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Test Monitoring Center

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

Spring 2022

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Heavy Duty Testing

Executive Summary

- ▶ **Test Issues**
 - Alternate fuel supplier criteria discussions across test areas.
 - COAT to EOAT equivalency process ongoing.
 - Reblend of COAT reference oil 833 has been received and QA testing complete. 833-2 has been approved for use by the TMC.

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Calibrated Labs and Stands*

Test	Labs	Stands
1K	1	1
1N	3	3
1M-PC	0	0
1P	2	2
1R	1	1
C13	3	3
ISB	4	5
ISM	3	4
EOAT	1	1
RFWT	1	1
T-8/E	1	1
T-11	2	4
T-12/T-12A	3/3	4/5
T-13	4	7
COAT	2	2
DD13	2	2

*As of 3/3/2022

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SCOTE 1K

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1 K 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 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

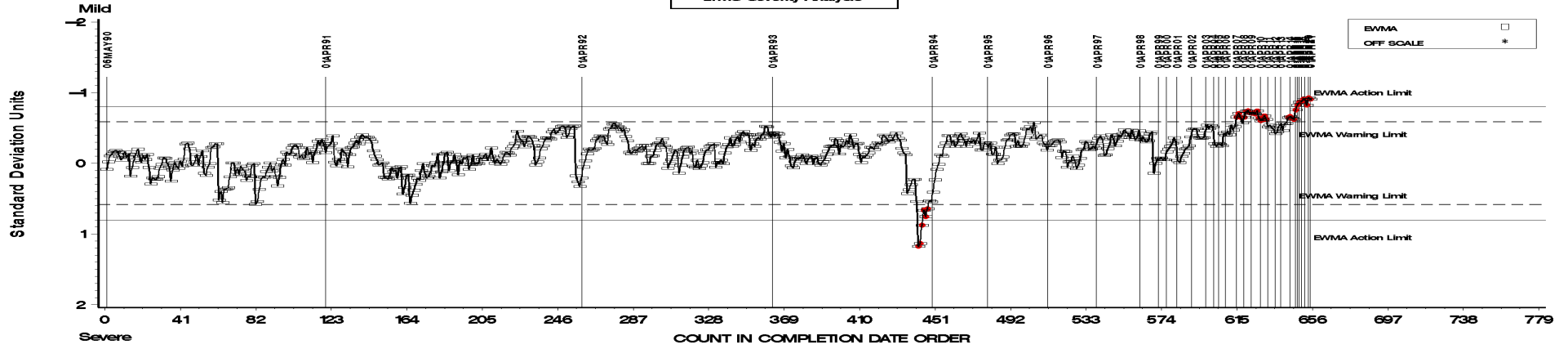
- ▶ As no 1K tests were run during this period no statement about test severity can be made.

CATERPILLAR 1K INDUSTRY OPERATIONALLY VALID DATA

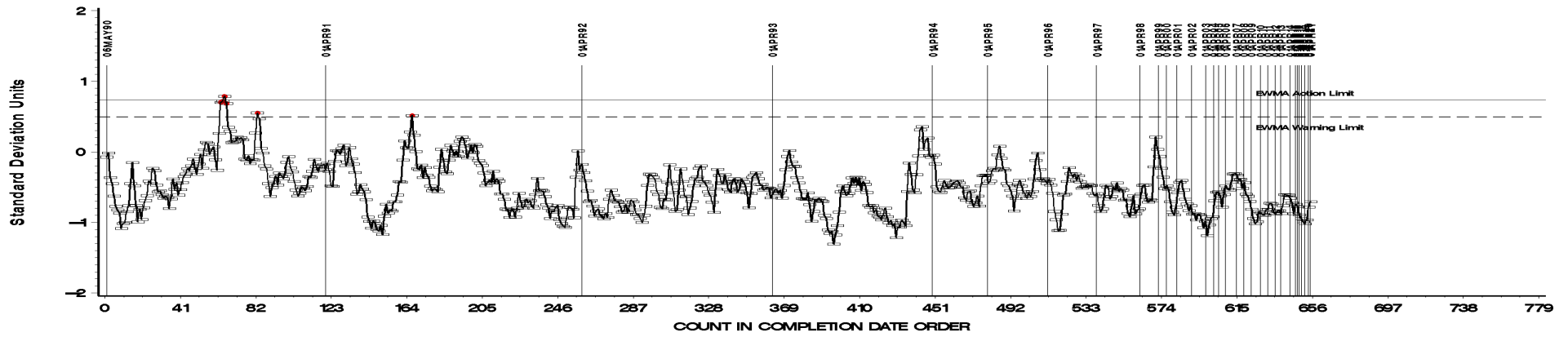


FINAL BSOC

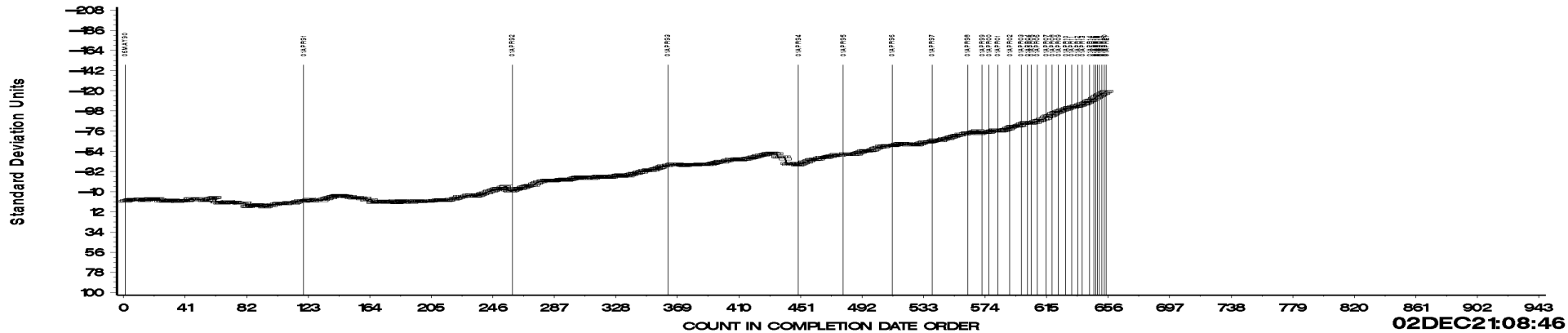
LTMS Severity Analysis



LTMS Precision Analysis



CUSUM Severity Analysis

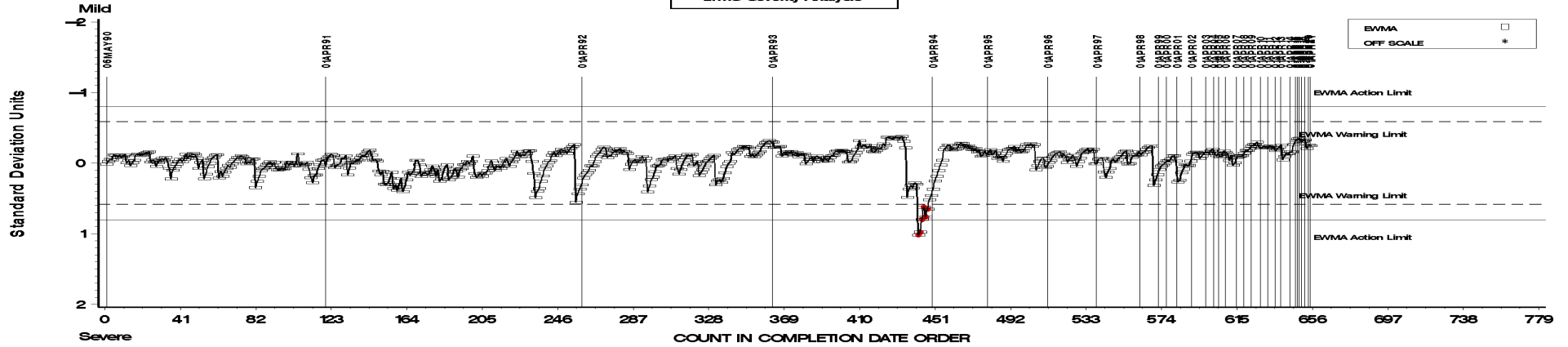


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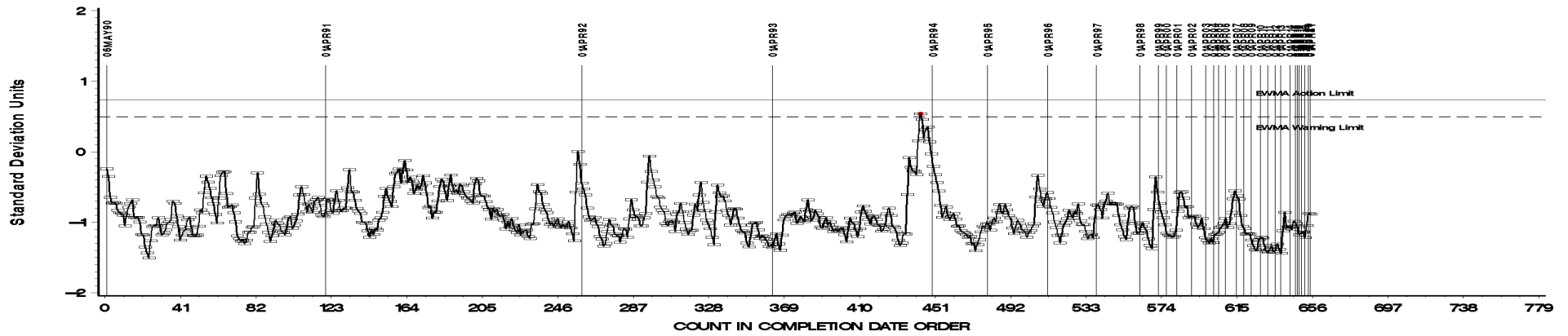


FINAL EOTC

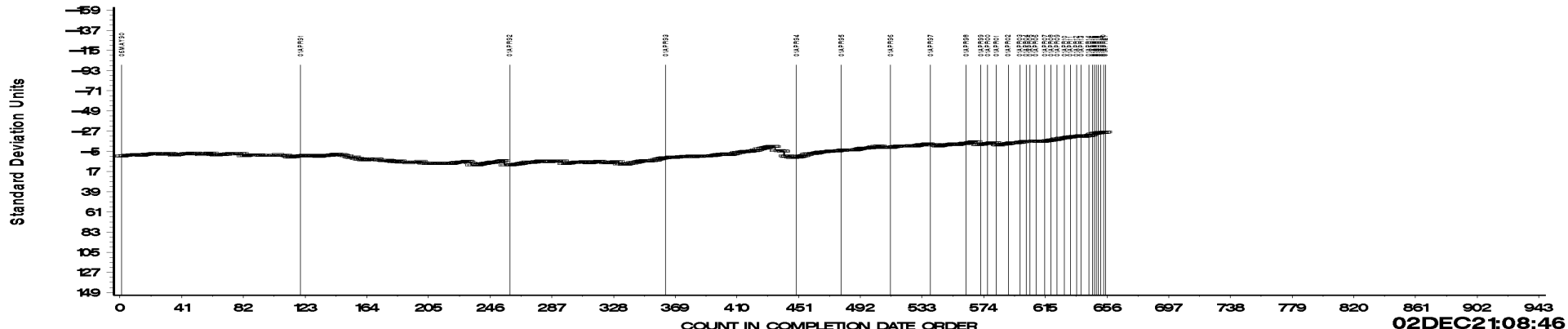
LTMS Severity Analysis



LTMS Precision Analysis



CUSUM Severity Analysis

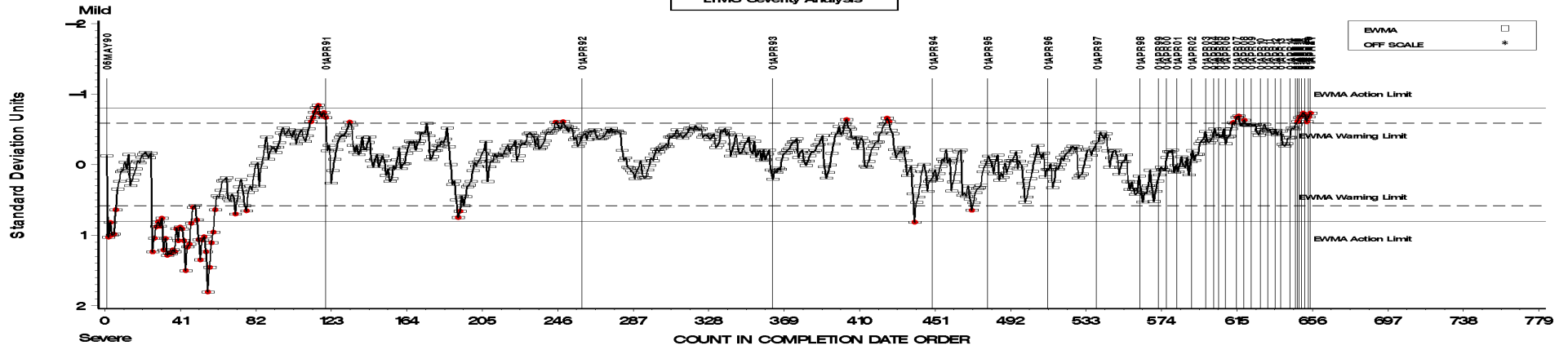


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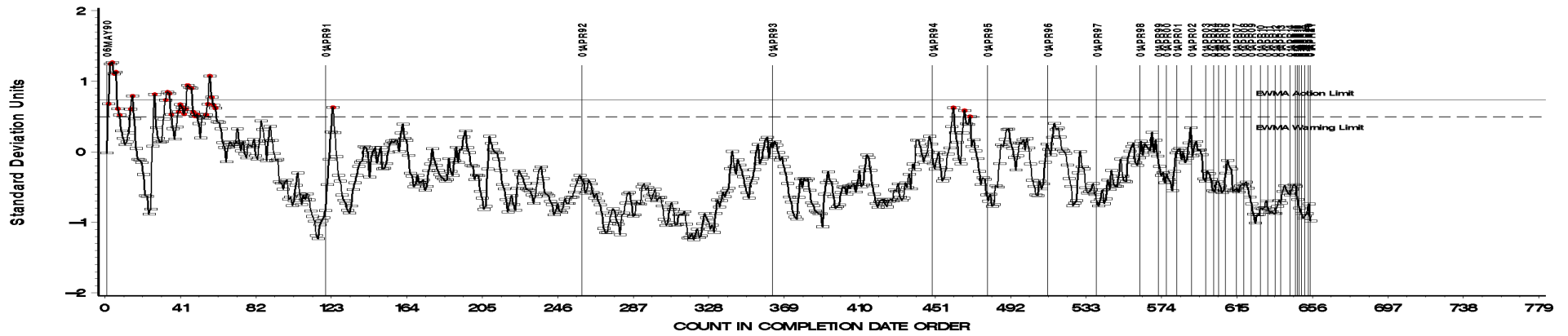


FINAL TGF

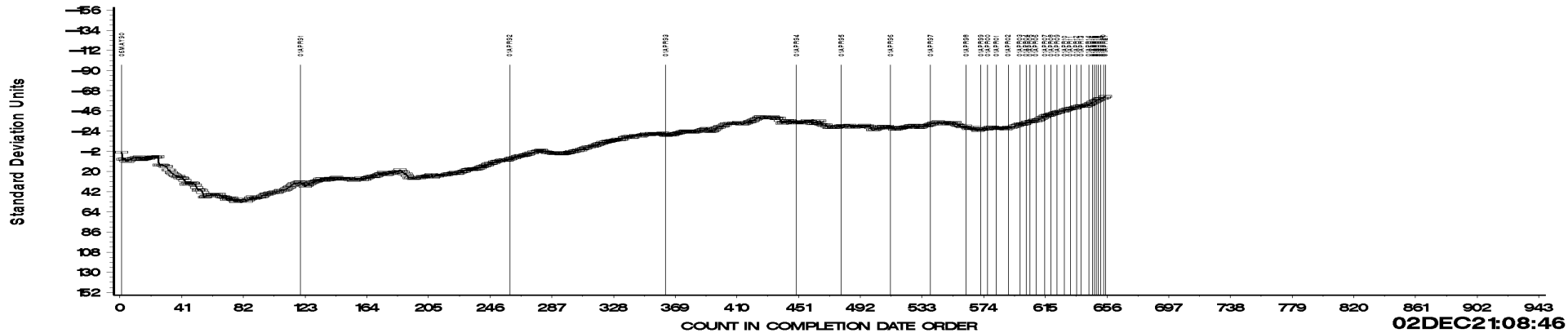
LTMS Severity Analysis



LTMS Precision Analysis



CUSUM Severity Analysis

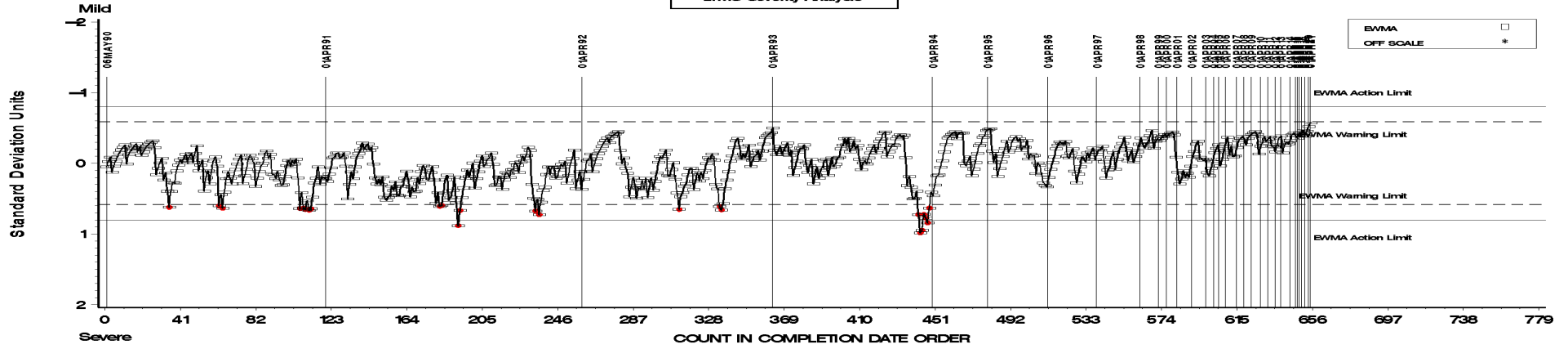


CATERPILLAR 1K INDUSTRY OPERATIONALLY VALID DATA

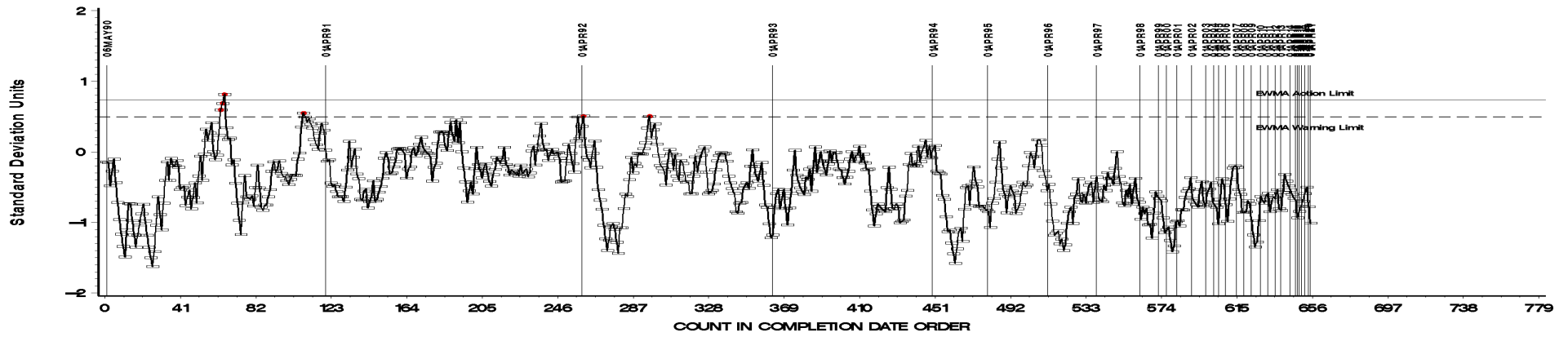


FINAL TLHC

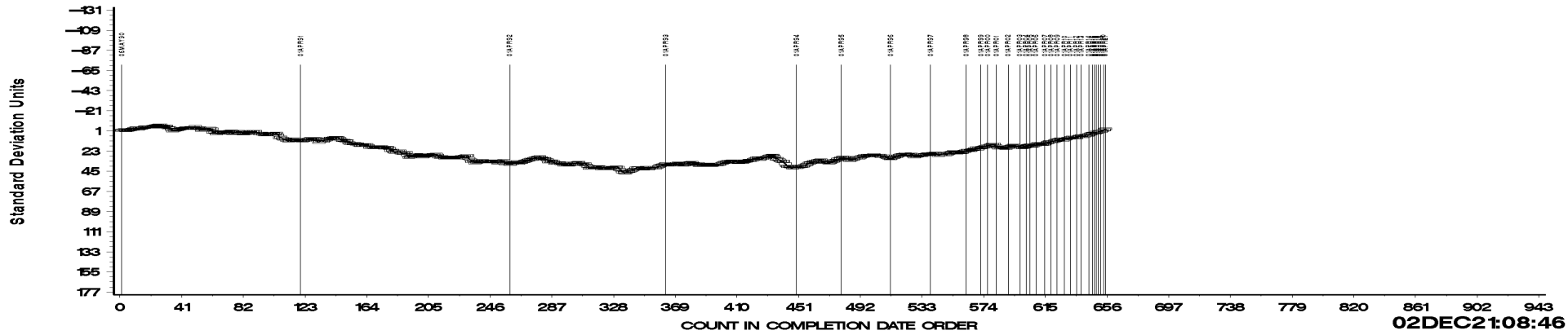
LTMS Severity Analysis



LTMS Precision Analysis



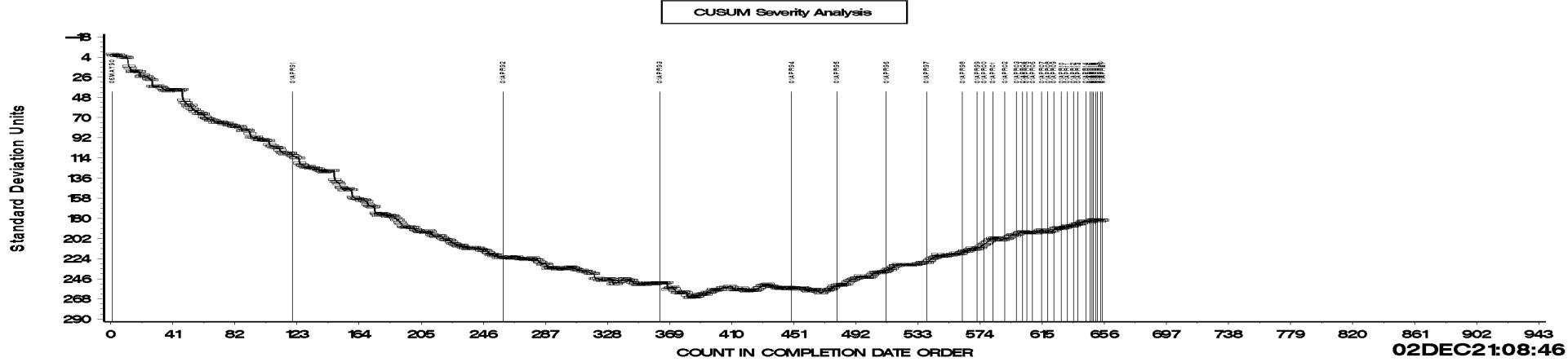
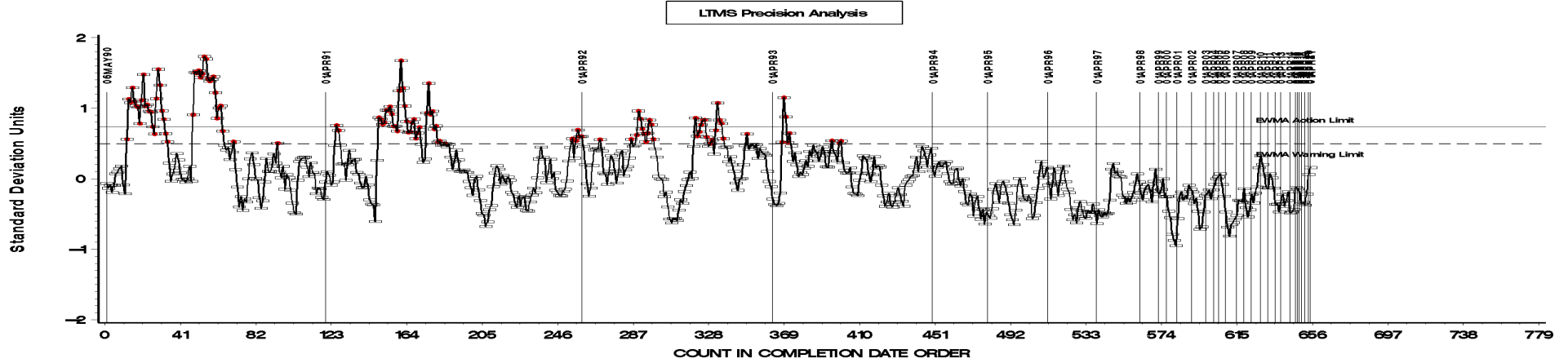
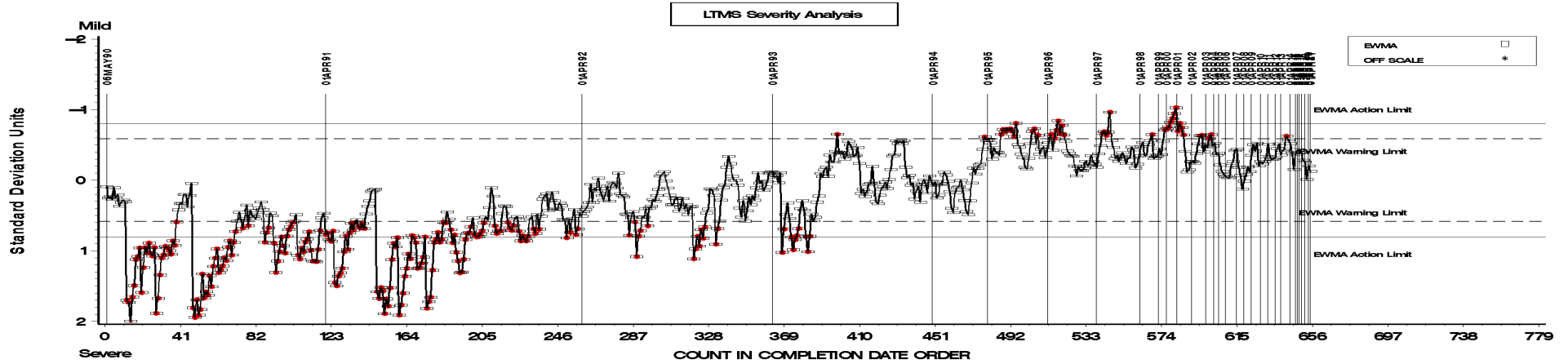
CUSUM Severity Analysis



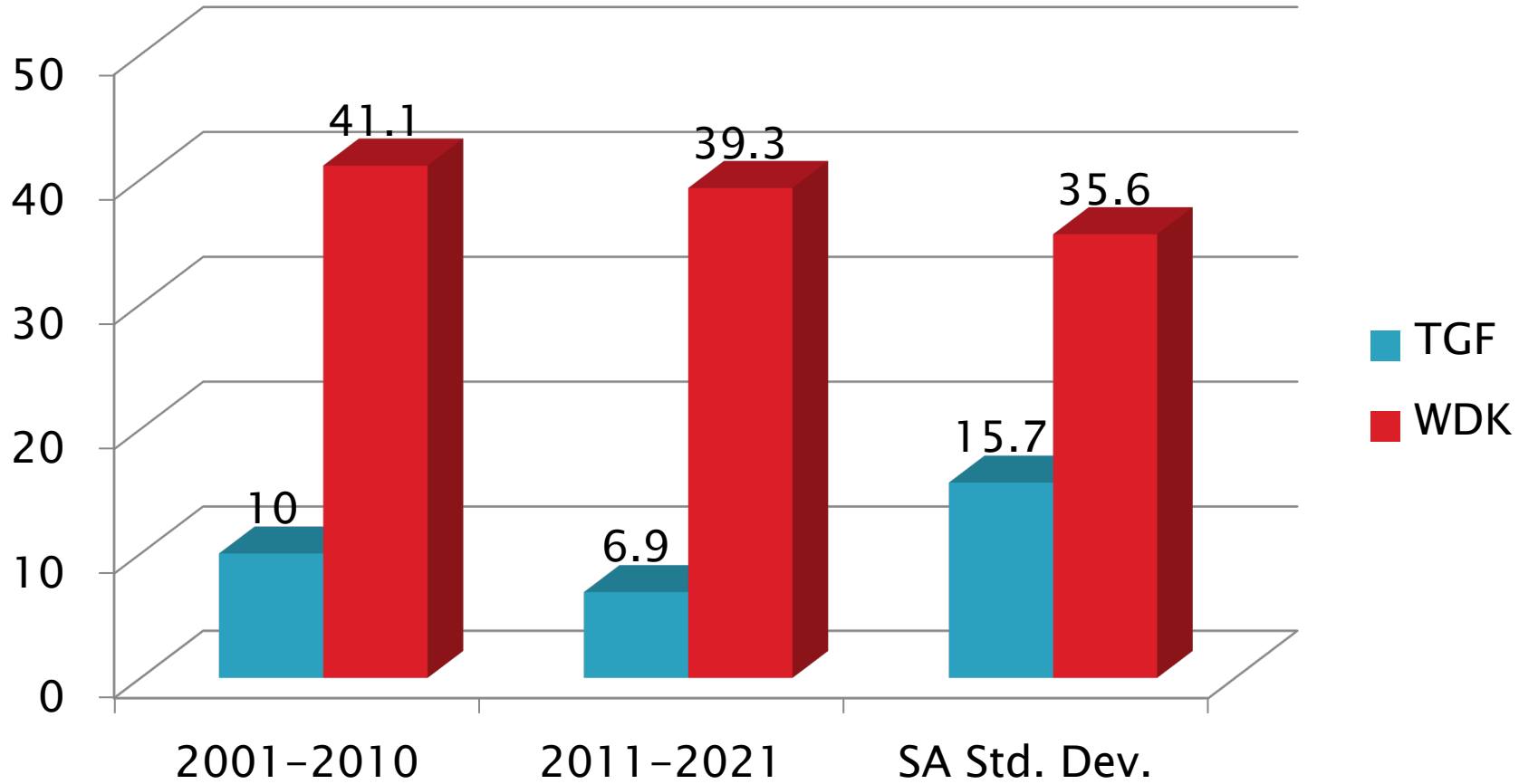
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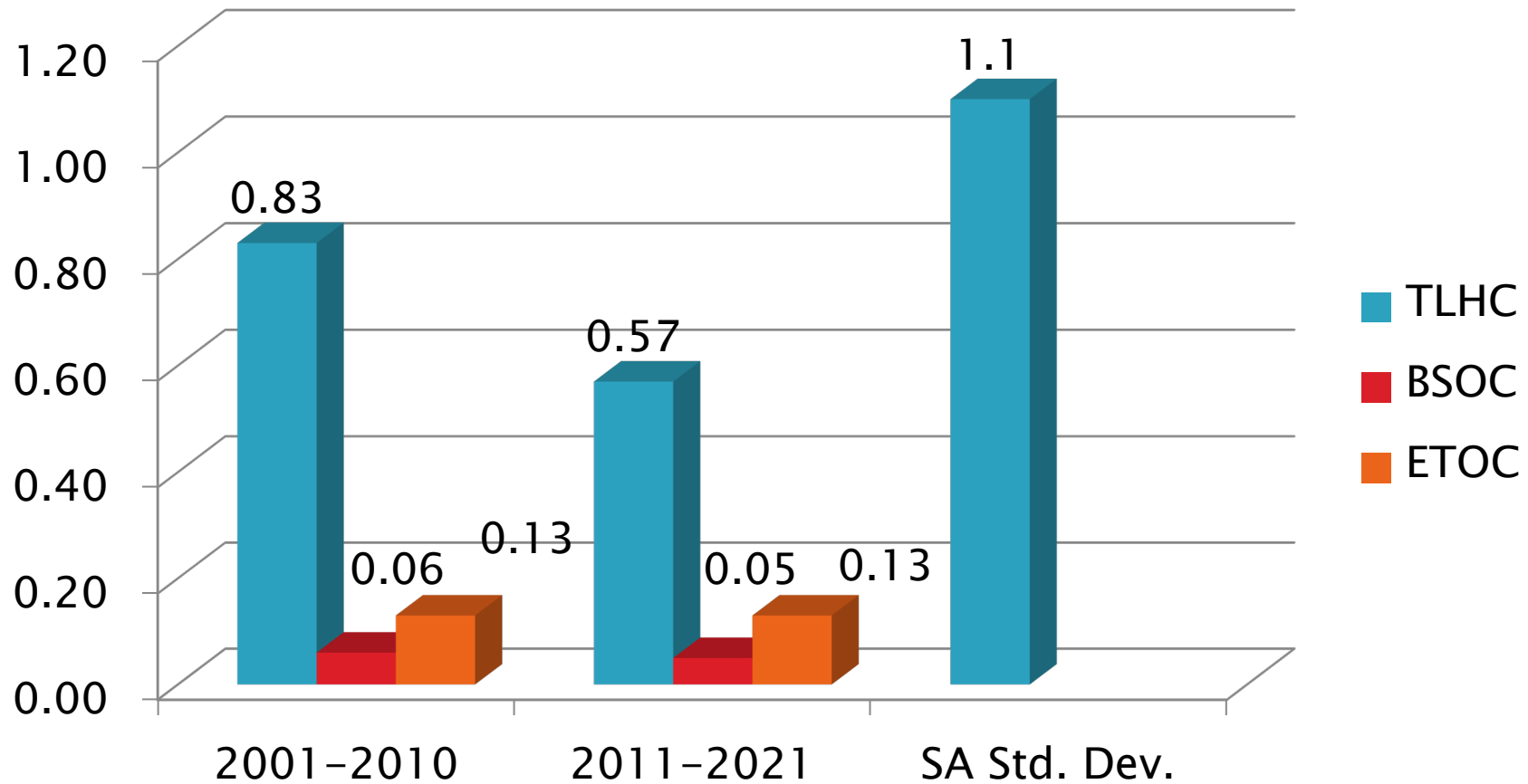
FINAL Weighted Total Demerits



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	0
Failed Calibration Test	OC	0
Operationally Invalid	LC	0
Aborted	XC	0
Informational	NN	0
Total		0

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

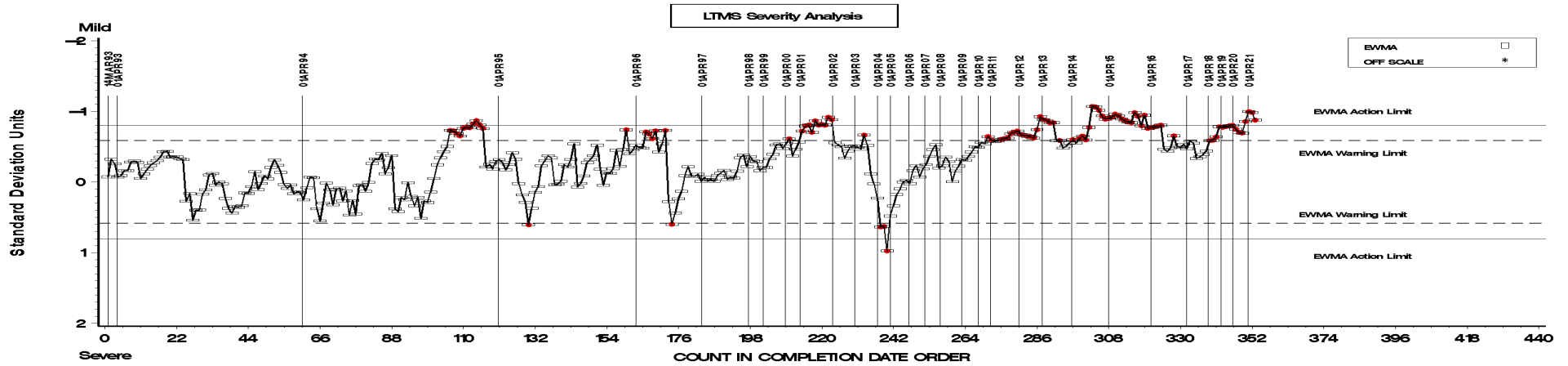
1 N Test Severity

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

CATERPILLAR 1N INDUSTRY OPERATIONALLY VALID DATA



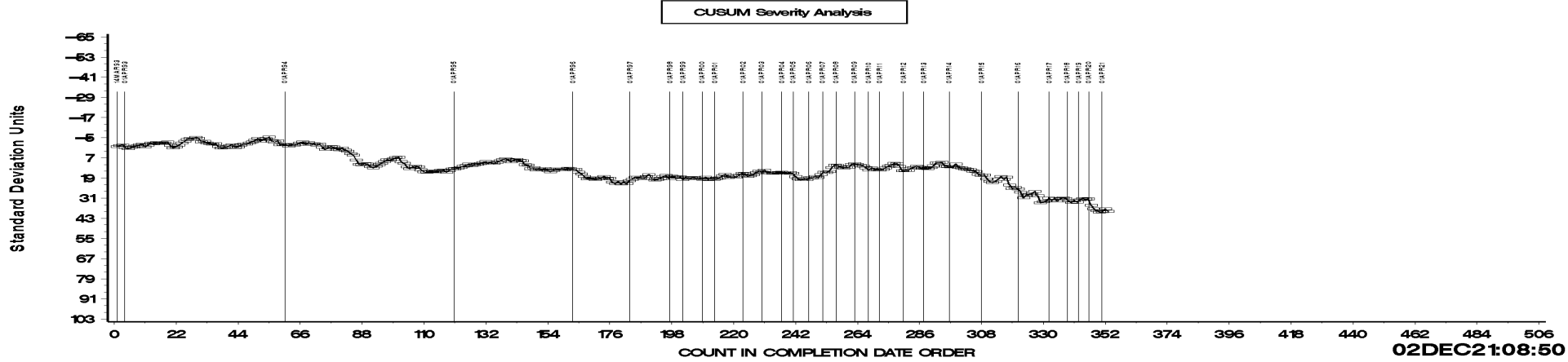
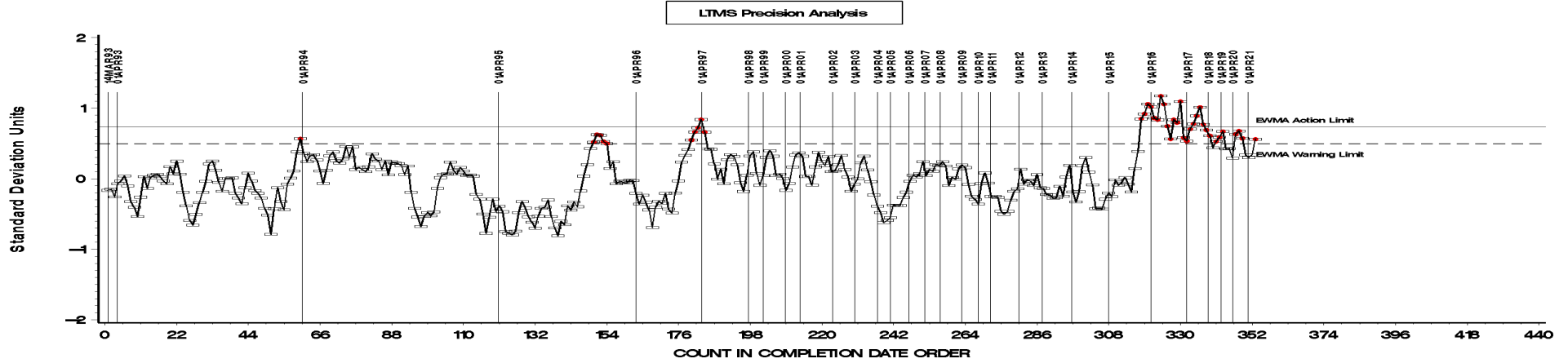
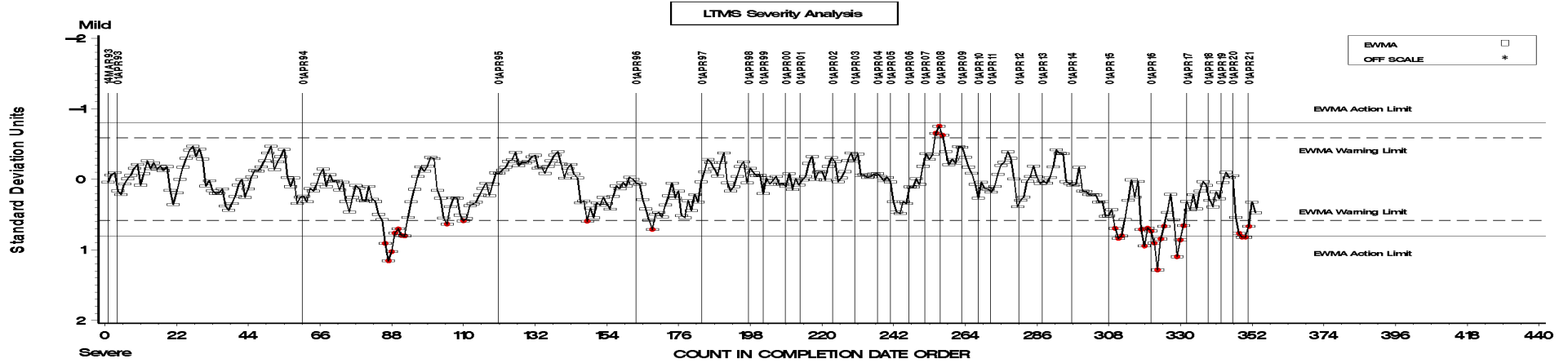
BSOC



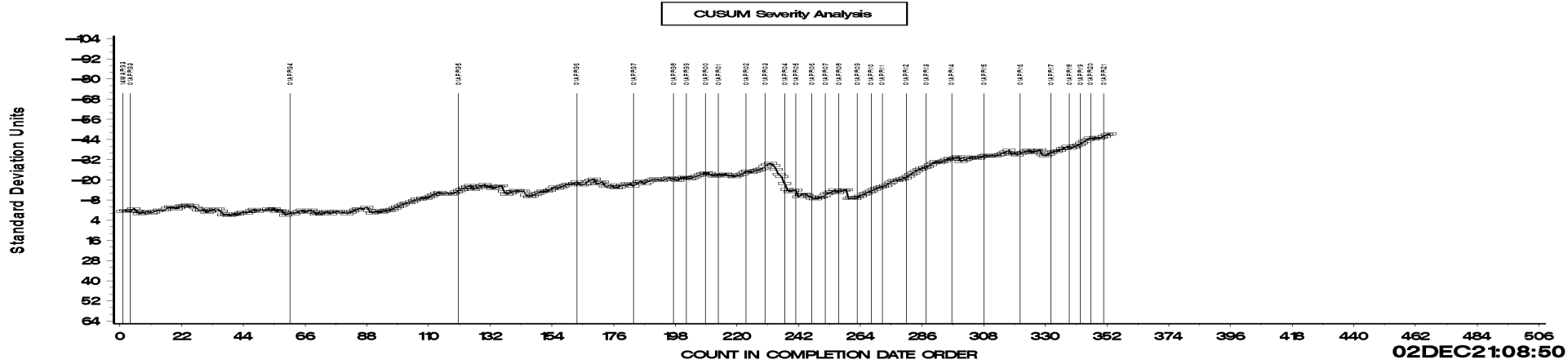
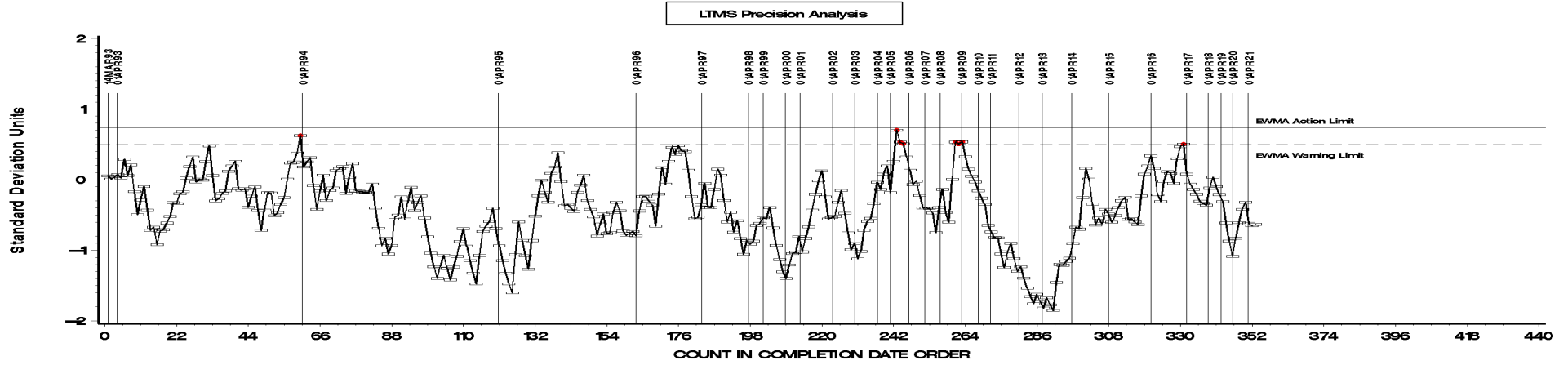
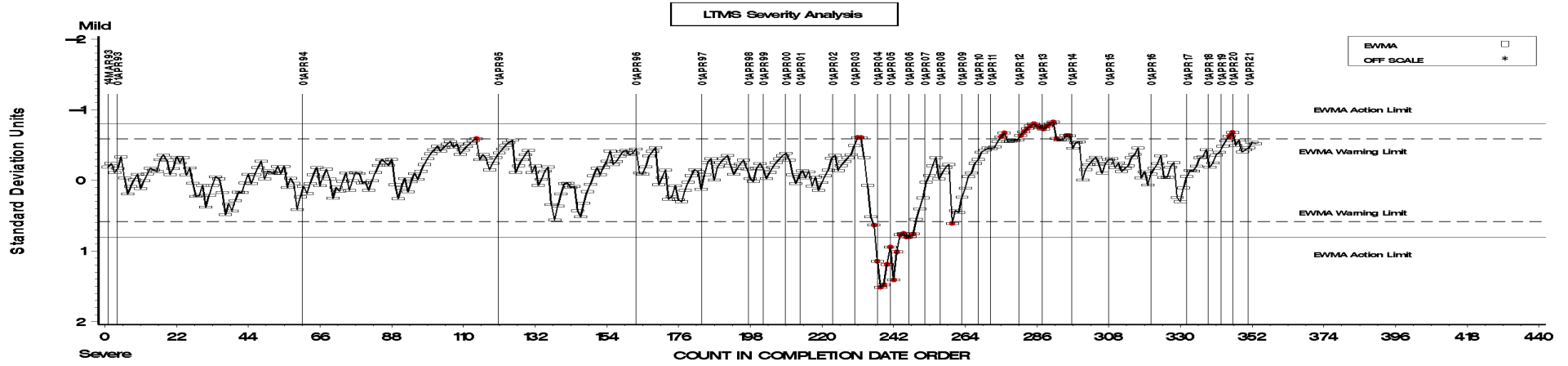
CATERPILLAR 1N INDUSTRY OPERATIONALLY VALID DATA



FINAL CORRECTED TGF



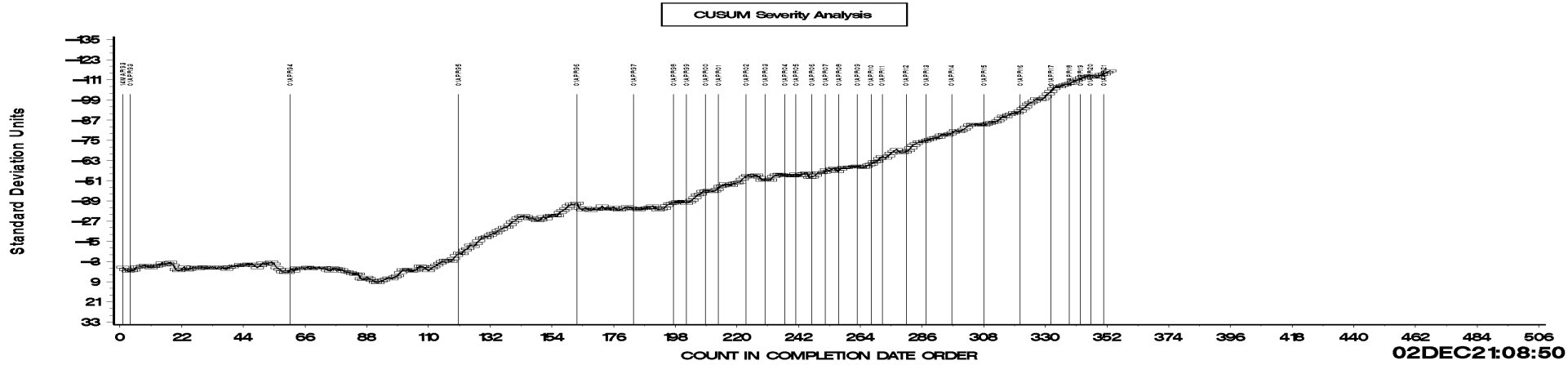
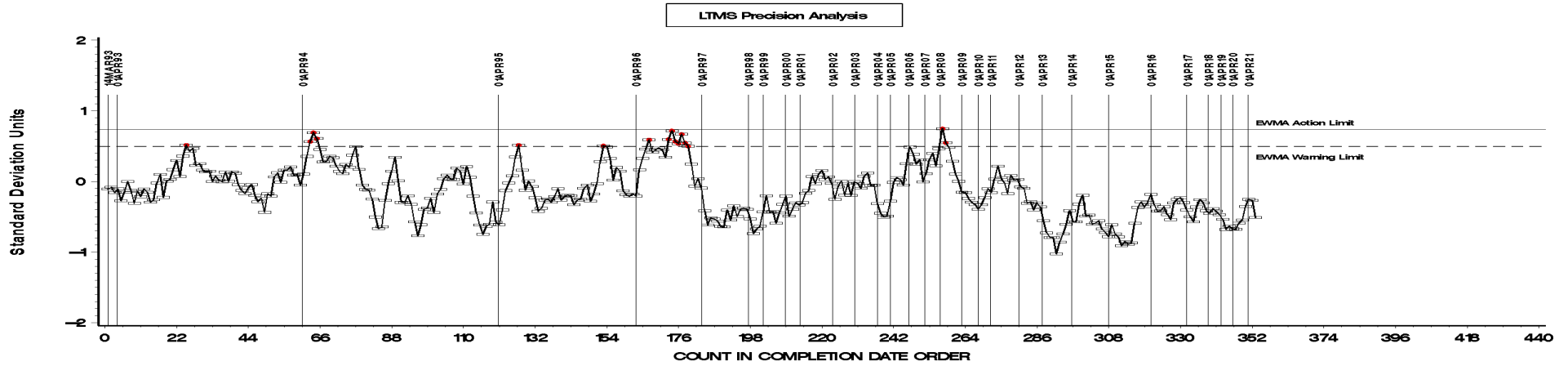
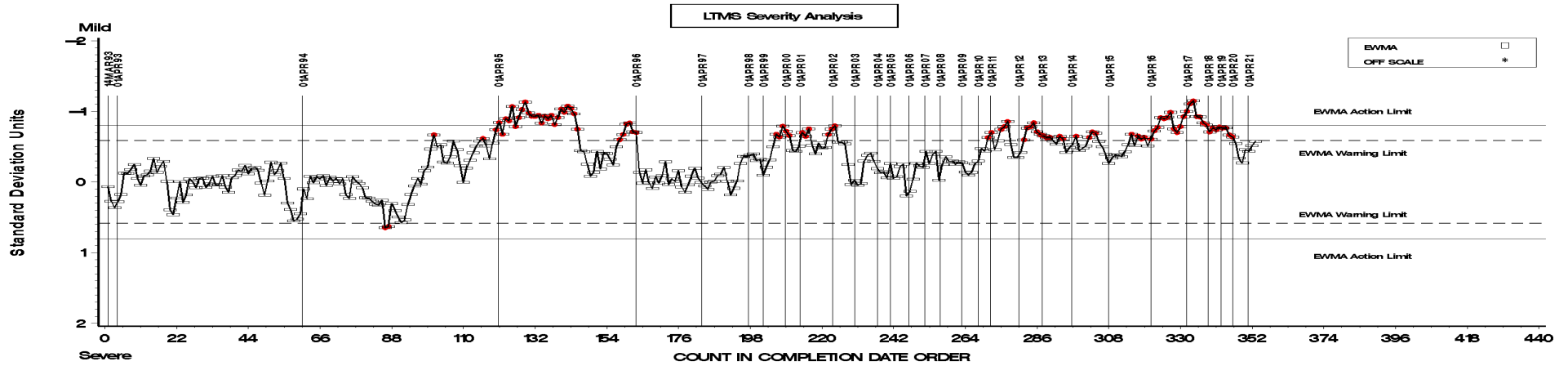
Top Land Heavy Carbon



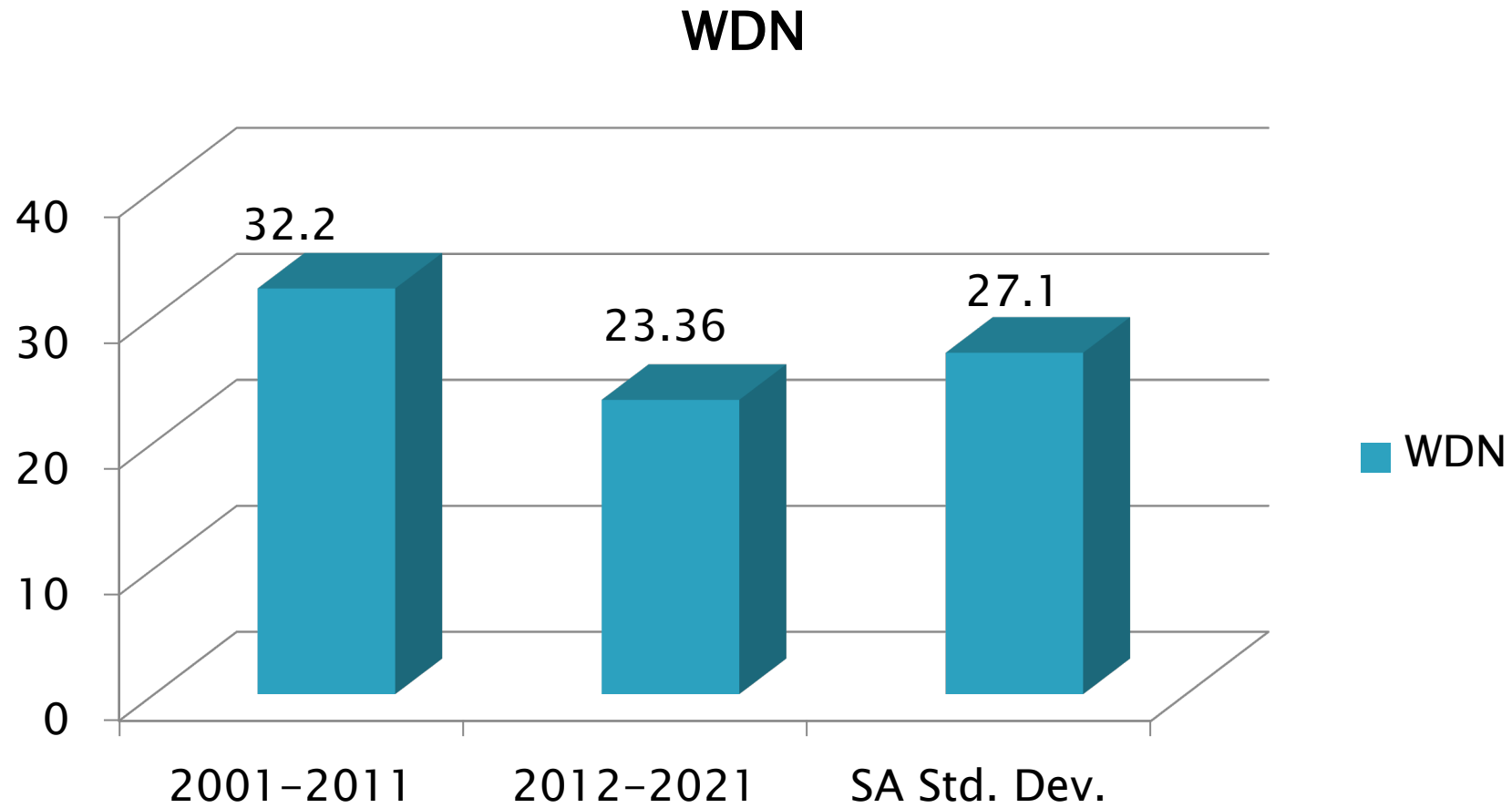
CATERPILLAR 1N INDUSTRY OPERATIONALLY VALID DATA



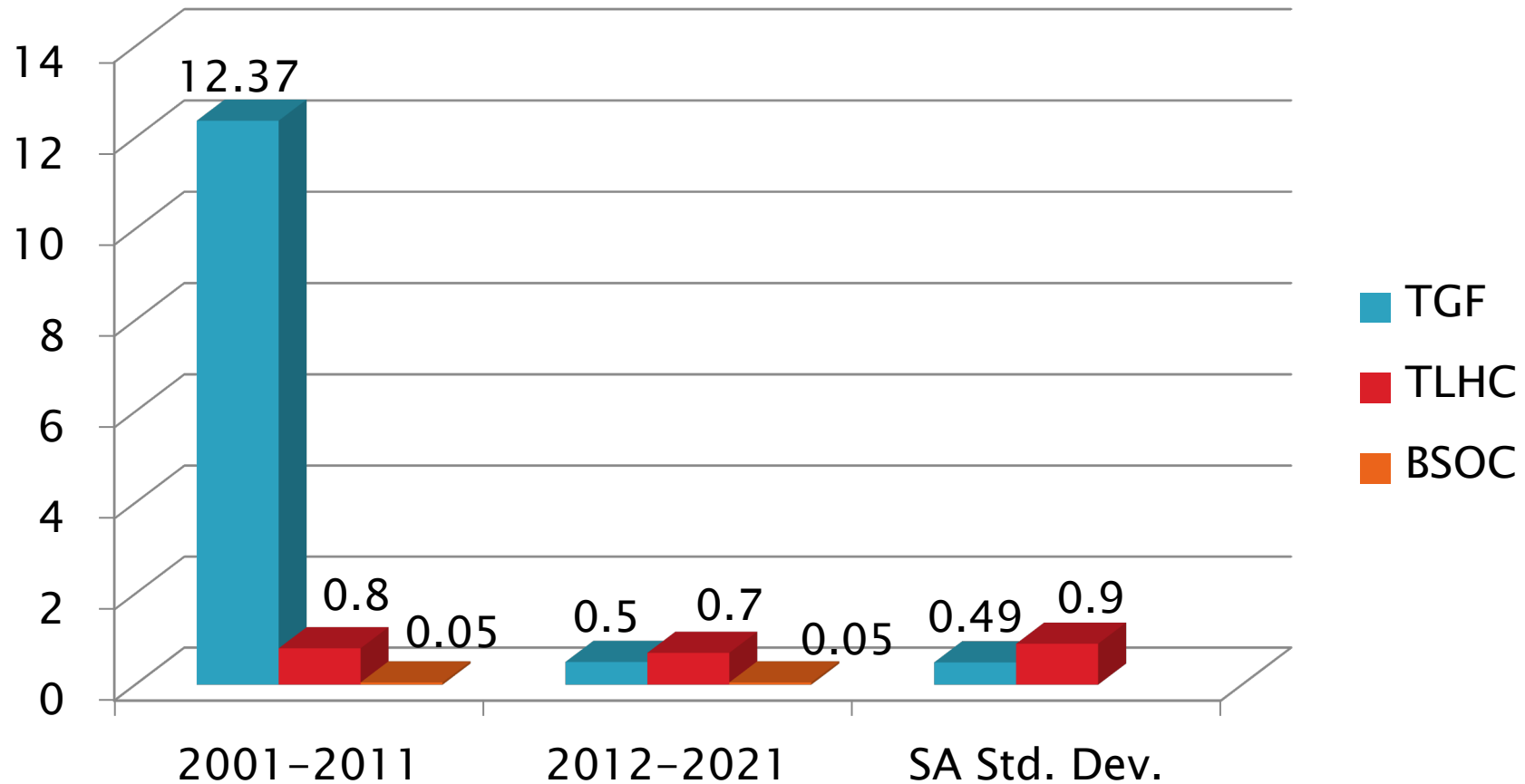
Weighted Total Demerits



1 N Precision Estimates



1 N 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	0
Failed Calibration Test	OC	0
Operationally Invalid	LC	0
Total		0

1 M-PC Failed Tests

Failed Parameter	Number of Tests
No Failed Test	0
Total	0

1 M-PC Lost Tests*

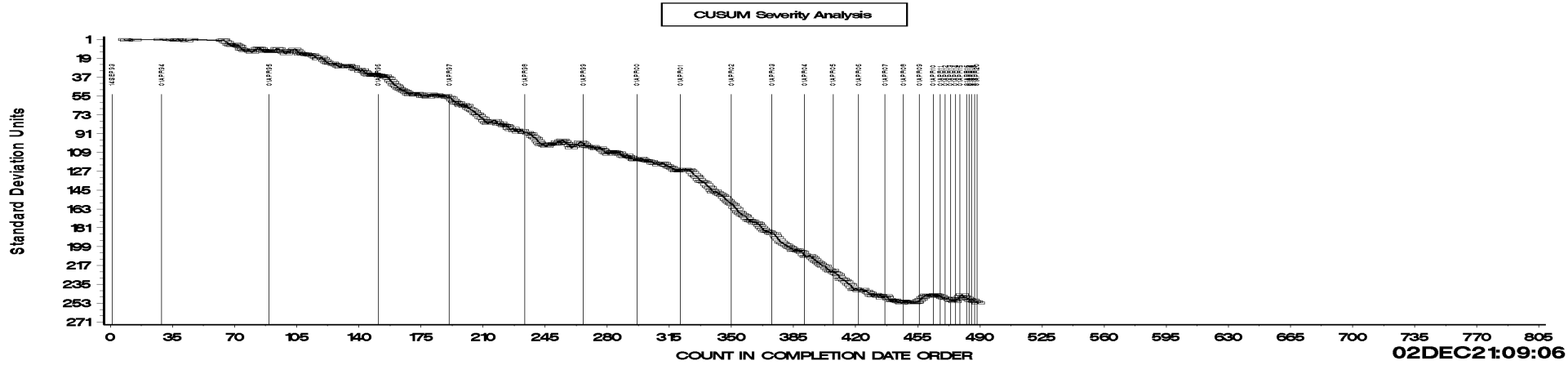
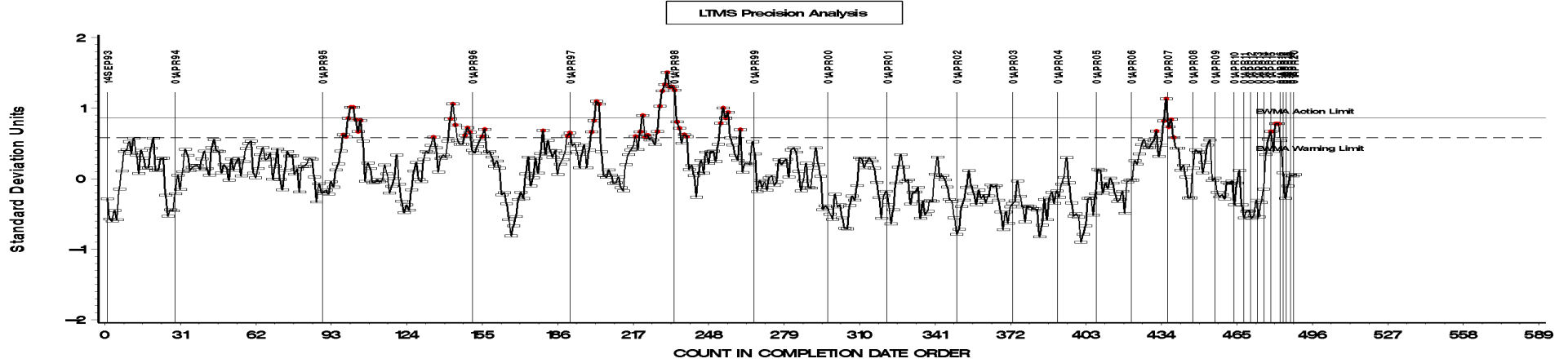
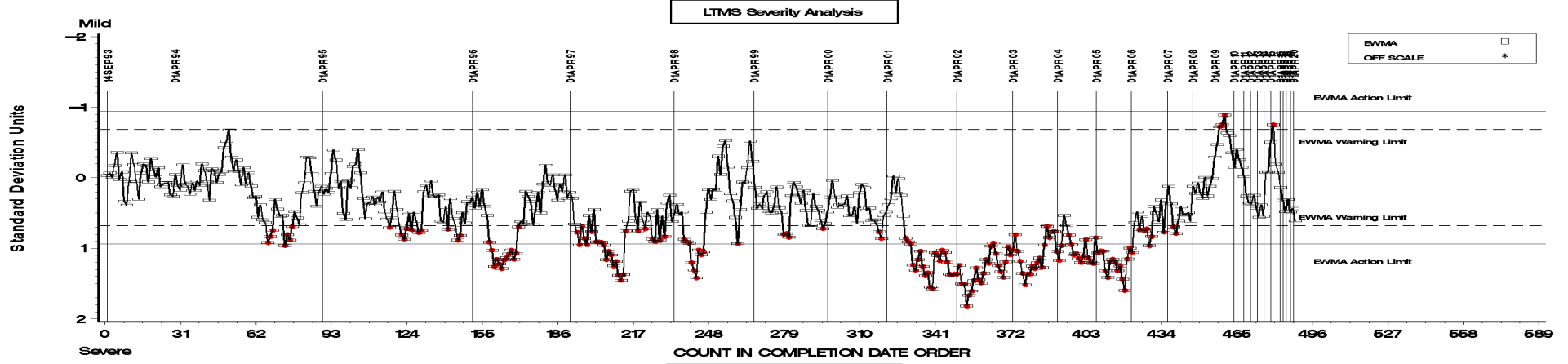
Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
Total		0

*Invalid and aborted tests

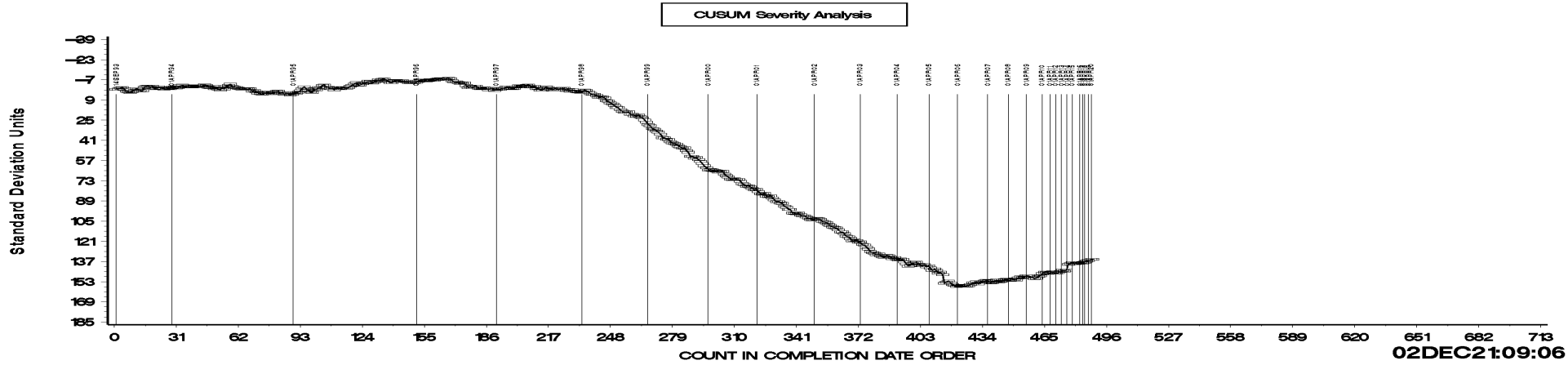
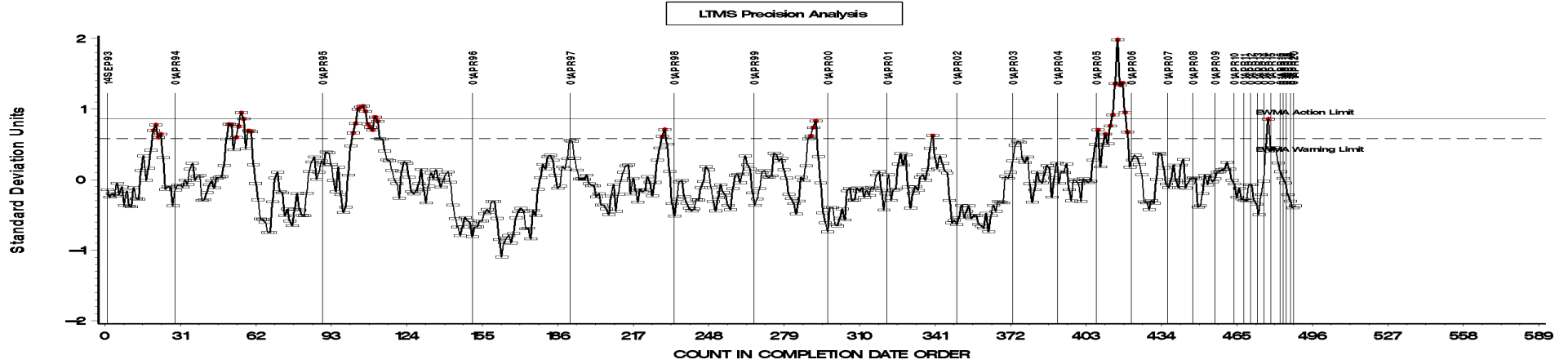
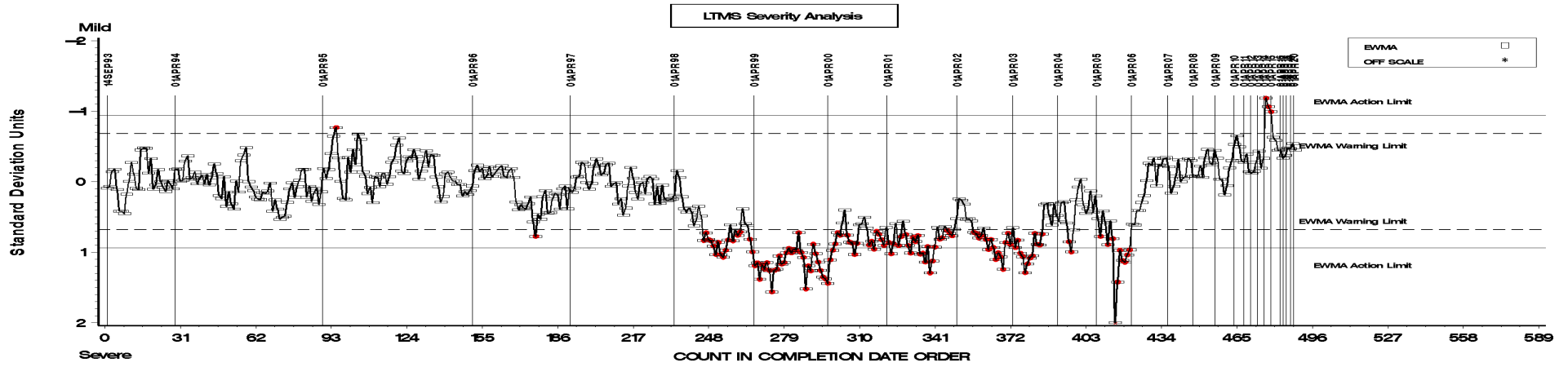
1 M-PC Test Severity

- ▶ As no 1 M-PC tests were run during this period no statement on test severity can be made.

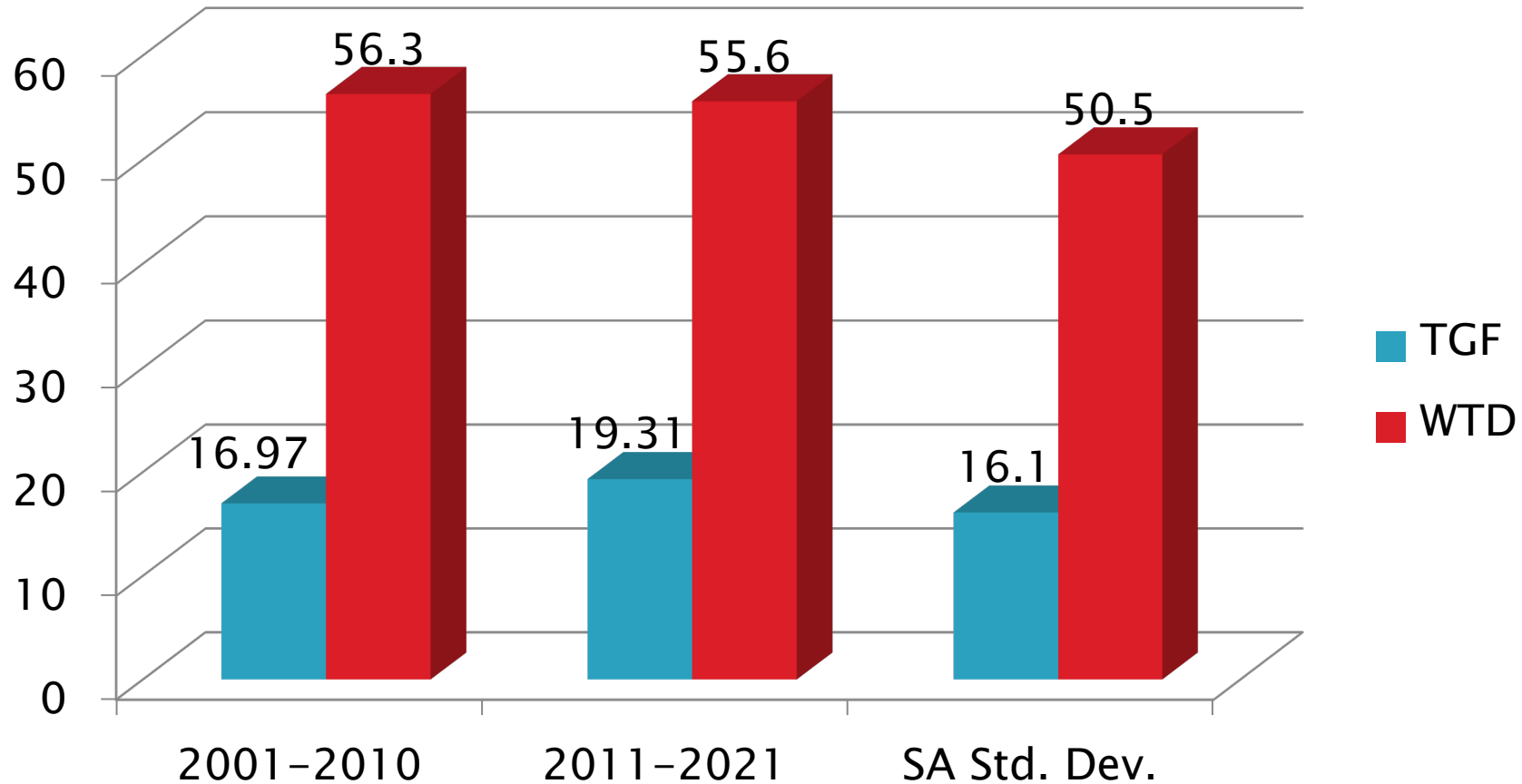
FINAL TOP GROOVE FILLING



Weighted Total Demerits



1 MPC Precision Estimates



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SCOTE 1P

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1 P Test Activity

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

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

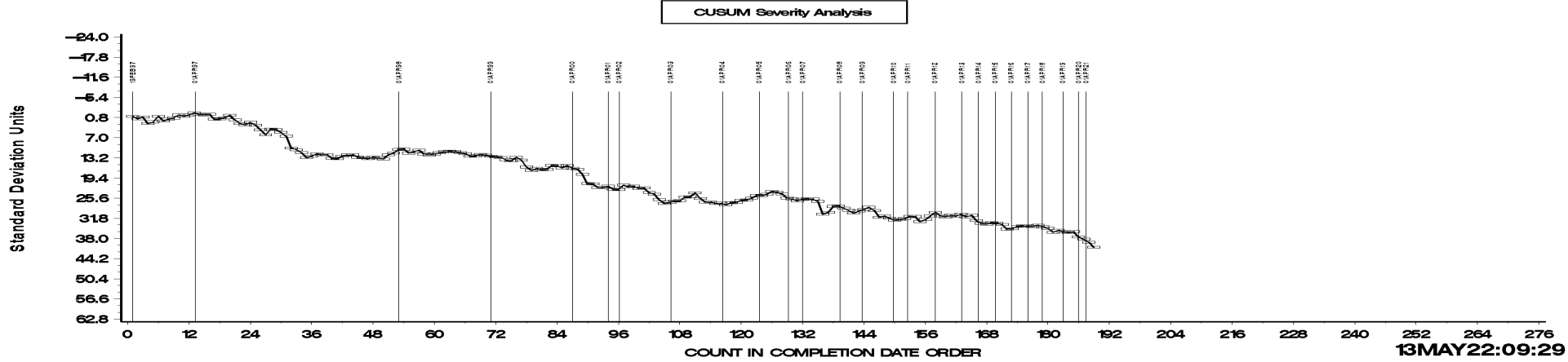
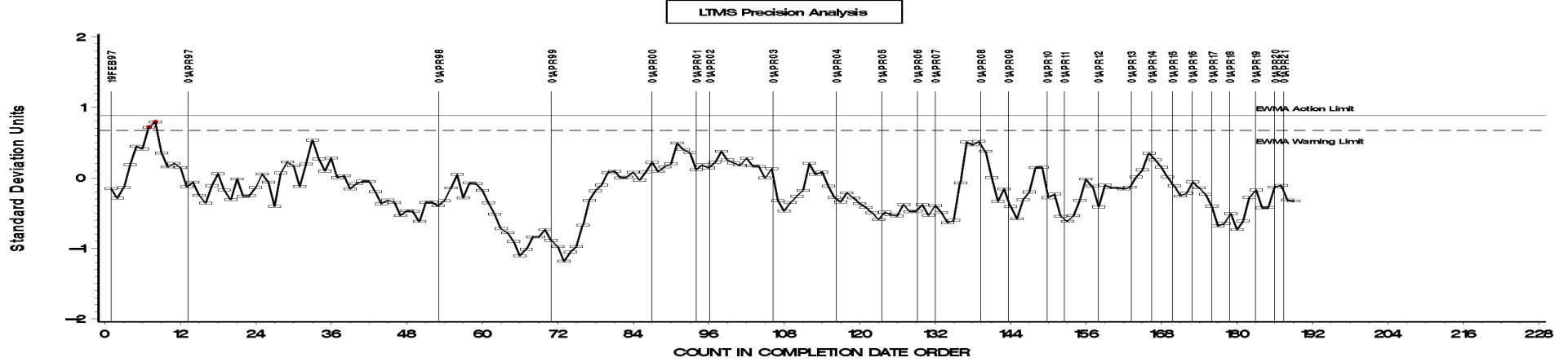
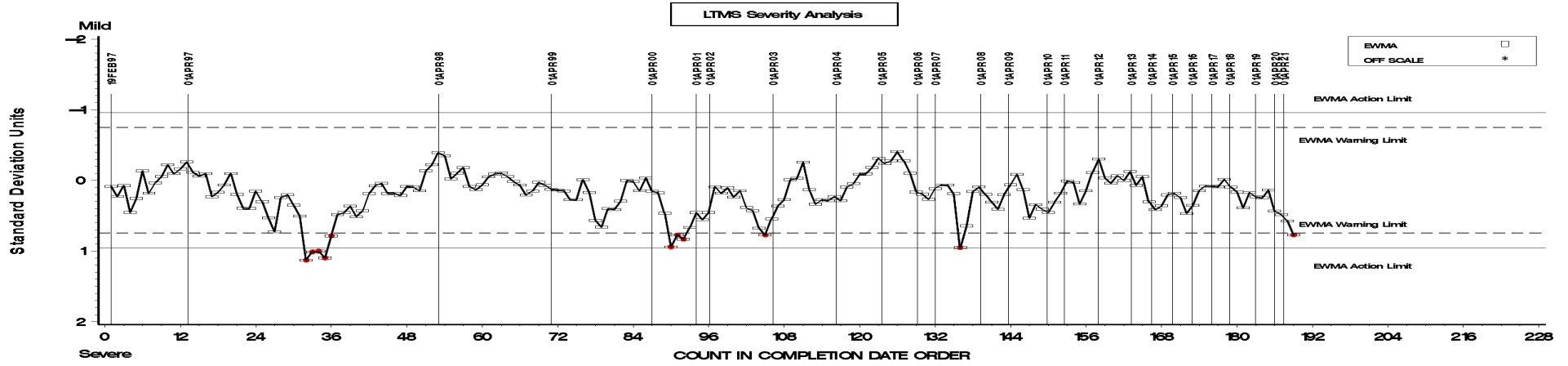
1 P Test Severity

- ▶ TGC, TLC and OC are in control.
- ▶ WD is in severity warning alarm in the severe direction.
- ▶ ETOC is in severity action alarm in the severe direction.

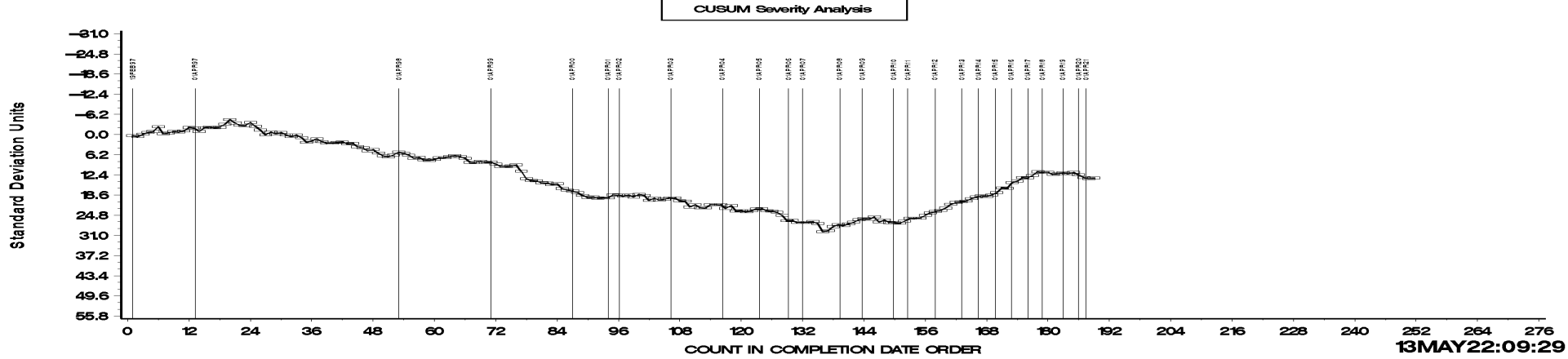
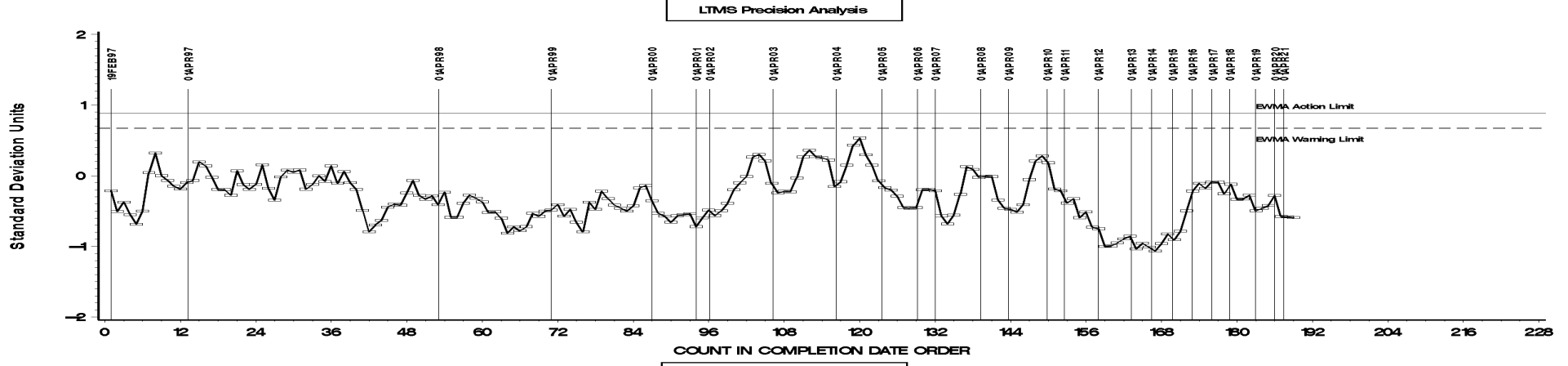
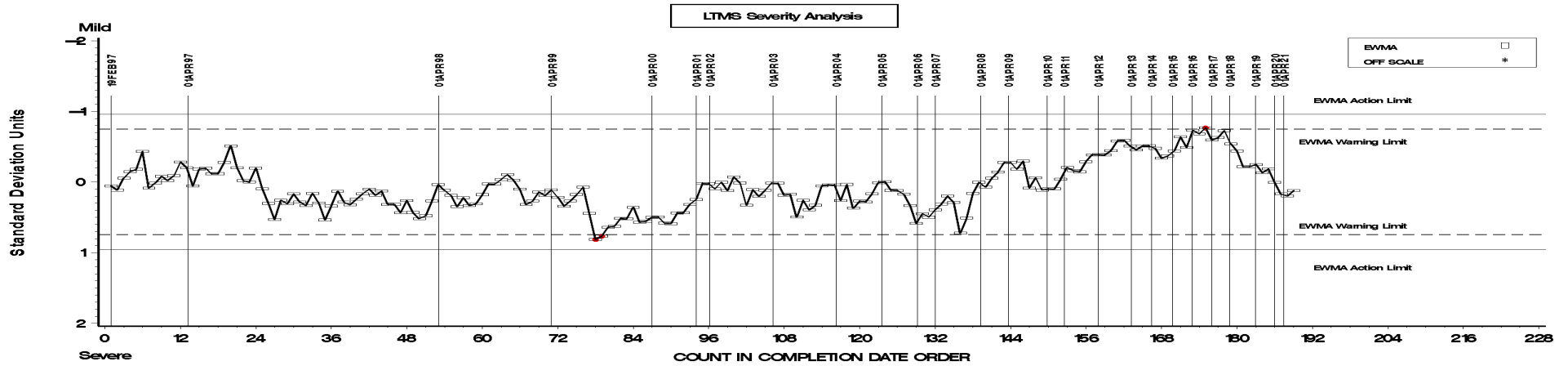
CATERPILLAR 1P INDUSTRY OPERATIONALLY VALID DATA



WEIGHTED TOTAL DEMERITS



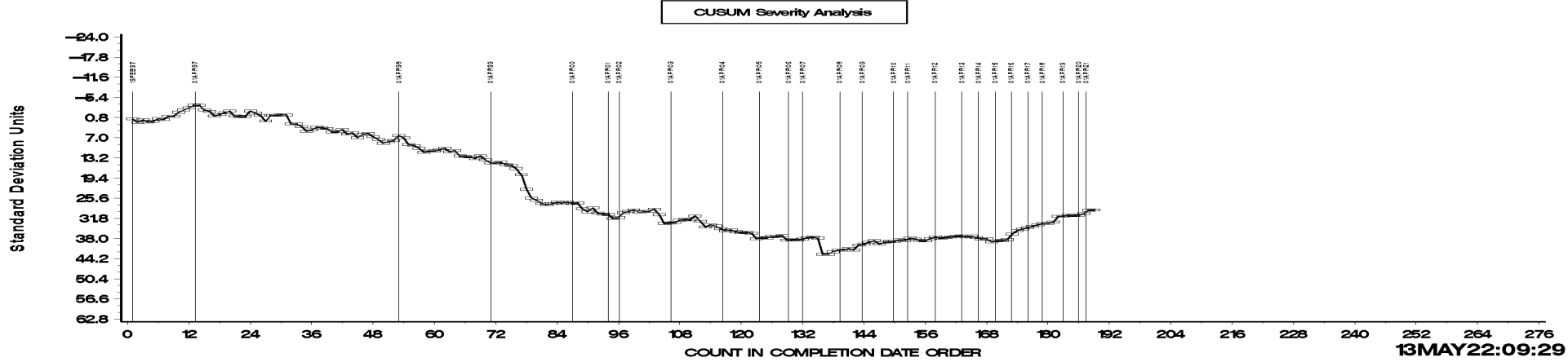
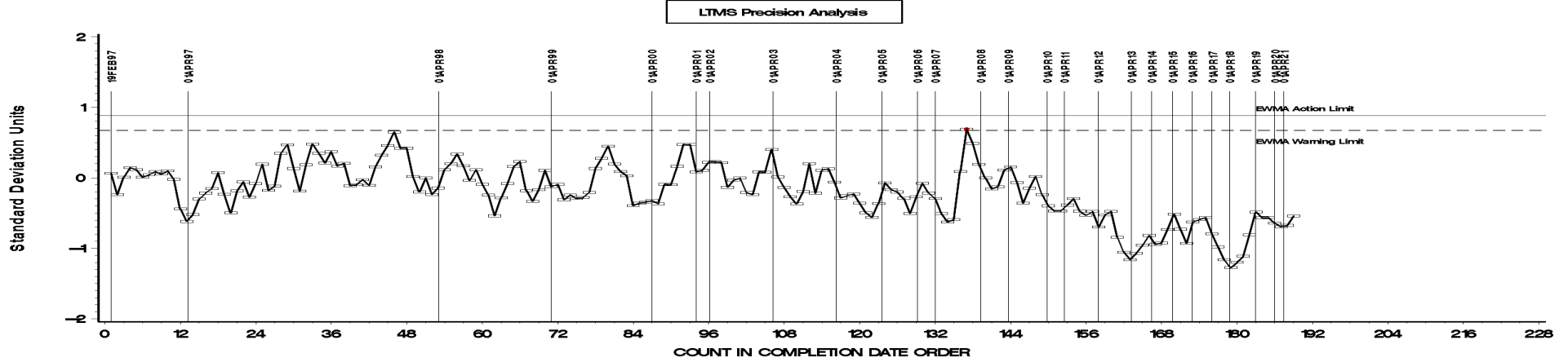
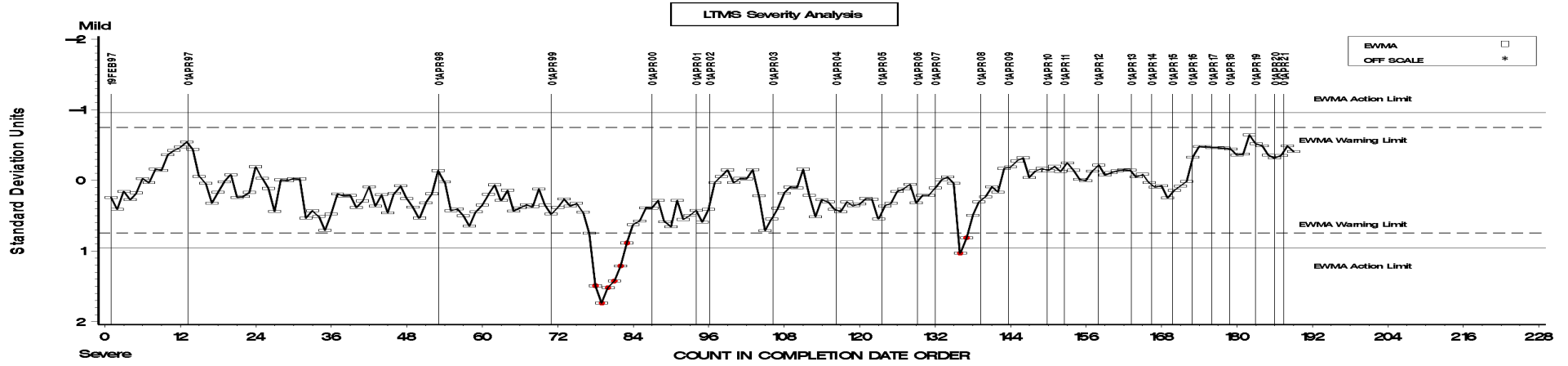
TOP LAND CARBON



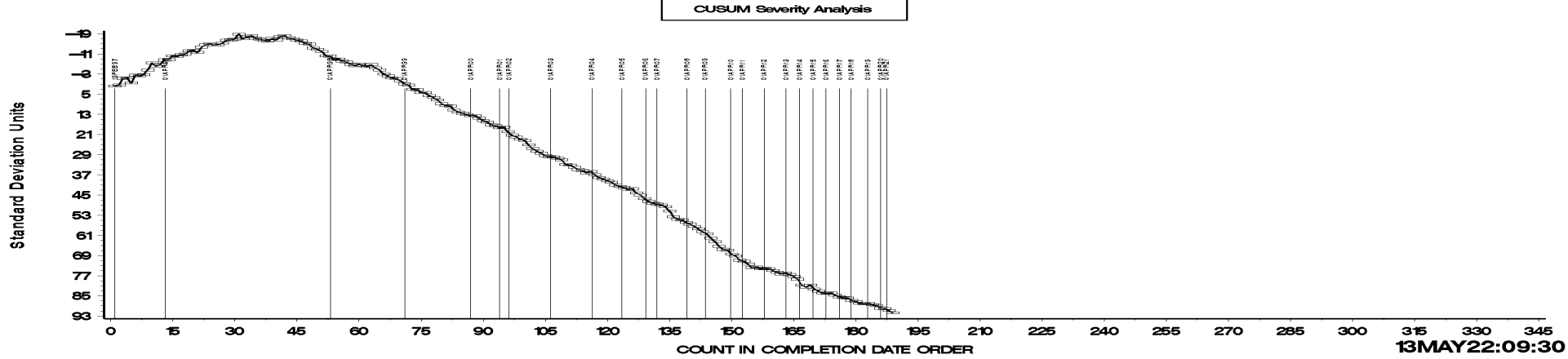
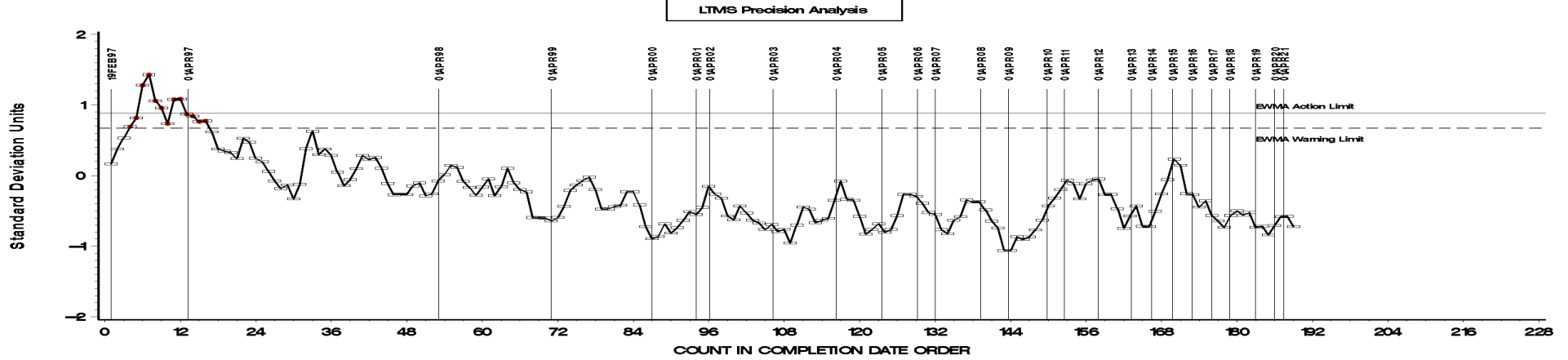
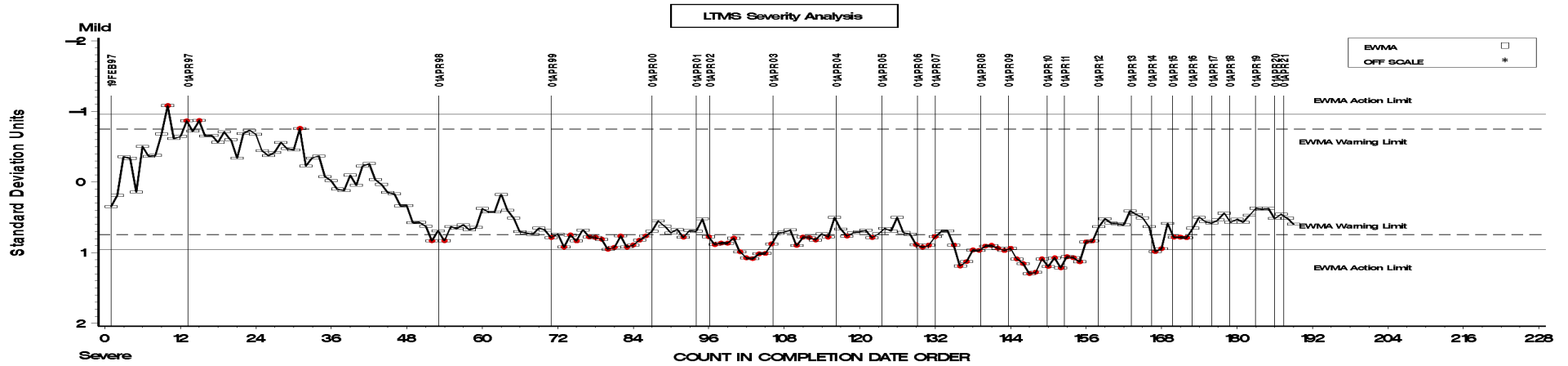
CATERPILLAR 1P INDUSTRY OPERATIONALLY VALID DATA



TOP GROOVE CARBON



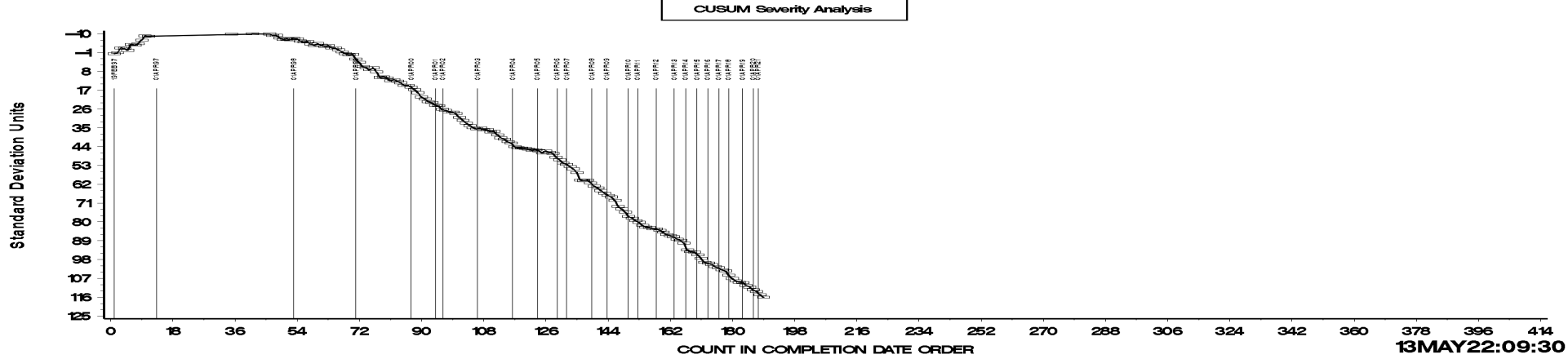
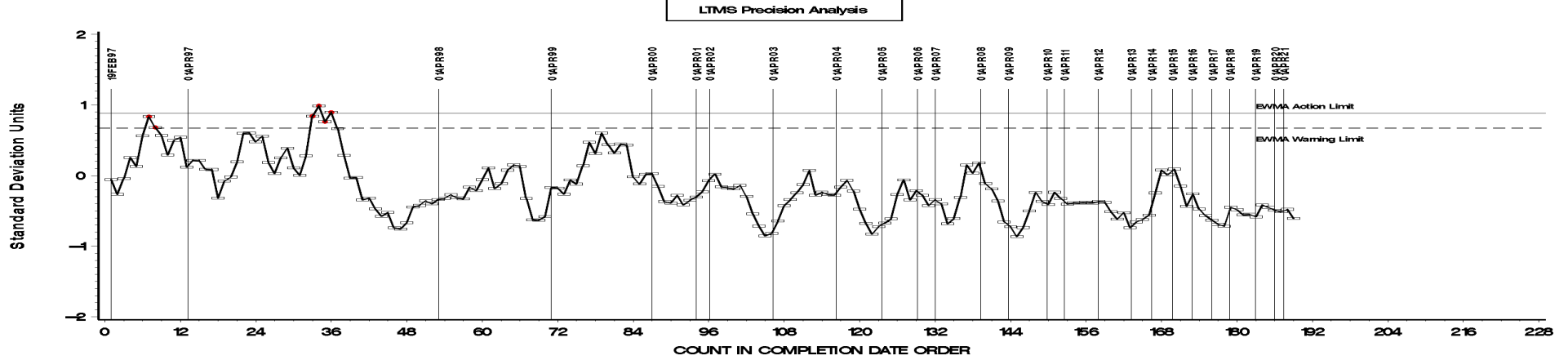
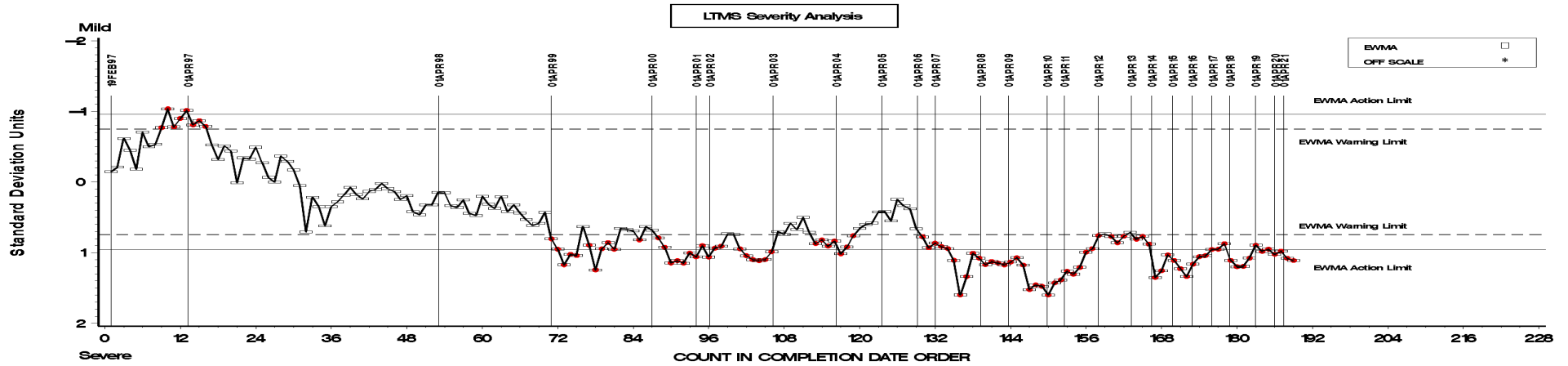
OIL CONSUMPTION



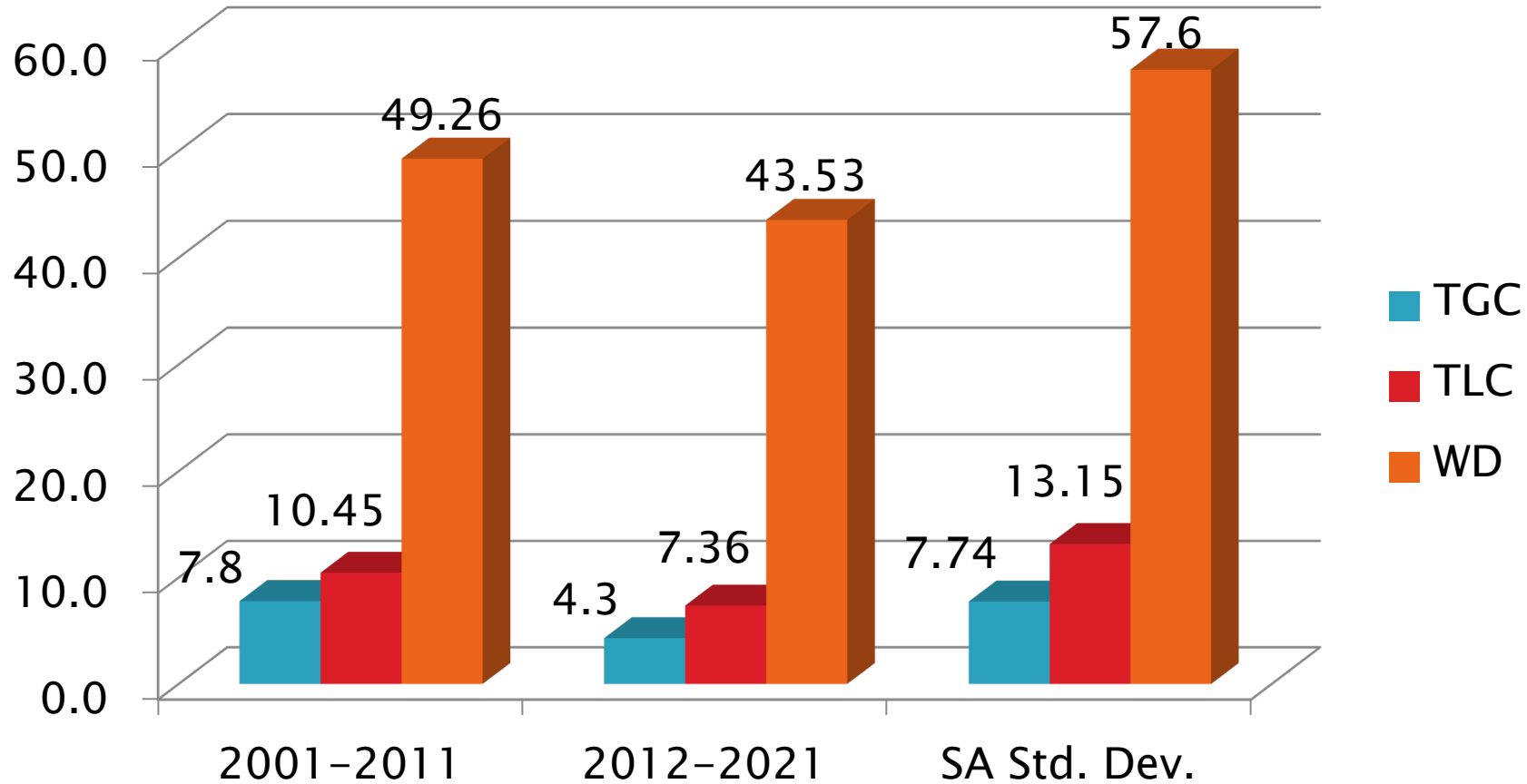
CATERPILLAR 1P INDUSTRY OPERATIONALLY VALID DATA



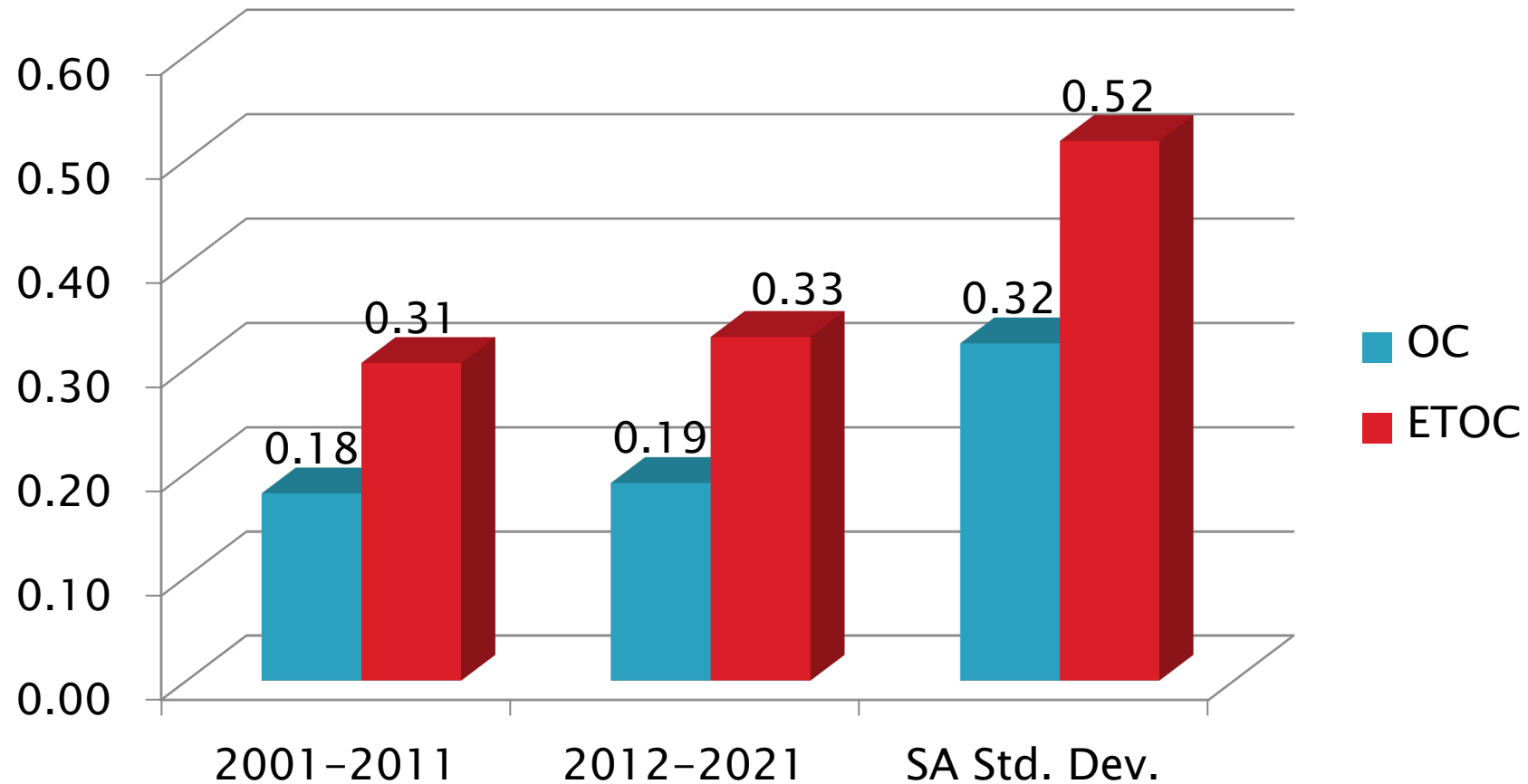
EOTOC



1 P Precision Estimates



1 P 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	1
Failed Calibration Test	OC	0
Operationally Invalid	LC	0
Aborted	XC	0
Total		1

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 test	0
Total		0

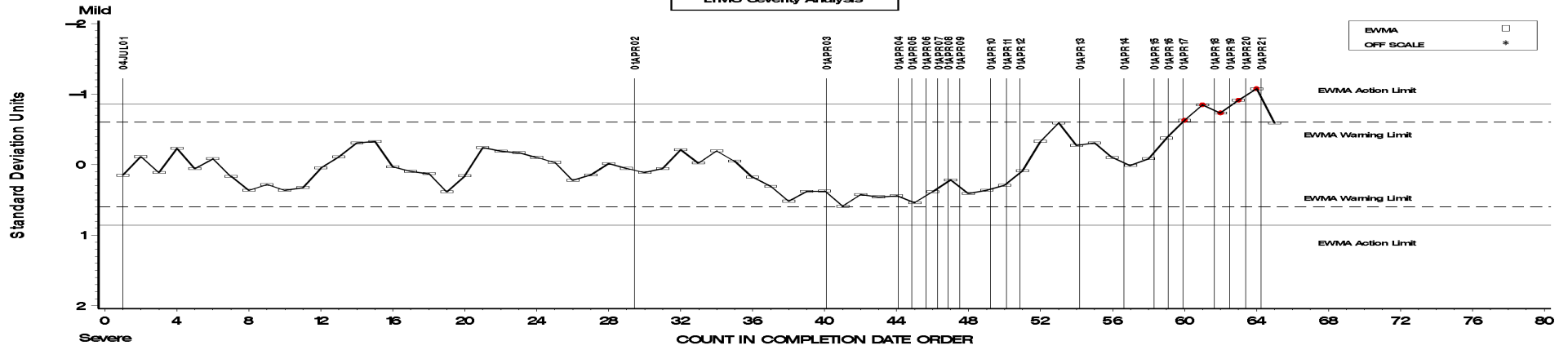
*Invalid and aborted tests

1 R Test Severity

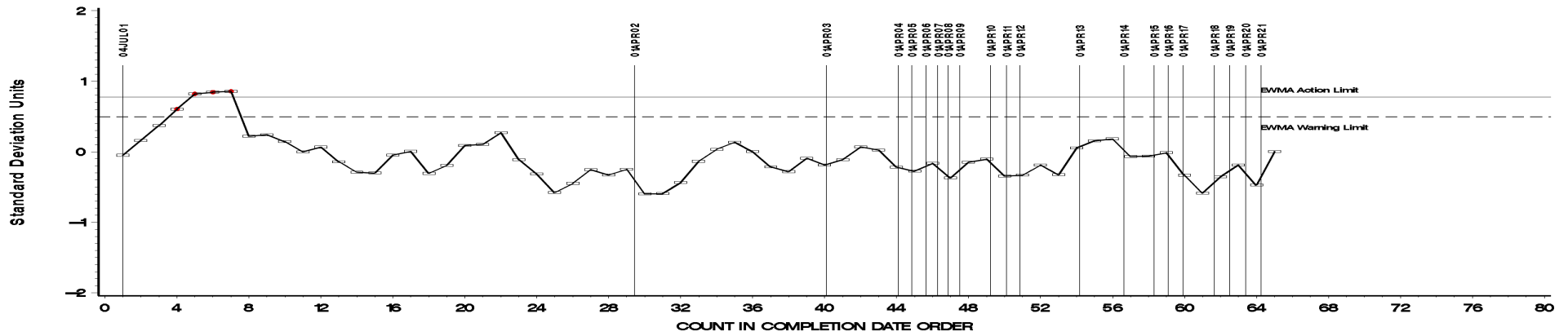
- ▶ TGC and BTOC are in control.
- ▶ TLC is in severity warning alarm in the mild direction.
- ▶ WD is in precision warning alarm.
- ▶ ETOC is in precision action alarm.

FINAL BOTOC

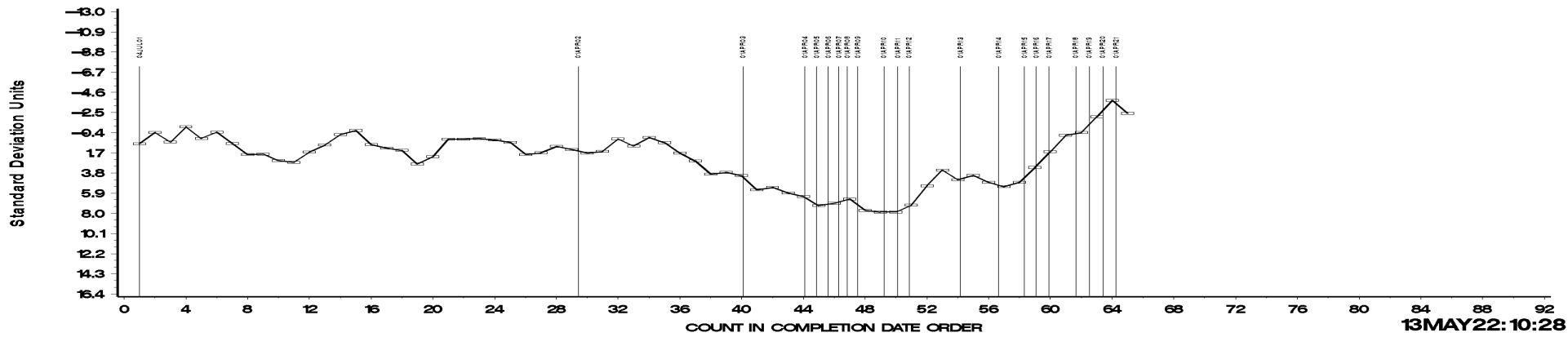
LTMS Severity Analysis



LTMS Precision Analysis



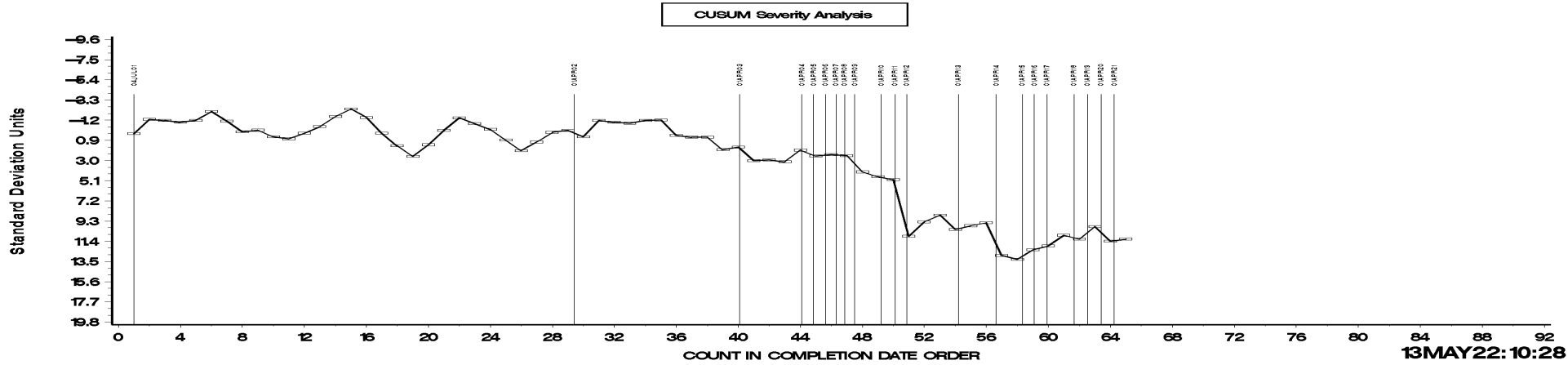
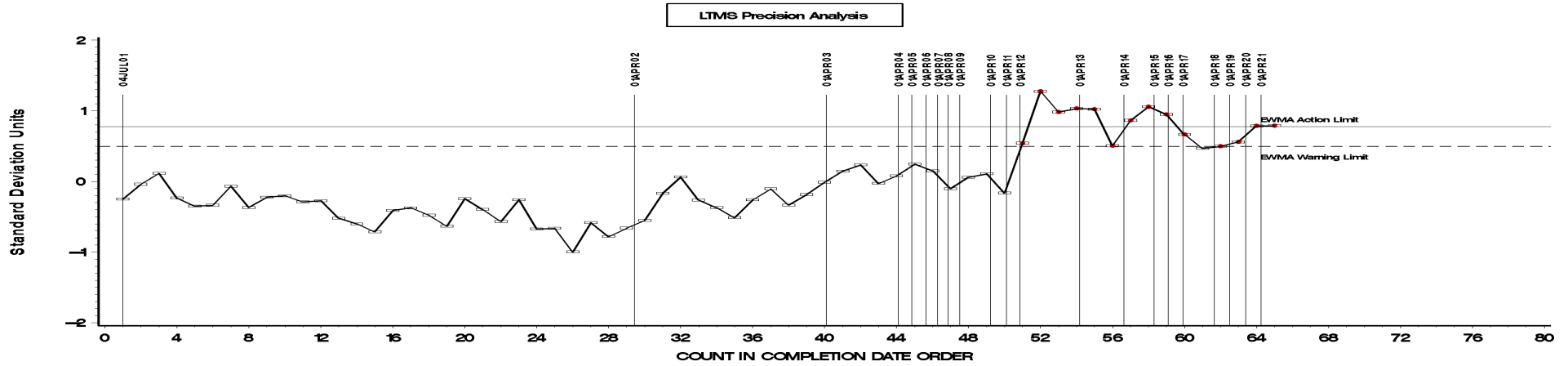
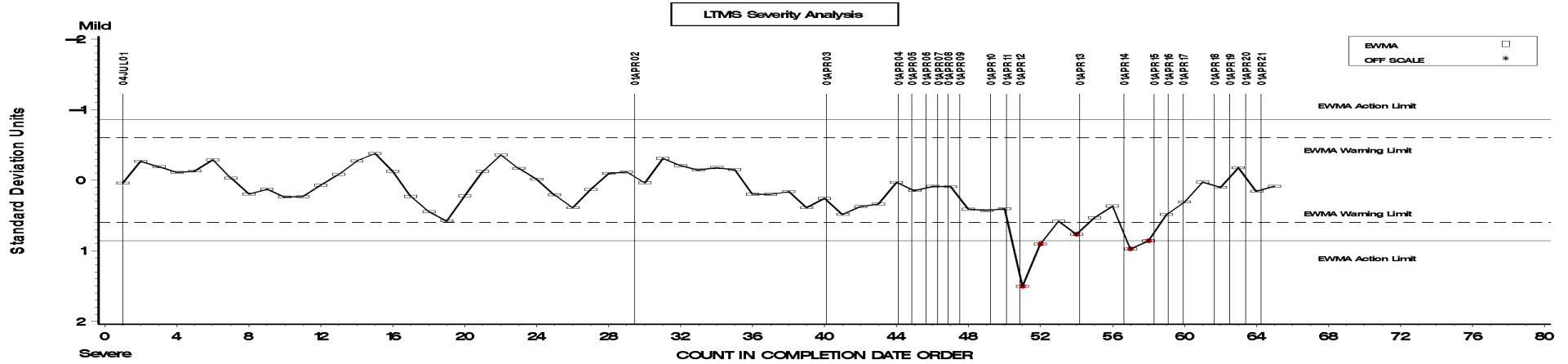
CUSUM Severity Analysis



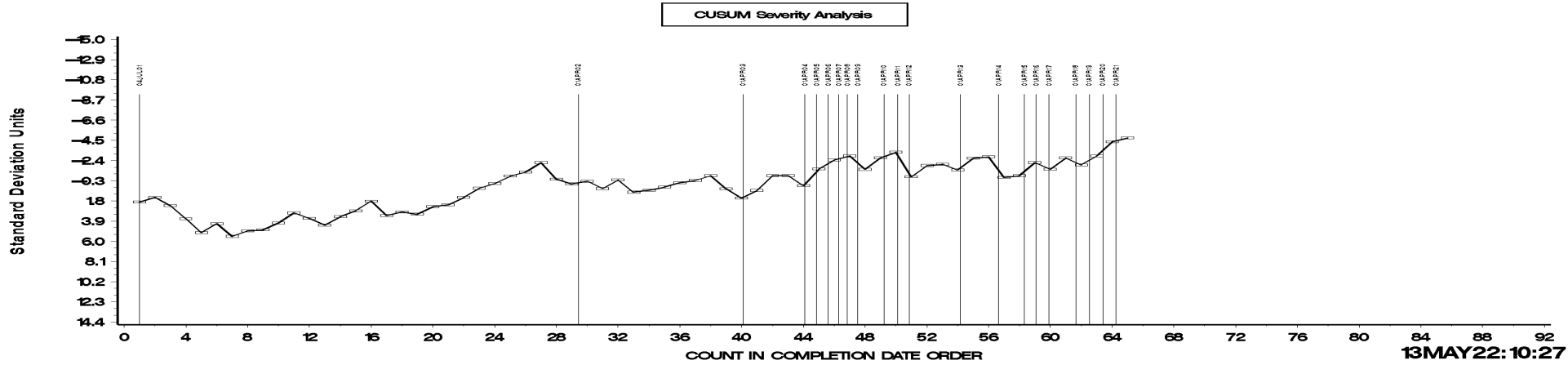
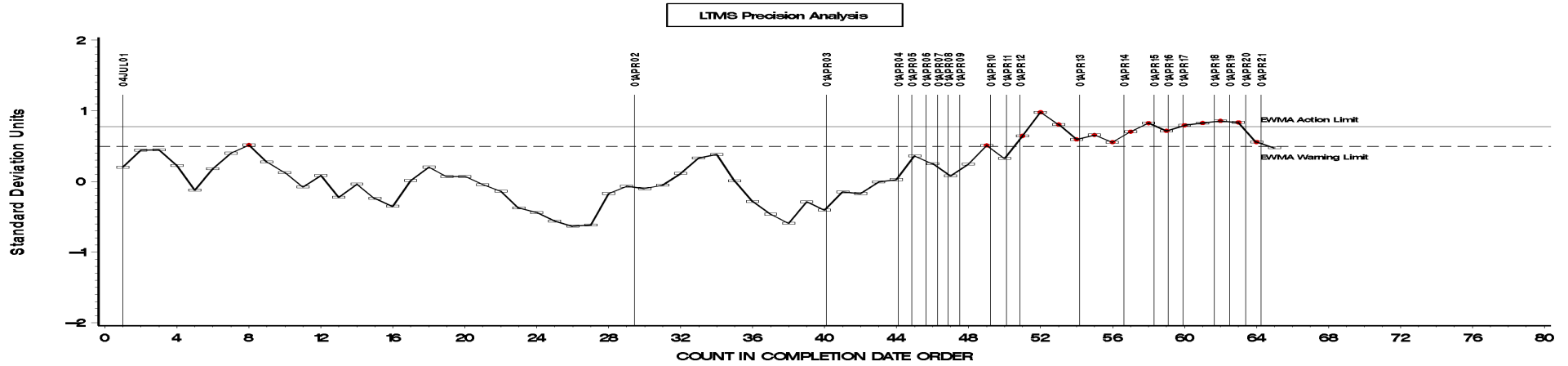
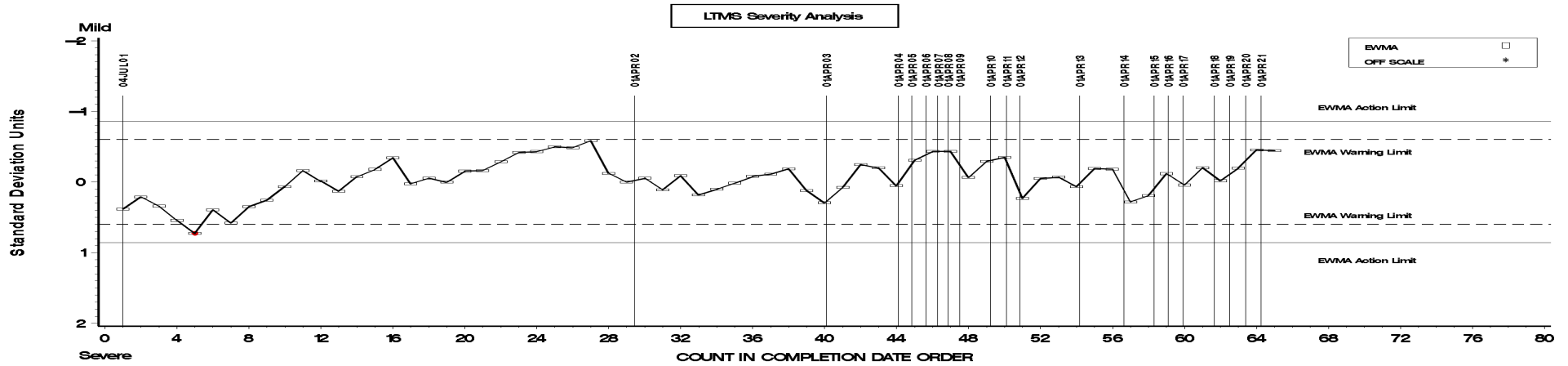
CATERPILLAR 1R INDUSTRY OPERATIONALLY VALID DATA



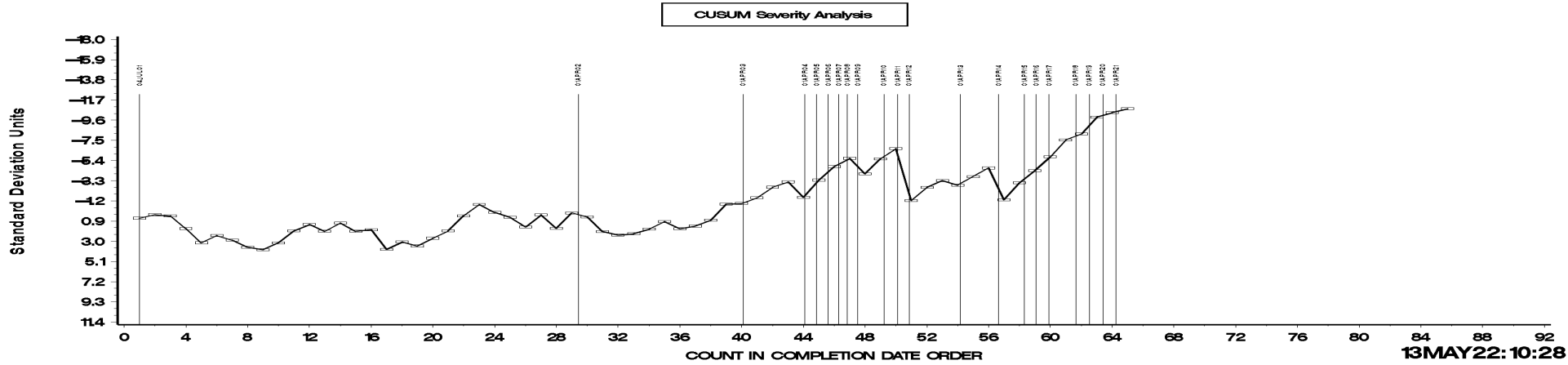
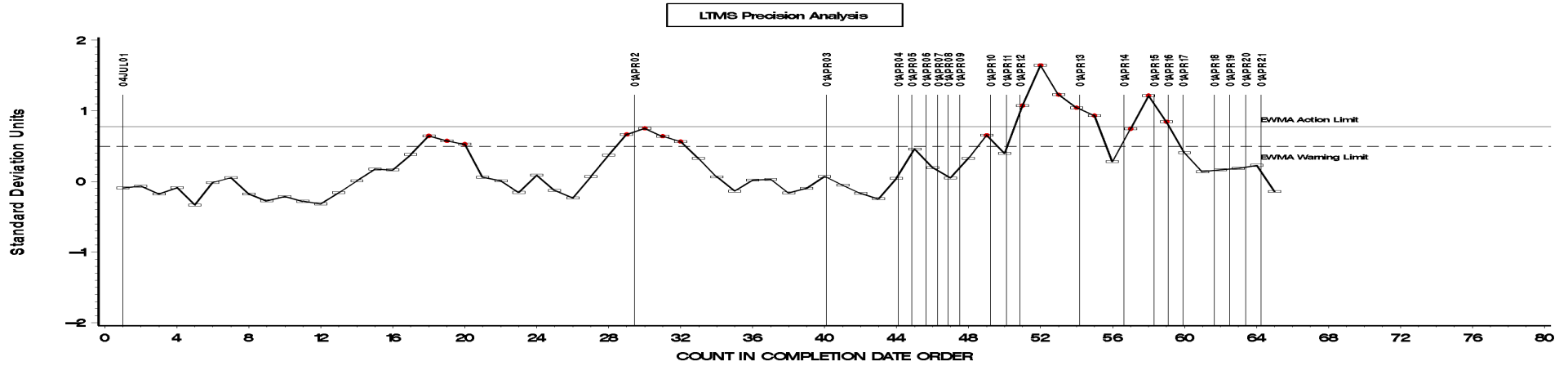
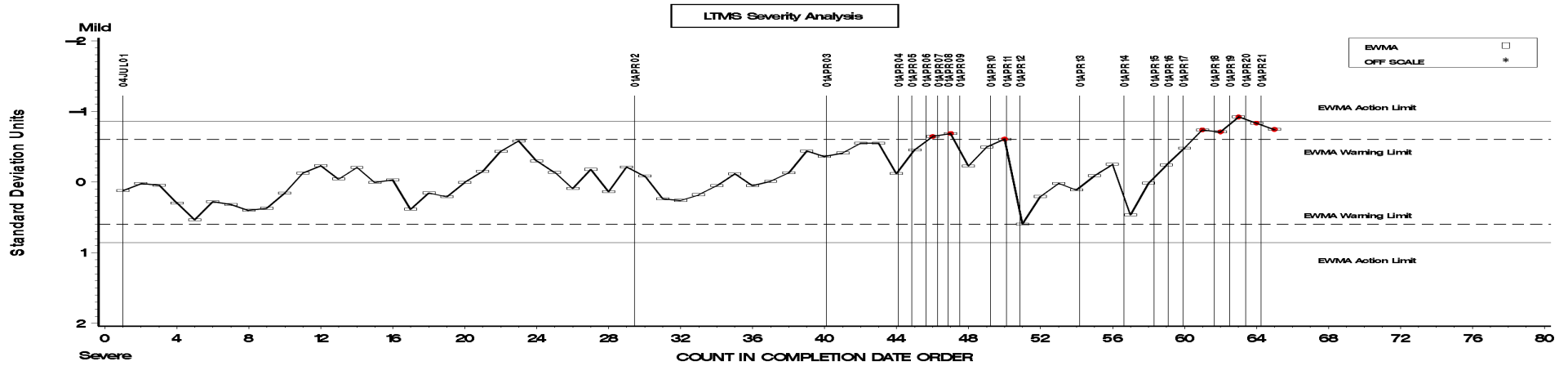
FINAL EOTOC (g/h)



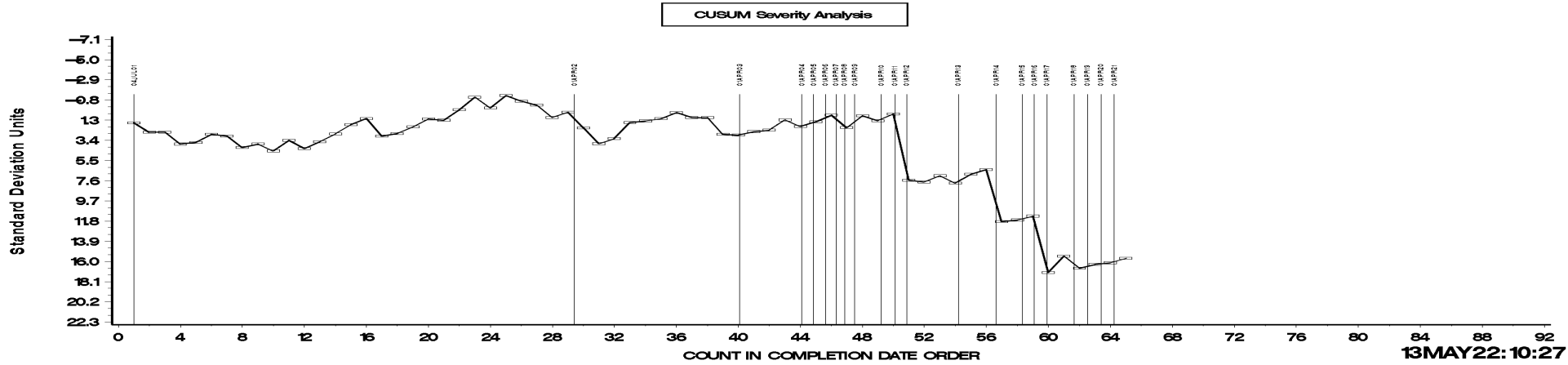
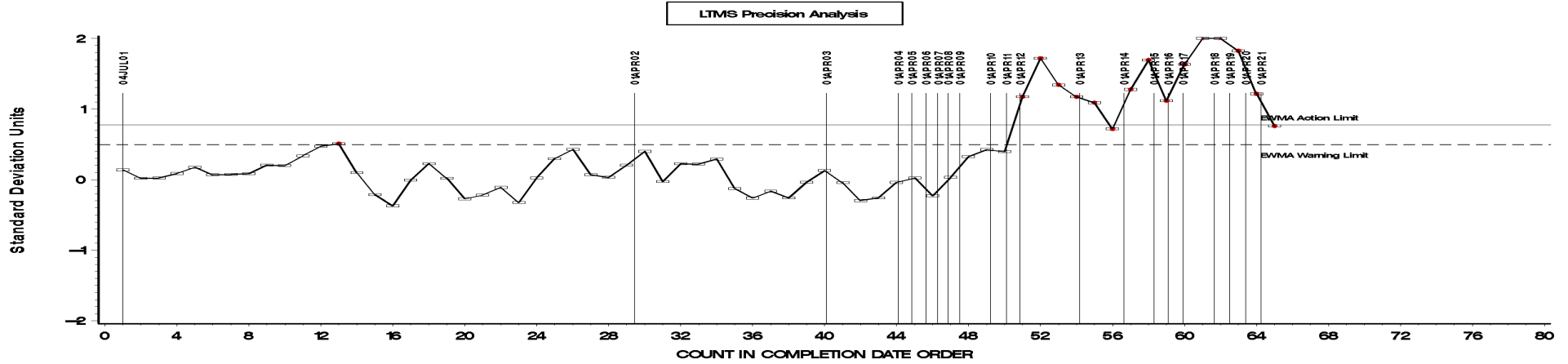
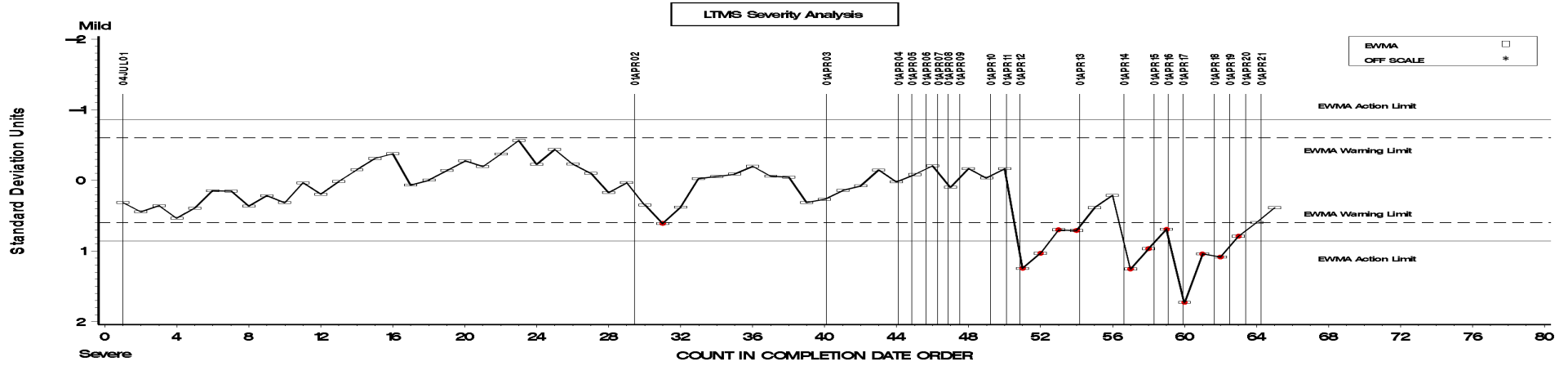
FINAL TOP GROOVE CARBON (DEMERITS)



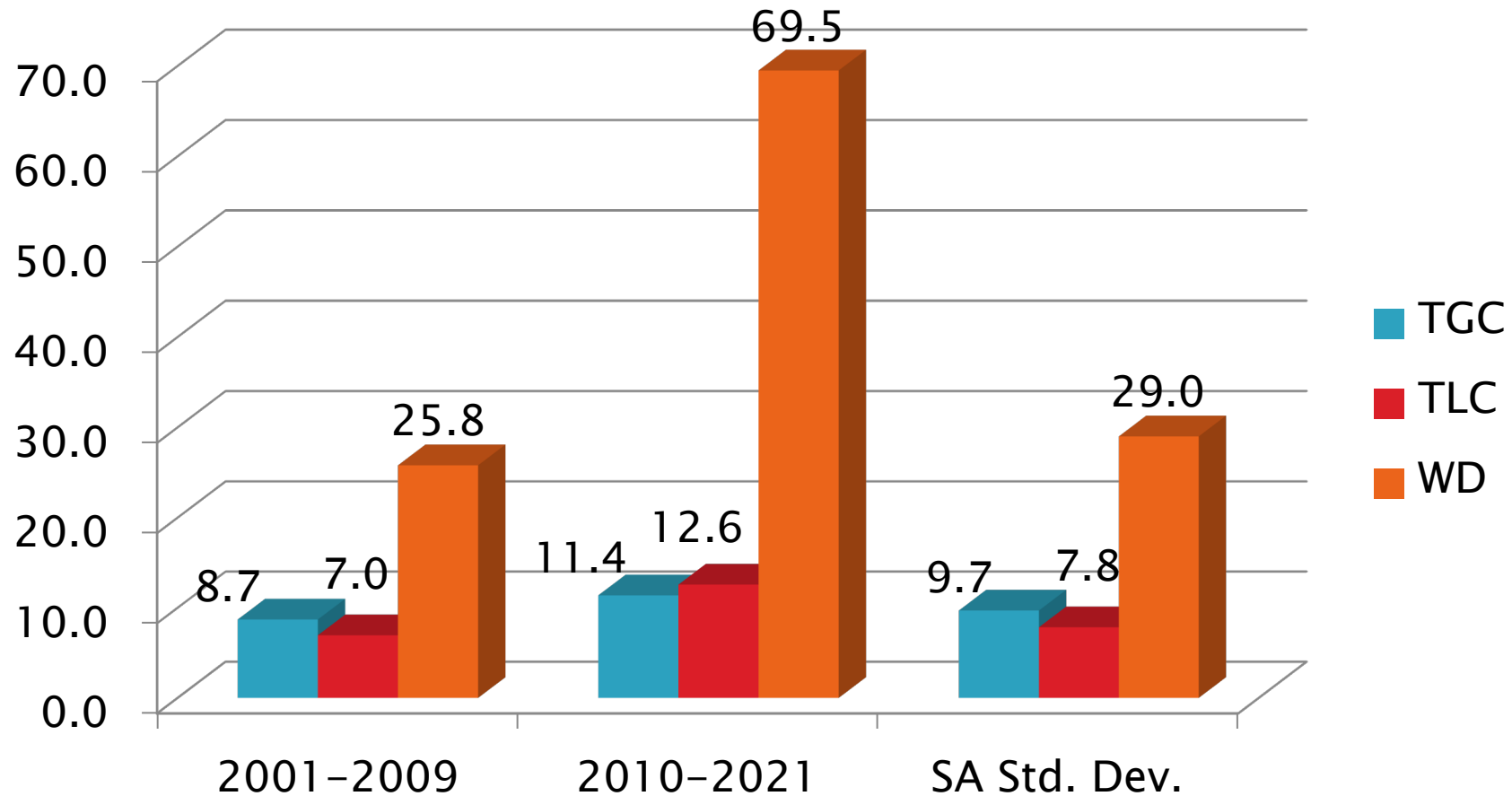
FINAL TOP LAND CARBON (DEMERITS)



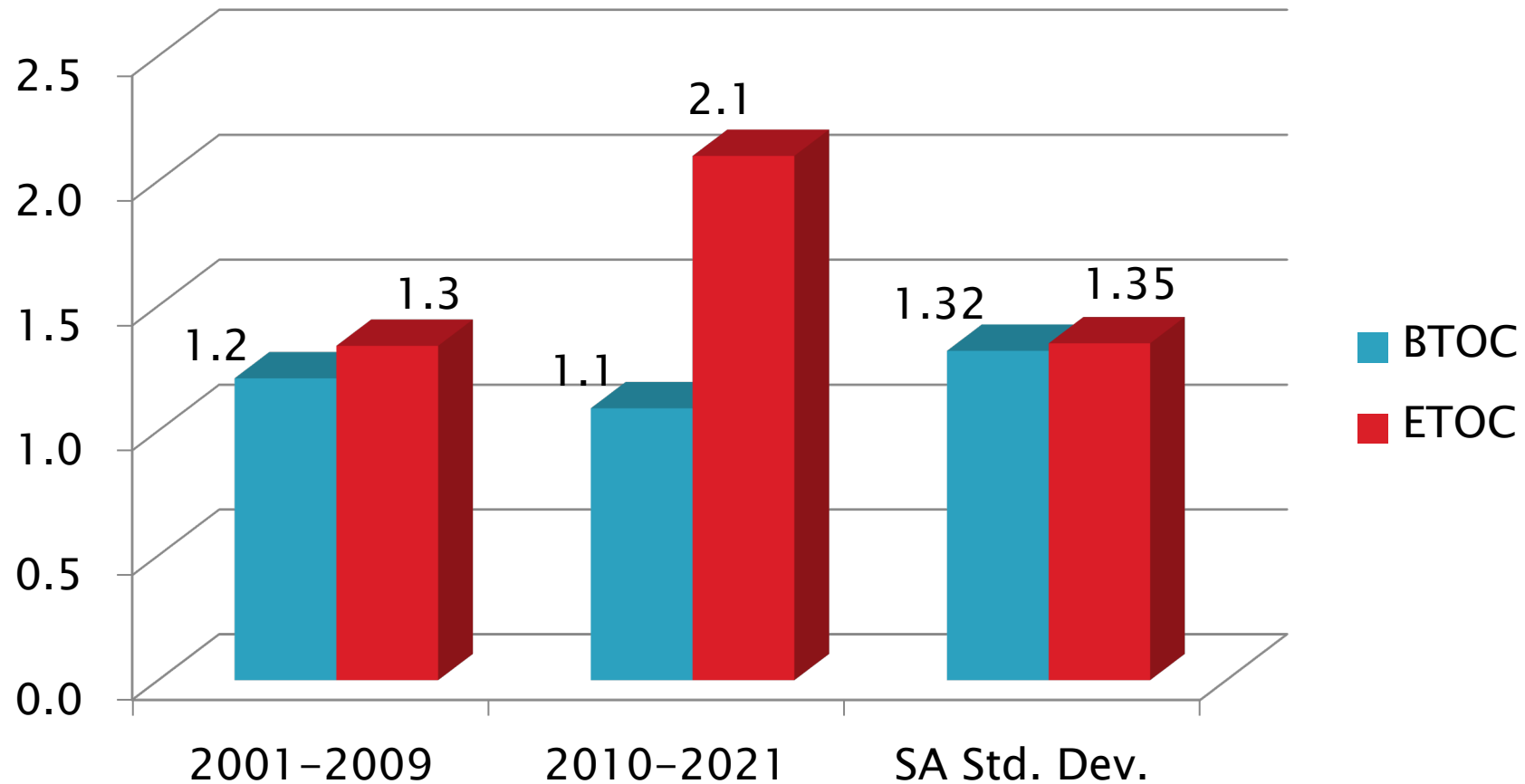
FINAL WEIGHTED TOTAL DEMERITS (DEMERITS)



1 R Precision Estimates



1 R Precision Estimates



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Test Monitoring Center
<https://www.astmtmc.org>



CAT C13

➤➤ April 2022

Test Monitoring Center
<https://www.astmtmc.org>



A Program of ASTM International

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

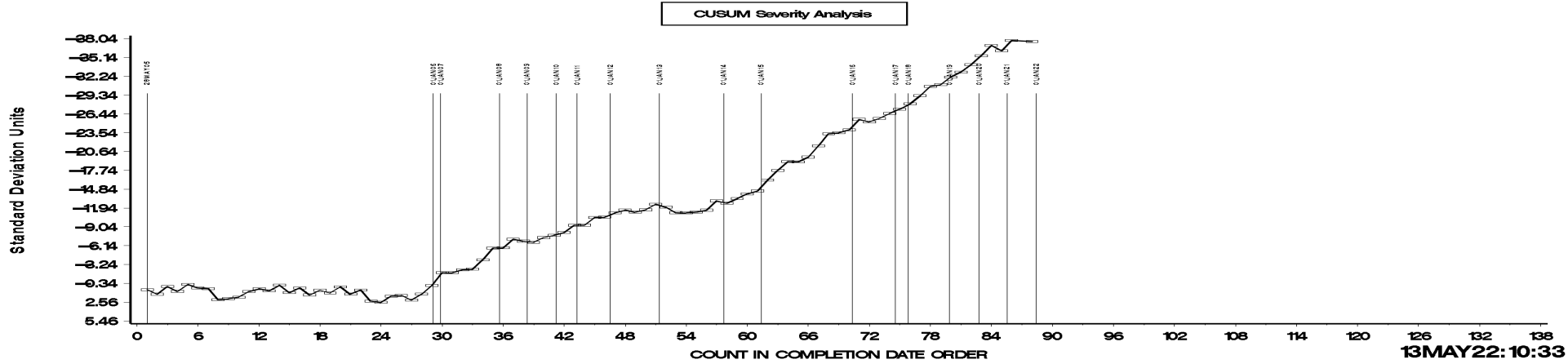
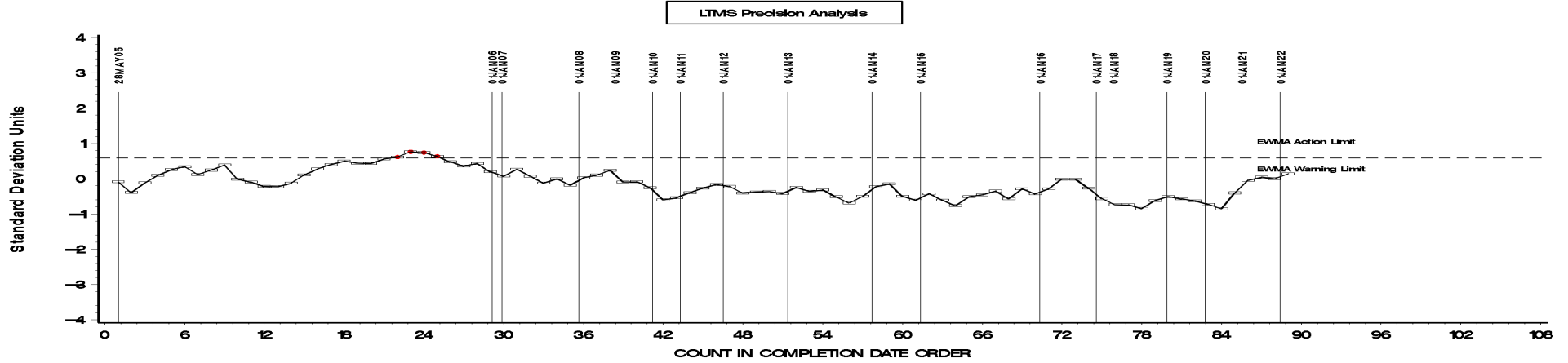
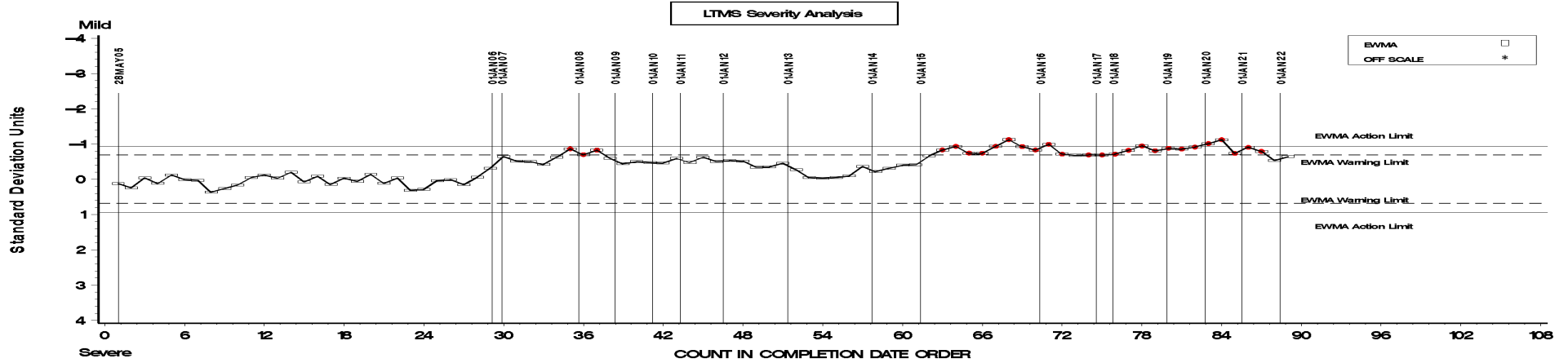
C13 Test Severity

- ▶ R2TC, TGC, OC are in control
- ▶ TLC in severity warning alarm in the mild direction but very near action alarm

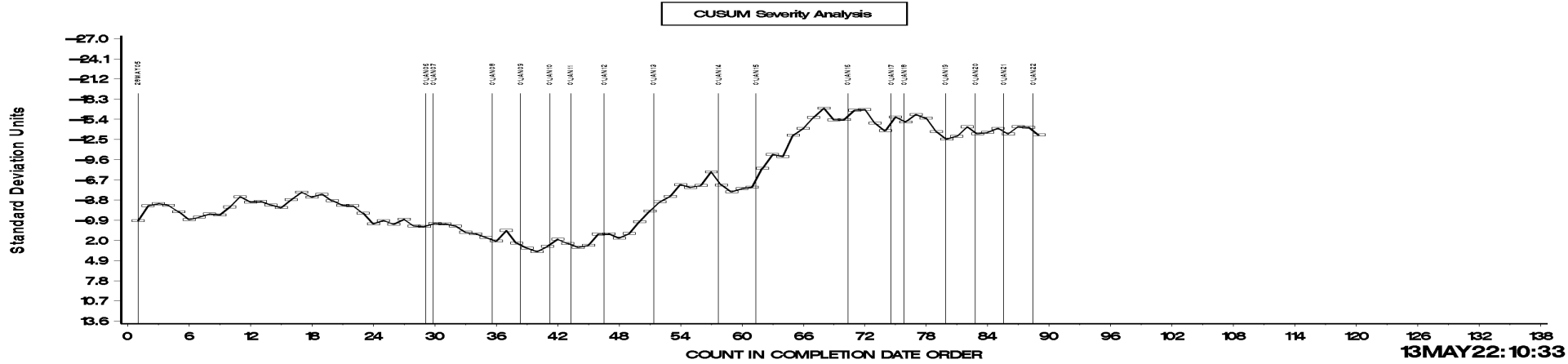
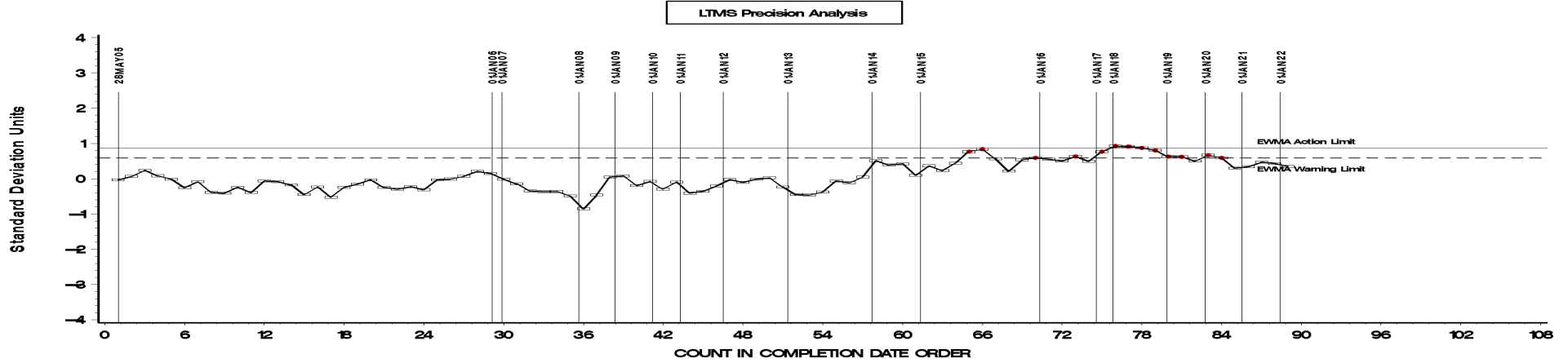
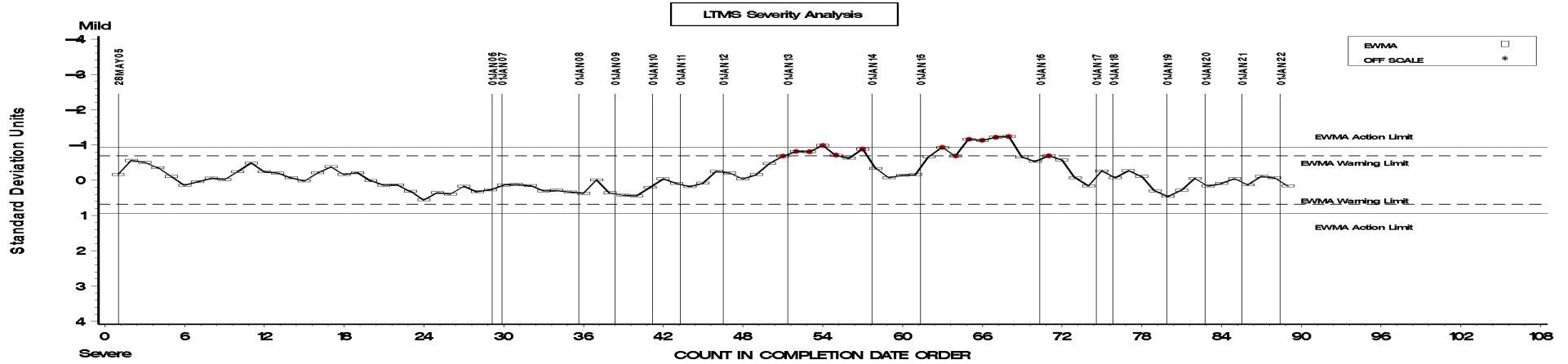
C13 INDUSTRY OPERATIONALLY VALID DATA



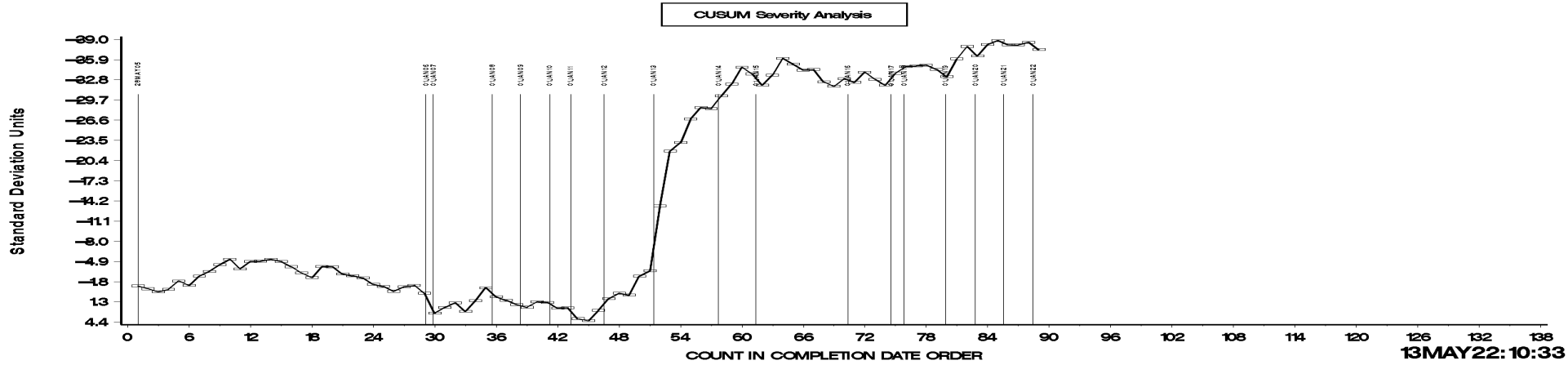
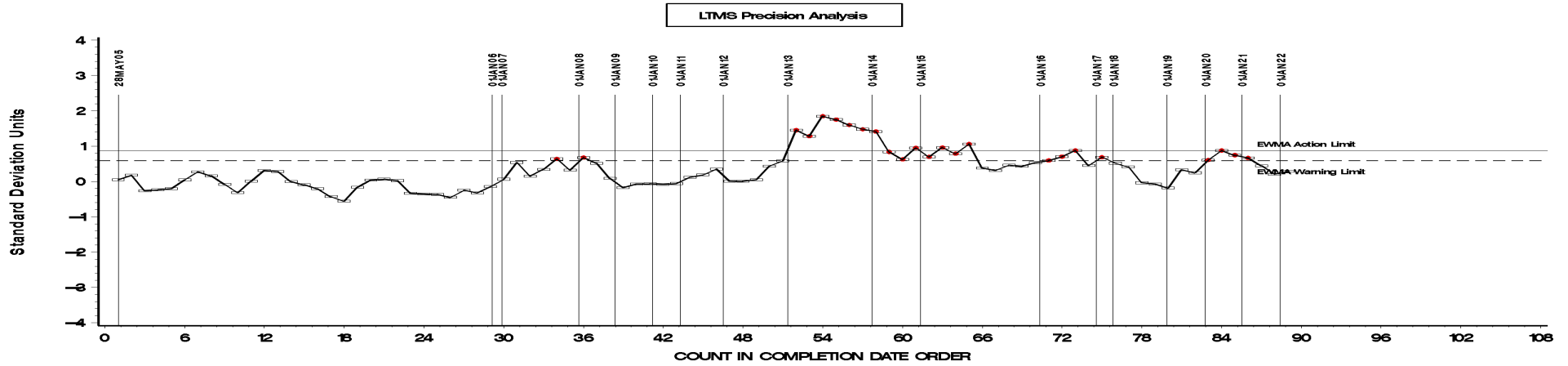
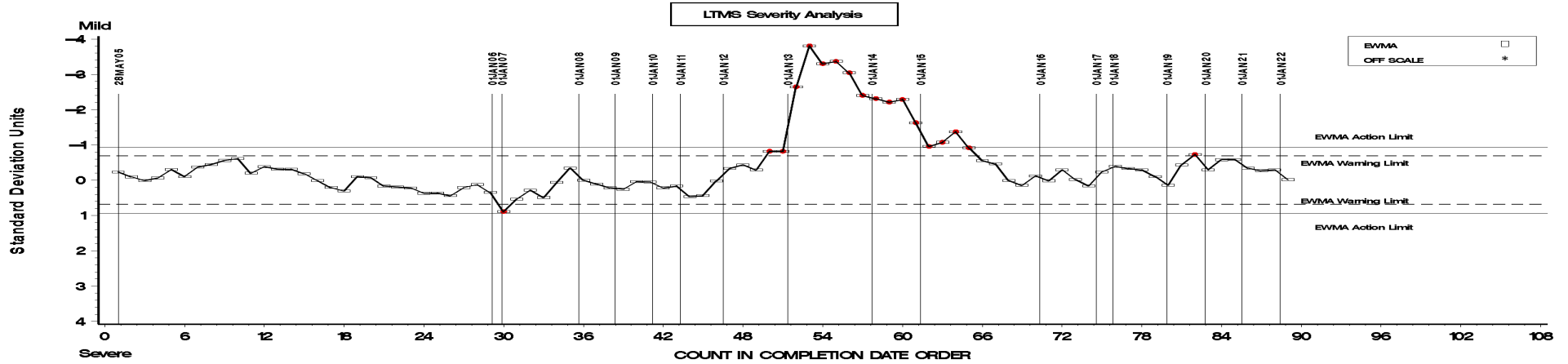
TOP LAND CARBON AVG. — FINAL RESULT



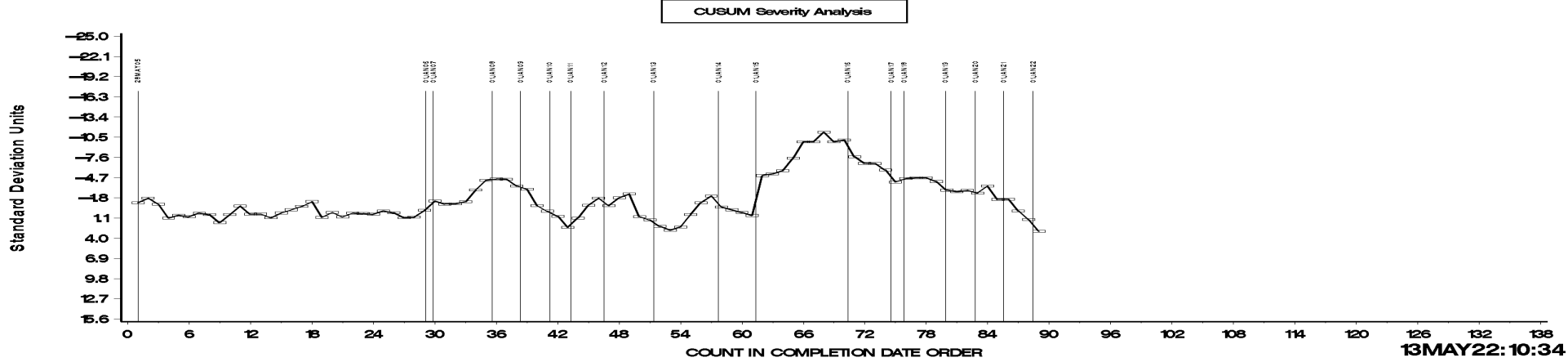
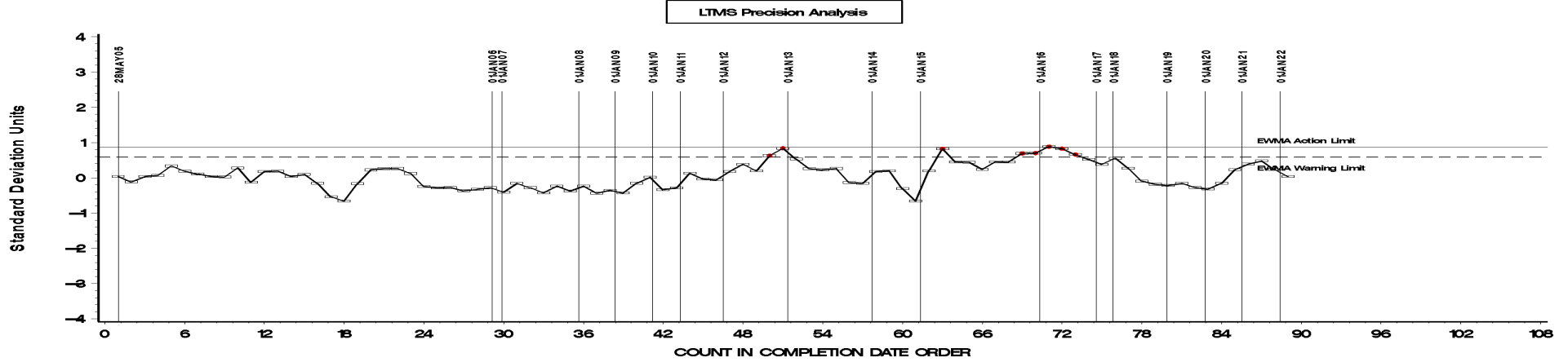
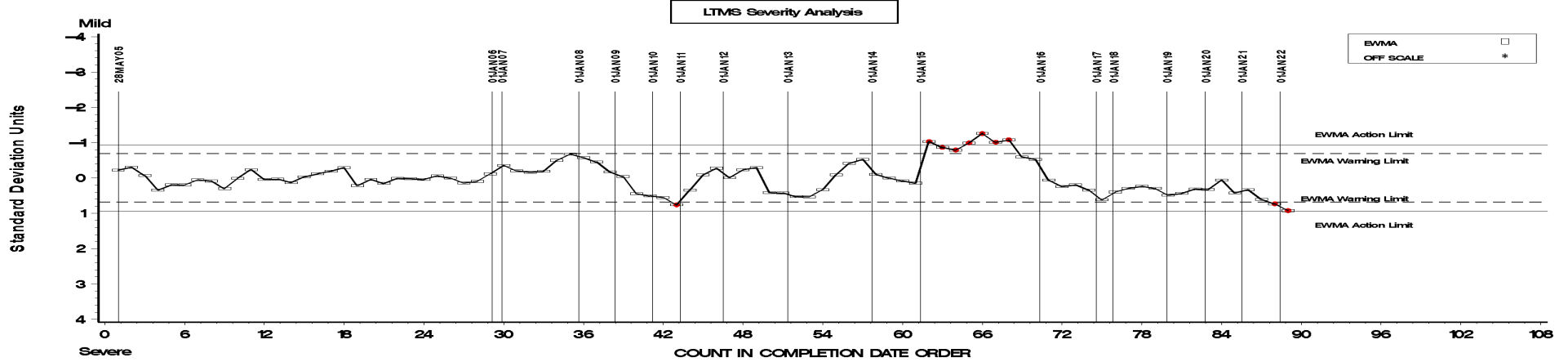
TOP GROOVE CARBON AVG — FINAL RESULT



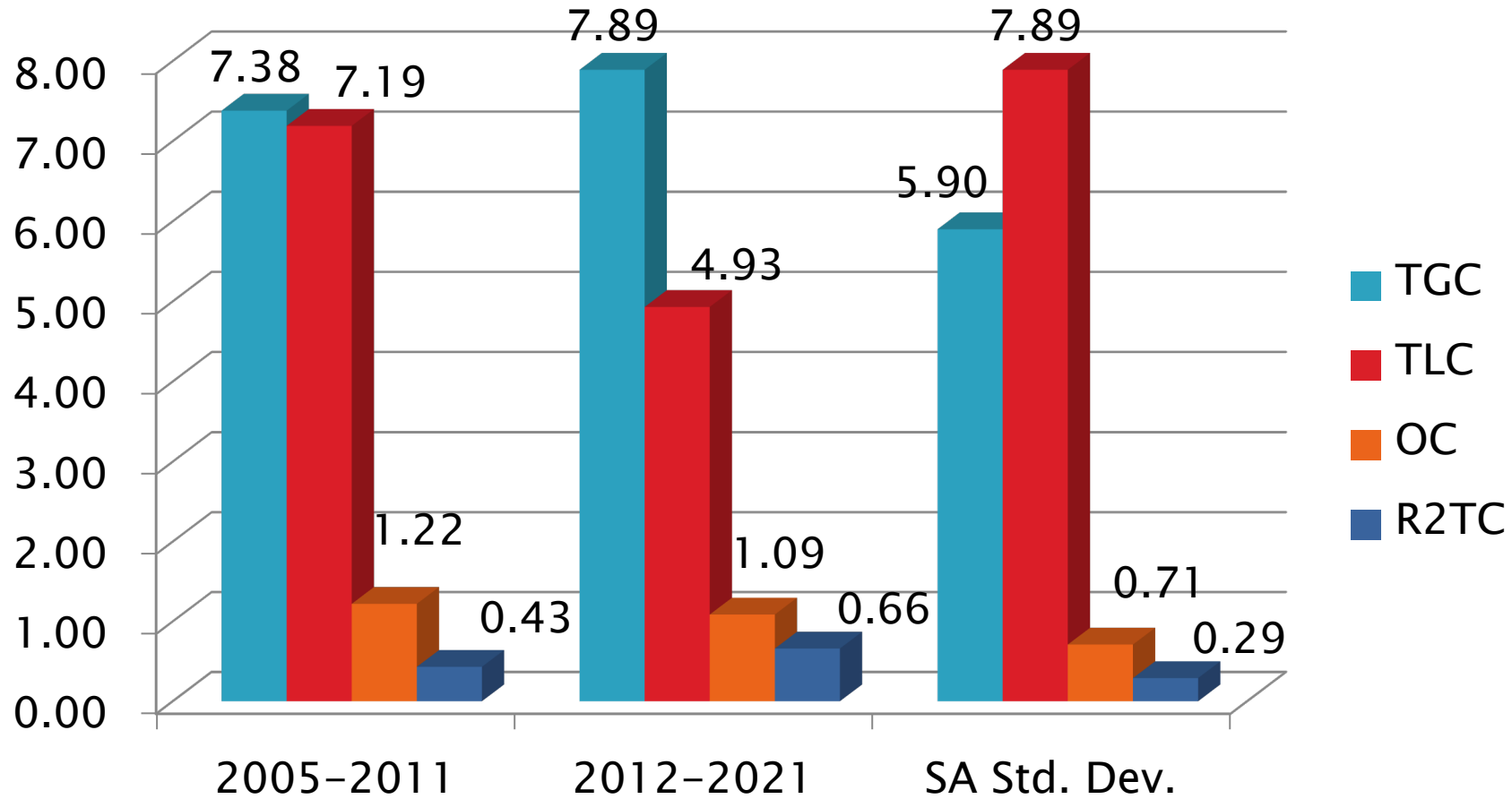
2ND RING TOP CARBON AVG. — FINAL RESULT



OIL CONS. DELTA — FINAL RESULT



C13 Precision Estimates



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Test Monitoring Center
<https://www.astmtmc.org>



C13 Oil Aeration (COAT)

»» April 2022

Test Monitoring Center
<https://www.astmtmc.org>



A Program of ASTM International

COAT Test Activity

Test Status	Validity Code	COAT
Acceptable Calibration Test	AC	2
Failed Calibration Test	OC	1
Operationally Invalid	LC	1
Aborted	XC	1
Informational Run	NN	1
Total		6

COAT Failed Tests

Failed Parameter	Number of Tests
Average oil aeration severe	1
Total	1

COAT Lost Tests*

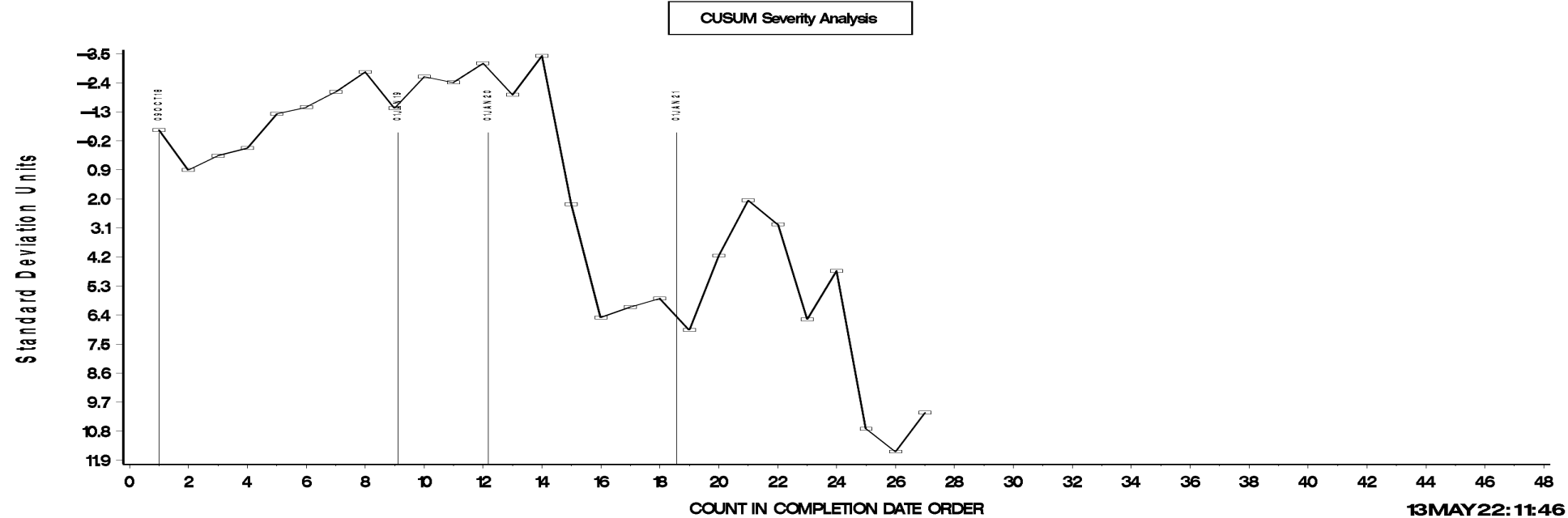
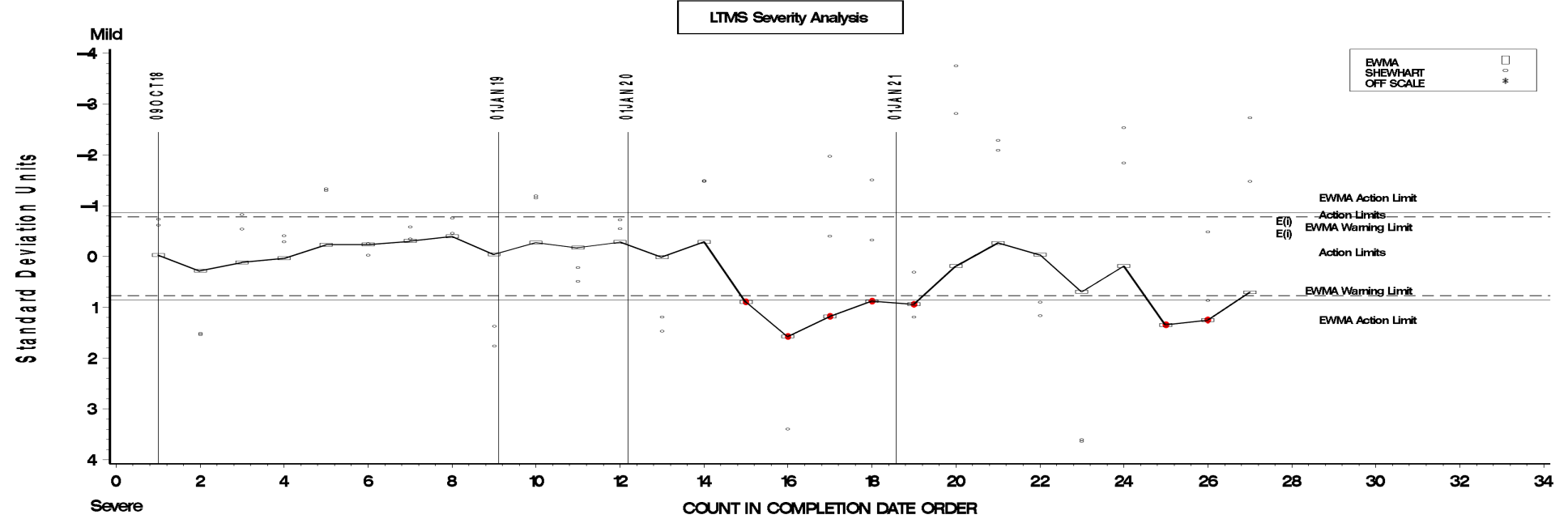
Status	Cause	#
Invalid	Bad crankcase pressure transducer calibration	1
Aborted	Insufficient oil charge due to incorrect pre-test flush	1
Total		2

*Invalid and aborted tests

COAT Test Severity

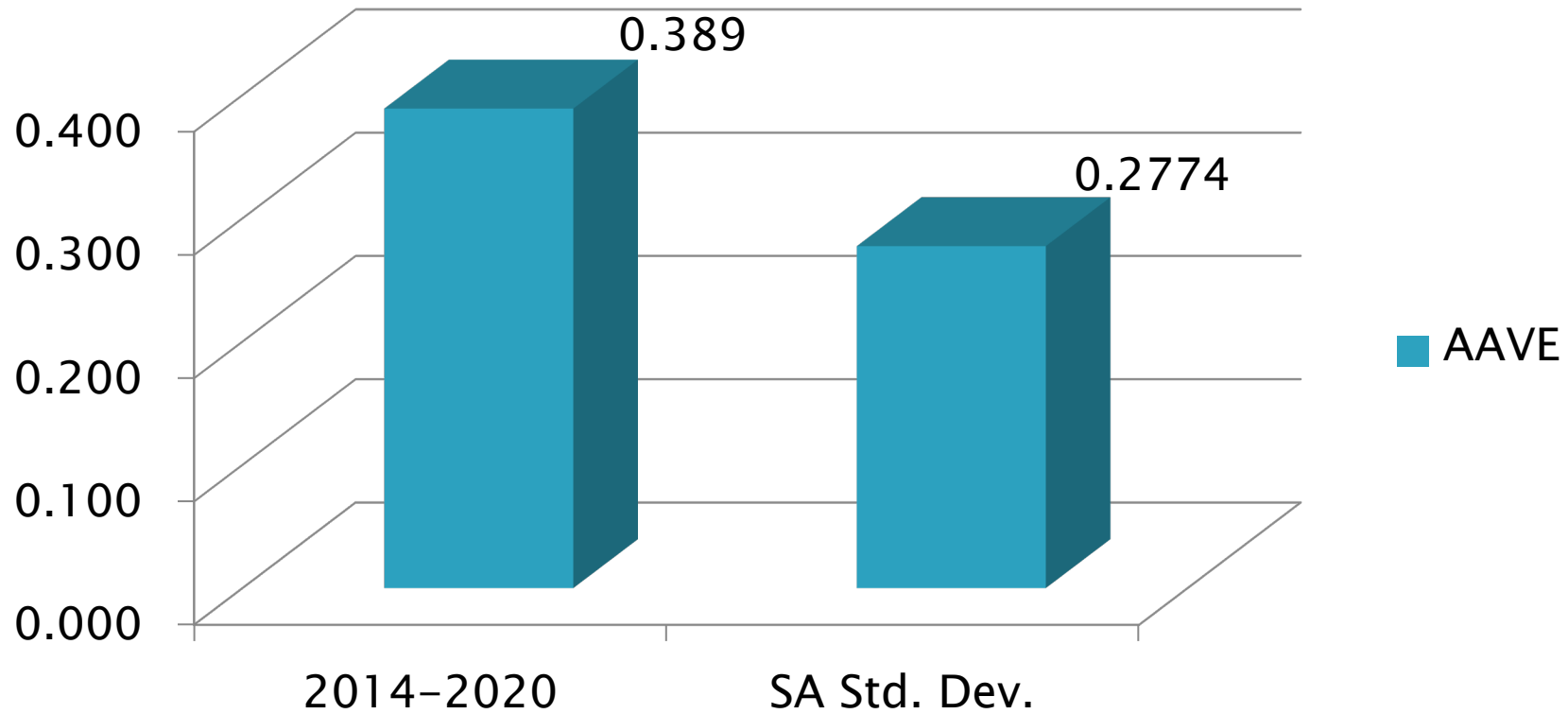
- ▶ AAVE is in control

CORRECTED AVERAGE OIL AERATION OVER TEST HOURS 40 —50



COAT Precision Estimates

AAVE



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Test Monitoring Center
<https://www.astmtmc.org>



Daimler DD13 Scuffing Test

➤➤ April 2022

Test Monitoring Center
<https://www.astmtmc.org>



A Program of ASTM International

DD13 Test Activity

Test Status	Validity Code	COAT
Acceptable Calibration Test	AC	2
Failed Calibration Test	OC	0
Operationally Invalid	LC	1
Aborted	XC	0
Total		3

DD13 Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
Total	0

DD13 Lost Tests*

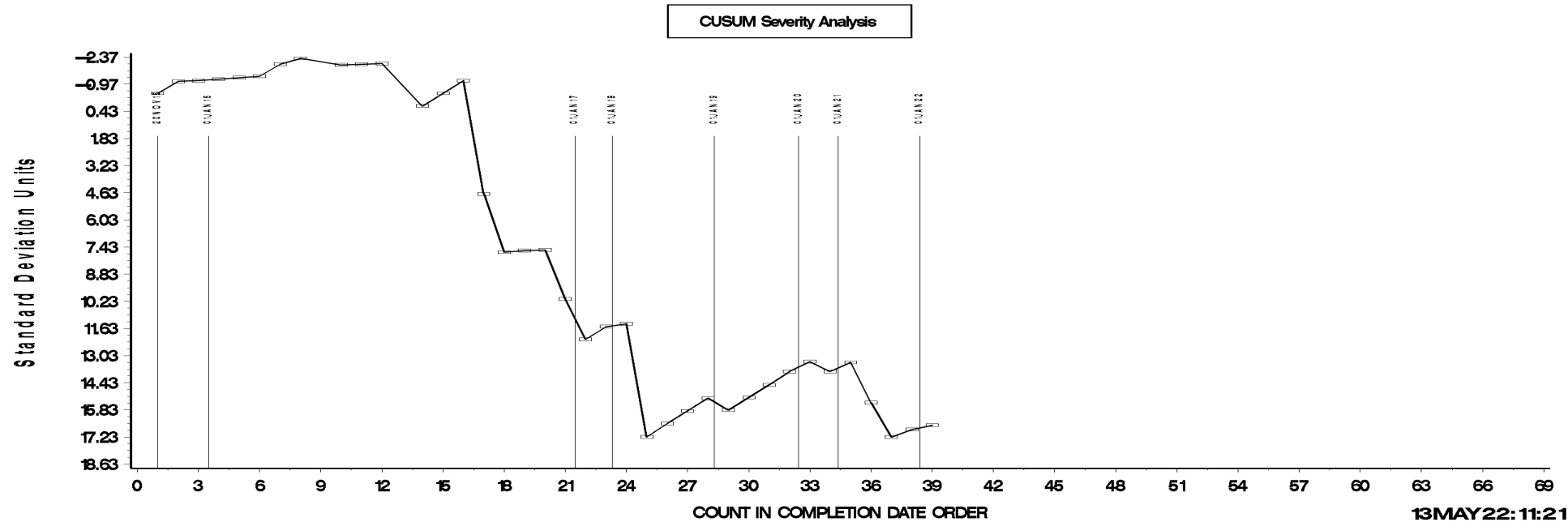
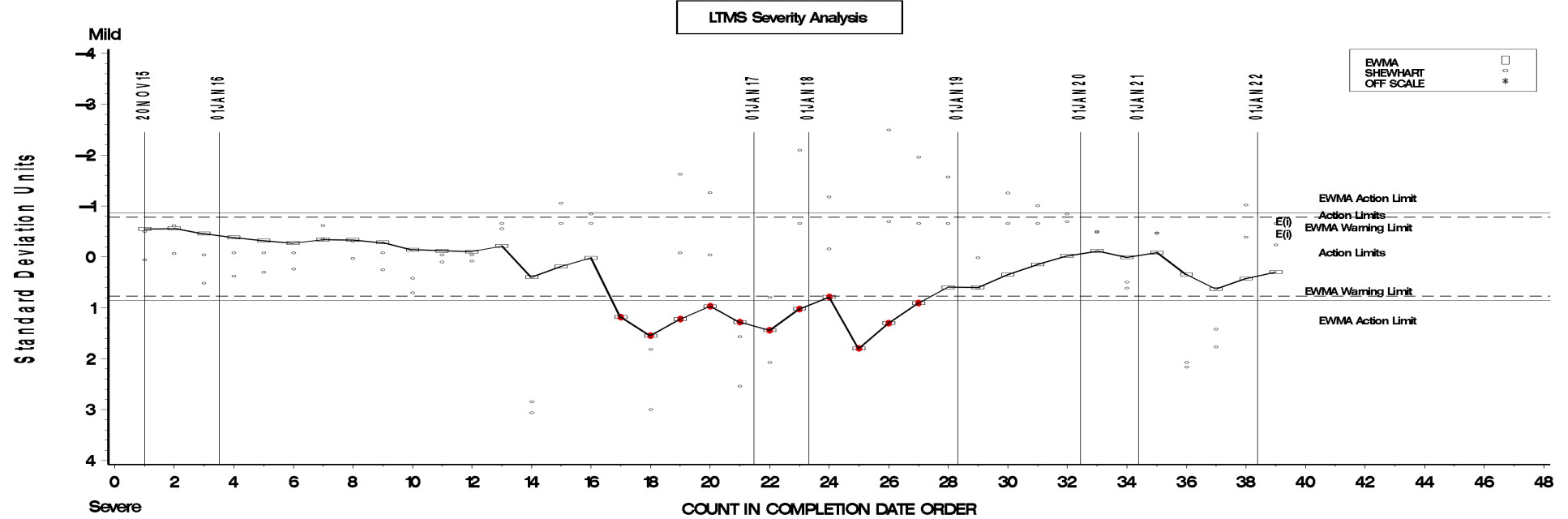
Status	Cause	#
Invalid	Scuffed before 30 hours	1
Aborted	No aborted tests	0
Total		1

*Invalid and aborted tests

DD13 Test Severity

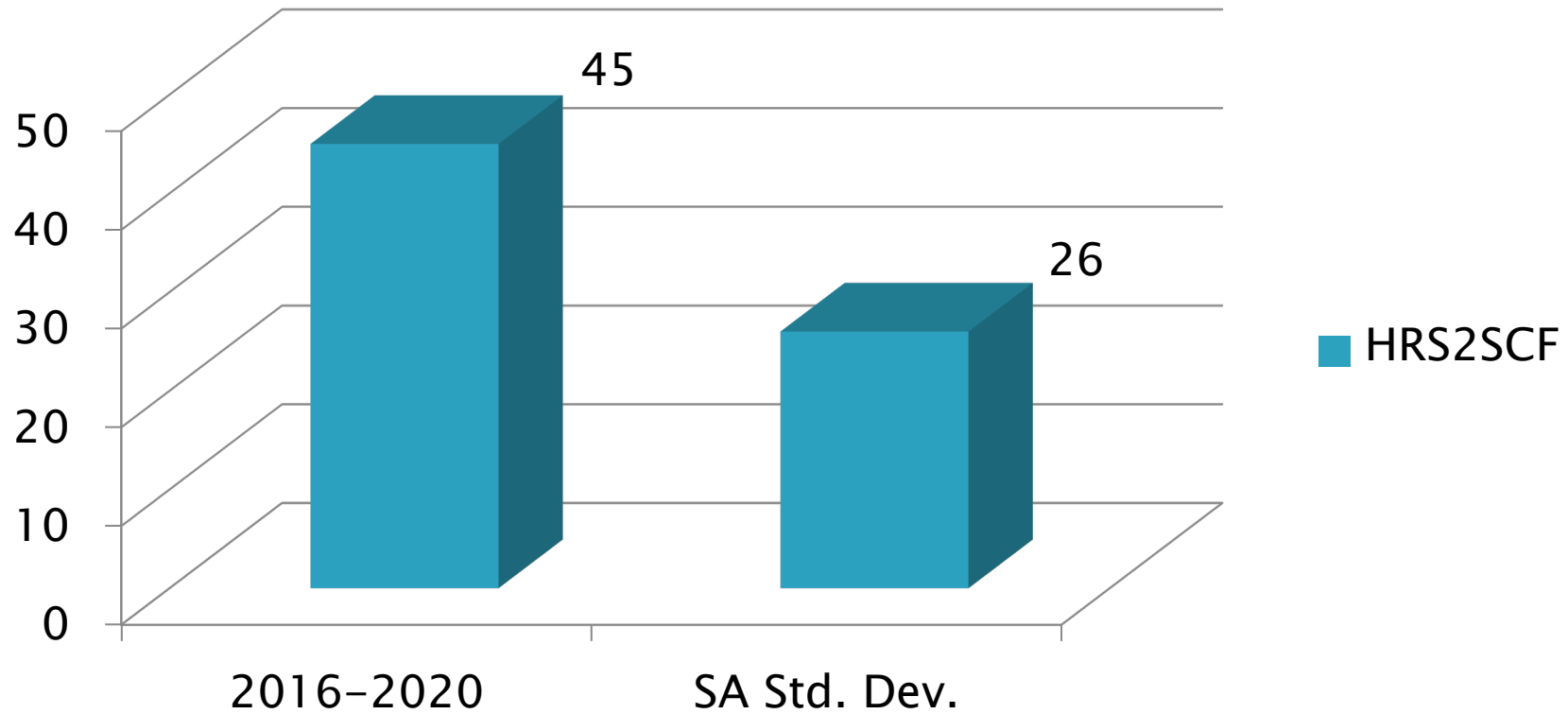
- ▶ HRS2 is in control.

FNL. ORIG. UNIT HOURS TO SCUFF



DD13 Precision Estimates

HRS2SCF



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Test Monitoring Center
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Cummins ISB

➤➤ April 2022

Test Monitoring Center
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A Program of ASTM International

ISB Test Activity

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

ISB Failed Tests

Failed Parameter	Number of Tests
No failed test	0
Total	0

ISB Lost Tests*

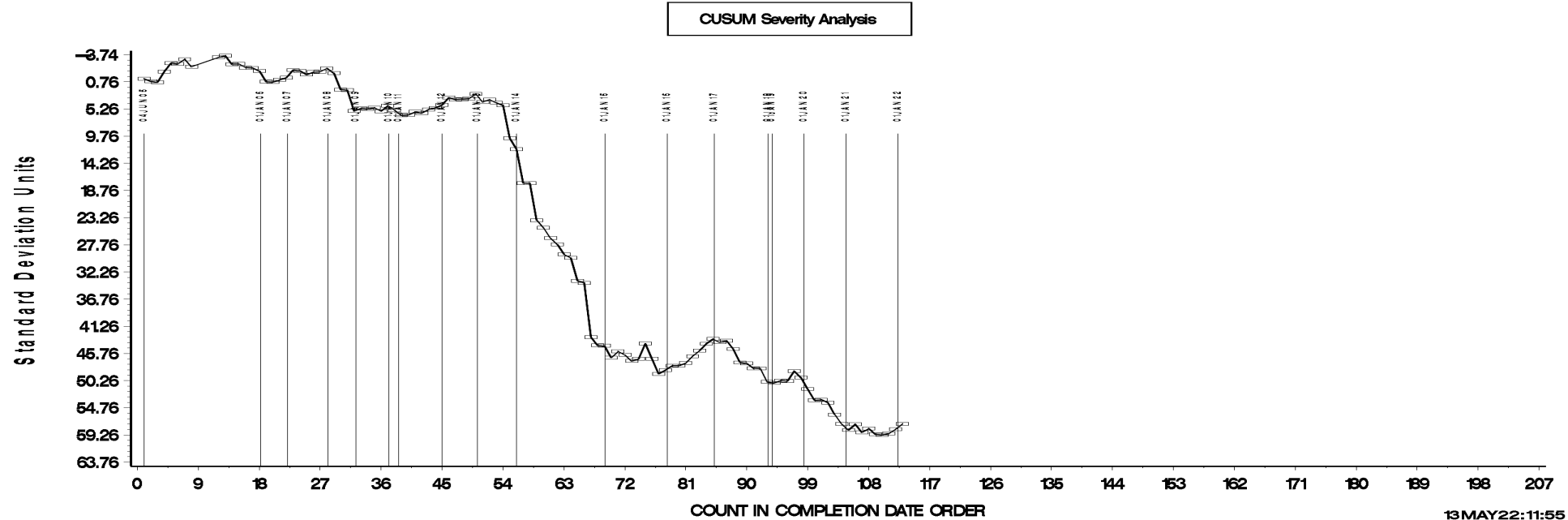
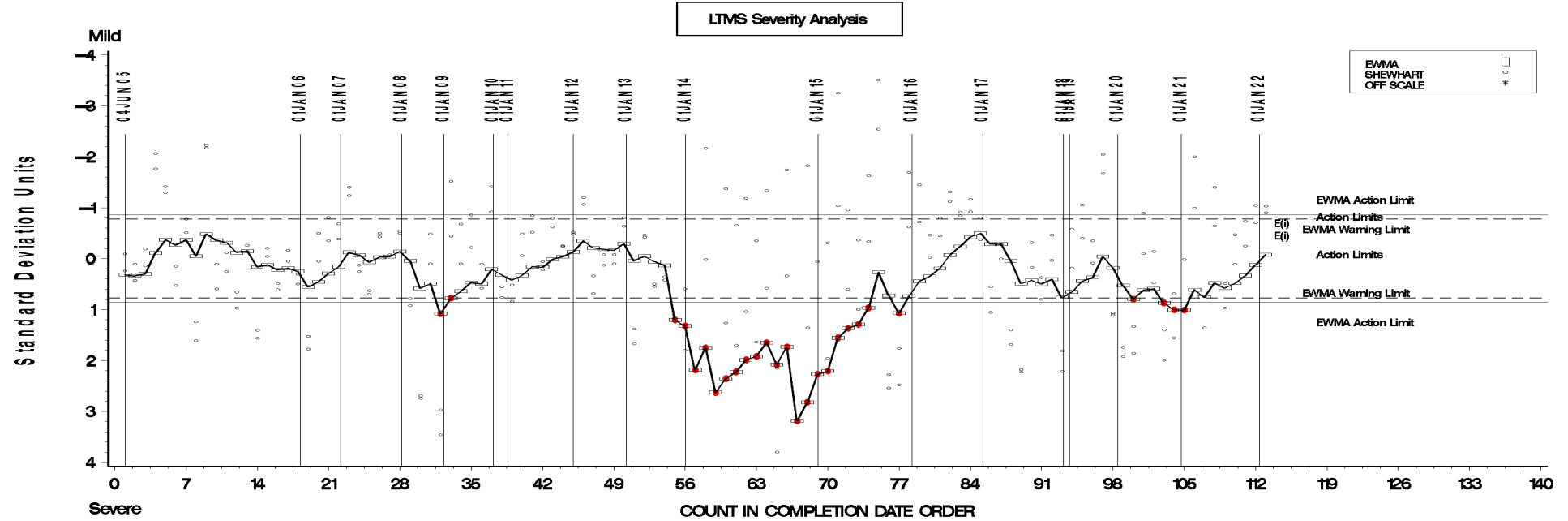
Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
Total		0

*Invalid and aborted tests

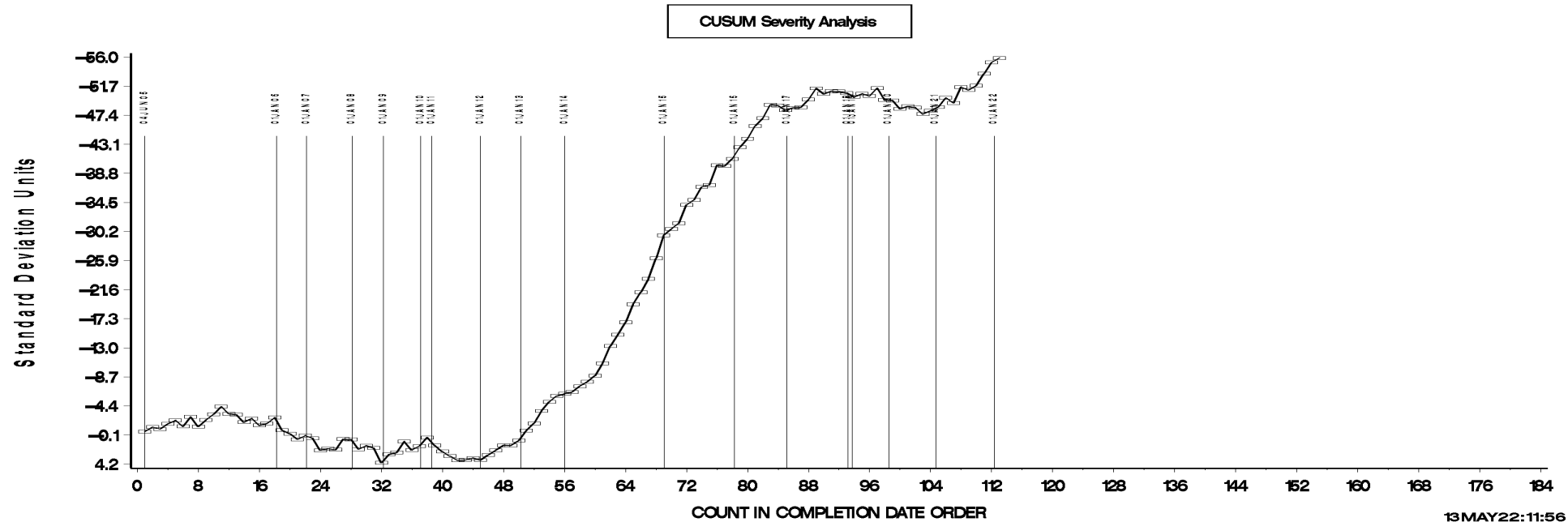
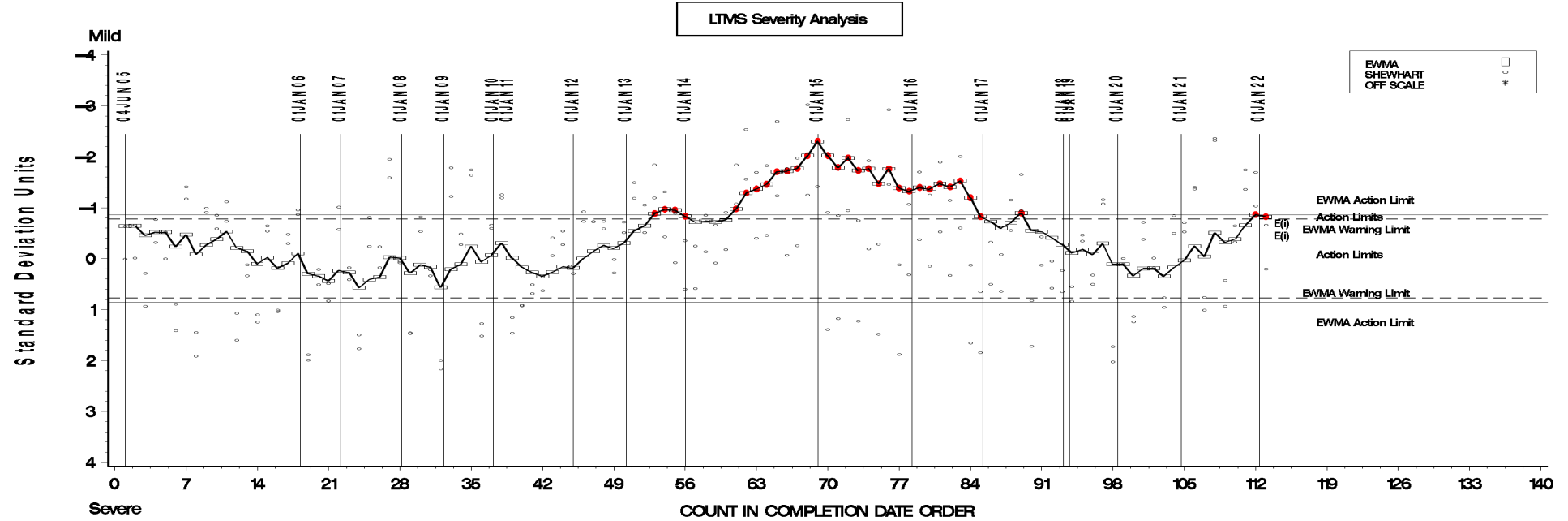
ISB Test Severity

- ▶ ATWL in level 2 Zi alarm
- ▶ ACSW is in control.

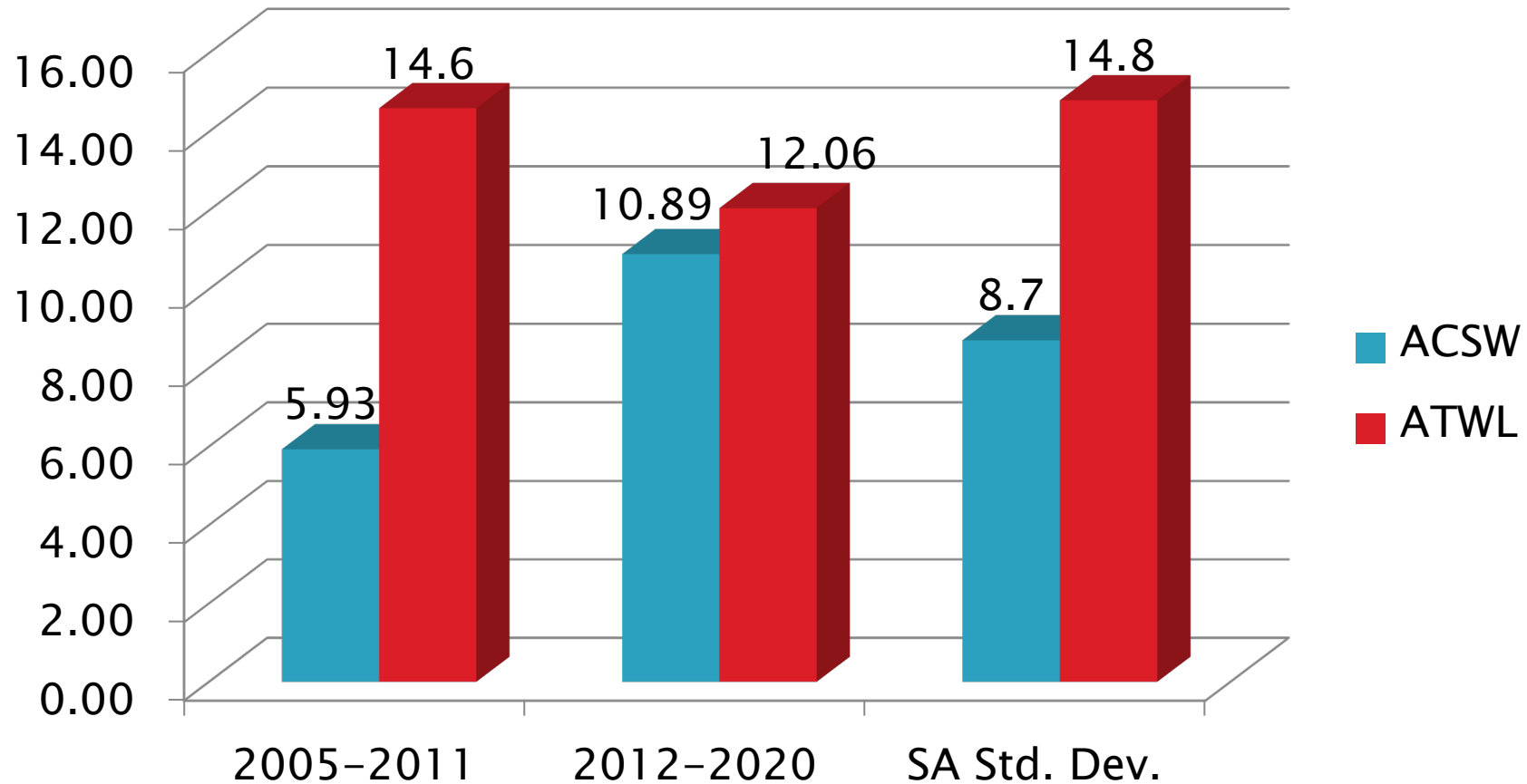
AVERAGE CAMSHAFT WEAR



AVERAGE TAPPET WEIGHT LOSS



ISB Precision Estimates



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Test Monitoring Center
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Cummins ISM

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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
Total		3

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

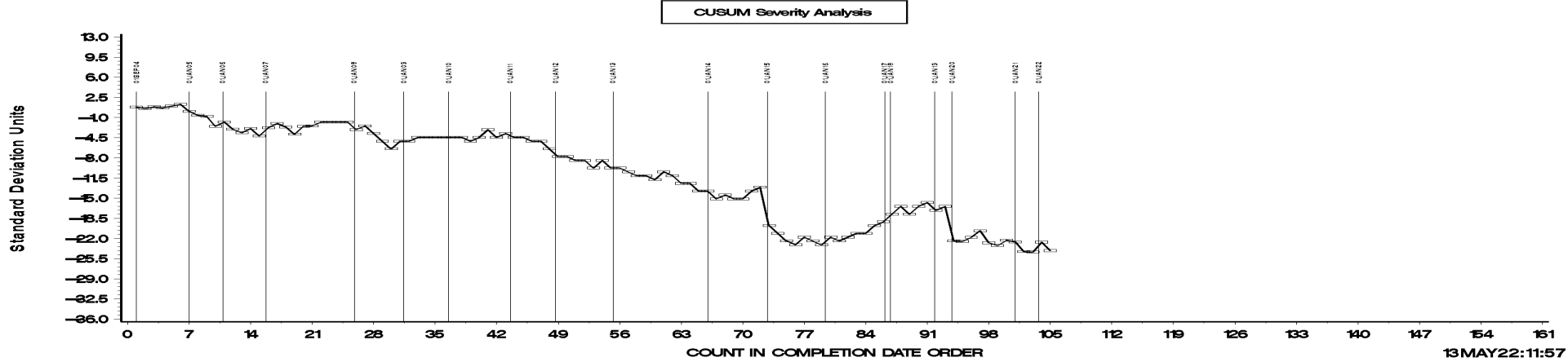
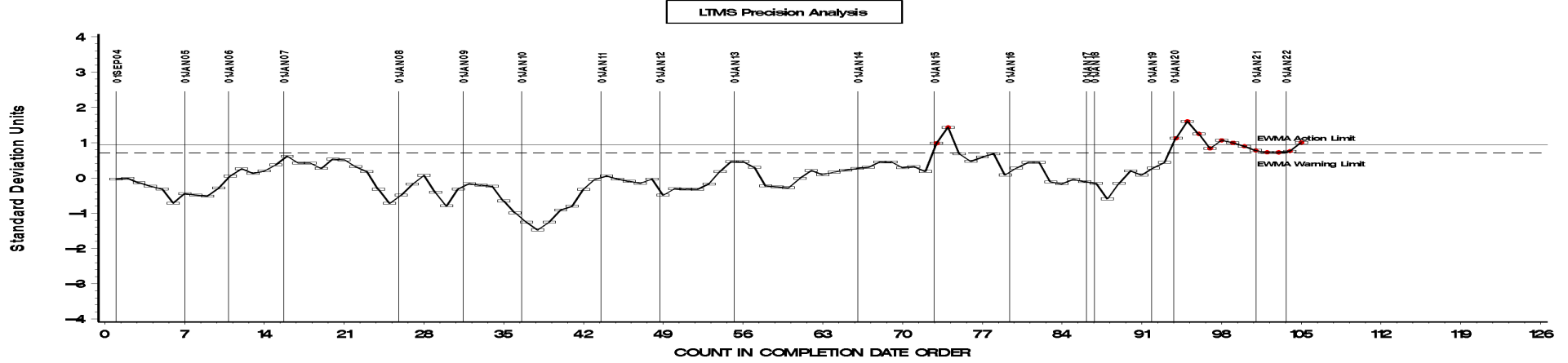
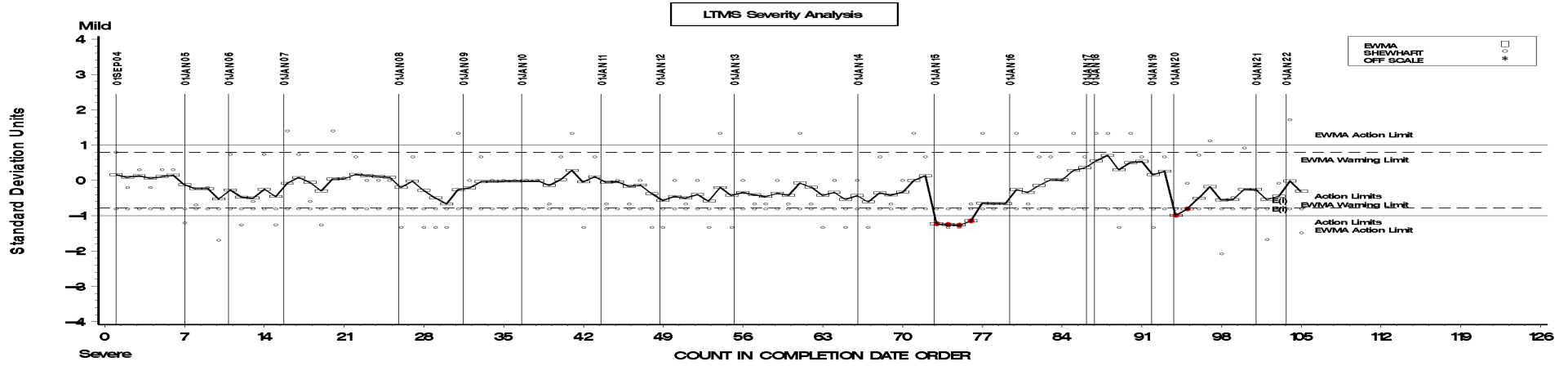
ISM Test Severity

- ▶ CWL and FPD are in control.
- ▶ ASR and IAS are in a precision warning alarm.
- ▶ IAS is in a severity action alarm in the severe direction.

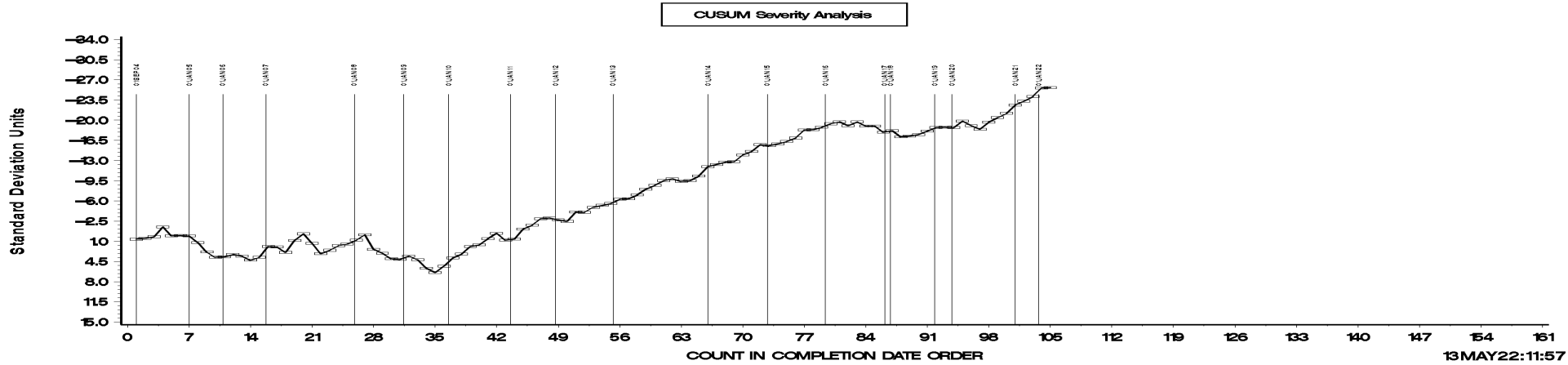
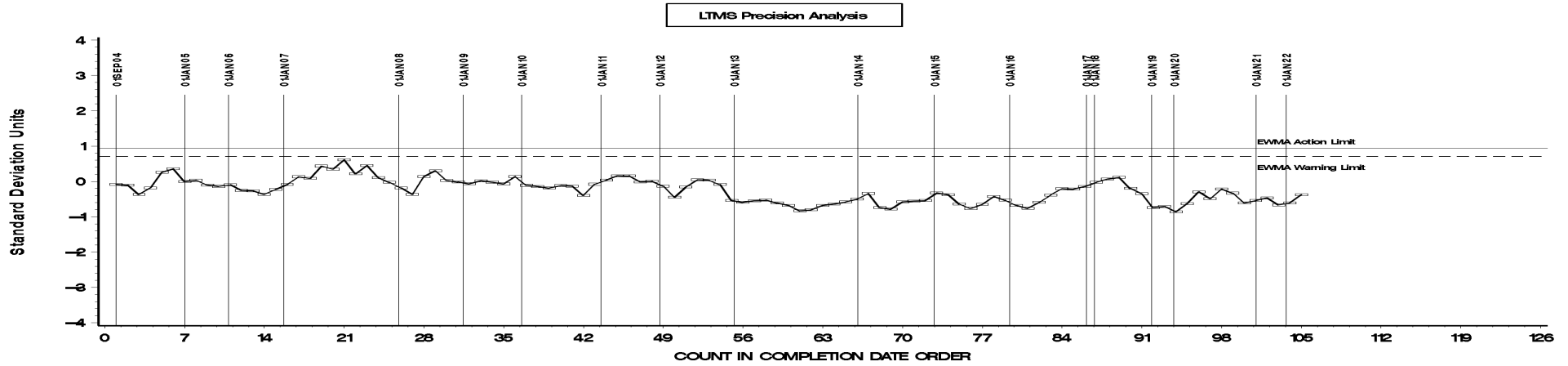
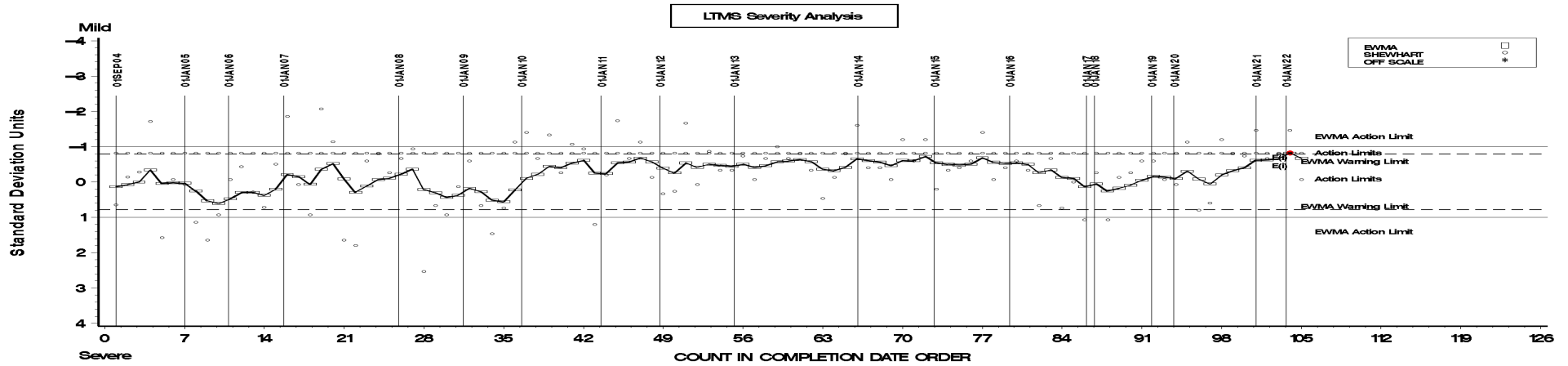
ISM INDUSTRY OPERATIONAL VALID DATA



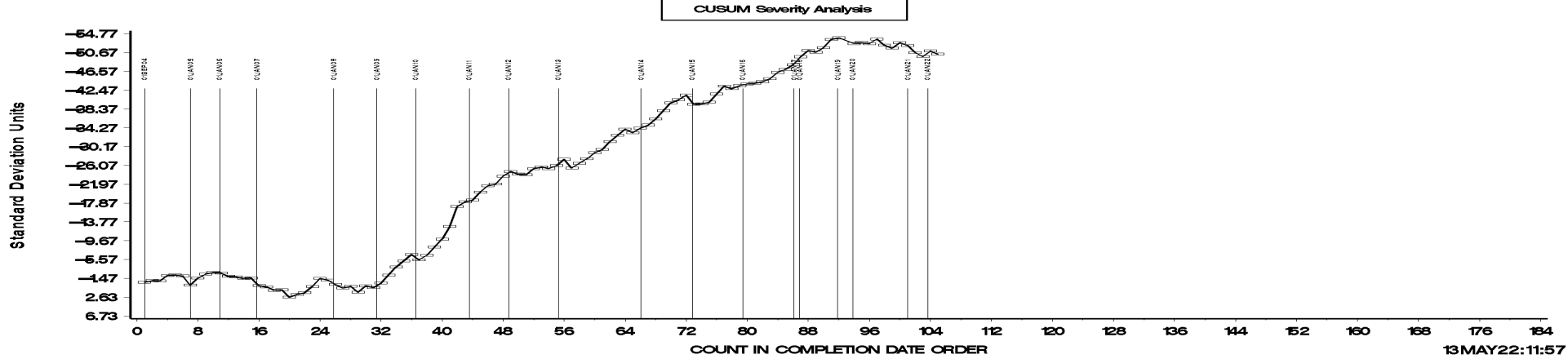
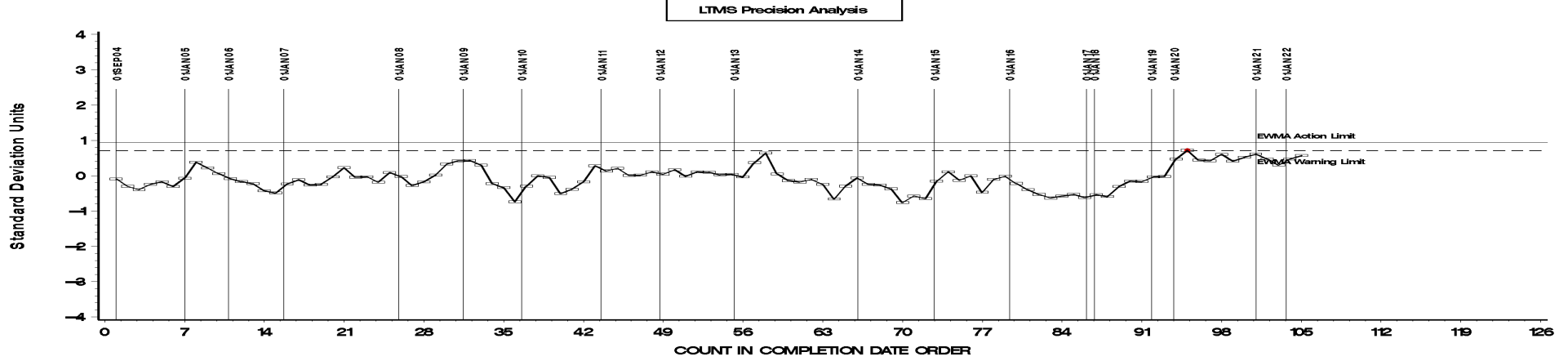
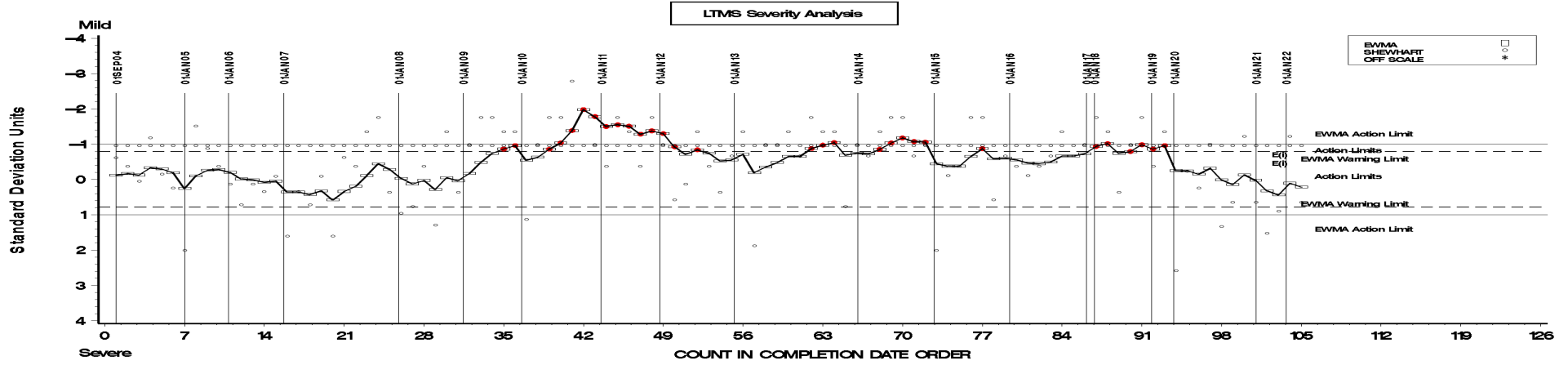
AVERAGE SLUDGE RATING



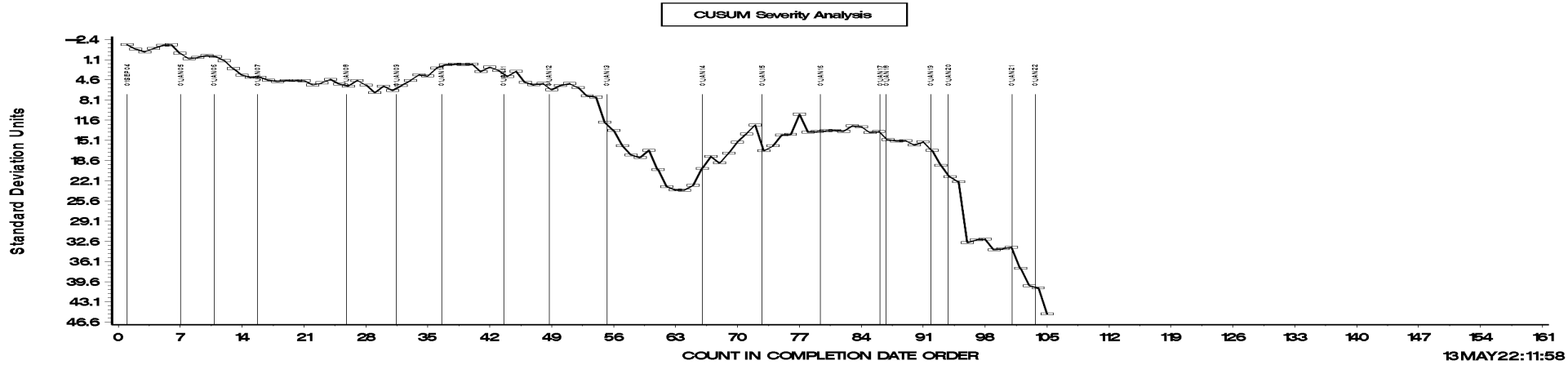
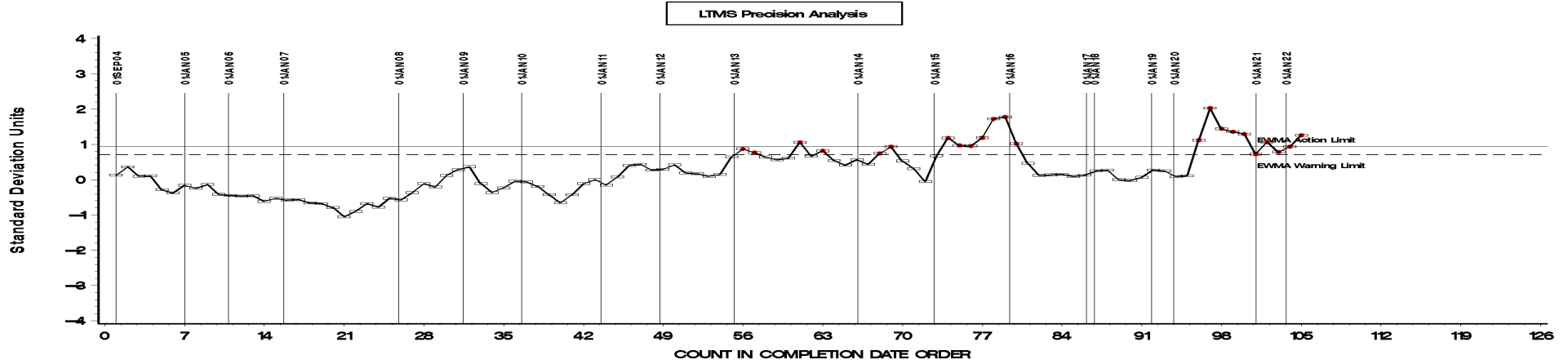
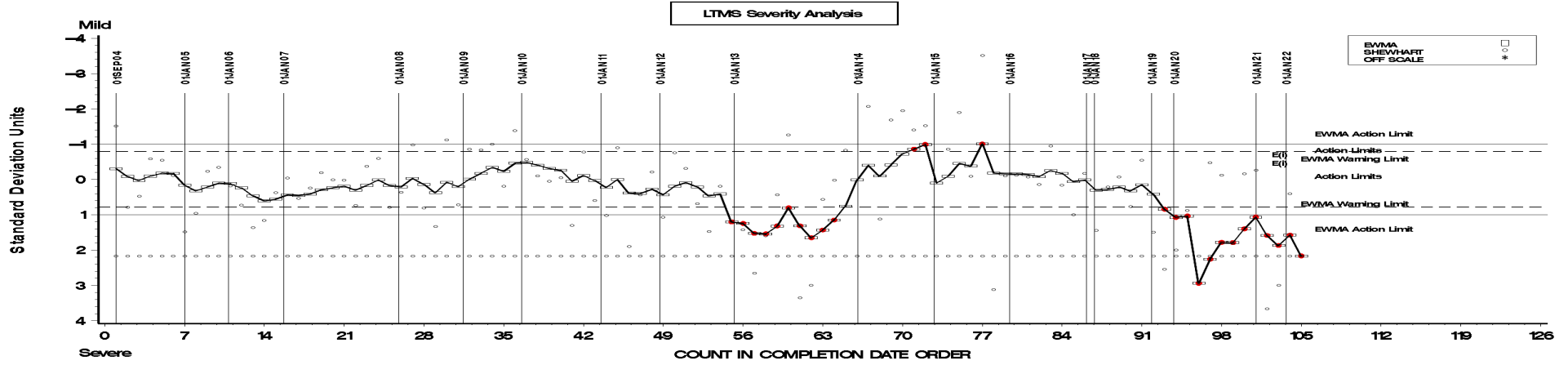
ISM INDUSTRY OPERATIONALY VALID DATA
CROSSHEAD WEIGHT LOSS ADJUSTED TO 3.9 % SOOT



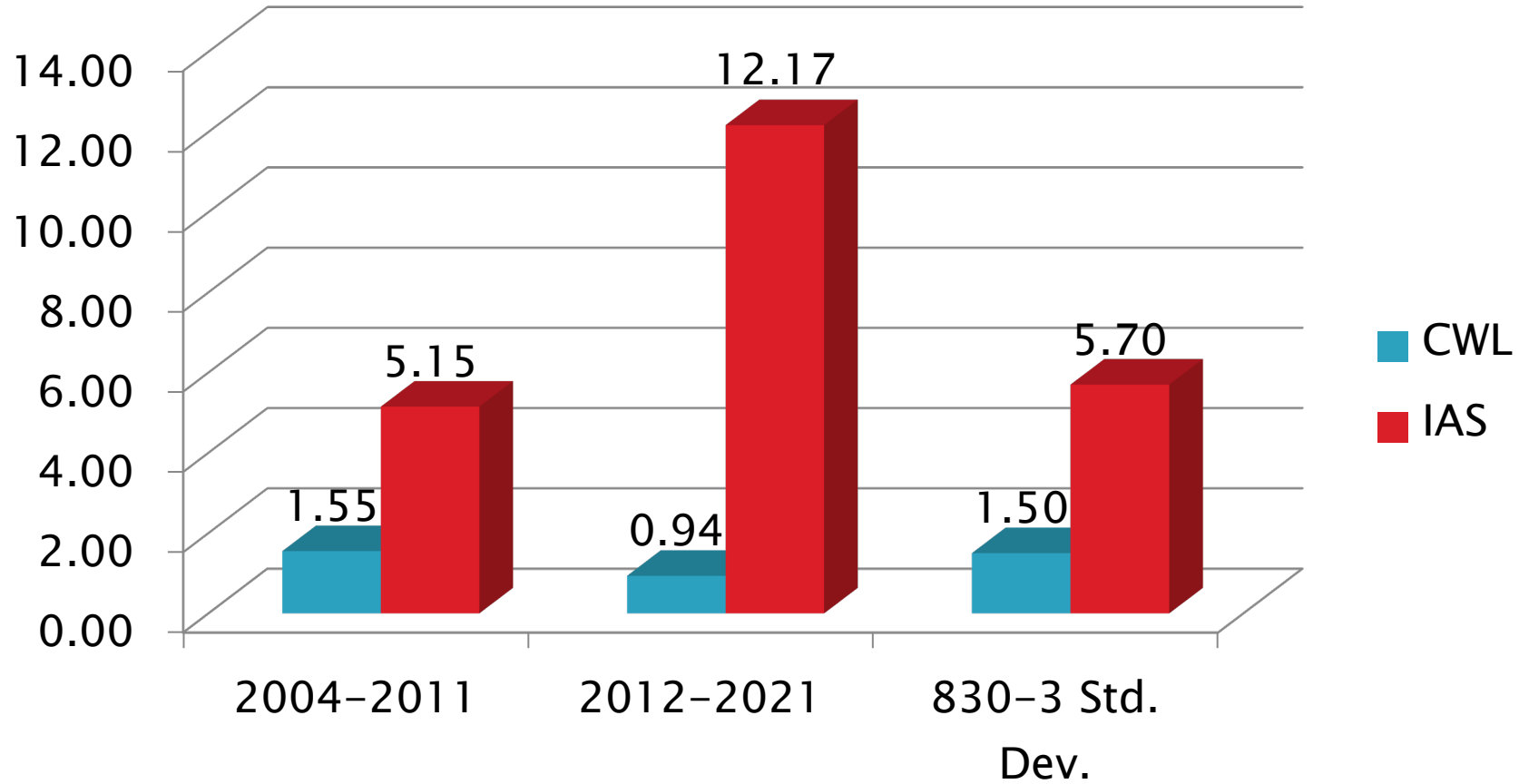
OIL FILTER DELTA PRESSURE



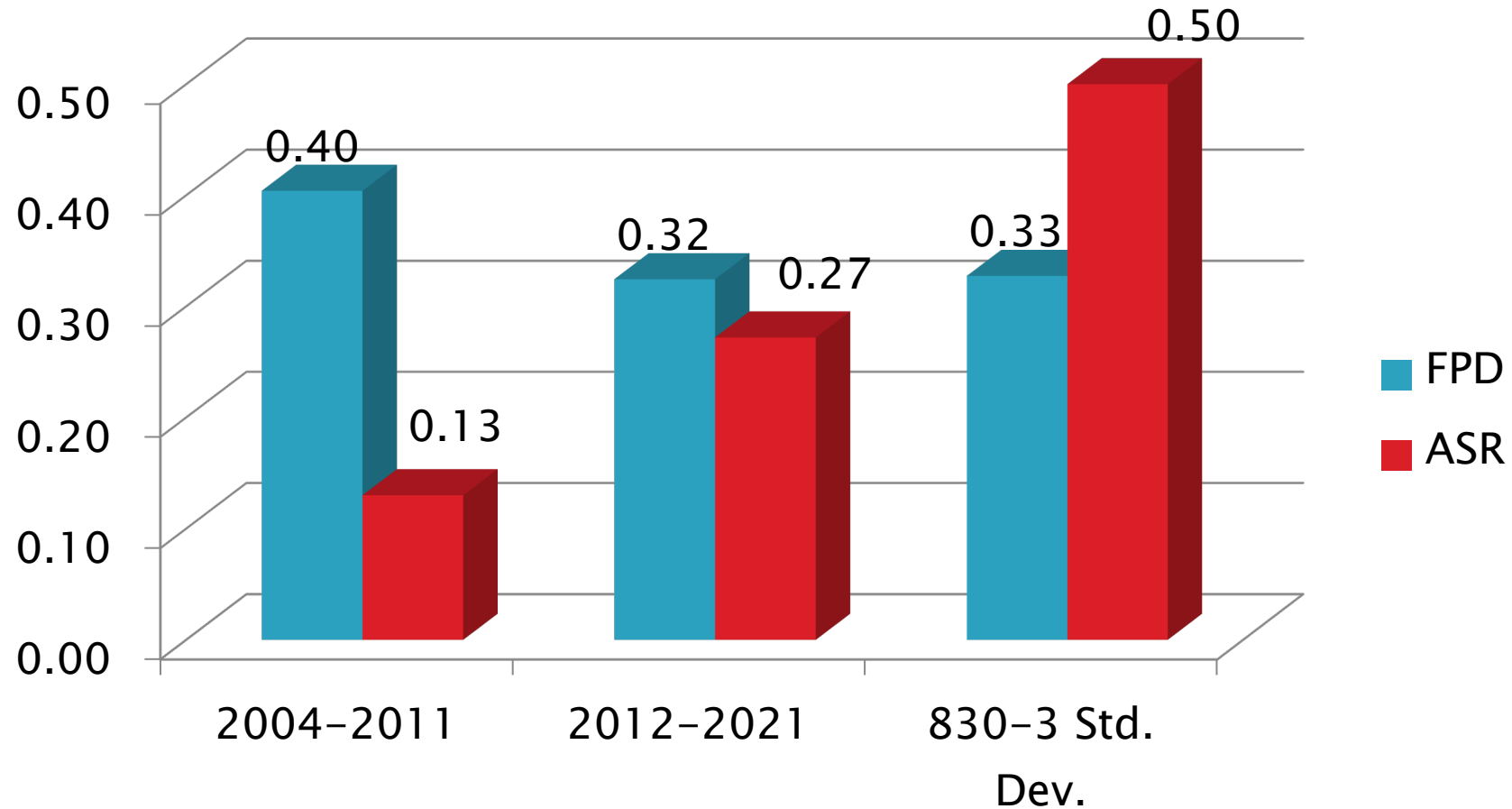
ISM INDUSTRY OPERATIONAL VALID DATA
 INJECTOR SCREW WEIGHT LOSS ADJUSTED TO 3.9% SOOT



ISM Precision Estimates



ISM Precision Estimates



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Test Monitoring Center
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EOAT

»» April 2022

EOAT 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

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

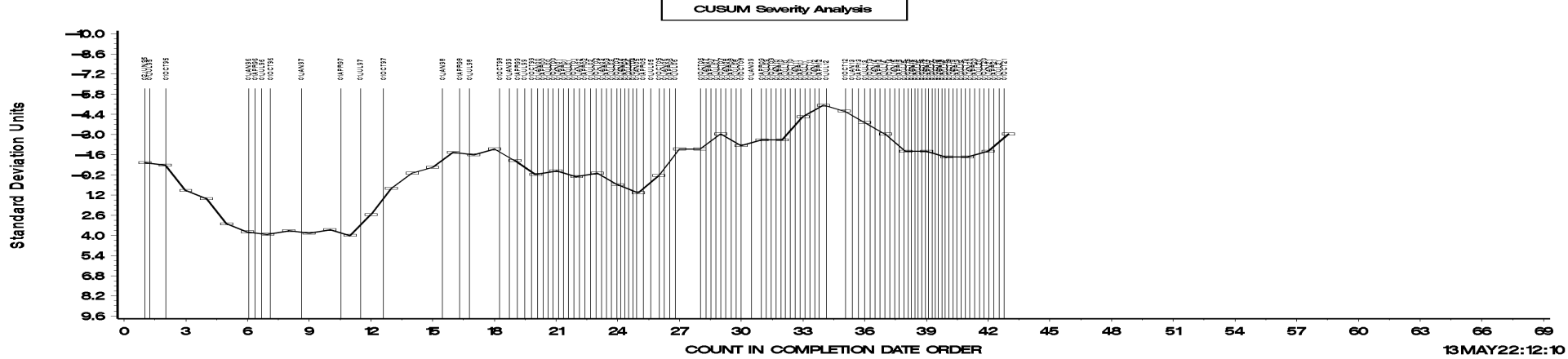
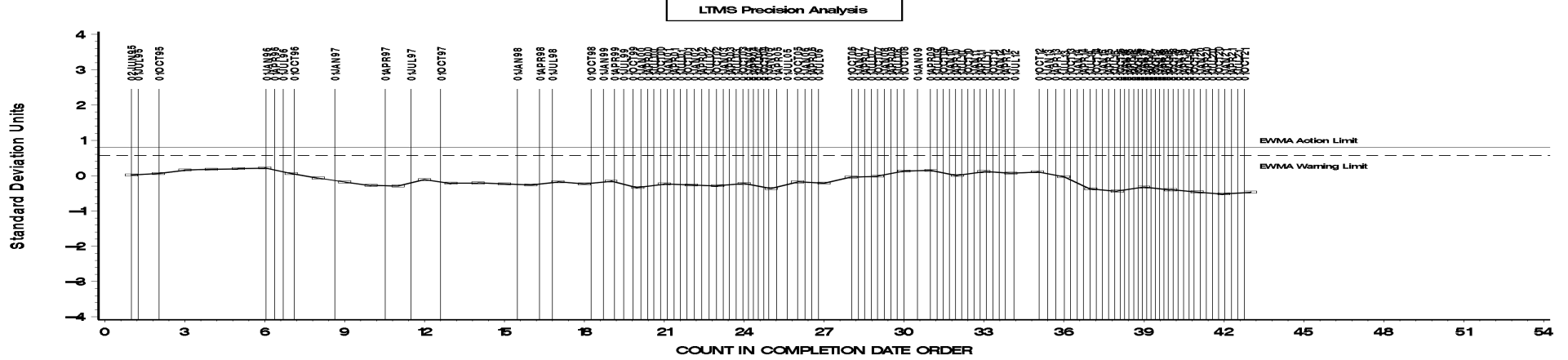
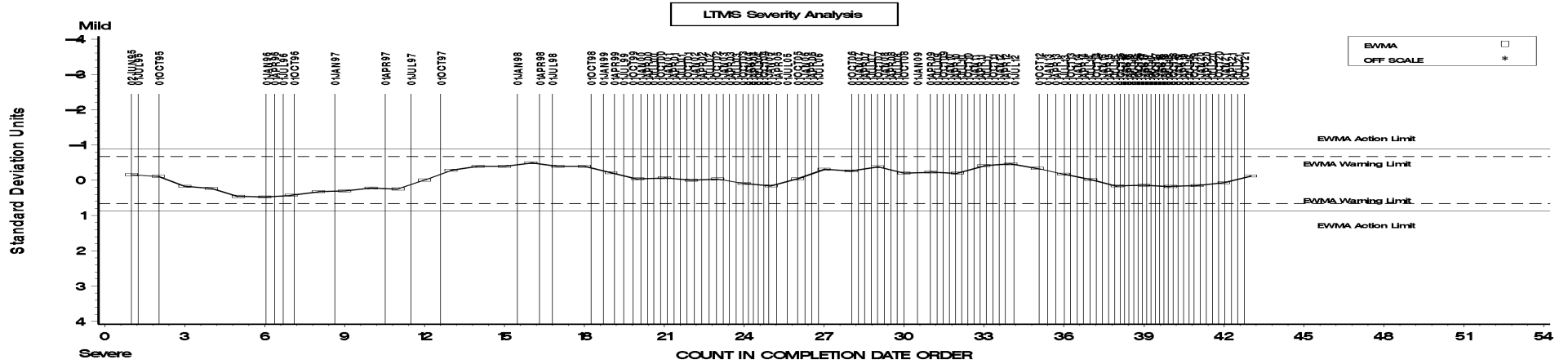
EOAT Test Severity

- ▶ AEOA is in control.

EOAT INDUSTRY OPERATIONAL VALID DATA

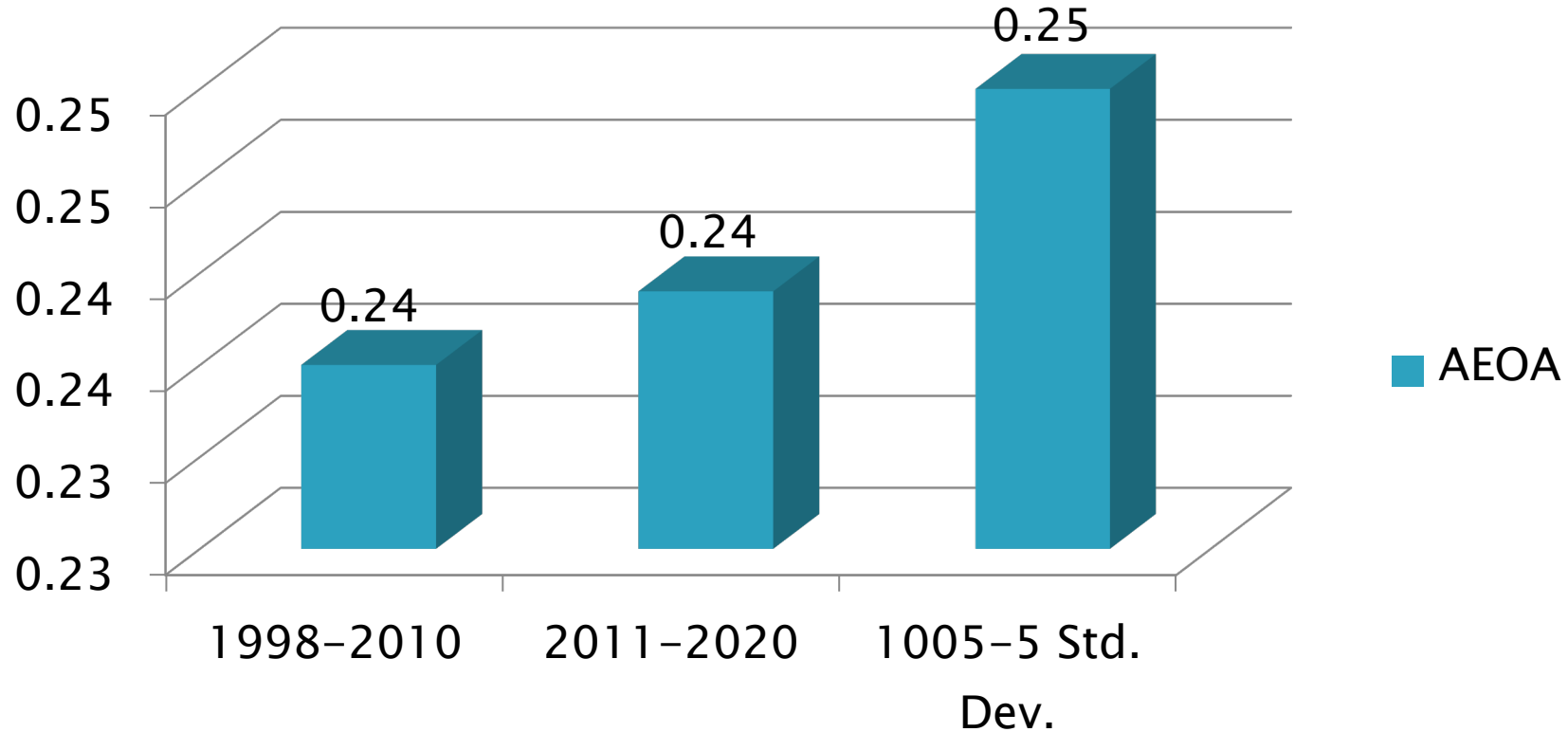


ENGINE OIL AERATION



EOAT Precision Estimates

AEOA



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Test Monitoring Center
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RFWT

➤➤ April 2022

Test Monitoring Center
<https://www.astmtmc.org>



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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

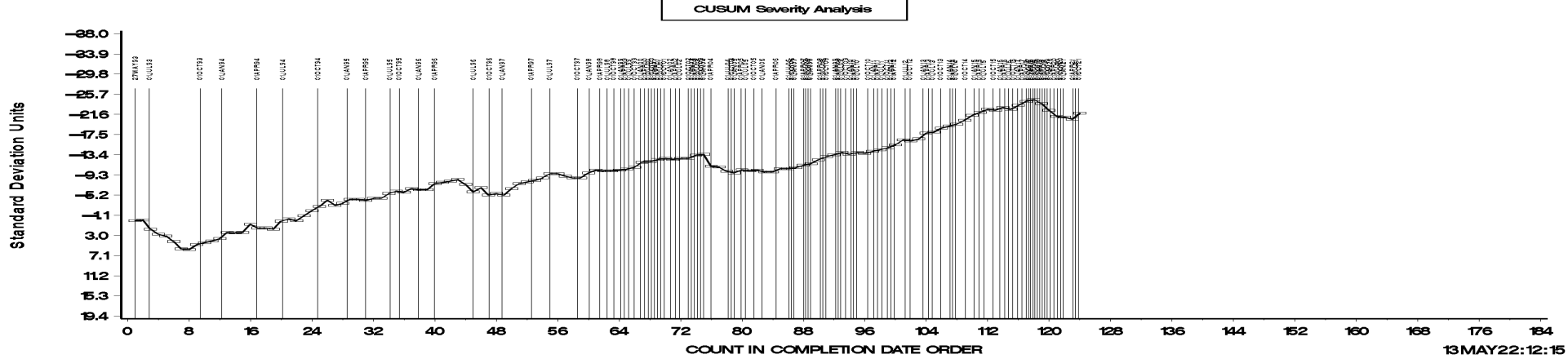
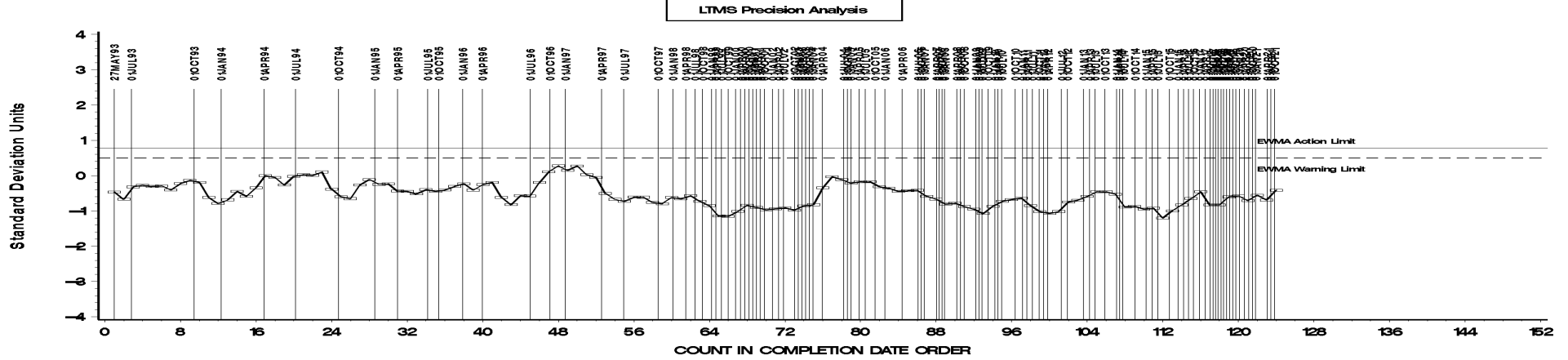
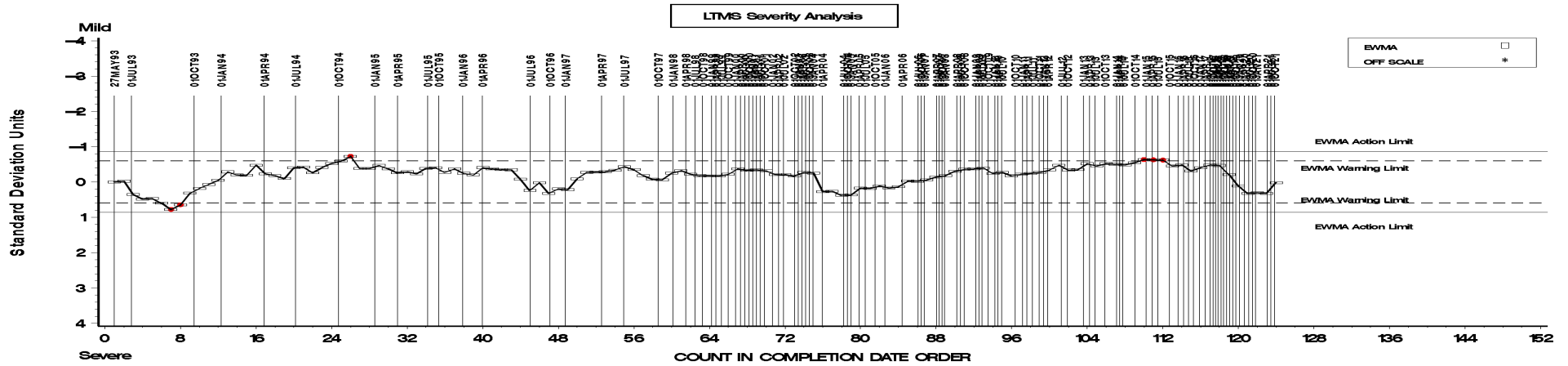
RFWT Test Severity

- ▶ AFW is in control.

RFW INDUSTRY OPERATIONAL VALID DATA

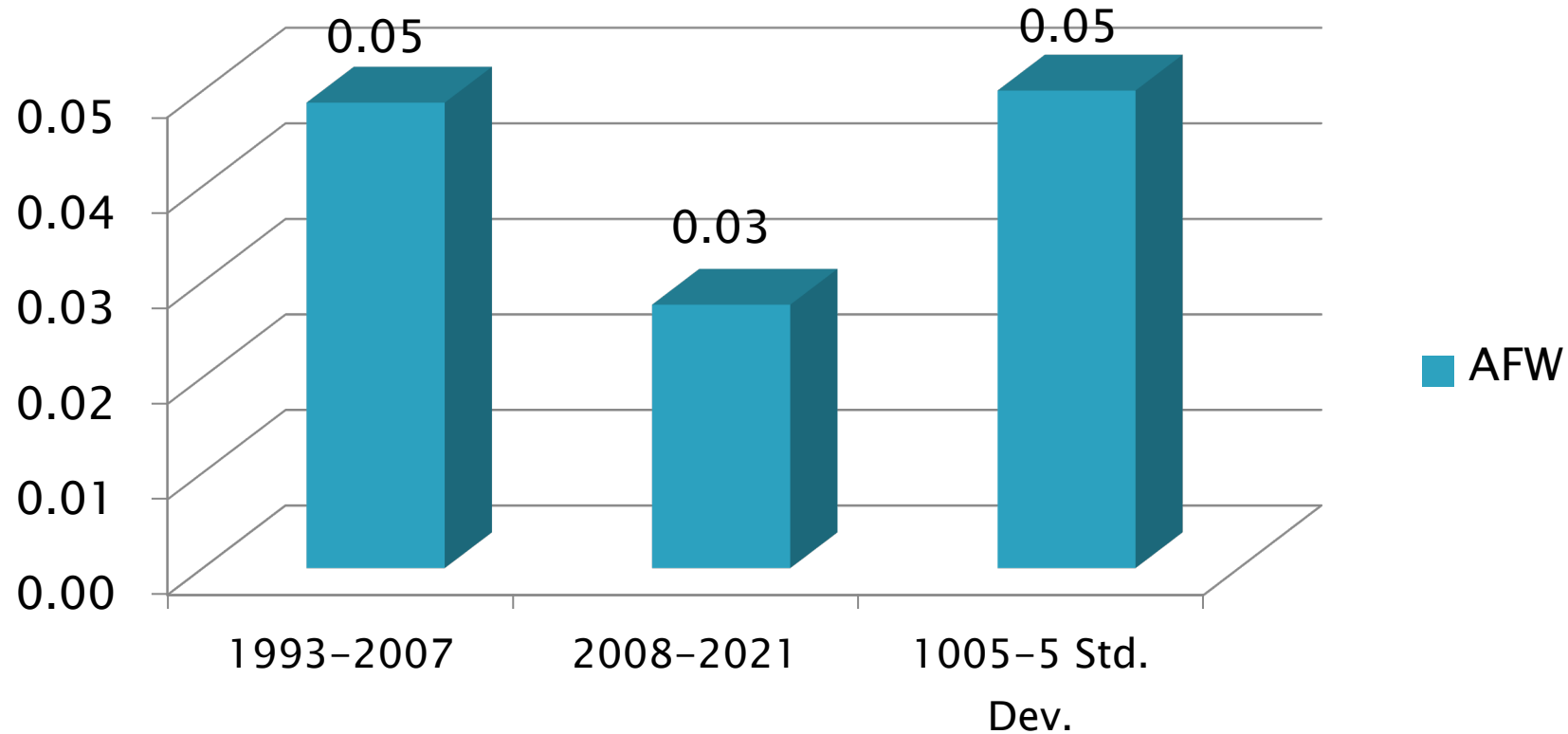


Average Follower Wear



RFWT Precision Estimates

AFW



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Test Monitoring Center
<https://www.astmtmc.org>



Mack T-8/T-8E

➤➤ April 2022

Test Monitoring Center
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T-8/T-8E Test Activity

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

T-8/T8-E Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
Total	0

T-8/T8-E Lost Tests*

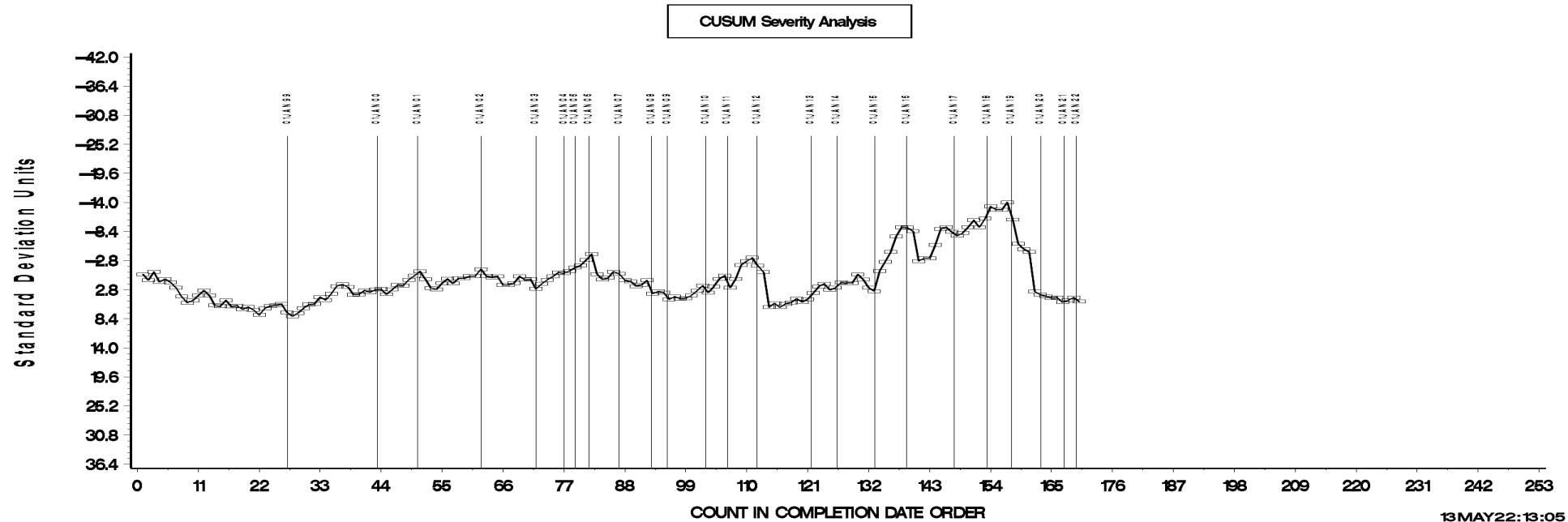
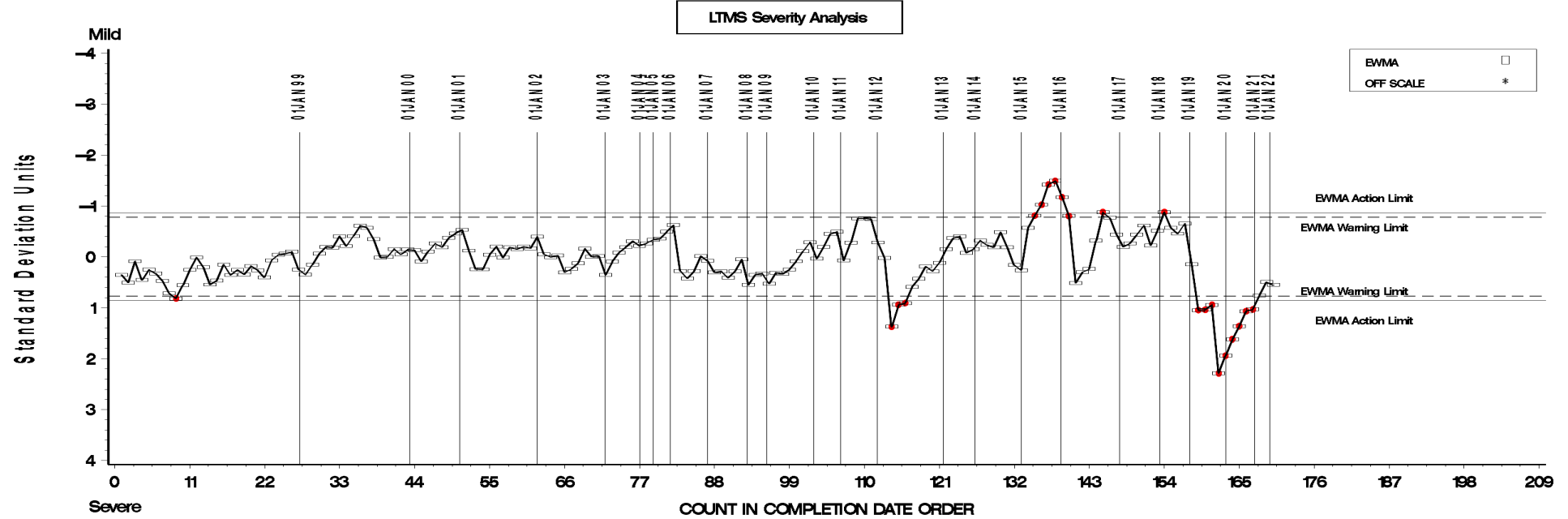
Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
Total		0

*Invalid and aborted tests

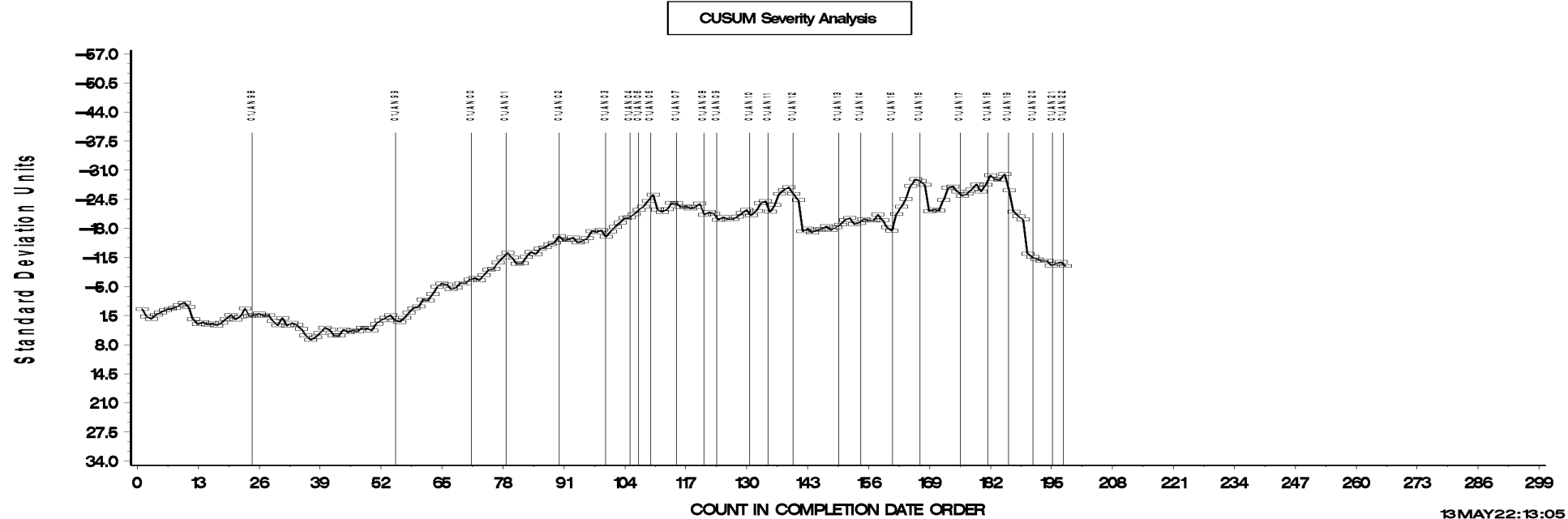
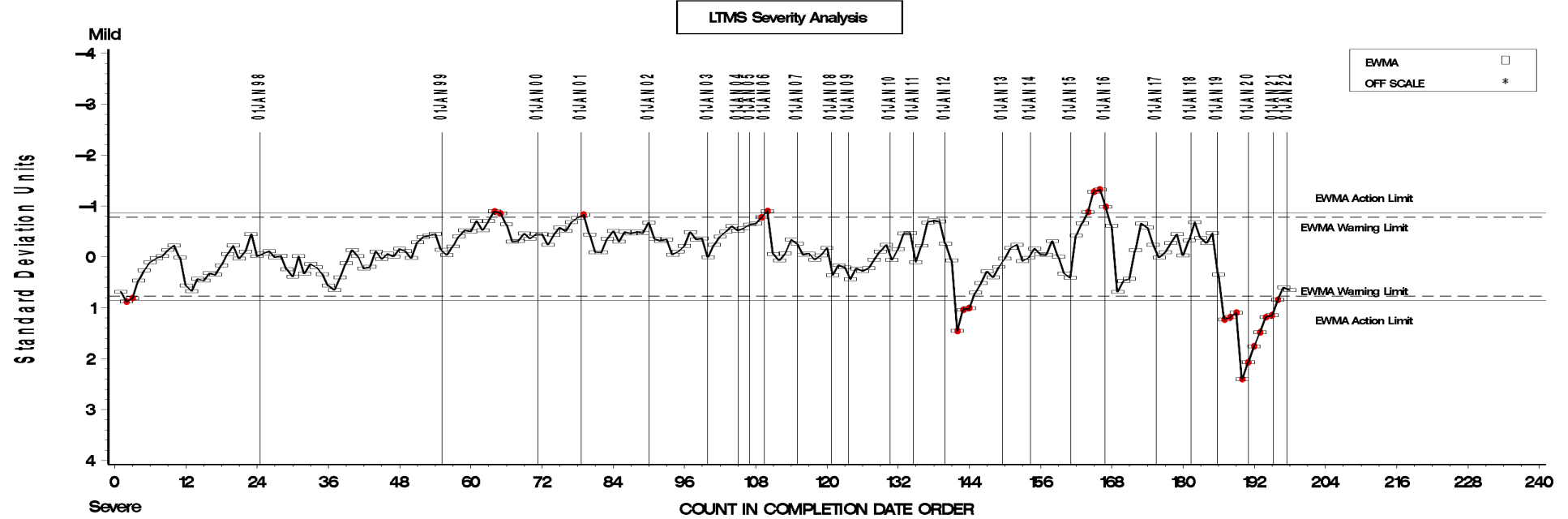
T-8/T-8E Test Severity

- ▶ VI38 is level 2 Zi alarm in mild direction
- ▶ RV48 and RV2 are in control.

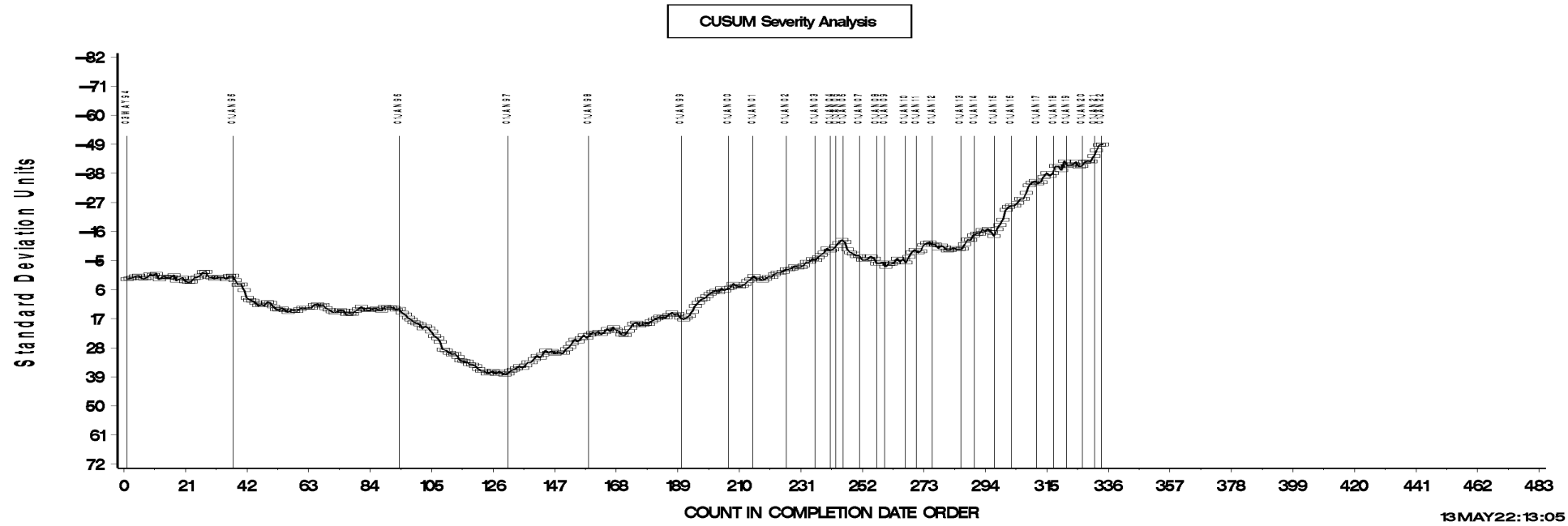
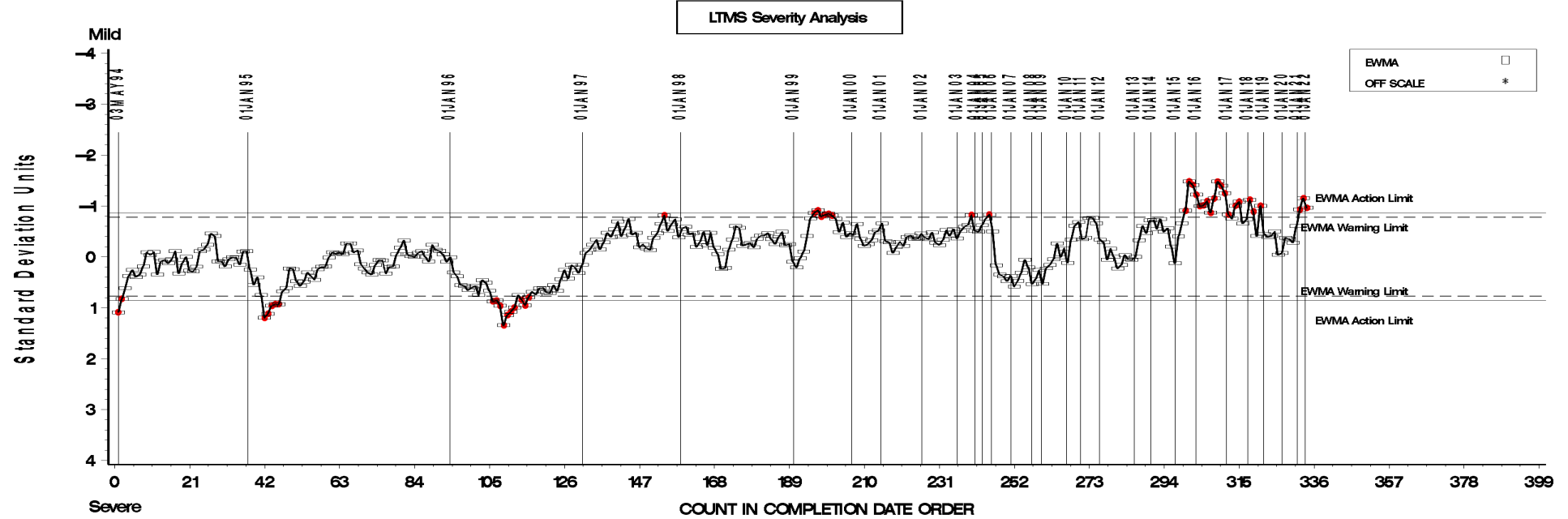
RELATIVE VISCOSITY @ 4.8% (100% LOSS)



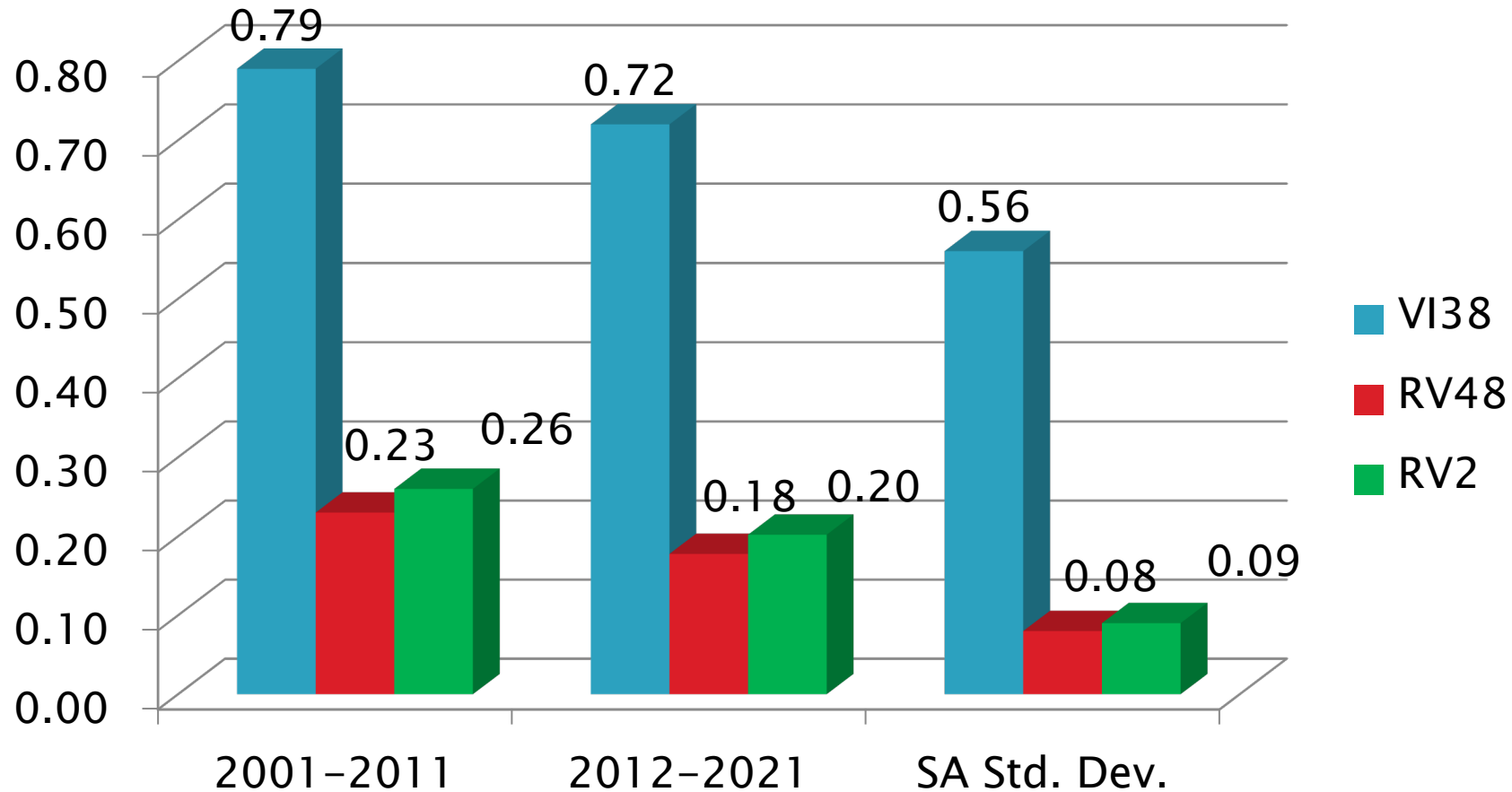
RELATIVE VISCOSITY @ 4.8% (50% LOSS)



VISCOSITY INCR @ 3.8% SOOT



T-8/E Precision Estimates



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Test Monitoring Center
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Mack T-11

➤➤ April 2022

Test Monitoring Center
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T-11 Test Activity

Test Status	Validity Code	#
Acceptable Calibration Test	AC	5
Failed Calibration Test	OC	0
Operationally Invalid	LC	0
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	No invalid tests	0
Aborted	No aborted tests	0
Total		0

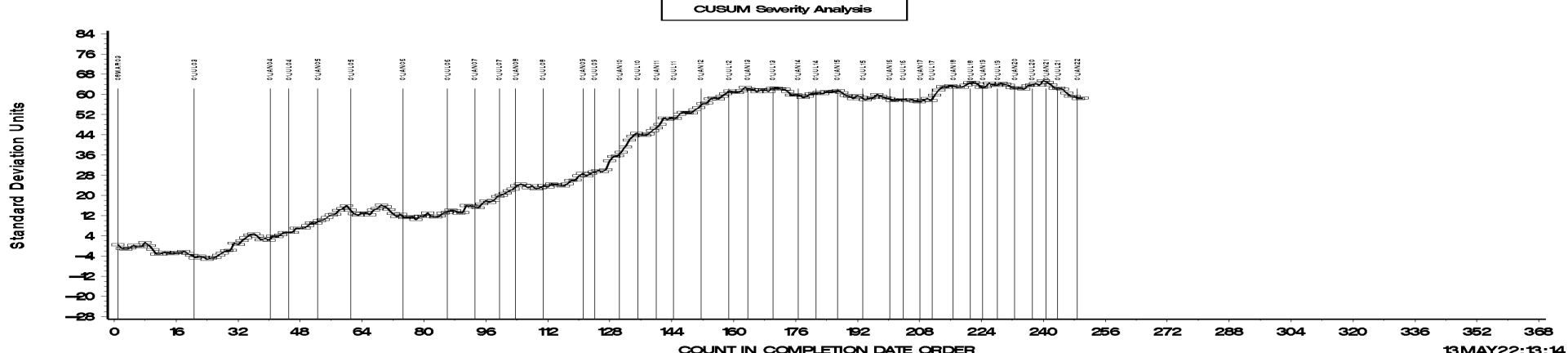
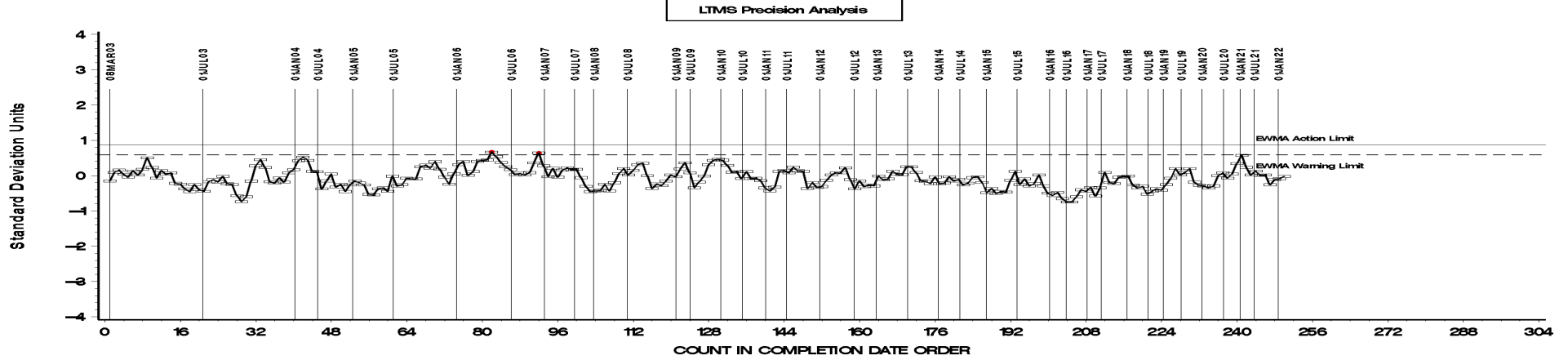
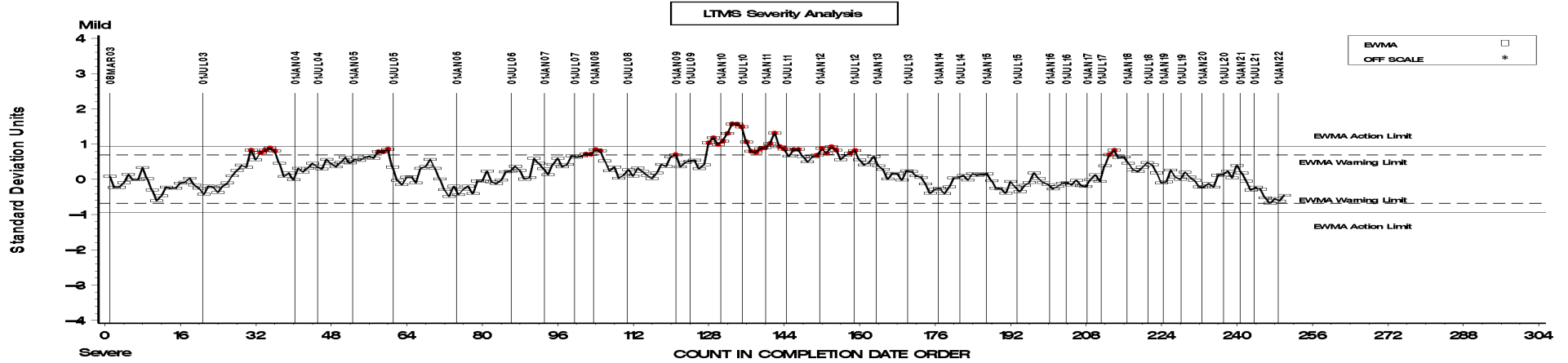
*Invalid and aborted tests

T-11 Test Severity

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

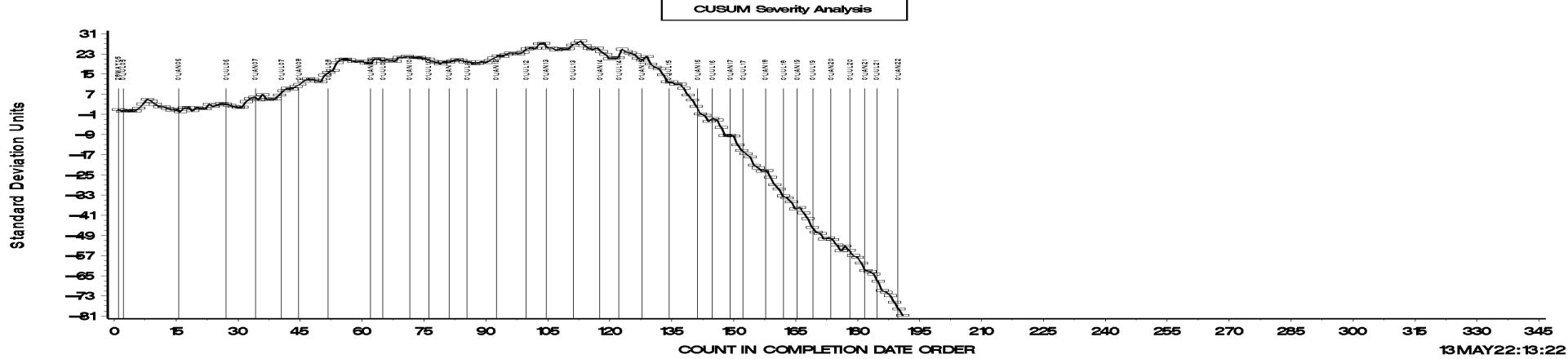
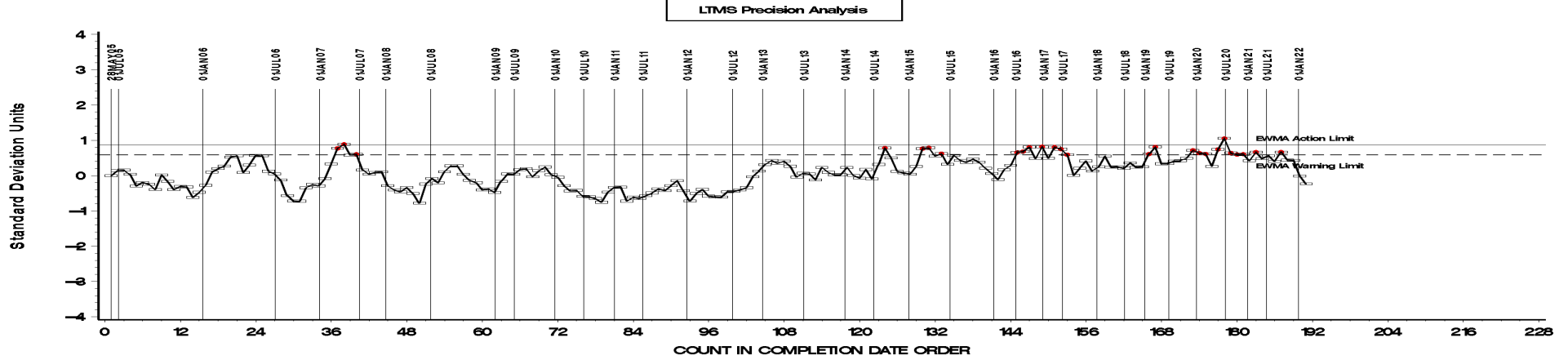
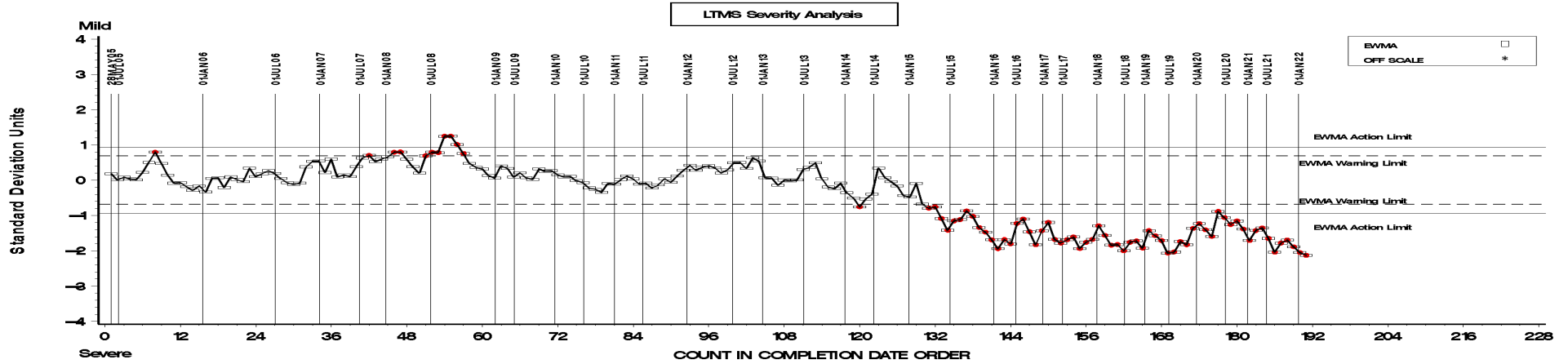
T-41 INDUSTRY OPERATIONAL VALID DATA

SOOT AT 12 cSt



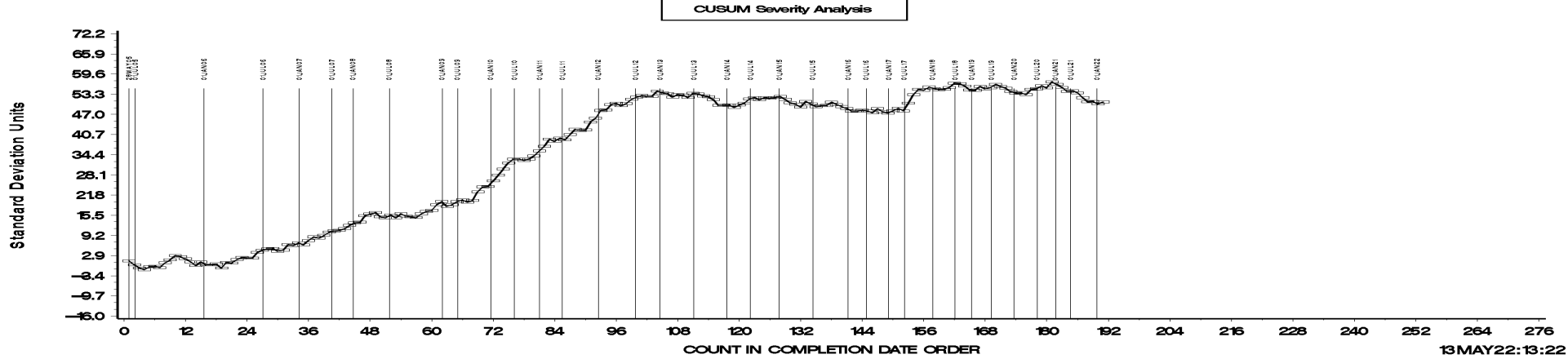
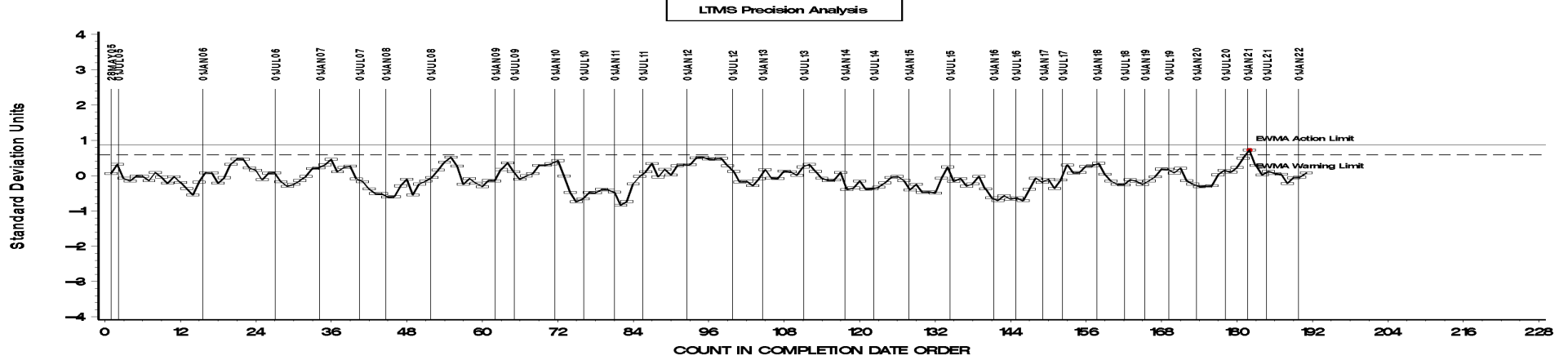
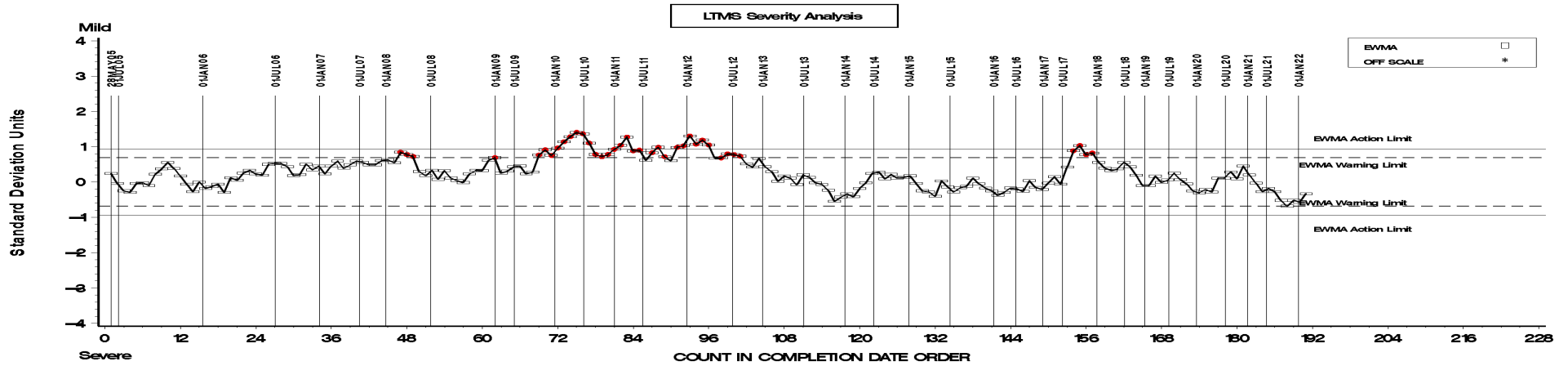
T-41 INDUSTRY OPERATIONAL VALID DATA

SOOT @ 4 cSt — FINAL RESULT



T-41 INDUSTRY OPERATIONAL VALID DATA

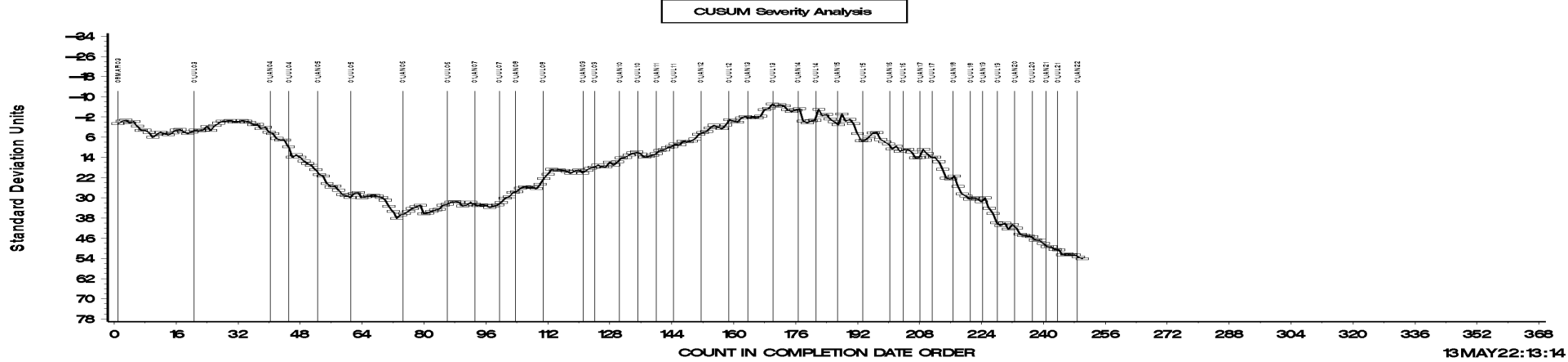
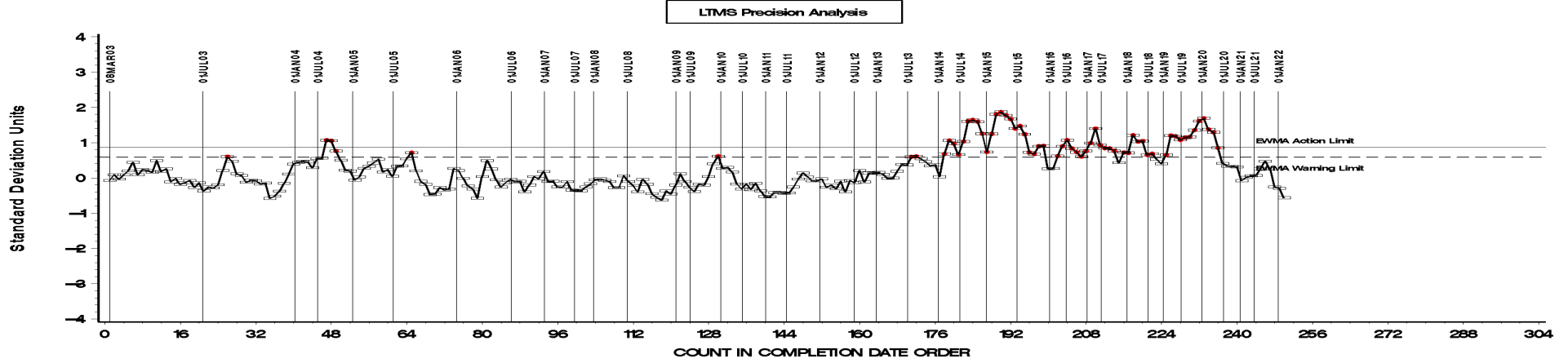
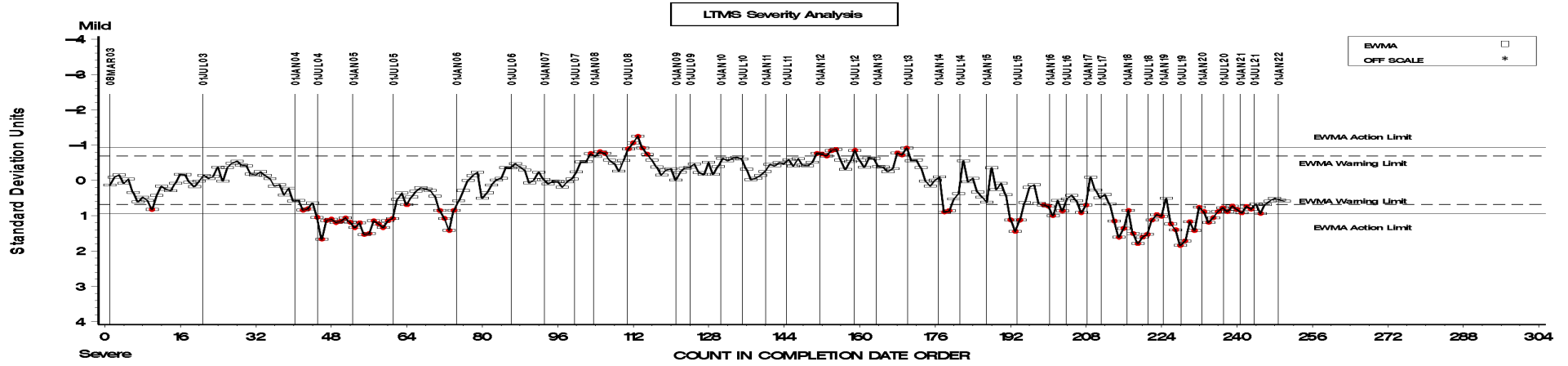
SOOT @ 15 cSt —FINAL RESULT



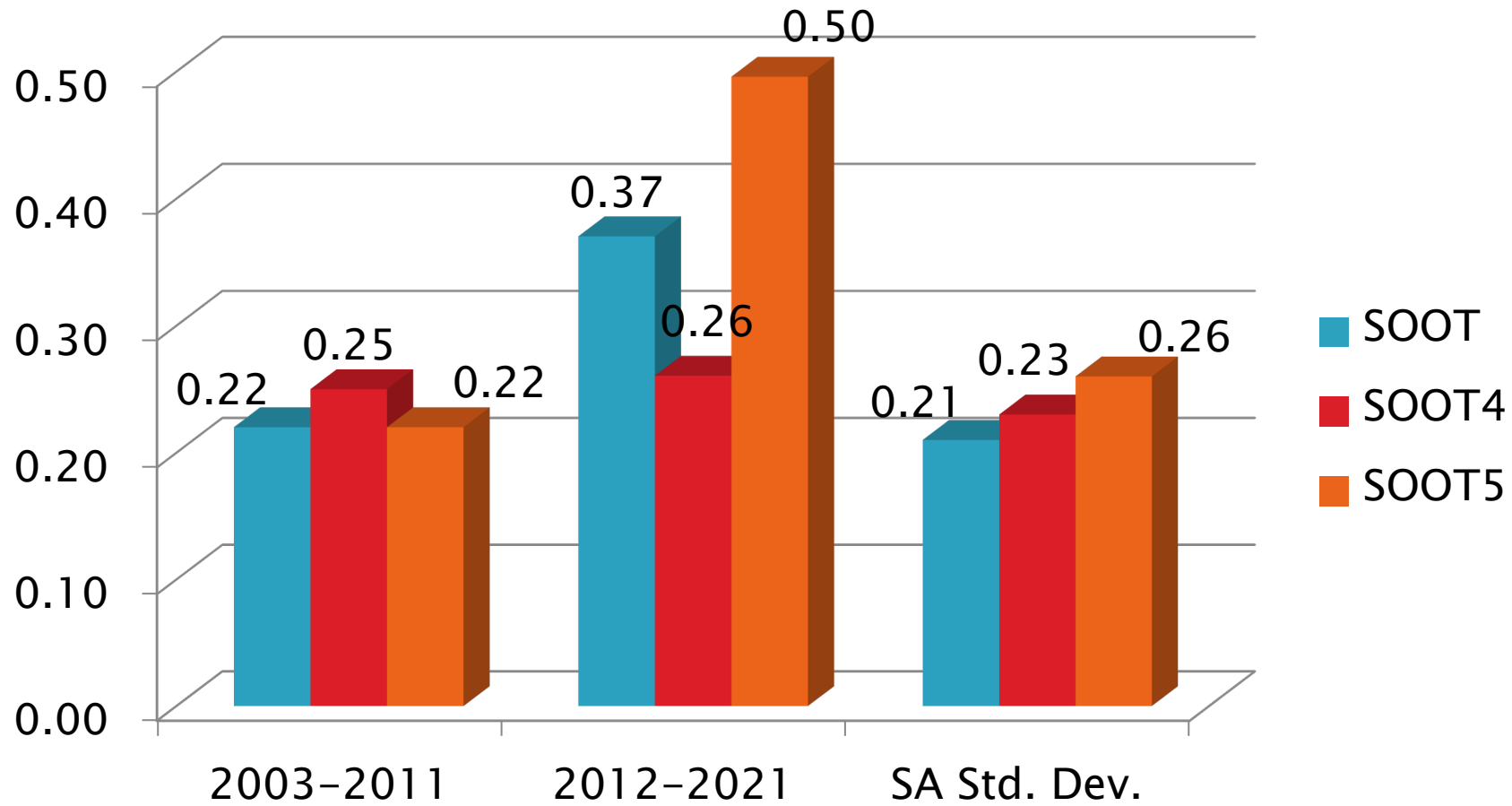
T-41 INDUSTRY OPERATIONAL VALID DATA



MRV VISCOSITY

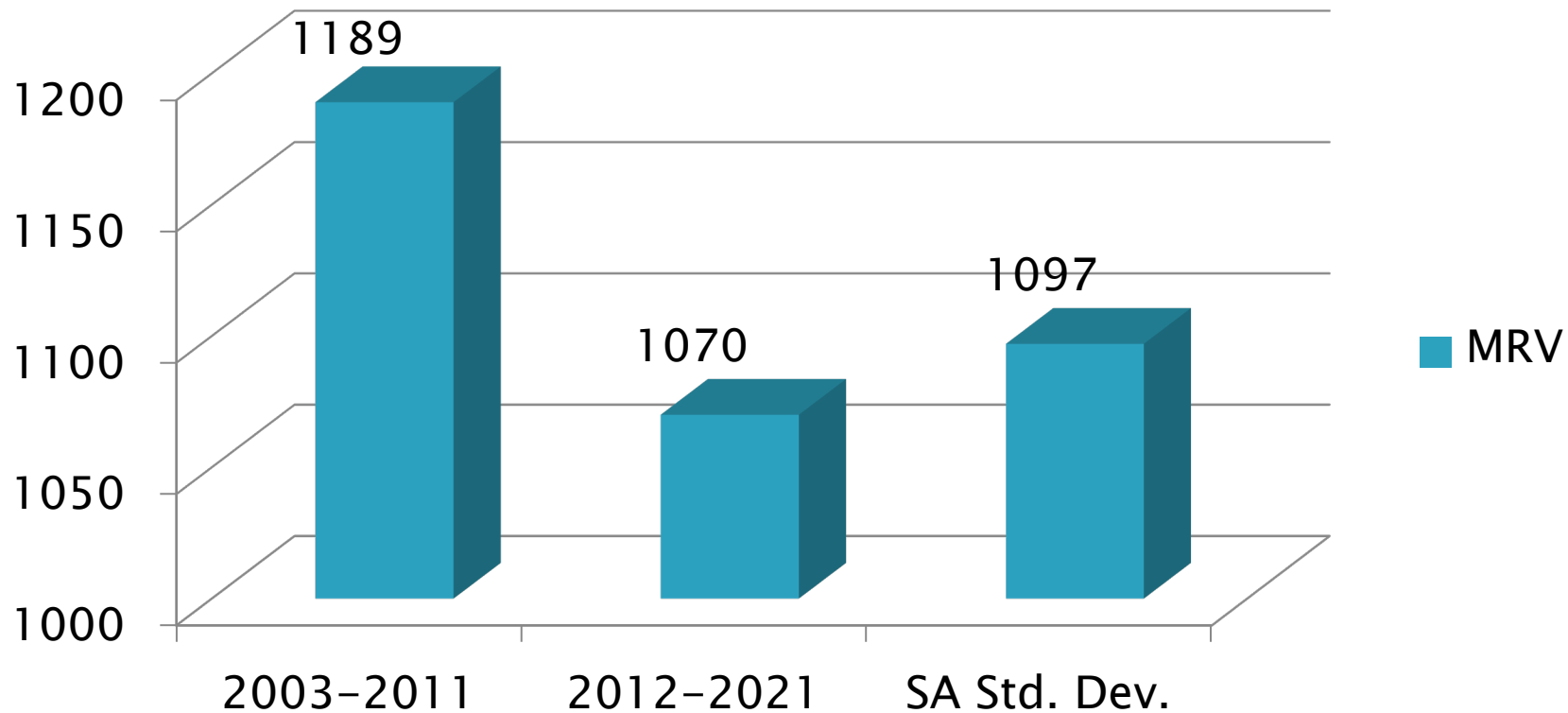


T-11 Precision Estimates



T-11 Precision Estimates

MRV



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Test Monitoring Center
<https://www.astmtmc.org>



Mack T-12

➤➤ April 2022

T-12 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

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

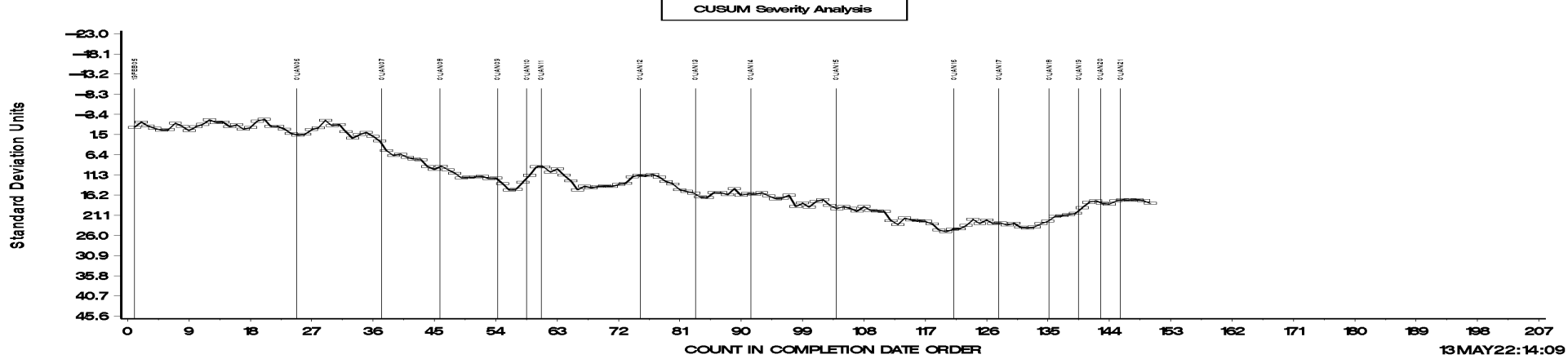
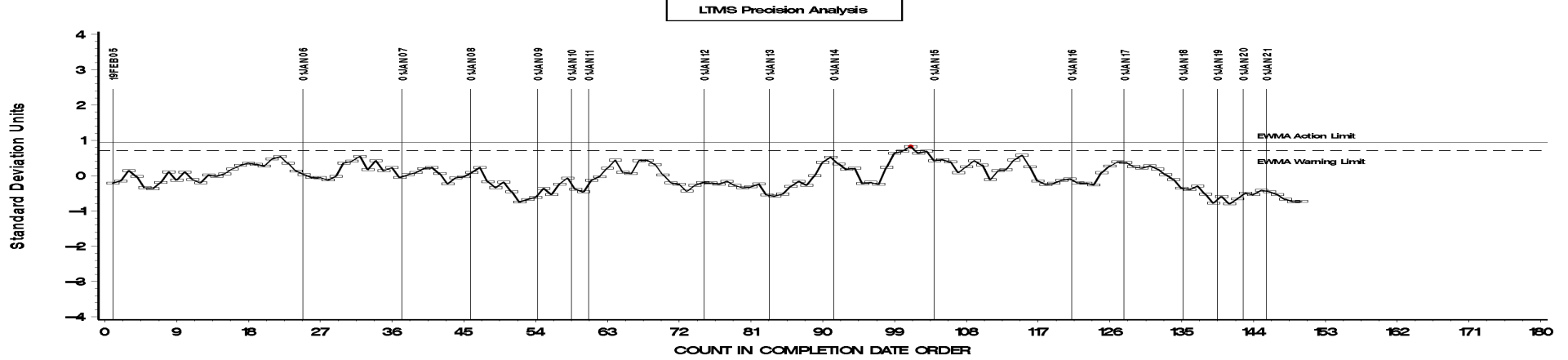
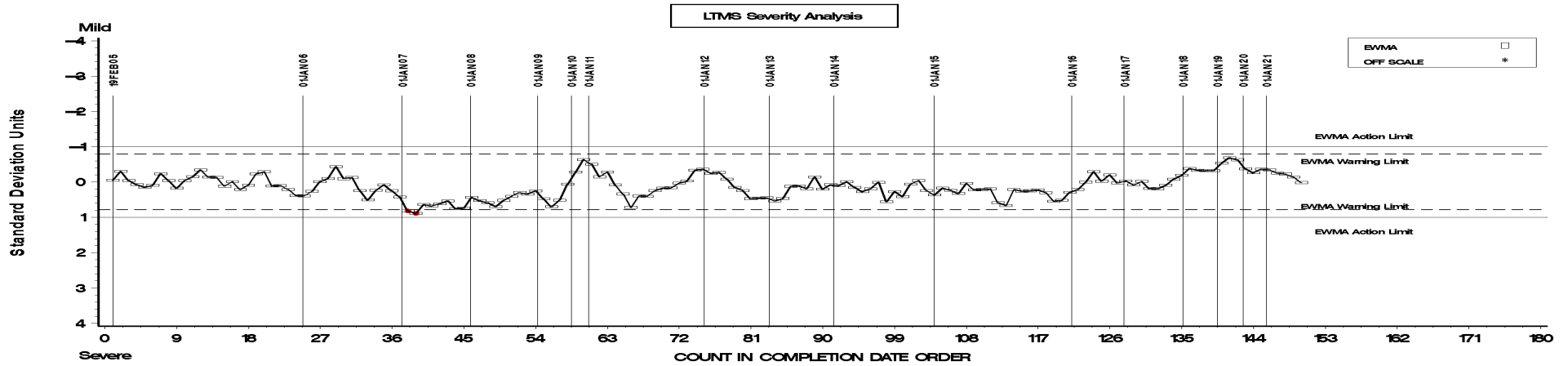
*Invalid and aborted tests

T-12 Test Severity

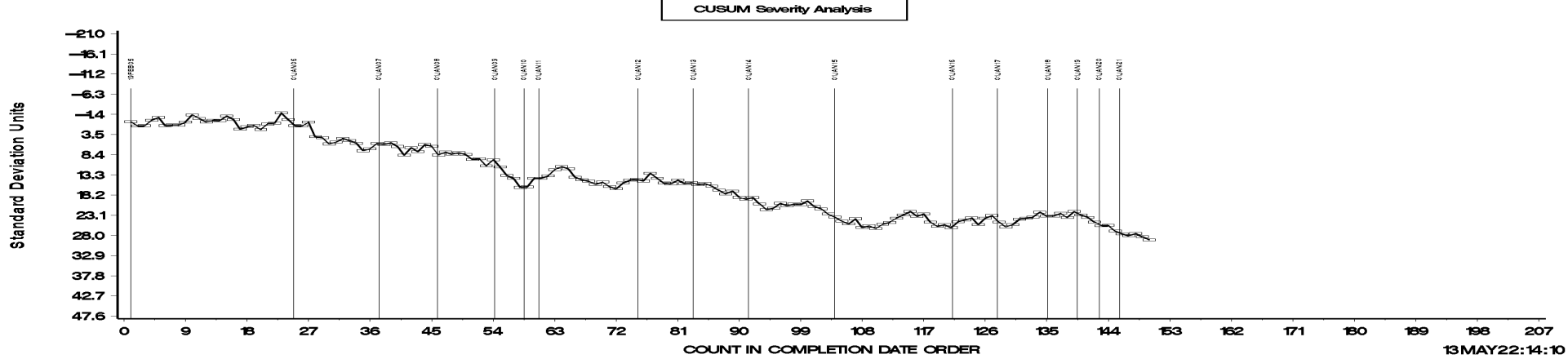
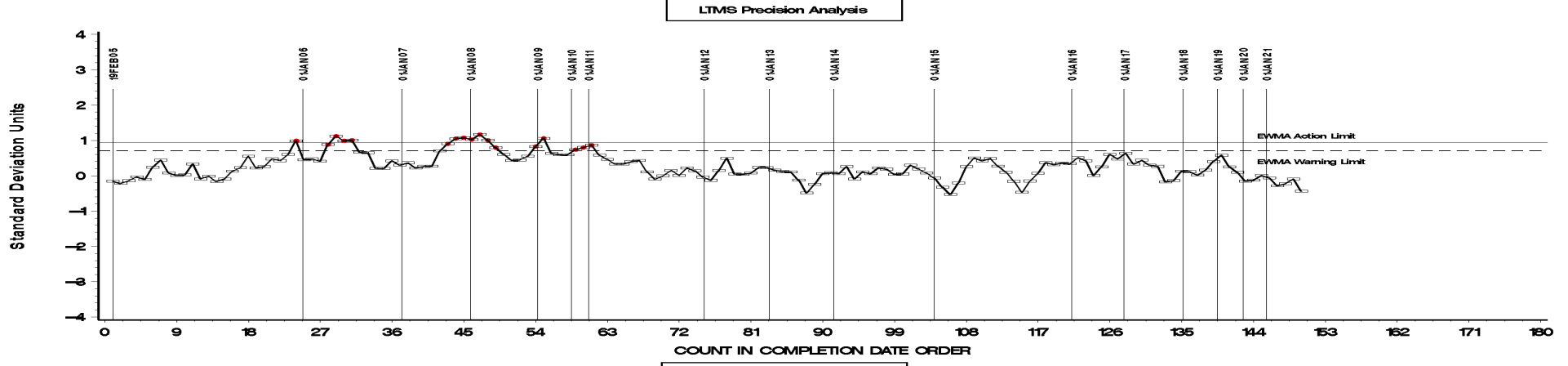
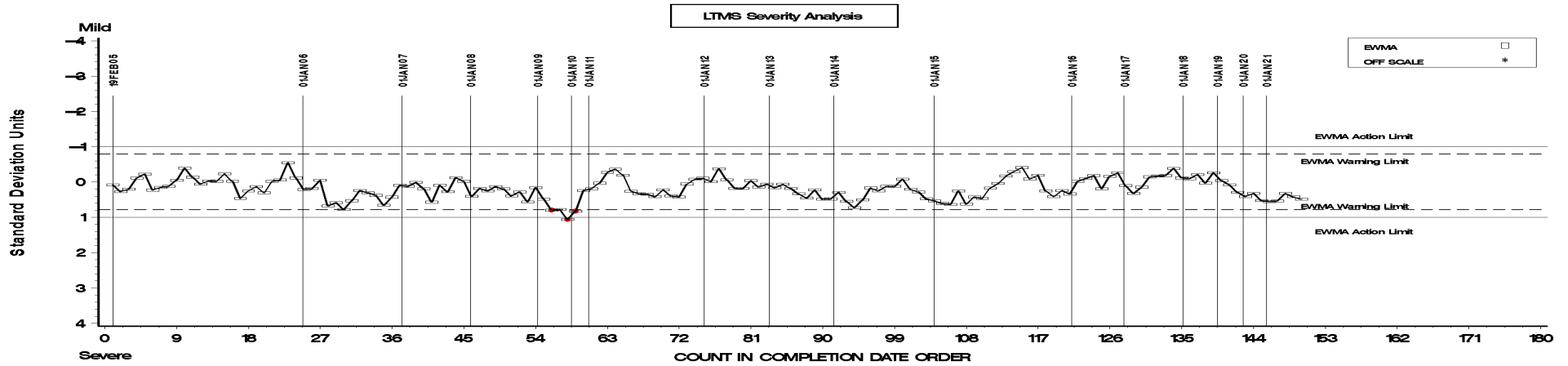
- ▶ All parameters are in control.

MACK T-42 INDUSTRY OPERATIONAL VALID DATA

AVG. CYLINDER LINER WEAR (CLW)

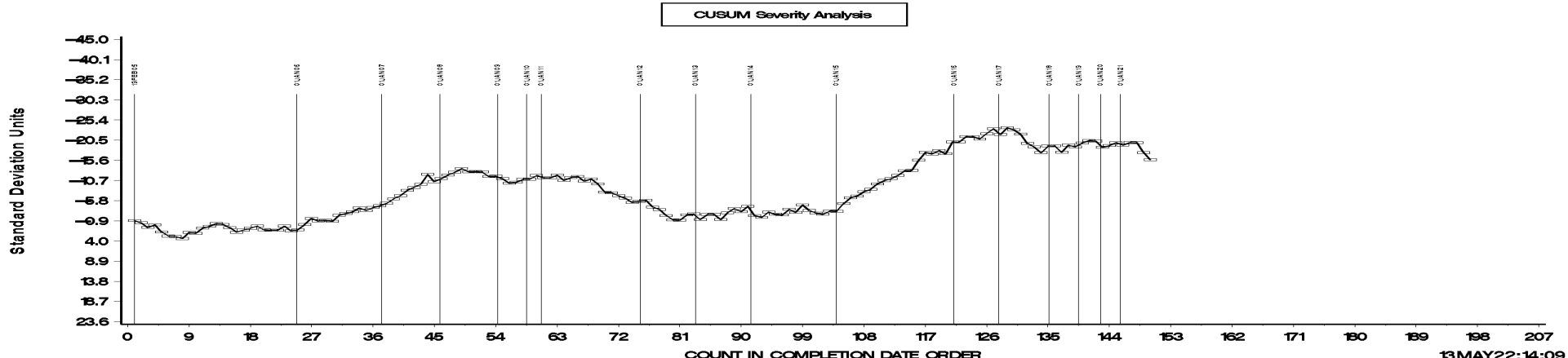
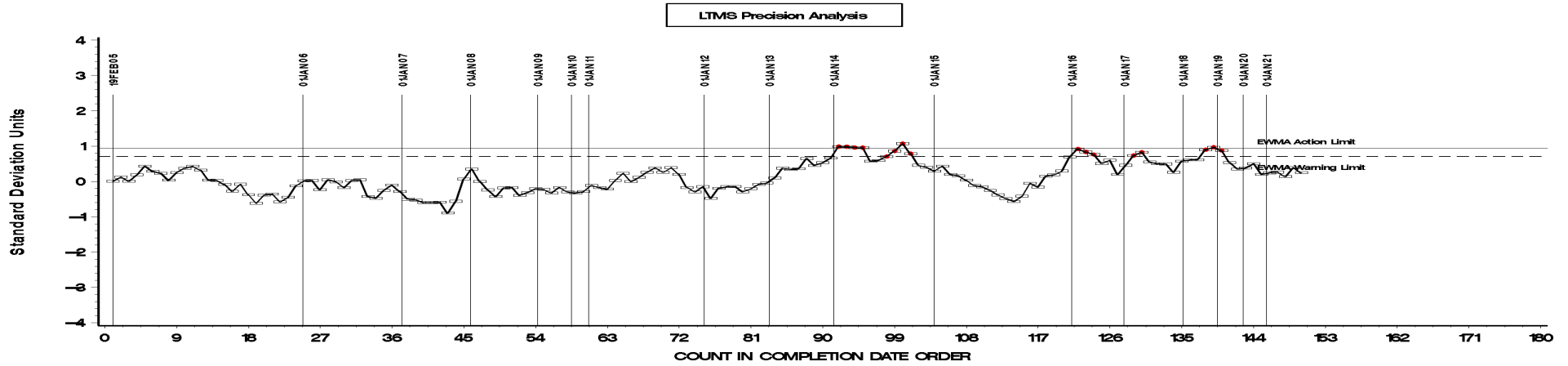
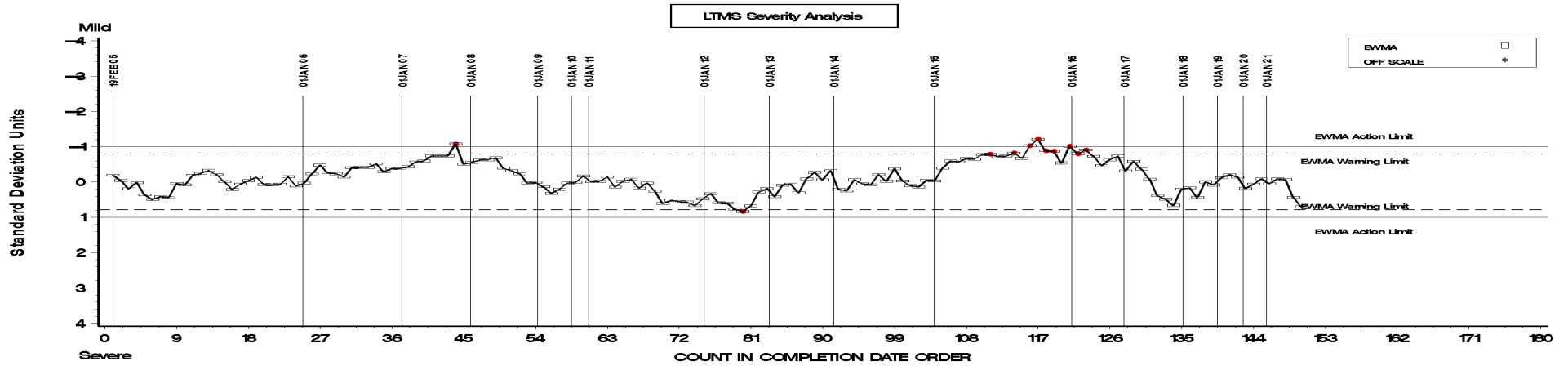


FINAL TRANS. RES. OIL CONSUMPTION



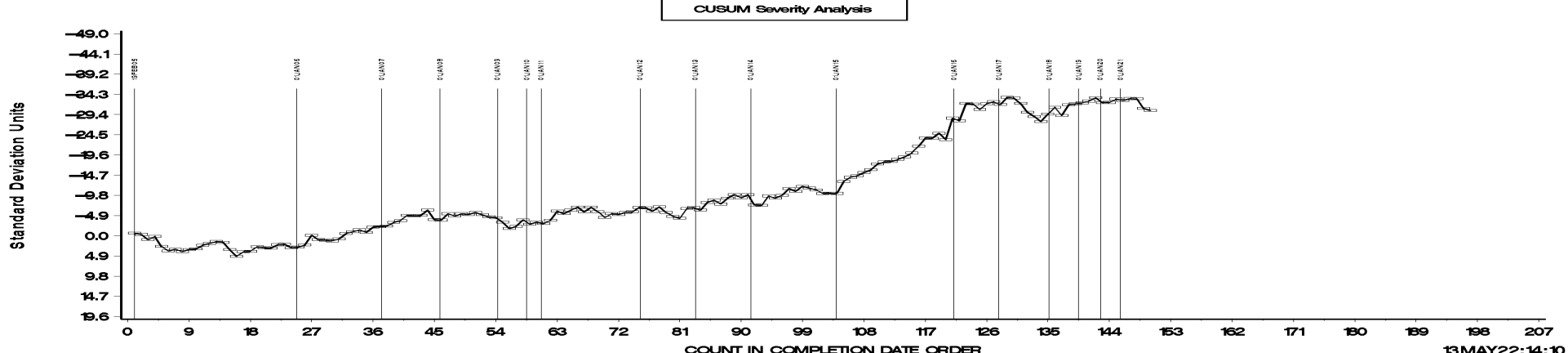
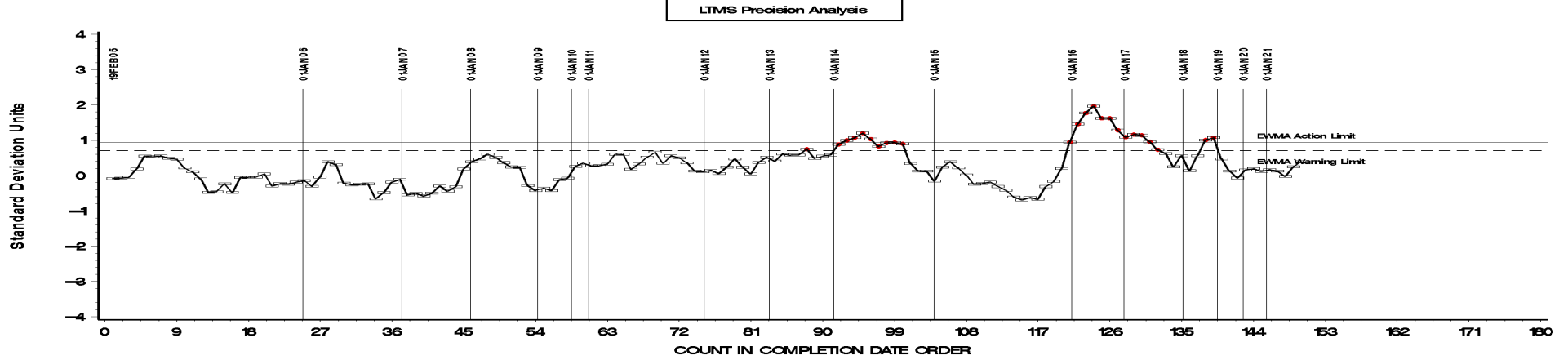
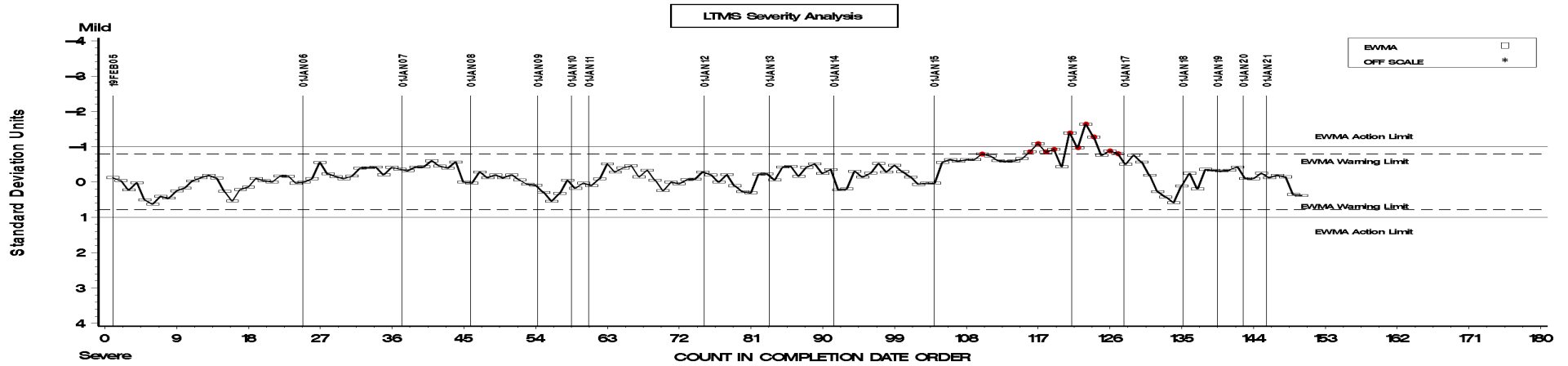
MACK T-42 INDUSTRY OPERATIONAL VALID DATA

FINAL TRANS. RES. DELTA PB @ EOT



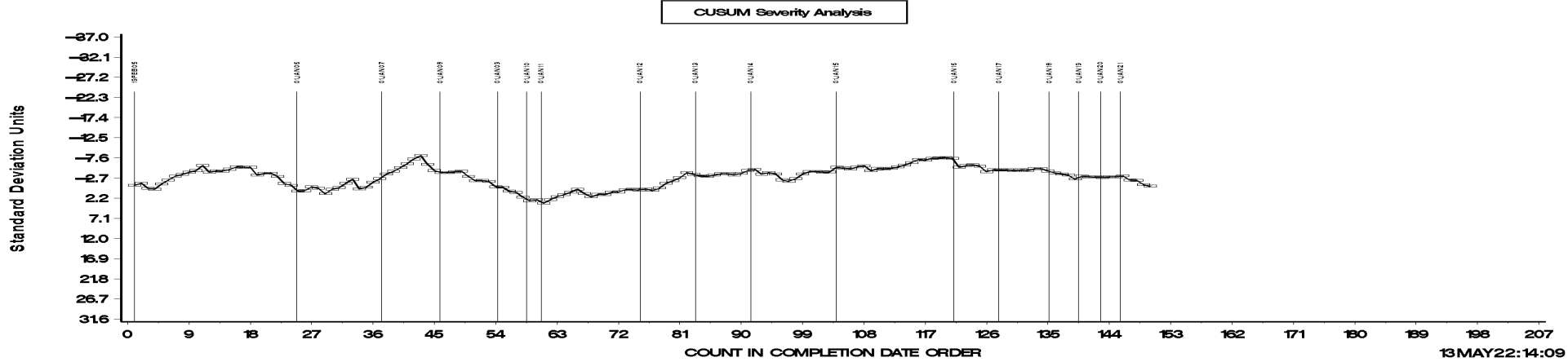
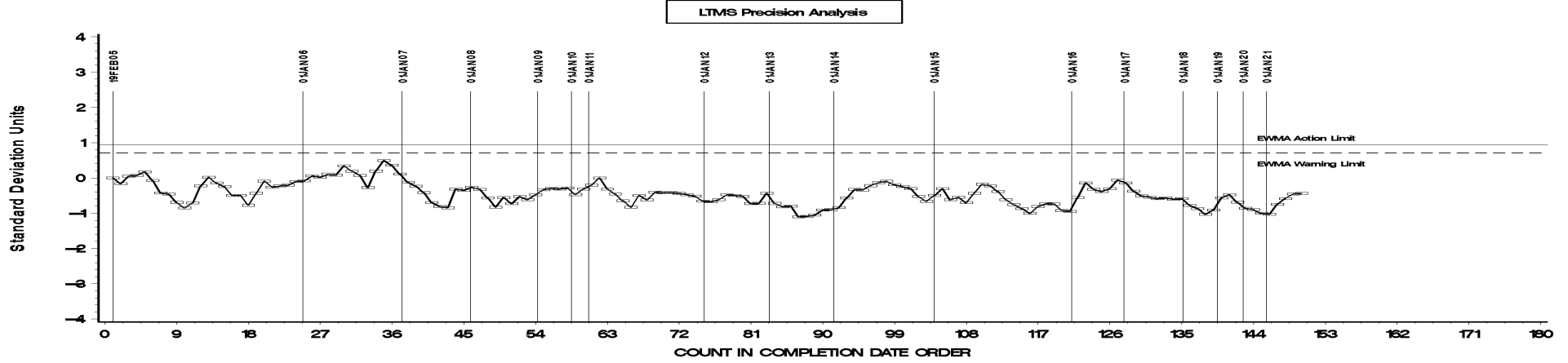
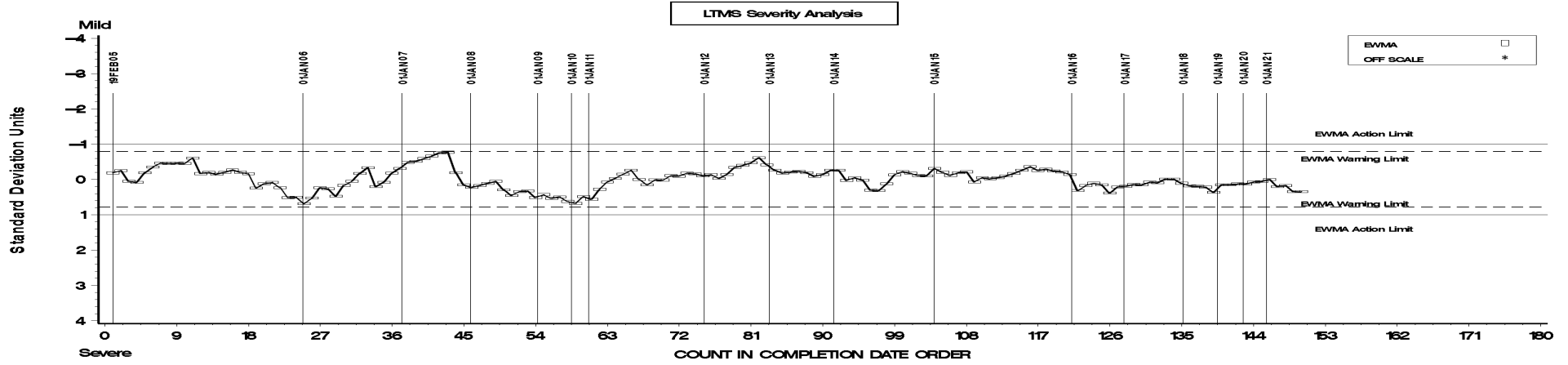
MACK T-42 INDUSTRY OPERATIONAL VALID DATA

FINAL TRANS. RES. DELTA PB 250-300H

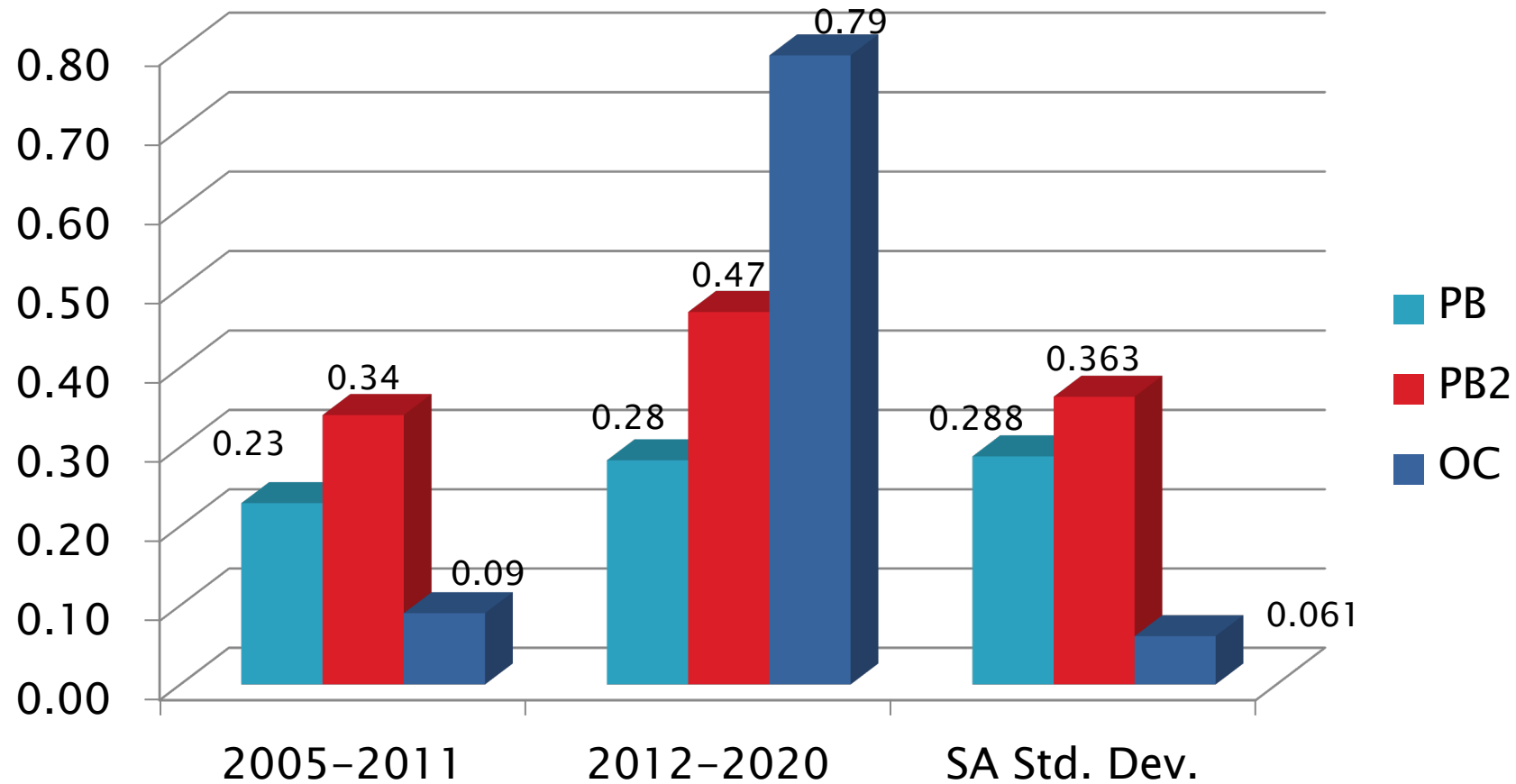


MACK T-42 INDUSTRY OPERATIONAL VALID DATA

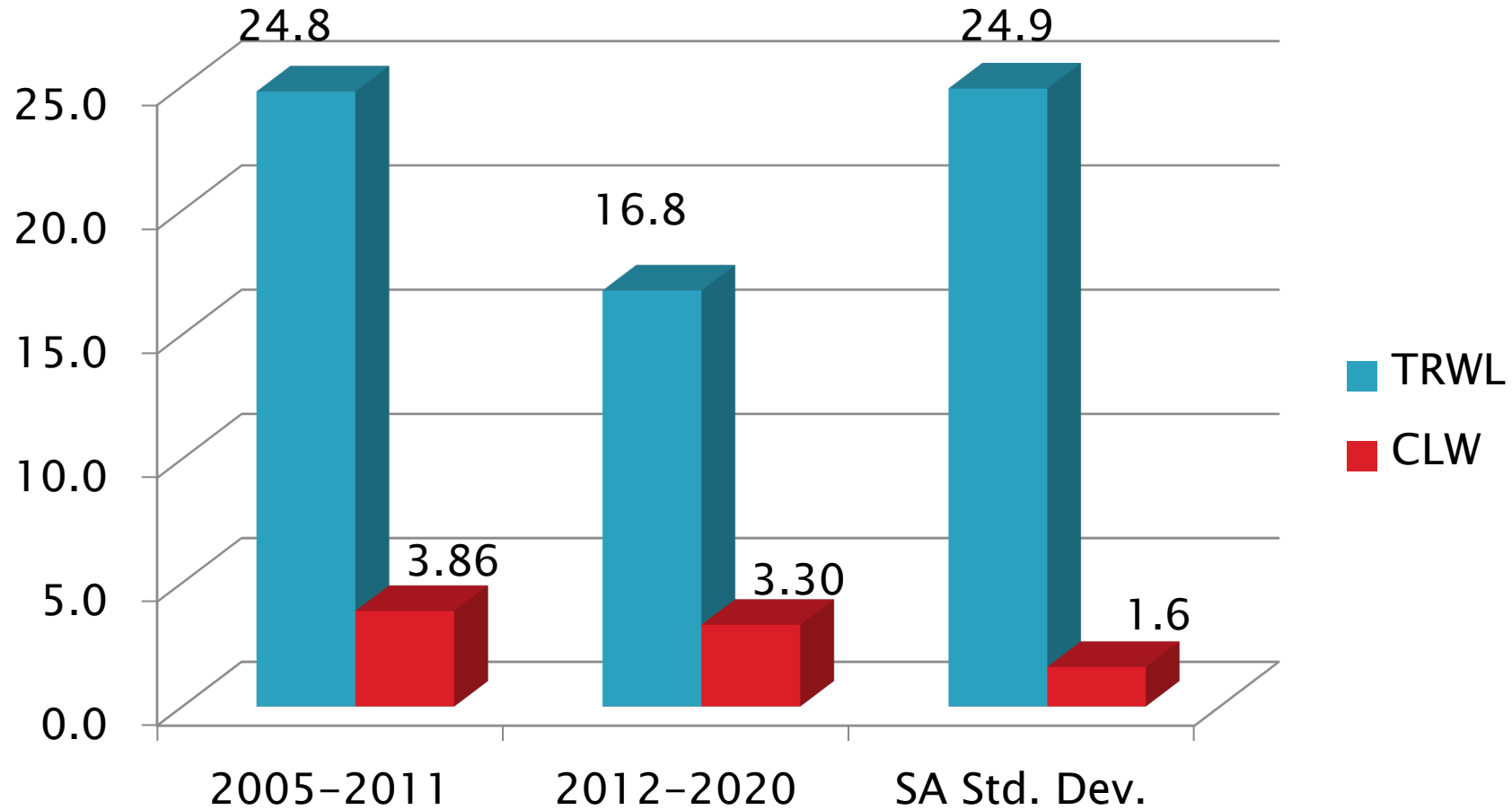
AVG. TOP RING WEIGHT LOSS (TRWL)



T-12 Precision Estimates



T-12 Precision Estimates



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Mack T-12A

➤➤ April 2022

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<https://www.astmtmc.org>



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T-12A Test Activity

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

T-12A Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
Total	0

T-12A Lost Tests*

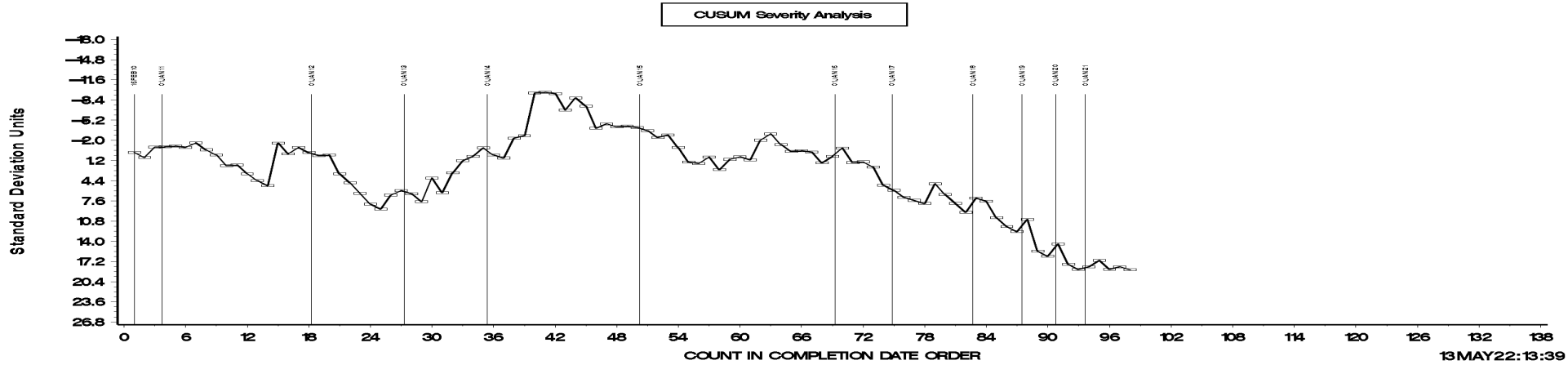
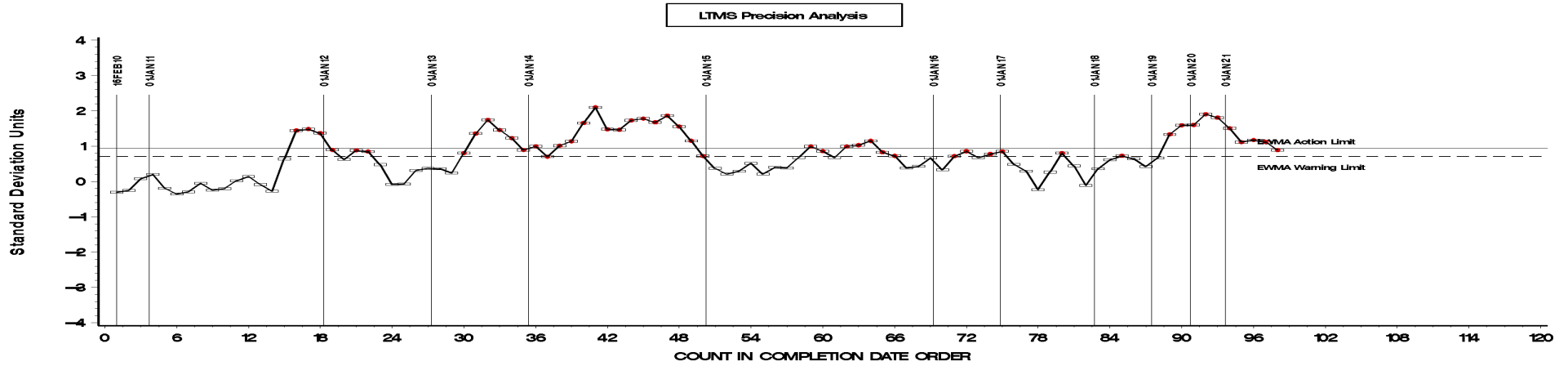
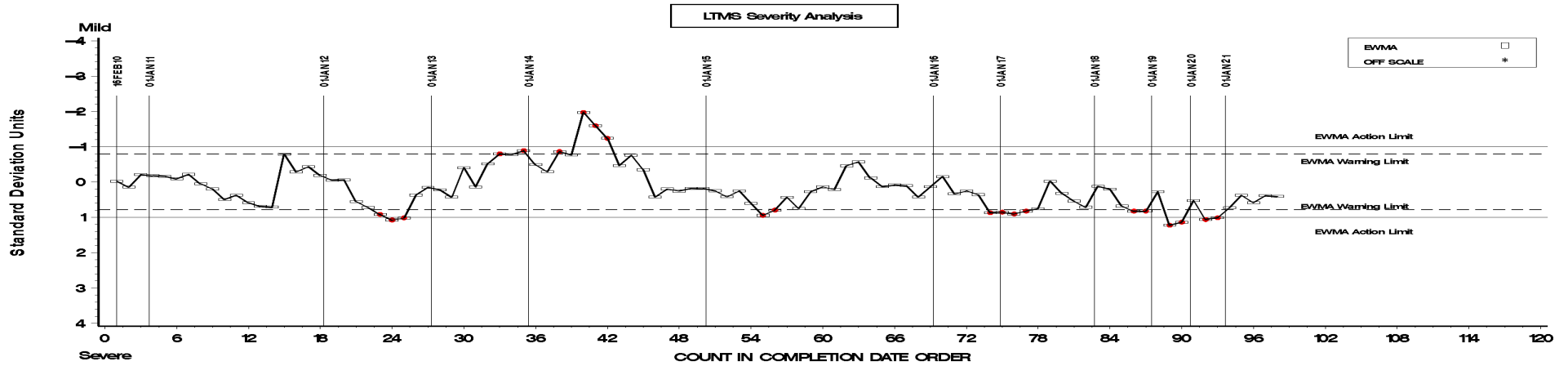
Status	Cause	#
Invalid	Missed soot window	0
Aborted	No aborted tests	0
Total		0

*Invalid and aborted tests

T-12A Test Severity

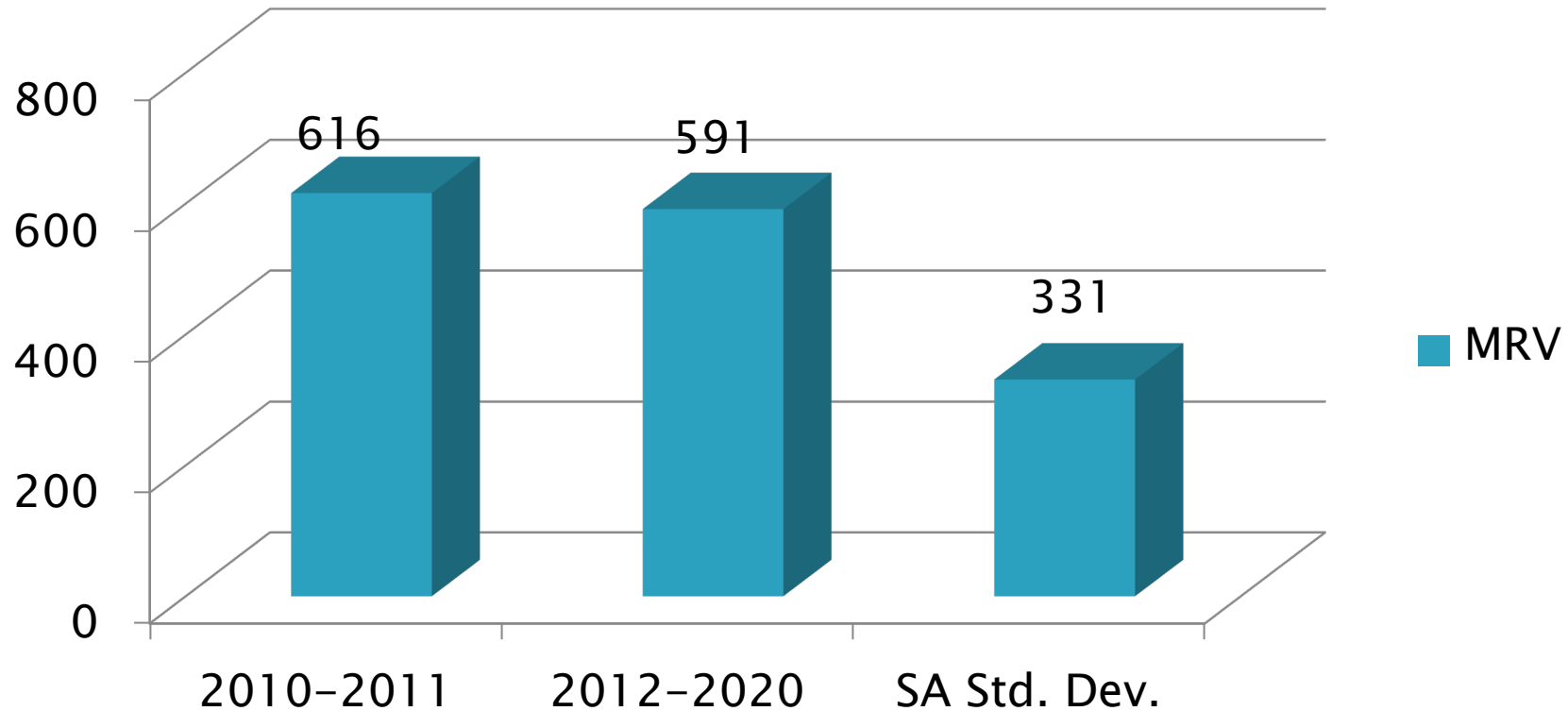
- ▶ MRV is in a precision warning alarm.

MACK T-12A INDUSTRY OPERATIONAL VALID DATA
 FINAL ORIGINAL UNIT MRV VISCOSITY [NM, SOLID, FROZEN, <, >]



T-12A Precision Estimates

MRV



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Mack T-13

➤➤ April 2022

T-13 Test Activity

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

T-13 Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
Total	0

T-13 Lost Tests*

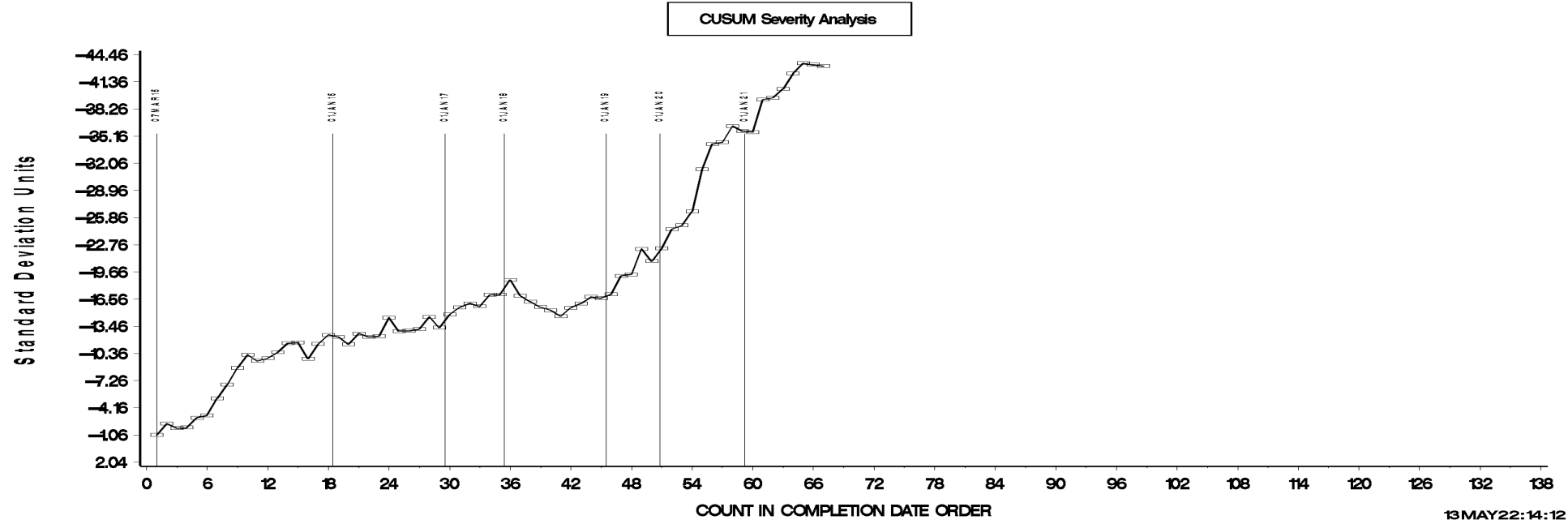
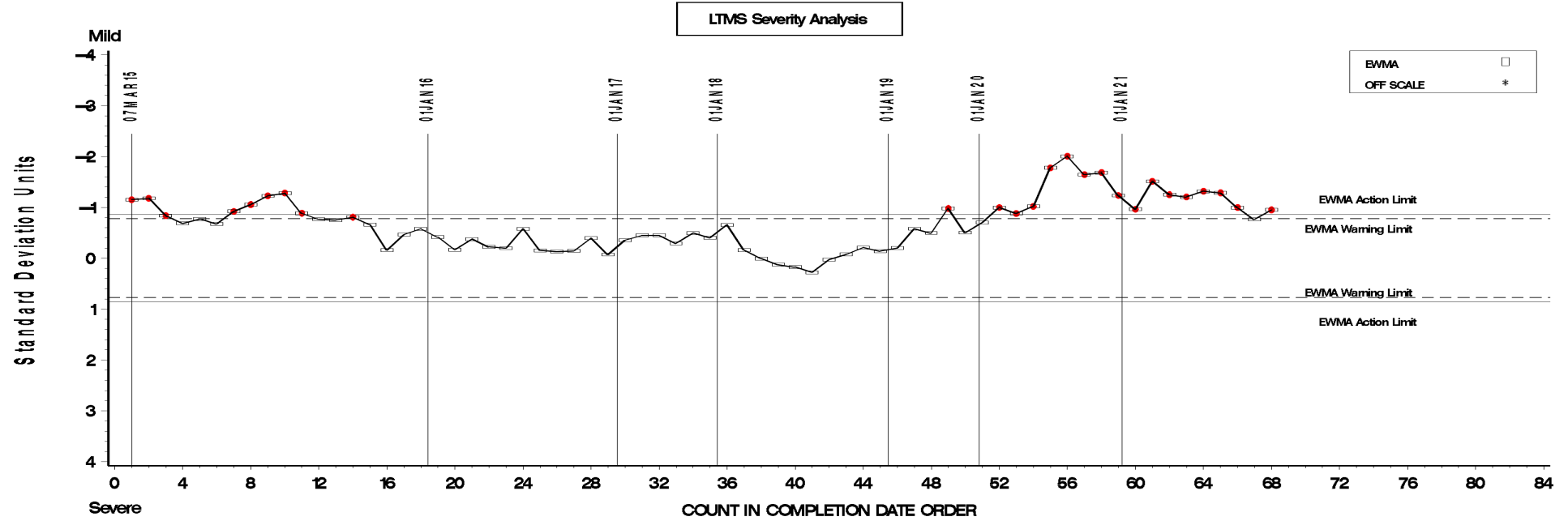
Status	Cause	#
Invalid	No invalid tests	0
Aborted	Mechanical failure at break-in	1
Total		1

*Invalid and aborted tests

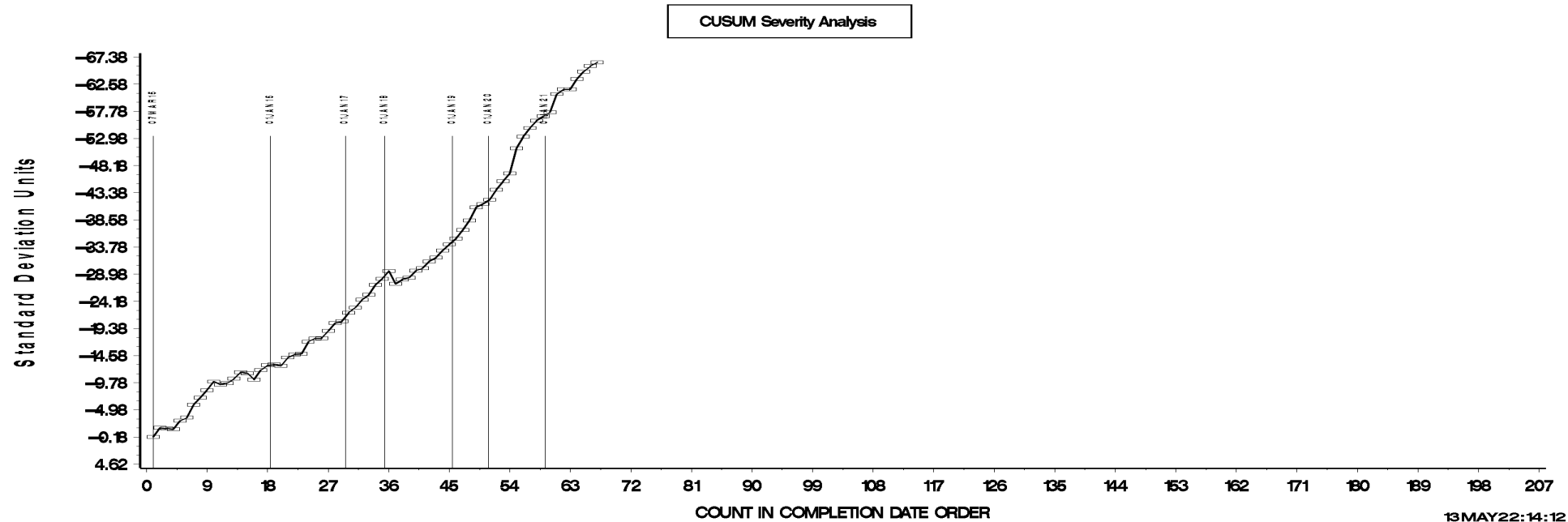
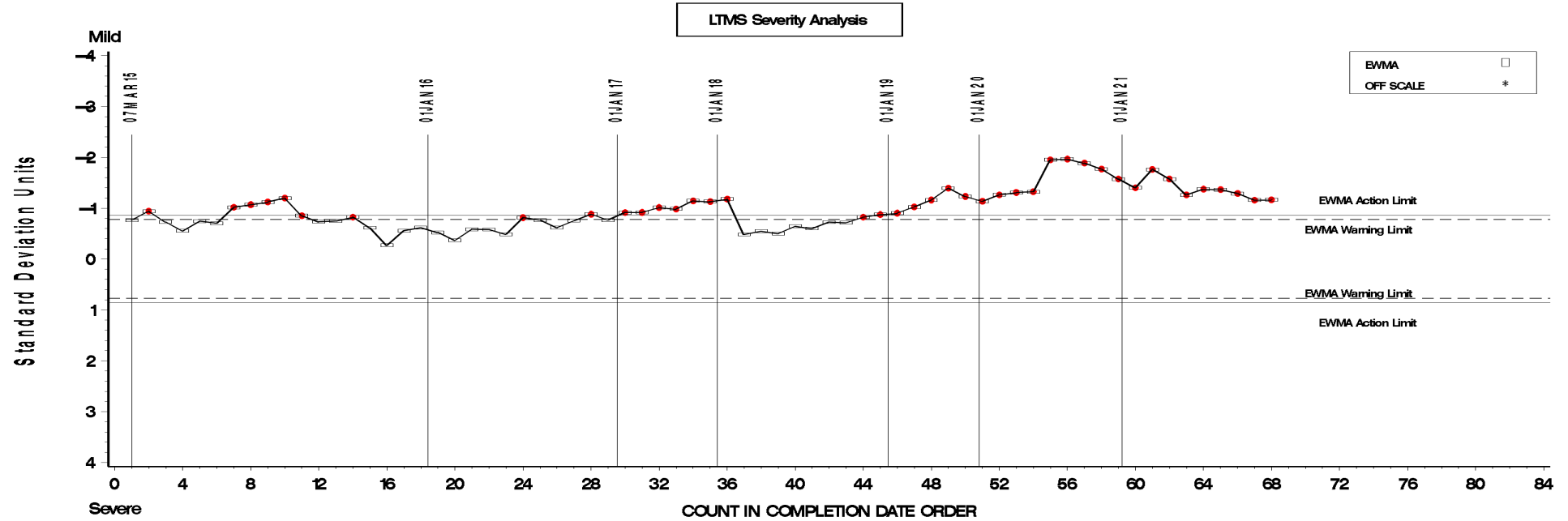
T-13 Test Severity

- ▶ IRPH and KV40 is in level 2 Zi alarm in the mild direction

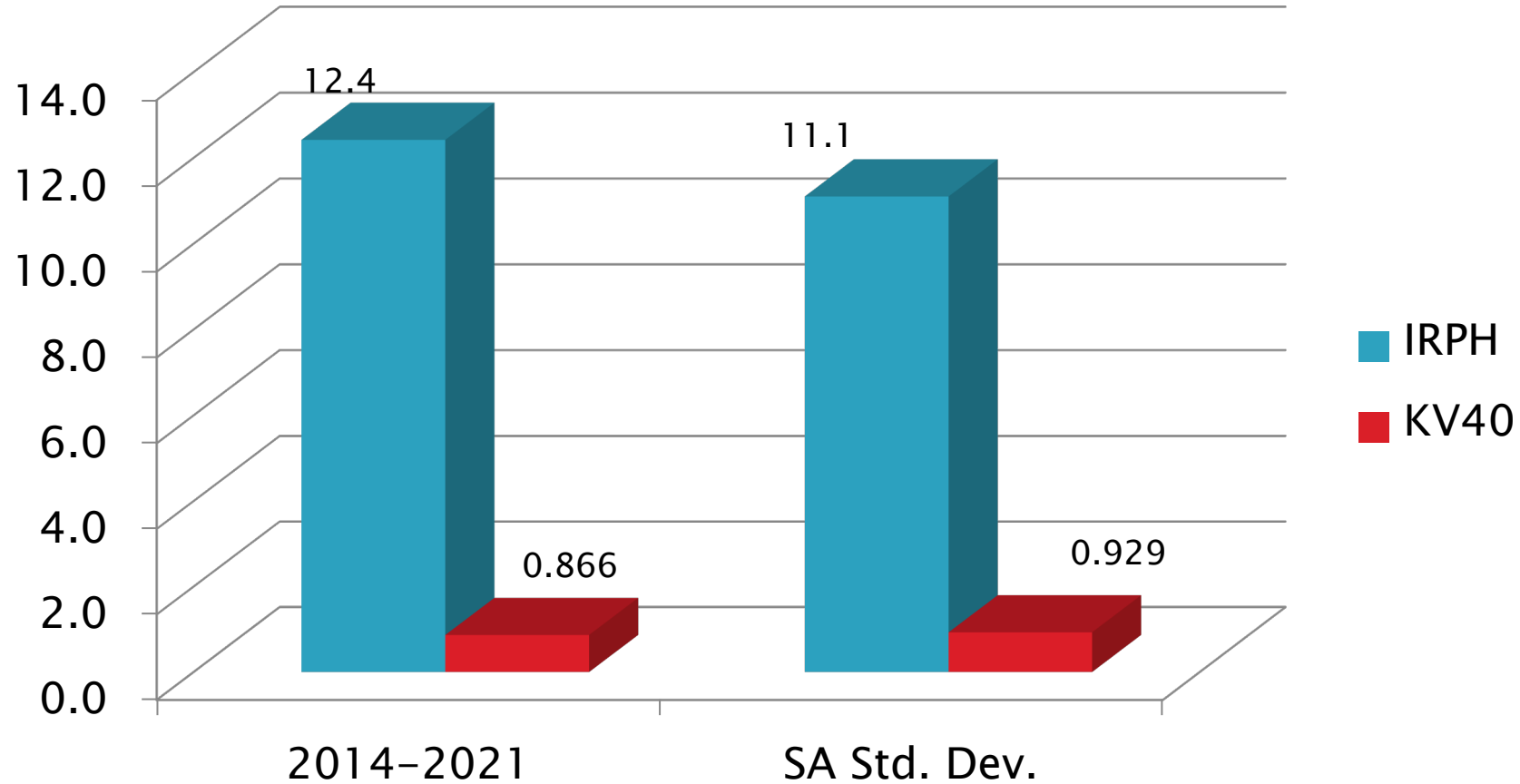
FINAL ORIGINAL PEAK HEIGHT IR AT EOT



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



T-13 Precision Estimates



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Information Letters

➤➤ October 1, 2021–

March 31, 2022

Test Monitoring Center
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Information Letters*

Test	Date	IL	Topic
N/A	N/A	N/A	No information letters were issued during this period

*Available from TMC Website

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Test Monitoring Center
<https://www.astmtmc.org>



Memos

➤➤ October 1, 2021–

March 31, 2022

Memos*

Date	Number	Topic
N/A	N/A	No memos were issued during the period

*Available from TMC Website

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Test Monitoring Center
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Reference Oil Inventory



Actions, Re-blends, Inventories
and Estimated Life

Reference Oil Reblends

- ▶ Reblend of COAT reference oil 833 has been received and QA testing complete. 833-2 has been approved for use by the TMC.

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	30	1948	116	5+ years
811-2	1K, 1N	1732	20	802	30	5+ years
821-4	T-12	4495	245	2225	195	5+ years
822-2	1R, T-11	4386	280	1945	168	3+ years
823	T-13	1796	200	229	120	<1 year
823-1	T-13	1421	0	1421	0	5+ years
830-3	ISM	2891	125	2437	125	5+ years
831-4	C13, ISB	1699	215	877	155	2 years

Reference Oil Inventory Estimated Life

Oil	Tests	Original Blend Amount	Quantity Shipped in last 6 months	TMC Inventory	Lab Inventory	Estimated Life
832-1	COAT	1951	56	1384	56	4+ years
833-1	COAT	1248	196	579	84	1.5 years
864-1	DD13	1576	100	641	125	1.5 years
873-2	1M-PC	1650	0	6	10	1 year
1005-5	1P, 1R, EOAT, RFWT, T-8/E	3826	212	1094	179	1 year

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LTMS Deviations



October 1, 2021 –

March 31, 2022

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, 2021 –

March 31, 2022

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Quality Index Deviations

- ▶ T11 Engine Speed
 - Facility power surge caused hard engine shutdown.

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	8
T-13	3
COAT	4

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TMC Laboratory Visits

➤➤ October 1, 2021–

March 31, 2022

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TMC Lab Visits

- ▶ No lab visits this period.

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Test Area Timelines

➤➤ October 1, 2021–

March 31, 2022

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Test Area Timeline Additions*

Test	Date	IL/Memo	Topic
N/A	N/A	N/A	No test area timeline additions this period

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*As of 3/31/2021

Test Monitoring Center
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Rating Workshop Data



2022 Heavy Duty Workshop

Test Monitoring Center
<https://www.astmtmc.org>



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Rating Workshop Data

- ▶ The 2022 HD Rating Workshop was held in February 2022 in conjunction with the LD rating workshop.

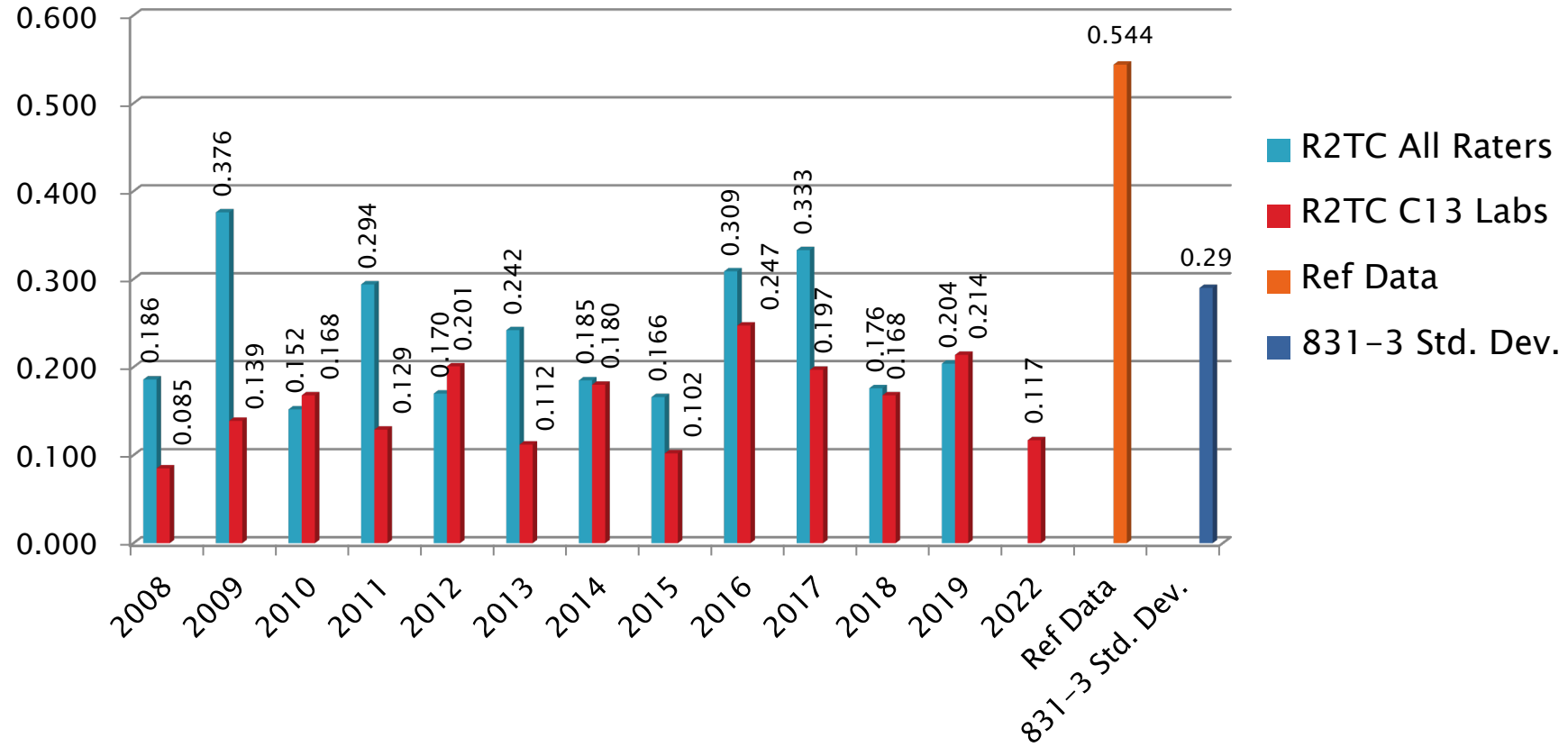
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<https://www.astmtmc.org>

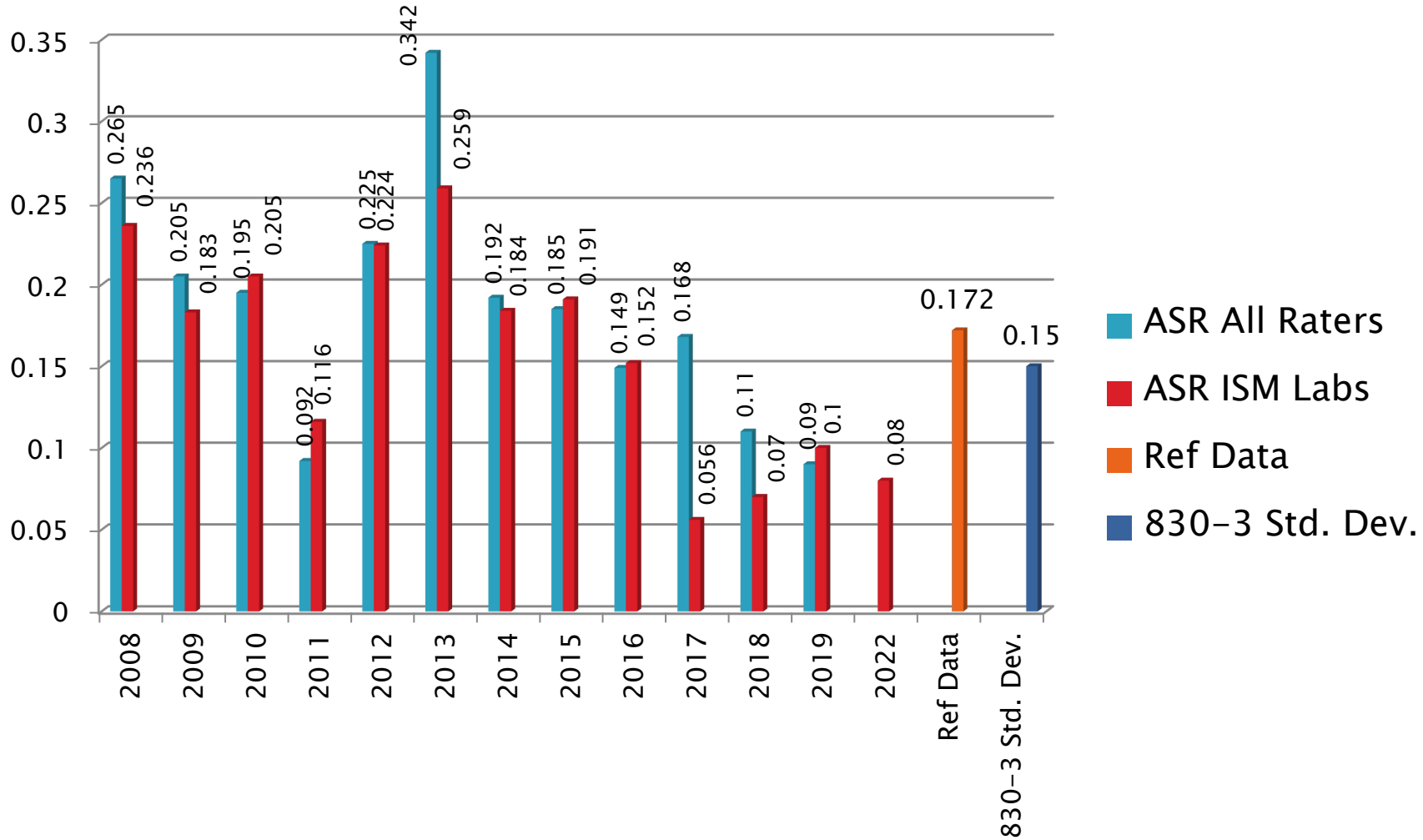


C13 2nd Ring Carbon Precision – Rating Workshop Data

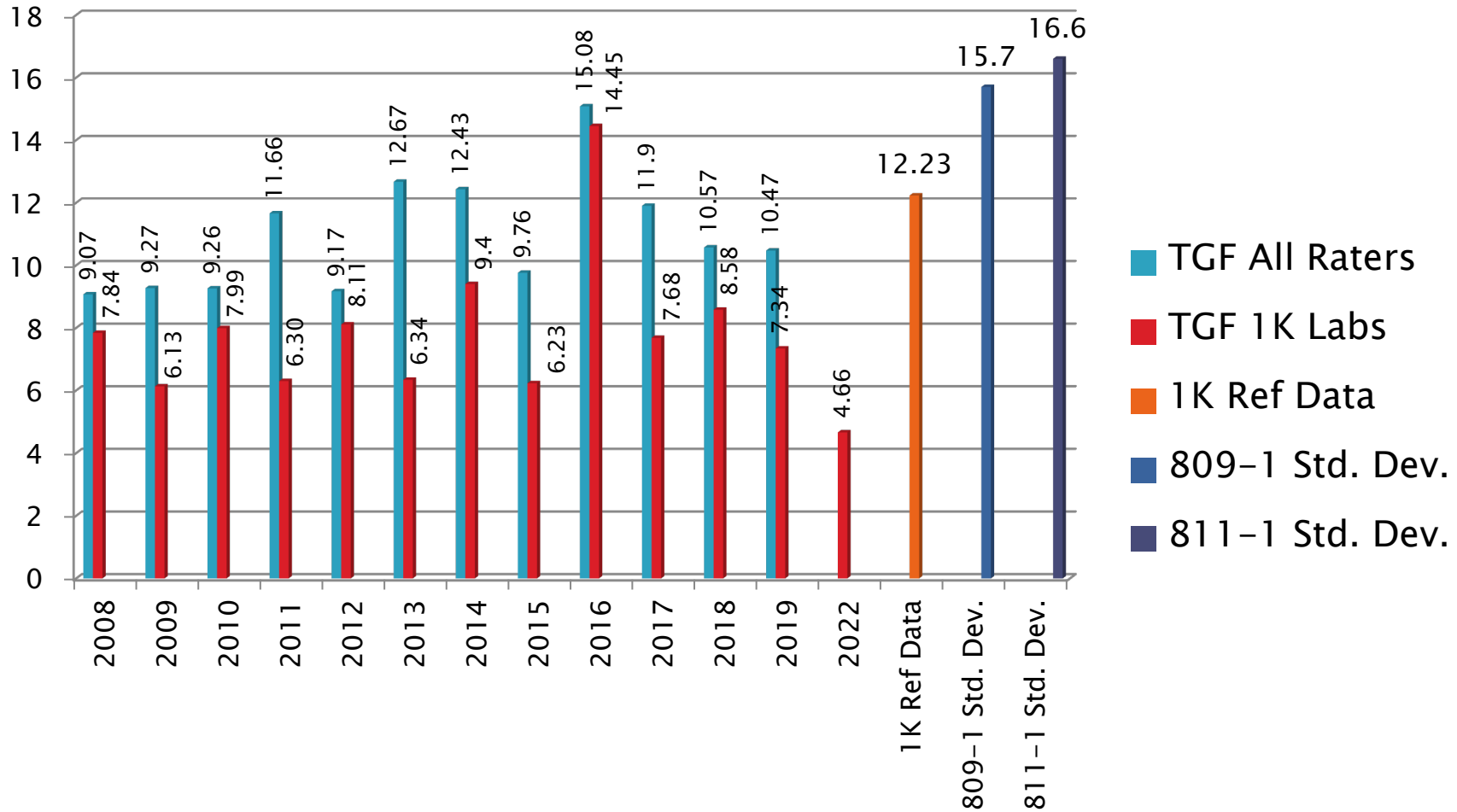
R2TC



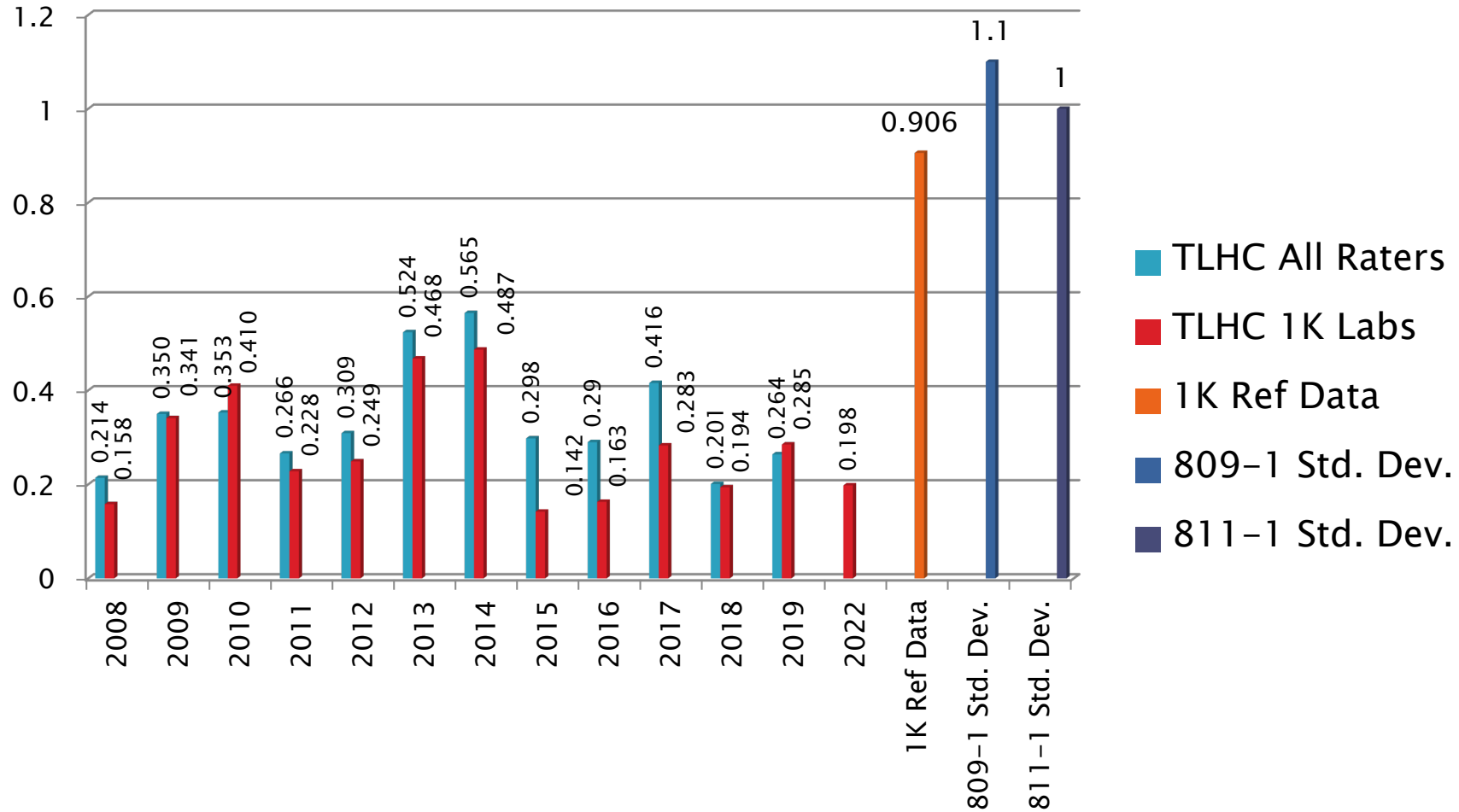
ISM Sludge Rating Precision - Rating Workshop Data



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
- ▶ <https://www.astmtmc.org>

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