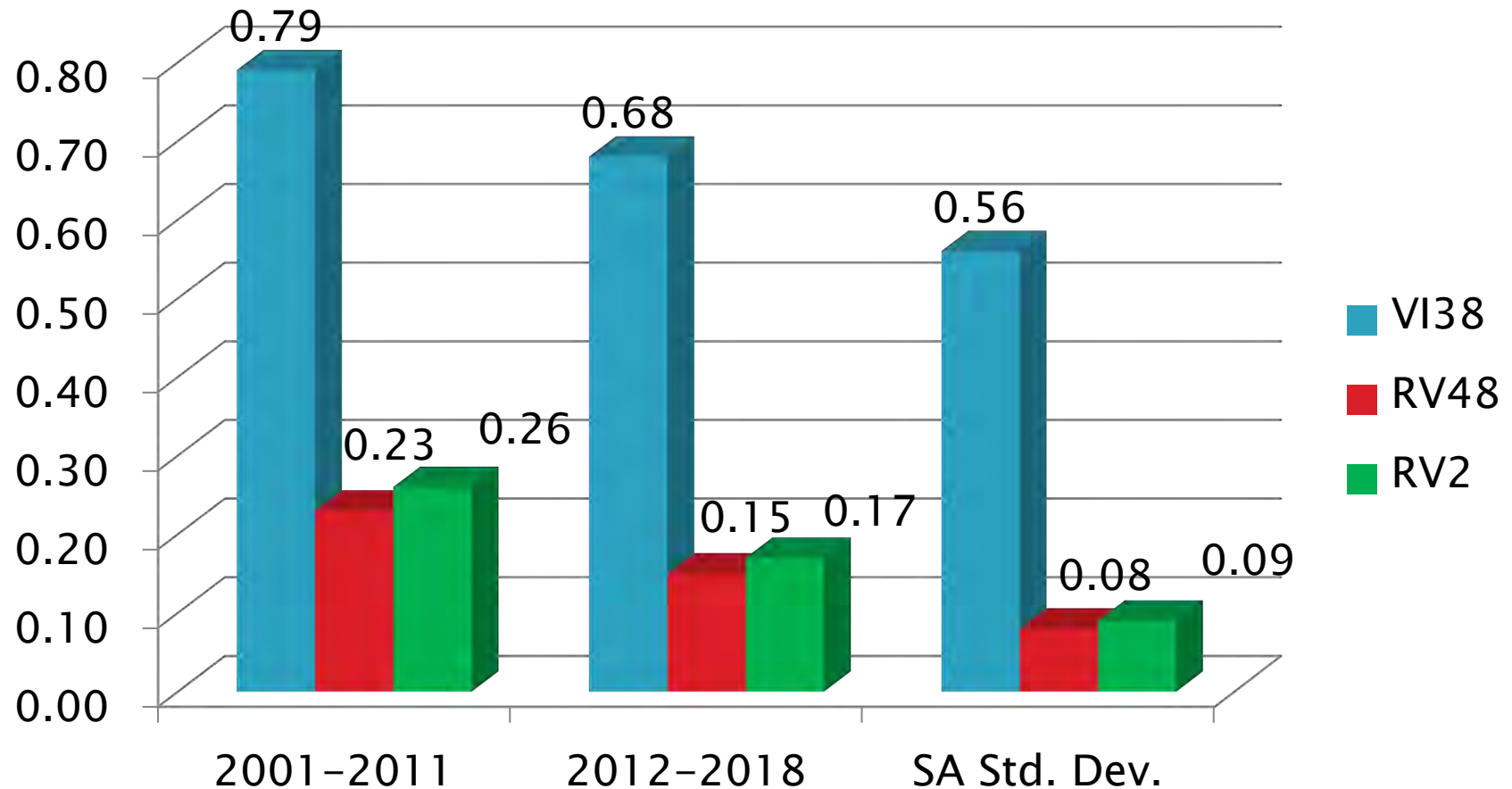


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T-8/E Precision Estimates



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Mack T-11

»» April 2019

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T-11 Test Activity

Test Status	Validity Code	#
Acceptable Calibration Test	AC	4
Failed Calibration Test	OC	0
Operationally Invalid	LC	1
Aborted	XC	0
Total		5

T-11 Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
Total	0

T-11 Lost Tests*

Status	Cause	#
Invalid	Did not achieve 12cSt increase	1
Aborted	No aborted tests	0
Total		0

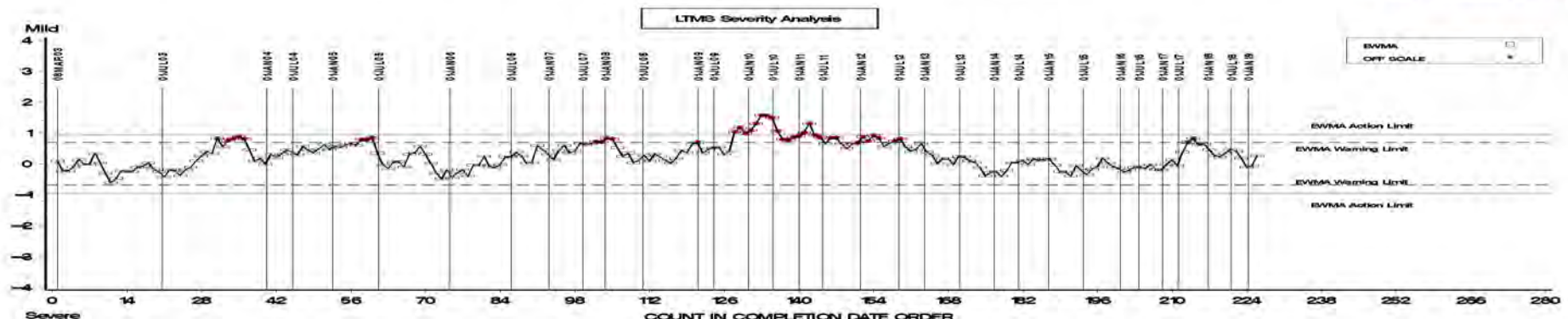
*Invalid and aborted tests

T-11 Test Severity

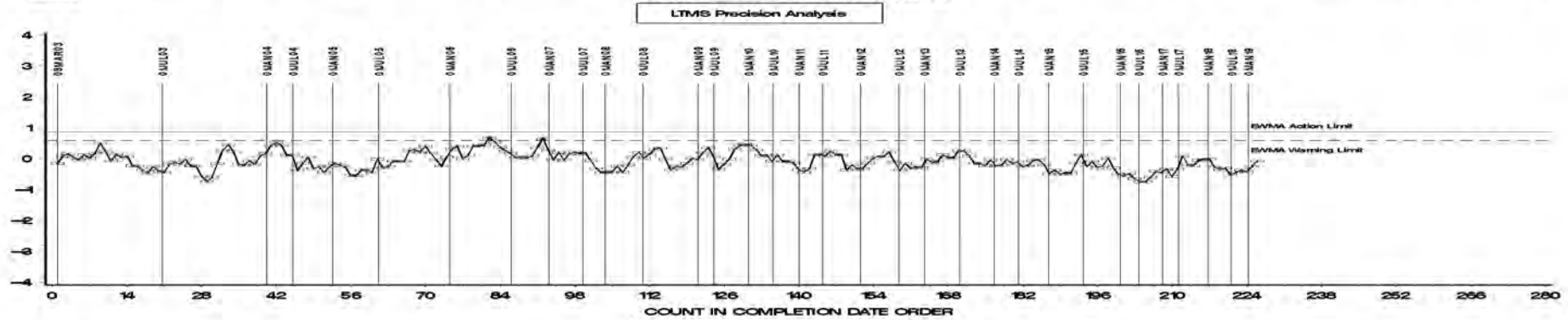
- ▶ SOOT and SOOT5 are in control.
- ▶ SOOT4 and MRV are in severity action alarm in the severe direction.
- ▶ SOOT4 and MRV in precision action alarm.

SOOT AT 12 cSt

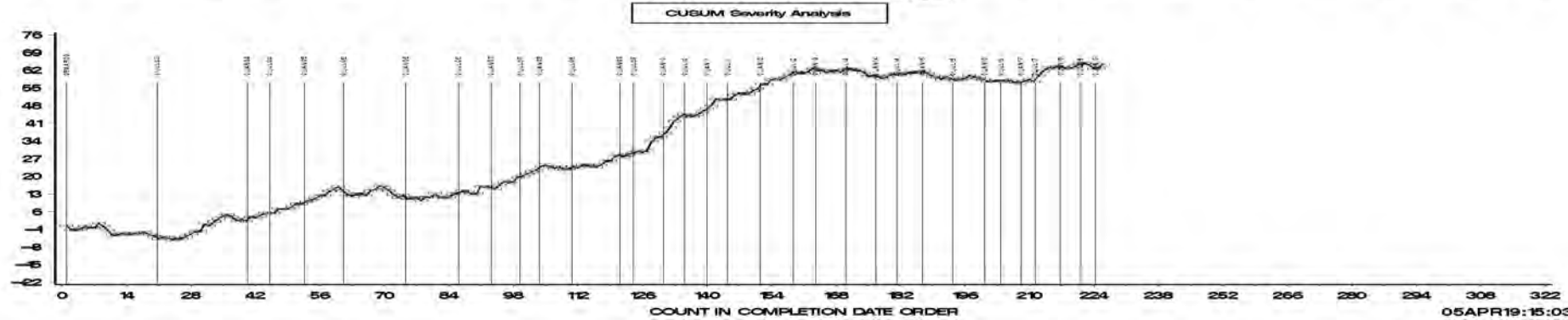
Standard Deviation Units



Standard Deviation Units

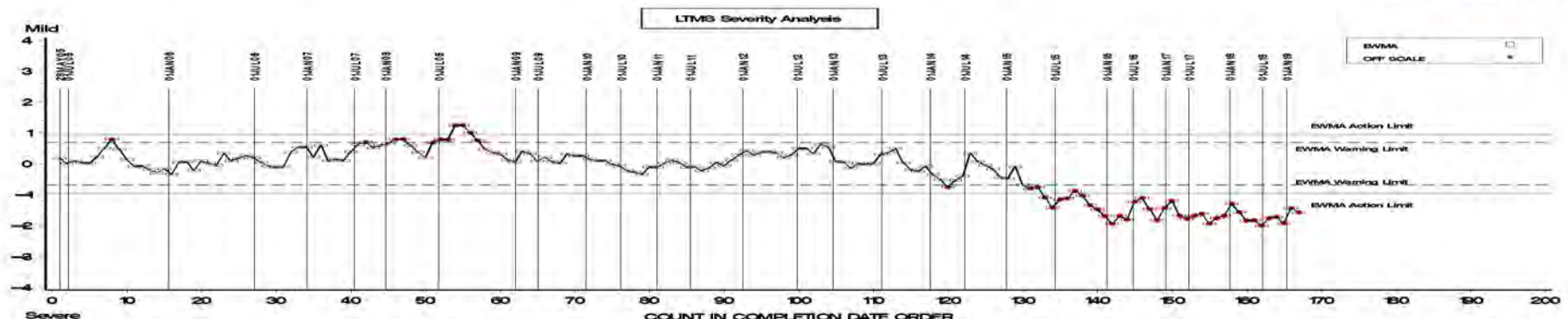


Standard Deviation Units

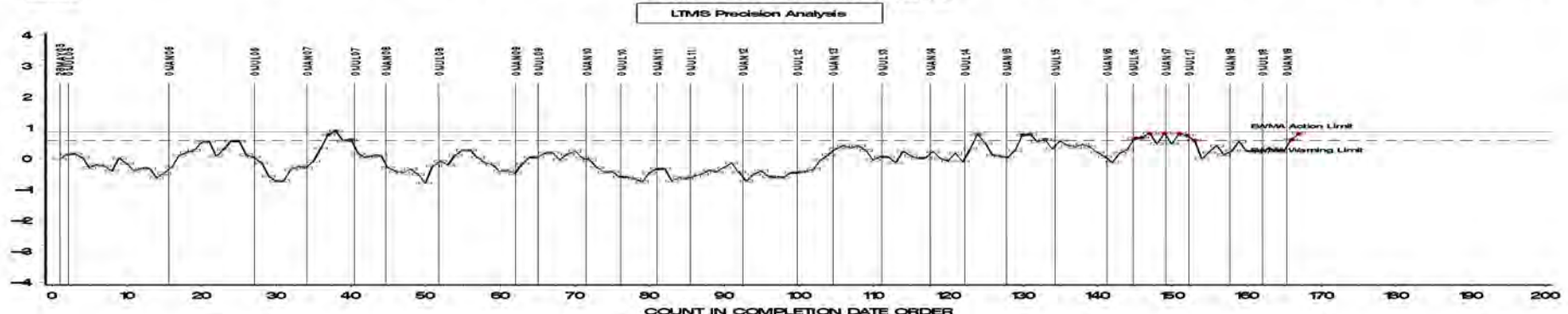


05APR19:15:03

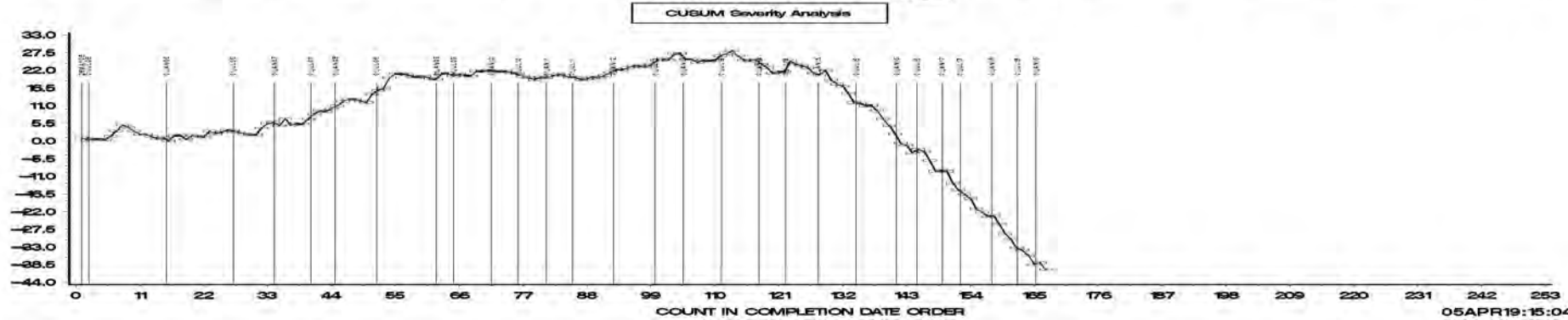
Standard Deviation Units



Standard Deviation Units

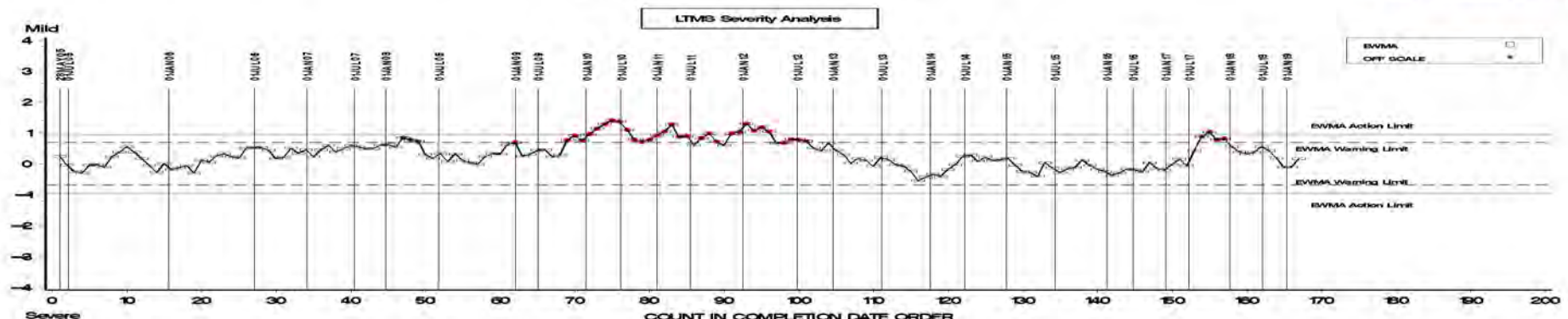


Standard Deviation Units

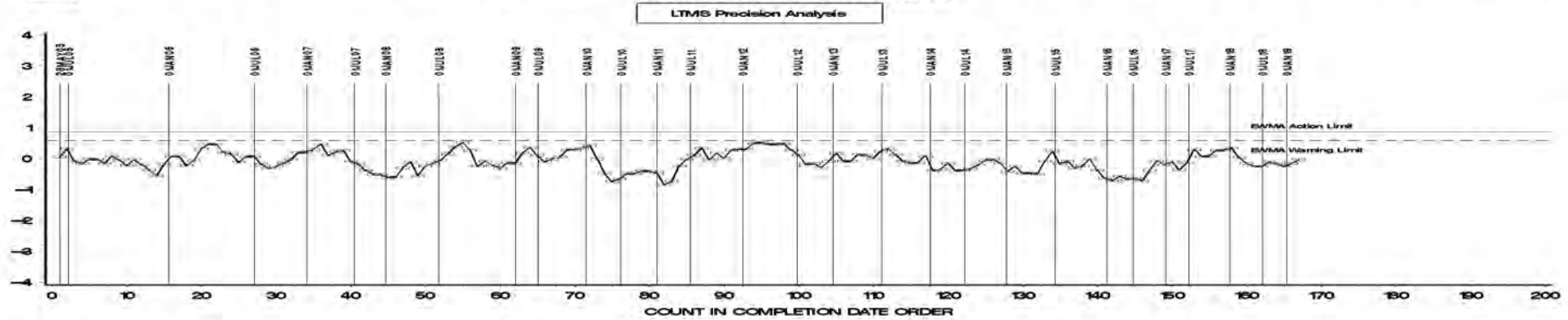


05APR19:15:04

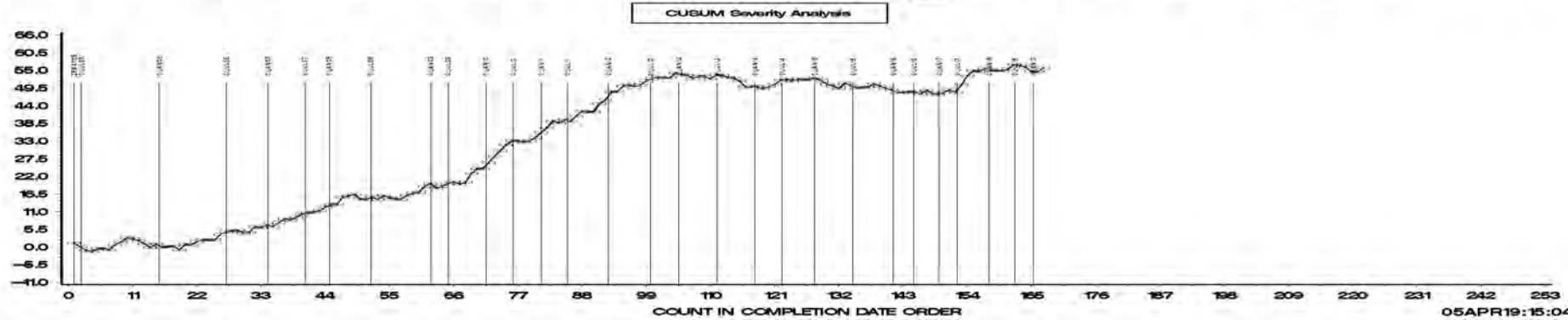
Standard Deviation Units



Standard Deviation Units



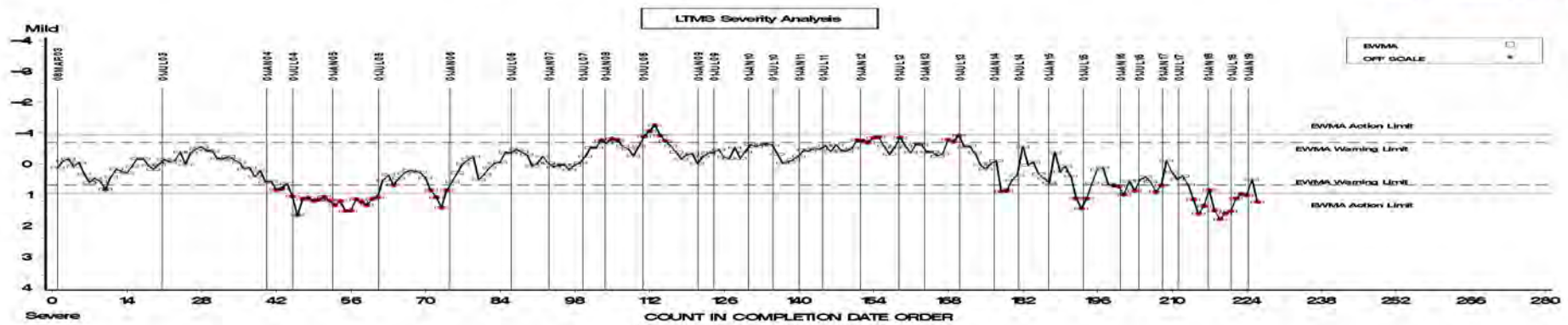
Standard Deviation Units



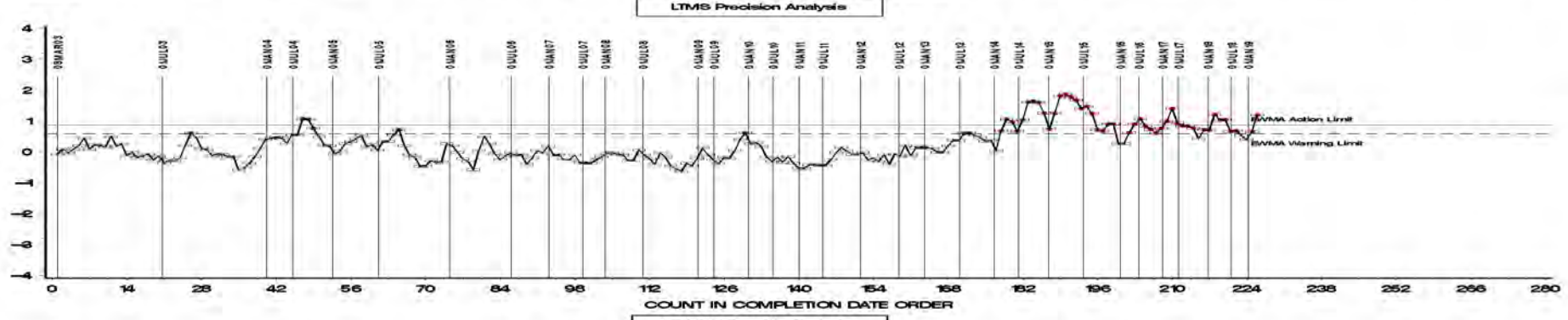
05APR19:15:04

MRV VISCOSITY

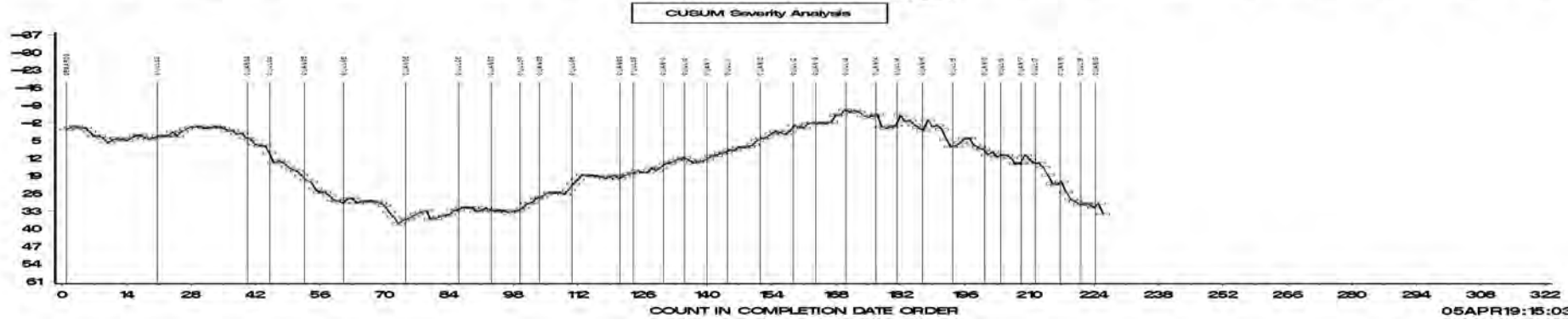
Standard Deviation Units



Standard Deviation Units

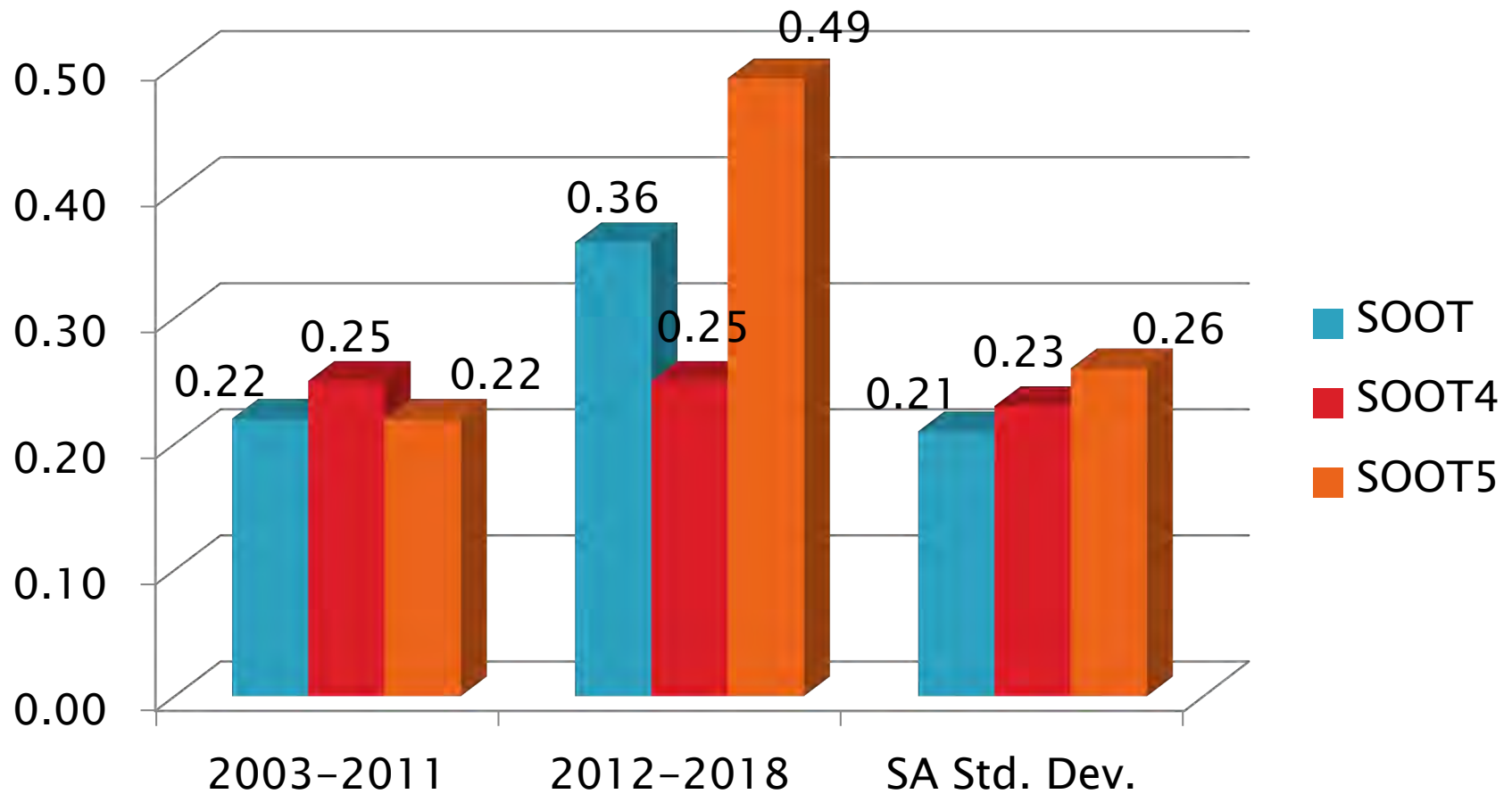


Standard Deviation Units



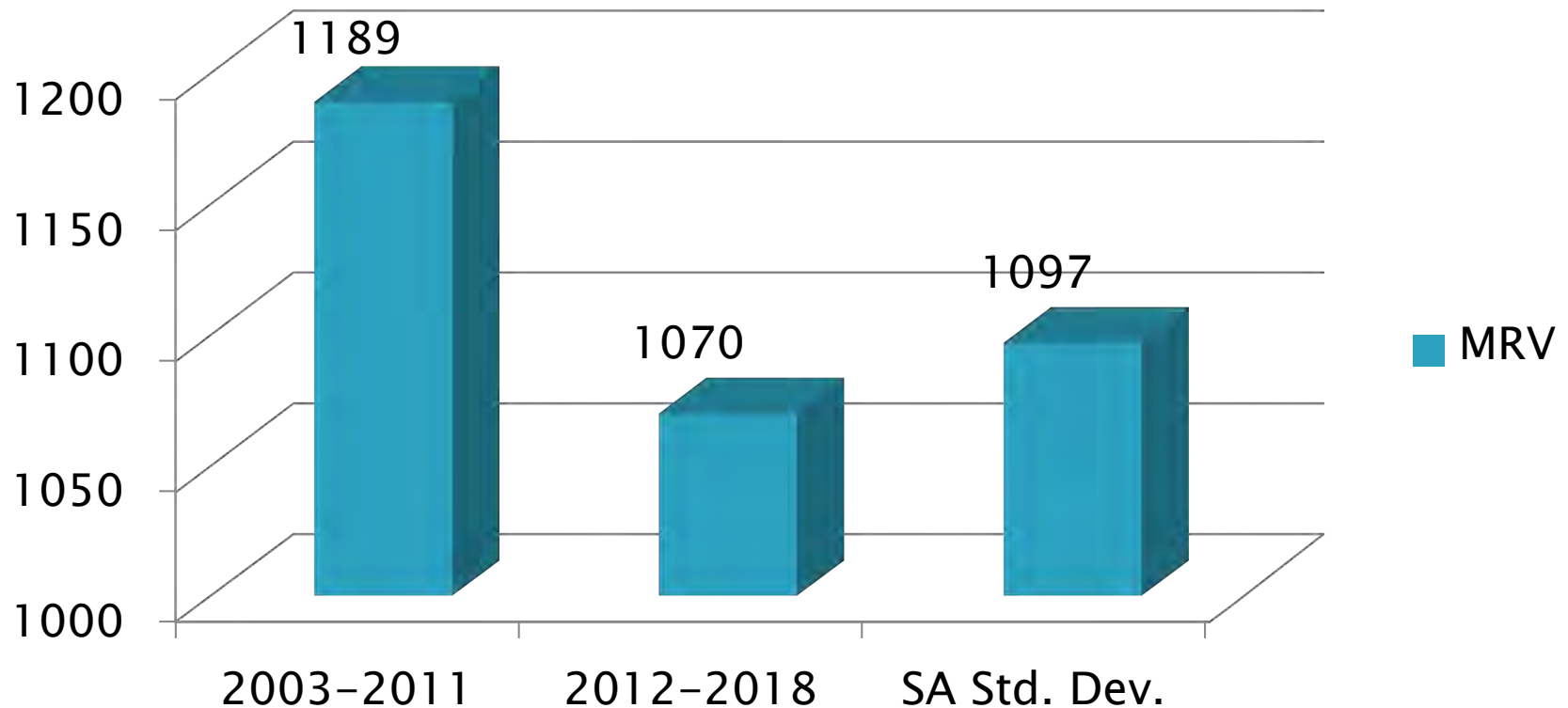
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T-11 Precision Estimates



T-11 Precision Estimates

MRV



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Mack T-12

»» April 2019

Test Monitoring Center

<http://astmtmc.cmu.edu>



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T-12 Test Activity

Test Status	Validity Code	#
Acceptable Calibration Test	AC	0
Failed Calibration Test	OC	0
Operationally Invalid	LC	0
Aborted	XC	0
Total		0

T-12 Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
Total	0

T-12 Lost Tests*

Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
Total		0

*Invalid and aborted tests

T-12 Test Severity

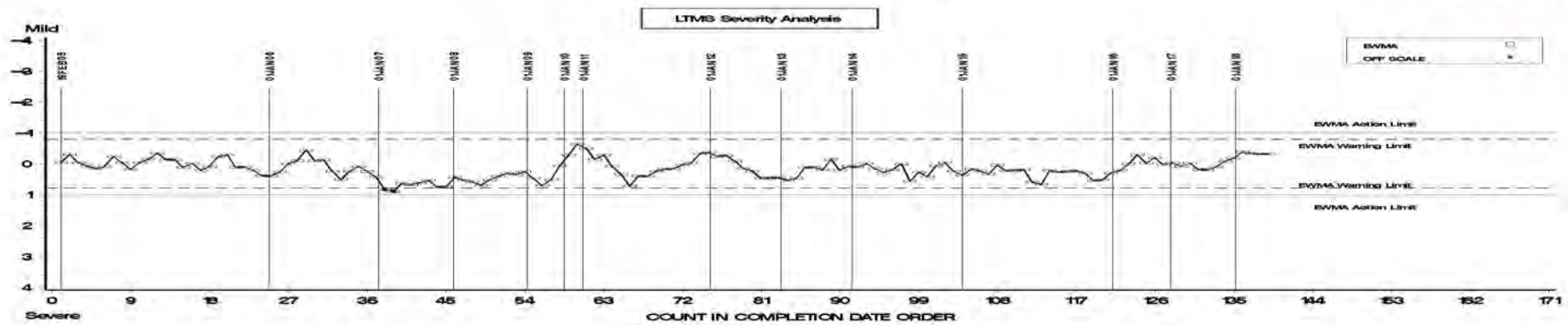
- ▶ As no T-12 tests were run during this period no statement about test severity can be made.

MACK T-42 INDUSTRY CYCLER VALID DATA

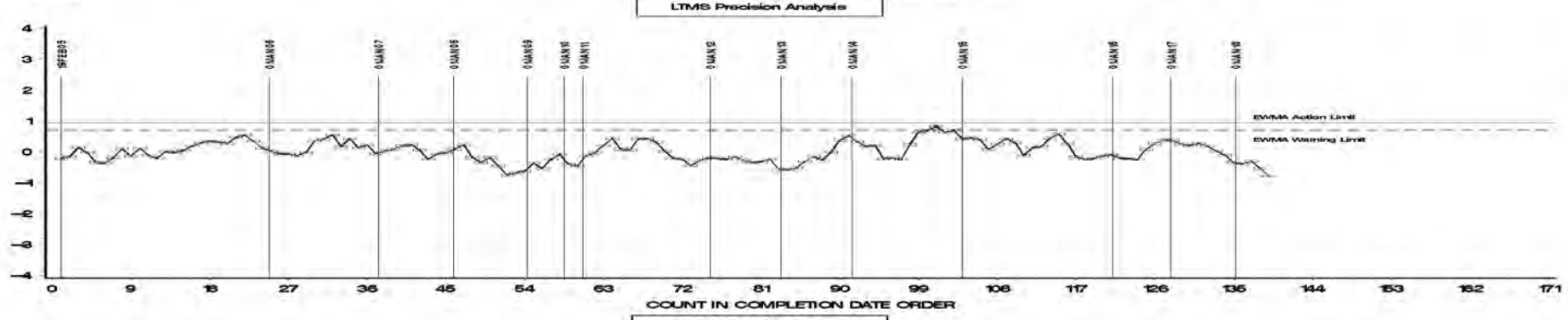
AVG. CYLINDER LINER WEAR (CLW)



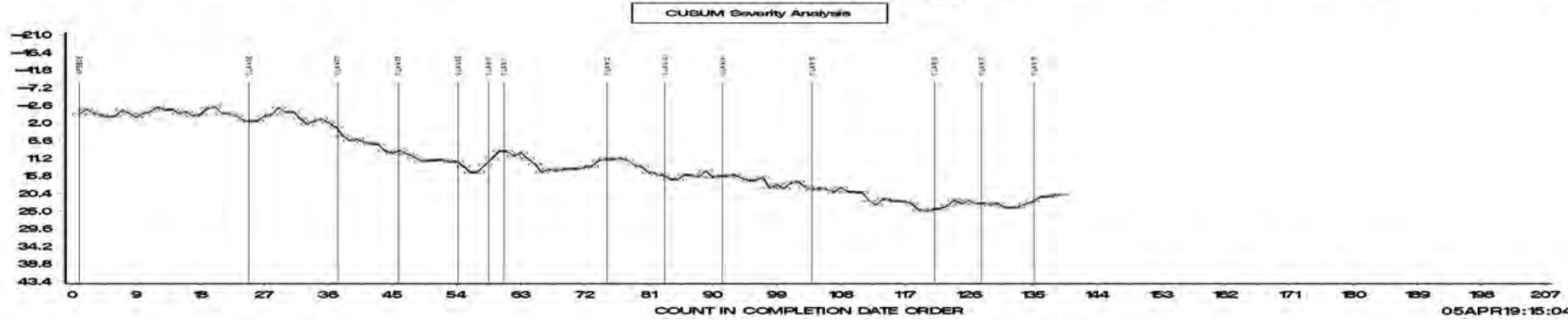
Standard Deviation Units



Standard Deviation Units



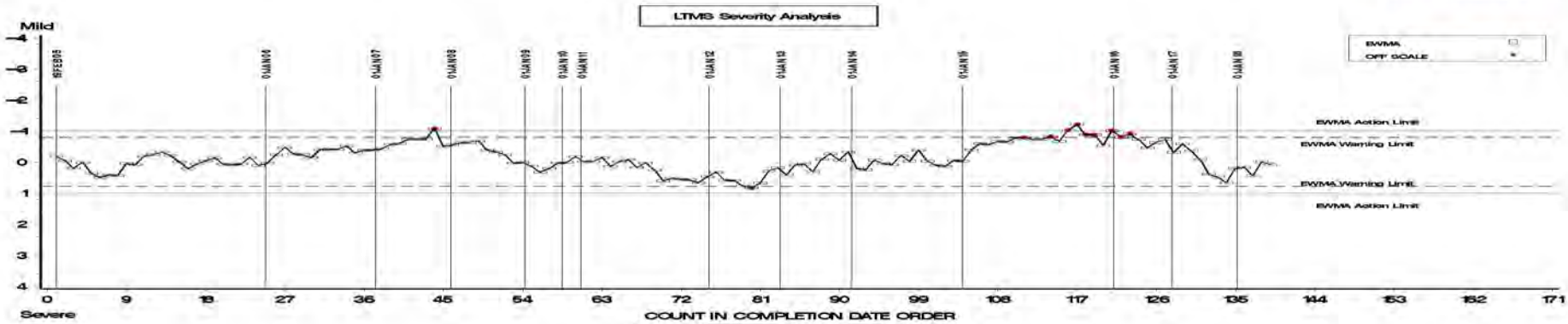
Standard Deviation Units



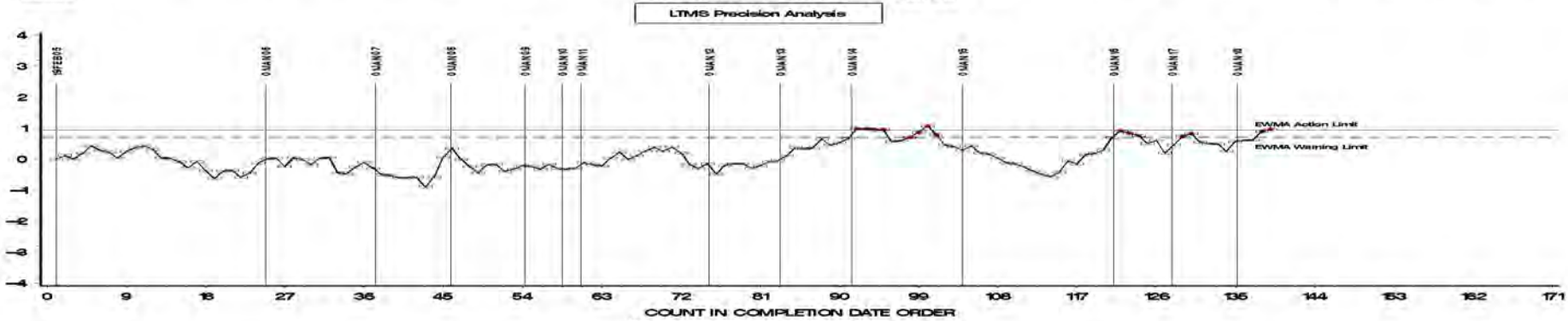
05APR19:15:04



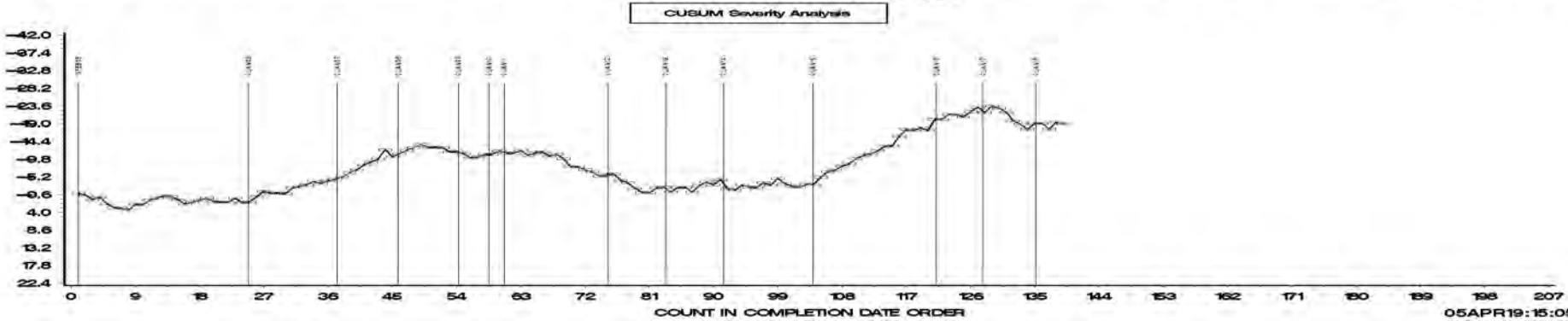
Standard Deviation Units



Standard Deviation Units



Standard Deviation Units

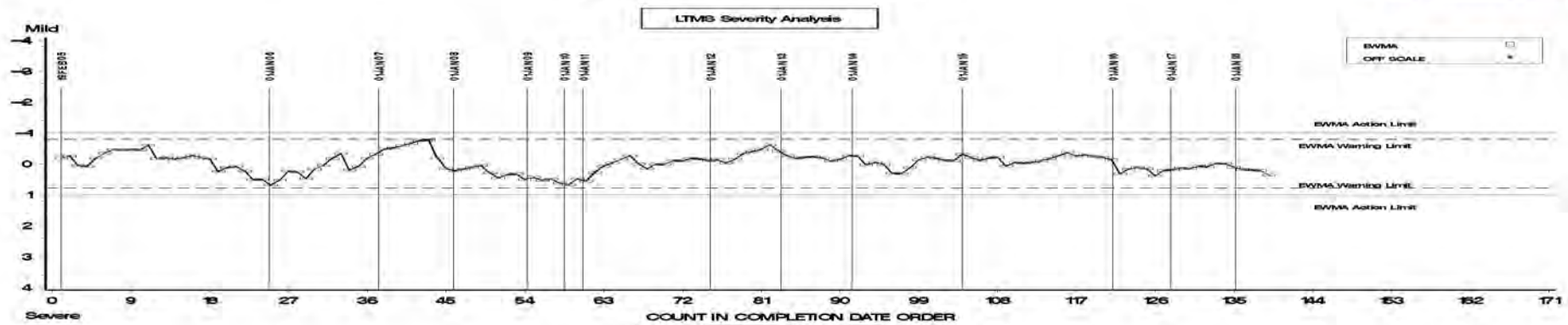


05APR19:15:05

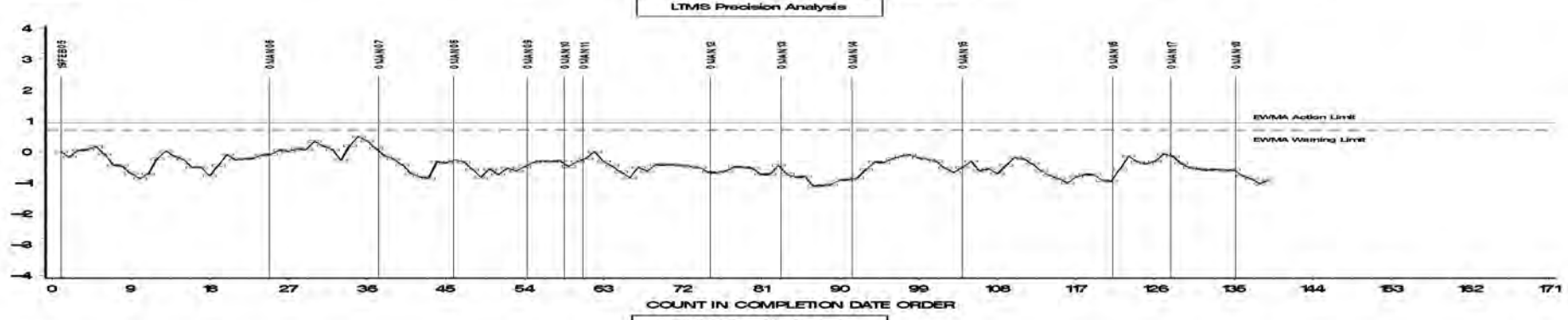
MACK T-42 INDUSTRY OPERATIONAL VALID DATA
AVG. TOP RING WEIGHT LOSS (TRWL)



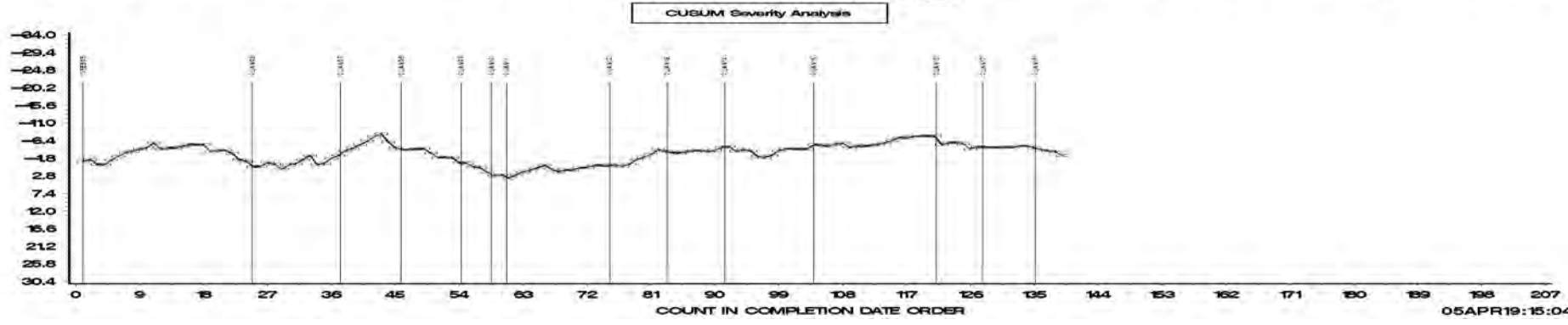
Standard Deviation Units



Standard Deviation Units



Standard Deviation Units



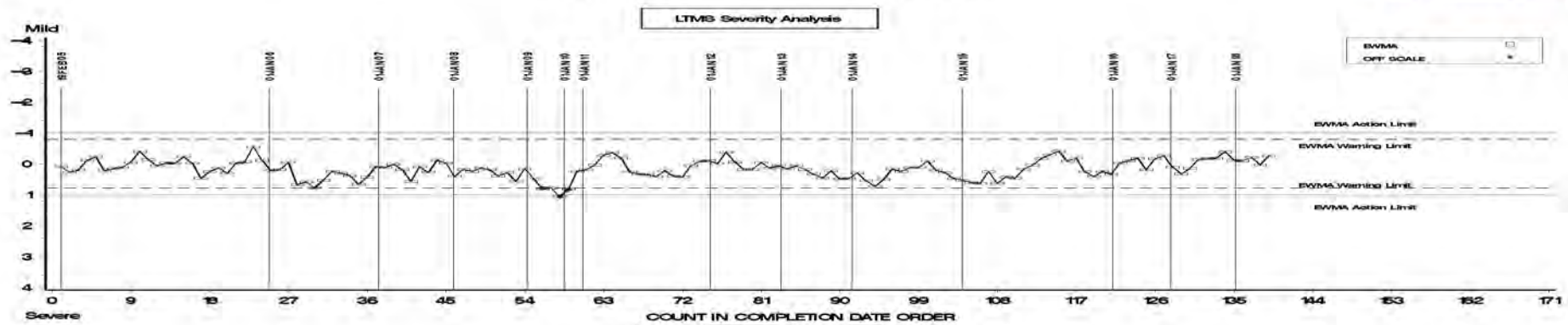
05APR19:15:04



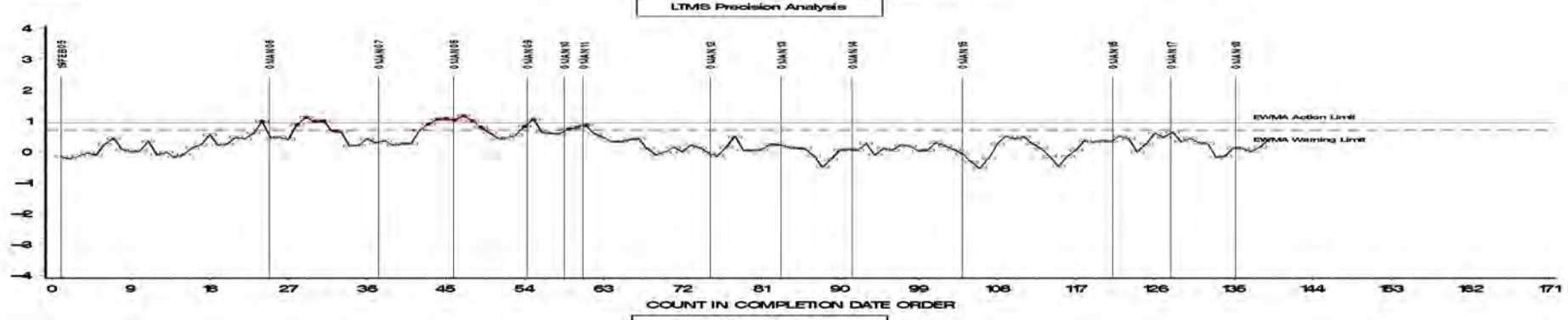
MACK T-42 INDUSTRY OPERATIONAL VALID DATA
FINAL TRANS. RES. OIL CONSUMPTION



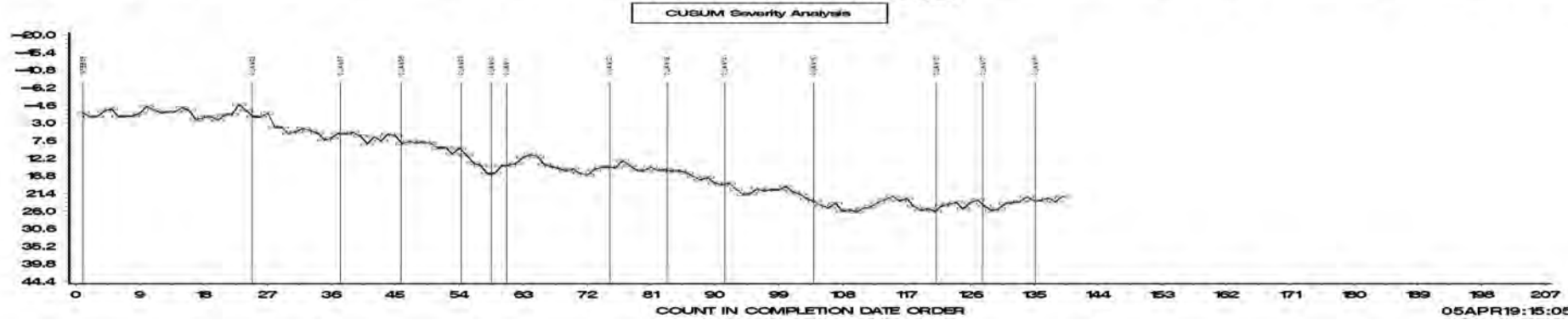
Standard Deviation Units



Standard Deviation Units



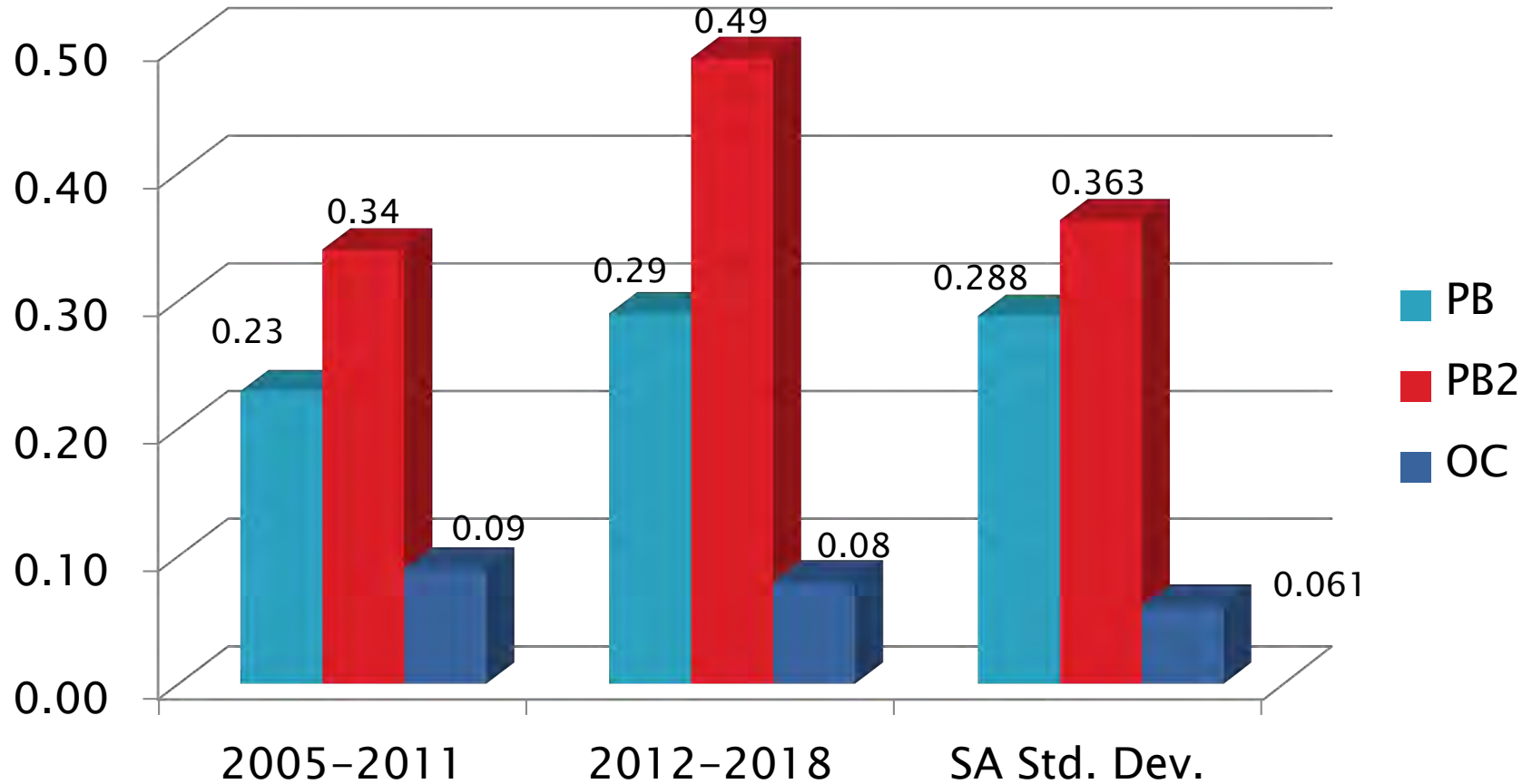
Standard Deviation Units



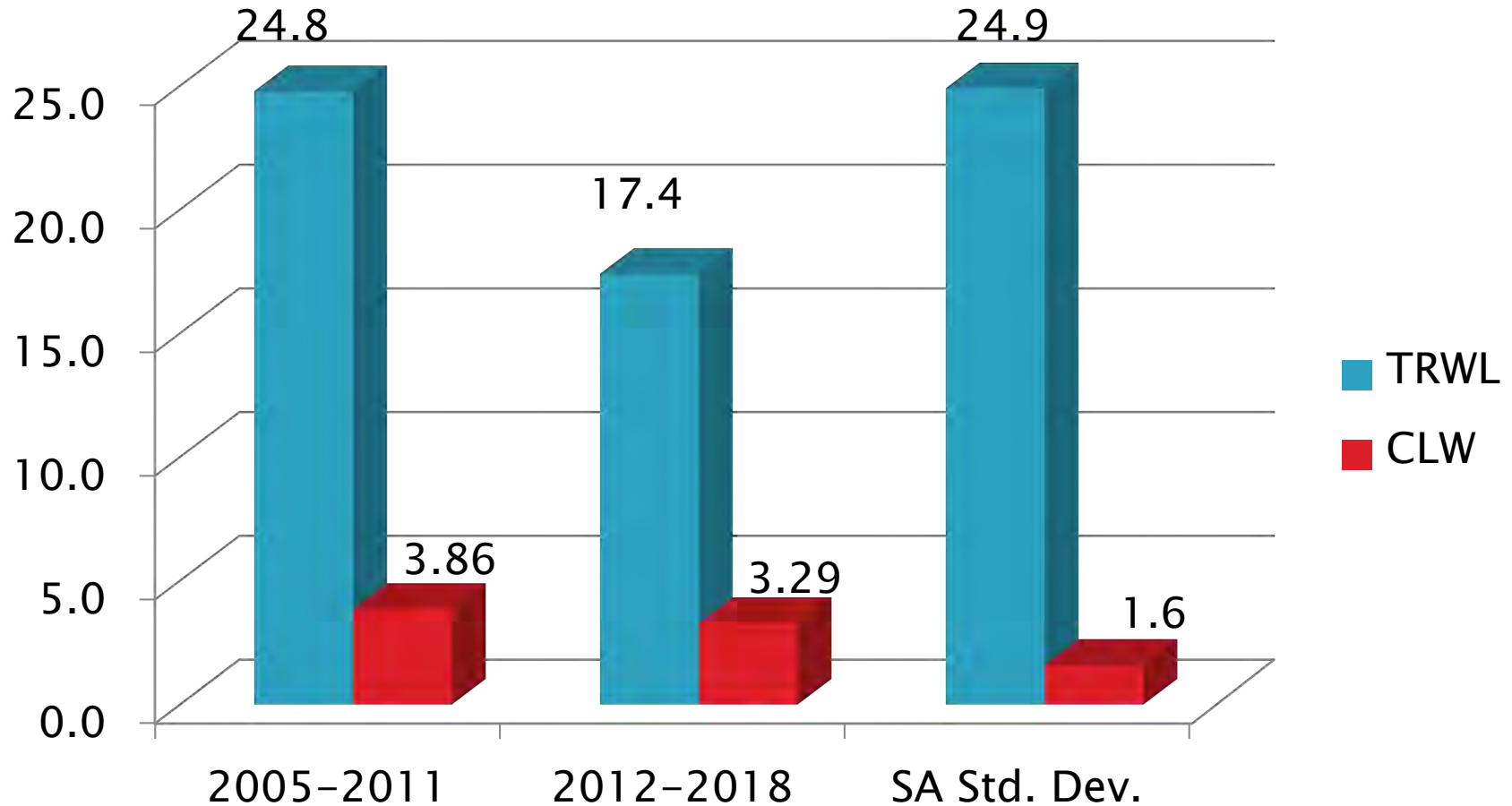
05APR19:15:05



T-12 Precision Estimates



T-12 Precision Estimates



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Mack T-12A

»» April 2019

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T-12A Test Activity

Test Status	Validity Code	#
Acceptable Calibration Test	AC	0
Failed Calibration Test	OC	0
Operationally Invalid	LC	0
Aborted	XC	0
Total		0

T-12A Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
Total	0

T-12A Lost Tests*

Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
Total		0

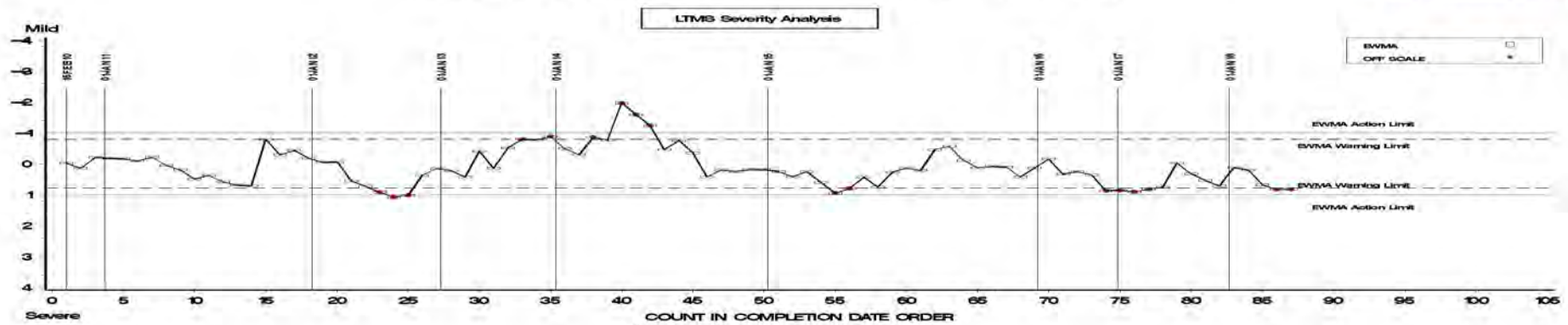
*Invalid and aborted tests

T-12A Test Severity

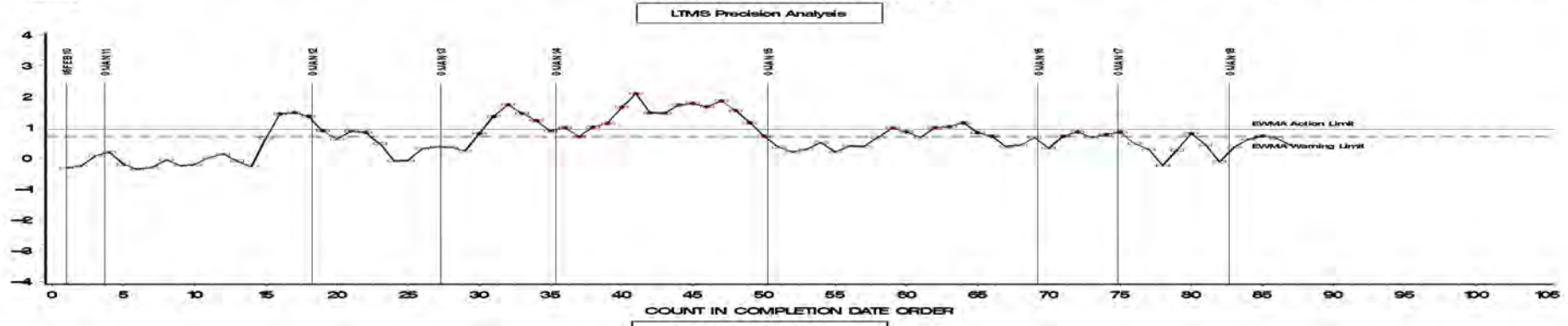
- ▶ MRV is in severity warning alarm.

MACK T-42A INDUSTRY OPERATIONAL VALID DATA
 FINAL ORIGINAL UNIT MRV VISCOSITY [NM, SOLID, FROZEN, <, >]

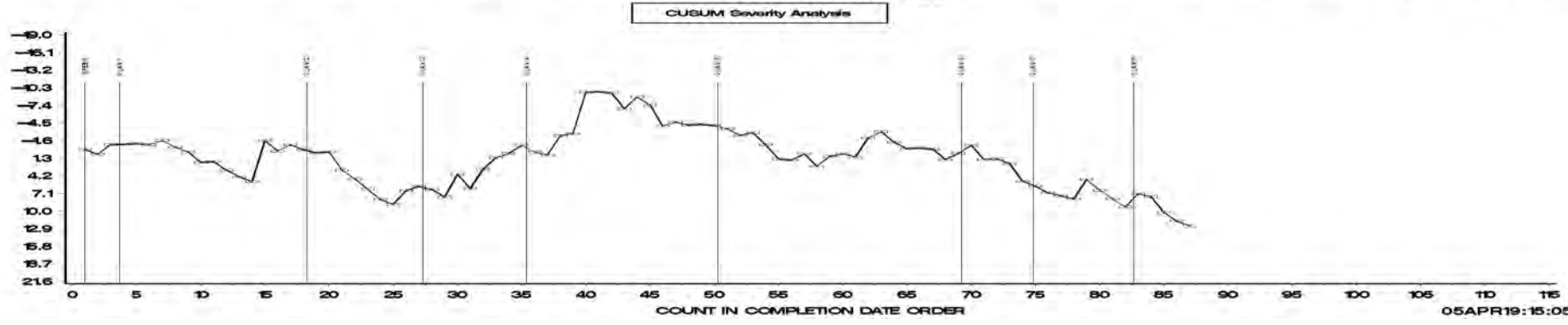
Standard Deviation Units



Standard Deviation Units



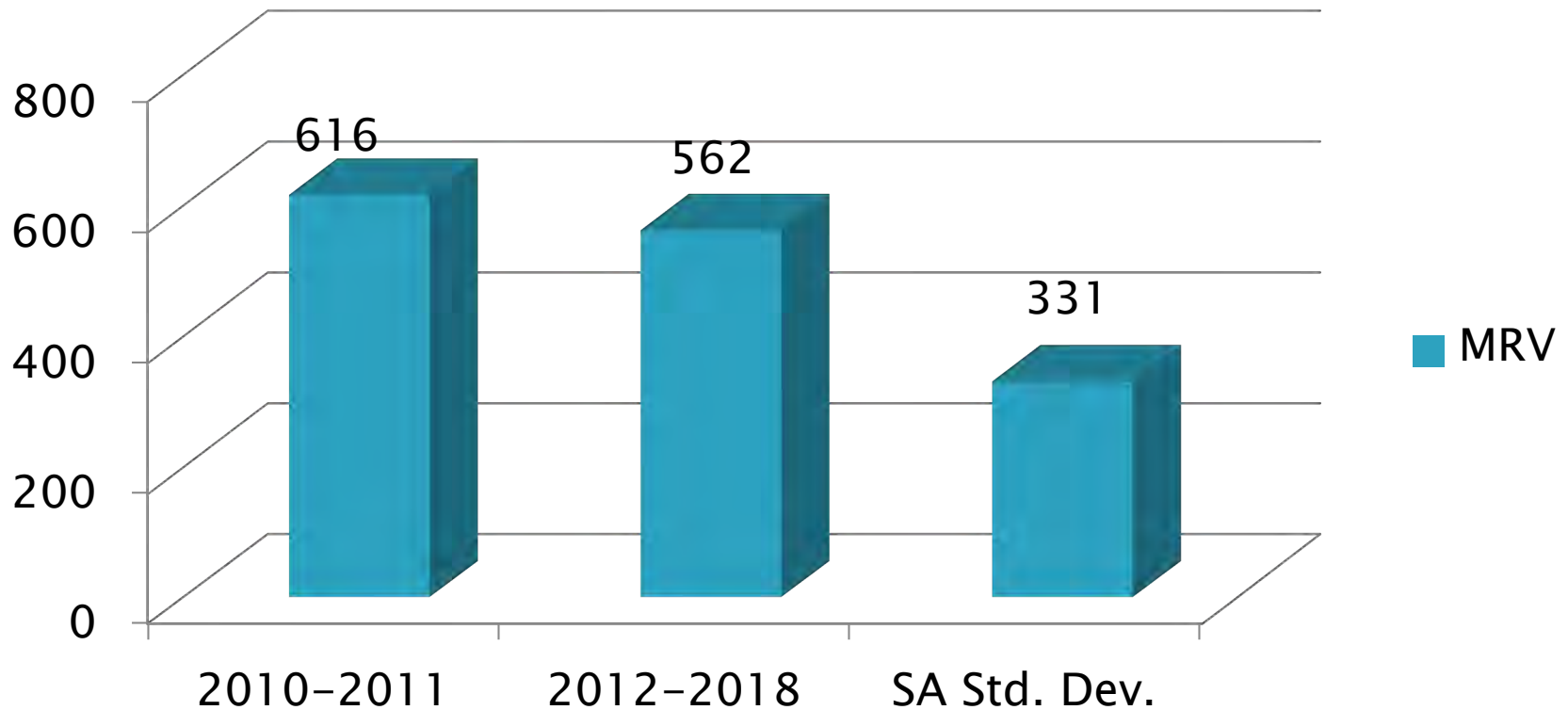
Standard Deviation Units



05APR19:15:05

T-12A Precision Estimates

MRV



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Mack T-13

»» April 2019

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T-13 Test Activity

Test Status	Validity Code	#
Acceptable Calibration Test	AC	0
Failed Calibration Test	OC	0
Operationally Invalid	LC	0
Aborted	XC	0
Total		0

T-13 Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
Total	0

T-13 Lost Tests*

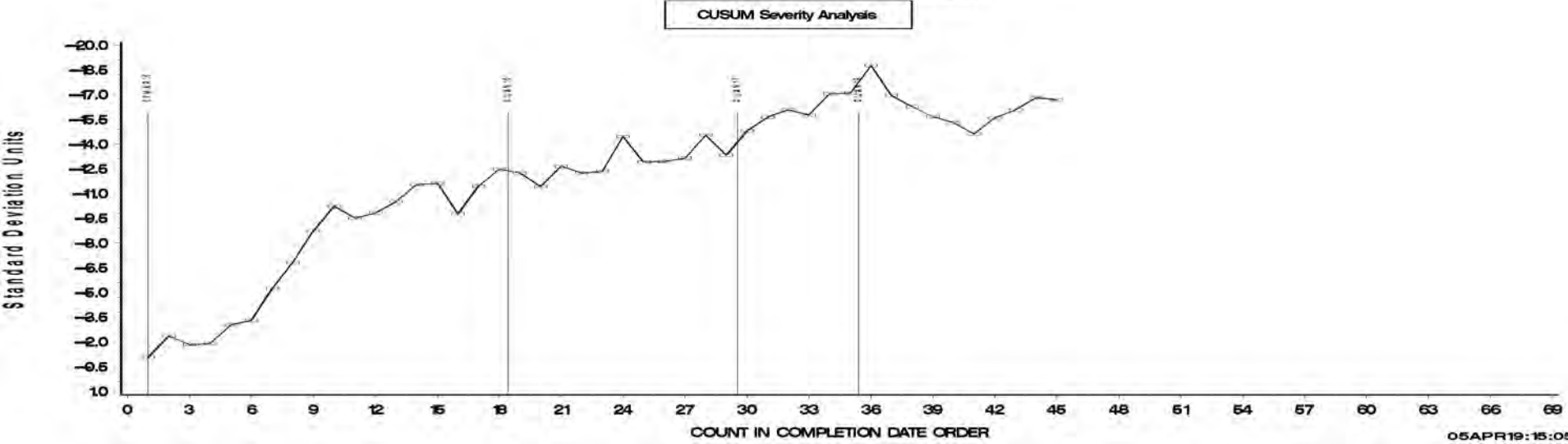
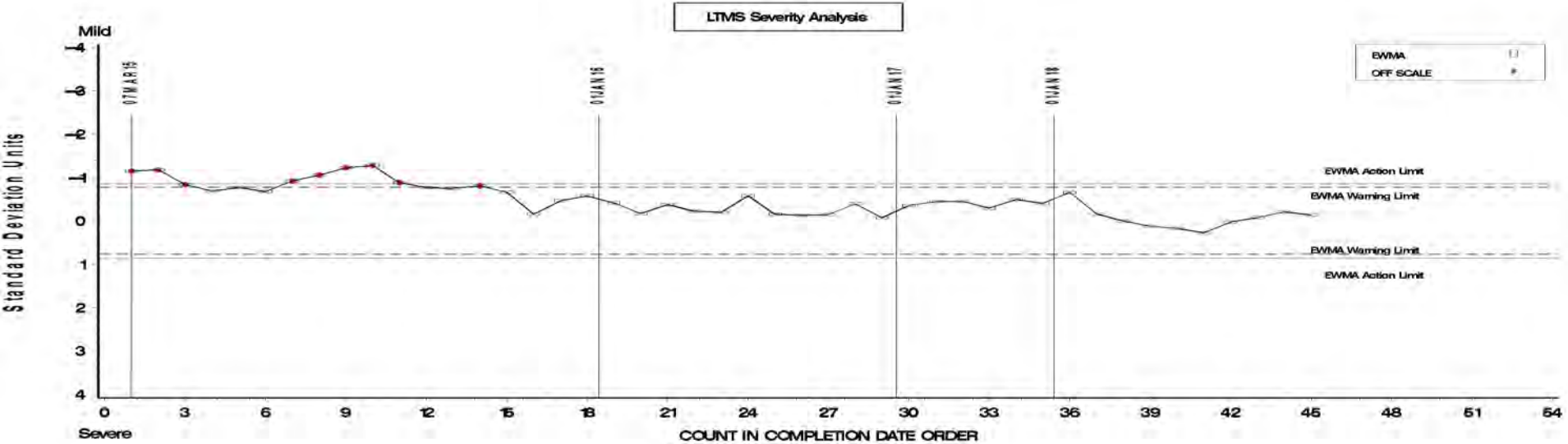
Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
Total		0

*Invalid and aborted tests

T-13 Test Severity

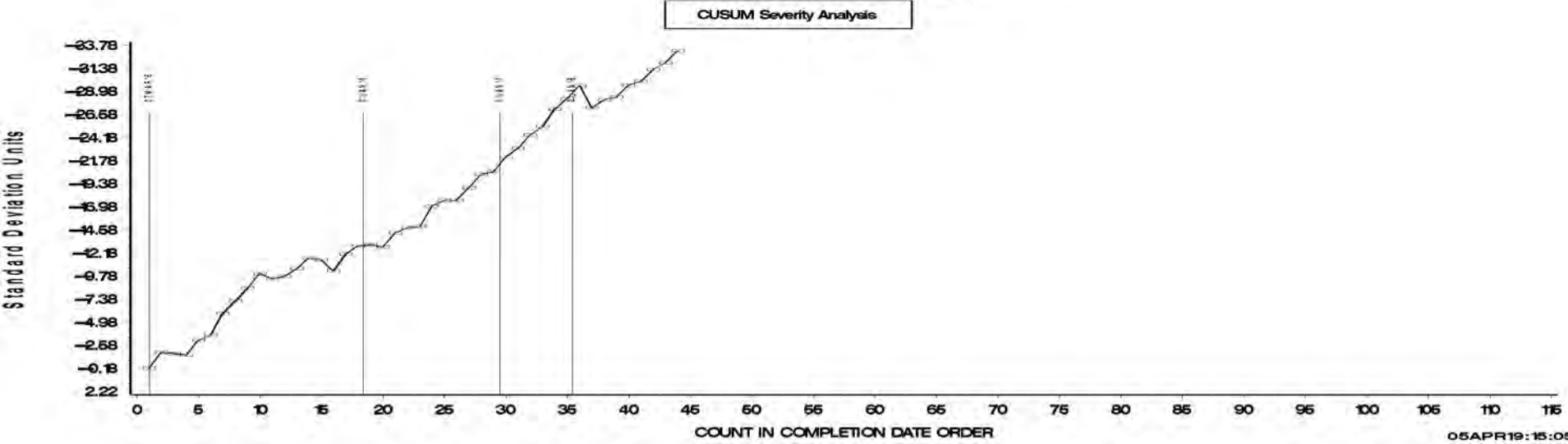
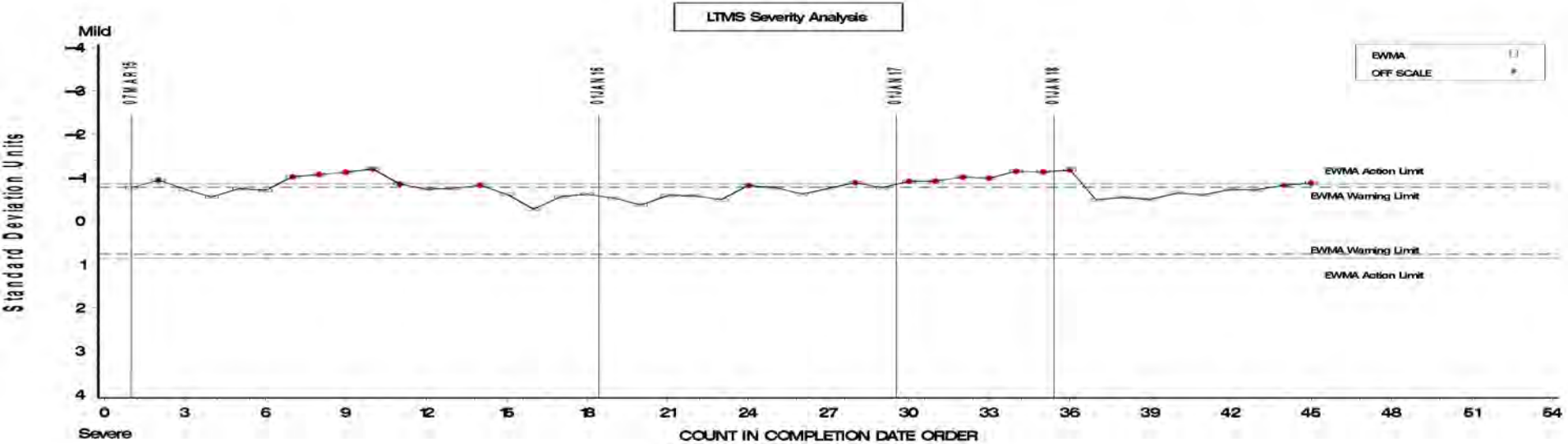
- ▶ As no T-13 tests were run during this period no statement about test severity can be made.

FINAL ORIGINAL PEAK HEIGHT IR AT EOT



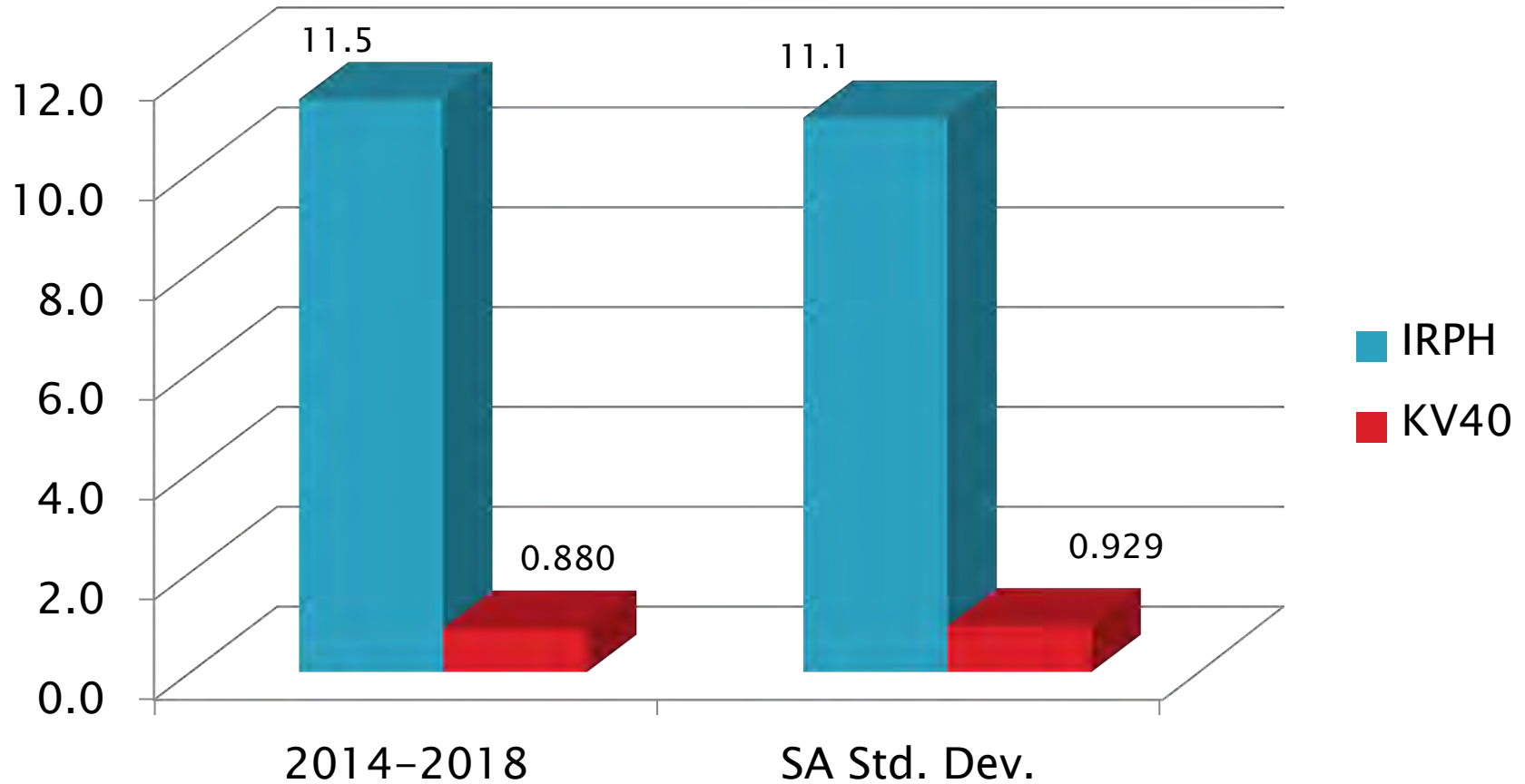
05APR19:15:05

FNL. ORIG. UNIT KINEMATIC VISCOSITY AT 40 DEG C % CHANGE 300-360 HRS



05APR19:15:05

T-13 Precision Estimates



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Information Letters

»» October 1, 2018 –
March 31, 2019

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Information Letters*

Test	Date	IL	Topic
C13	12/26/2018	18-3	Updated Valve Guide and Seal Part Numbers in Critical Parts List and Rescind Information Letter 18-2

*Available from TMC Website

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Reference Oil Inventory

»» Actions, Re-blends, Inventories
and Estimated Life

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Reference Oil Reblends

- ▶ No re-blends in this reporting period

Reference Oil Inventory Estimated Life

Oil	Tests	Original Blend Amount	Quantity Shipped in last 6 months	TMC Inventory	Lab Inventory	Estimated Life
809-1	1K, 1N	9134	10	2123	126	5+ years
811-2	1K, 1N	1732	10	898	40	5+ years
821-4	T-12	4495	0	2676	150	5+ years
822-2	1R, T-11	4386	112	2707	168	5+ years
823	T-13	1796	40	722	180	2.5 years
830-2	ISM	3786	25	89	75	< 1 year
830-3	ISM	2891	25	2791	75	5+ years
831-3	C13, ISB	972	50	5	140	<1 year
831-4	C13, ISB	1699	50	1447	195	5+ years

Reference Oil Inventory Estimated Life

Oil	Tests	Original Blend Amount	Quantity Shipped in last 6 months	TMC Inventory	Lab Inventory	Estimated Life
832	COAT	1166	140	38	0	< 1 year
832-1	COAT	1951	28	1722	28	5+ years
833	COAT	1152	28	48	0	< 1 year
833-1	COAT	1248	140	1027	0	5+ years
864-1	DD13	1576	100	1071	150	5+ years
873-2	1M-PC	1650	10	26	40	1.5 years
1005-4	1P, 1R, EOAT, RFWT, T-8/E	2000	0	74	30	< 0.5 years
1005-5	1P, 1R, EOAT, RFWT, T-8/E	3826	155	2108	207	3 years

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LTMS Deviations

»» October 1, 2018 –

March 31, 2019

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LTMS Deviations

- No LTMS Deviations in Current Period

Historical Count of HD LTMS Deviations

Test	LTMS Deviations
1M-PC	2
1N	2
T-8/E	2
T-10A	1
T-12	1

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Quality Index Deviations

»» October 1, 2018 –

March 31, 2019

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Quality Index Deviations

- ▶ No Quality Index deviations during this period

Quality Index Deviations

Historical Count of HD Quality Index Deviations

Test	Qi Deviations
1P	15
1R	1
ISM	3
C13	2
T-10A	1
T-11	3
T-12	6
T-13	2
COAT	4

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TMC Laboratory Visits

»» October 1, 2018 –
March 31, 2019

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TMC Lab Visits

- ▶ 1 Lab was visited during this period

Test	Number of Labs-Number of Stands
T-8/E	1-1
T-11	1-1
T-12	1-1
T-13	1-1

Lab Visit Issues

- ▶ T8
 - No discrepancies were found.
- ▶ T11
 - No discrepancies were found.
- ▶ T12
 - No discrepancies were found.
- ▶ T13
 - No discrepancies were found.

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Test Area Timelines

»» October 1, 2018 –
March 31, 2019

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Test Area Timeline Additions*

Test	Date	IL/Memo	Topic
C-13	12/26/2018	18-3	Updated Valve Guide and Seal Part Numbers in Critical Parts List and Rescind Information Letter 18-2

*As of 3/31/2018

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Rating Workshop Data

»» 2018 Heavy Duty Workshop

Test Monitoring Center

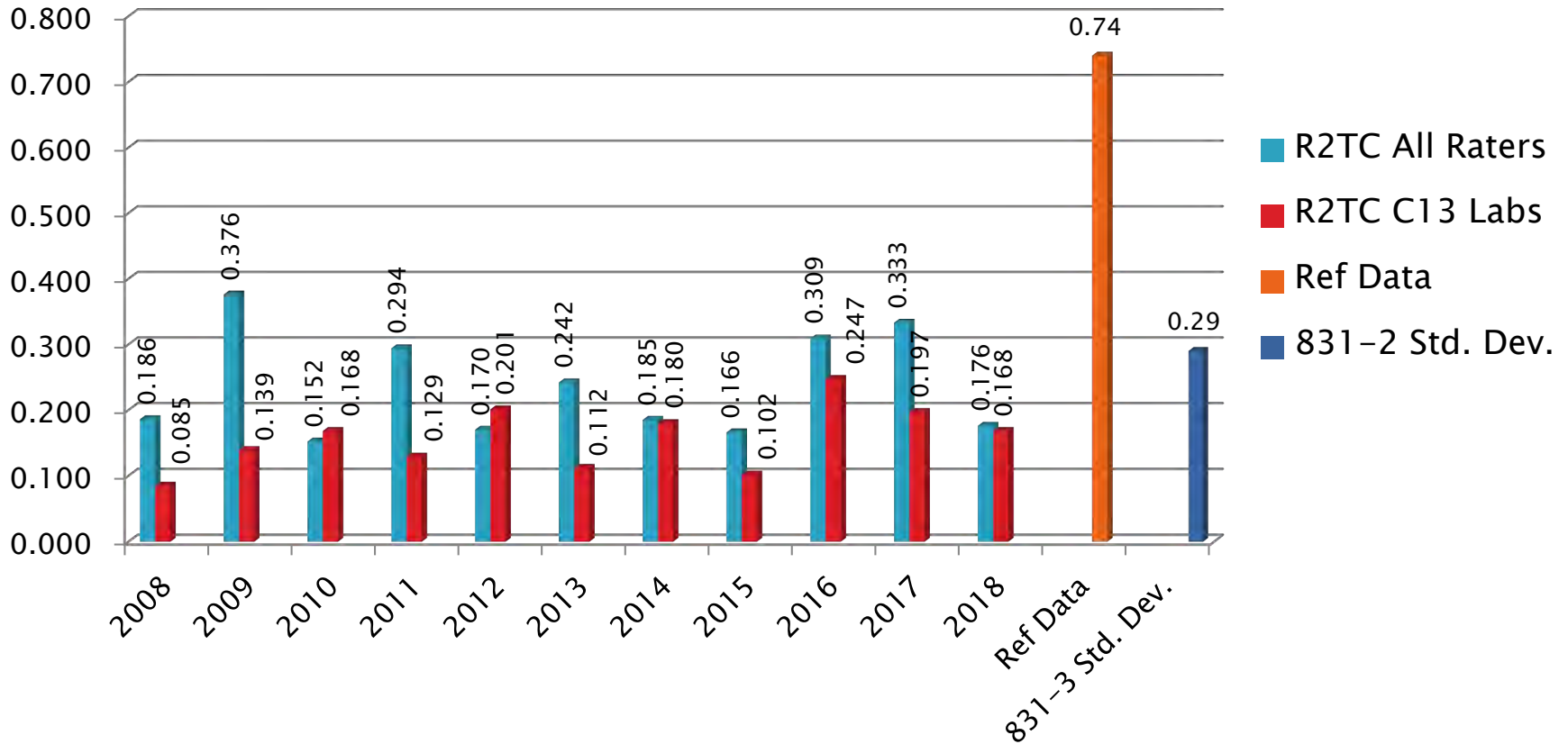
<http://astmtmc.cmu.edu>



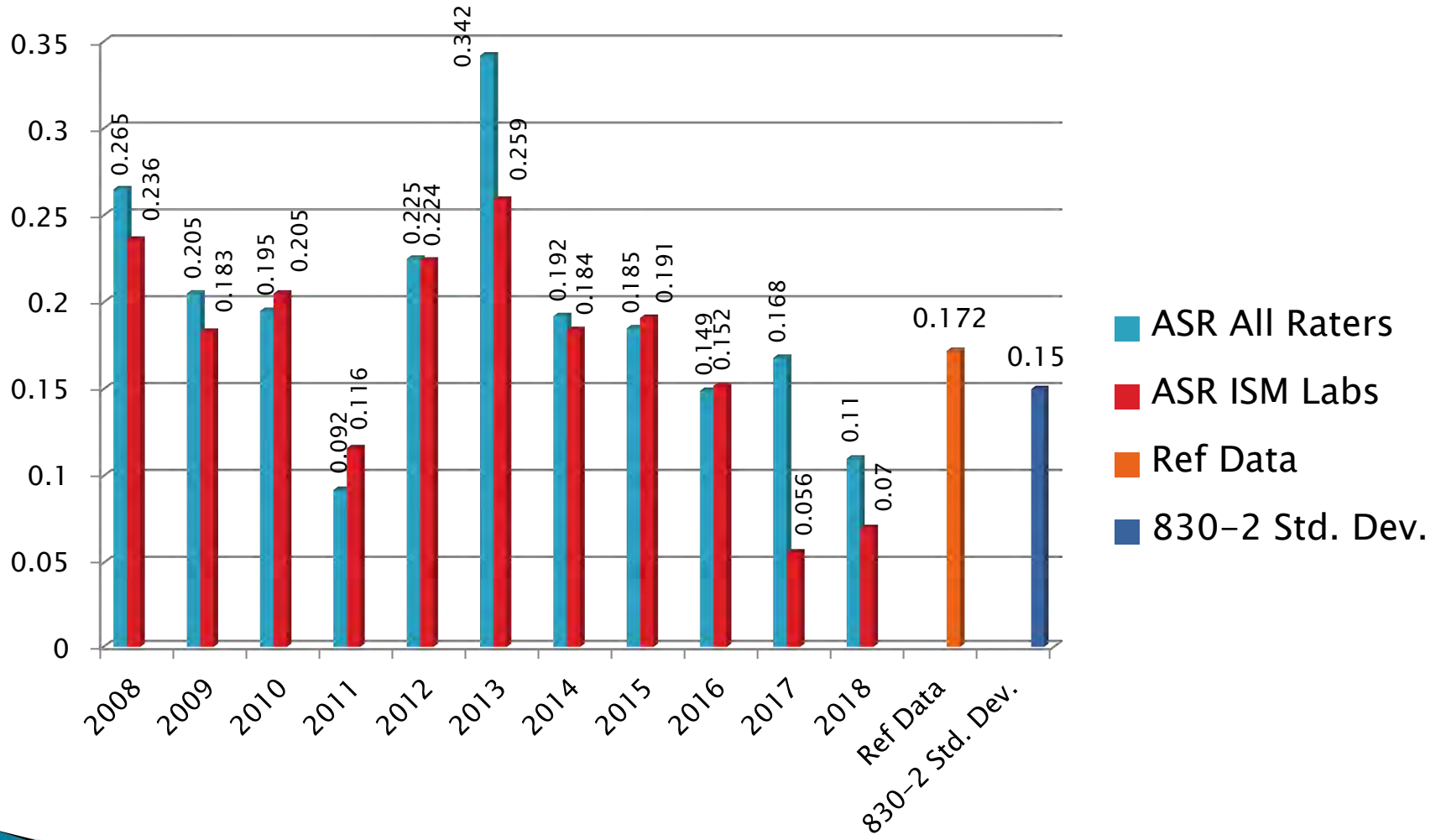
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C13 2nd Ring Carbon Precision – Rating Workshop Data

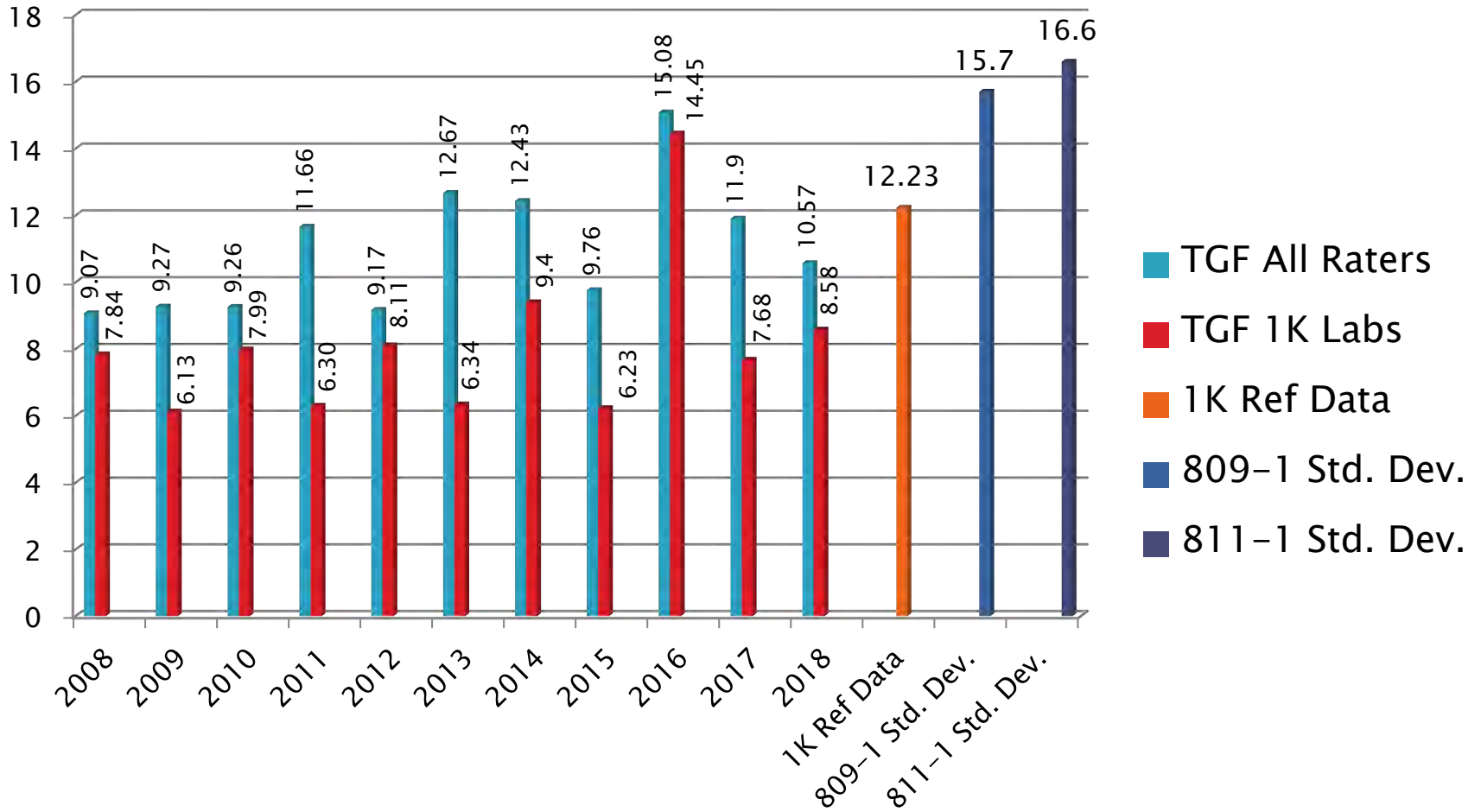
R2TC



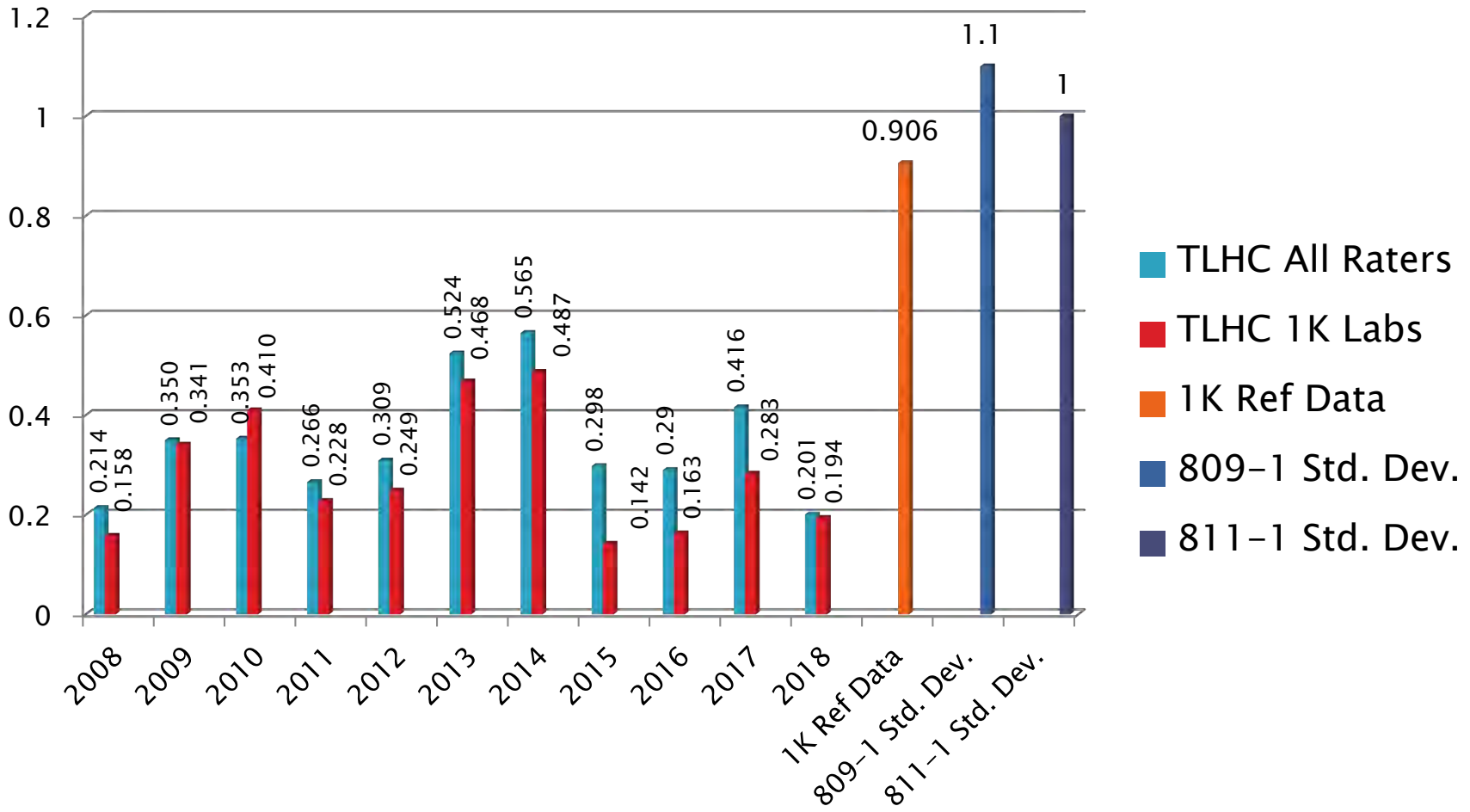
ISM Sludge Rating Precision - Rating Workshop Data



Deposit Rating Precision - Rating Workshop Data



Deposit Rating Precision - Rating Workshop Data



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Miscellaneous Information

- ▶ Available on TMC Website:
 - Oil Assignment Request and Test File Upload
 - 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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