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# ***Test Monitoring Center***

<https://www.astmtmc.org>

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

Spring 2023

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# Heavy Duty Testing Executive Summary

- ▶ **Test Issues**
  - COAT
    - COAT to EOAT equivalency process ongoing.

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# Calibrated Labs and Stands\*

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

\*As of 3/31/2023

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# SCOTE 1K

➤➤ April 2023

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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
<b>Total</b>		<b>0</b>

# 1 K Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
<b>Total</b>	<b>0</b>

# 1 K Lost Tests\*

Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
<b>Total</b>		<b>0</b>

\*Invalid and aborted tests



# 1 K Test Severity

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

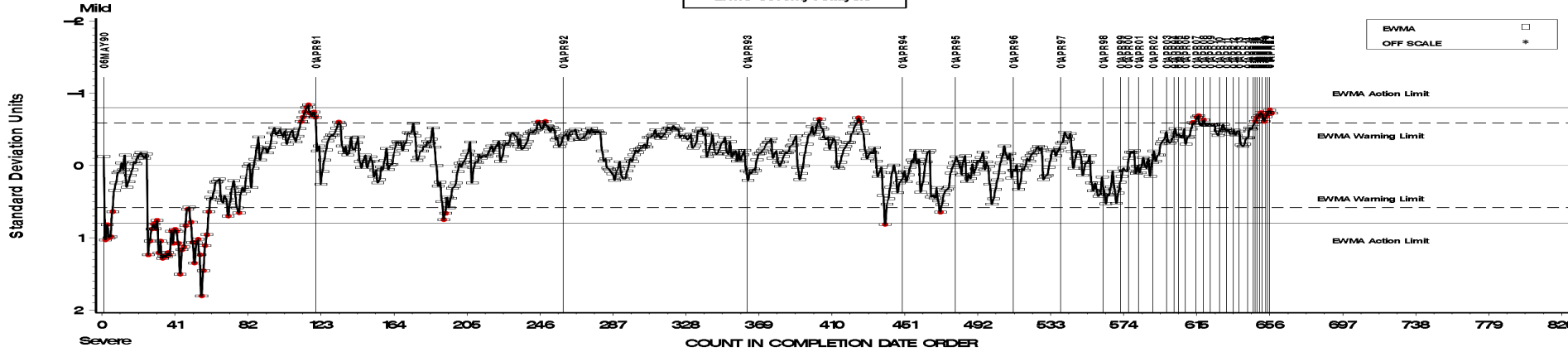
# CATERPILLAR 1K INDUSTRY OPERATIONALLY VALID DATA



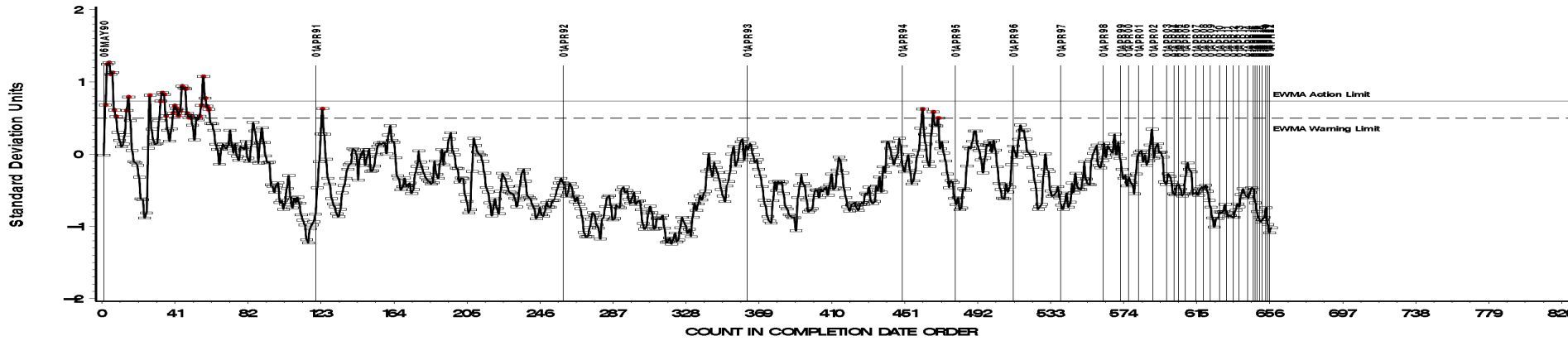
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## FINAL TGF

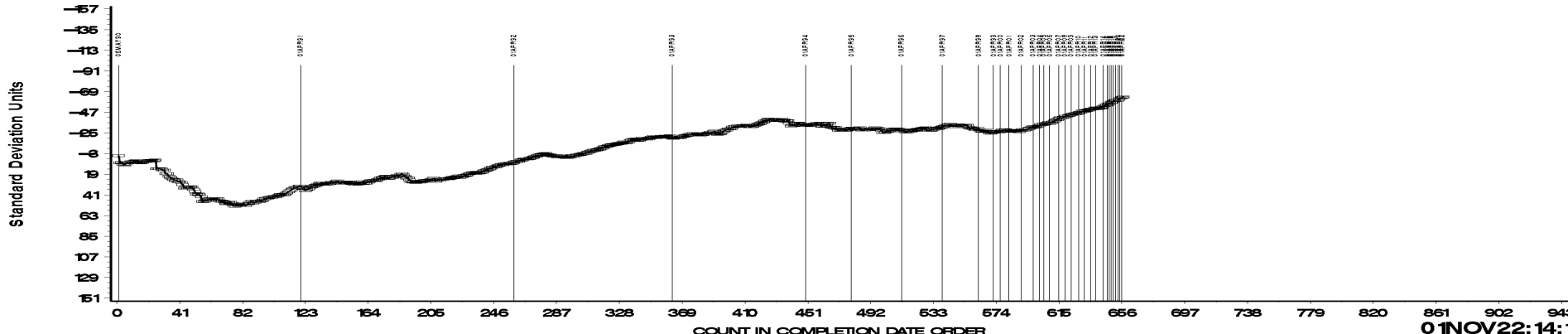
LTMS Severity Analysis



LTMS Precision Analysis



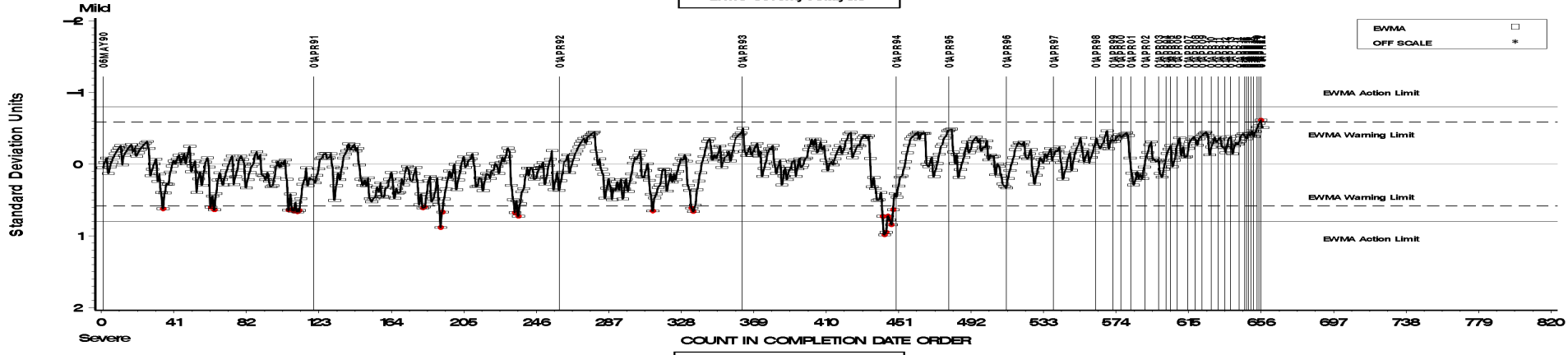
CUSUM Severity Analysis



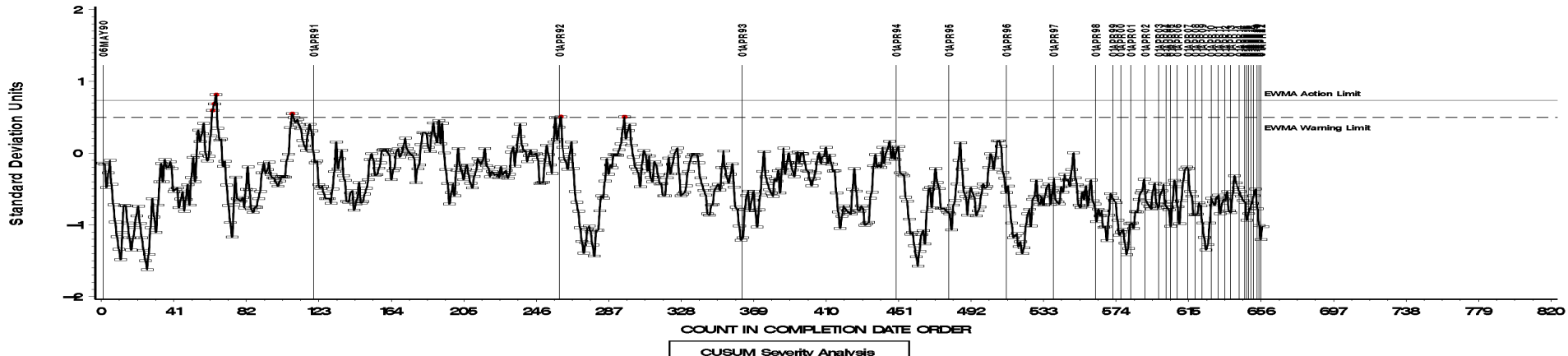


## FINAL TLHC

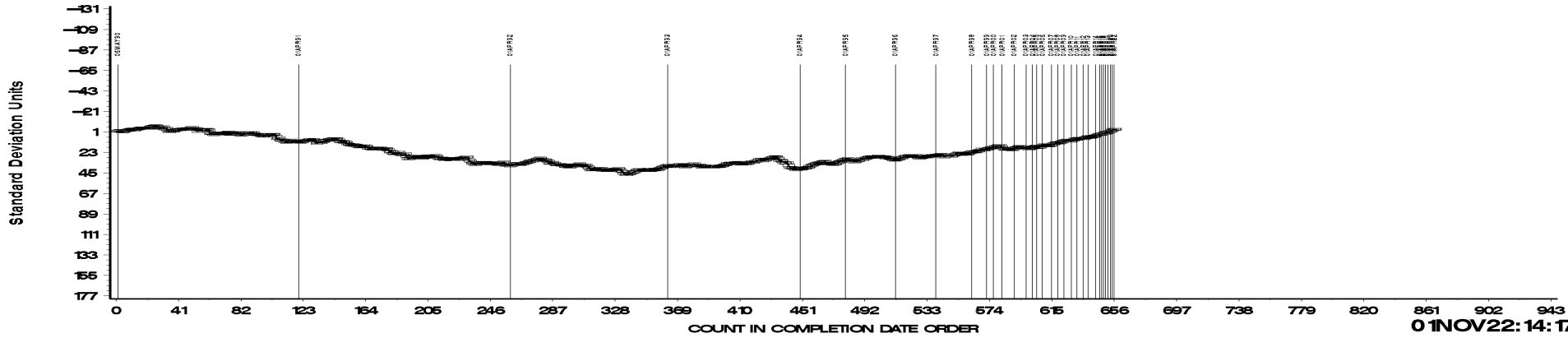
LTMS Severity Analysis



LTMS Precision Analysis



CUSUM Severity Analysis





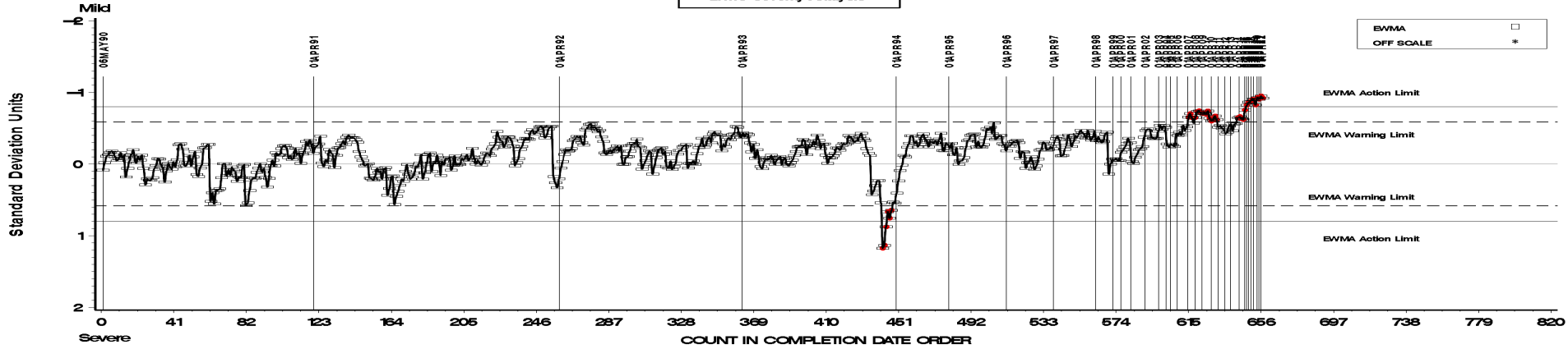
# CATERPILLAR 1K INDUSTRY OPERATIONALLY VALID DATA



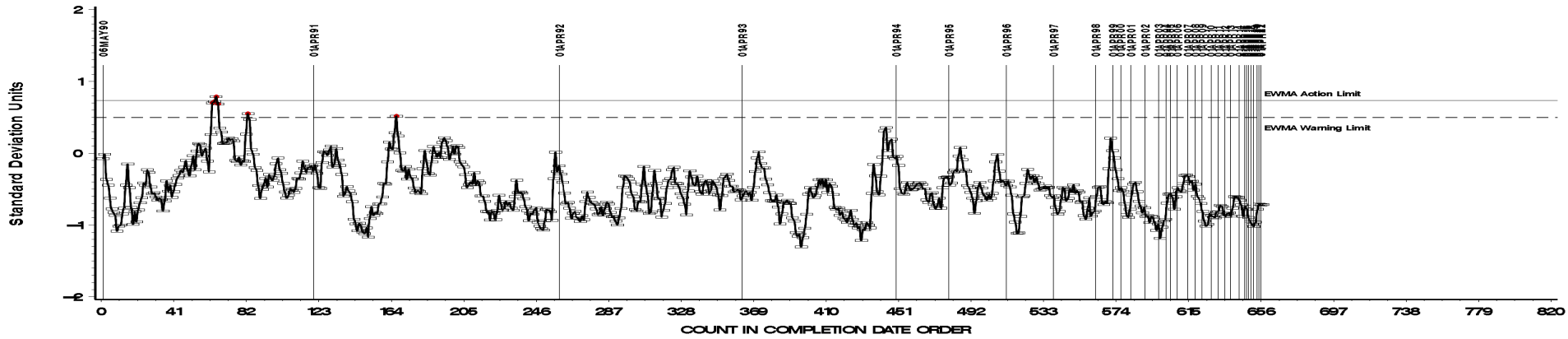
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## FINAL BSOC

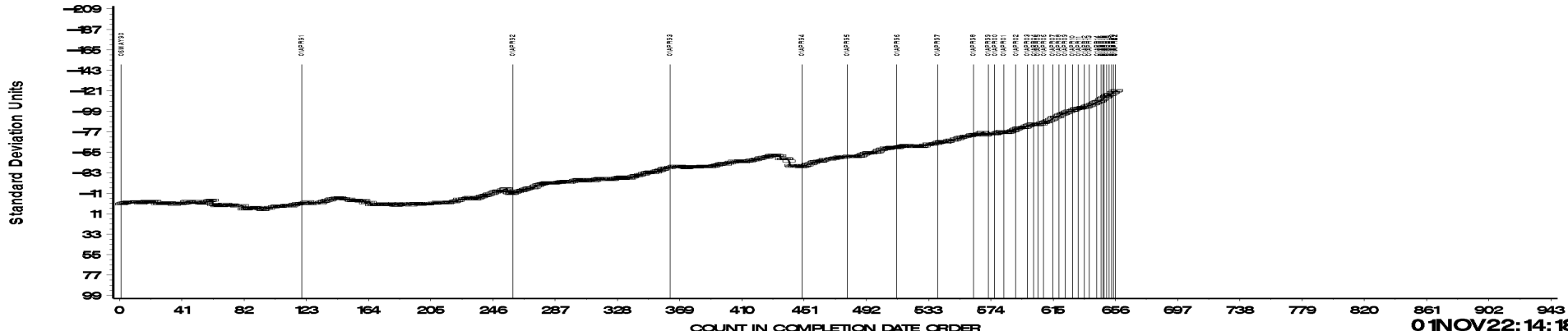
### LTMS Severity Analysis



### LTMS Precision Analysis

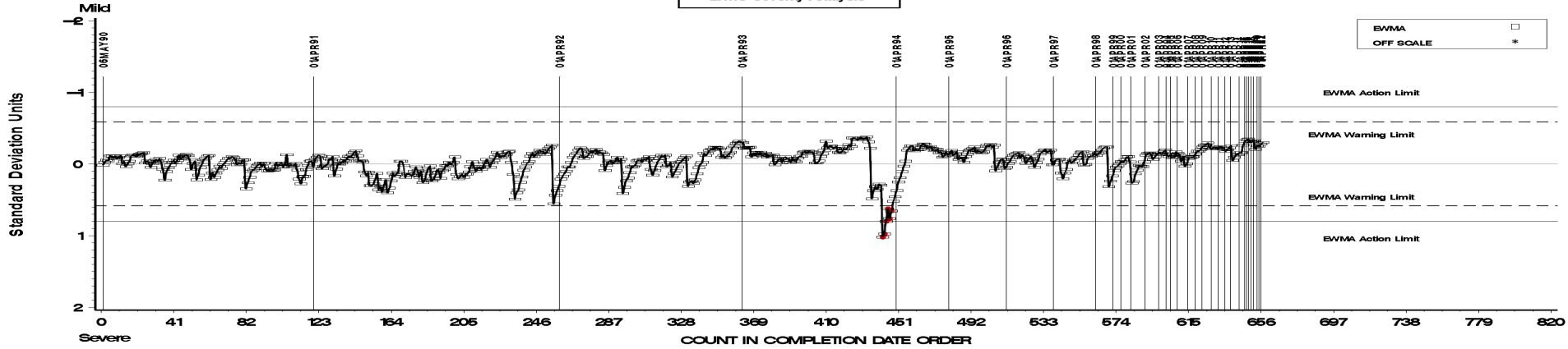


### CUSUM Severity Analysis

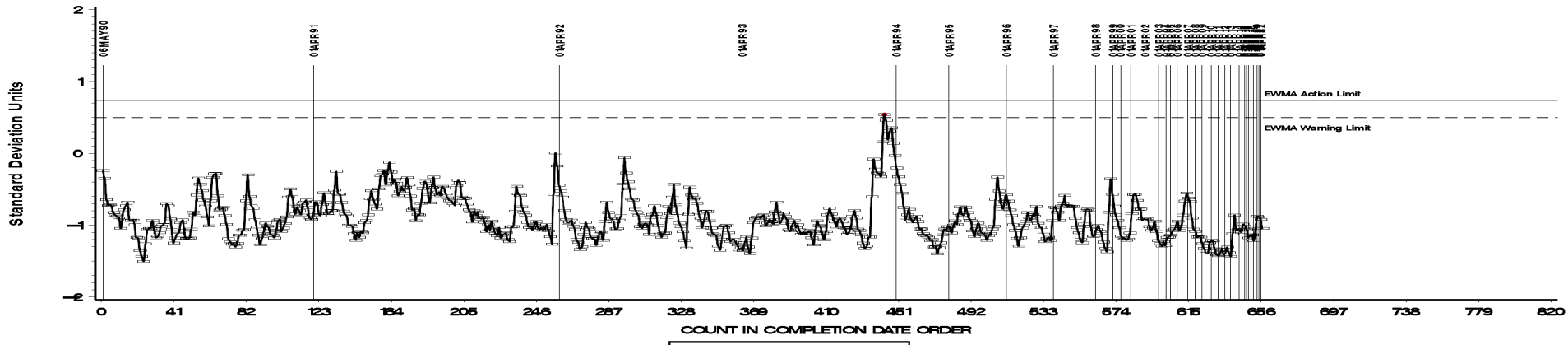


## FINAL EOTC

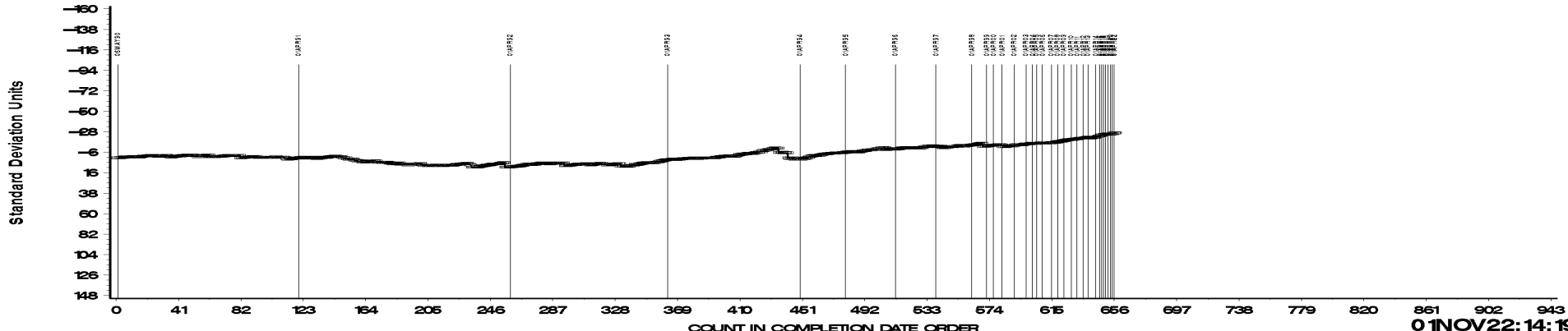
LTMS Severity Analysis



LTMS Precision Analysis

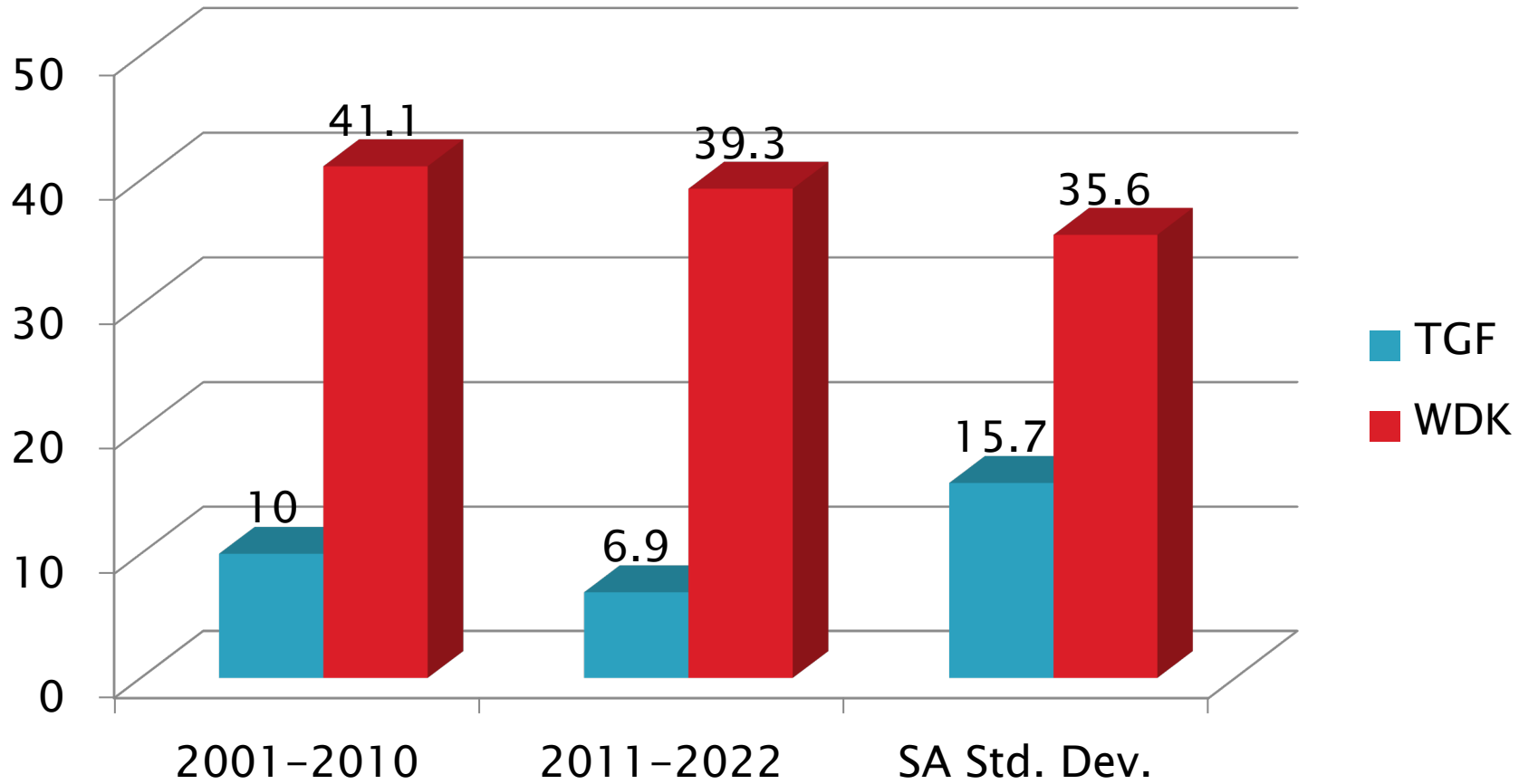


CUSUM Severity Analysis

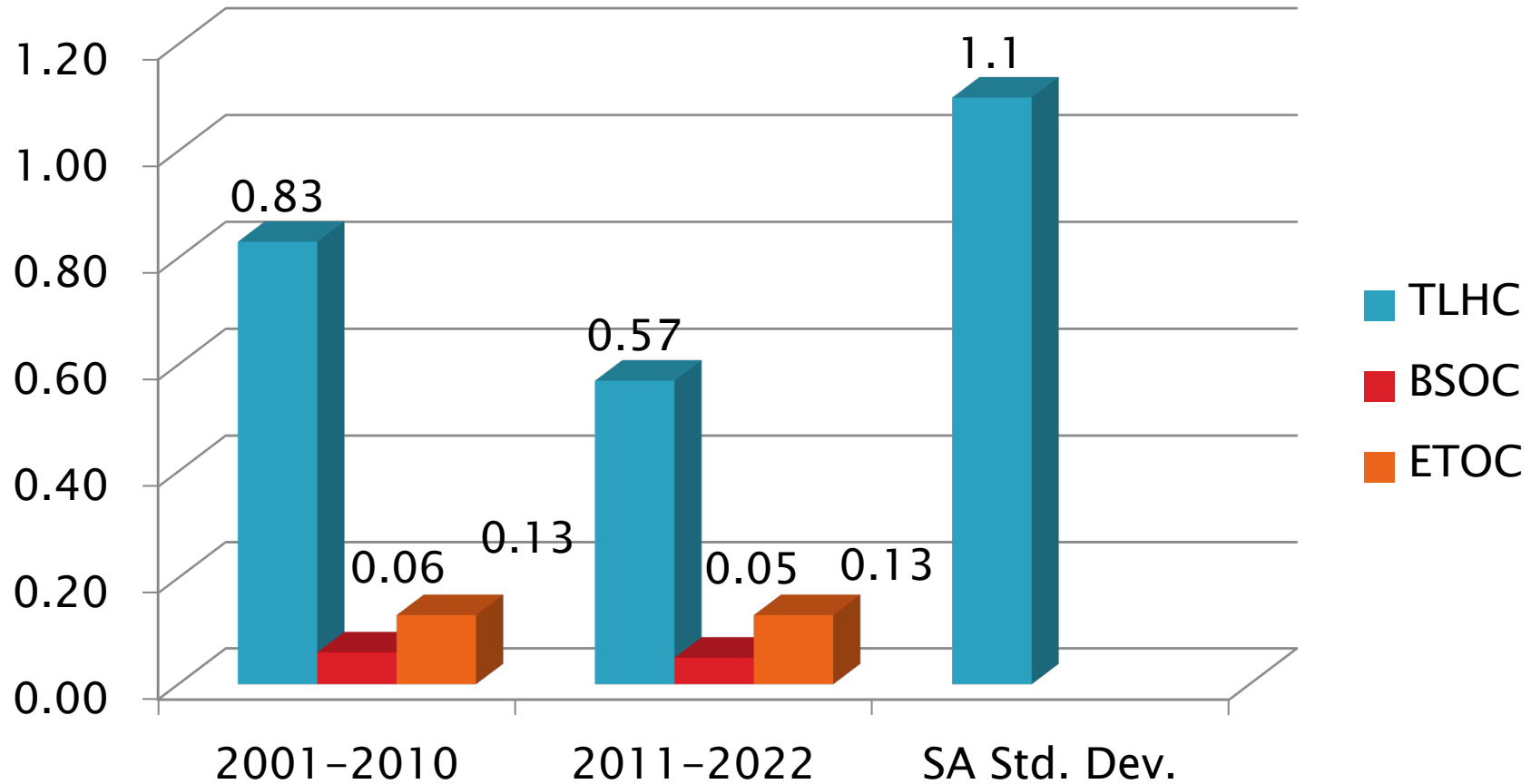




# 1 K Precision Estimates



# 1 K Precision Estimates



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# SCOTE 1N

➤➤ April 2023

# 1 N Test Activity

Test Status	Validity Code	#
Acceptable Calibration Test	AC	1
Failed Calibration Test	OC	0
Operationally Invalid	LC	1
Aborted	XC	0
Informational	NN	0
<b>Total</b>		<b>2</b>

# 1 N Failed Tests

Failed Parameter	Number of Tests
No Failed Tests	0
<b>Total</b>	<b>0</b>

# 1 N Lost Tests\*

Status	Cause	#
Invalid	Exceeded downtime limit	1
Aborted	No aborted tests	0
<b>Total</b>		<b>1</b>

\*Invalid and aborted tests



# 1 N Test Severity

- ▶ WTD and TLHC are in control
- ▶ TGF is in precision action alarm
- ▶ BSOC is in severity warning limit in mild direction

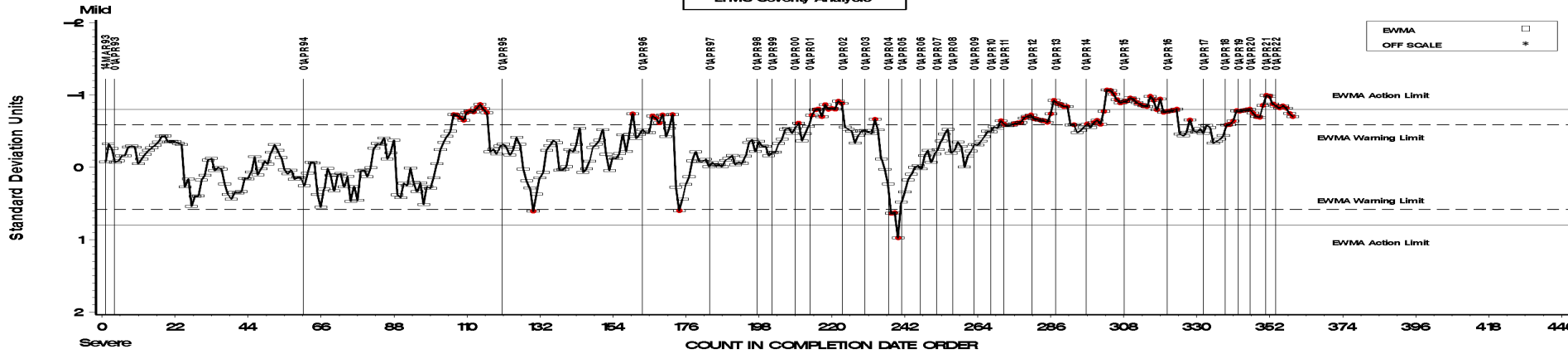
# CATERPILLAR 1N INDUSTRY OPERATIONALLY VALID DATA



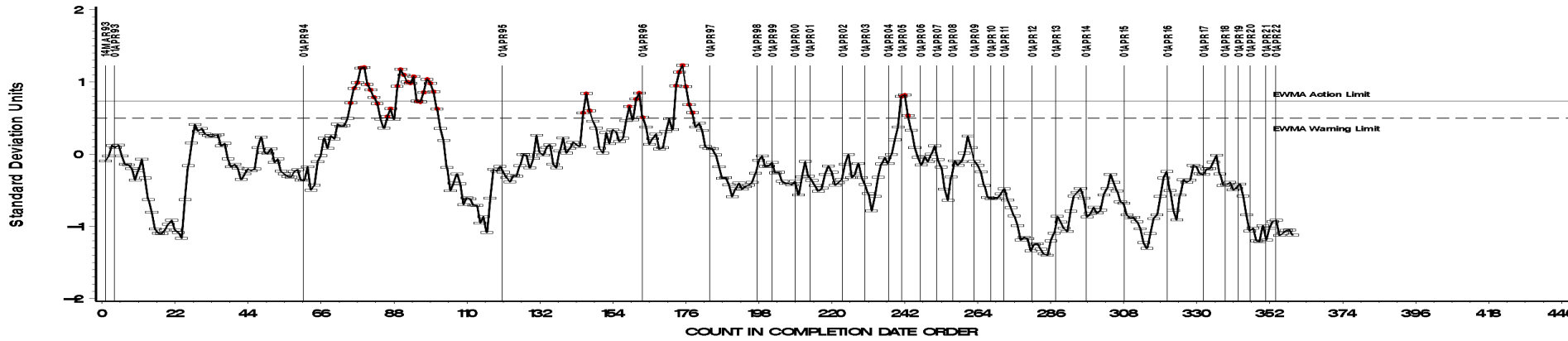
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## BSOC

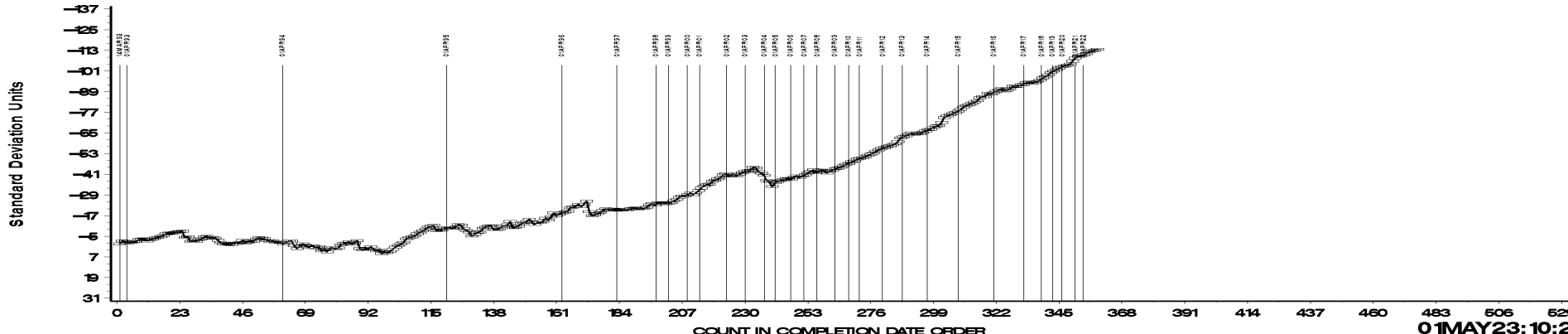
LTMS Severity Analysis



LTMS Precision Analysis



CUSUM Severity Analysis

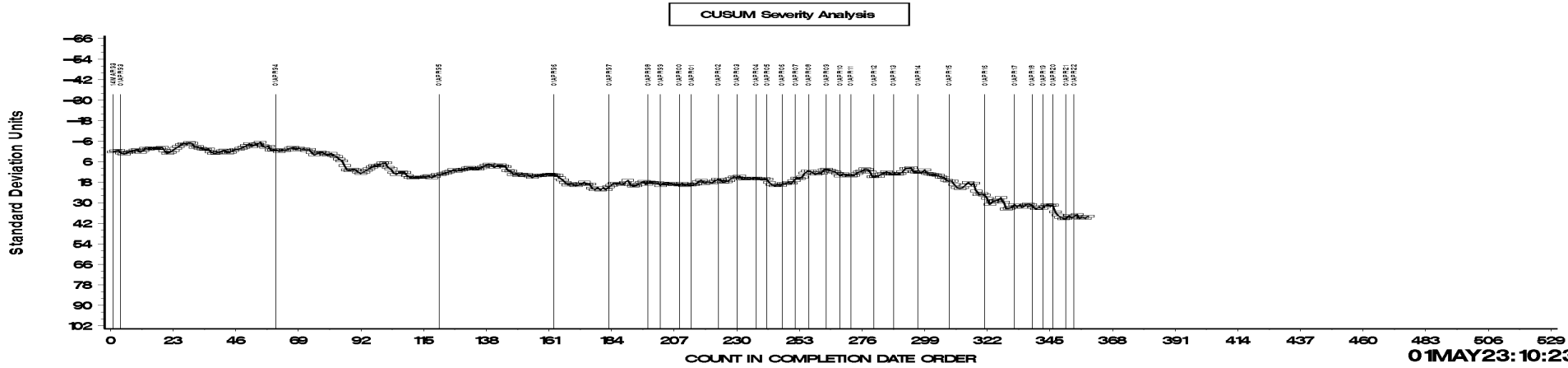
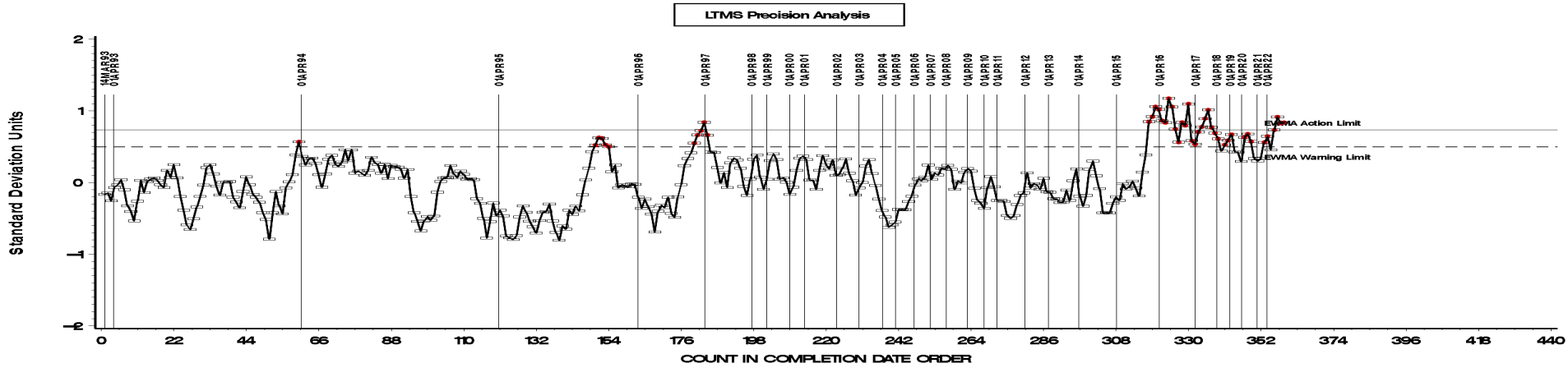
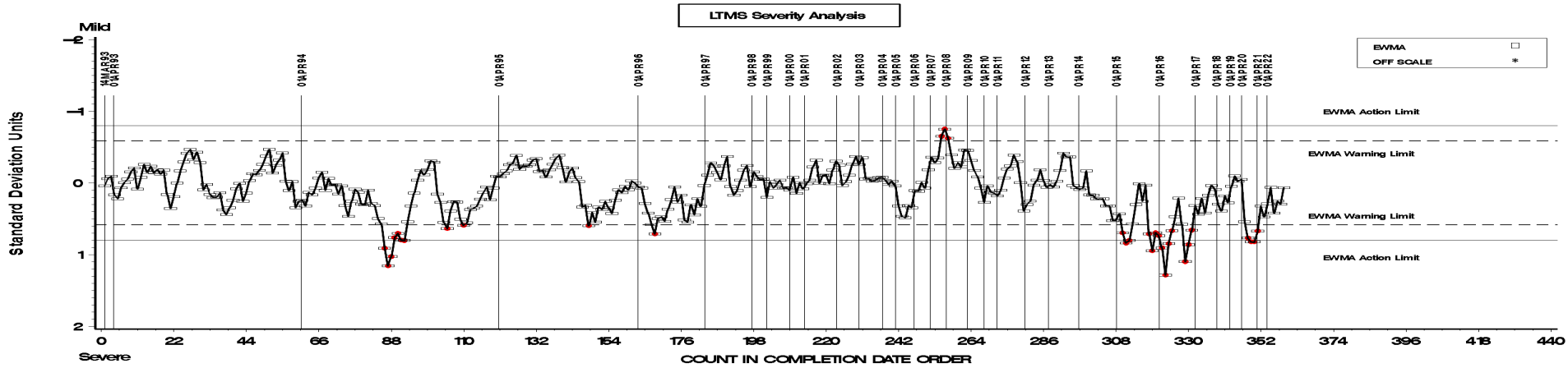


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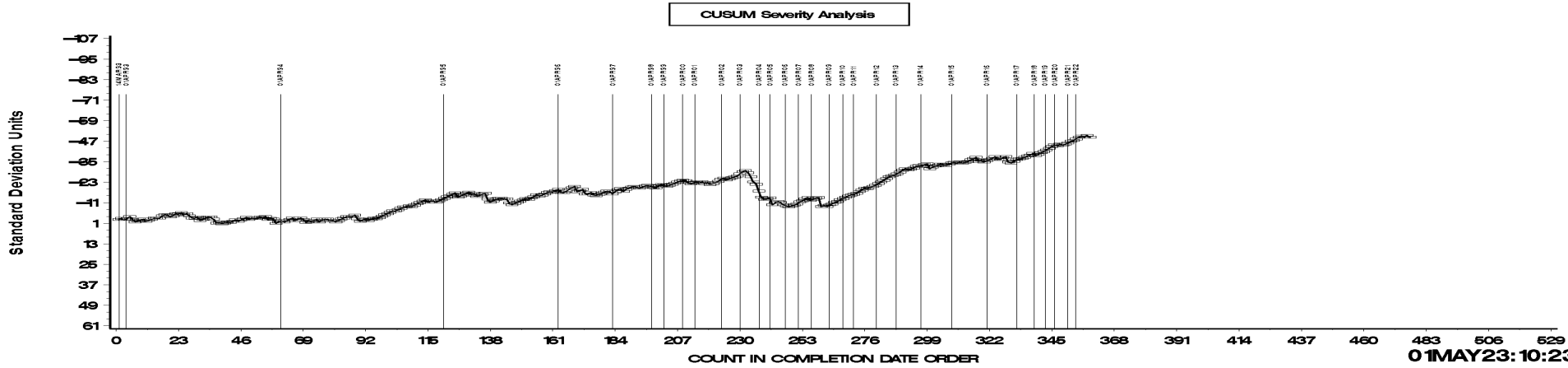
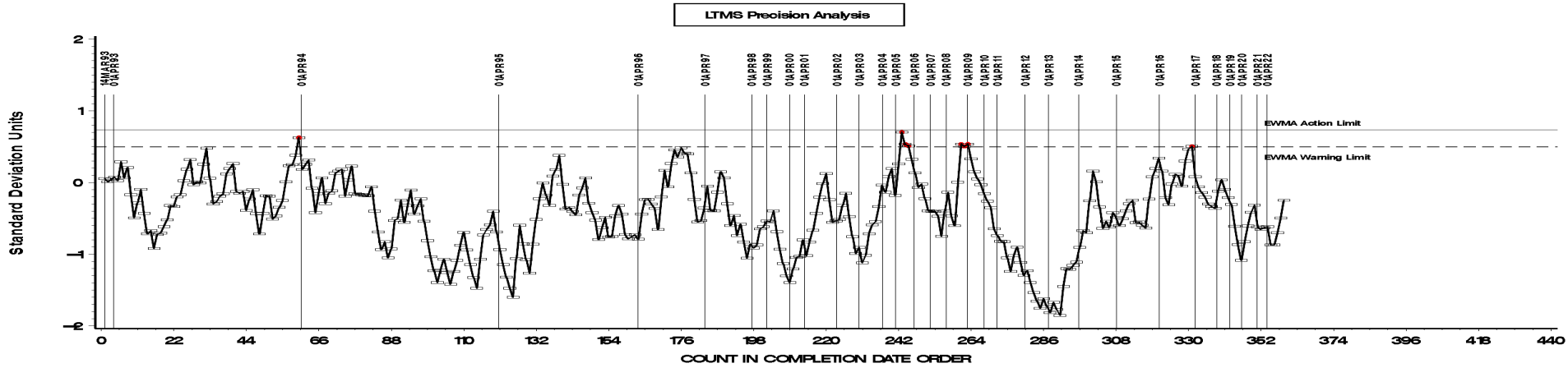
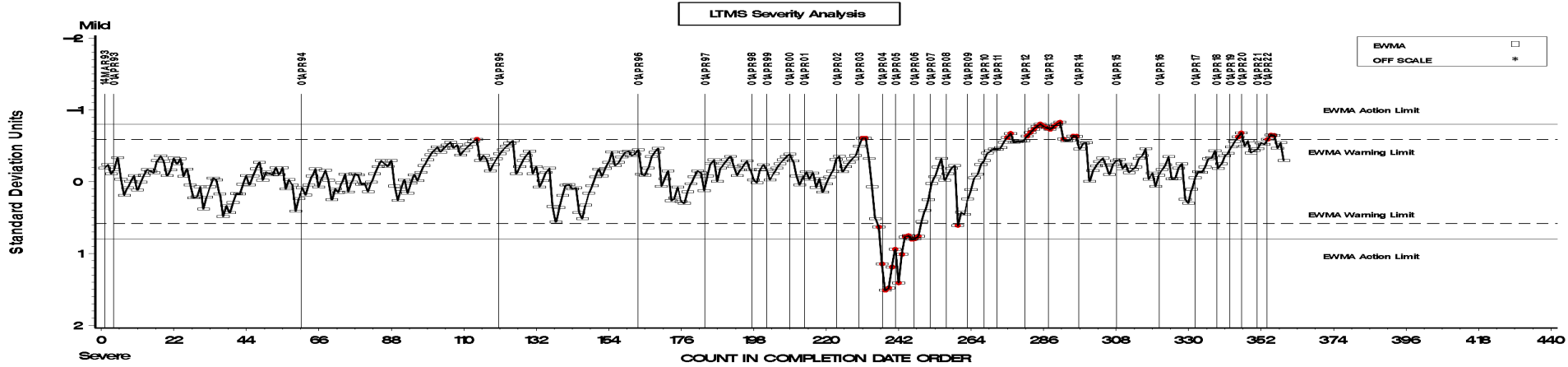


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## FINAL CORRECTED TGF

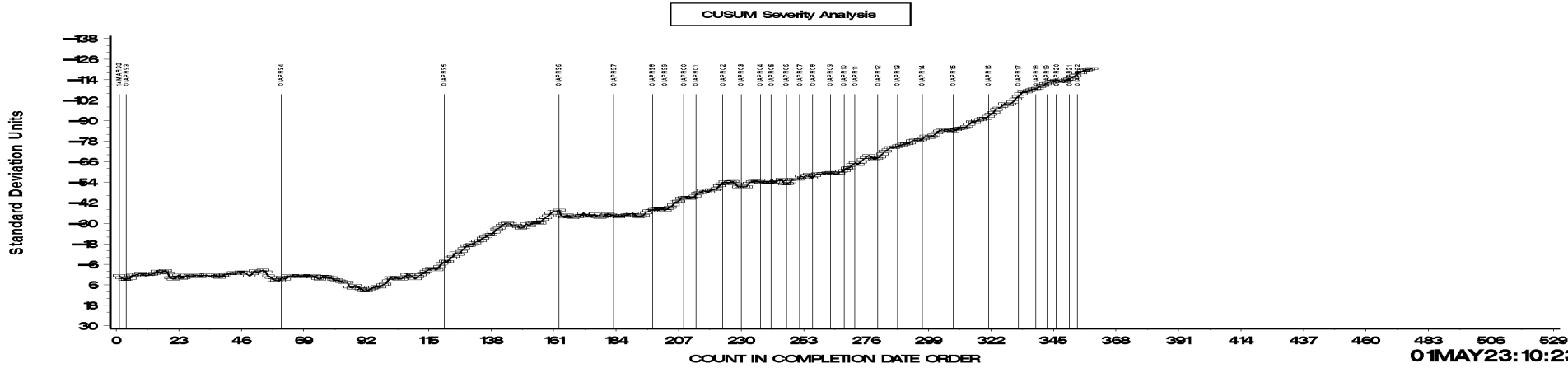
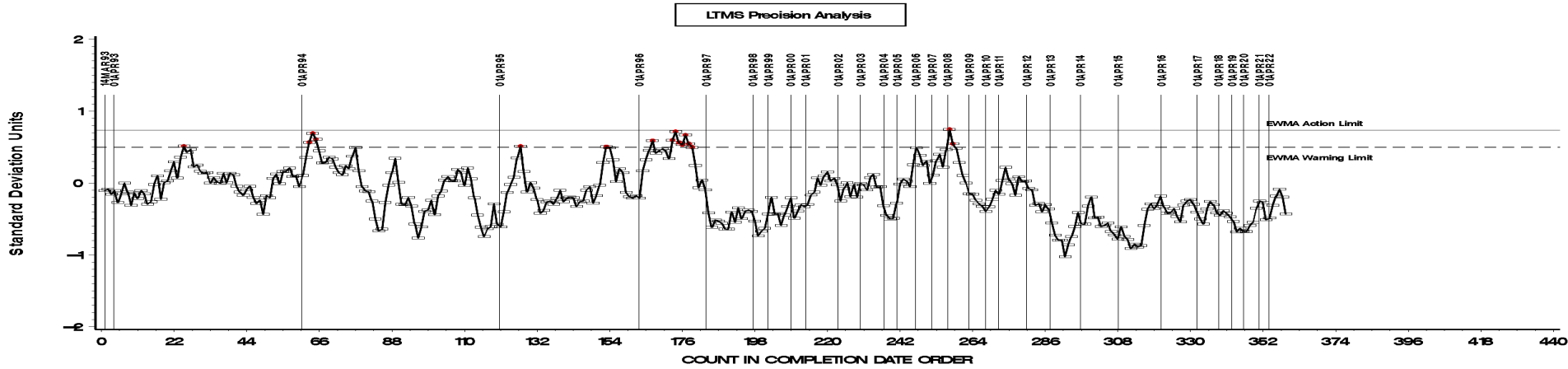
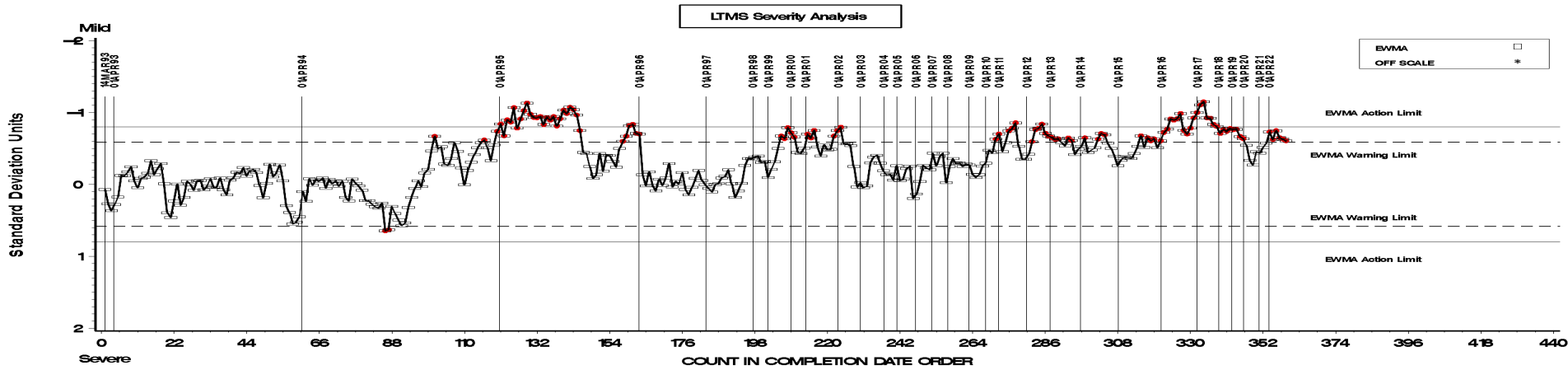


## Top Land Heavy Carbon

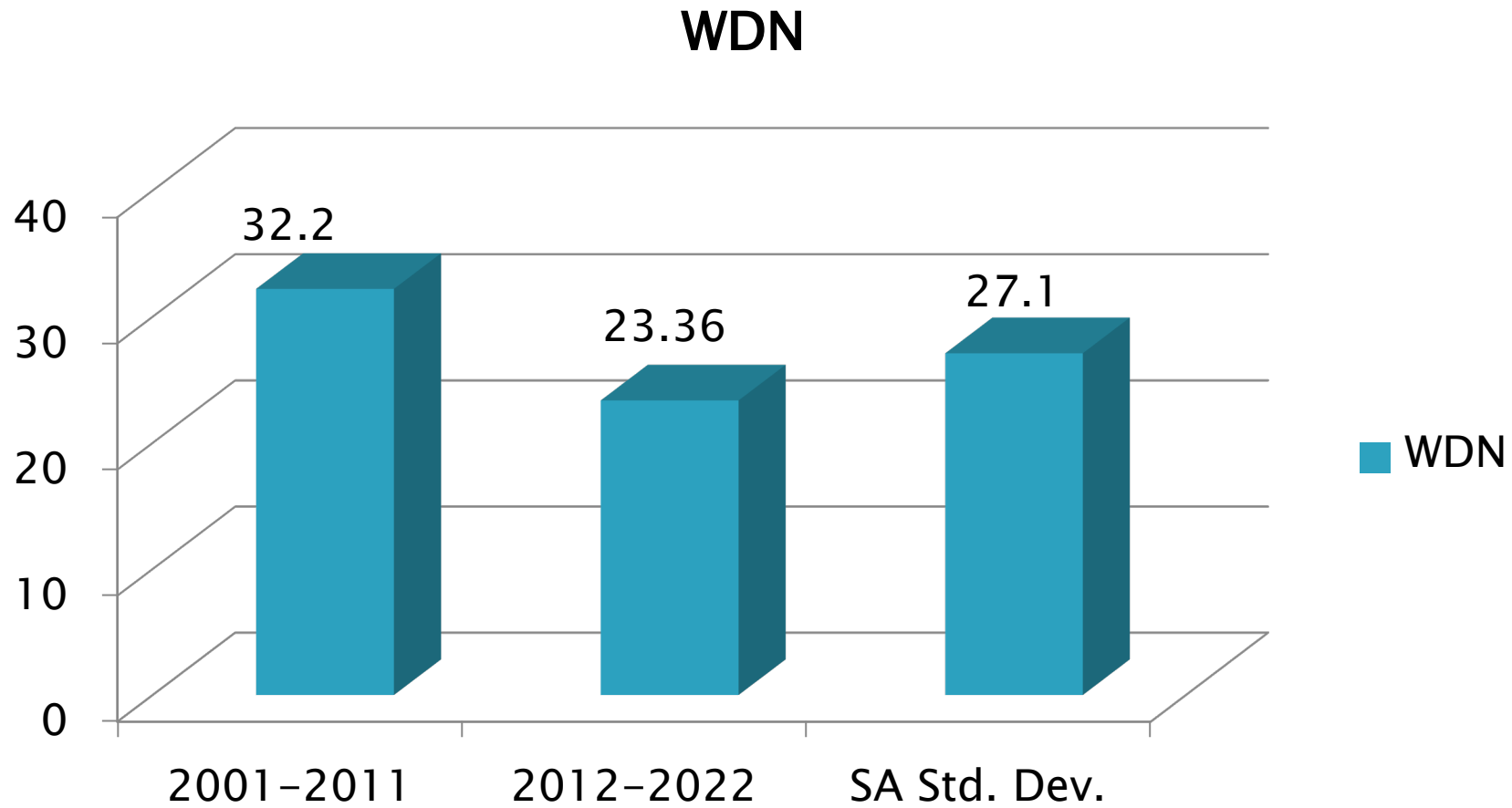




## Weighted Total Demerits

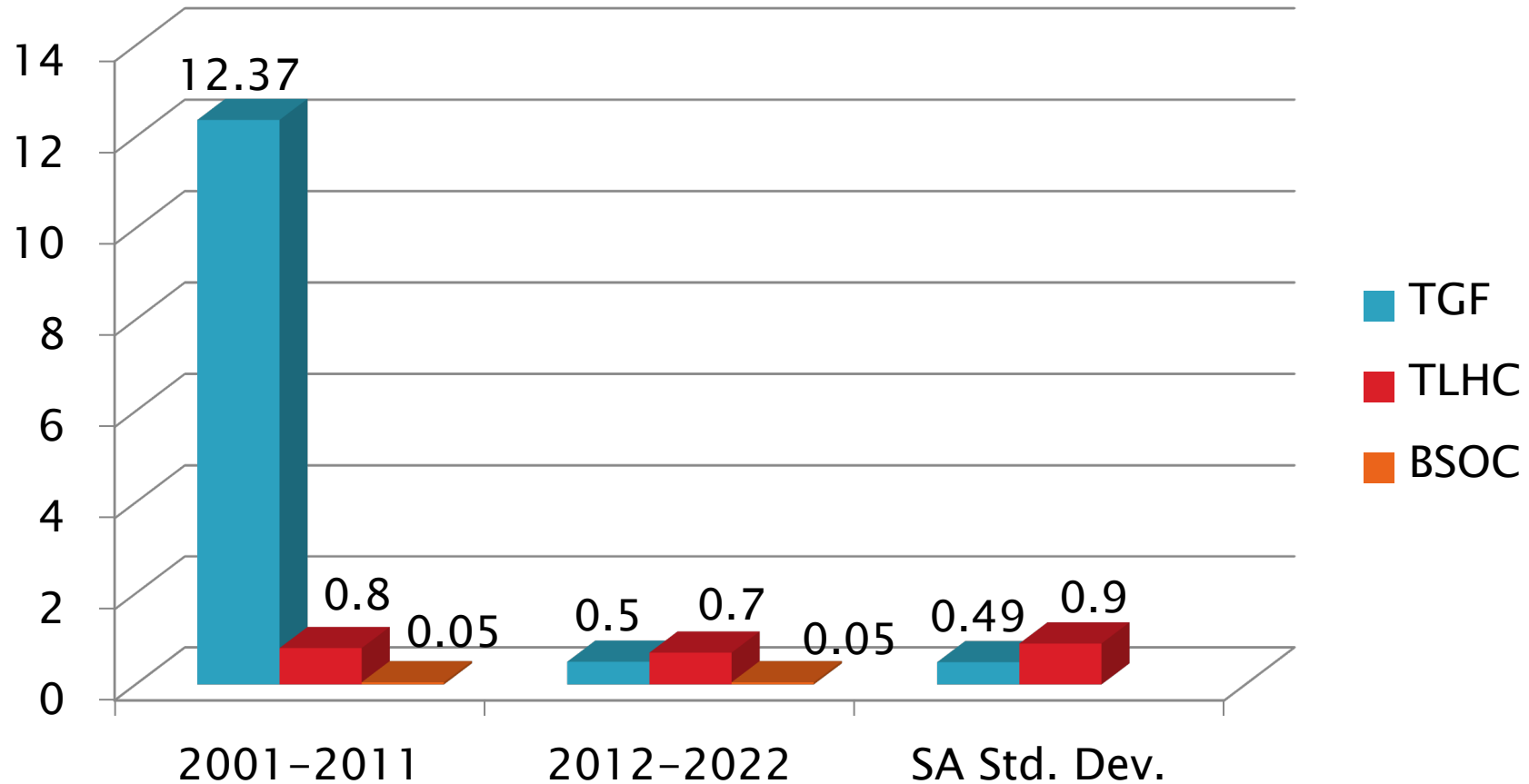


# 1 N Precision Estimates





# 1 N Precision Estimates



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# SCOTE 1 P

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# 1 P Test Activity

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

# 1 P Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
<b>Total</b>	<b>0</b>

# 1P Lost Tests\*

Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
<b>Total</b>		<b>0</b>

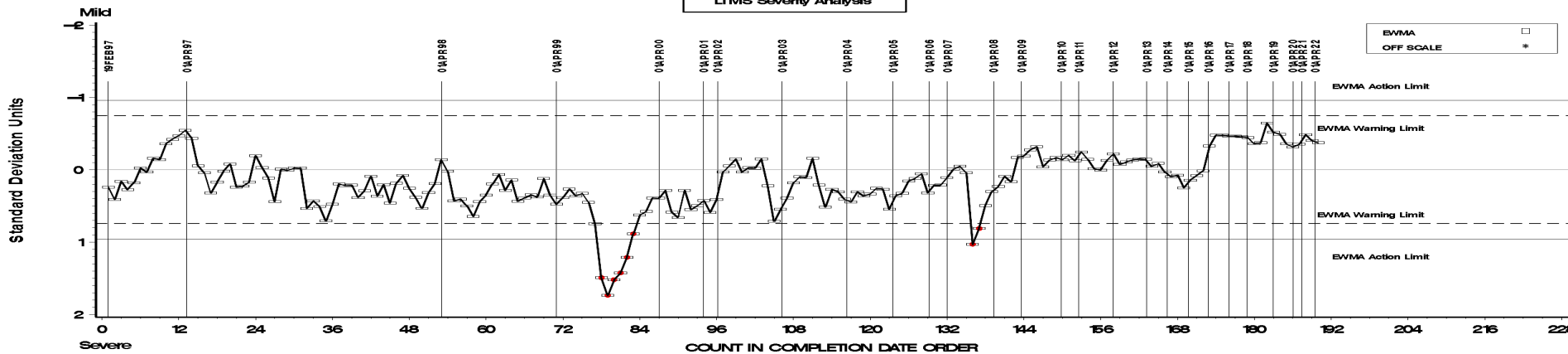
\*Invalid and aborted tests

# 1 P Test Severity

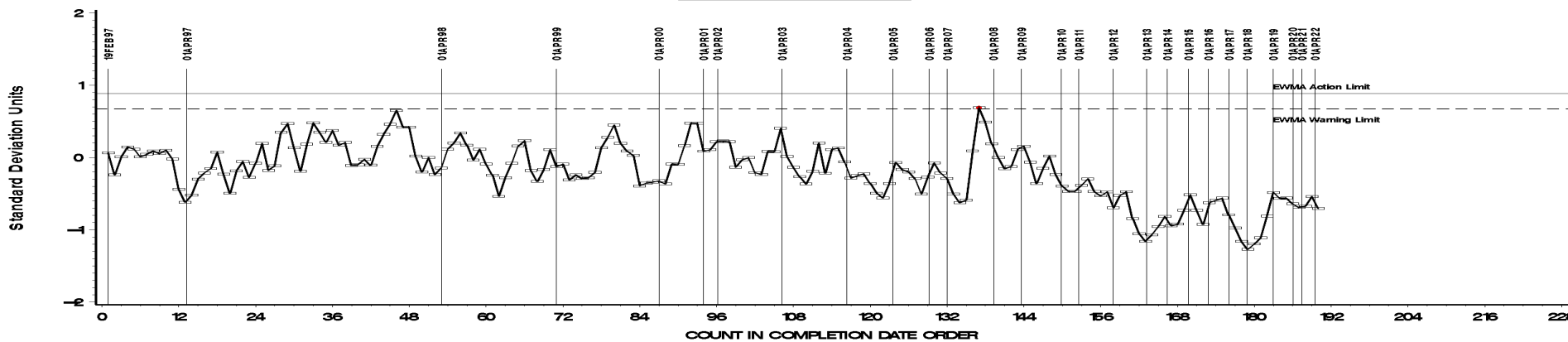
- ▶ As no 1P tests were run during the reporting period no statement about test severity can be made.

## TOP GROOVE CARBON

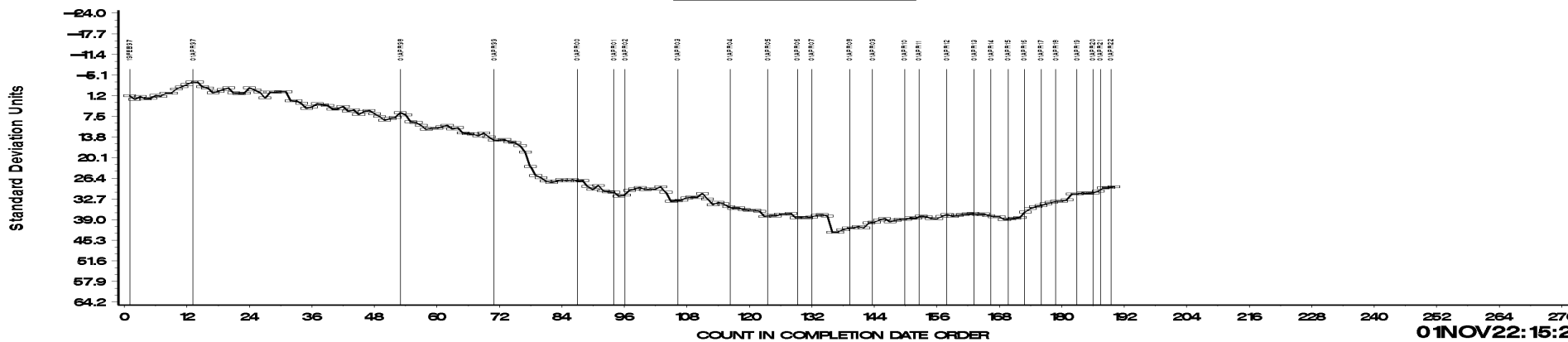
LTMS Severity Analysis



LTMS Precision Analysis

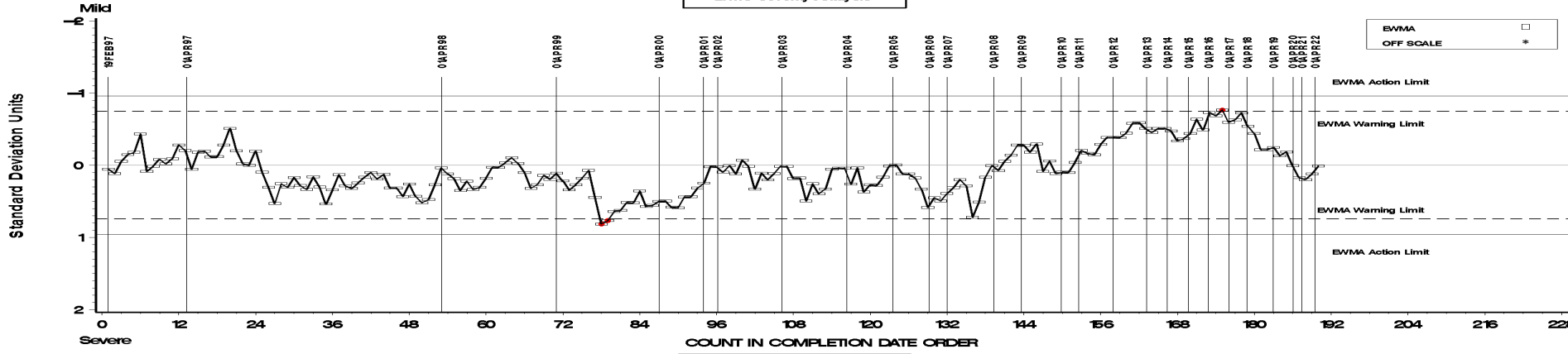


CUSUM Severity Analysis

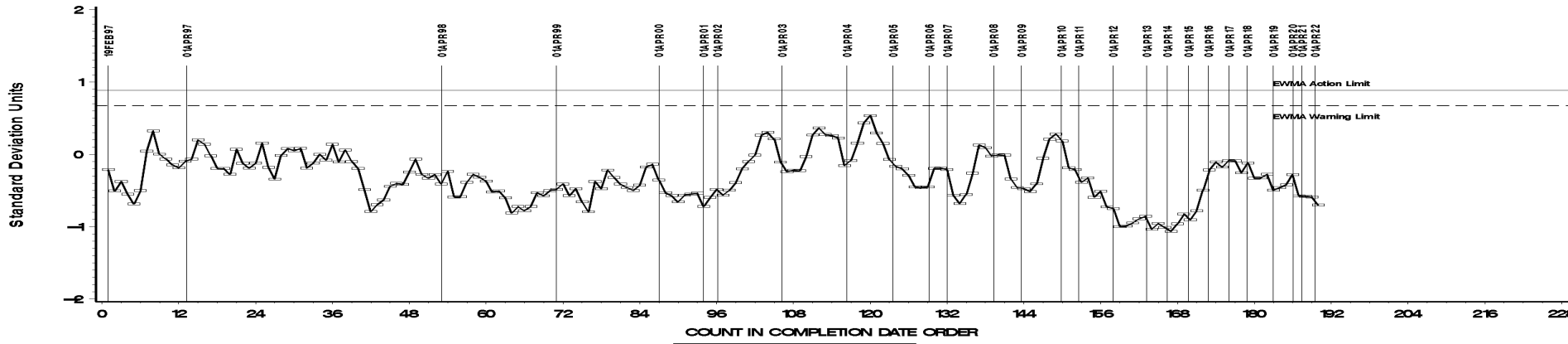


## TOP LAND CARBON

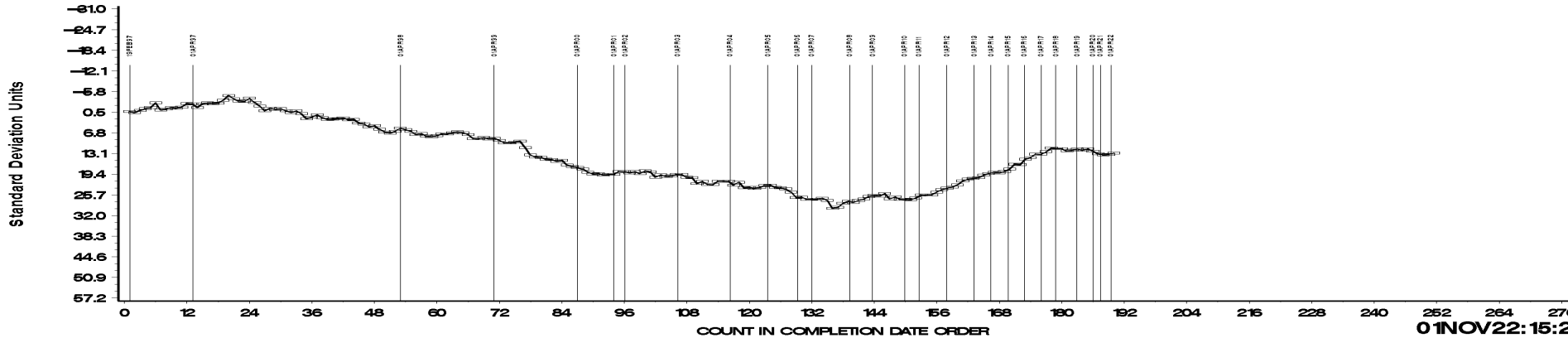
LTMS Severity Analysis



LTMS Precision Analysis



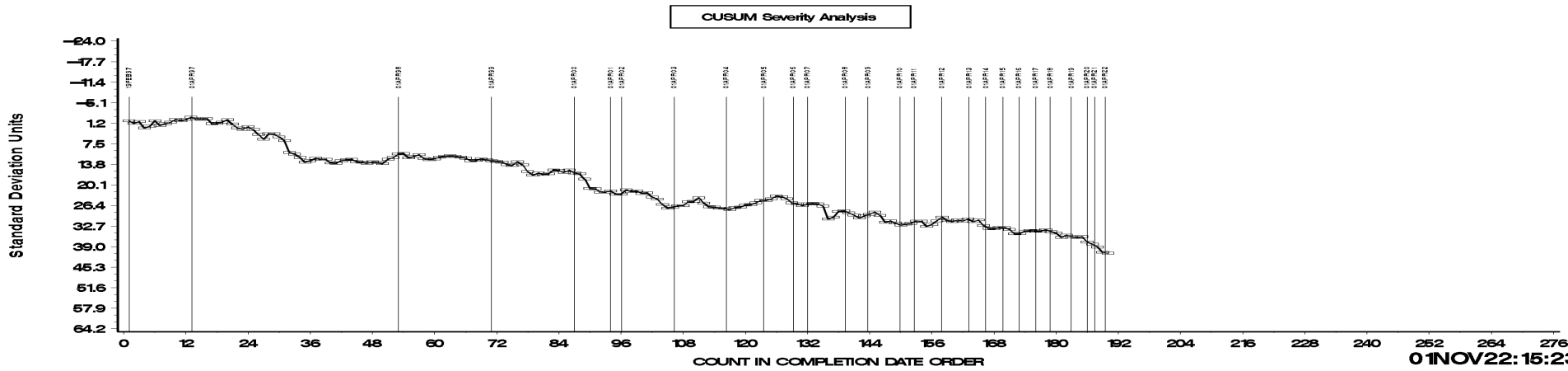
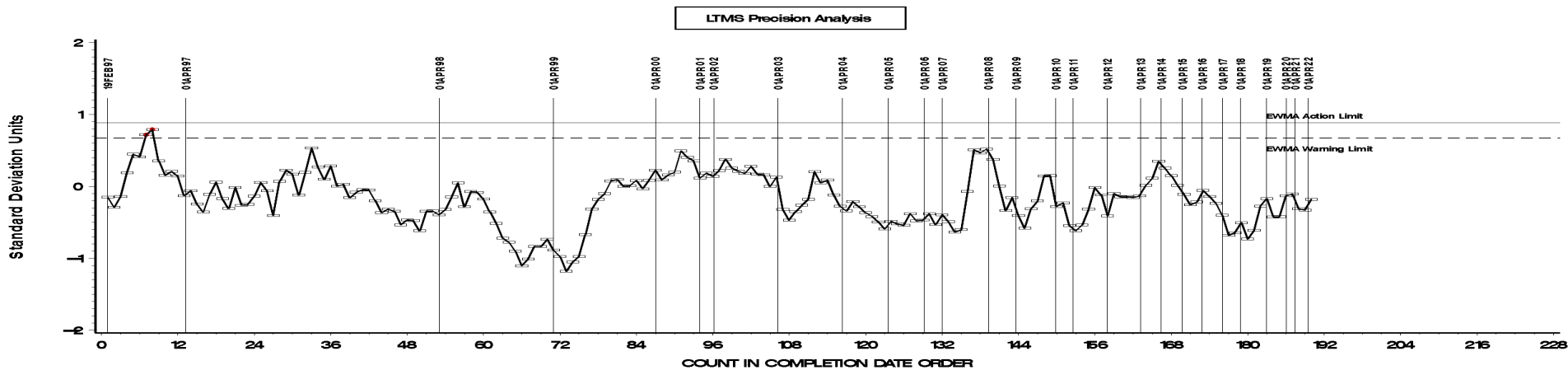
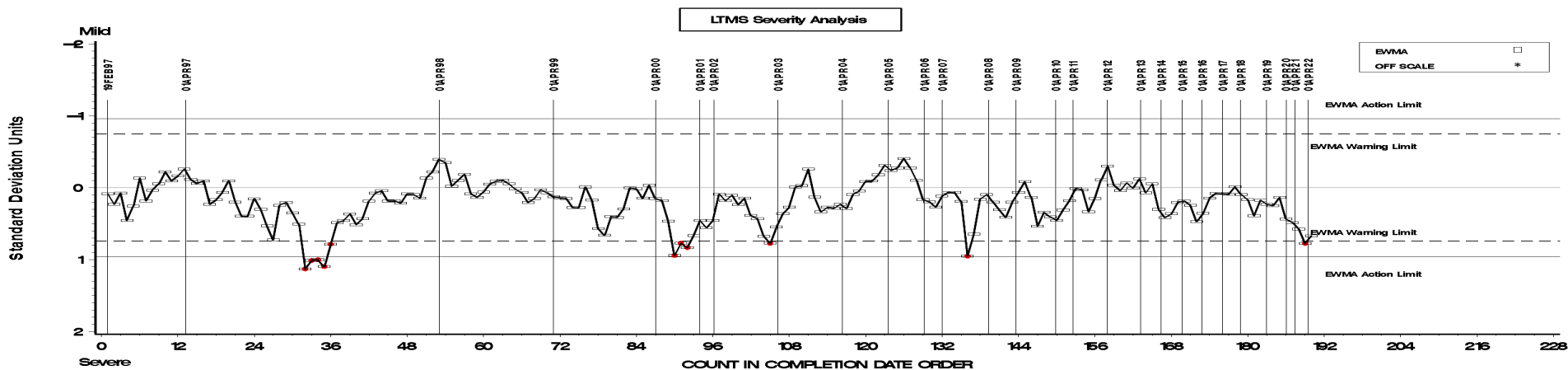
CUSUM Severity Analysis







## WEIGHTED TOTAL DEMERITS



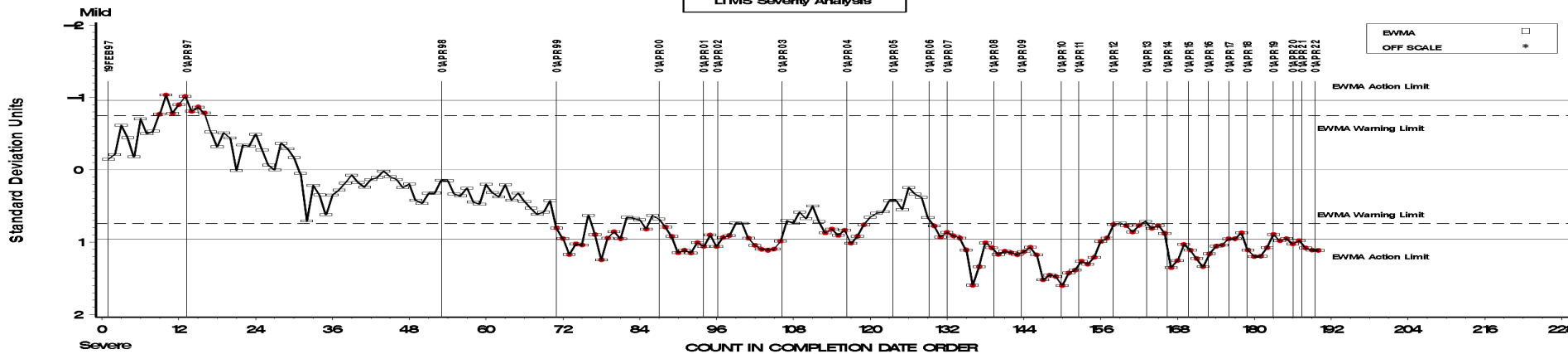
# CATERPILLAR 1P INDUSTRY OPERATIONALLY VALID DATA



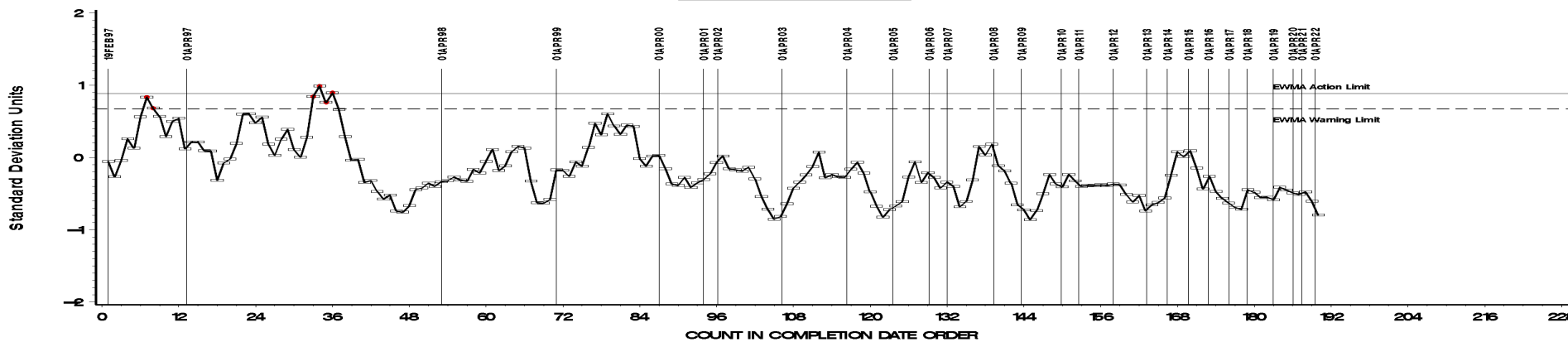
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## EOTOC

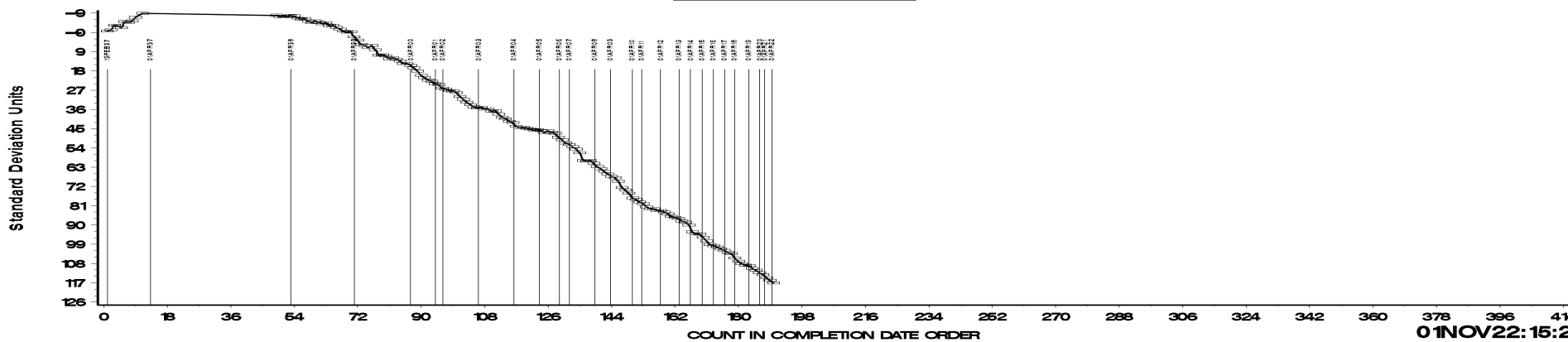
LTMS Severity Analysis



LTMS Precision Analysis

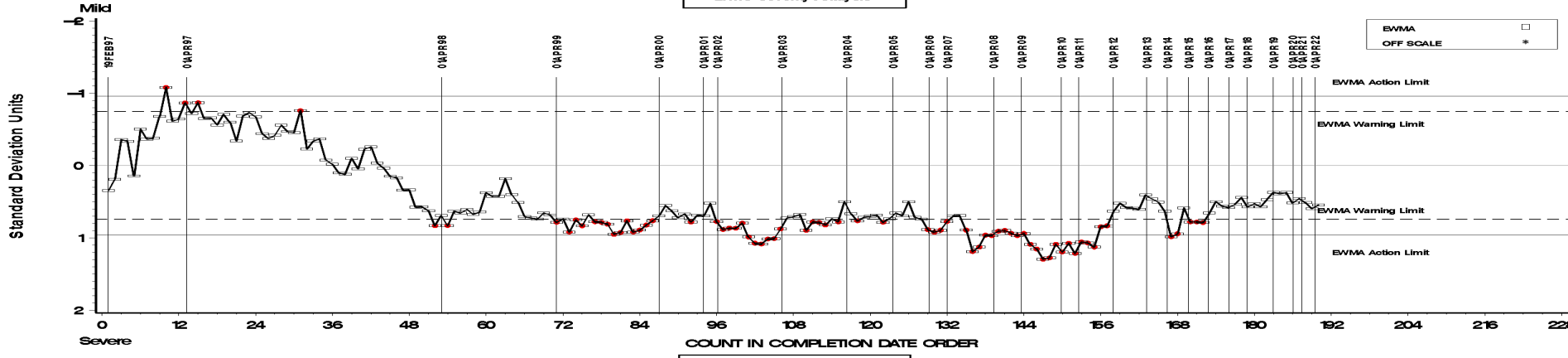


CUSUM Severity Analysis

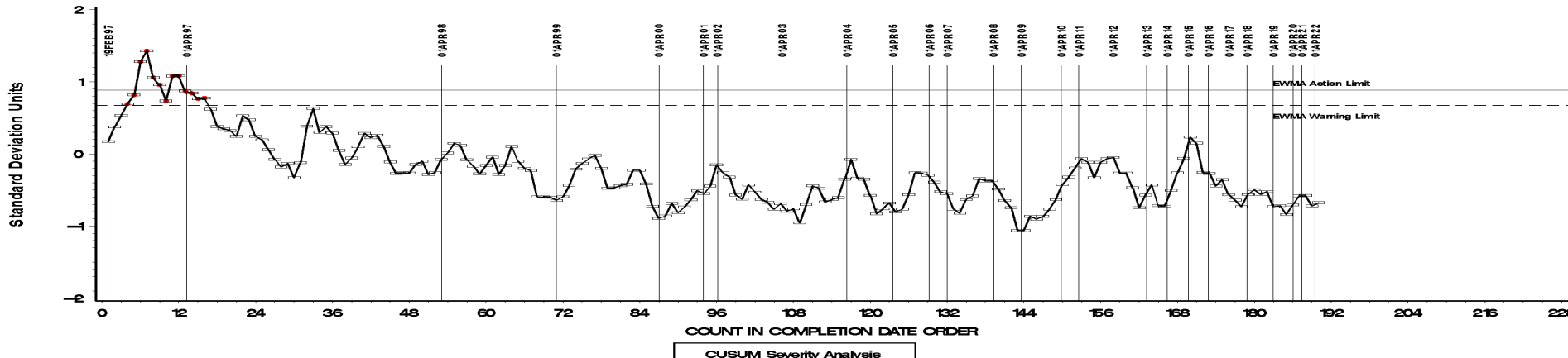


## OIL CONSUMPTION

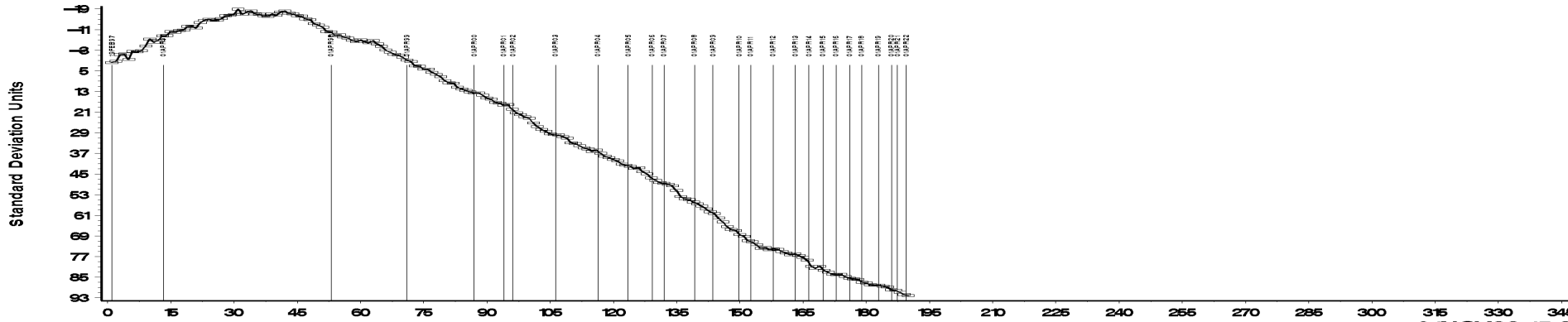
LTMS Severity Analysis



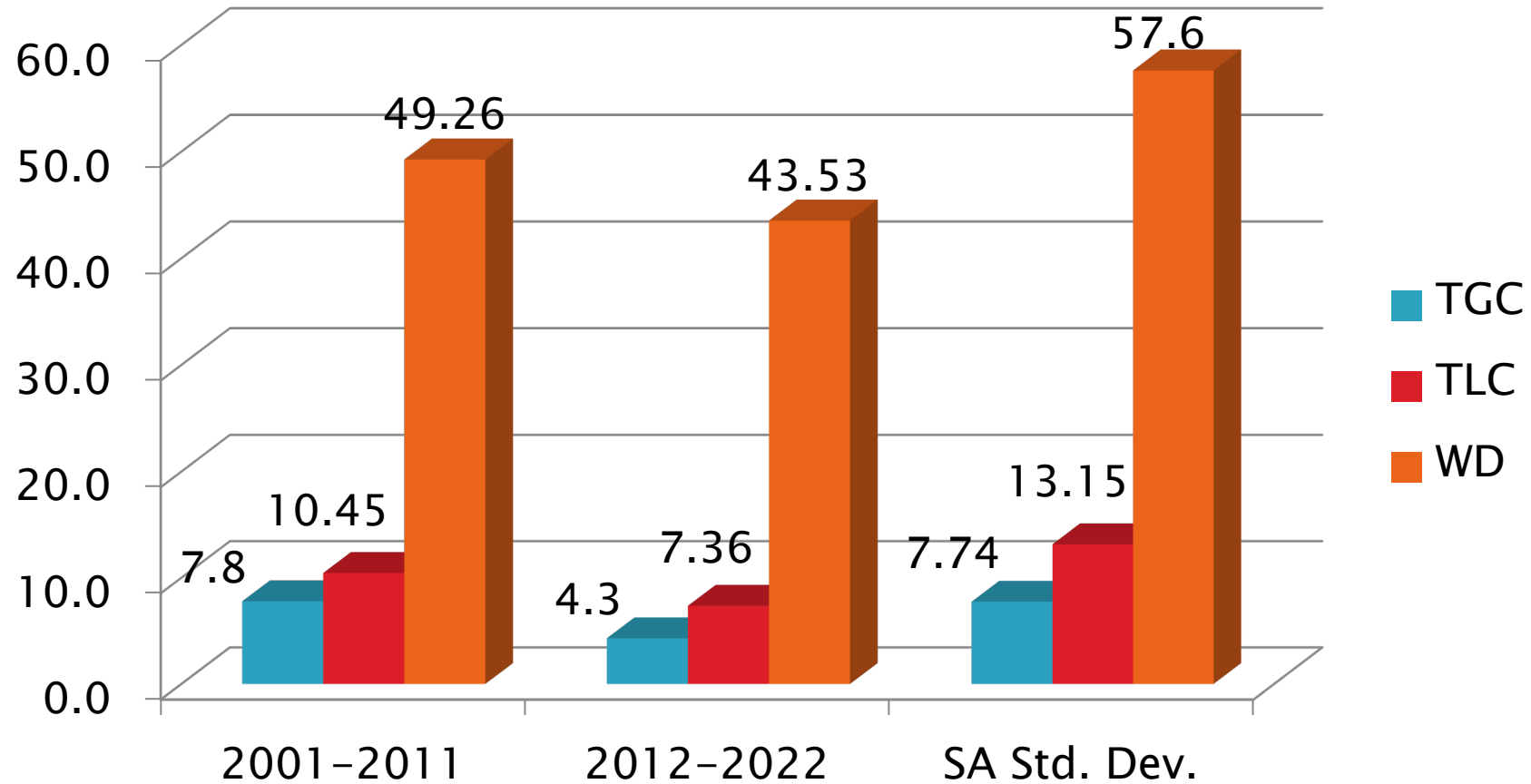
LTMS Precision Analysis



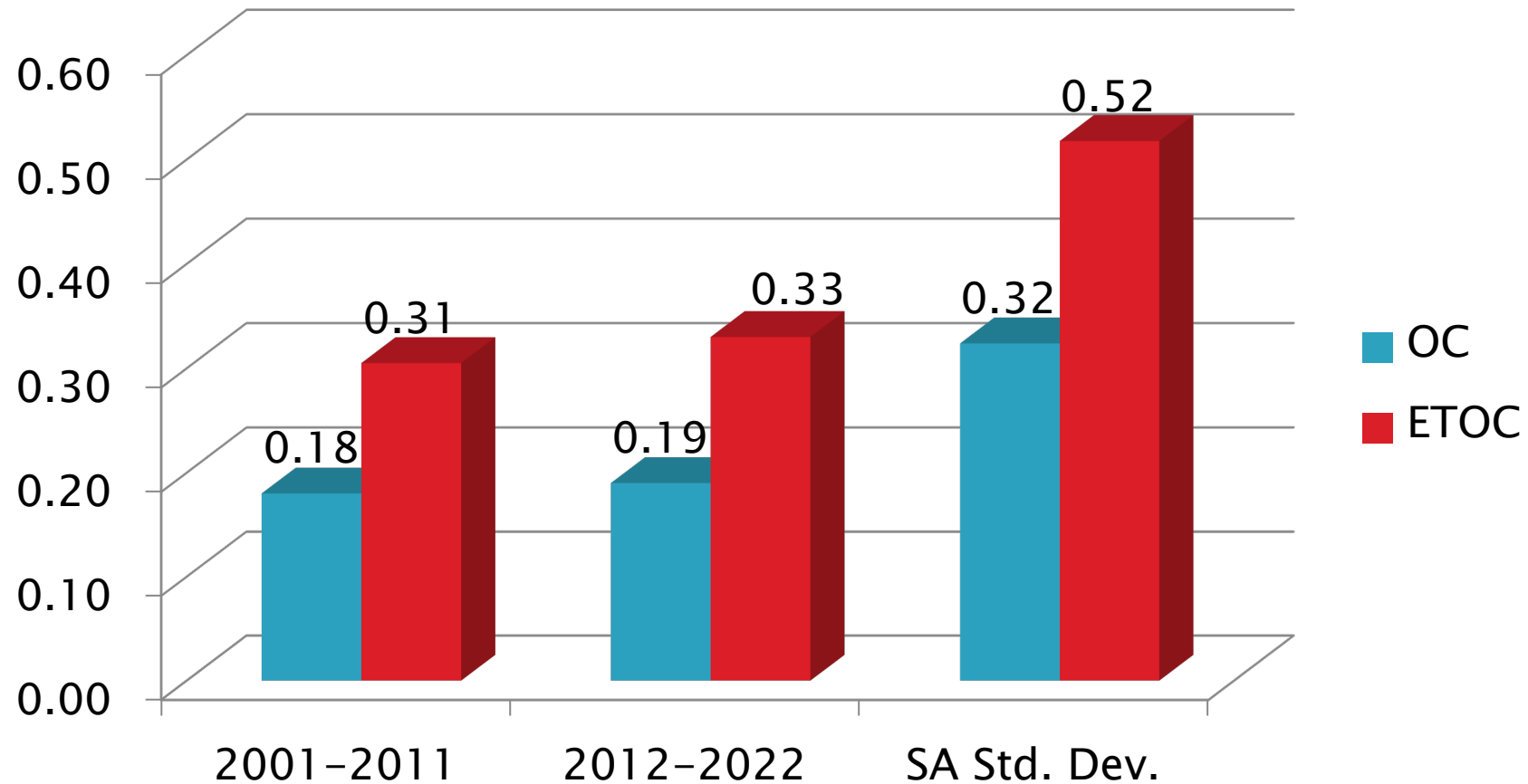
CUSUM Severity Analysis



# 1 P Precision Estimates



# 1 P Precision Estimates



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# SCOTE 1 R

➤➤ April 2023

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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
<b>Total</b>		<b>0</b>

# 1 R Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
<b>Total</b>	<b>0</b>



# 1 R Lost Tests\*

Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted test	0
<b>Total</b>		<b>0</b>

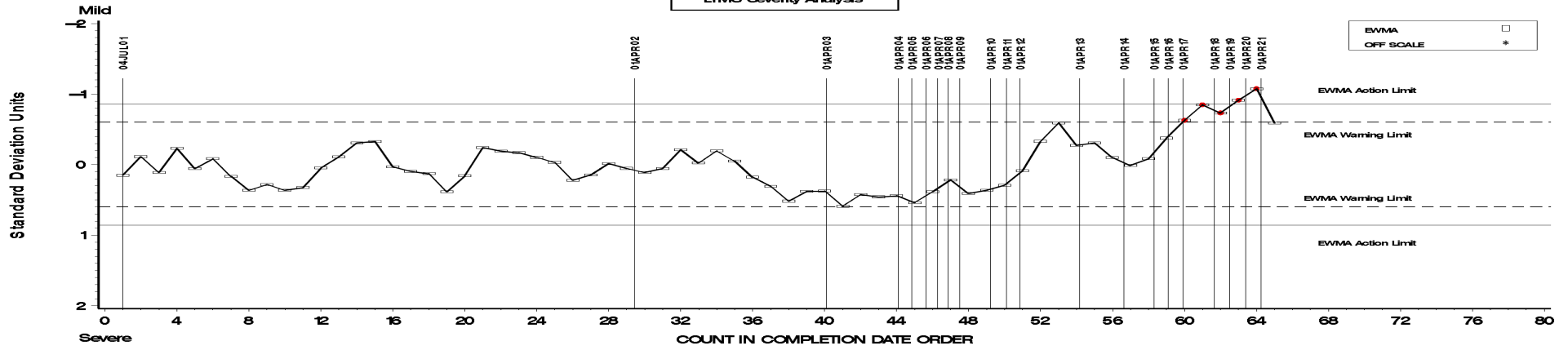
\*Invalid and aborted tests

# 1 R Test Severity

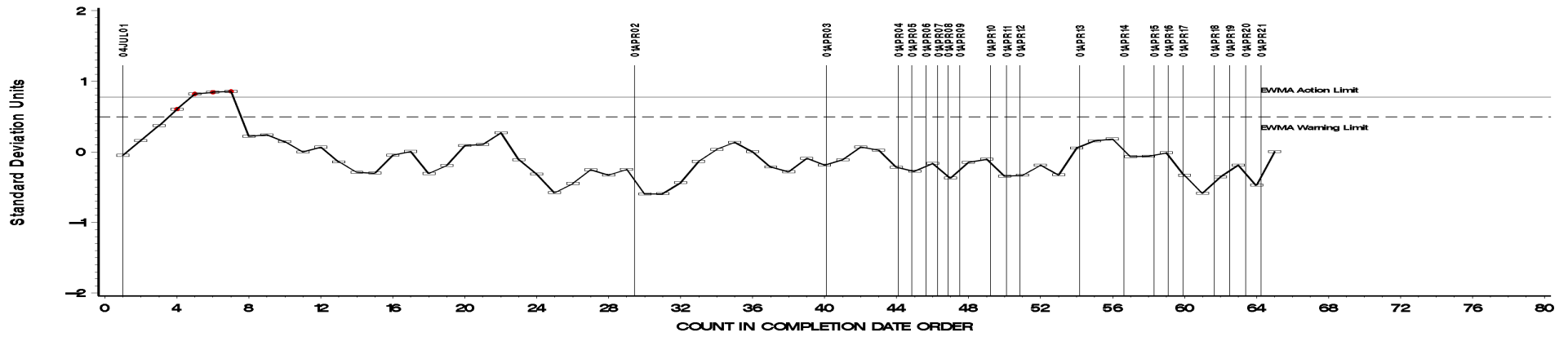
- ▶ As no 1R tests were run during this period no statement on test severity can be made.

## FINAL BOTOC

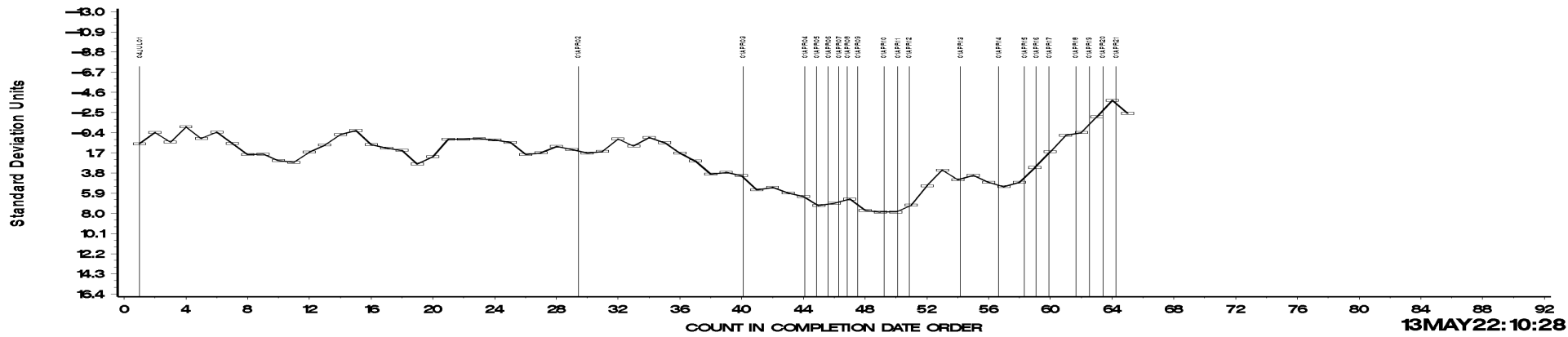
### LTMS Severity Analysis



### LTMS Precision Analysis



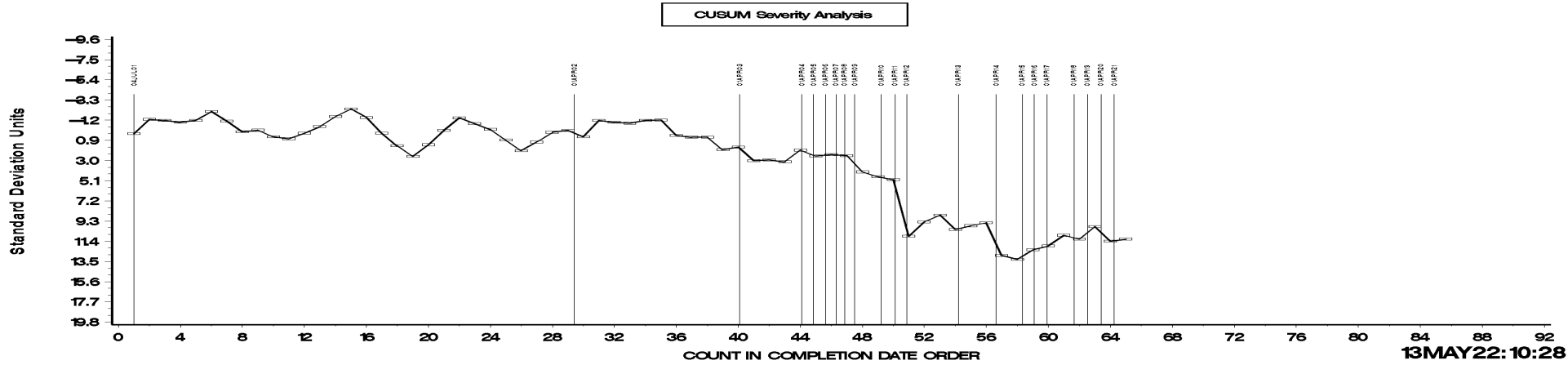
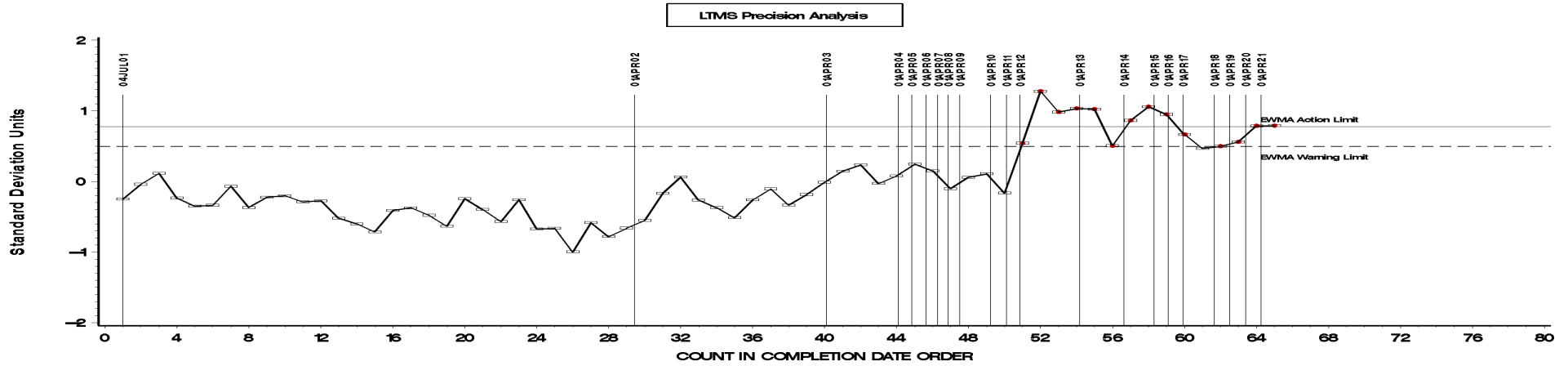
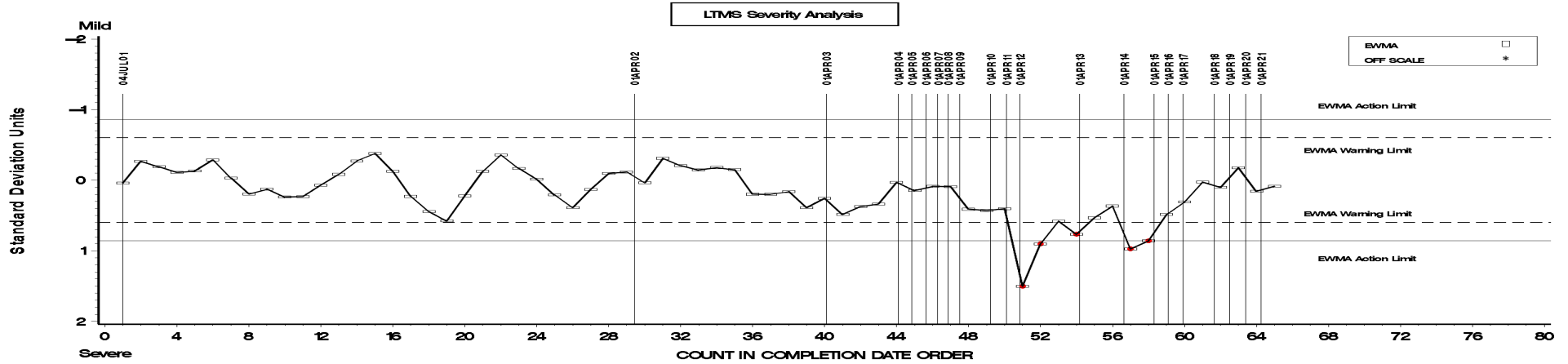
### CUSUM Severity Analysis



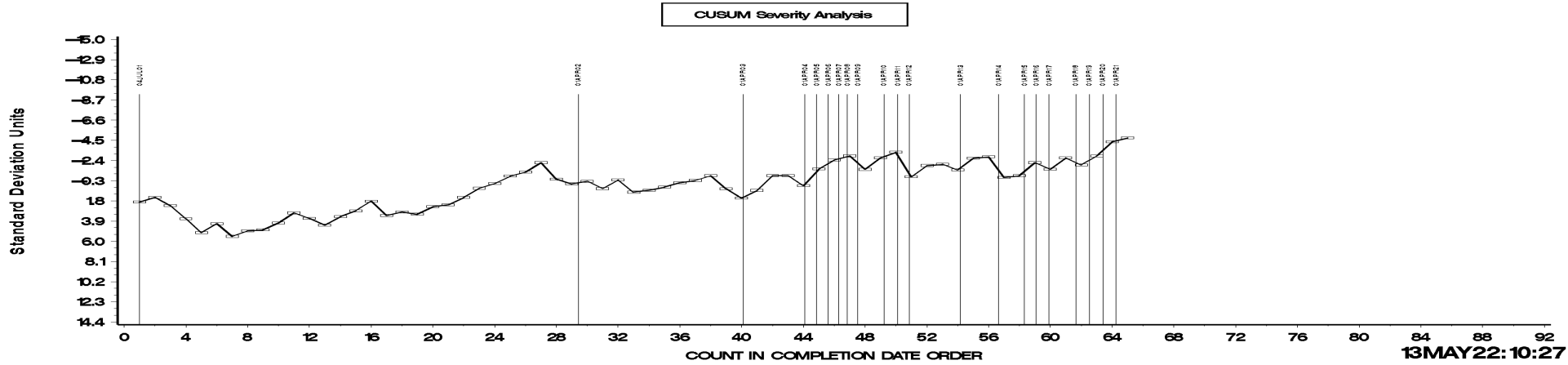
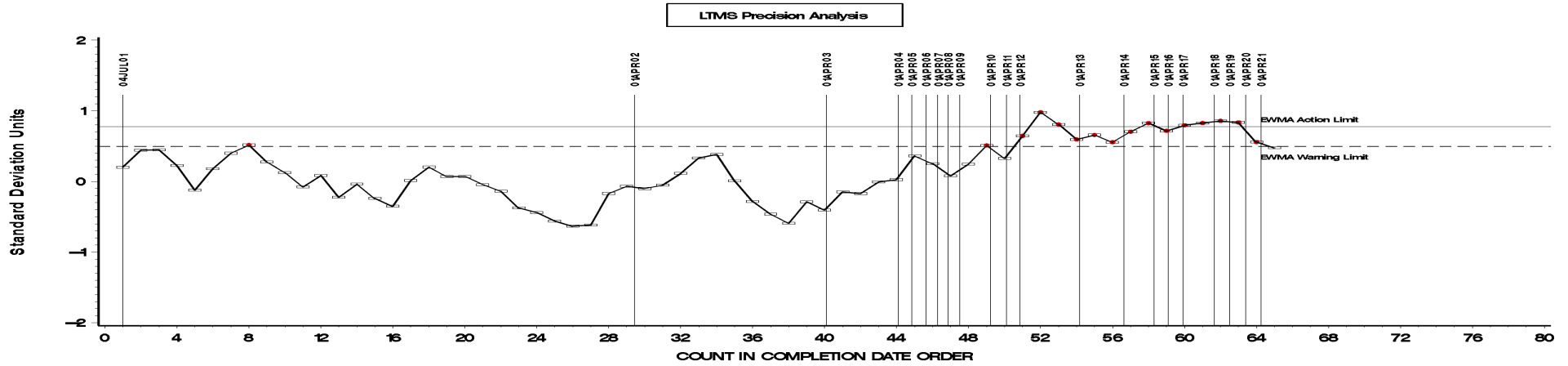
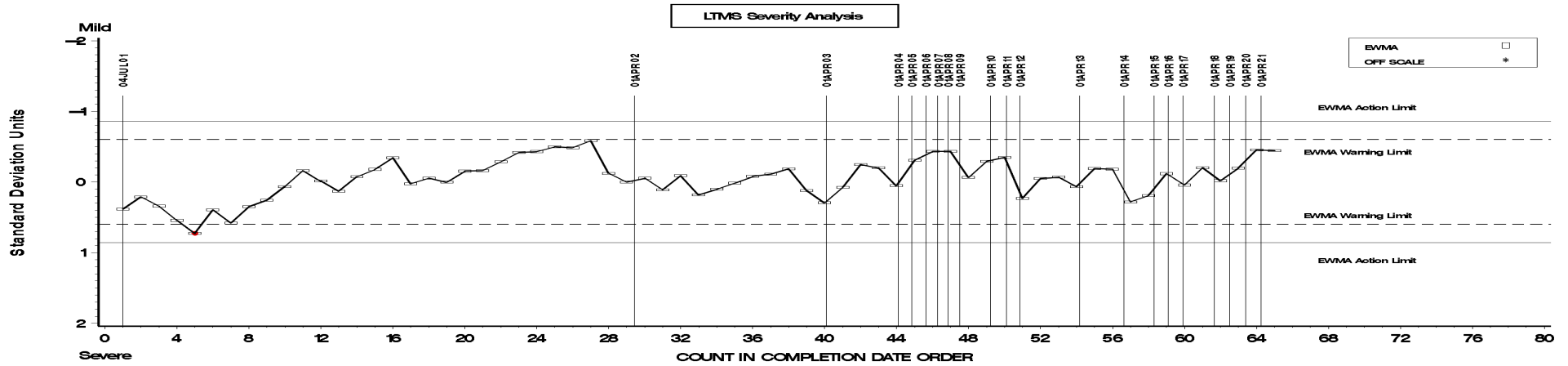
# CATERPILLAR 1R INDUSTRY OPERATIONALLY VALID DATA



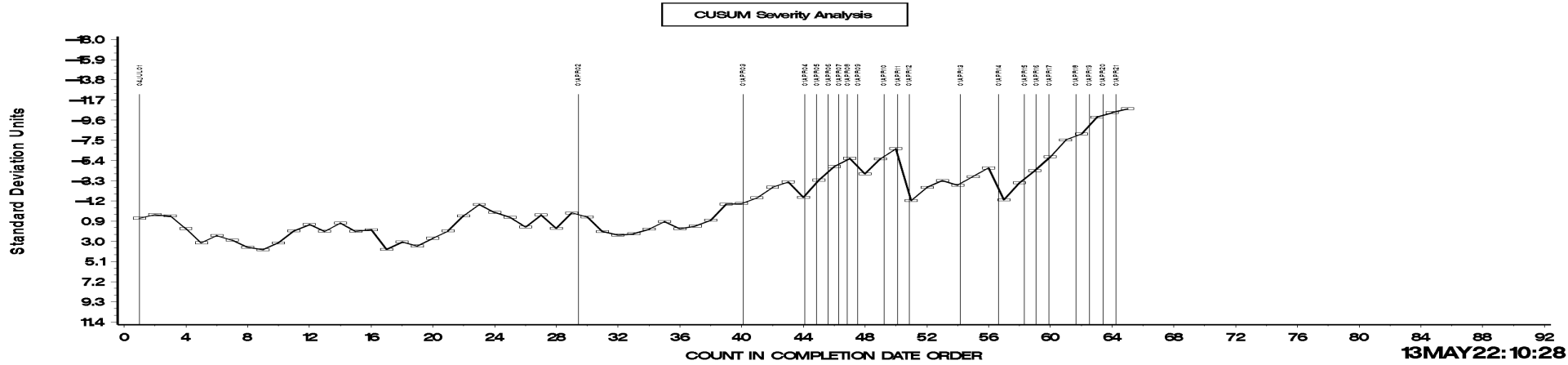
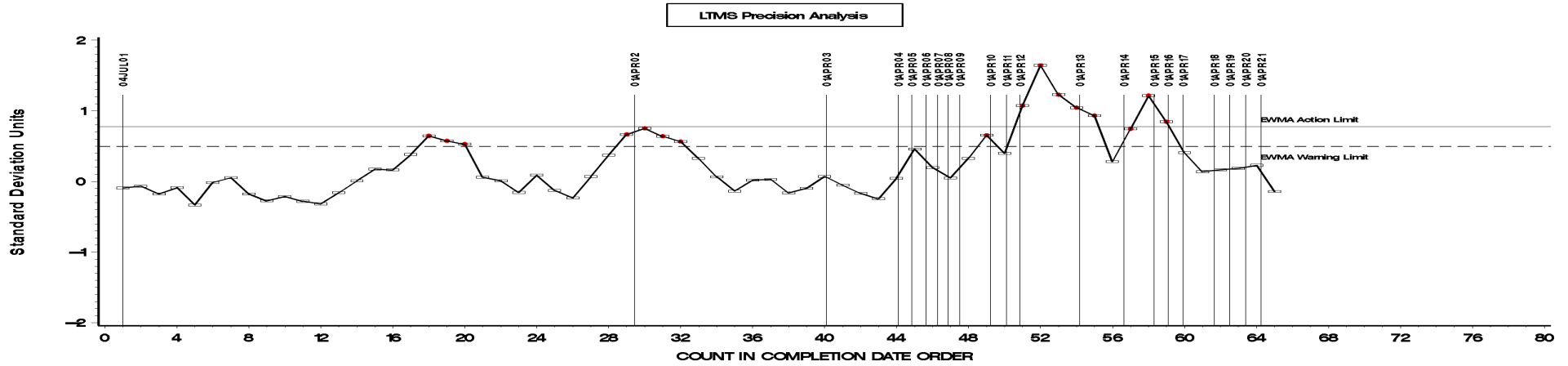
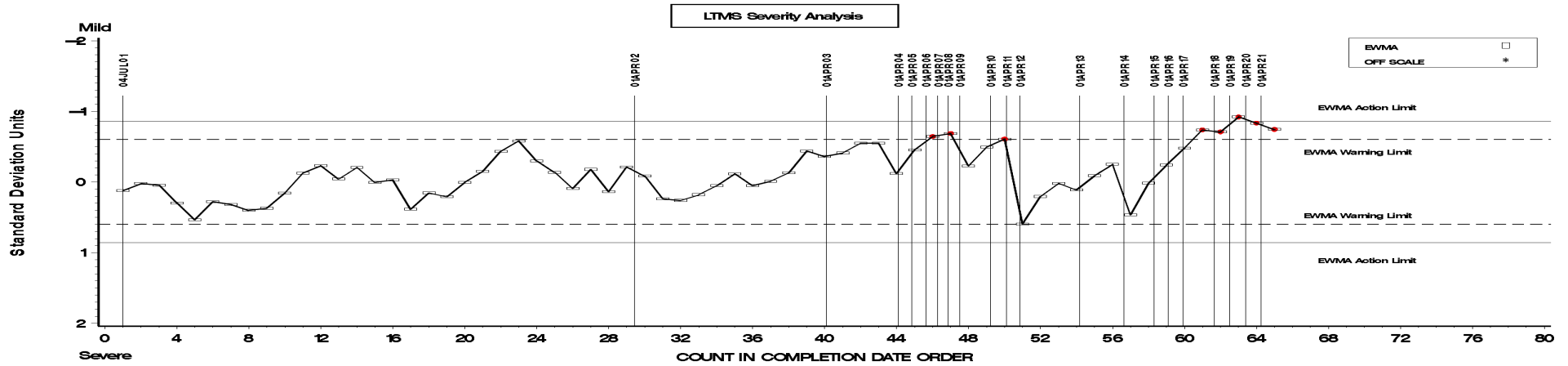
## FINAL EOTOC (g/h)



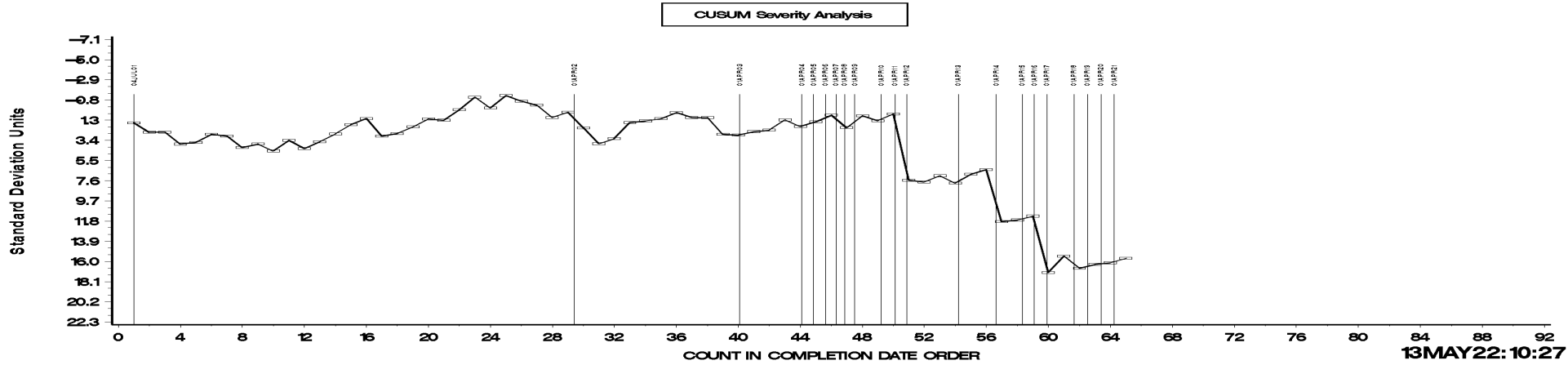
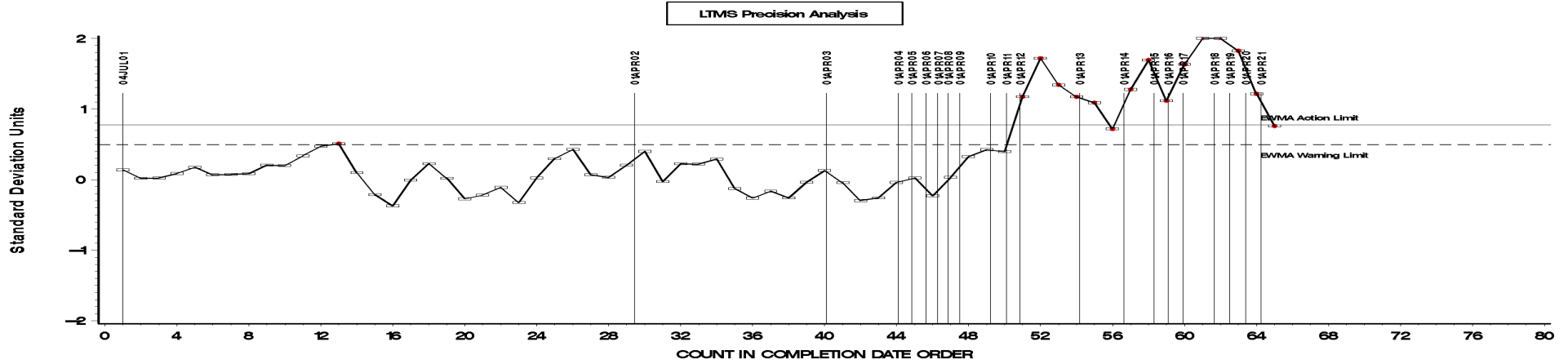
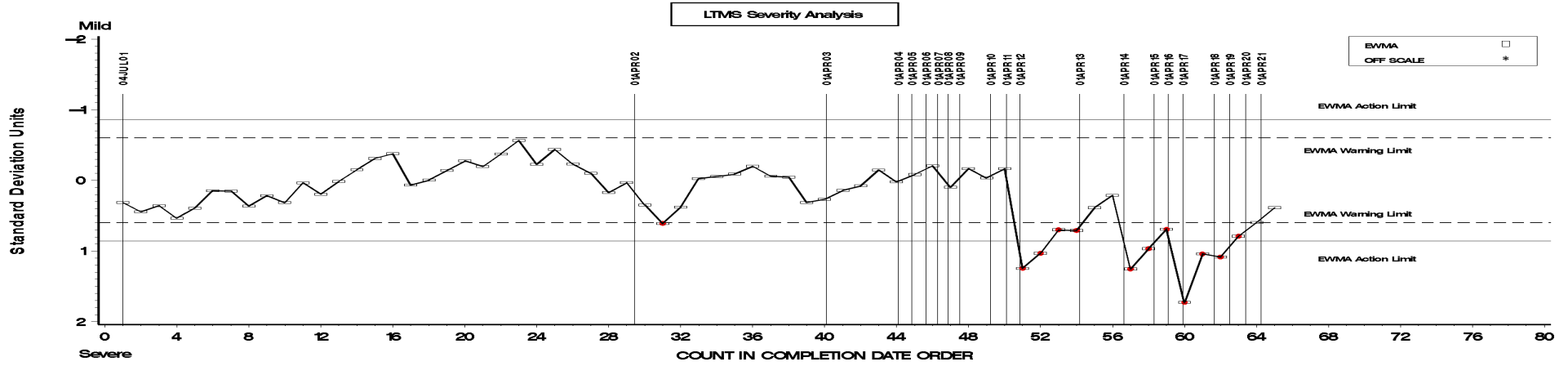
## FINAL TOP GROOVE CARBON (DEMERITS)



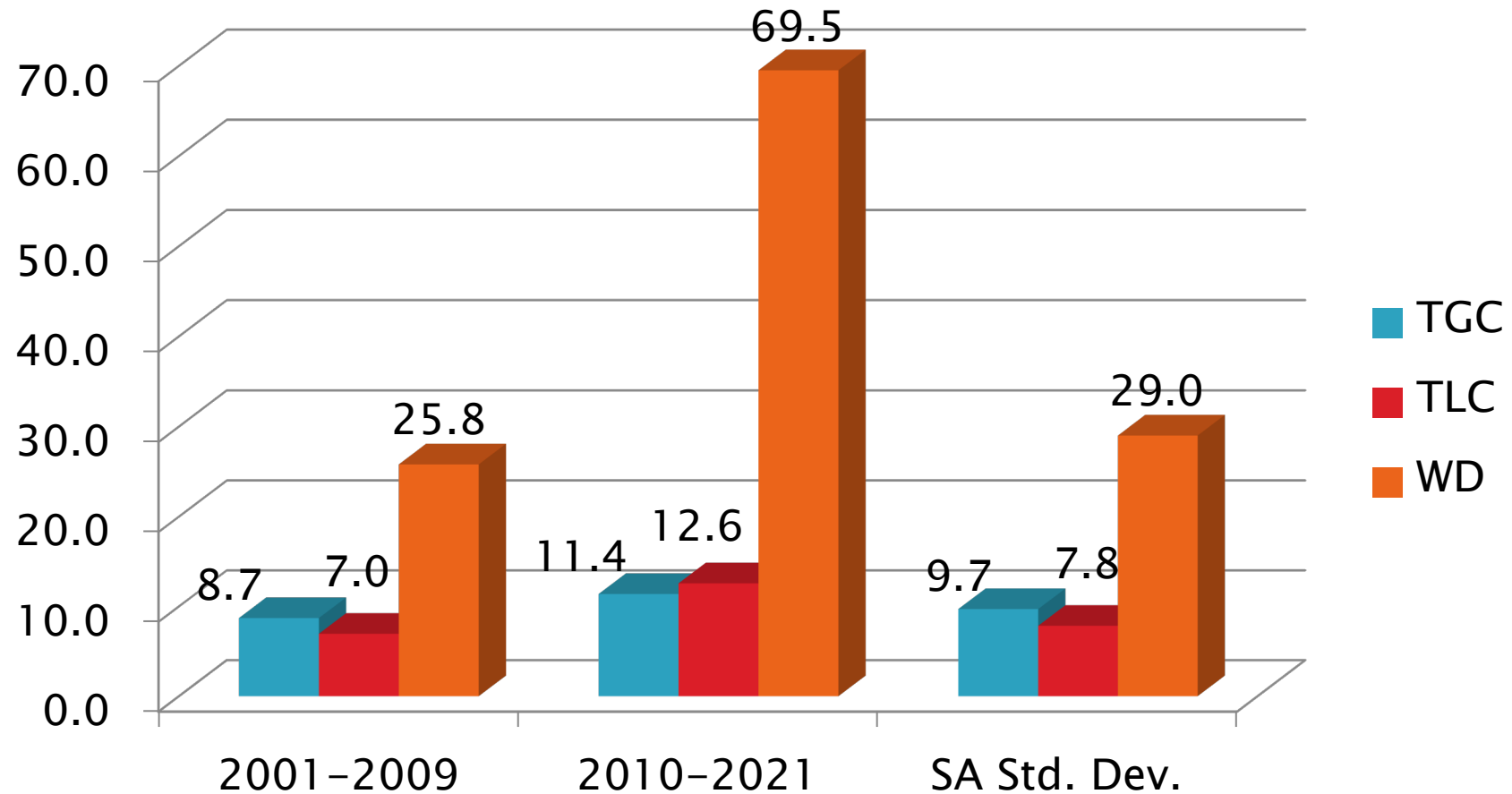
## FINAL TOP LAND CARBON (DEMERITS)



## FINAL WEIGHTED TOTAL DEMERITS (DEMERITS)

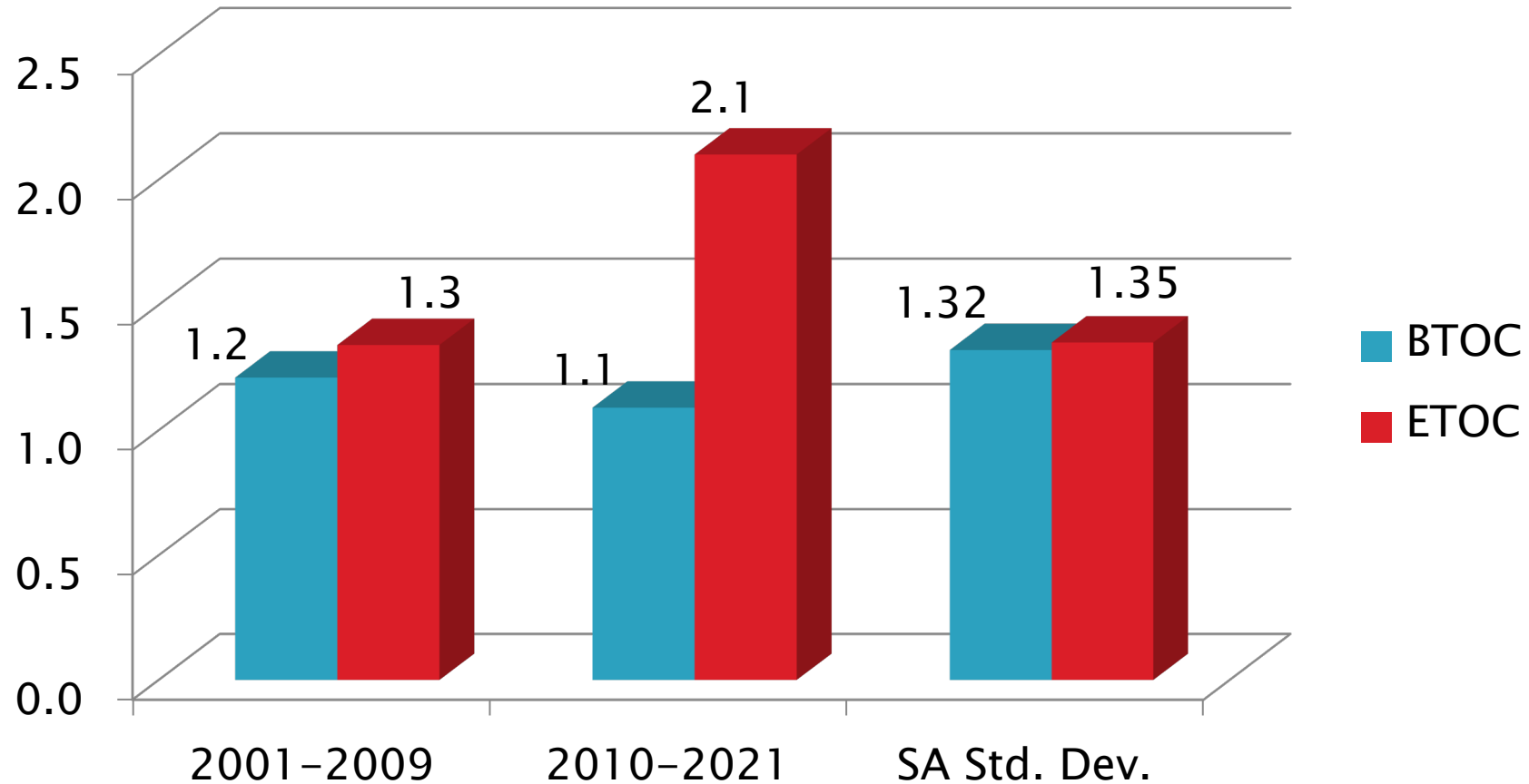


# 1 R Precision Estimates





# 1 R Precision Estimates



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# CAT C13

➤➤ April 2023

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# C13 Test Activity

Test Status	Validity Code	C13
Acceptable Calibration Test	AC	2
Failed Calibration Test	OC	0
Operationally Invalid	LC	0
Aborted	XC	0
<b>Total</b>		<b>2</b>

# C13 Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
<b>Total</b>	<b>0</b>

# C13 Lost Tests\*

Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
<b>Total</b>		<b>0</b>

\*Invalid and aborted tests

# C13 Test Severity

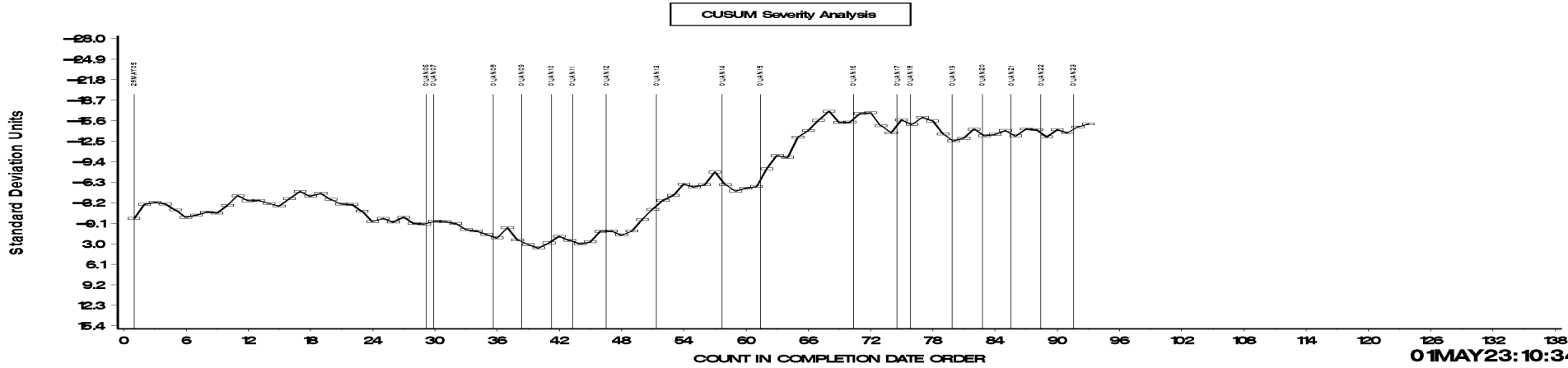
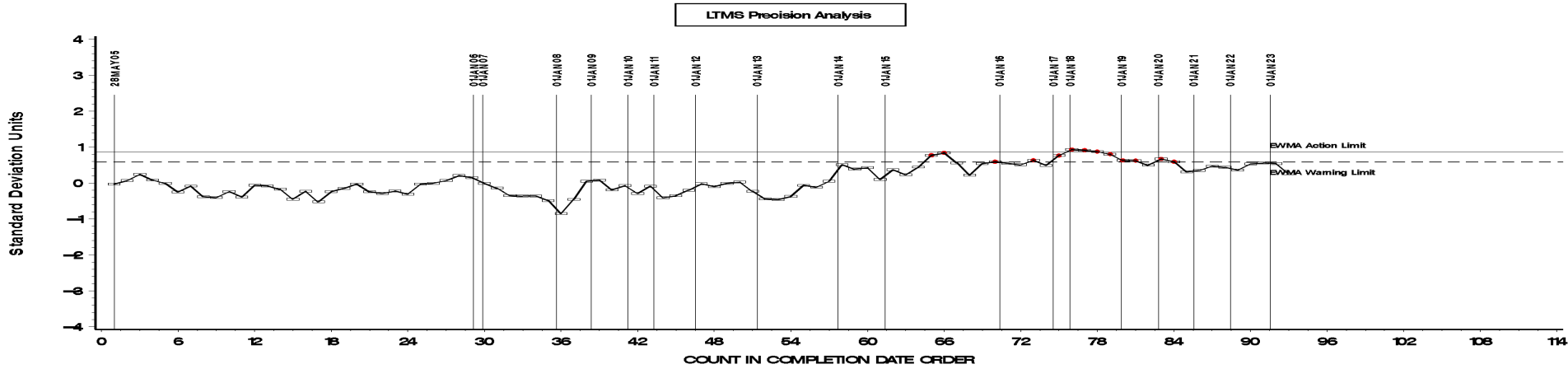
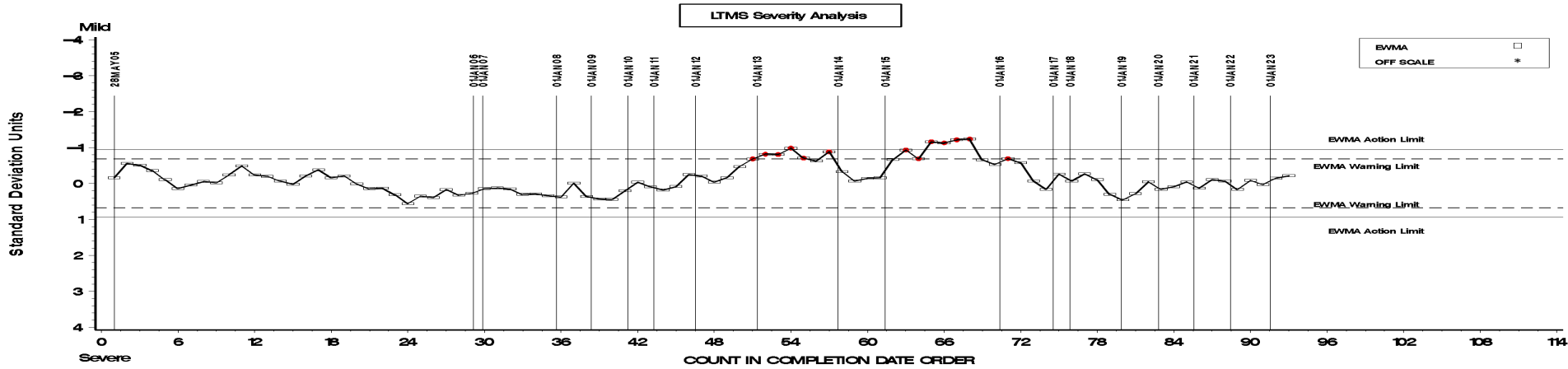
- ▶ R2TC, TGC, OC are in control
- ▶ TLC in severity warning alarm in the mild direction but very near action alarm

# C13 INDUSTRY OPERATIONALLY VALID DATA



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## TOP GROOVE CARBON AVG — FINAL RESULT

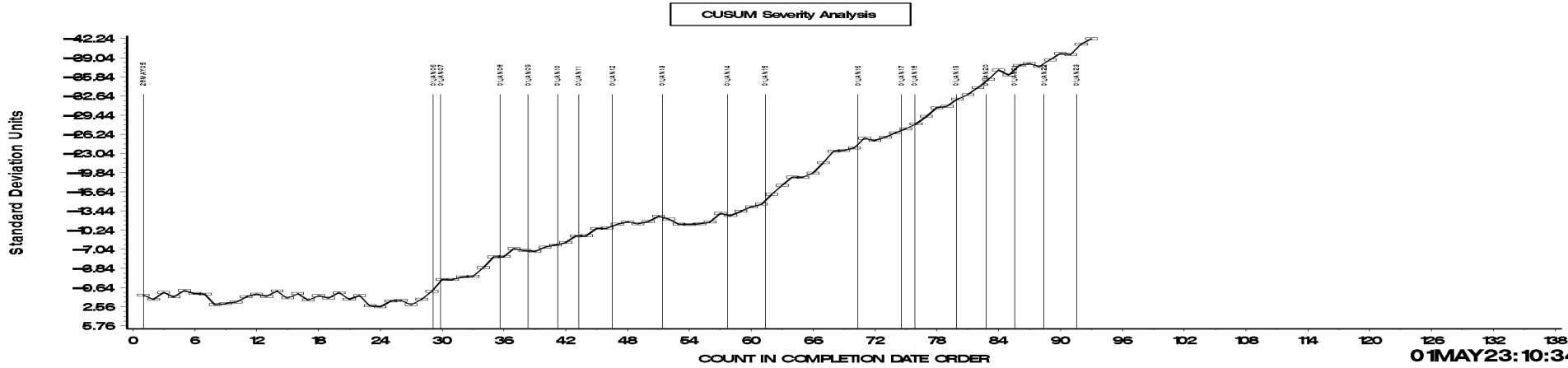
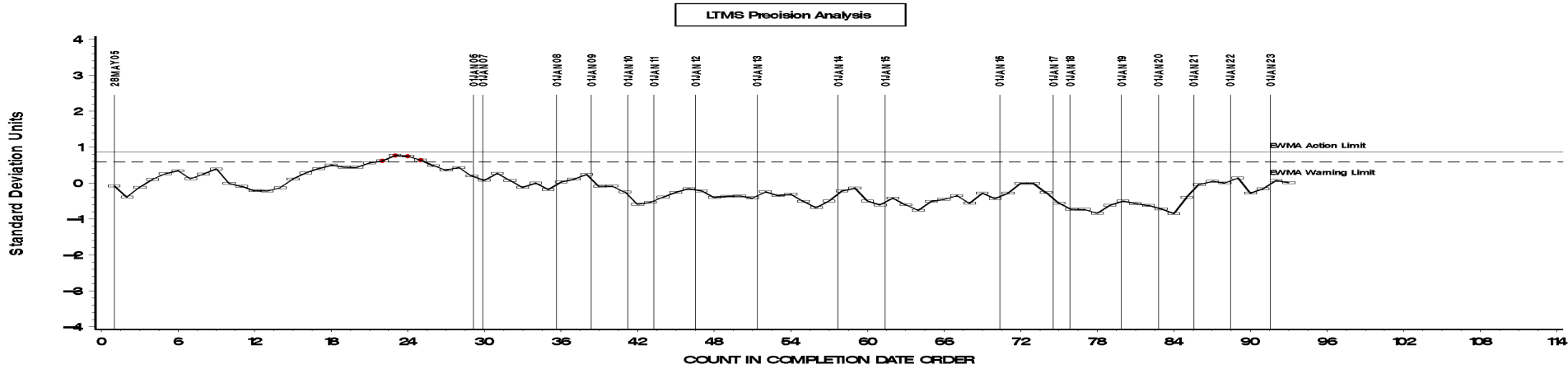
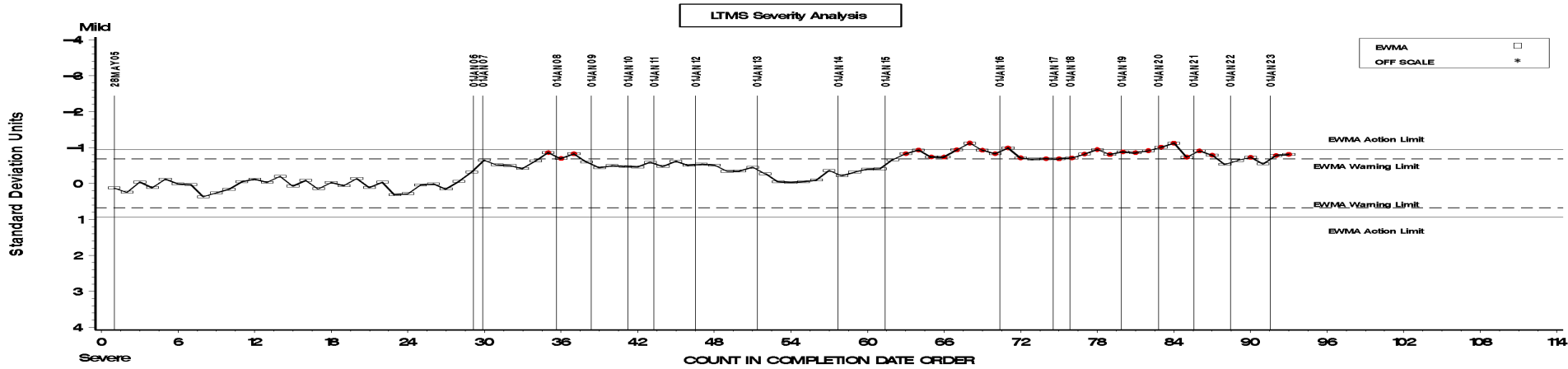


# C13 INDUSTRY OPERATIONALLY VALID DATA



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## TOP LAND CARBON AVG. — FINAL RESULT



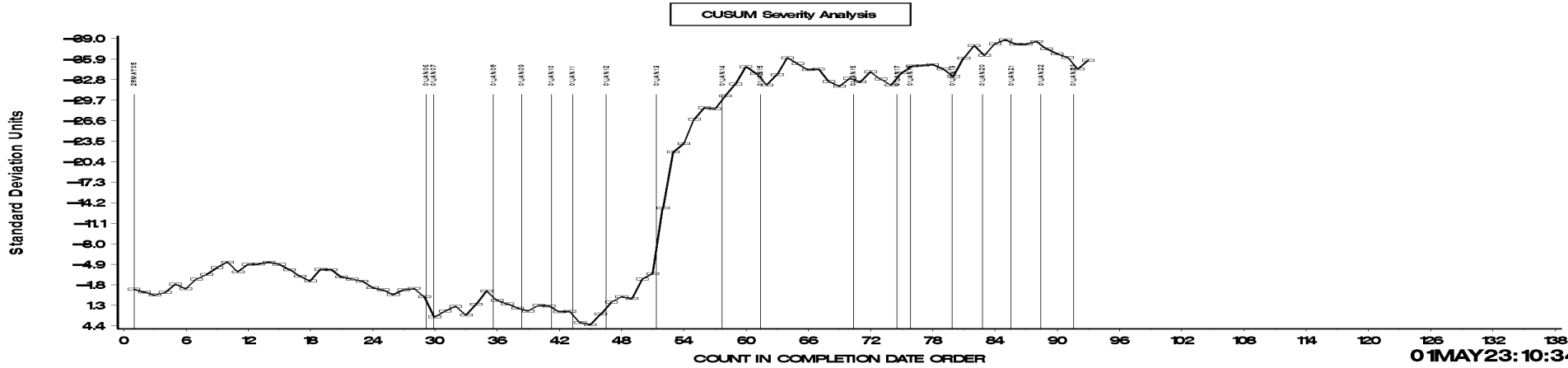
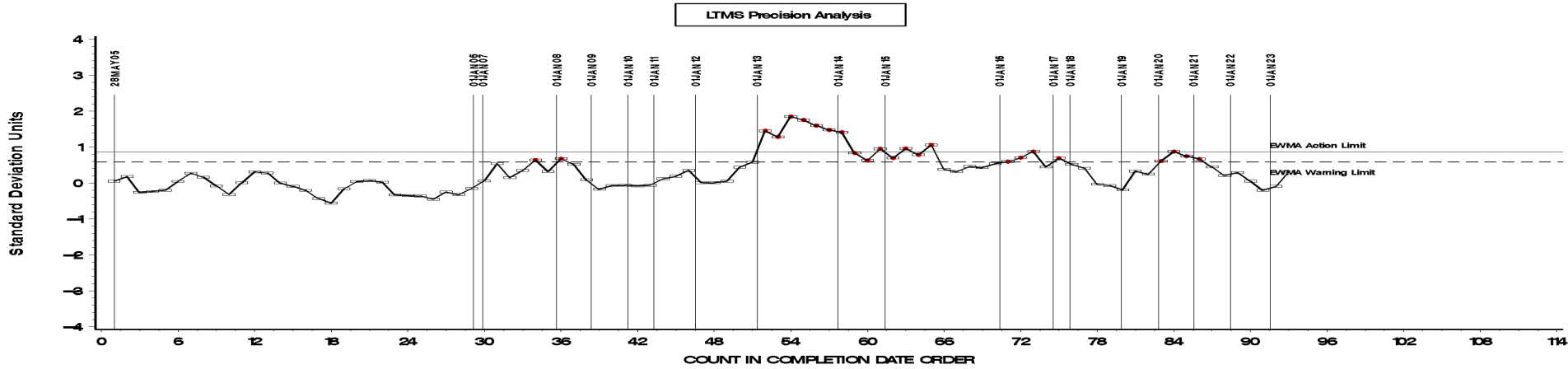
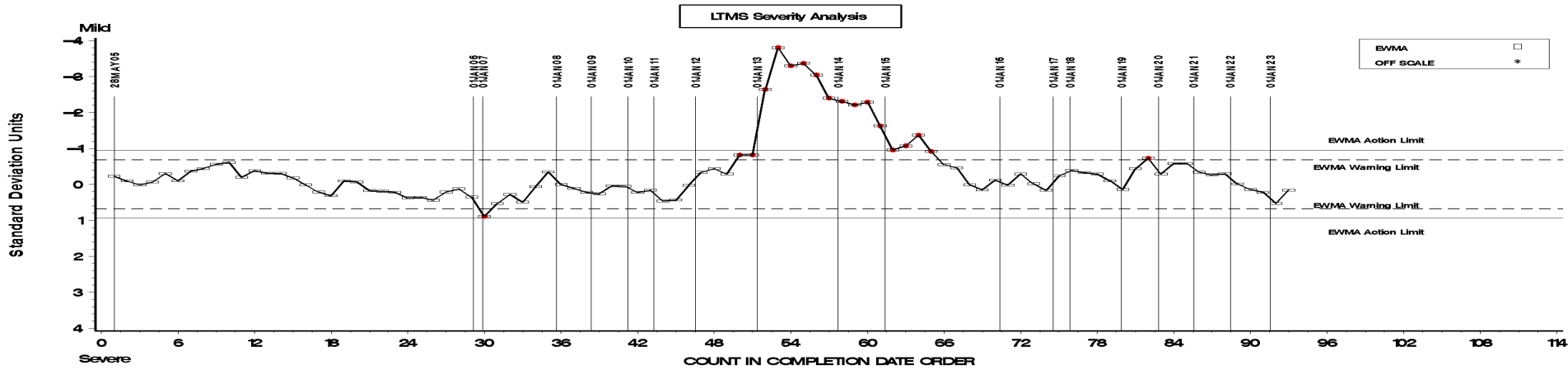


# C13 INDUSTRY OPERATIONALLY VALID DATA



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## 2ND RING TOP CARBON AVG. — FINAL RESULT

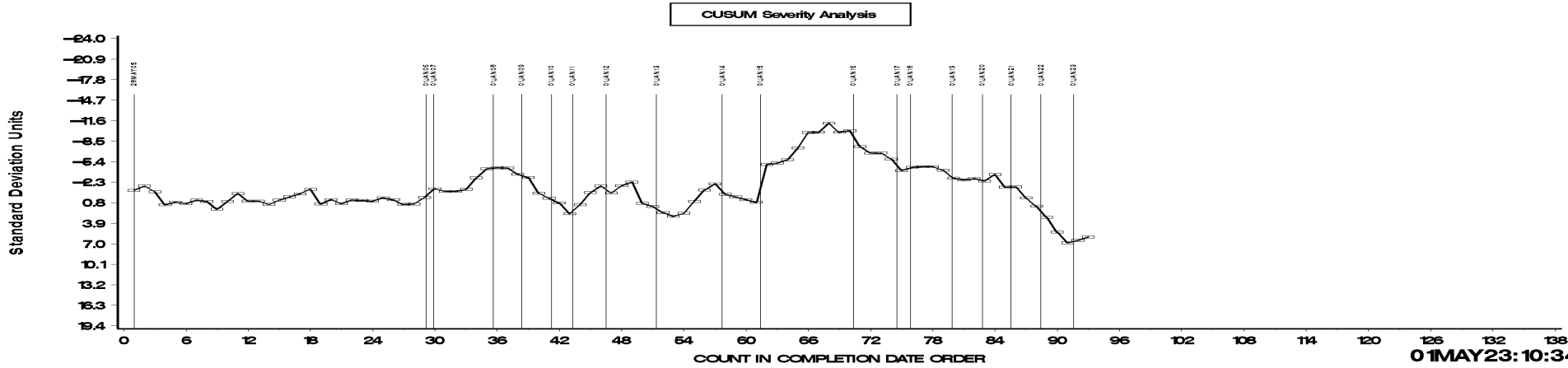
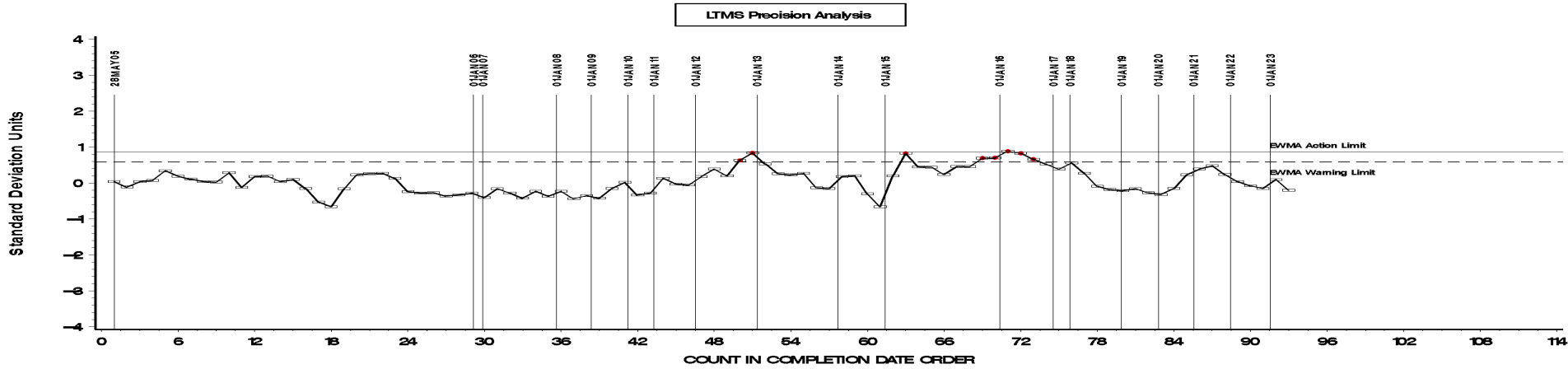
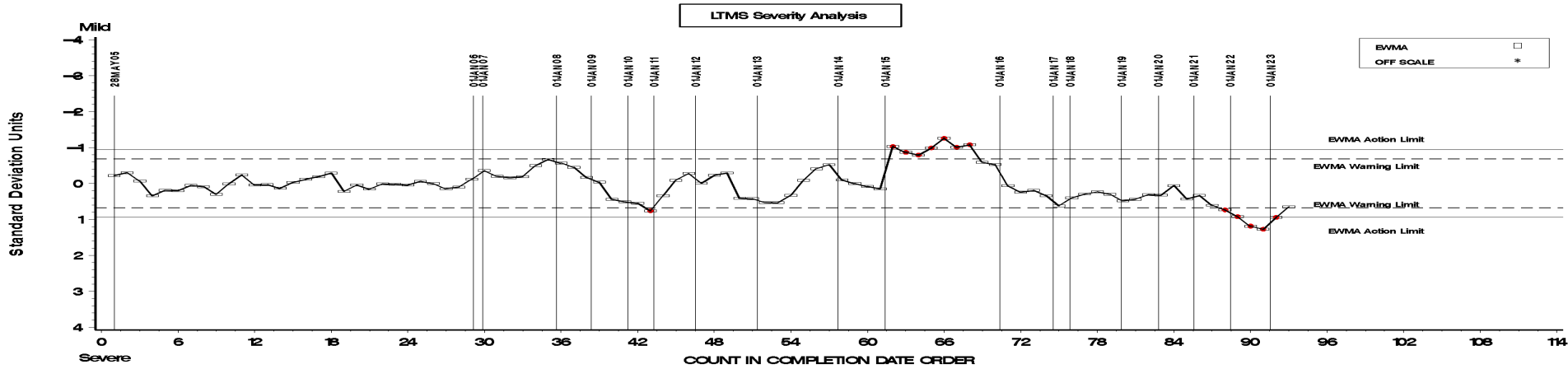


# C13 INDUSTRY OPERATIONALLY VALID DATA

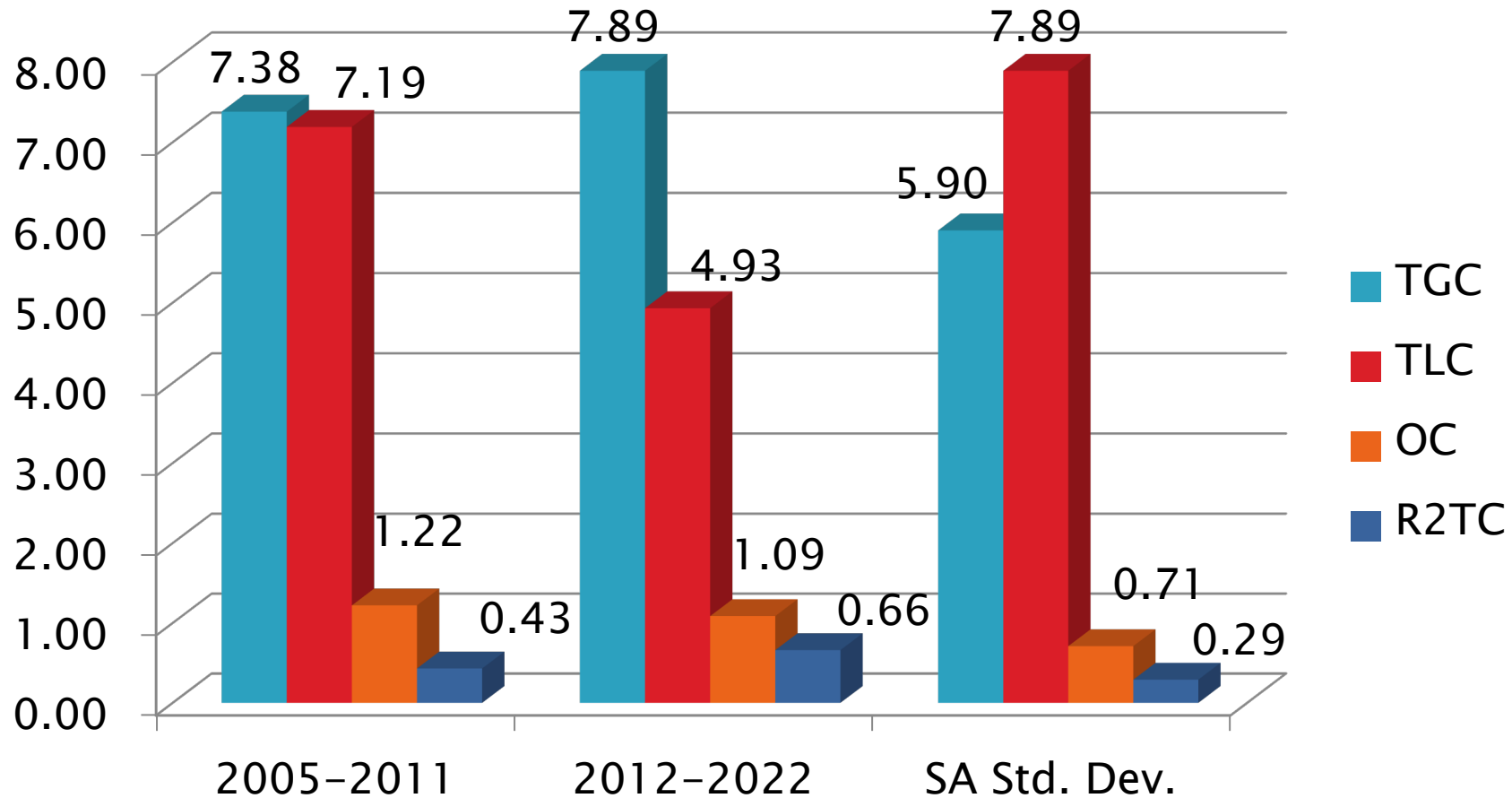


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## OIL CONS. DELTA — FINAL RESULT



# C13 Precision Estimates



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



# C13 Oil Aeration (COAT)

➤➤ April 2023

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



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# COAT Test Activity

Test Status	Validity Code	COAT
Acceptable Calibration Test	AC	3
Failed Calibration Test	OC	0
Operationally Invalid	LC	0
Aborted	XC	0
Informational Run	NN	1
<b>Total</b>		<b>10</b>

# COAT Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
<b>Total</b>	<b>0</b>

# COAT Lost Tests\*

Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
<b>Total</b>		<b>0</b>

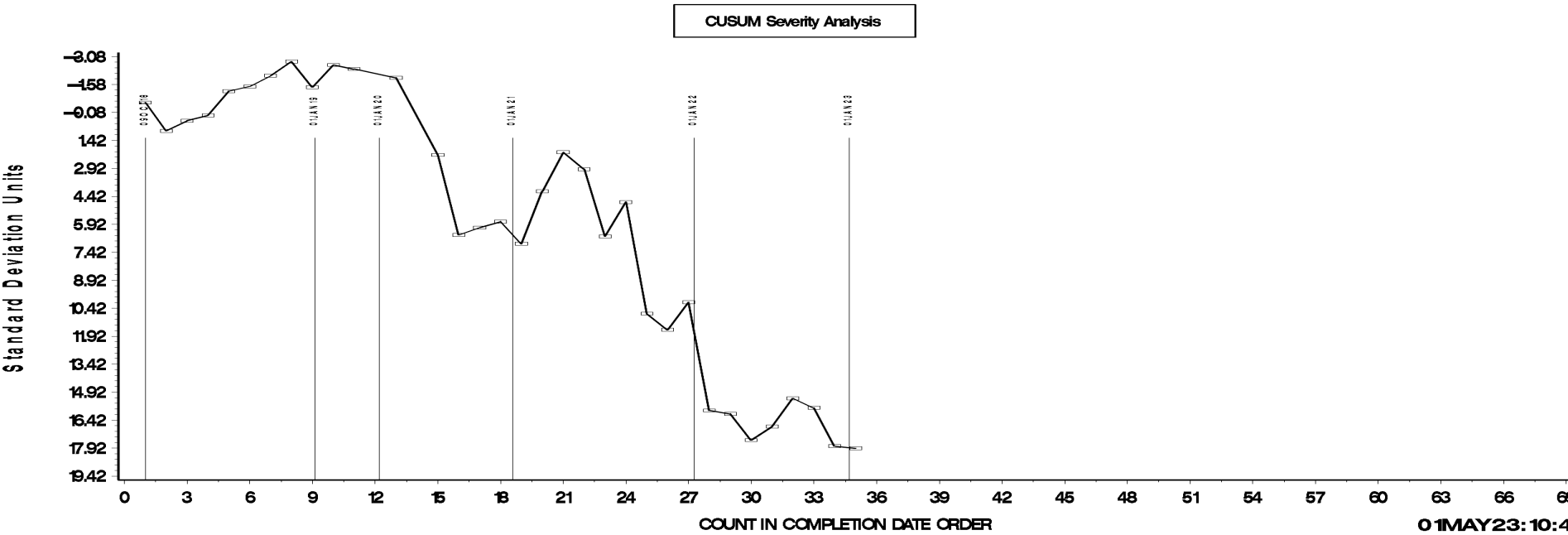
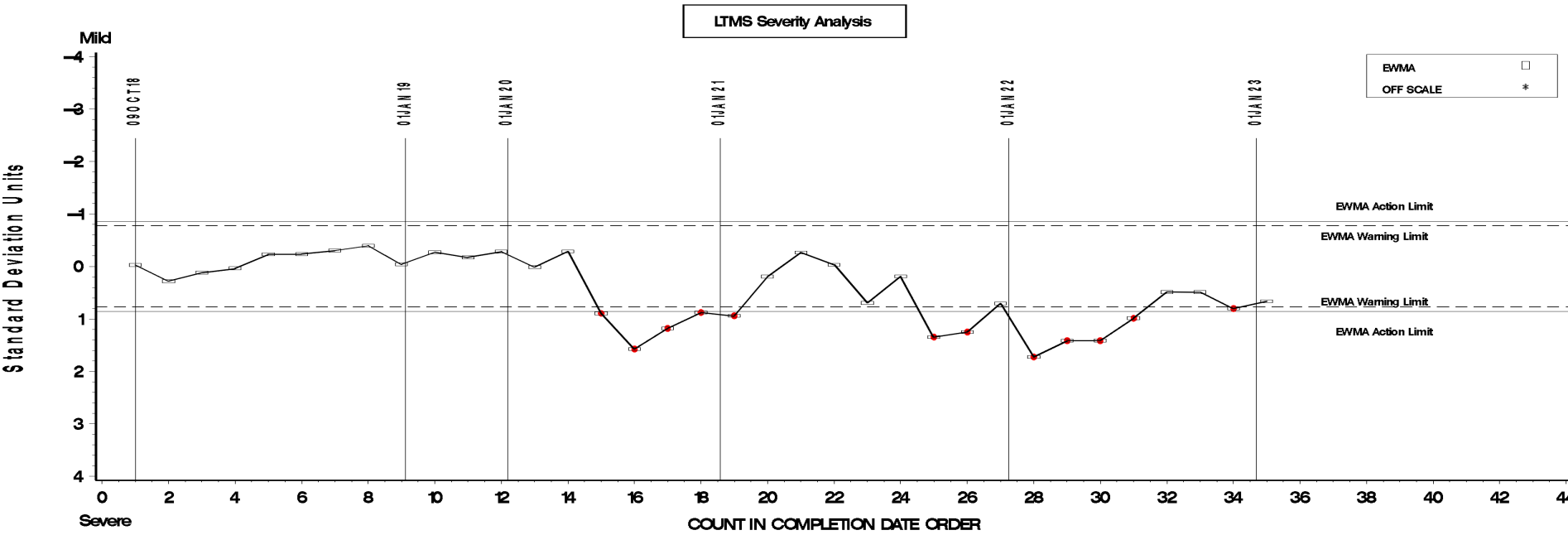
\*Invalid and aborted tests

# COAT Test Severity

- ▶ AAVE is in control.

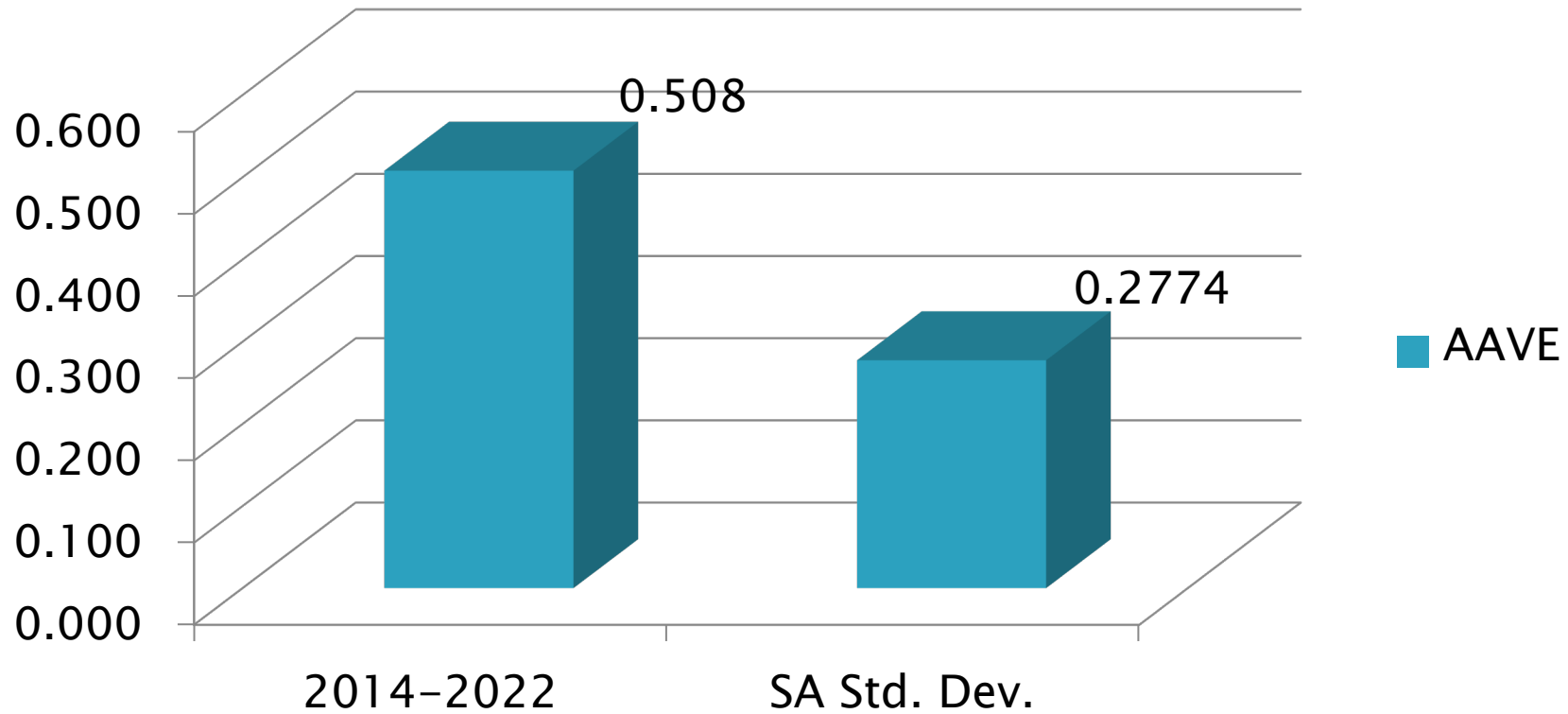


CORRECTED AVERAGE OIL AERATION OVER TEST HOURS 40 — 50



# COAT Precision Estimates

AAVE



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



# Daimler DD13 Scuffing Test

➤➤ April 2023

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



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# DD13 Test Activity

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

# DD13 Failed Tests

Failed Parameter	Number of Tests
Level 3 Ei alarm for HRS2	1
<b>Total</b>	<b>1</b>

# DD13 Lost Tests\*

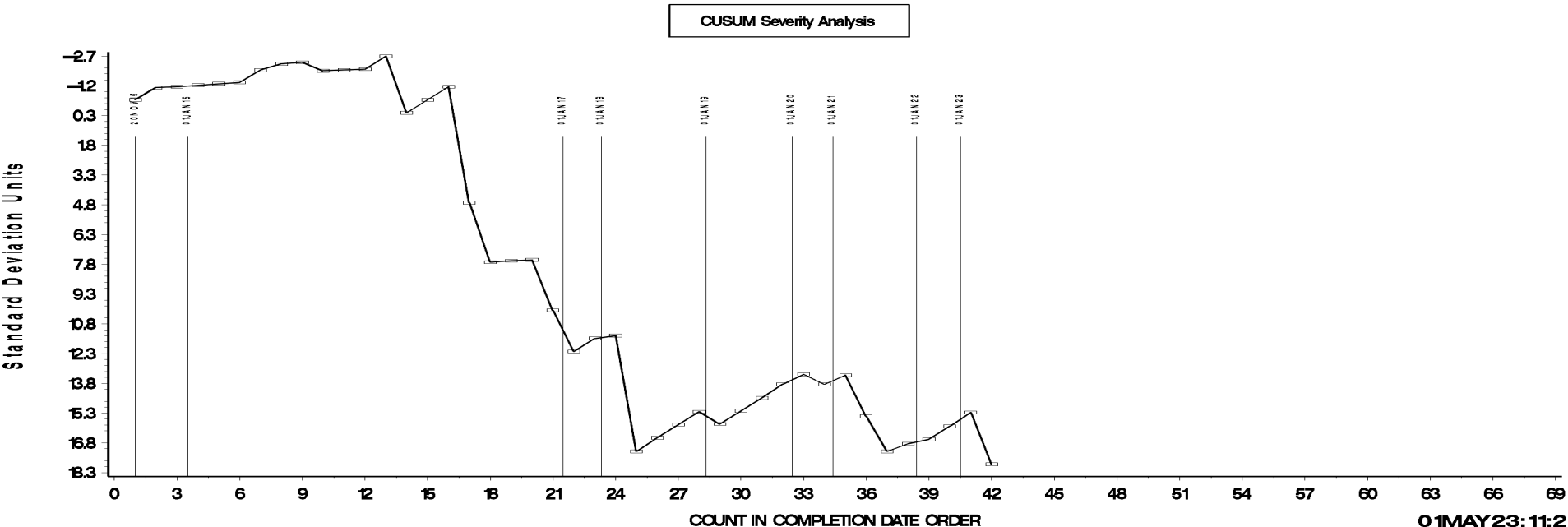
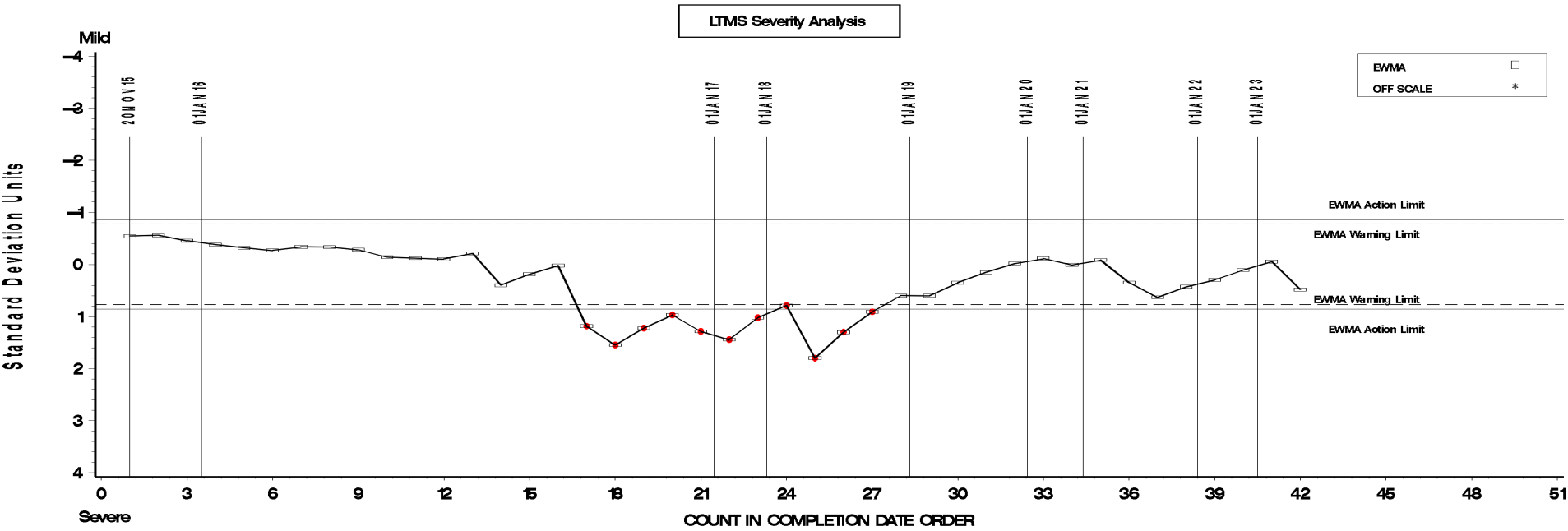
Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
<b>Total</b>		<b>0</b>

\*Invalid and aborted tests

# DD13 Test Severity

- ▶ HRS2 is in control.

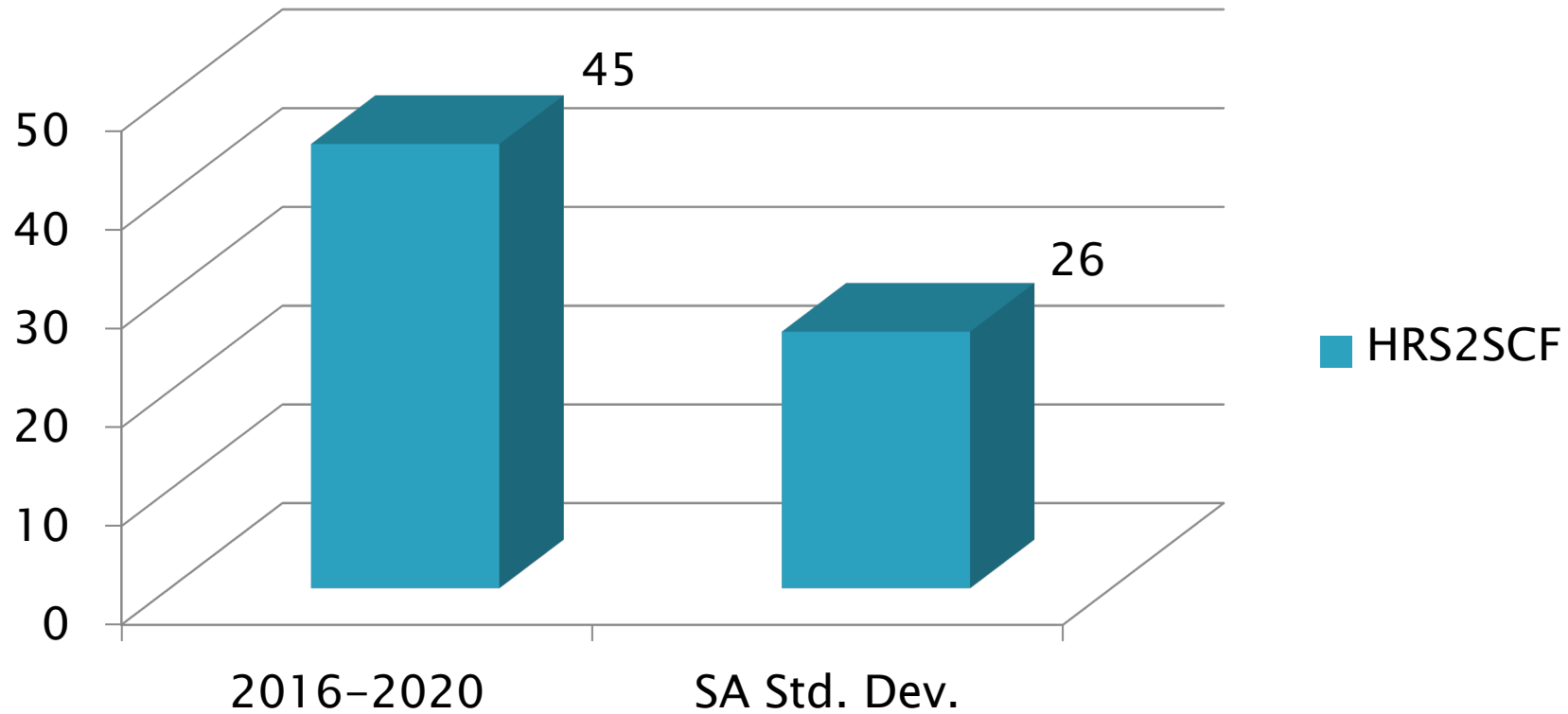
FNL. ORIG. UNIT HOURS TO SCUFF





# DD13 Precision Estimates

## HRS2SCF



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



# Cummins ISB

➤➤ April 2023

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



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# ISB Test Activity

Test Status	Validity Code	#
Acceptable Calibration Test	AC	3
Failed Calibration Test	OC	1
Operationally Invalid	LC	0
Aborted	XC	0
Pending Calibration	PC	2
<b>Total</b>		<b>6</b>

# ISB Failed Tests

Failed Parameter	Number of Tests
ATWL Mild	1
<b>Total</b>	<b>1</b>

# ISB Lost Tests\*

Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
<b>Total</b>		<b>0</b>

\*Invalid and aborted tests

# ISB Pending Tests

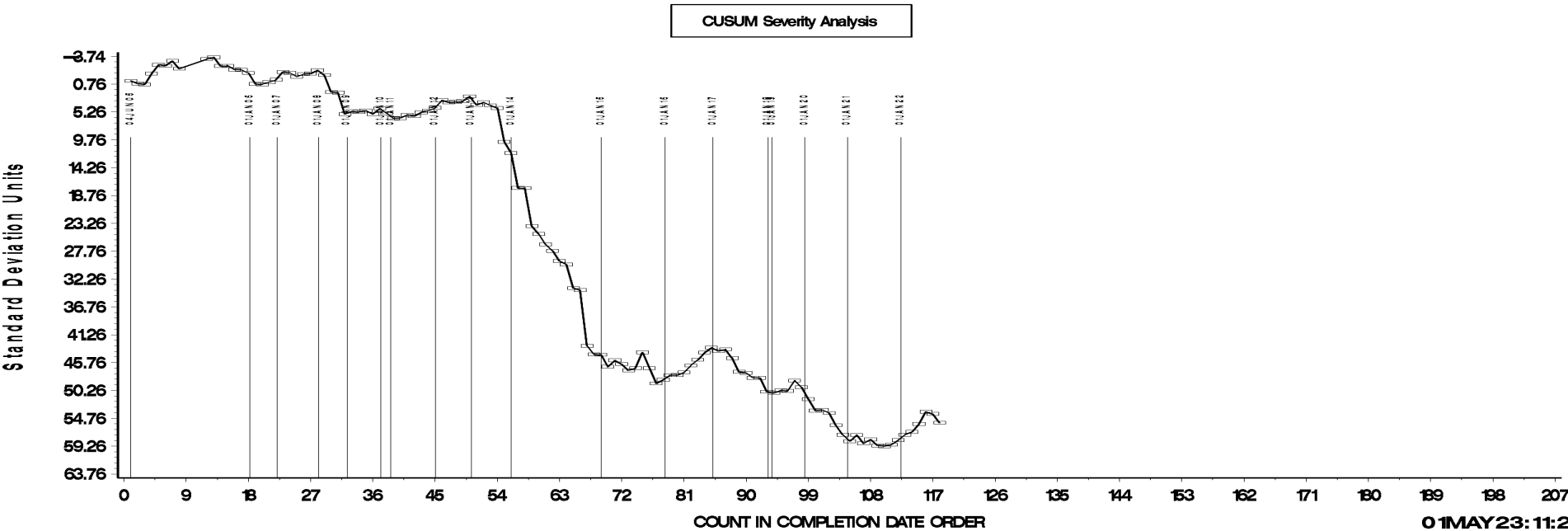
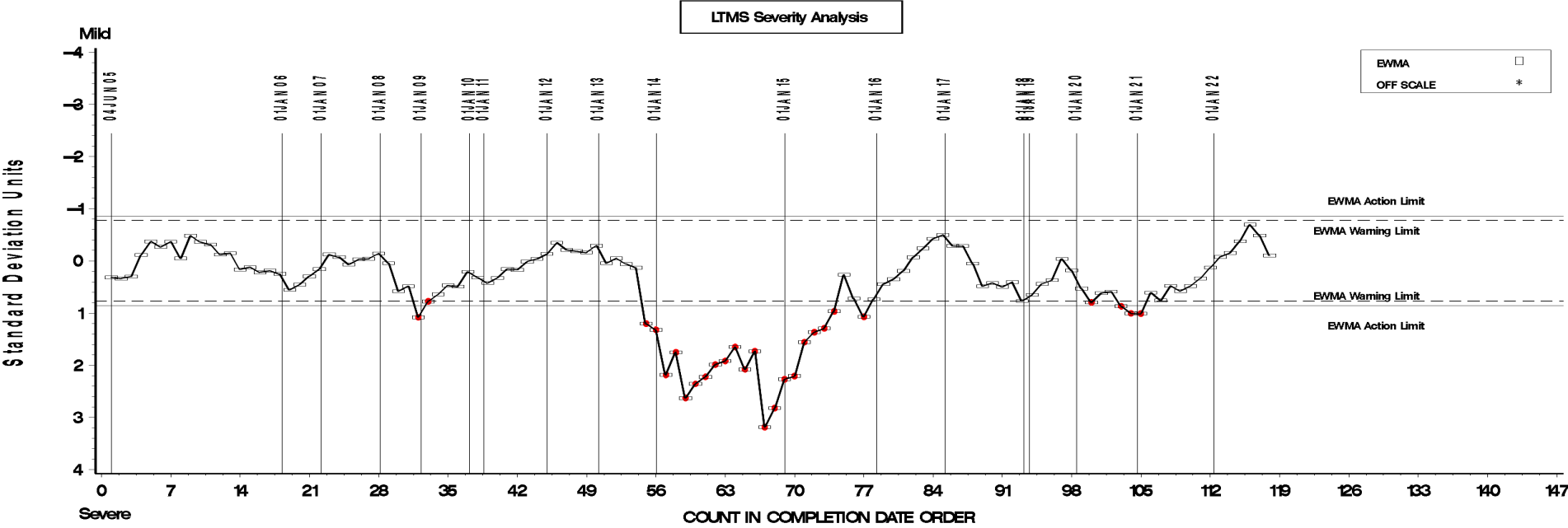
Status	Cause	#
Pending	Hardware approval tests	2
<b>Total</b>		<b>2</b>

\*Invalid and aborted tests

# ISB Test Severity

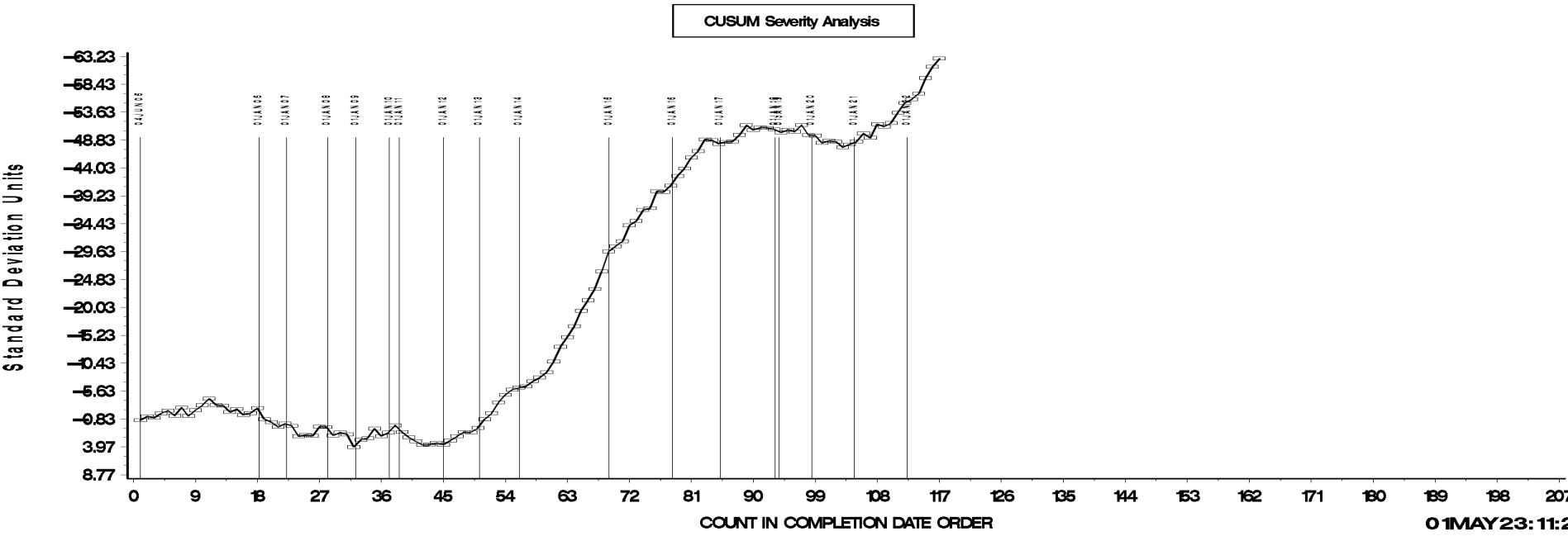
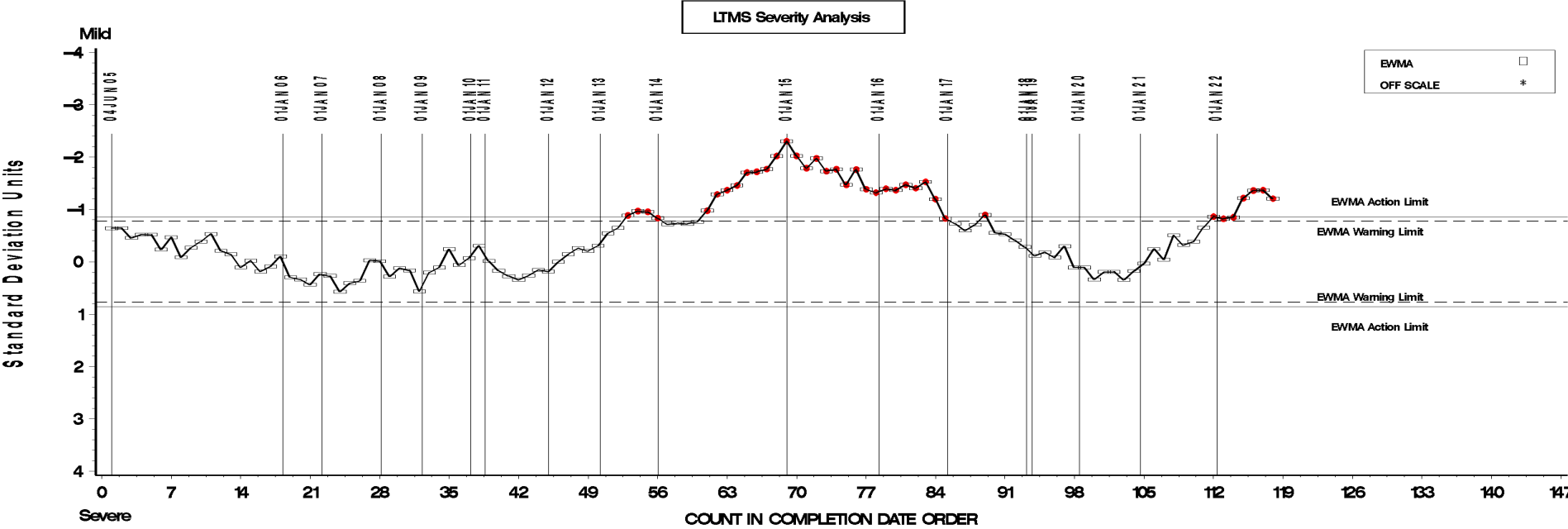
- ▶ ATWL in level 2 Zi alarm in the mild direction
- ▶ ACSW is in control.

AVERAGE CAMSHAFT WEAR

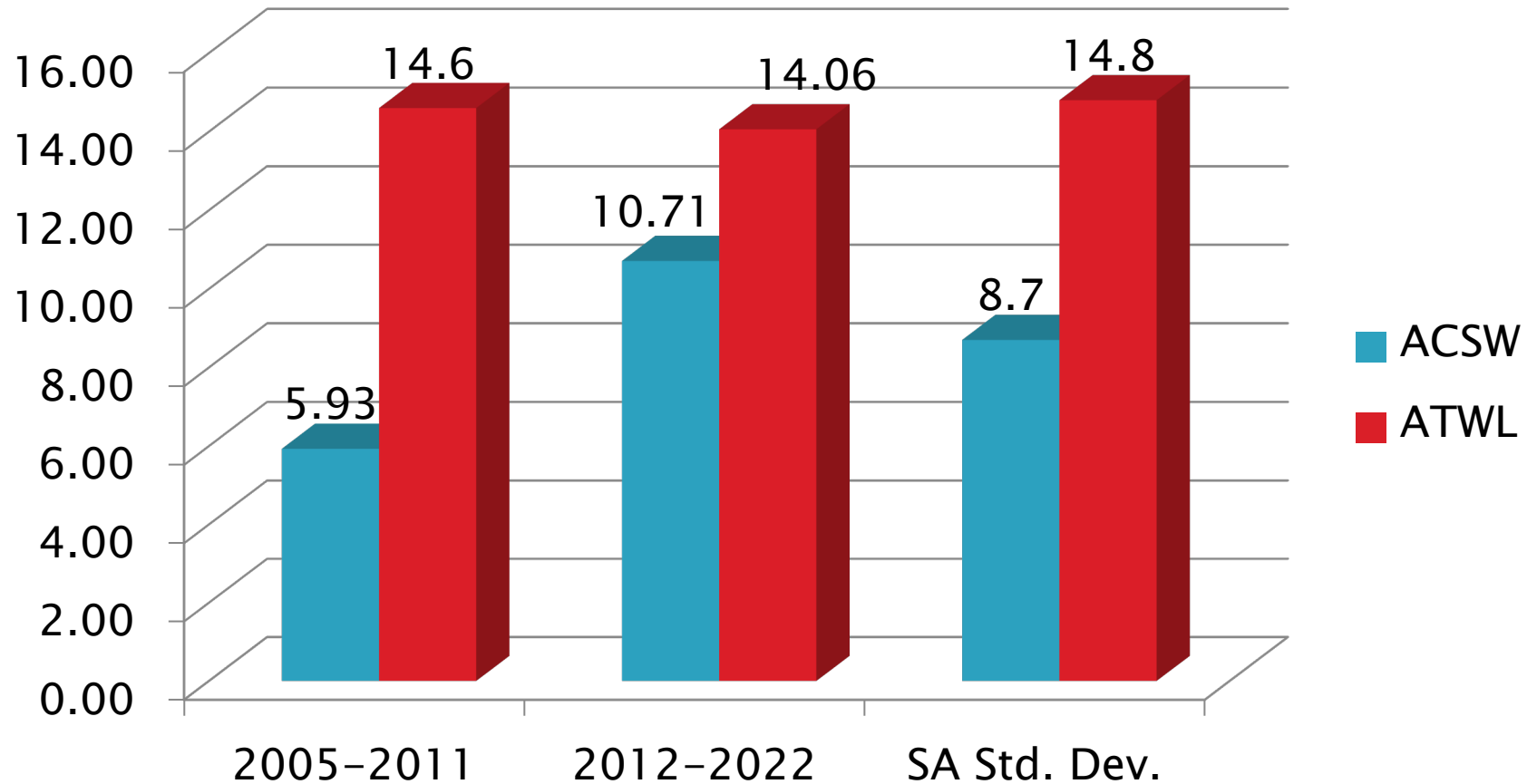




AVERAGE TAPPET WEIGHT LOSS



# ISB Precision Estimates



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



# Cummins ISM

»» April 2023

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



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# ISM Test Activity

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

# ISM Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
<b>Total</b>	<b>0</b>

# ISM Lost Tests\*

Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
<b>Total</b>		<b>0</b>

\*Invalid and aborted tests

# ISM Test Severity

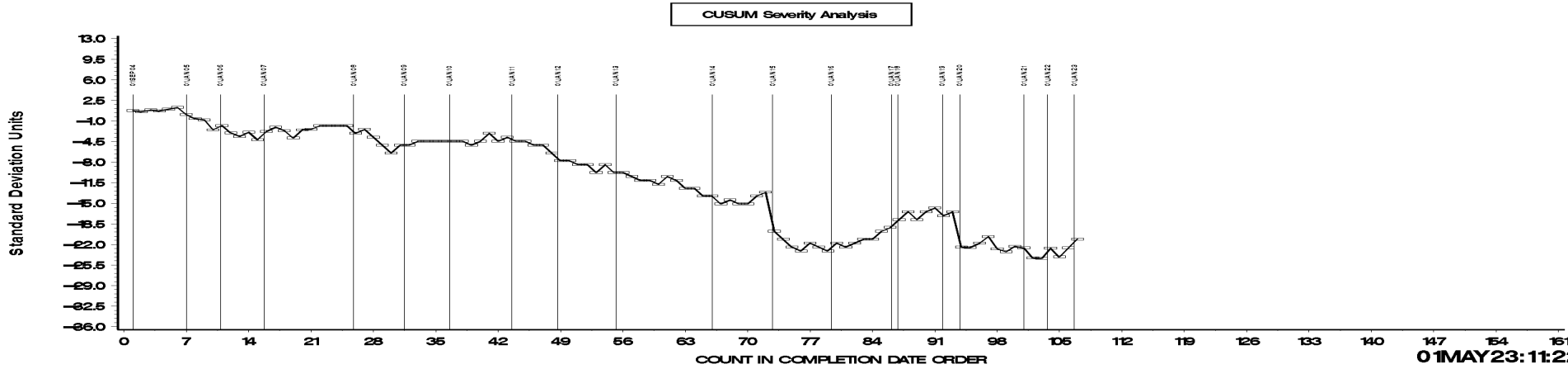
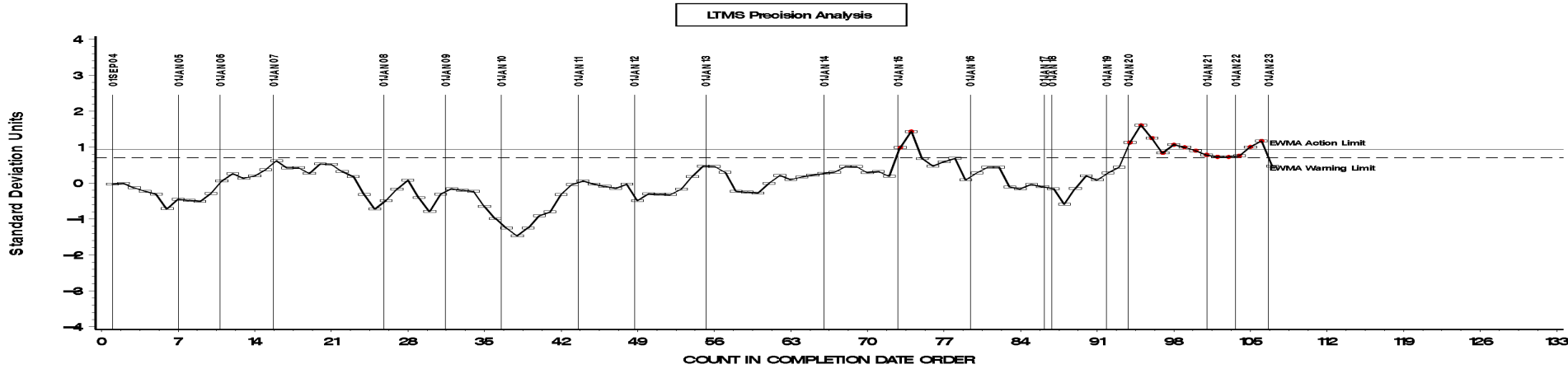
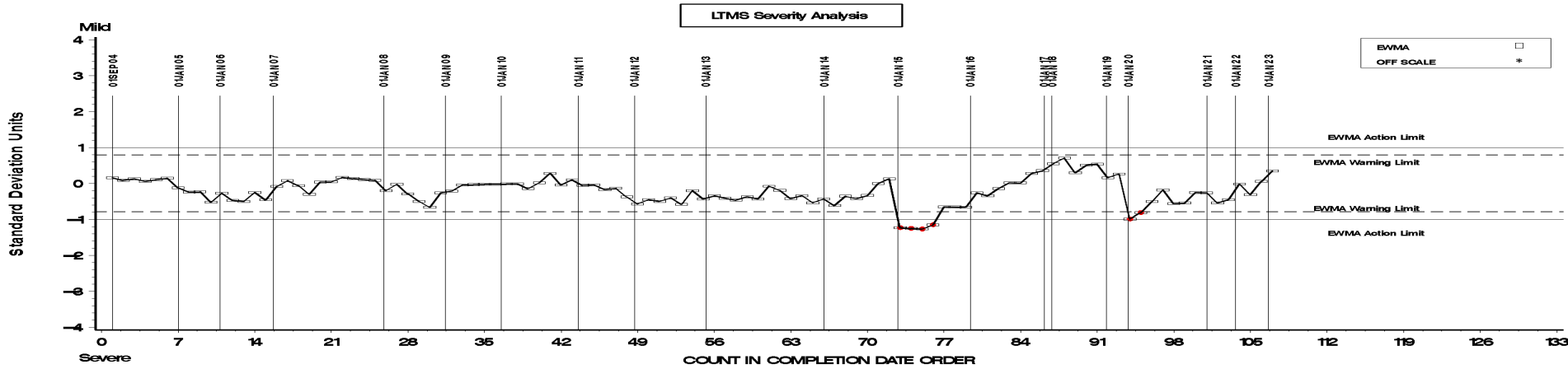
- ▶ As no ISM tests were run during this reporting period no statement about test severity can be made.

# ISM INDUSTRY OPERATIONALLY VALID DATA



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## AVERAGE SLUDGE RATING



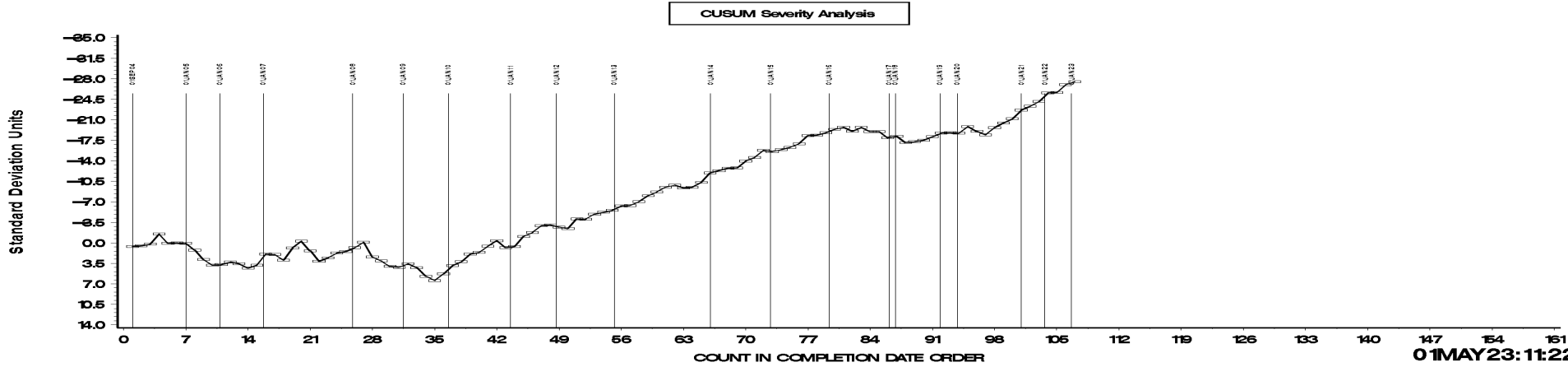
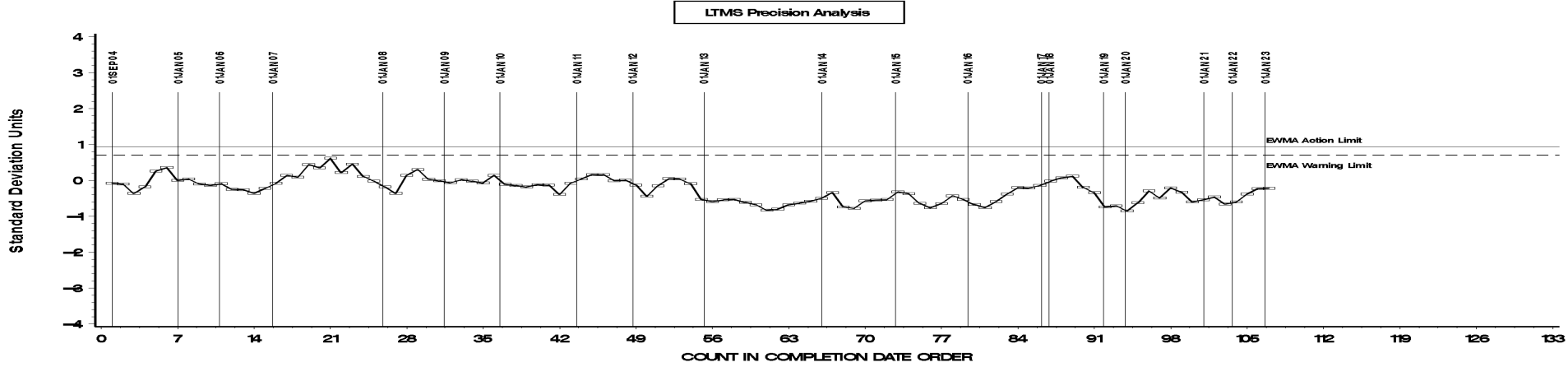
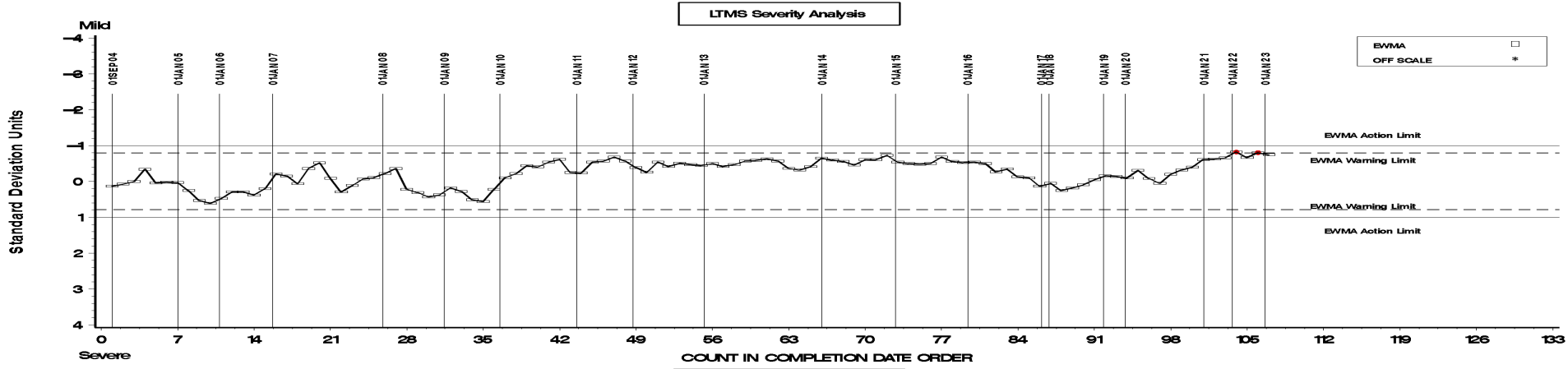


# ISM INDUSTRY OPERATIONALLY VALID DATA



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## CROSSHEAD WEIGHT LOSS ADJUSTED TO 3.9 % SOOT



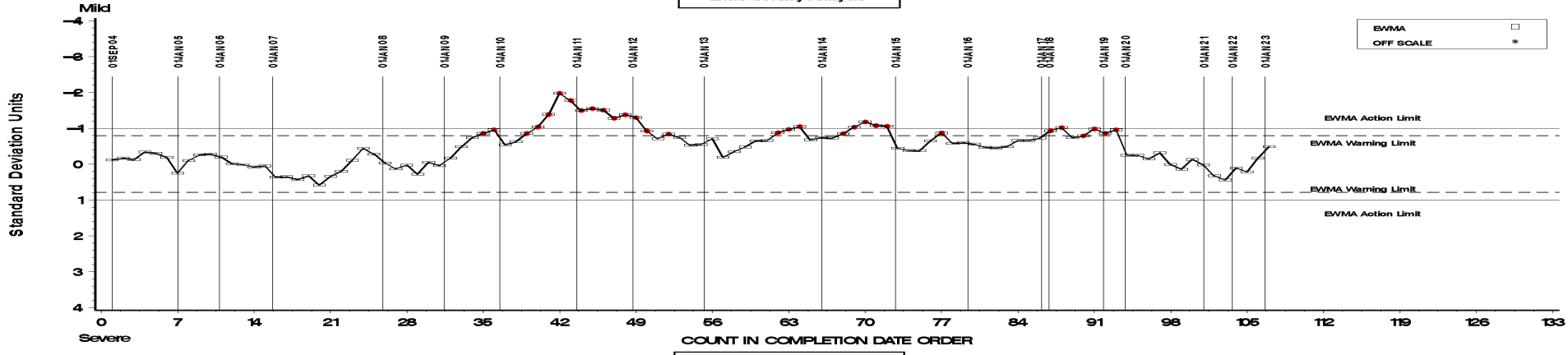
# ISM INDUSTRY OPERATIONALLY VALID DATA



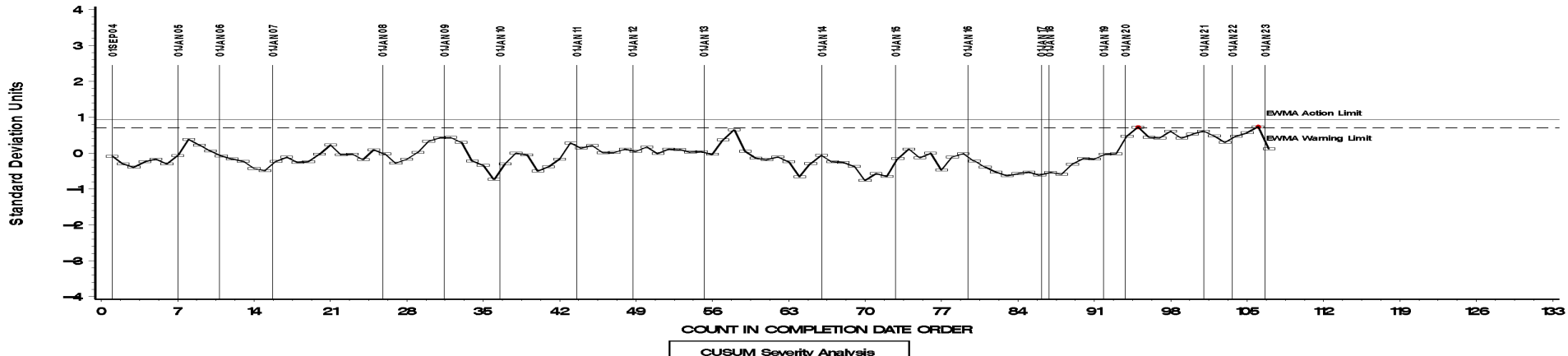
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## OIL FILTER DELTA PRESSURE

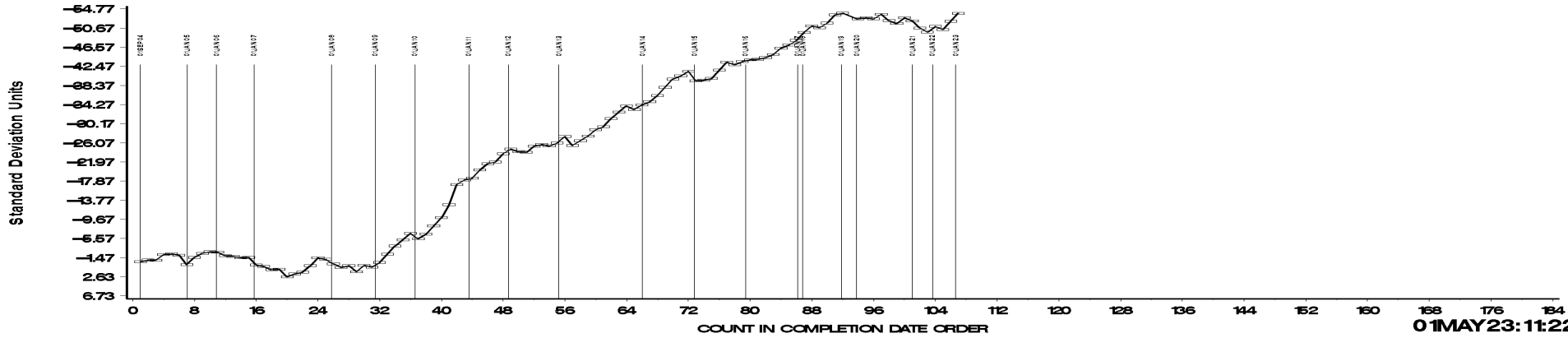
LTMS Severity Analysis



LTMS Precision Analysis



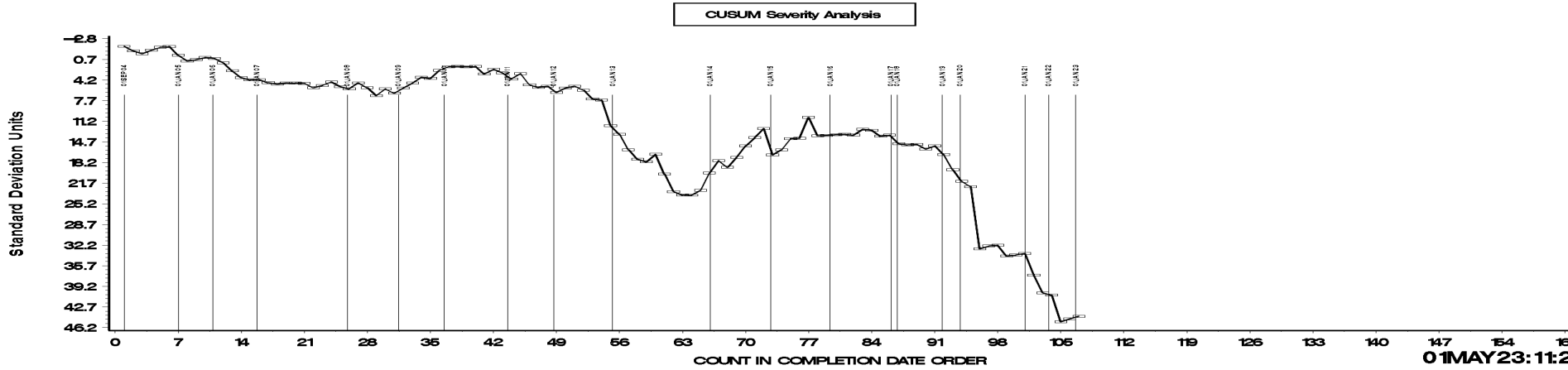
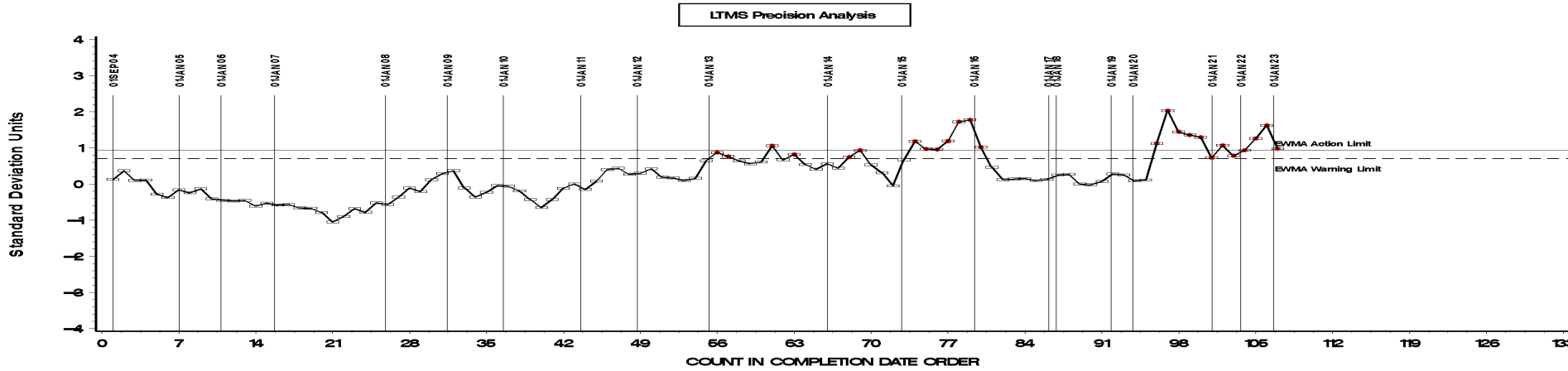
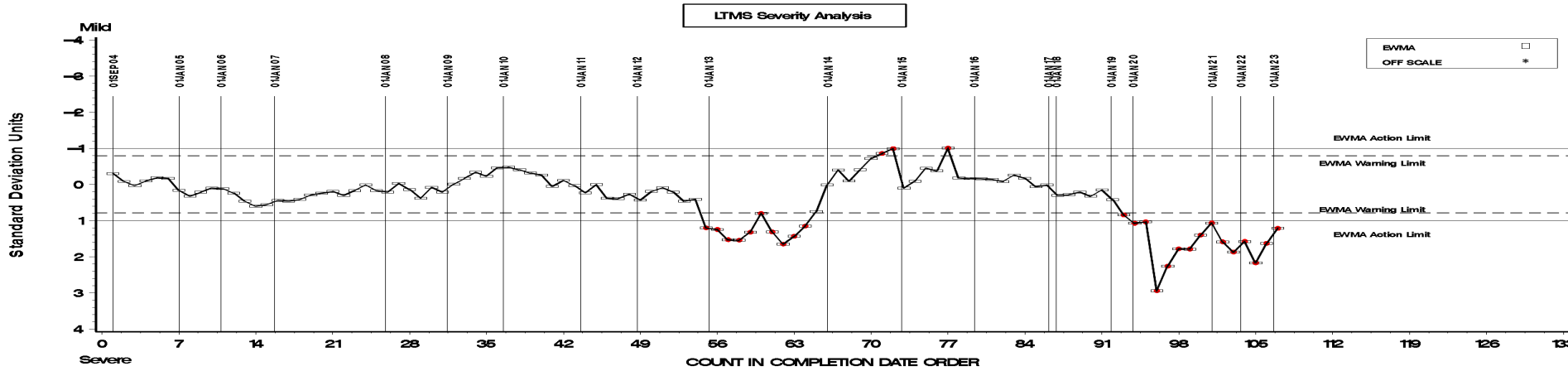
CUSUM Severity Analysis



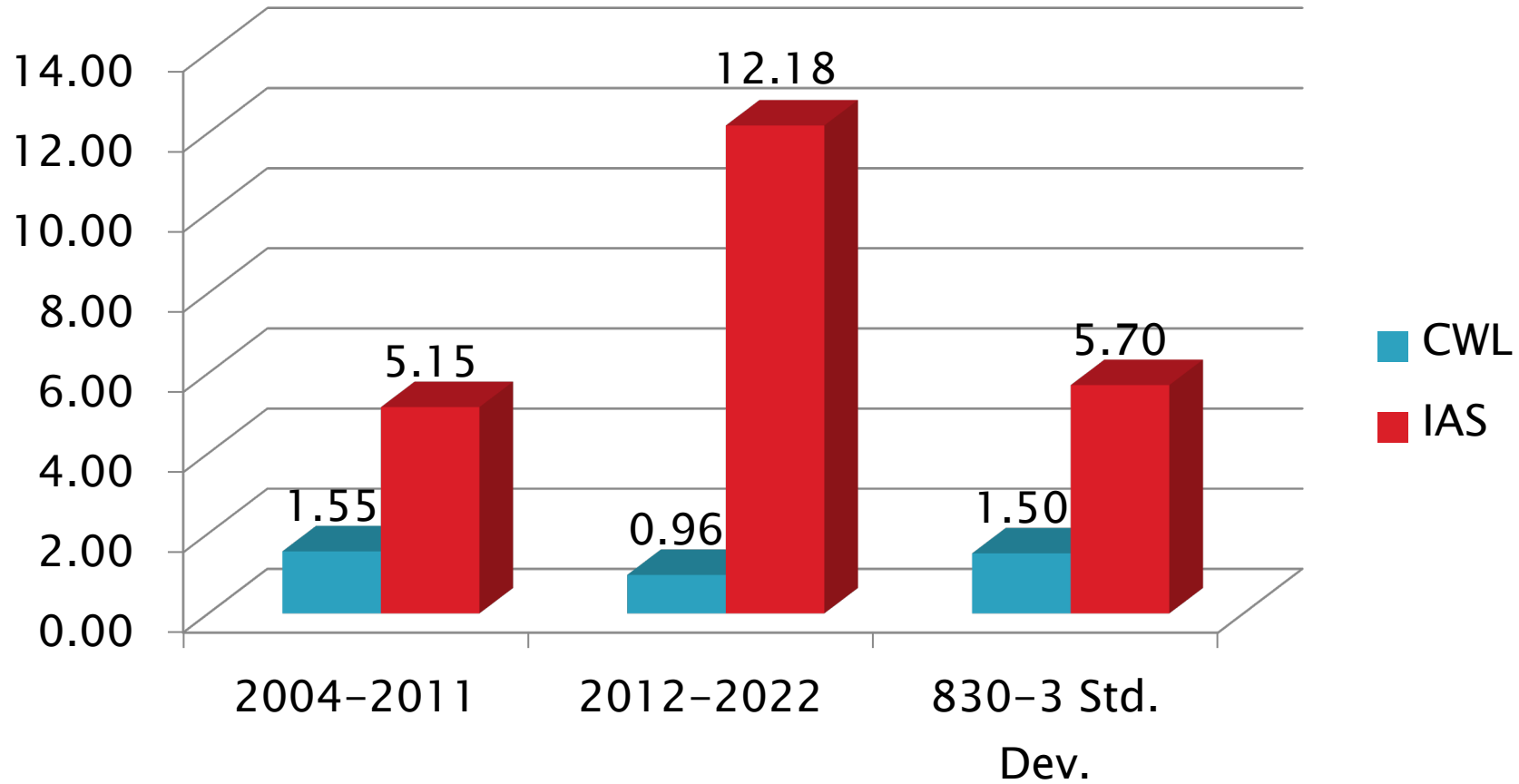
# ISM INDUSTRY OPERATIONALLY VALID DATA



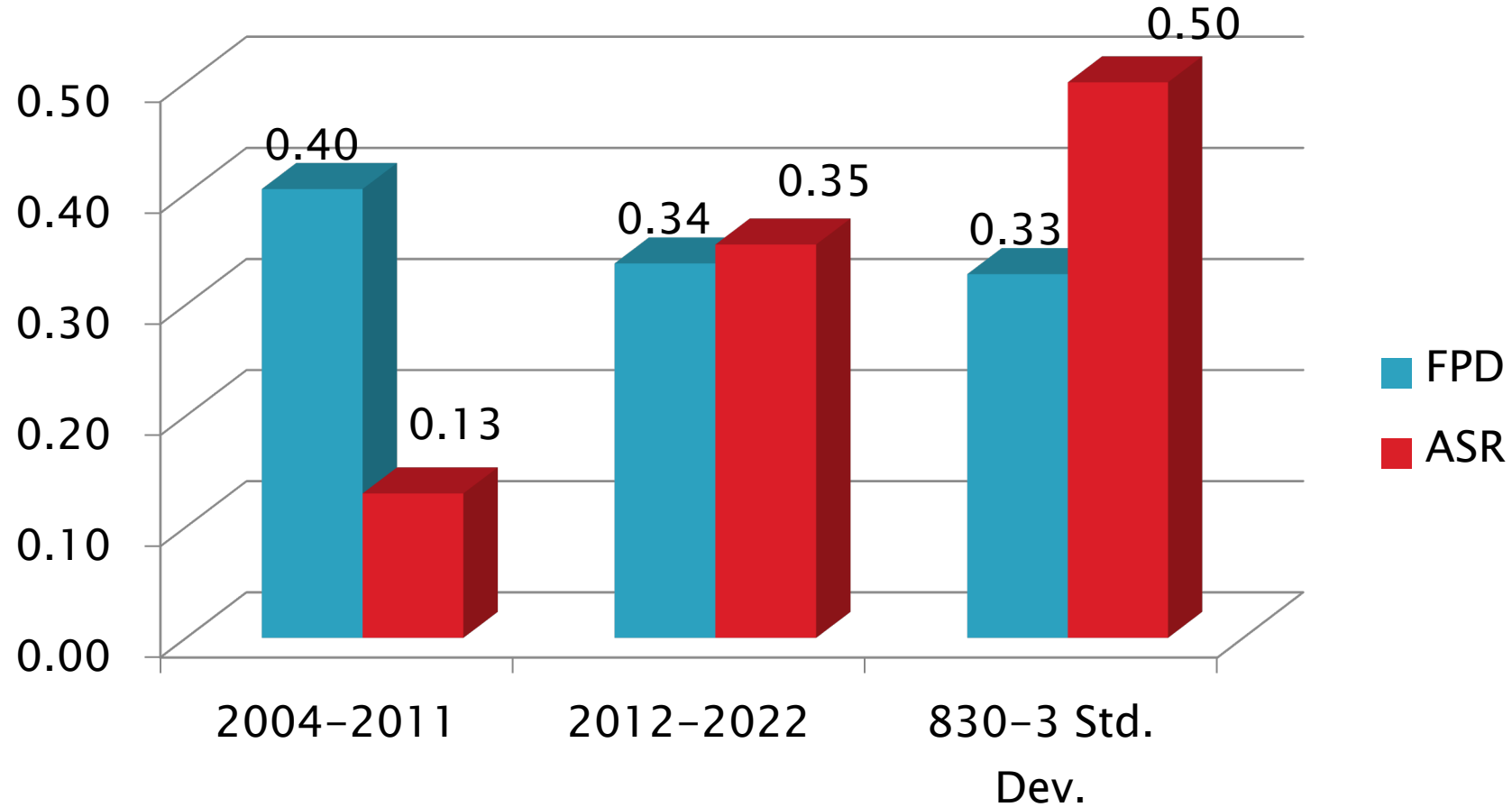
## INJECTOR SCREW WEIGHT LOSS ADJUSTED TO 3.9% SOOT



# ISM Precision Estimates



# ISM Precision Estimates



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



# EOAT

➤➤ April 2023

# EOAT Test Activity

Test Status	Validity Code	#
Acceptable Calibration Test	AC	1
Failed Calibration Test	OC	0
Operationally Invalid	LC	0
Aborted	XC	0
Information Run	NN	1
<b>Total</b>		<b>2</b>

# EOAT Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
<b>Total</b>	<b>0</b>



# EOAT Lost Tests\*

Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
<b>Total</b>		<b>0</b>

\*Invalid and aborted tests

# EOAT Informational Tests

	Number of Tests
COAT Correlation test run	1
<b>Total</b>	<b>1</b>

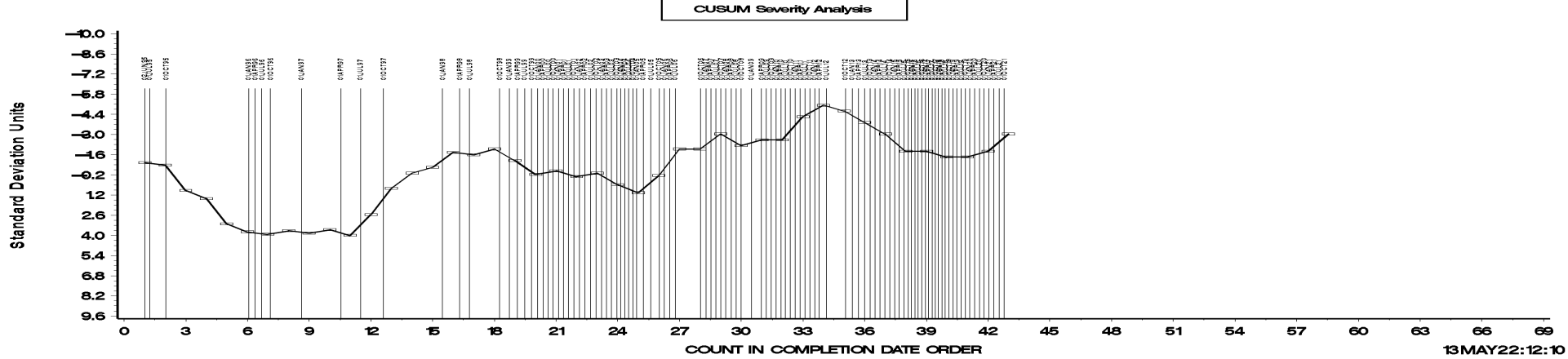
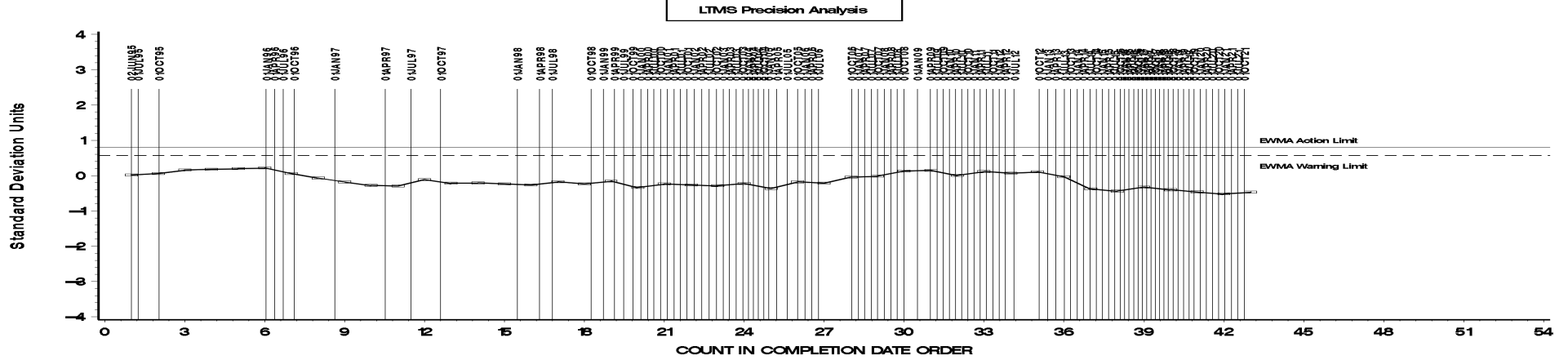
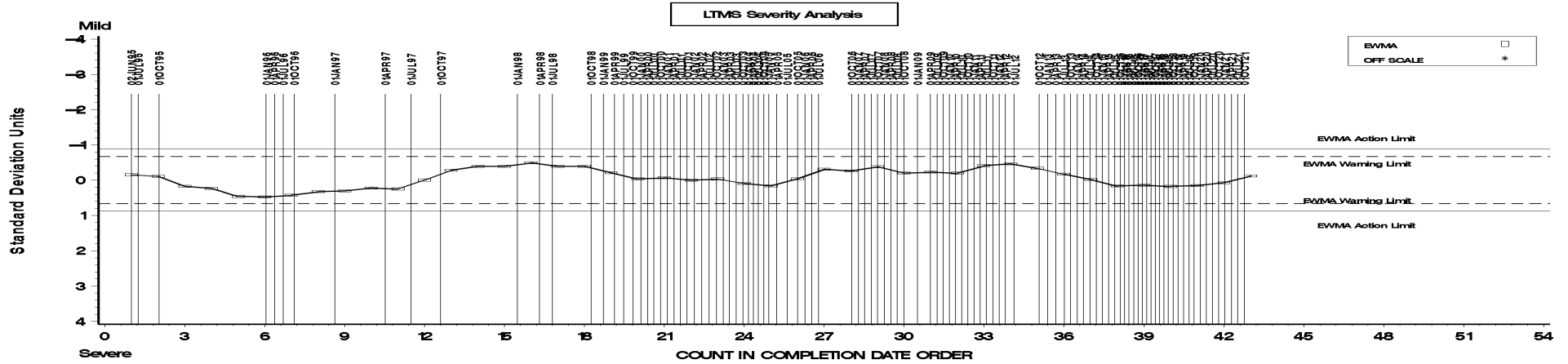
# EOAT Test Severity

- ▶ AEOA is in control.

# EOAT INDUSTRY OPERATIONAL VALID DATA

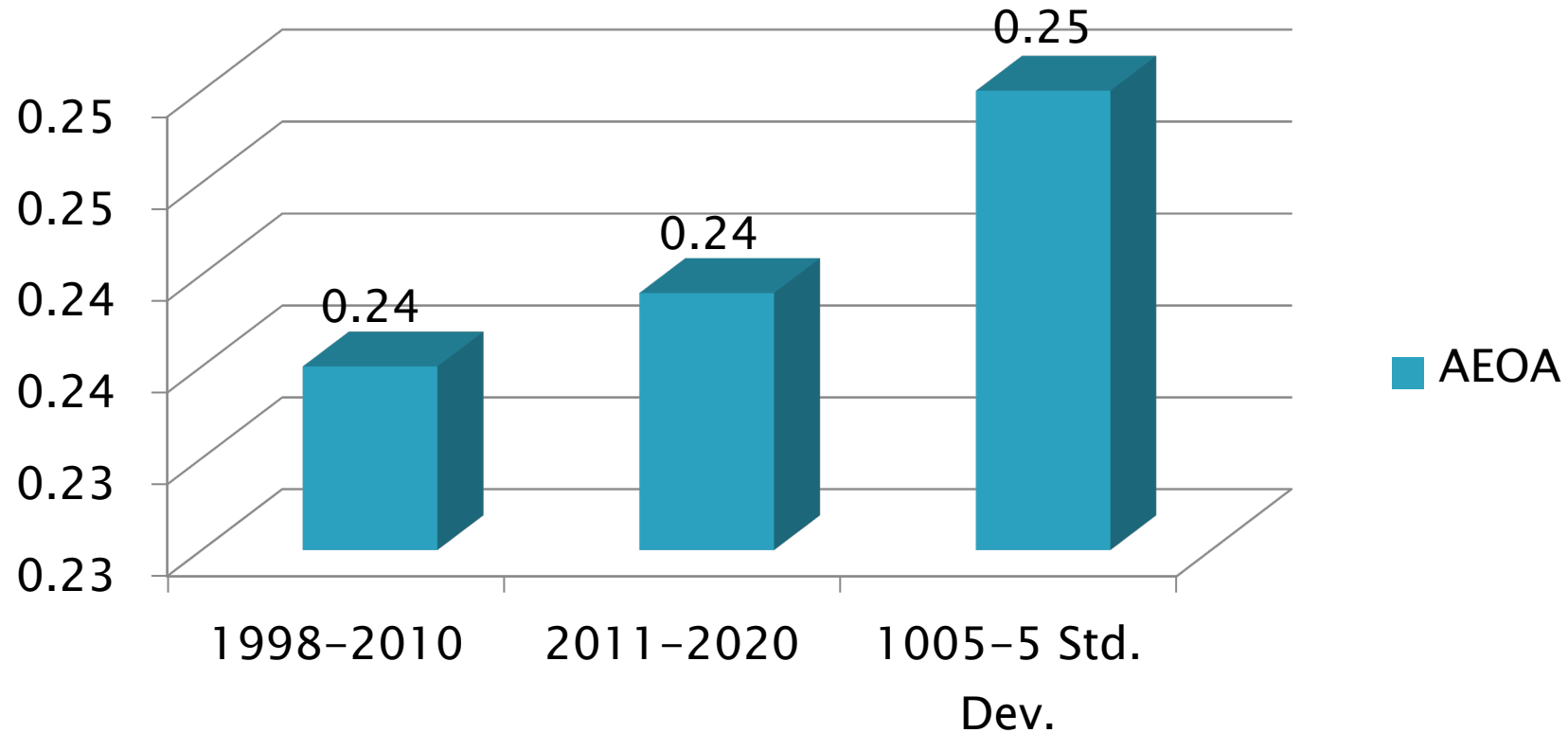


## ENGINE OIL AERATION



# EOAT Precision Estimates

## AEOA



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



# RFWT

➤➤ April 2023

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



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# RFWT Test Activity

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

# RFWT Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
<b>Total</b>	<b>0</b>



# RFWT Lost Tests\*

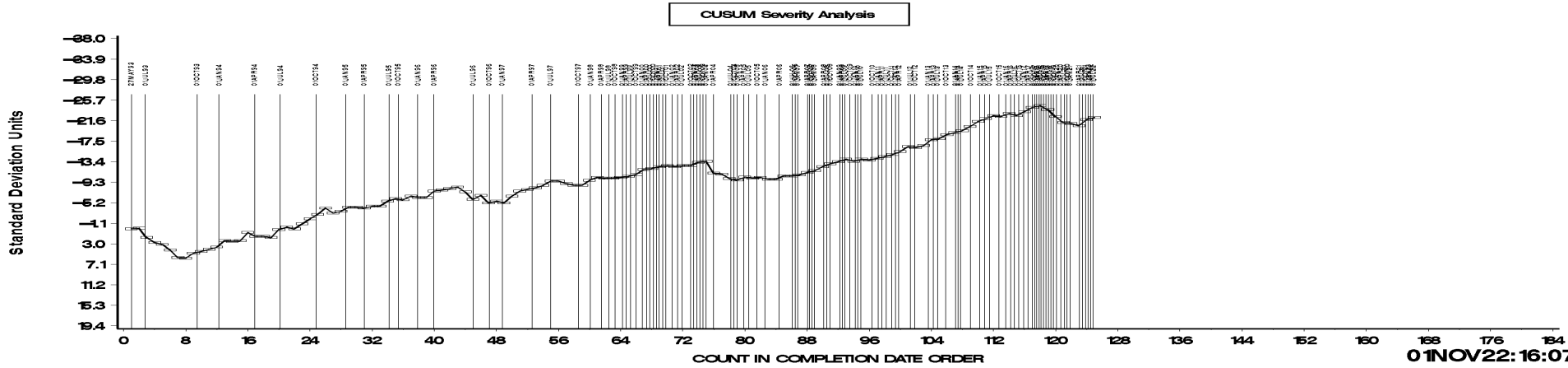
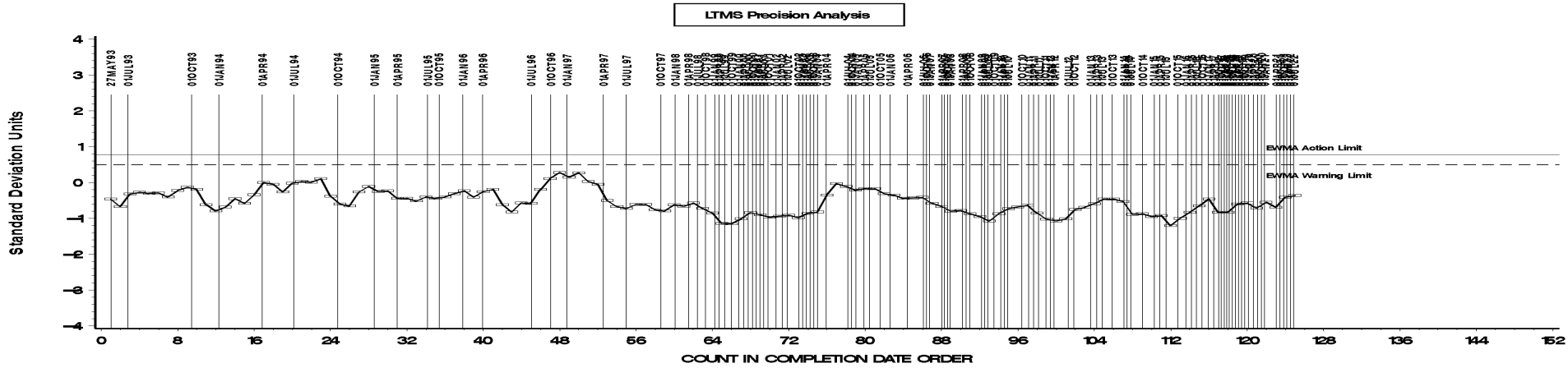
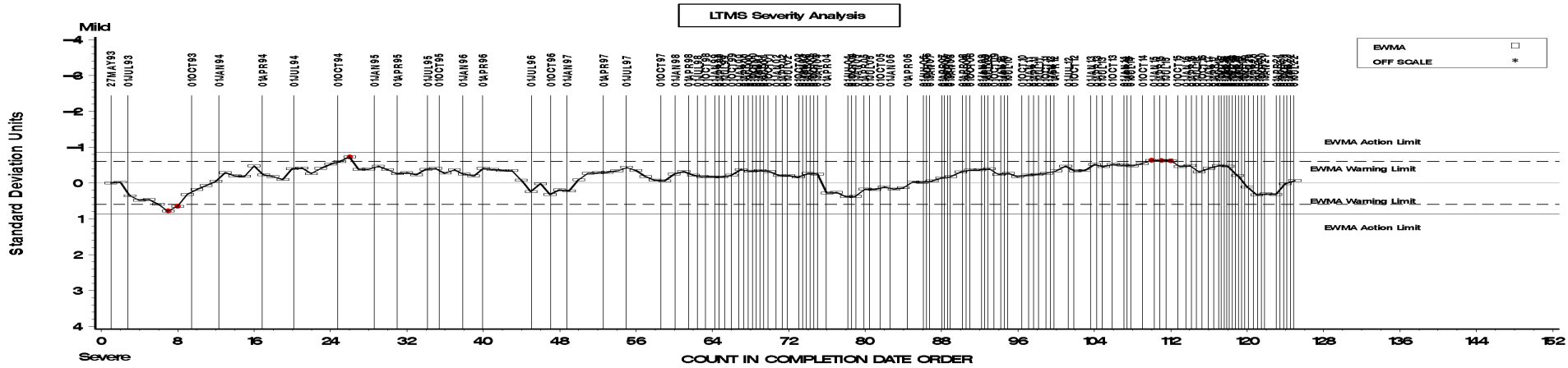
Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
<b>Total</b>		<b>0</b>

\*Invalid and aborted tests

# RFWT Test Severity

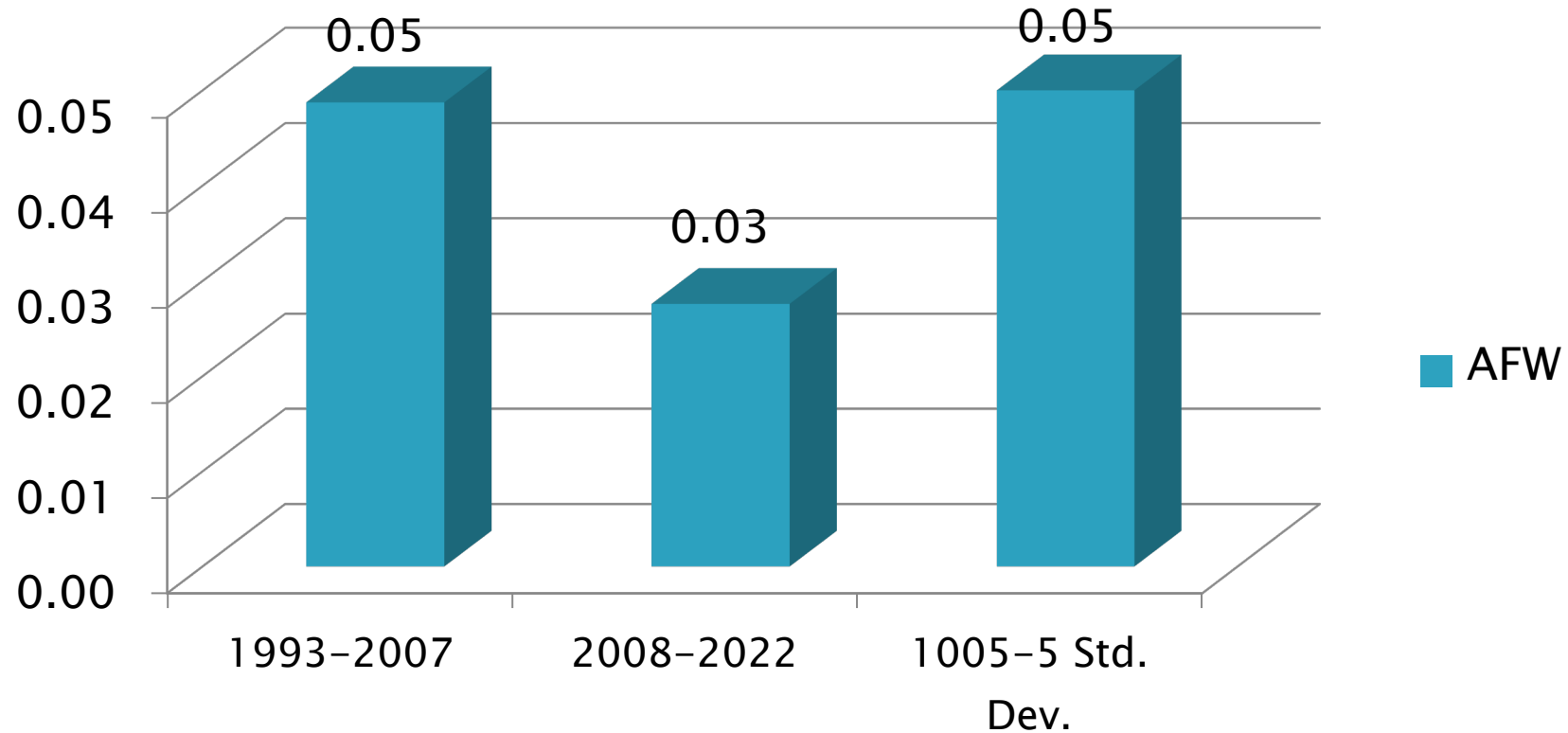
- ▶ As no RFWT tests were run during this period no statement about test severity can be made.

## Average Follower Wear



# RFWT Precision Estimates

AFW



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# Mack T-8/T-8E

➤➤ April 2023

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



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# T-8/T-8E Test Activity

Test Status	Validity Code	#
Acceptable Calibration Test	AC	0
Failed Calibration Test	OC	1
Operationally Invalid	LC	2
Aborted	XC	1
<b>Total</b>		<b>4</b>

# T-8/T8-E Failed Tests

Failed Parameter	Number of Tests
RV2 and RV48 severe	1
<b>Total</b>	<b>1</b>

# T-8/T8-E Lost Tests\*

Status	Cause	#
Invalid	Excessive oil consumption	1
Invalid	Missed soot window	1
Aborted	No aborted tests	0
<b>Total</b>		<b>2</b>

\*Invalid and aborted tests

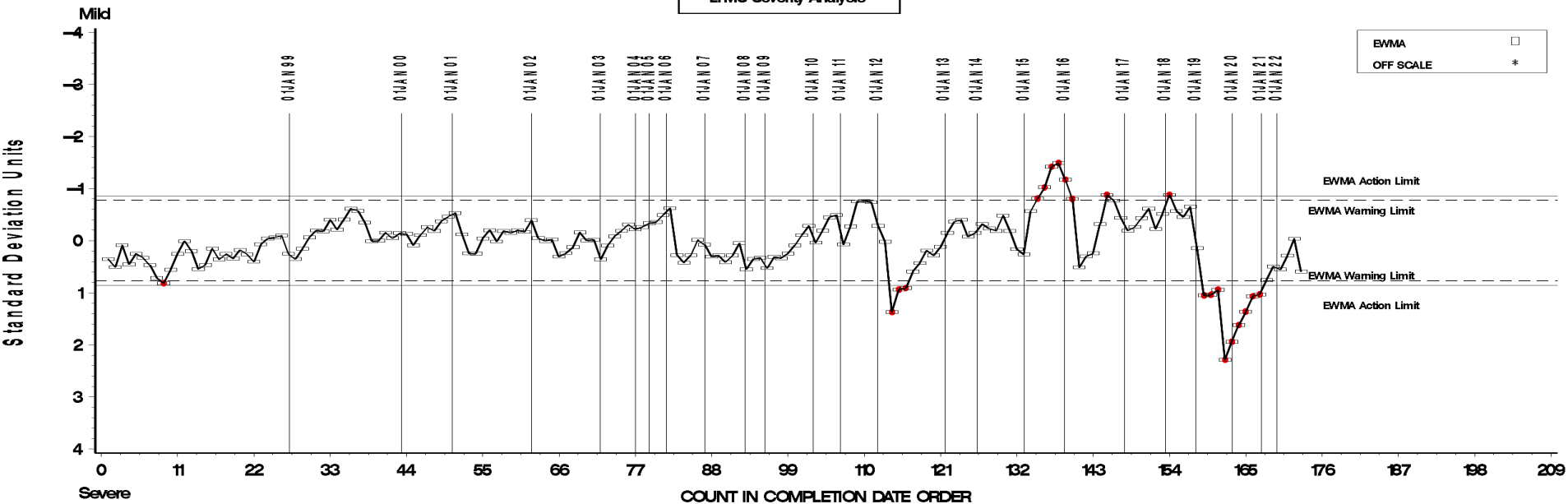


# T-8/T-8E Test Severity

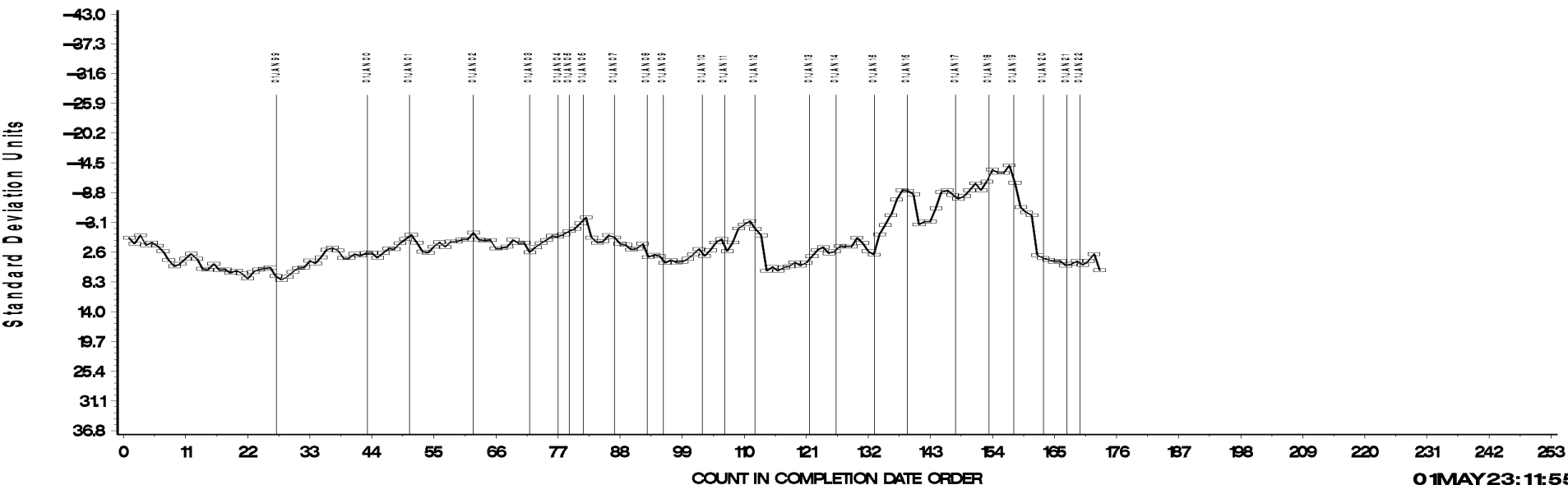
- ▶ VI38 is in level 2 Zi alarm in mild direction
- ▶ RV48 and RV2 are in control

RELATIVE VISCOSITY @ 4.8% (100% LOSS)

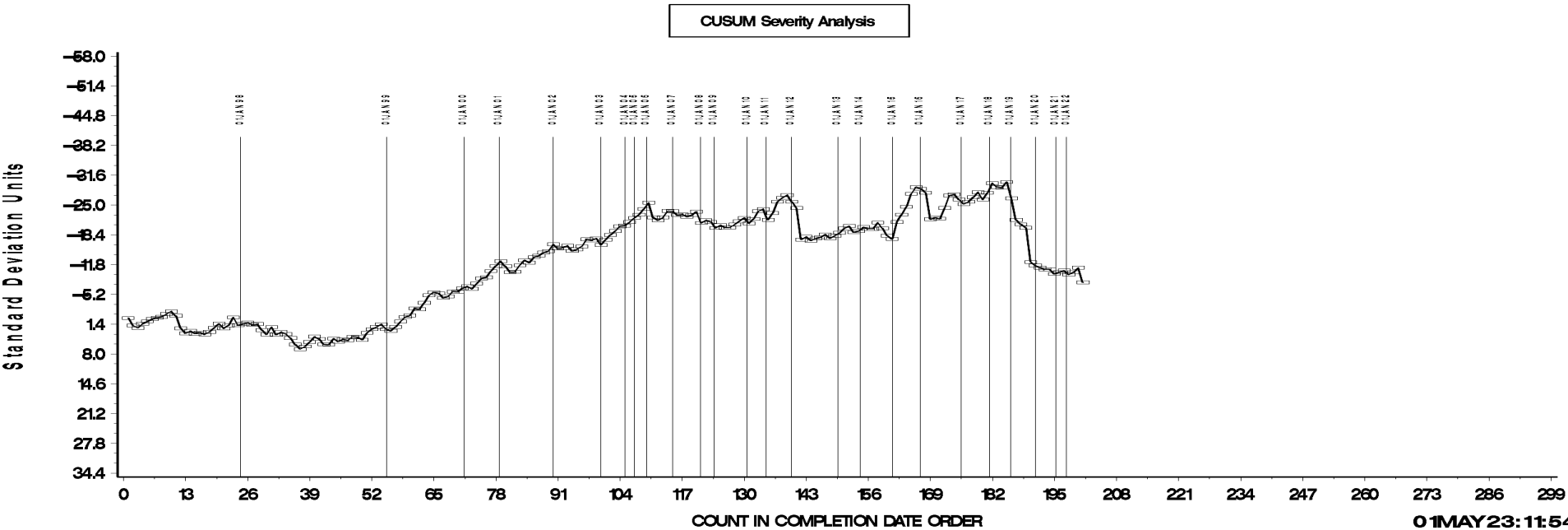
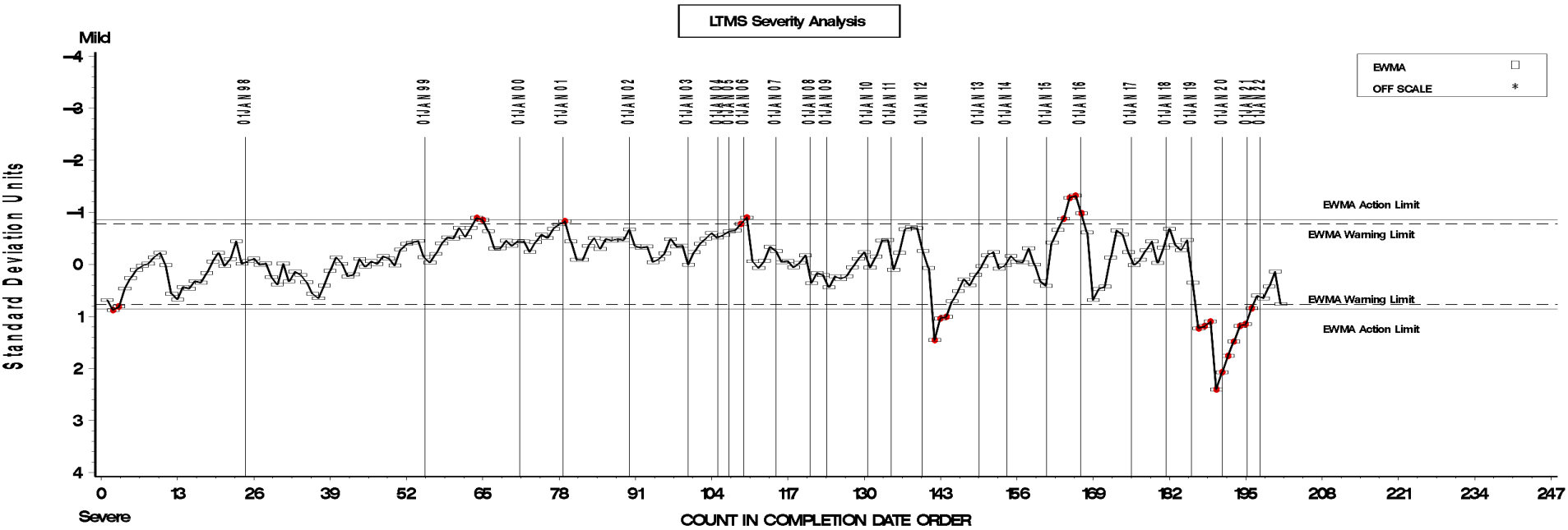
LTMS Severity Analysis



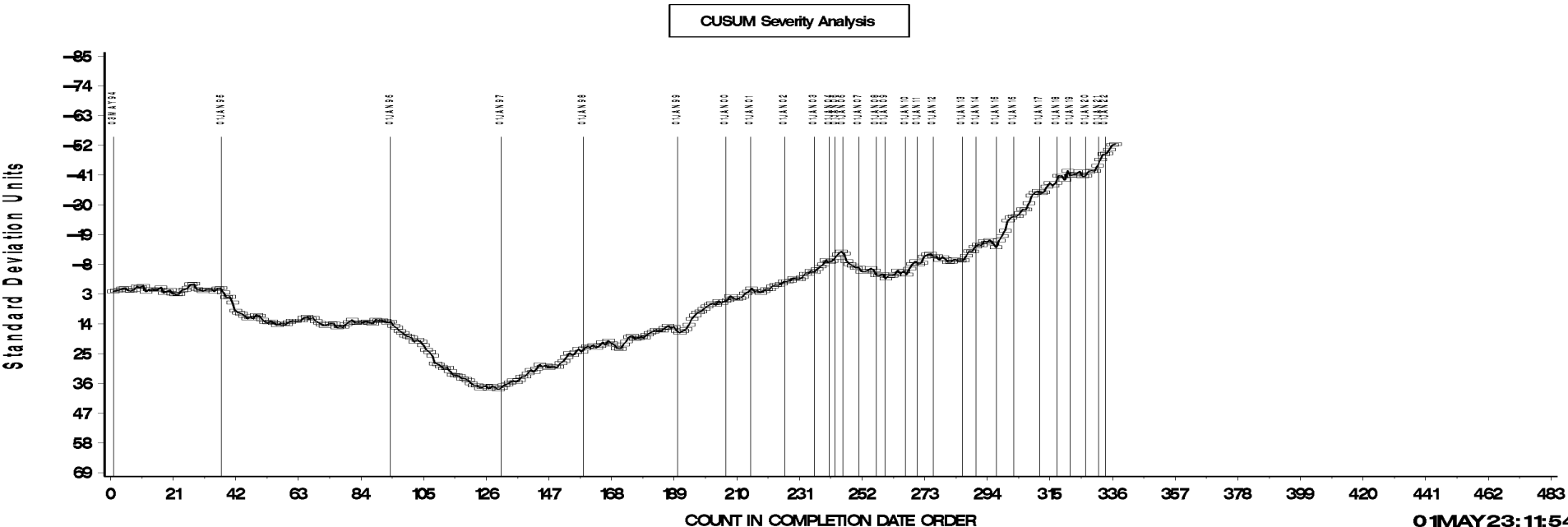
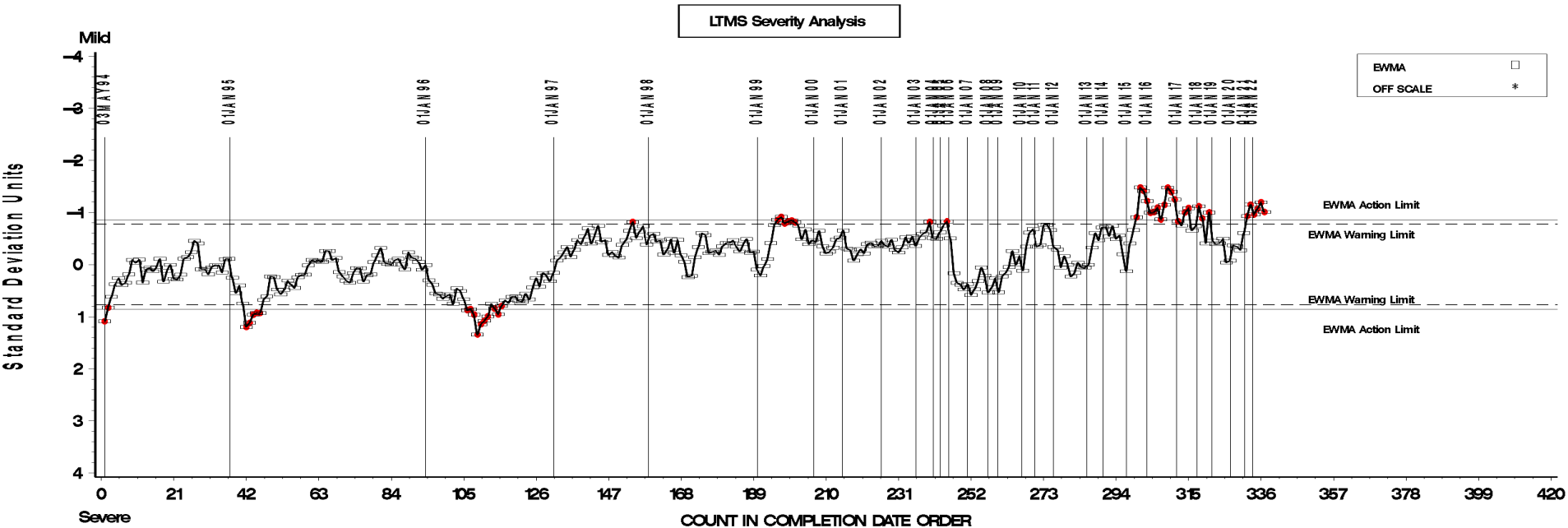
CUSUM Severity Analysis



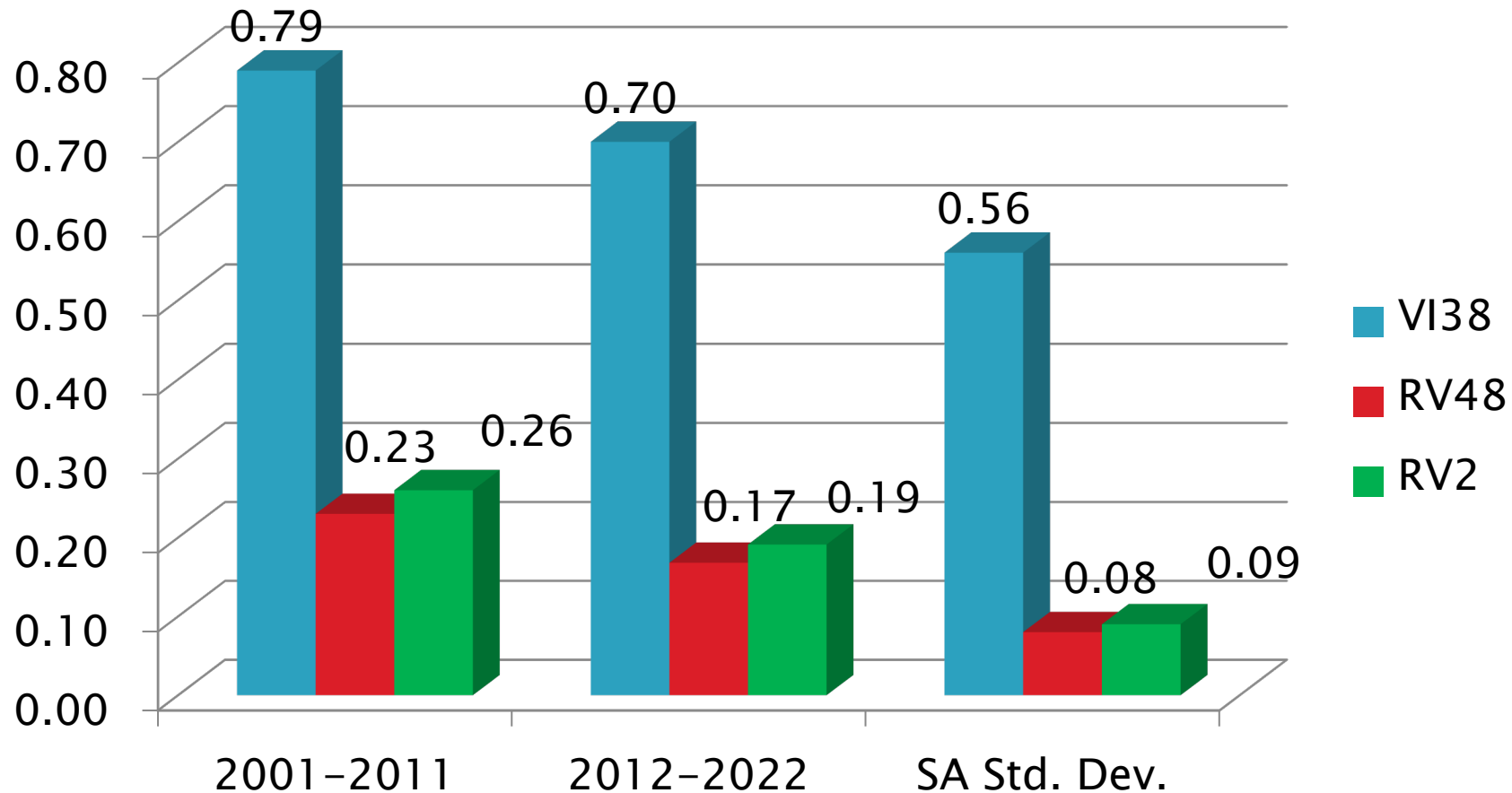
RELATIVE VISCOSITY @ 4.8% (50% LOSS)



VISCOSITY INCR @ 3.8% SOOT



# T-8/E Precision Estimates



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



# Mack T-11

➤➤ April 2023

# T-11 Test Activity

Test Status	Validity Code	#
Acceptable Calibration Test	AC	3
Failed Calibration Test	OC	0
Operationally Invalid	LC	0
Aborted	XC	1
Informational	NN	1
<b>Total</b>		<b>5</b>

# T-11 Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
<b>Total</b>	<b>0</b>



# T-11 Lost Tests\*

Status	Cause	#
Invalid	No invalid tests	0
Aborted	Oil loss	1
<b>Total</b>		<b>1</b>

\*Invalid and aborted tests

# T-11 Informational Tests

	#
ISM run as T11	1
<b>Total</b>	<b>1</b>

\*Invalid and aborted tests

# T-11 Test Severity

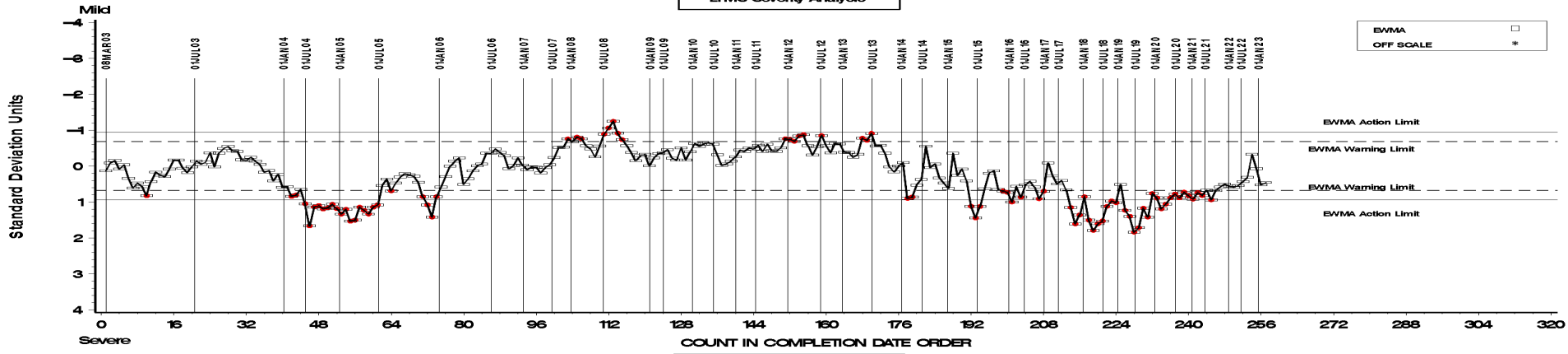
- ▶ SOOT, SOOT5 and MRV are in control.
- ▶ SOOT4 is in severity action alarm in the severe direction.

# T-11 INDUSTRY OPERATIONALLY VALID DATA

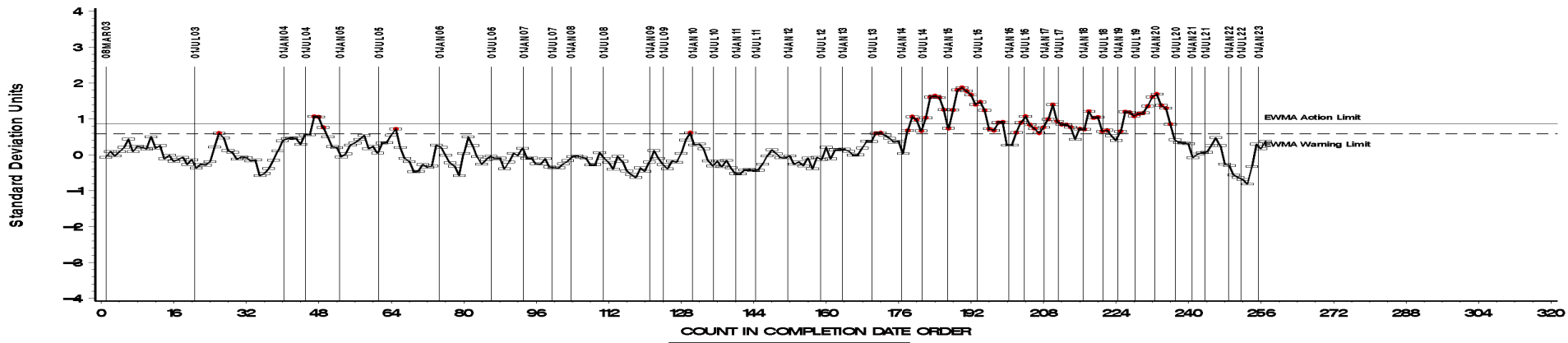


## MRV VISCOSITY

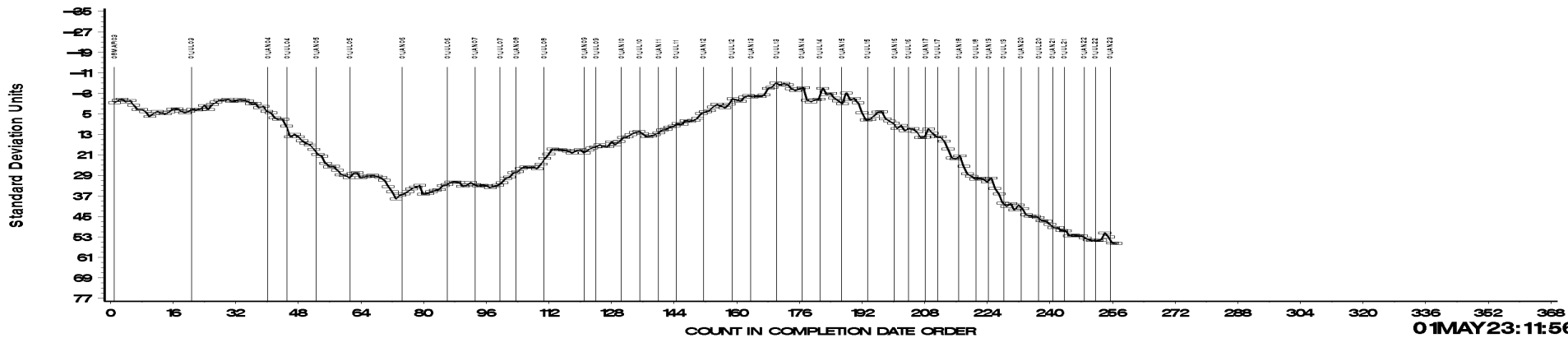
LTMS Severity Analysis



LTMS Precision Analysis



CUSUM Severity Analysis

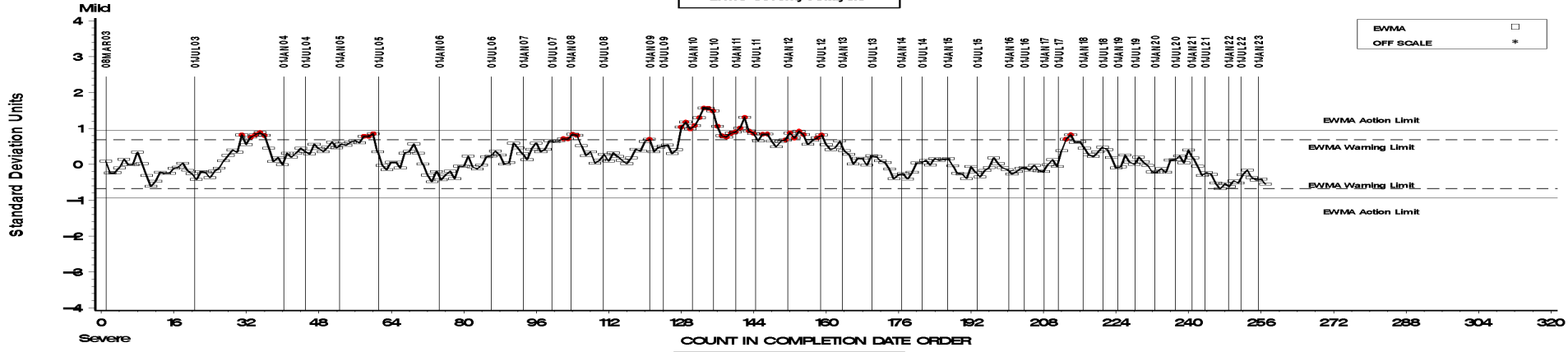


# T-41 INDUSTRY OPERATIONALLY VALID DATA

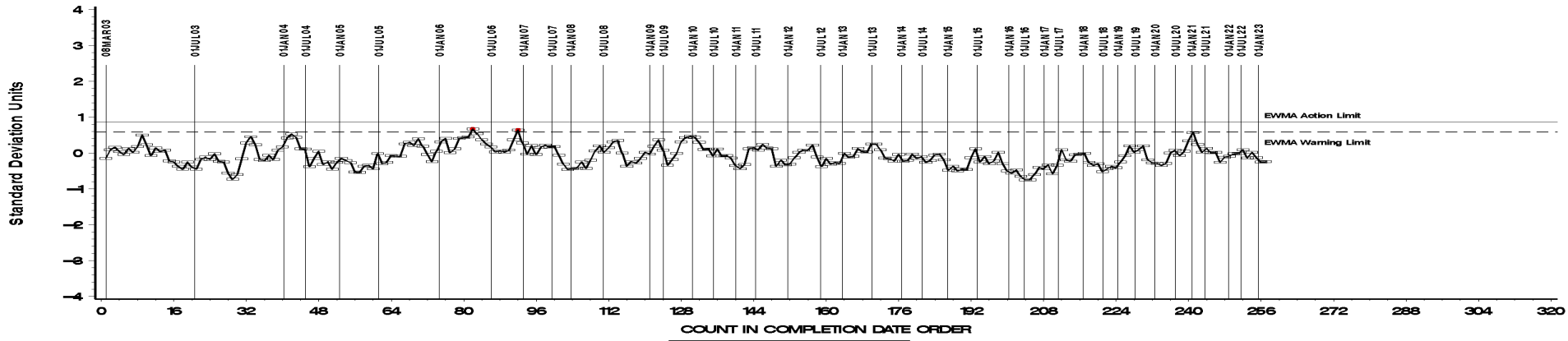


## SOOT AT 12 cSt

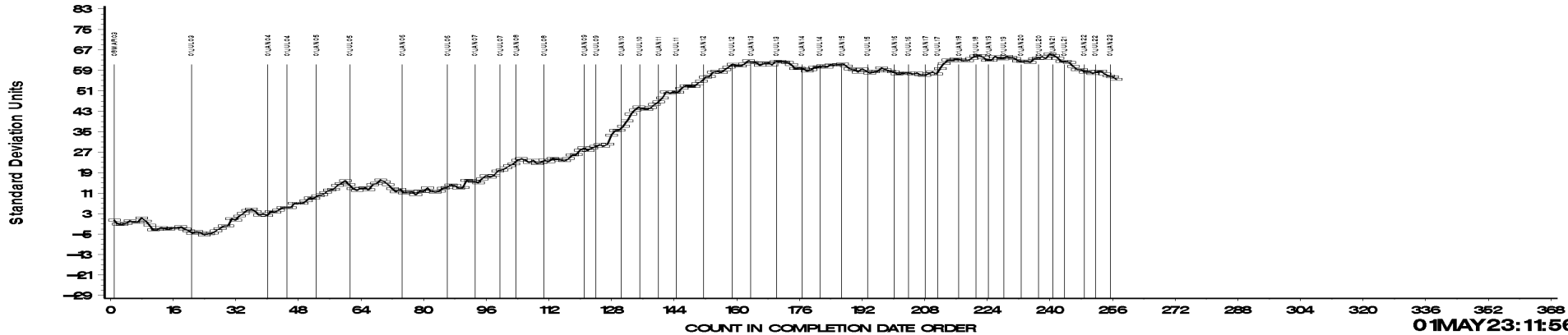
LTMS Severity Analysis



LTMS Precision Analysis



CUSUM Severity Analysis

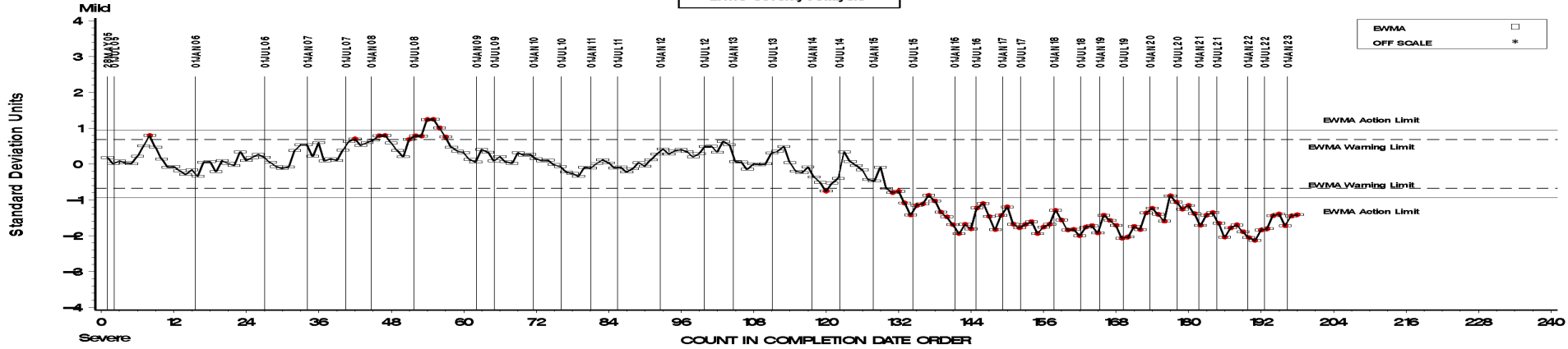


# T-41 INDUSTRY OPERATIONALLY VALID DATA

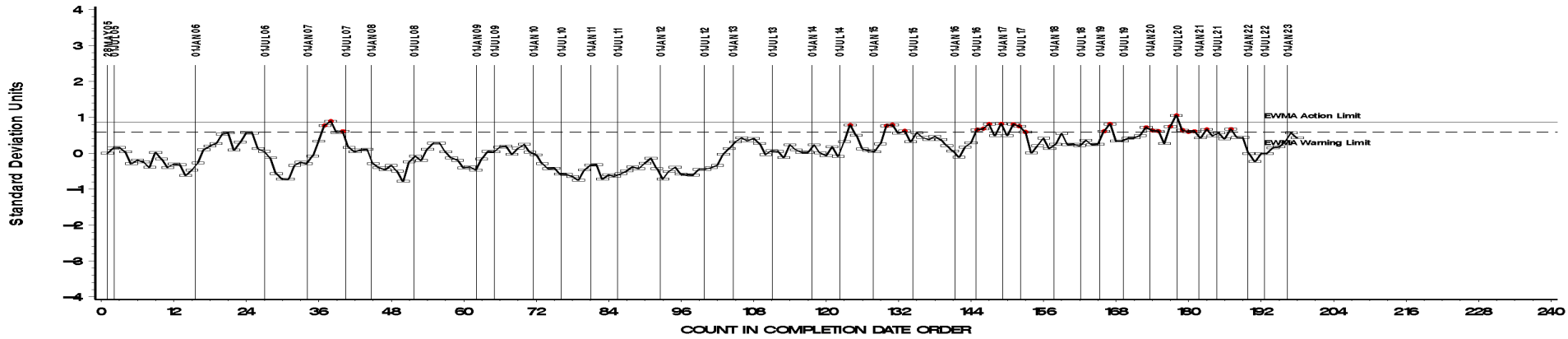


## SOOT @ 4 cSt — FINAL RESULT

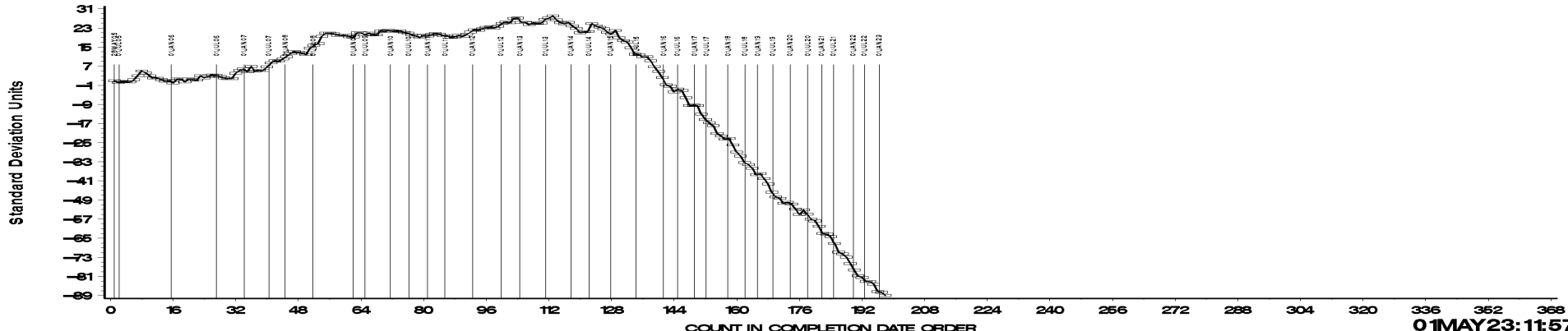
LTMS Severity Analysis



LTMS Precision Analysis



CUSUM Severity Analysis

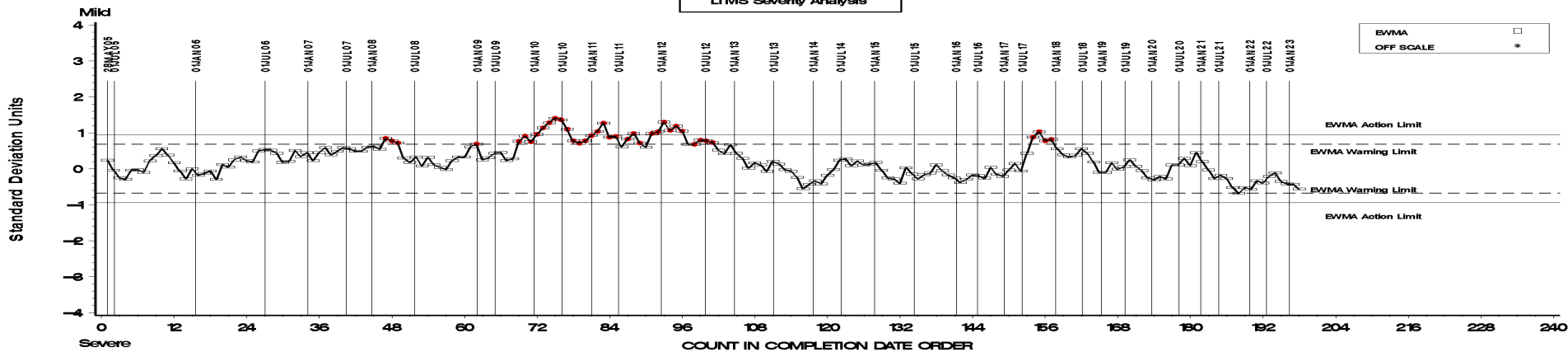


# T-41 INDUSTRY OPERATIONALLY VALID DATA

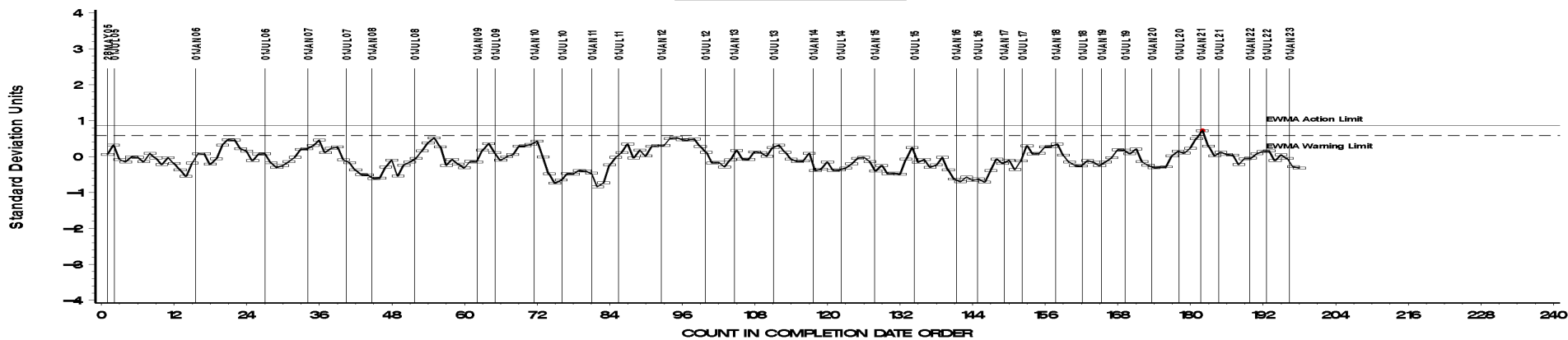


## SOOT @ 15 cSt — FINAL RESULT

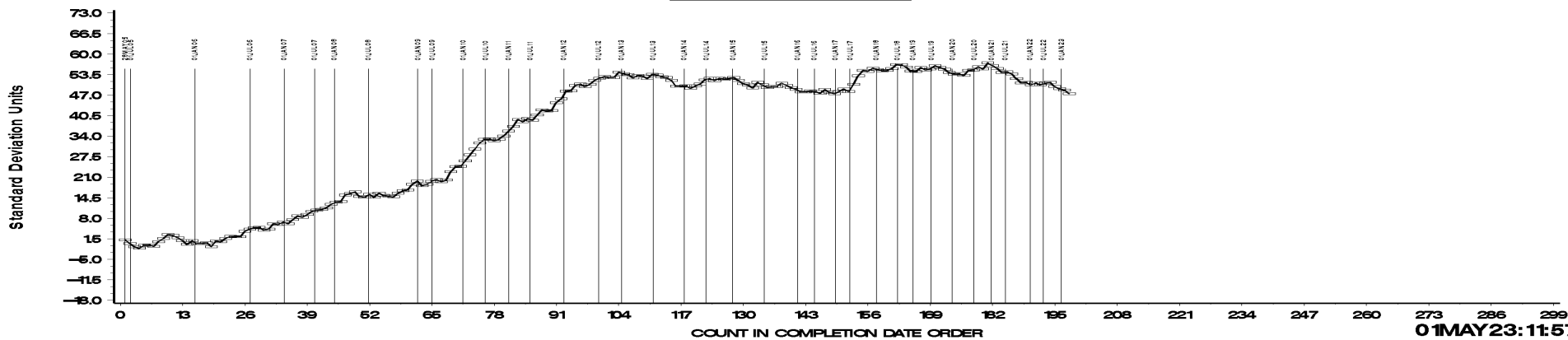
LTMS Severity Analysis



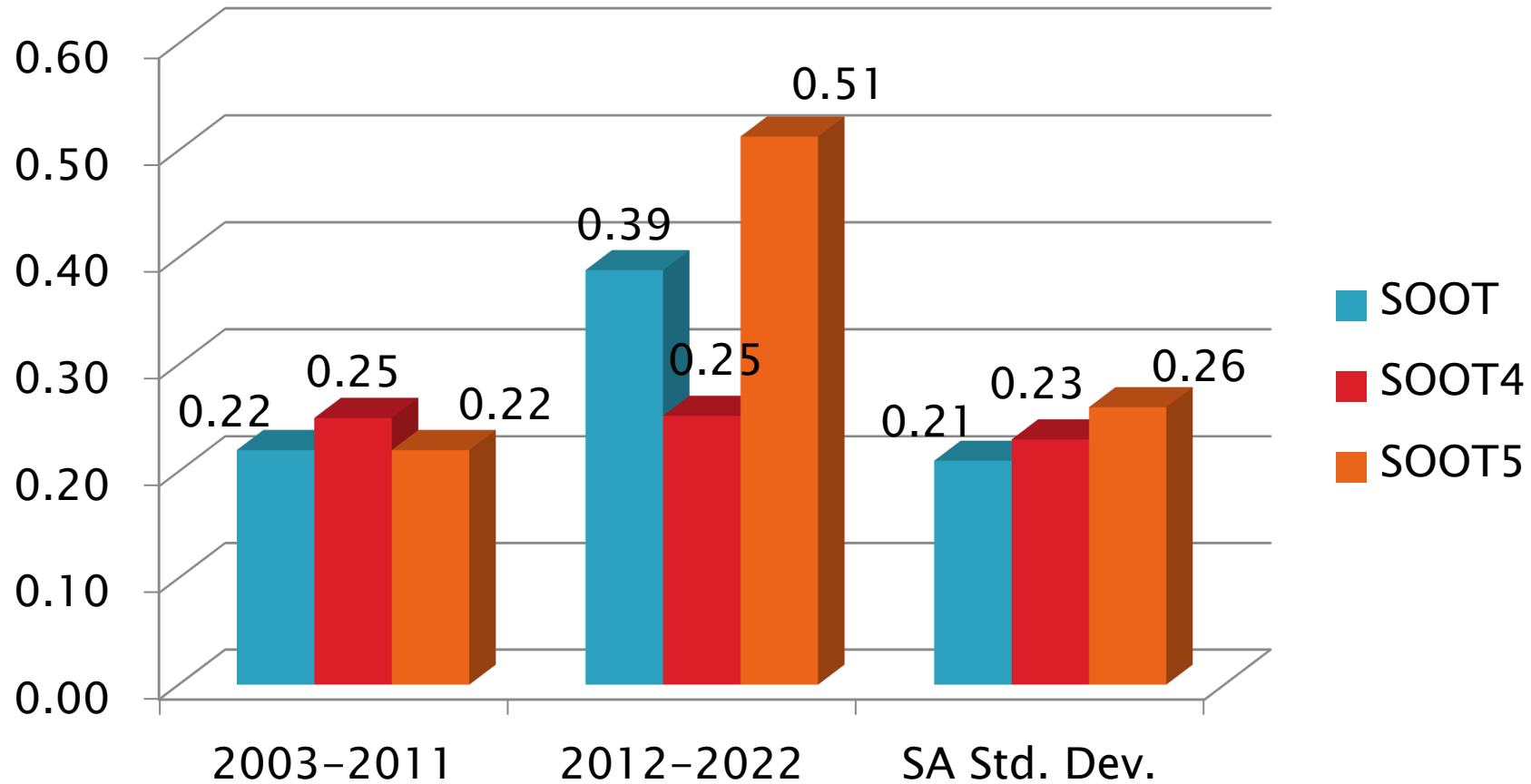
LTMS Precision Analysis



CUSUM Severity Analysis



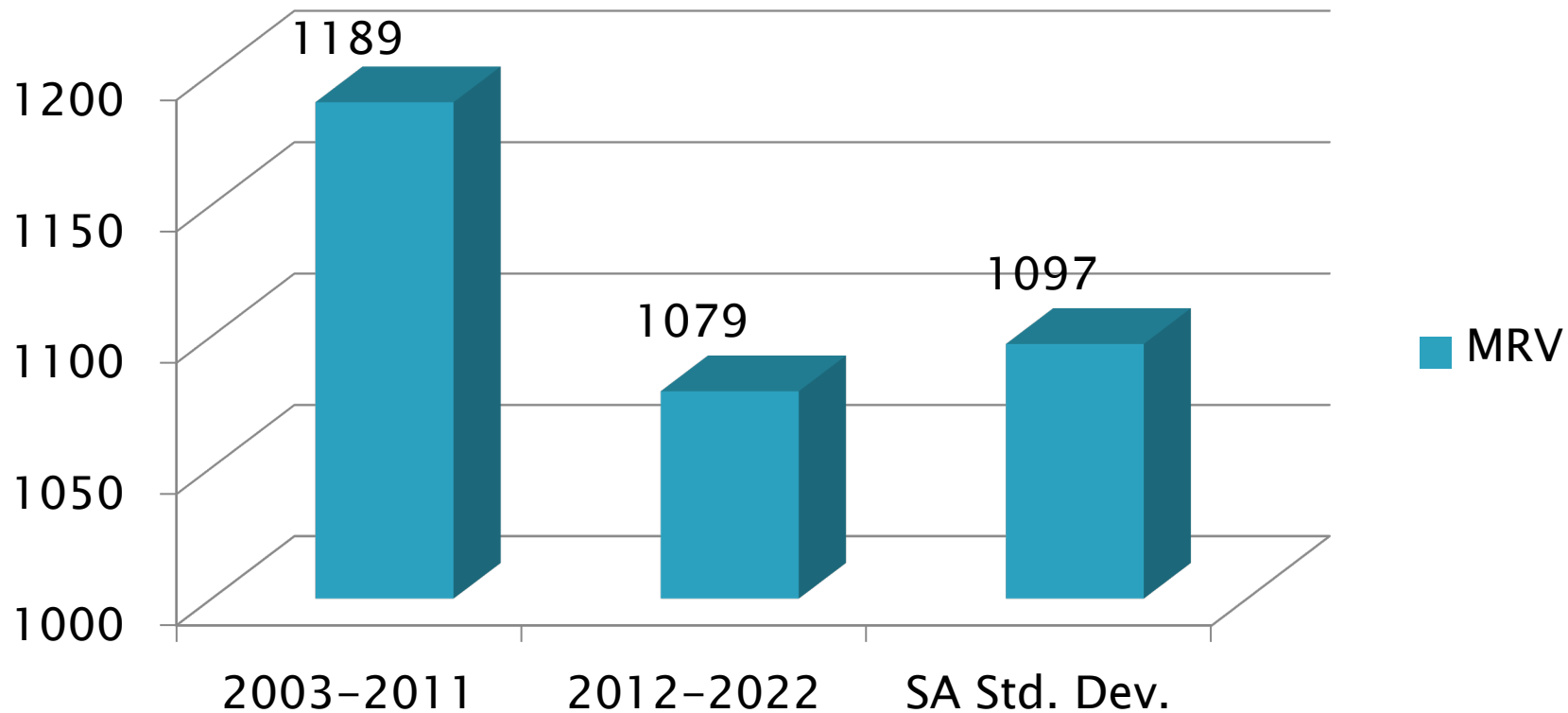
# T-11 Precision Estimates





# T-11 Precision Estimates

MRV



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# Mack T-12

➤➤ April 2023

# 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
<b>Total</b>		<b>0</b>

# T-12 Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
<b>Total</b>	<b>0</b>

# T-12 Lost Tests\*

Status	Cause	#
Invalid	No invalid tests	0
Aborted	No aborted tests	0
<b>Total</b>		<b>0</b>

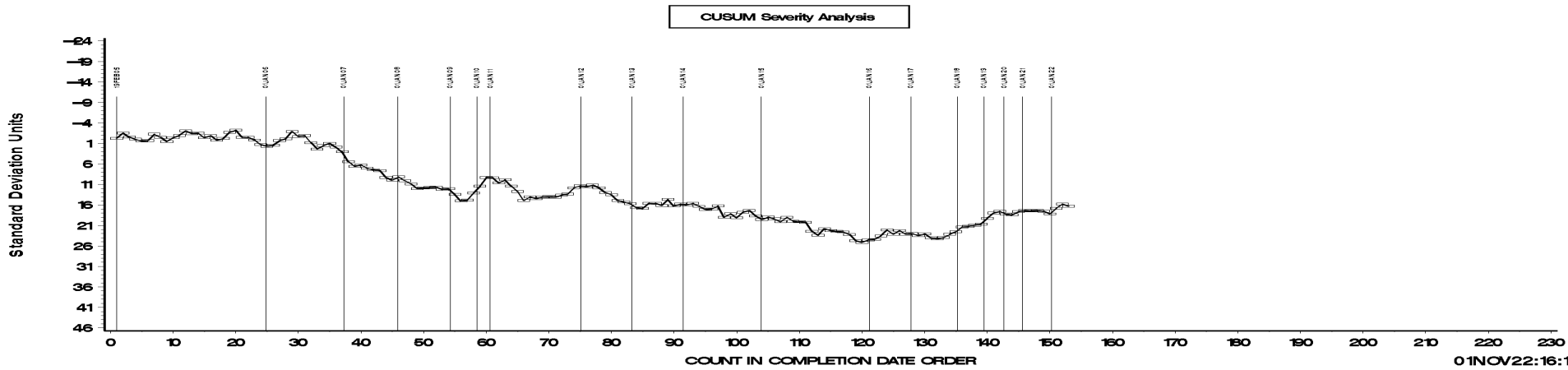
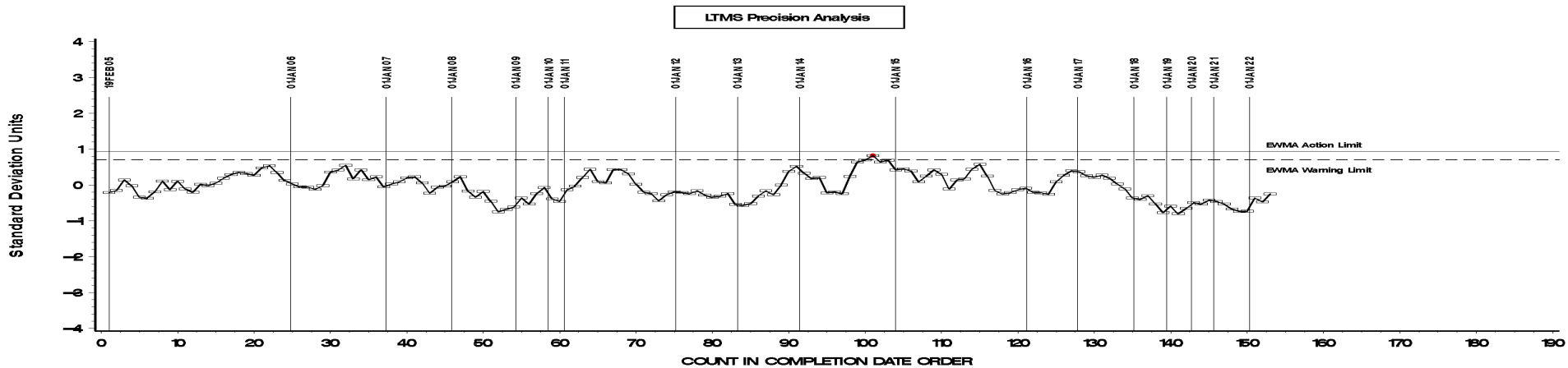
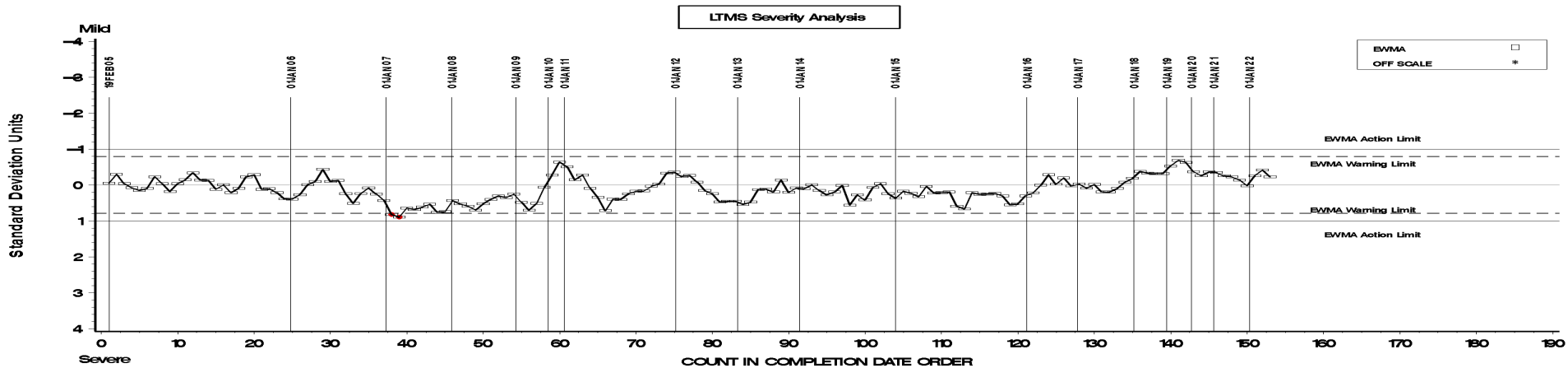
\*Invalid and aborted tests

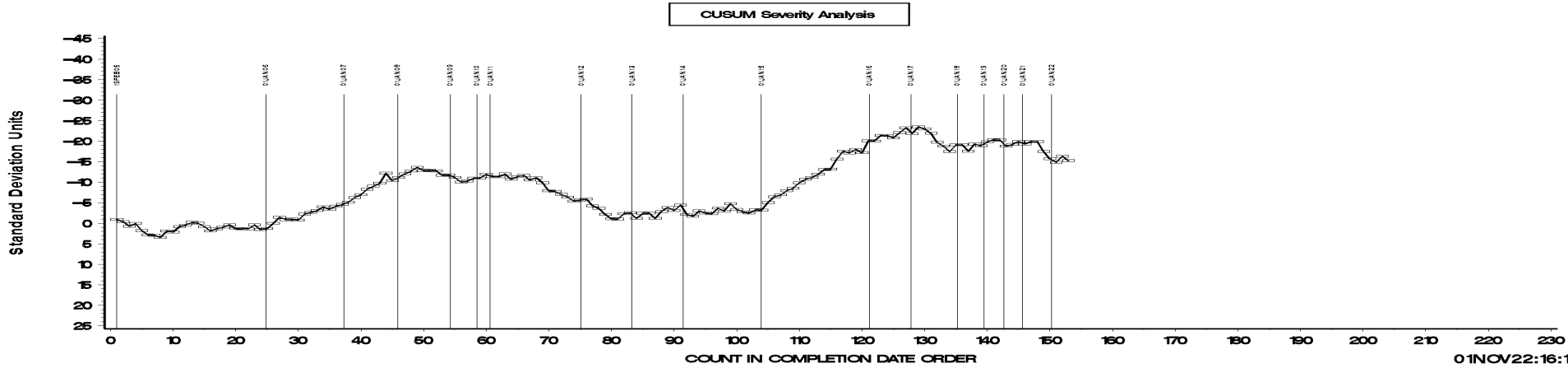
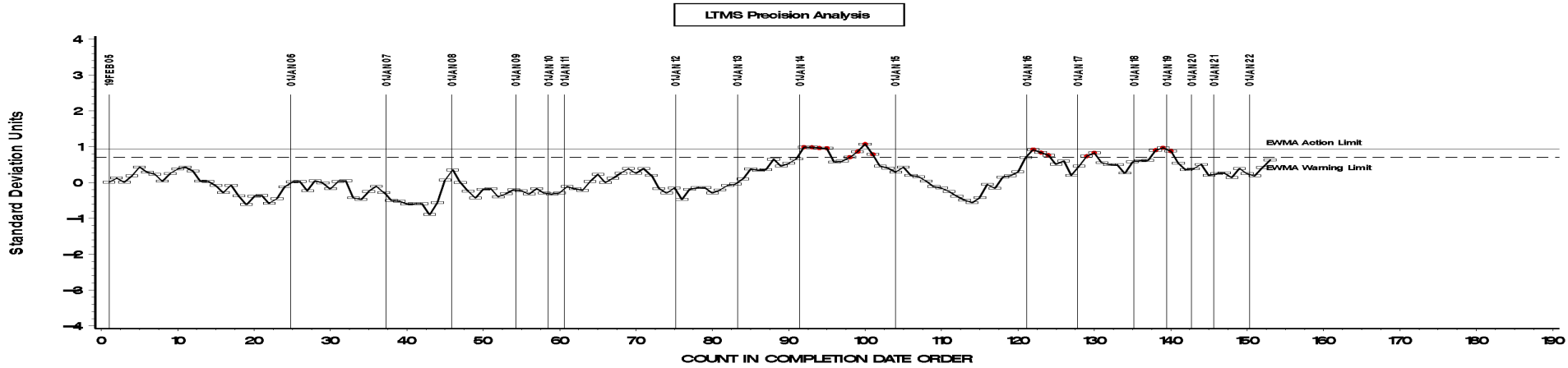
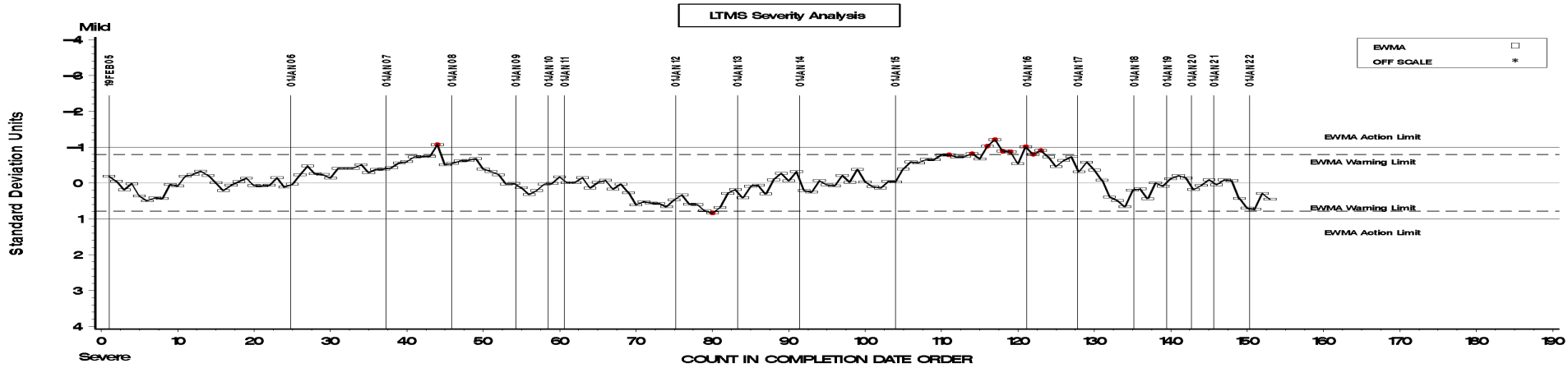
# T-12 Test Severity

- ▶ As no T12 tests were run during this period no statement about test severity can be made.

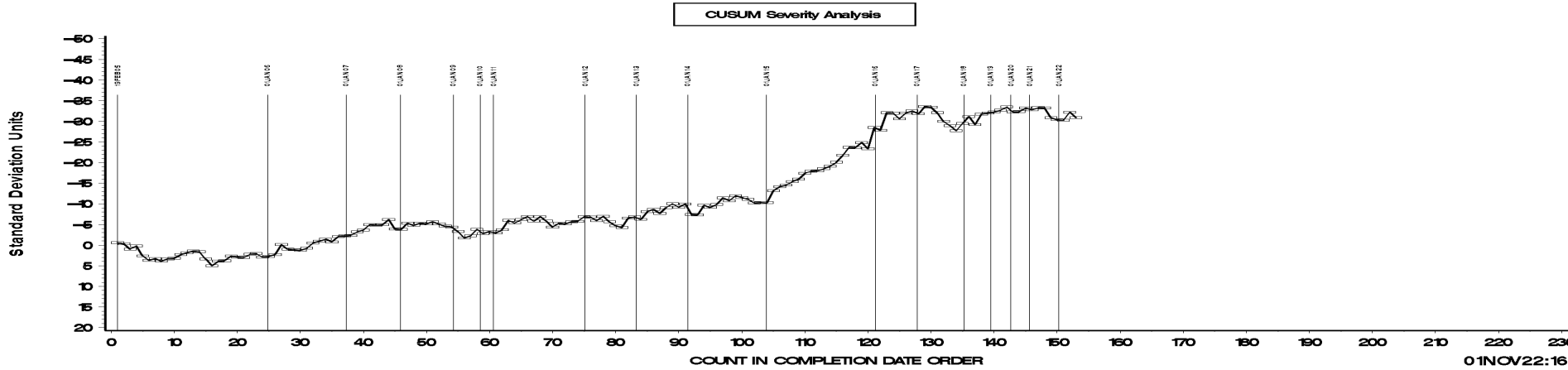
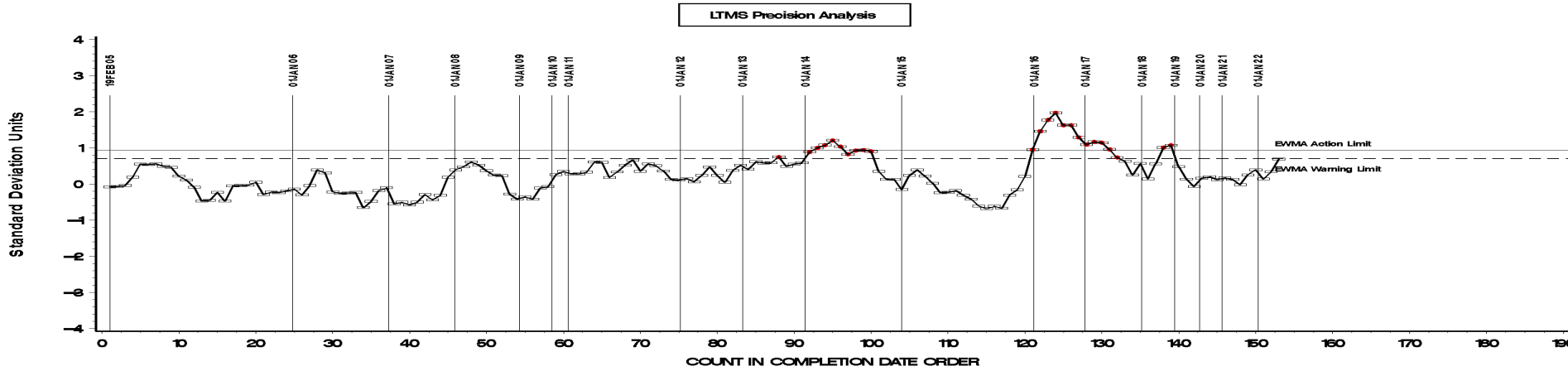
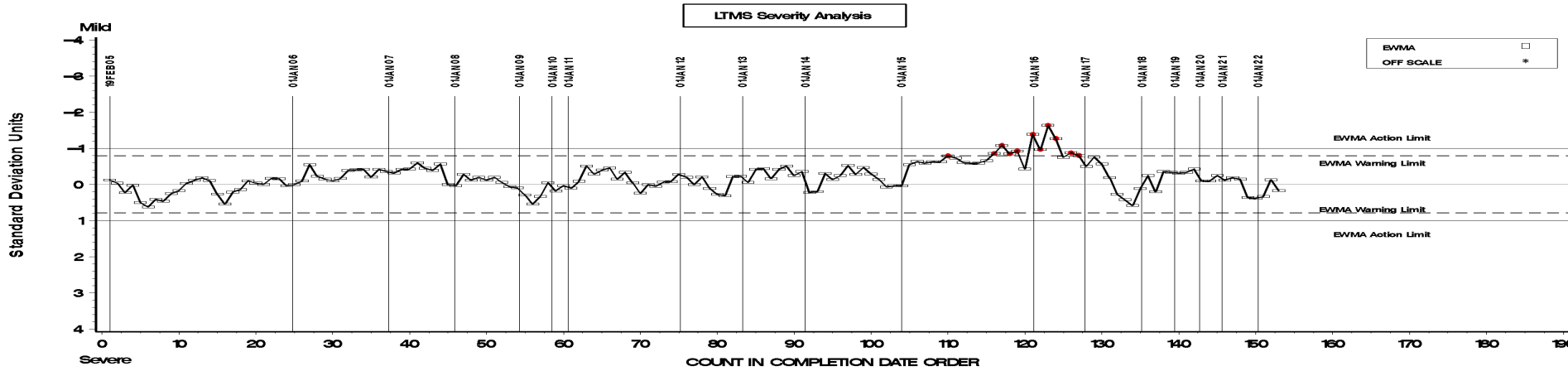
# MACK T-22 INDUSTRY OPERATIONALLY VALID DATA

## AVG. CYLINDER LINER WEAR (CLW)



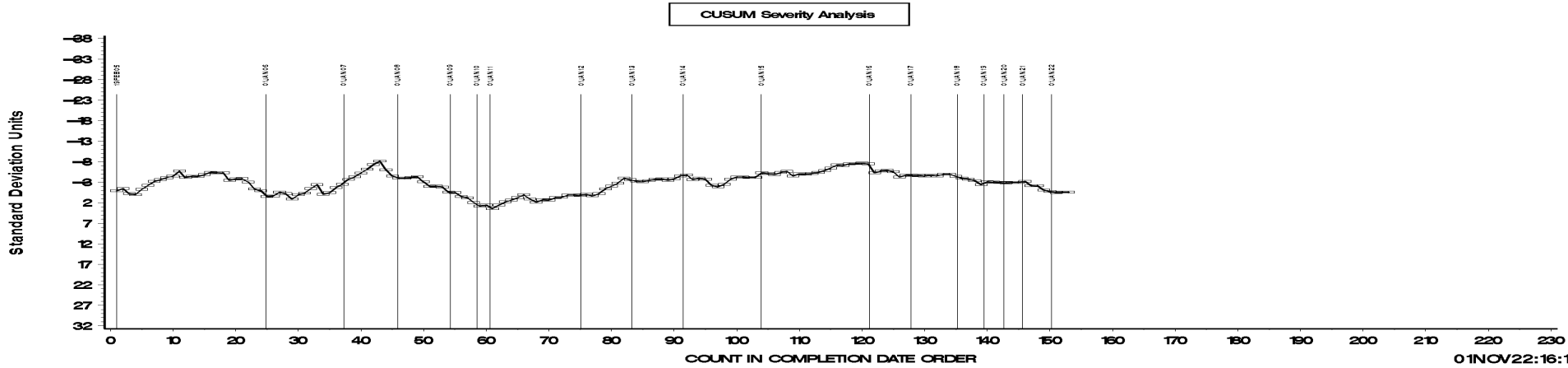
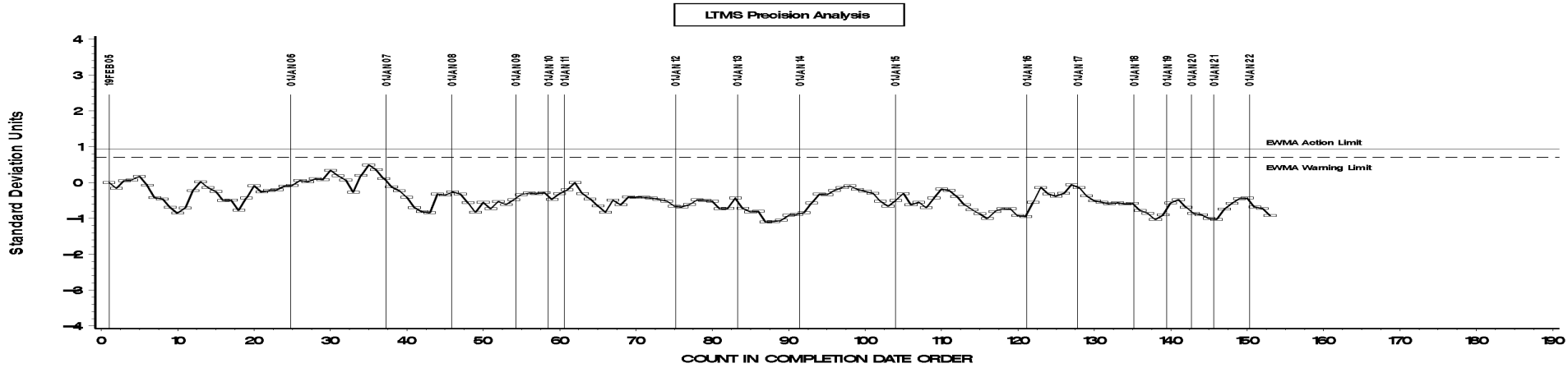
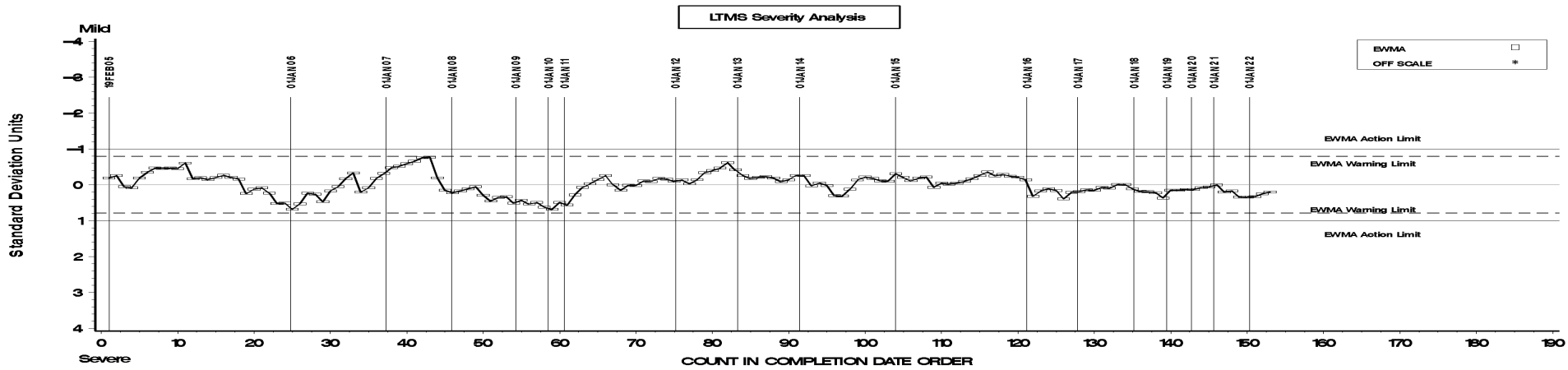


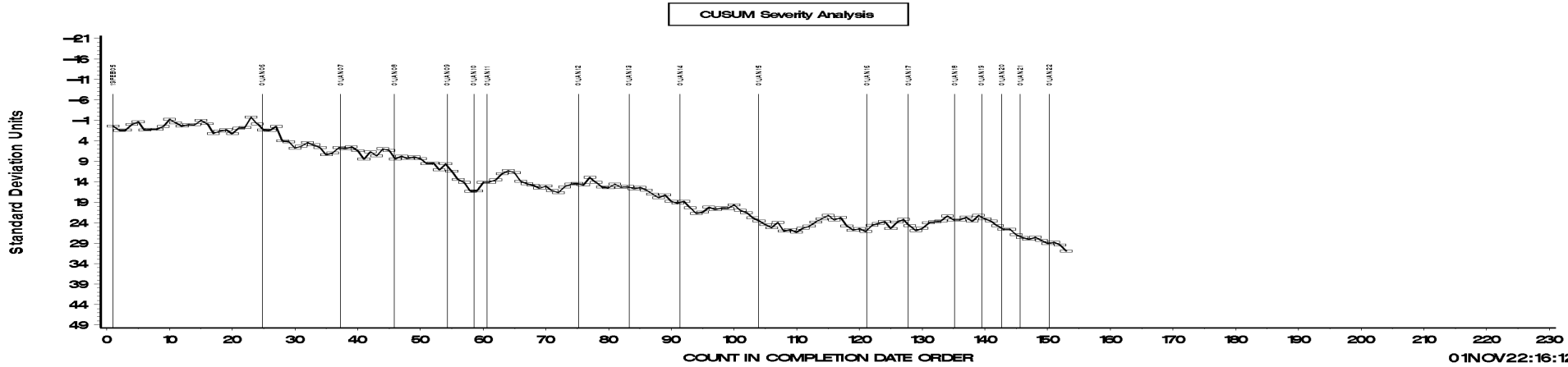
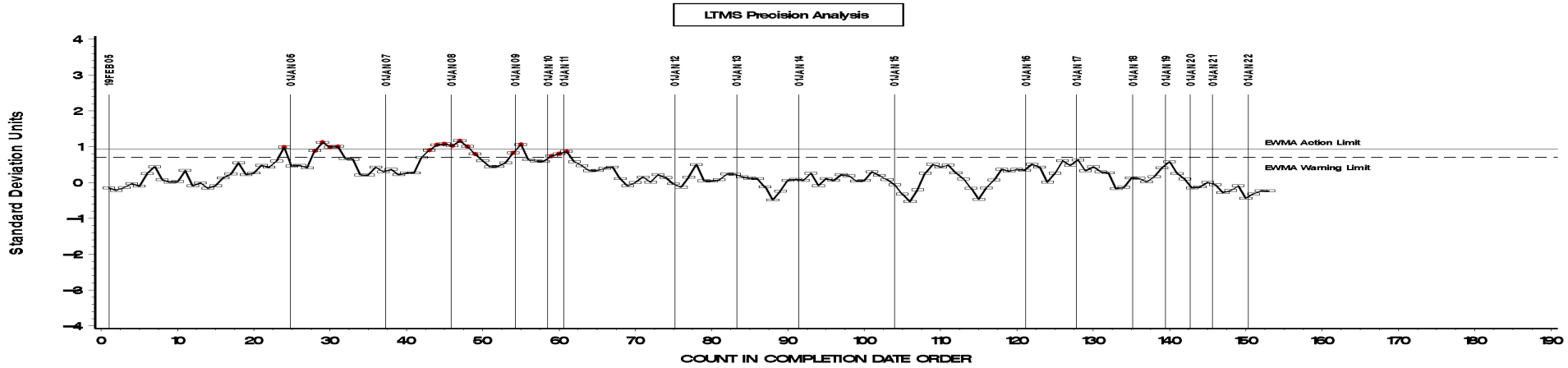
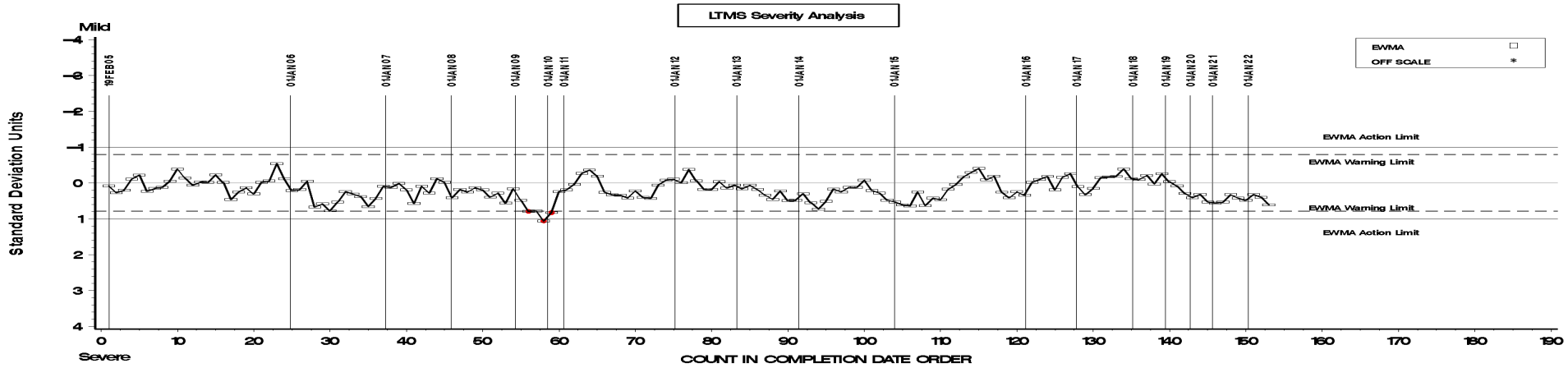




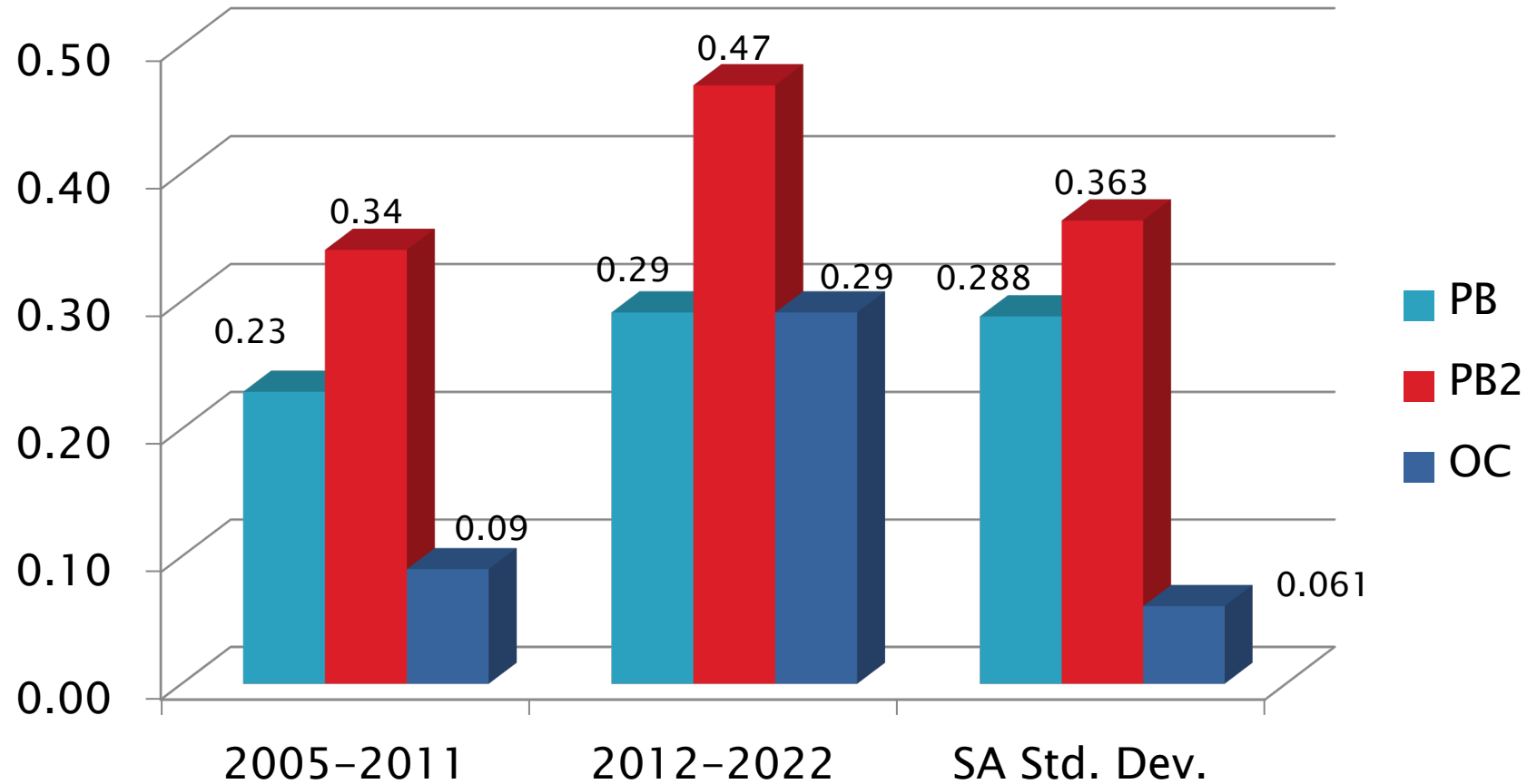
# MACK T-12 INDUSTRY OPERATIONAL VALID DATA

## AVG. TOP RING WEIGHT LOSS (TRWL)

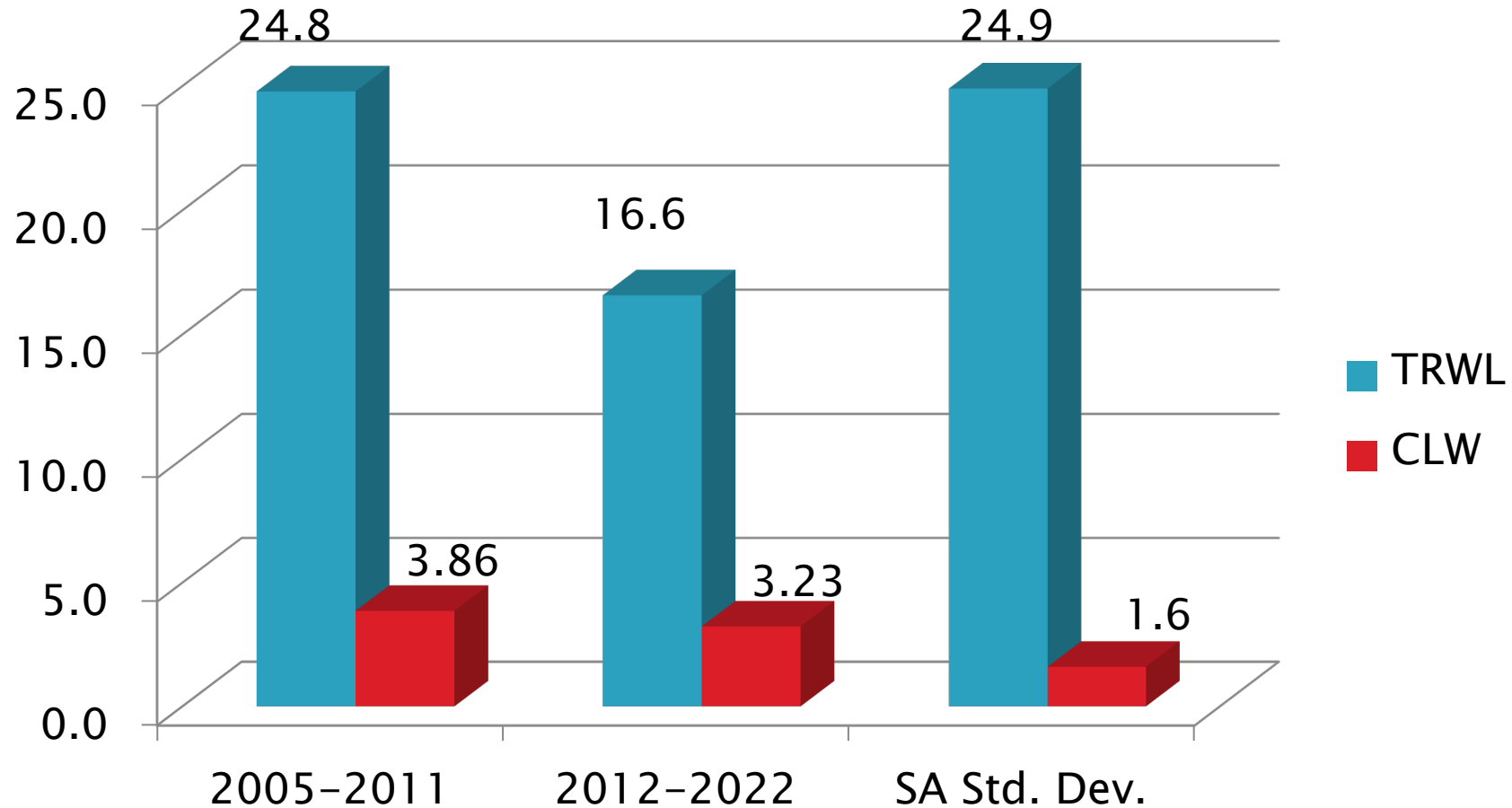




# T-12 Precision Estimates



# T-12 Precision Estimates



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# Mack T-12A

➤➤ April 2023

# T-12A Test Activity

Test Status	Validity Code	#
Acceptable Calibration Test	AC	0
Failed Calibration Test	OC	0
Operationally Invalid	LC	0
<b>Total</b>		<b>0</b>

# T-12A Failed Tests

Failed Parameter	Number of Tests
No failed tests	0
<b>Total</b>	<b>0</b>



# T-12A Lost Tests\*

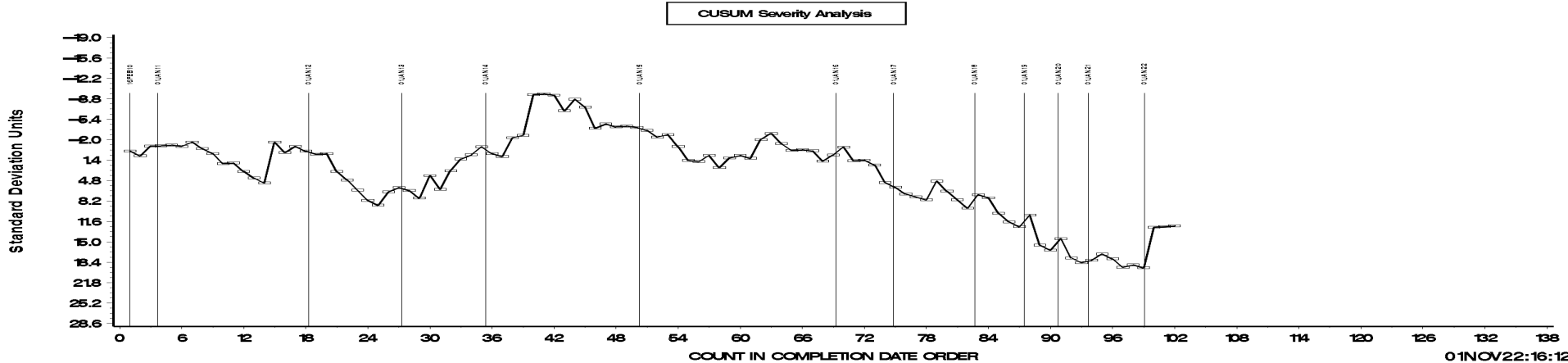
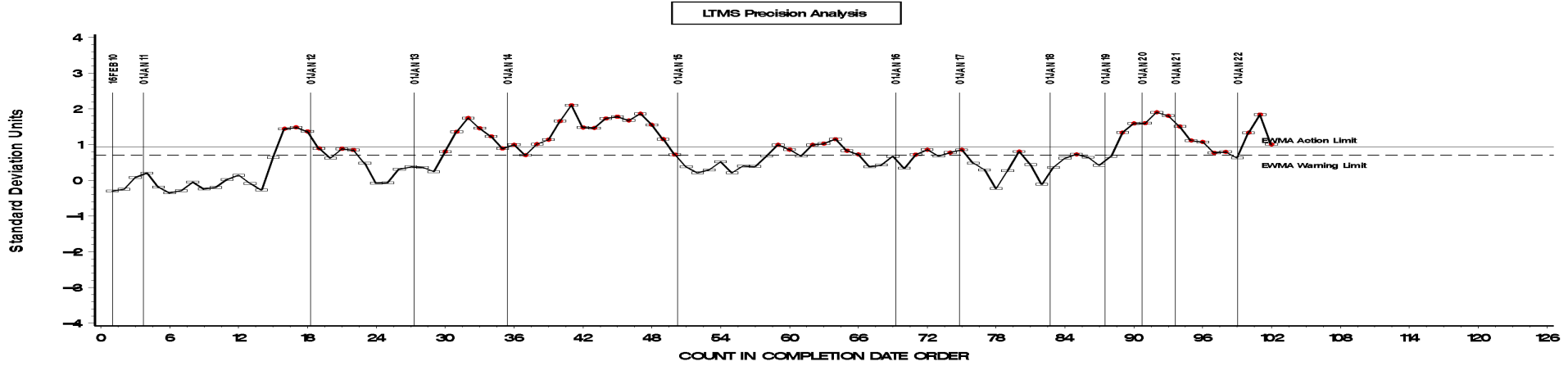
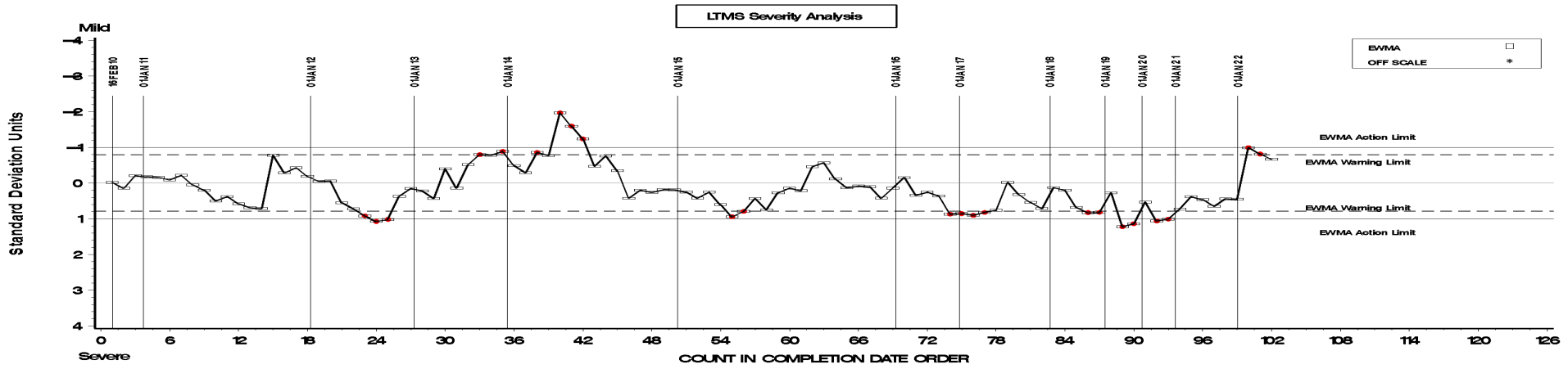
Status	Cause	#
Invalid	Missed soot window	0
Aborted	No aborted tests	0
<b>Total</b>		<b>0</b>

\*Invalid and aborted tests

# T-12A Test Severity

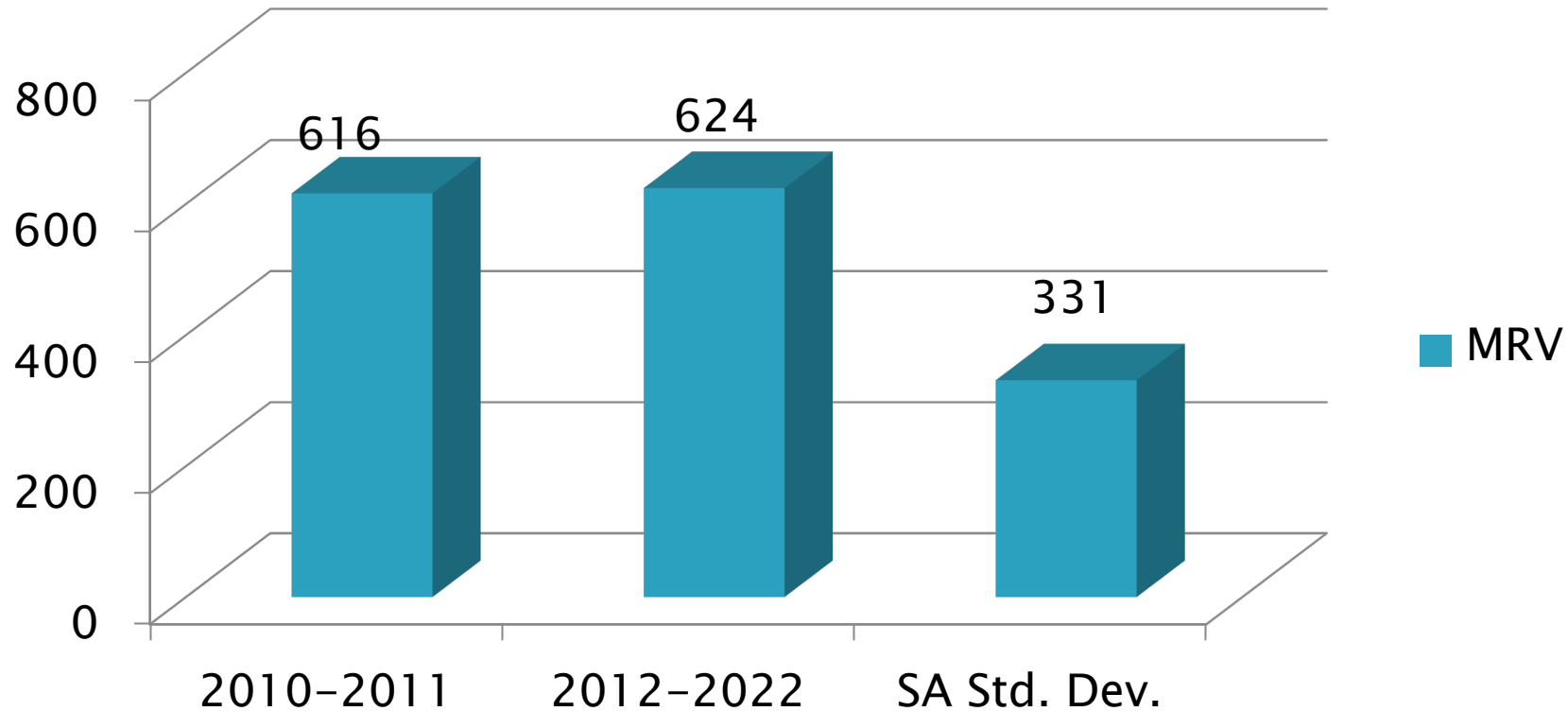
- ▶ As no T12A tests were run during this period no statement about test severity can be made.

MACK T-42A 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 2023

# T-13 Test Activity

Test Status	Validity Code	#
Acceptable Calibration Test	AC	3
Failed Calibration Test	OC	1
Operationally Invalid	LC	2
Aborted	XC	0
<b>Total</b>		<b>6</b>

# T-13 Failed Tests

Failed Parameter	Number of Tests
IRPH severe	1
<b>Total</b>	<b>1</b>

# T-13 Lost Tests\*

Status	Cause	#
Invalid	Coolant leak	1
Invalid	Missed oil adds	1
Aborted	No aborted tests	0
<b>Total</b>		<b>2</b>

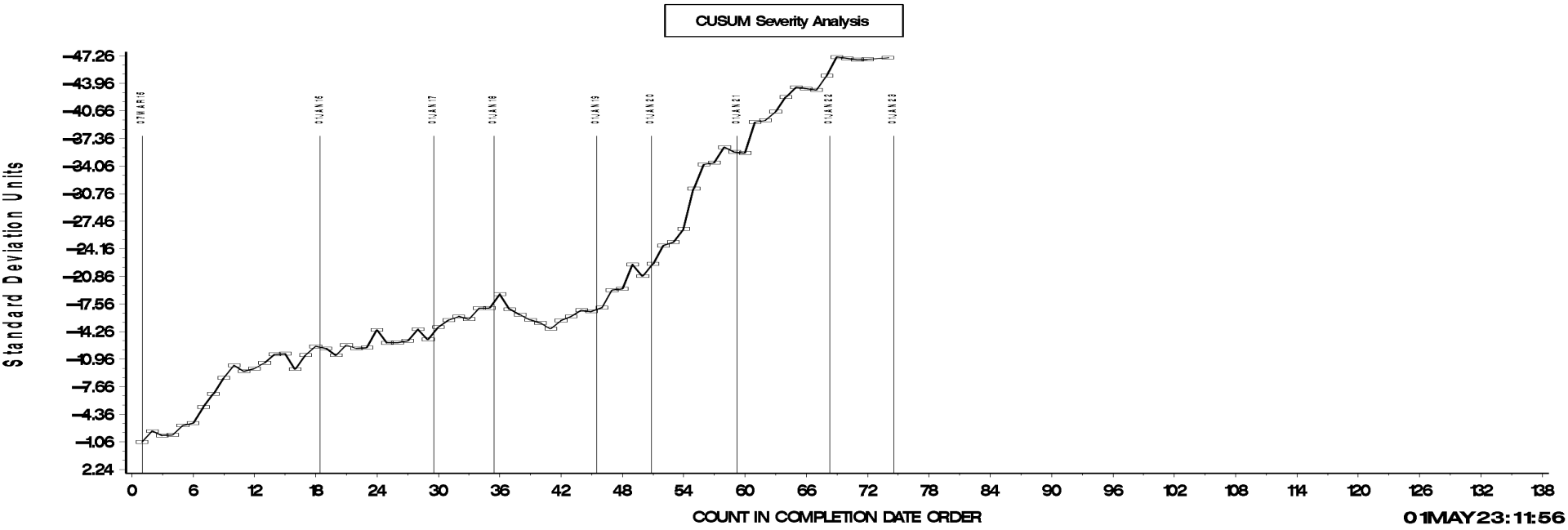
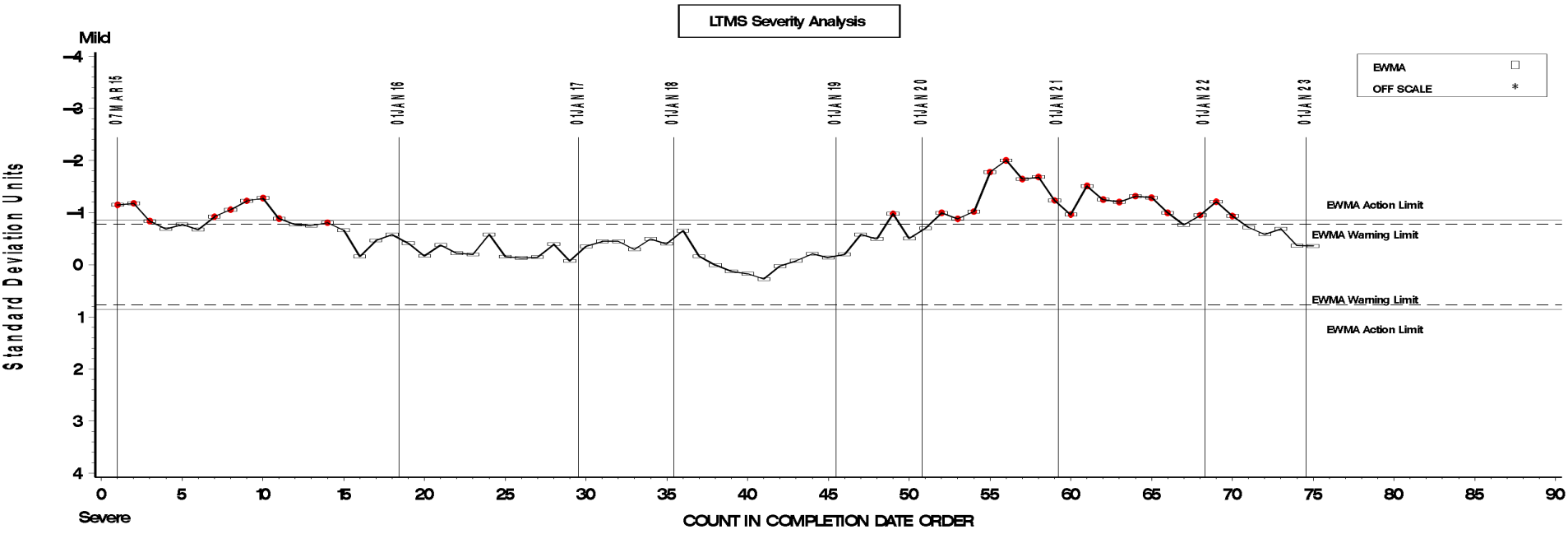
\*Invalid and aborted tests



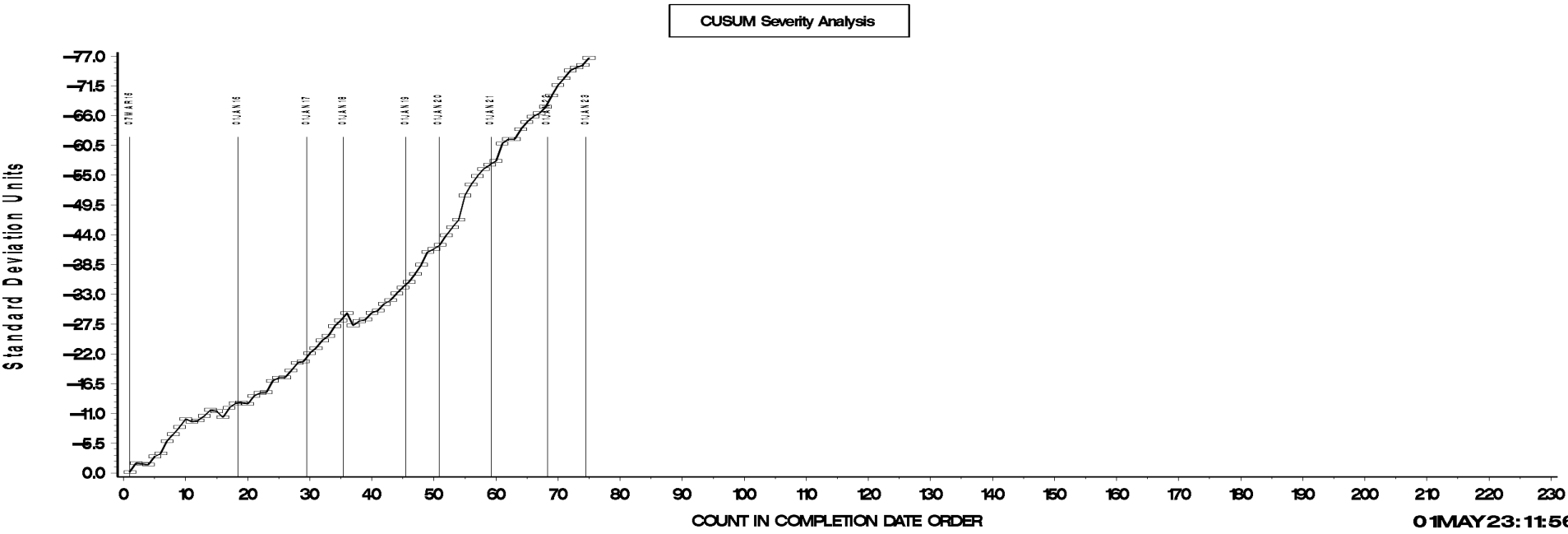
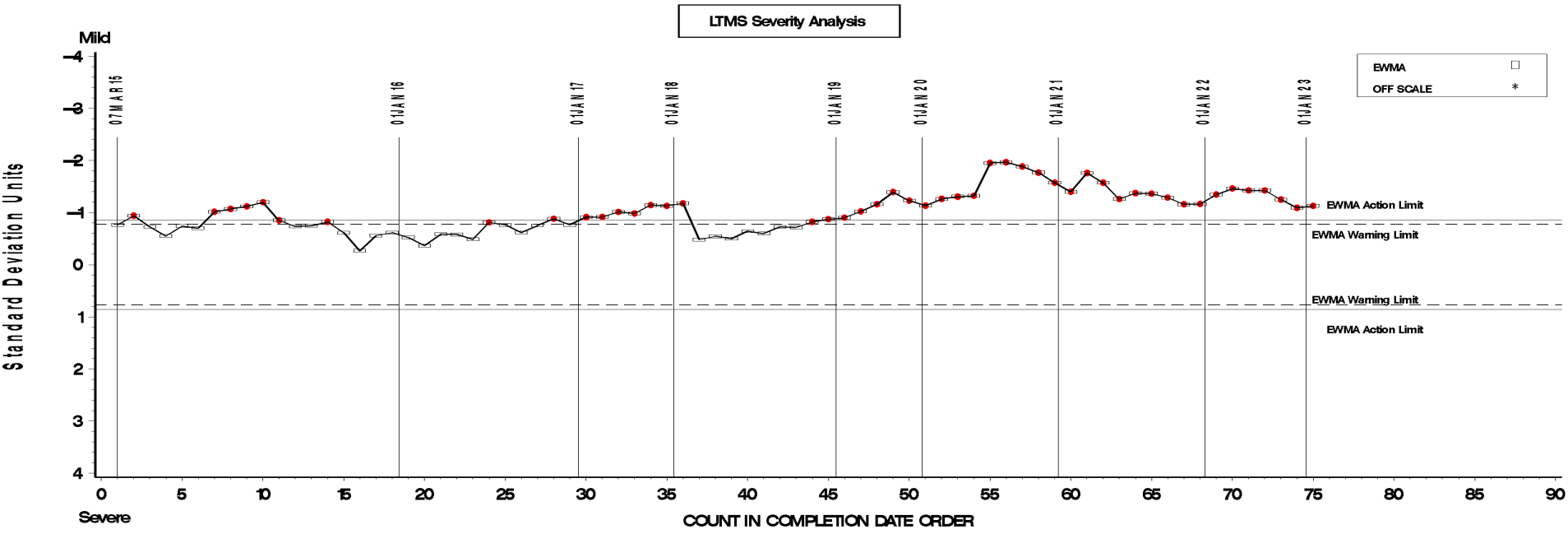
# T-13 Test Severity

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

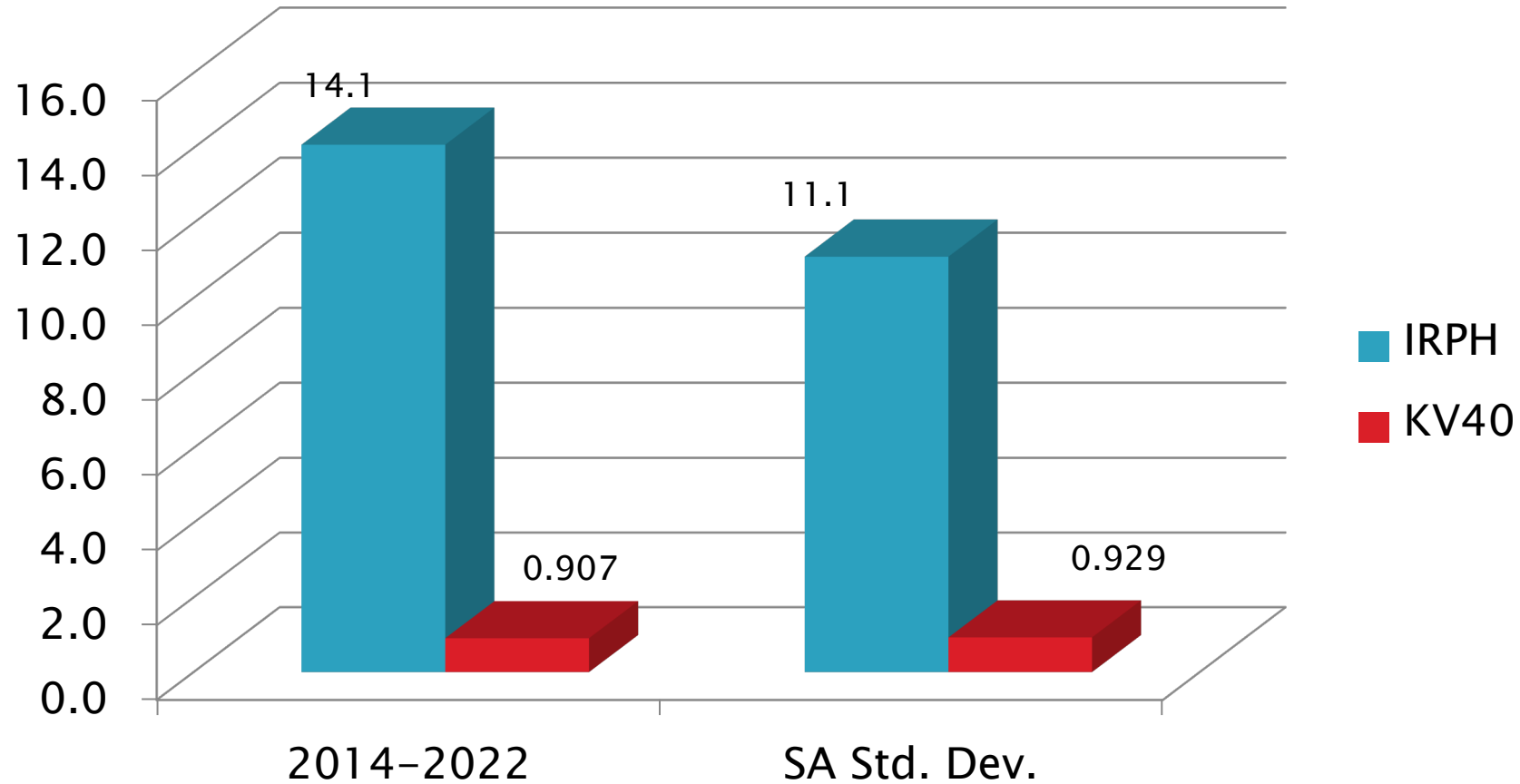
FINAL ORIGINAL PEAK HEIGHT IR AT EOT



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, 2022–March 31, 2023

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# Information Letters\*

Test	Date	IL	Topic
ISB	10/25/22	22-1	Average Camshaft Wear Correction Factor for Subsequent Hardware Batches
COAT	12/16/22	22-1	D8047 Procedure Major Revision
1K1N	1/31/23	23-1	1K/1N Rating Workshop Requirements Change
1MPC	1/31/23	23-1	1MPC Rating Workshop Requirements Change
1P	1/31/23	23-1	1P Rating Workshop Requirements Change
1R	1/31/23	23-1	1R Rating Workshop Requirements Change
C13	1/31/23	23-1	Addition of C13 Rater Calibration Requirements

\*Available from TMC Website

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# Memos

➤➤ October 1, 2022–March 31, 2023

# Memos\*

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

\*Available from TMC Website

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# Reference Oil Inventory



Actions, Re-blends, Inventories  
and Estimated Life

# Reference Oil Reblends

- ▶ No reference oil re-blends were received during the 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	70	1876	116	5+ years
811-2	1K, 1N	1732	40	760	40	5+ years
821-4	T-12	4495	25	2198	100	5+ years
822-2	1R, T-11	4386	280	1664	140	5+ years
823	T-13	1796	180	62	60	<1 year
823-1	T-13	1421	140	1282	60	5+ years
830-3	ISM	2891	75	2360	125	5+ years
831-4	C13, ISB	1699	385	498	175	2.5 years

# Reference Oil Inventory Estimated Life

Oil	Tests	Original Blend Amount	Quantity Shipped in last 6 months	TMC Inventory	Lab Inventory	Estimated Life
832-1	COAT	1951	112	1214	0	5+ years
833-1	COAT	1248	308	276	112	1.5 years
833-2	COAT	1078	0	1078	0	5+ years
864-1	DD13	1576	200	440	125	3 years
1005-5	1P, 1R, EOAT, RFWT, T-8/E	3826	332	702	144	2 years

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# LTMS Deviations

»» October 1, 2022–March 31, 2023

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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, 2022–March 31, 2023

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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	8
T-13	3
COAT	4

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# TMC Laboratory Visits

➤➤ October 1, 2022–March 31, 2023

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# TMC Lab Visits

- ▶ No HD lab visits were conducted during this reporting period.

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# Test Area Timelines

➤➤ October 1, 2022–March 31, 2023

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# Test Area Timeline Additions\*

Test	Date	IL/Memo	Topic
ISB	10/25/2022	22-1	ACSW CORRECTION FACTOR UPDATED

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\*As of 3/31/2021

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# Rating Workshop Data



2023 Standardized Testing Deposit  
Rating Workshop

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# Rating Workshop Data

- ▶ The 2023 Standardized Testing Deposit Rating Workshop was held in March 2023 in San Antonio as the first combined light and heavy duty rating workshops. The heavy duty rating data is presented here.

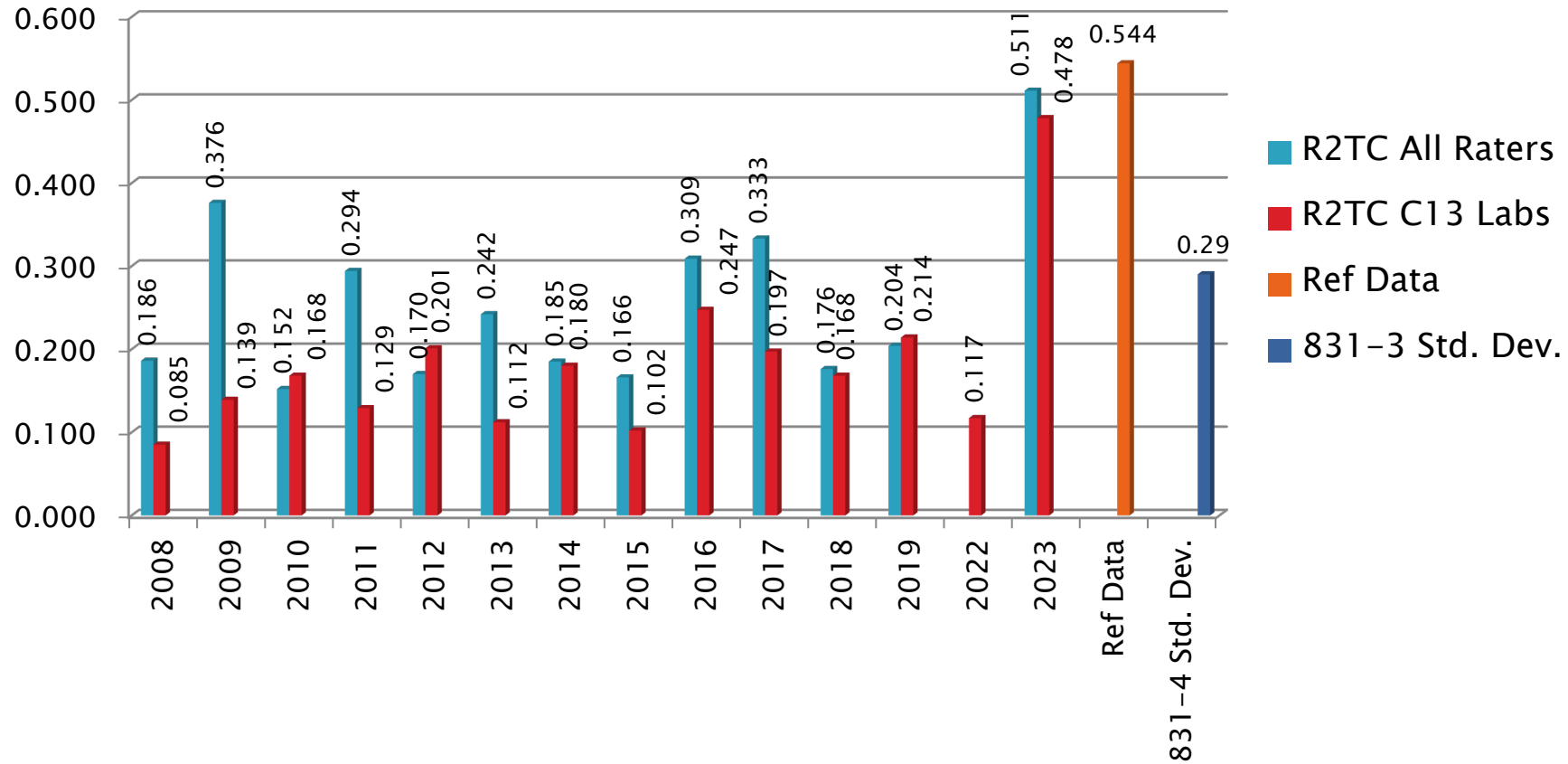
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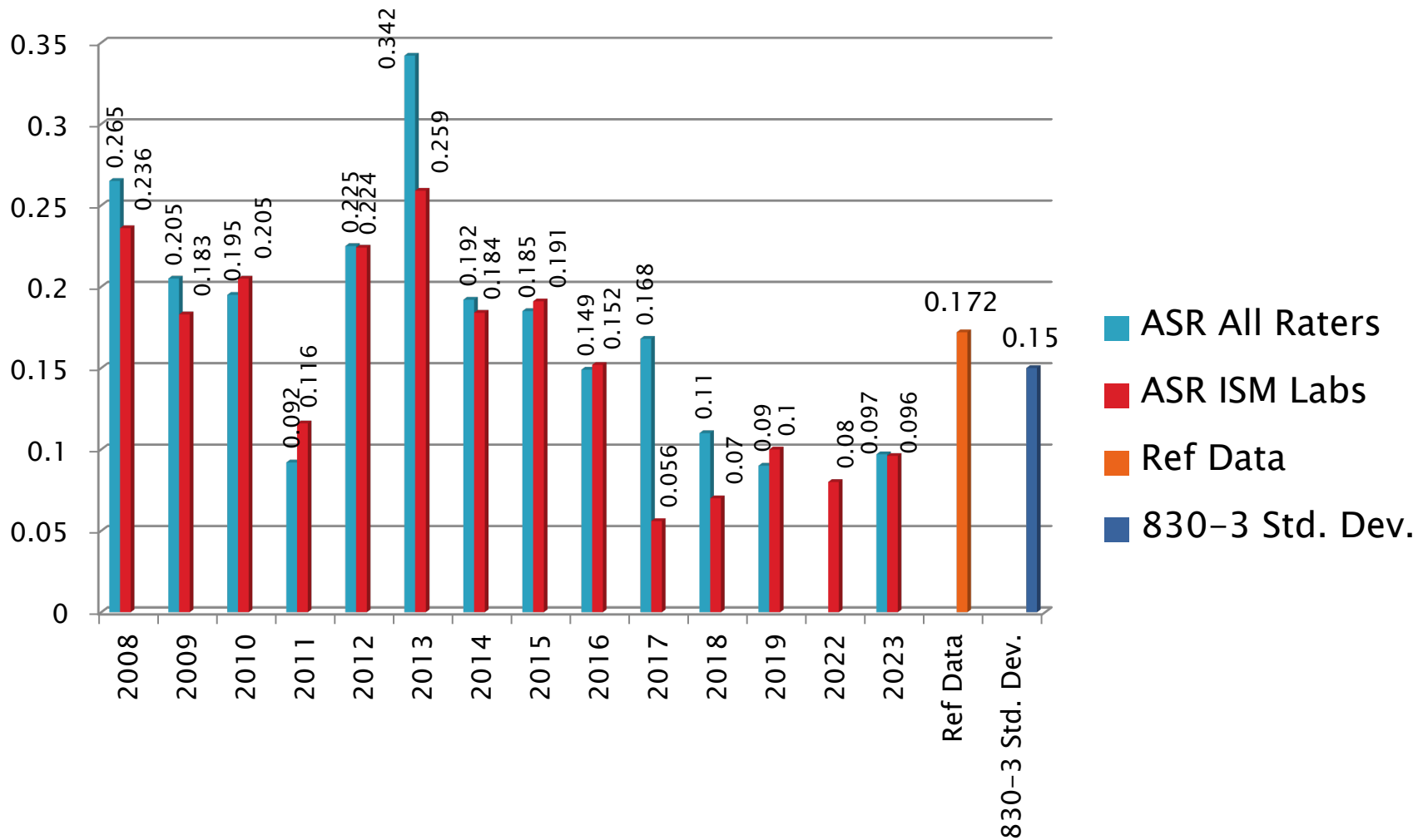
# C13 2<sup>nd</sup> Ring Carbon Precision – Rating Workshop Data

## R2TC

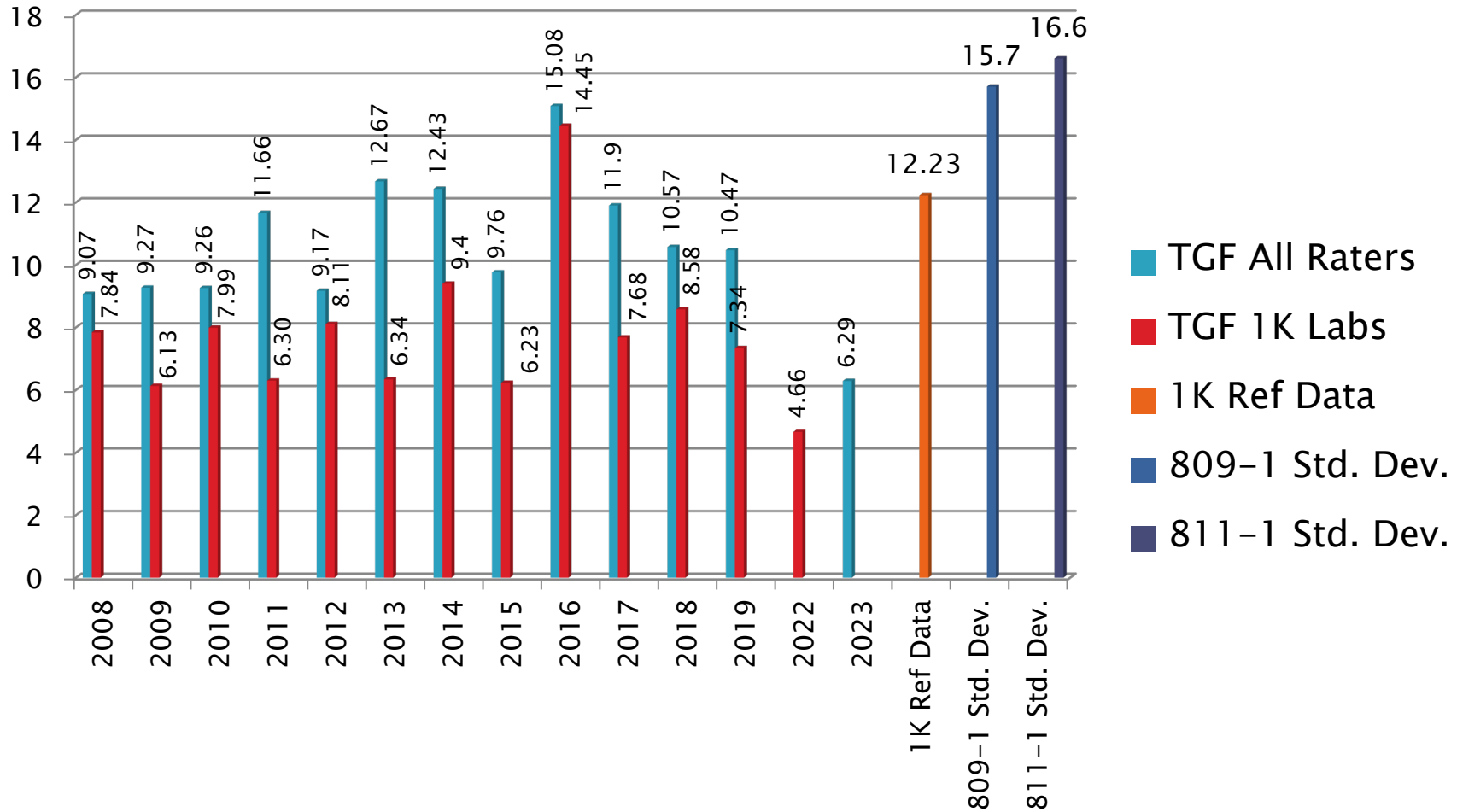




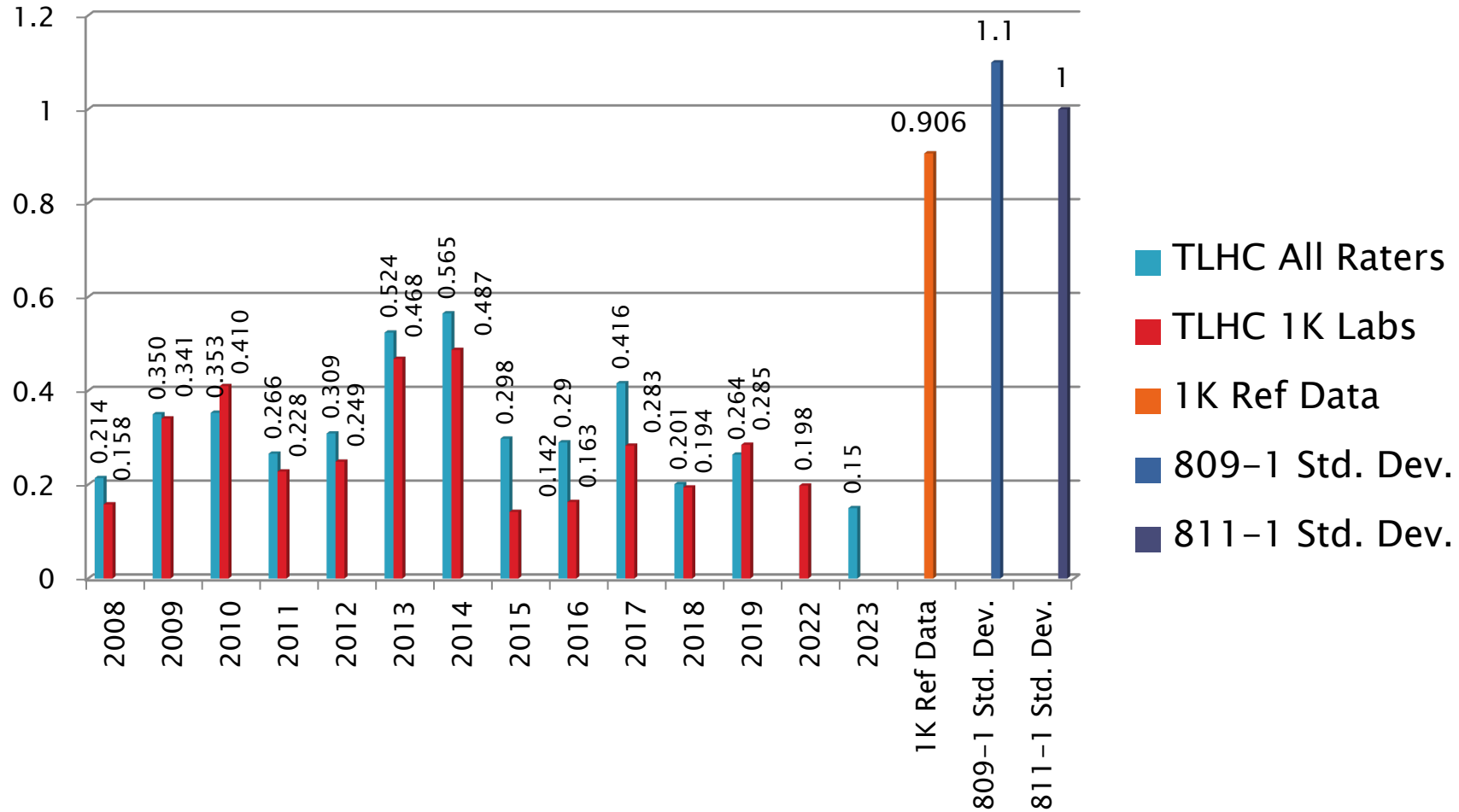
# ISM Sludge Rating Precision - Rating Workshop Data



# 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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