



Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

www.astmtmc.org
412-365-1000

MEMORANDUM: 23-046
DATE: November 28, 2023
TO: Nick Schaup, Chairman, L-60-1 Surveillance Panel
FROM: Dylan Beck *Dylan Beck*
SUBJECT: L-60-1 Reference Oil Testing from April 1, 2023 through September 30, 2023

Attached is a summary of testing activity this period

DJB/djb/mem23-046.djb.doc

cc: Jeff Clark

Sean Moyer

L-60-1 Surveillance Panel

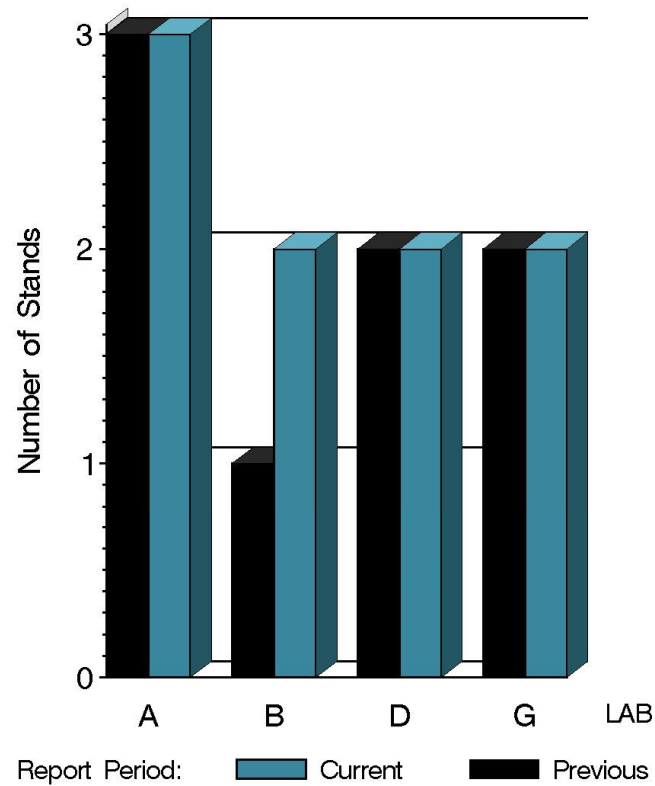
<https://www.astmtmc.org/ftp/docs/gear/l601/semiannualreports/l601-10-2023.pdf>

Distribution: email

L-60-1 (D5704)

| | Reporting Data | Calibrated on 9-30-23 |
|------------------|----------------|-----------------------|
| Number of Labs | 4 | 4 |
| Number of Stands | 9 | 9 |

BY-LAB STAND
DISTRIBUTION



12:43:12 17NOV2023



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Test Distribution by Oil and Validity

| | | 148-1 | 155-1 | 155-2 | Totals | |
|--------------------------|----|-----------|-----------|----------|-------------|-------------|
| | | | | | Last Period | This Period |
| Accepted for calibration | AC | 6 | 7 | 1 | 8 | 14 |
| Rejected (Mild) | OC | 0 | 1 | 0 | 0 | 1 |
| Rejected (Severe) | OC | 1 | 2 | 0 | 5 | 3 |
| Rejected (Combination) | OC | 4 | 0 | 0 | 0 | 4 |
| Rejected (Precision) | OC | 0 | 2 | 0 | 6 | 2 |
| Invalid cal attempt | LC | 1 | 0 | 0 | 0 | 1 |
| Unacceptable Info Run | MI | 0 | 0 | 0 | 1 | 0 |
| Acceptable info run | NI | 2 | 0 | 0 | 4 | 2 |
| Aborted | XC | 0 | 0 | 0 | 3 | 0 |
| Total | | 14 | 12 | 1 | 27 | 27 |



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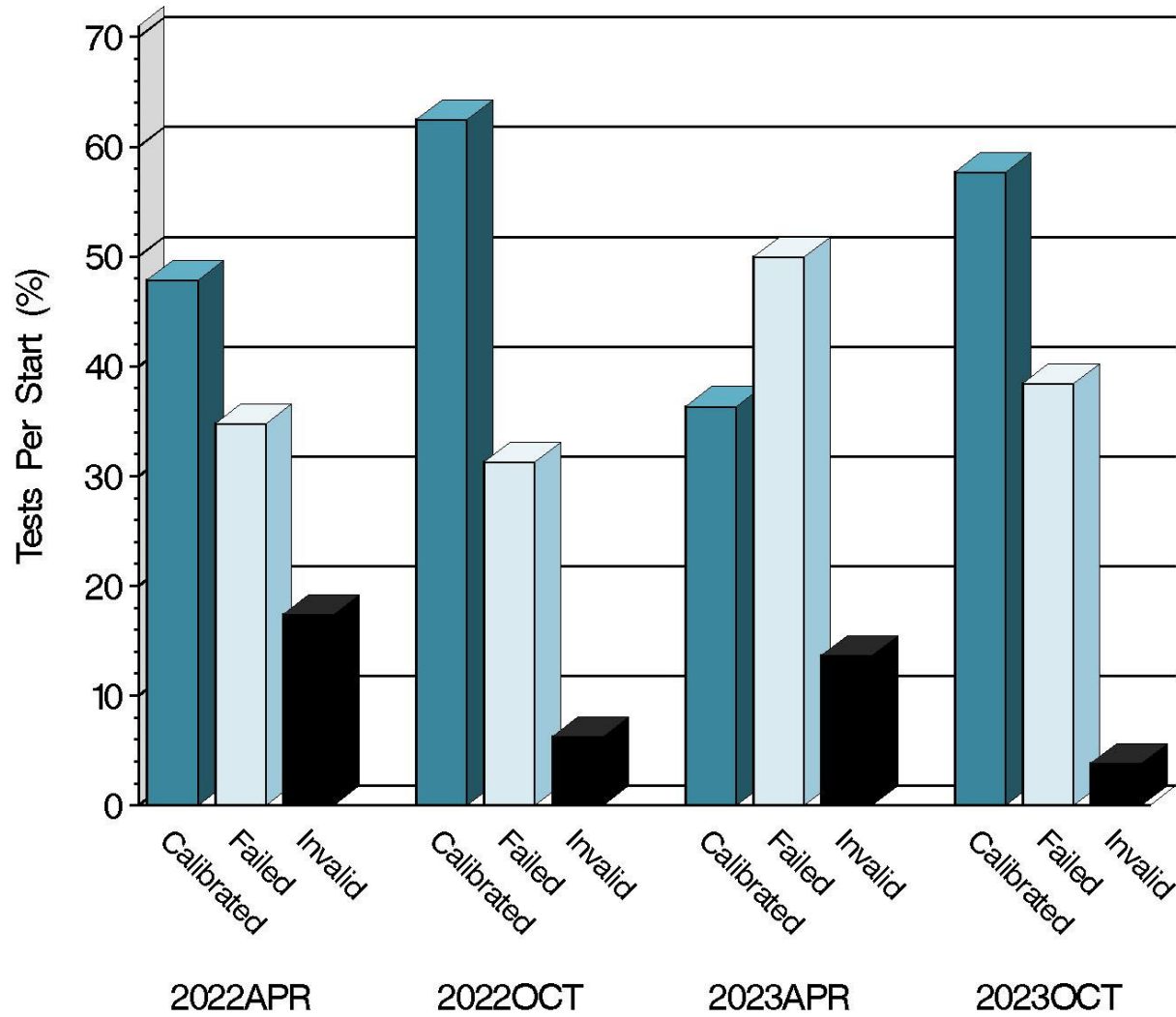
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CALIBRATION ATTEMPT SUMMARY



Resolution

Report Period

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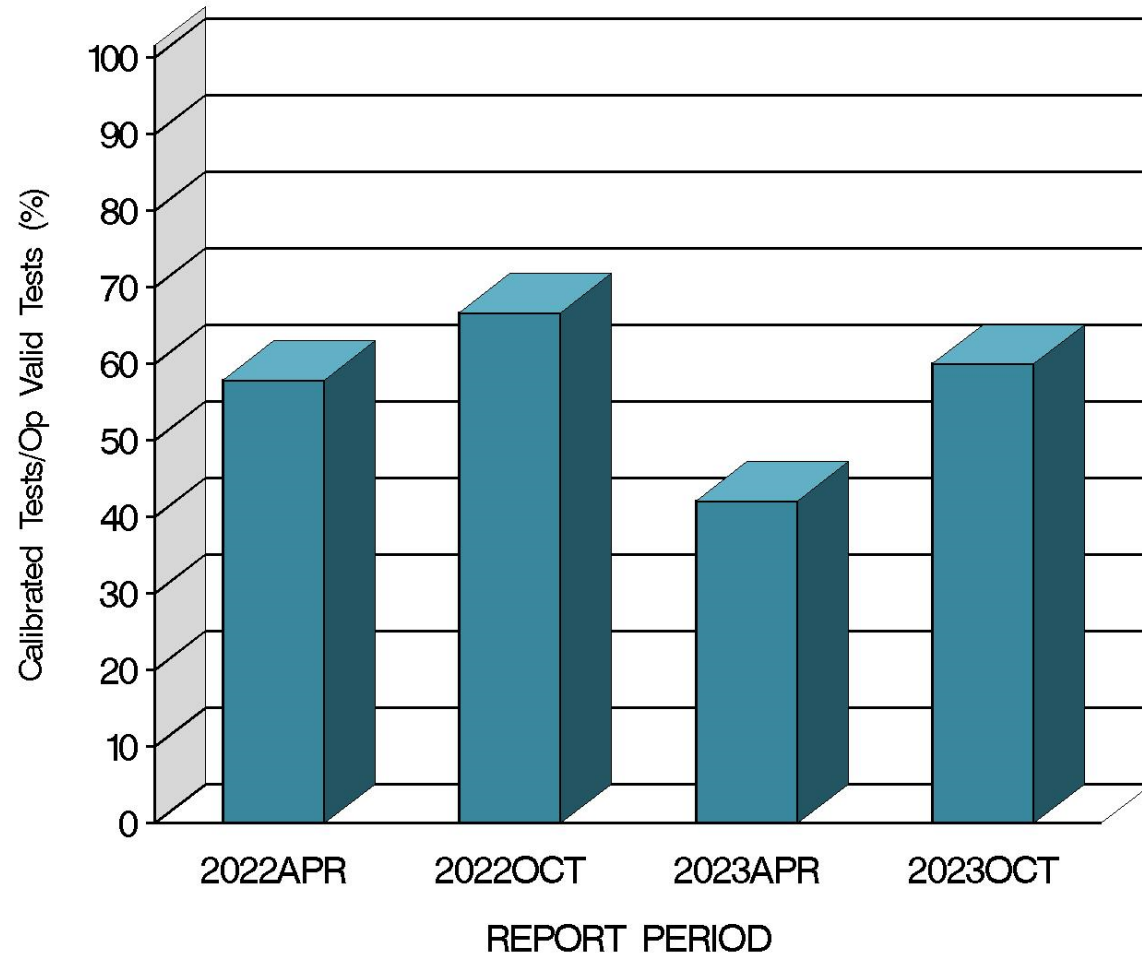
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OPERATIONALLY VALID TESTS
MEETING ACCEPTANCE CRITERIA



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CAUSES FOR LOST TESTS

| Lab | Cause | Oil | | | Validity | | | Loss Rate | | |
|-----|----------------------------------------------------------|-------|-------|-------|----------|----|----|-----------|--------|------|
| | | 148-1 | 155-1 | 155-2 | LC | RC | XC | Lost | Starts | % |
| A | Lab declared invalid due to ref oil 148-1 being retired. | ● | | | ● | | | 1 | 13 | 7.7% |
| | Lost | 1 | 0 | 0 | 1 | 0 | 0 | | | |
| | Starts | 14 | 12 | 1 | 27 | 27 | 27 | | | |
| | % | 7.1% | 0% | 0% | 3.7% | 0% | 0% | | | |

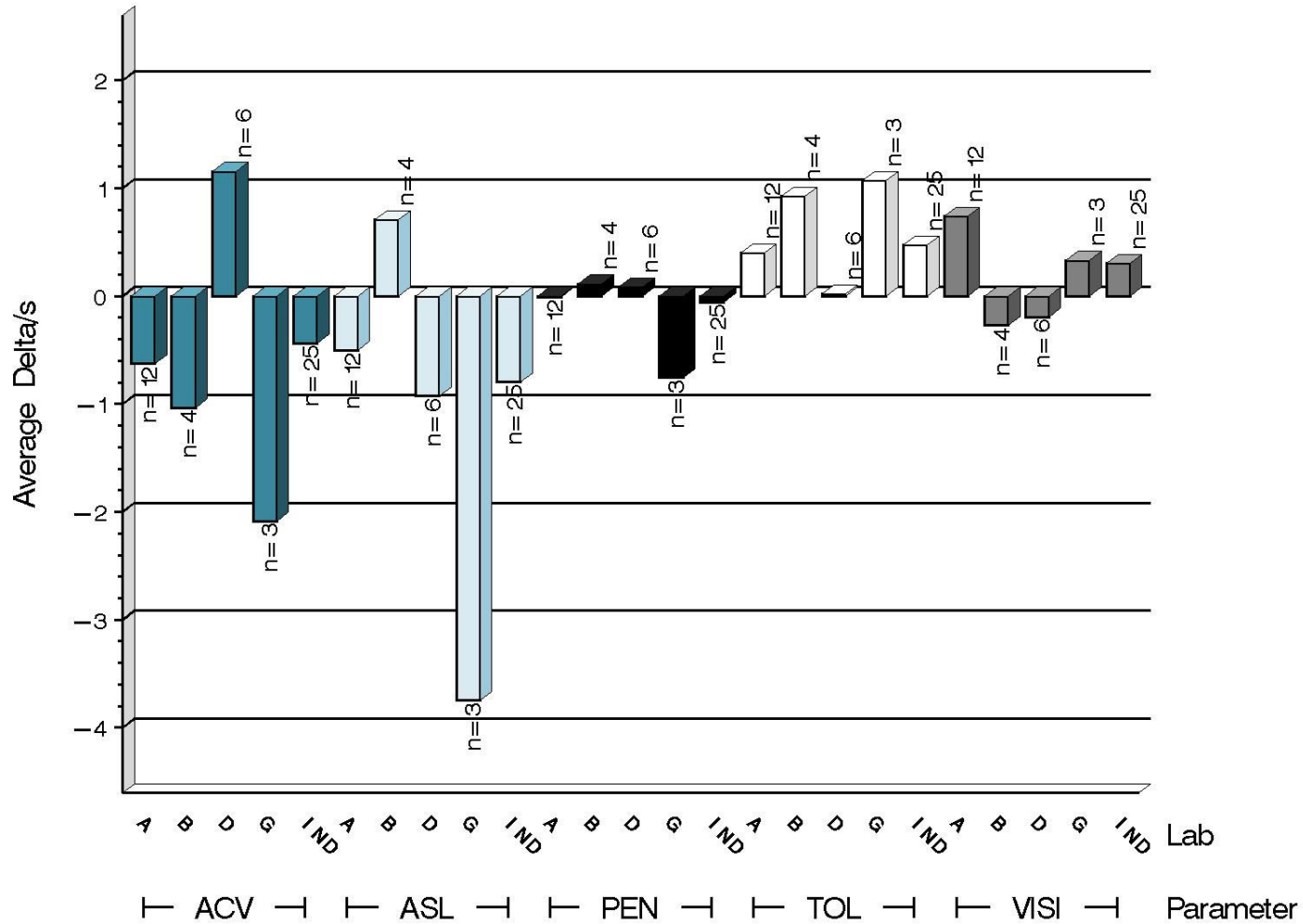
L-60-1 (D5704)

| Average Δ /s by Lab | | | | | | |
|----------------------------|----|--------|--------|--------|---------------|---------------|
| Lab | n | VISI | PEN | TOL | ACV | ASL |
| A | 12 | 0.738 | -0.008 | 0.399 | -0.625 | -0.500 |
| B | 4 | -0.267 | 0.113 | 0.928 | -1.033 | 0.710 |
| D | 6 | -0.196 | 0.086 | 0.019 | 1.156 | -0.924 |
| G | 3 | 0.333 | -0.754 | 1.071 | -2.088 | -3.746 |
| <i>Industry</i> | 25 | 0.304 | -0.056 | 0.473 | -0.438 | -0.798 |
| <i>Shift*</i> | 25 | 2.330 | -0.023 | 0.12 % | -0.224 merits | -0.085 merits |

*computed using severity adjustment standard deviation.

L-60-1 (D5704)

TEST SEVERITY
DELTA/S BY LAB



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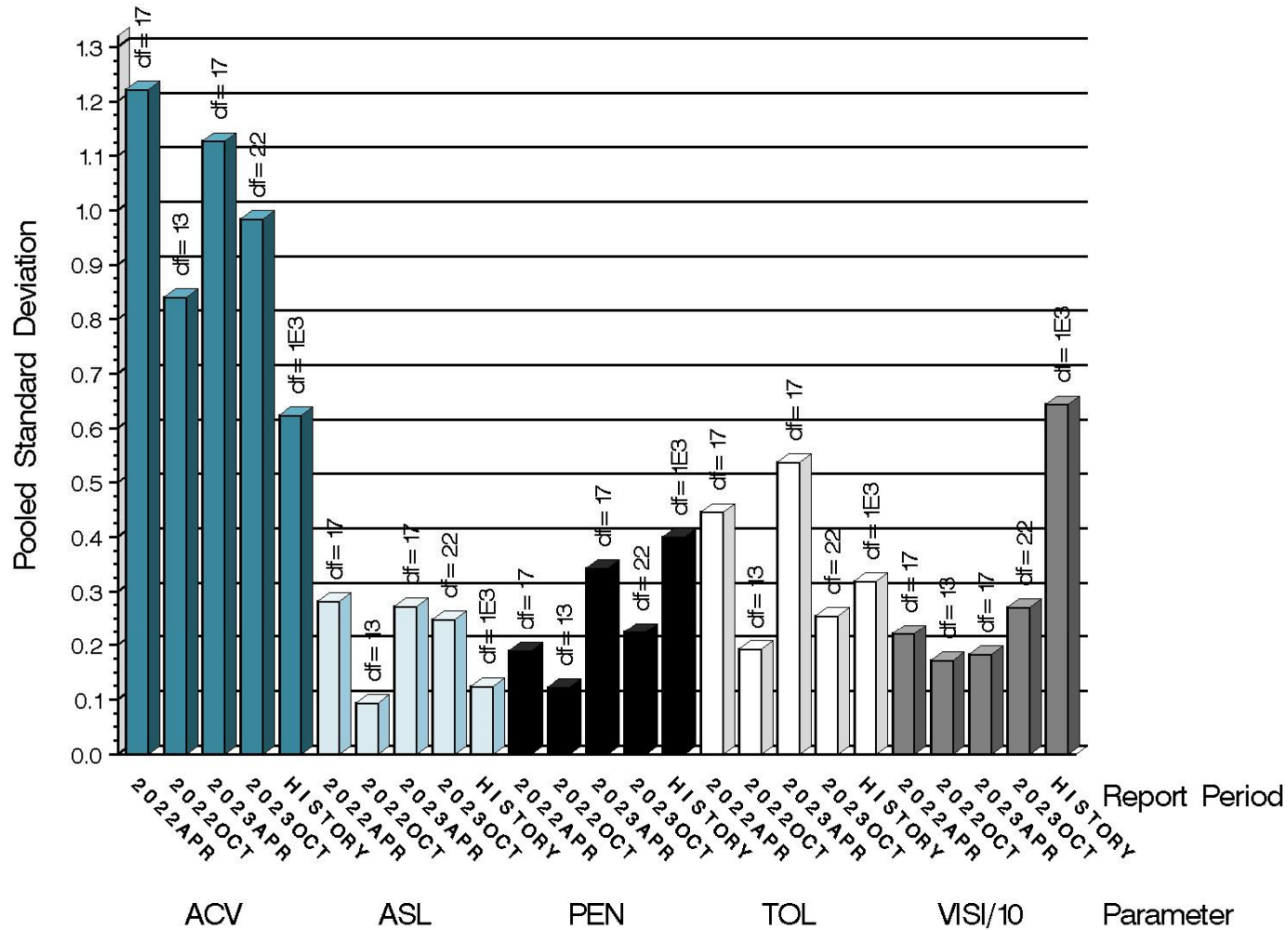


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TEST PRECISION
 POOLED STANDARD DEVIATION
 BY SIX-MONTH ASTM REPORT PERIOD



due to the vastly larger reported results for VISI in relation to the other parameters, it is shown scaled by 0.1

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SUMMARY OF SEVERITY & PRECISION

Severity

ACV started the period exceeding the warning limit in the severe direction but has since returned within limits.

ASL remained outside of the limits in the severe direction for most of the reporting period.

TOL exceeded the action limit in the severe direction with two tests this period but has since returned within limits.

VISI exceeded the action limit in the mild direction with the two most recent tests to end the reporting period.

Precision

ACV and TOL exceeded the action limit this period but has now returned within limits.

ASL exceeded the action limit for most of the reporting period.

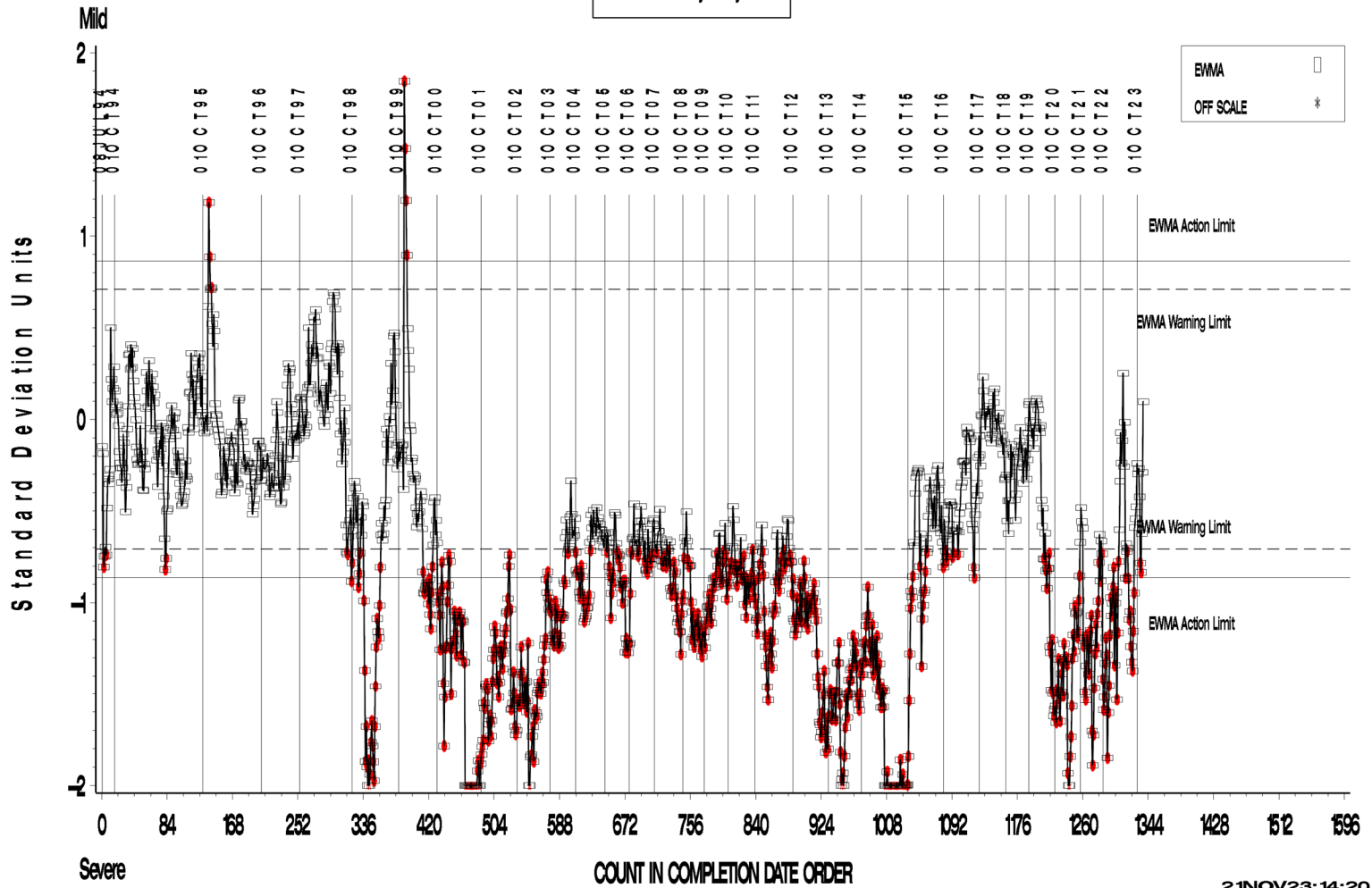
Industry control charts follow.

L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

LTMS Severity Analysis



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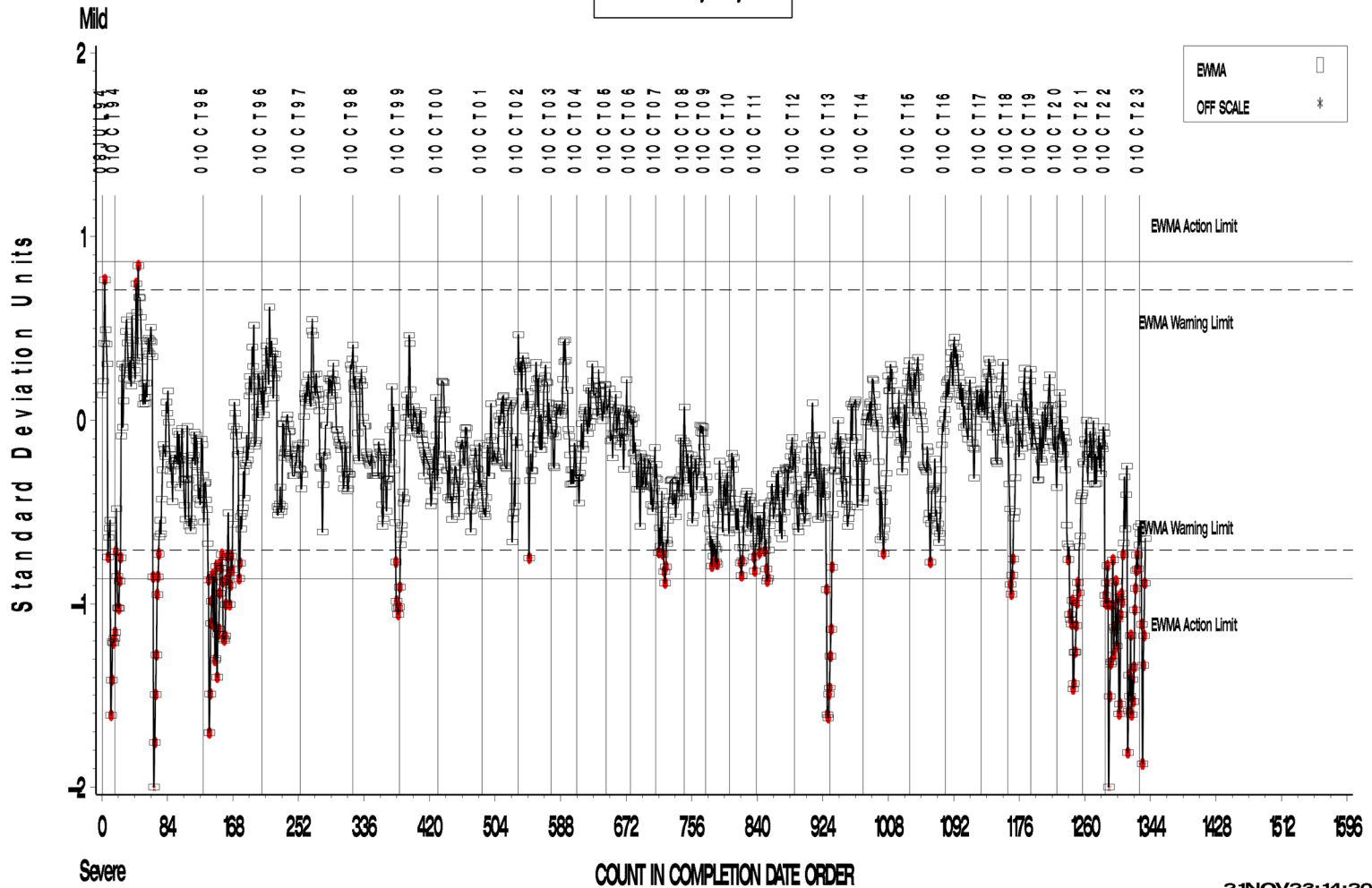
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L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

LTMS Severity Analysis



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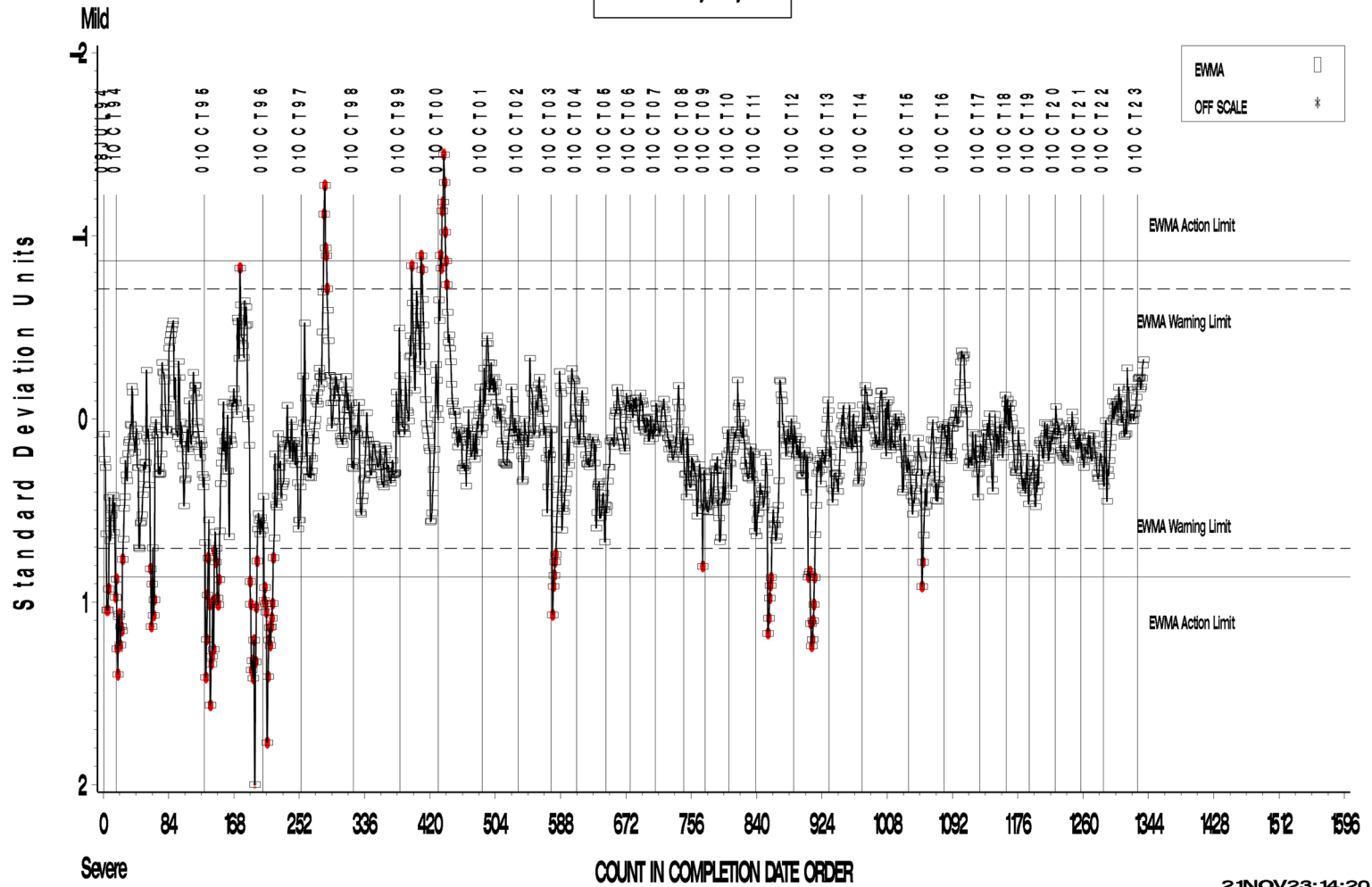
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L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

LTMS Severity Analysis



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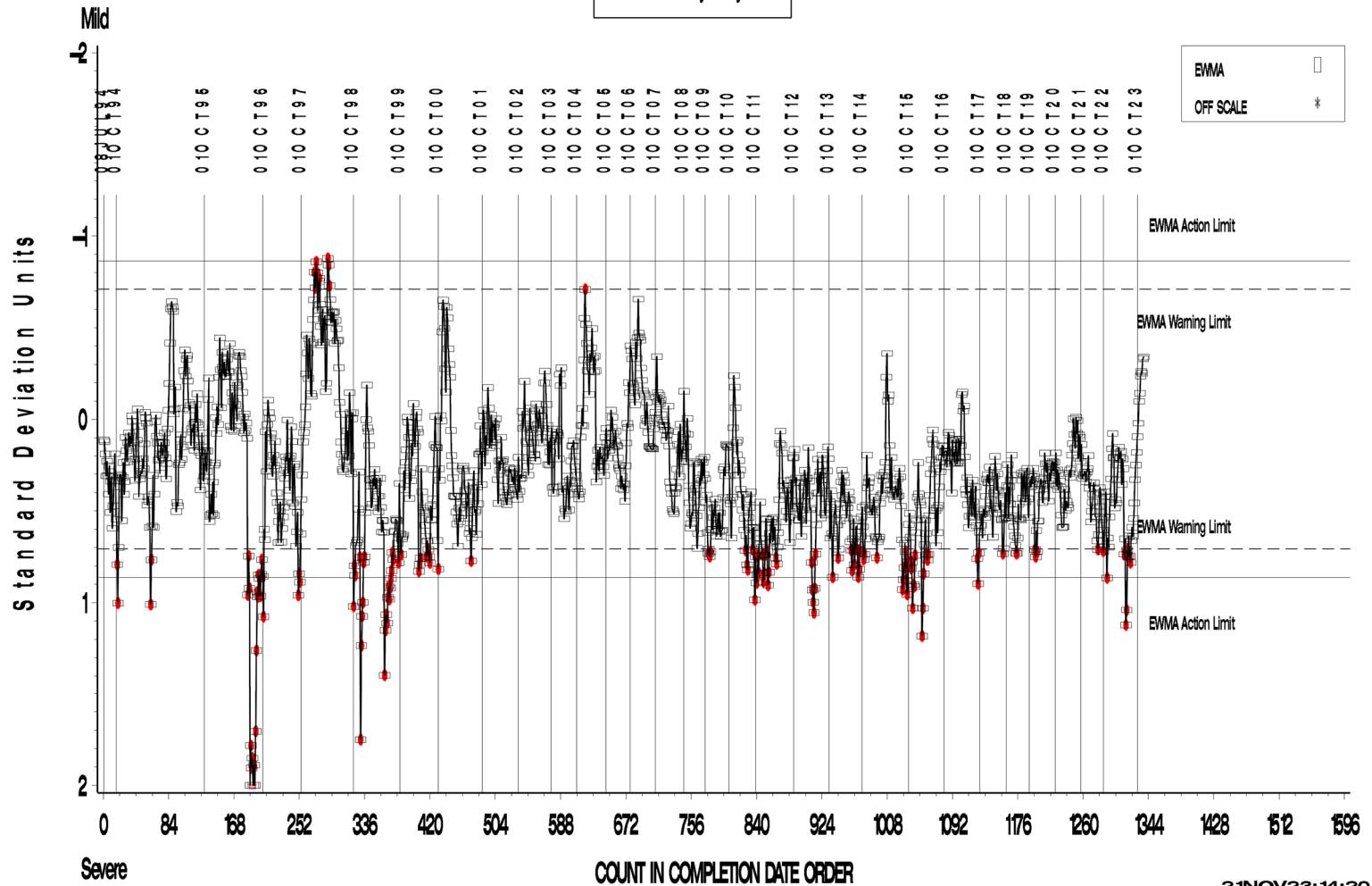
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

LTMS Severity Analysis



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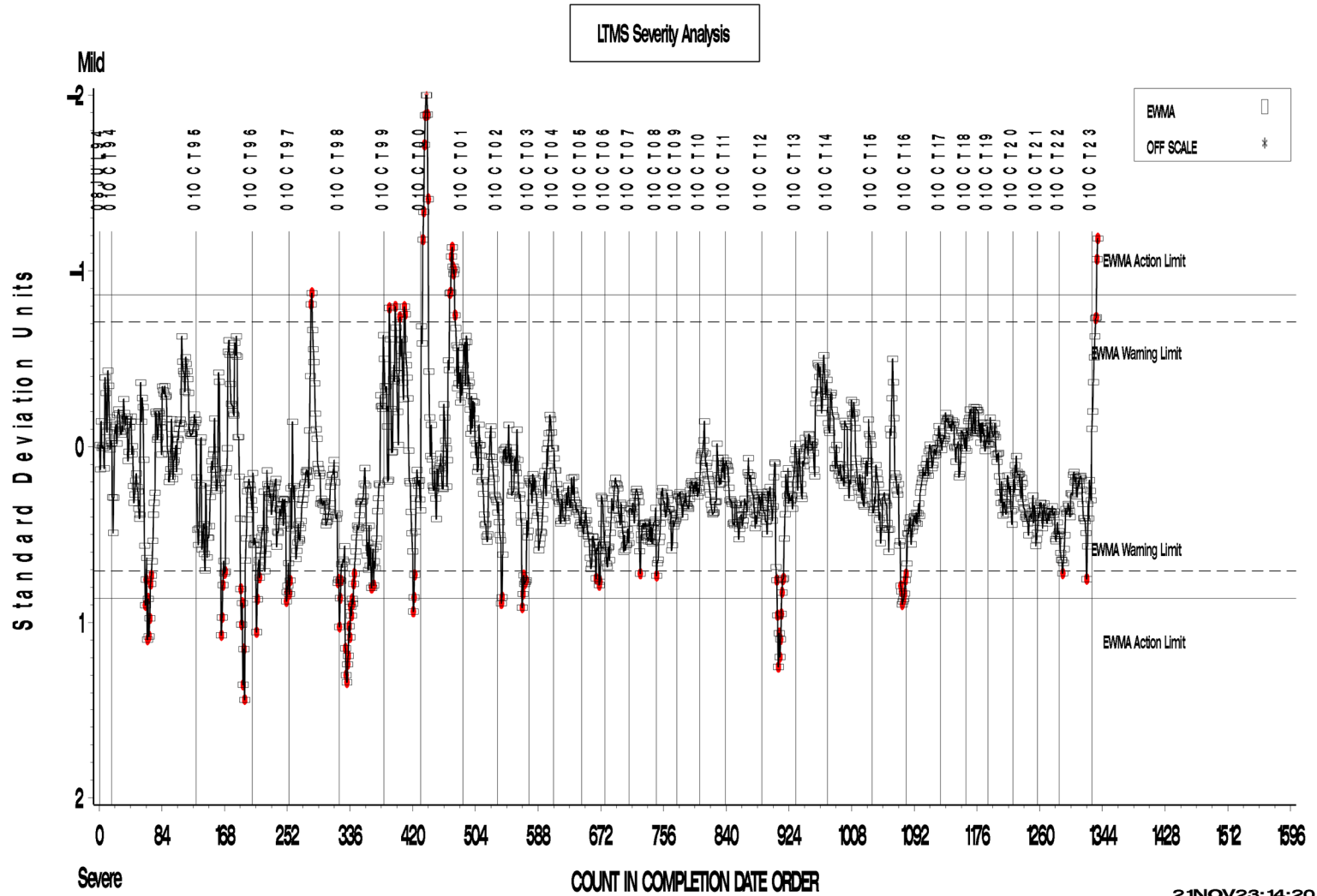
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL VISCOSITY INCREASE



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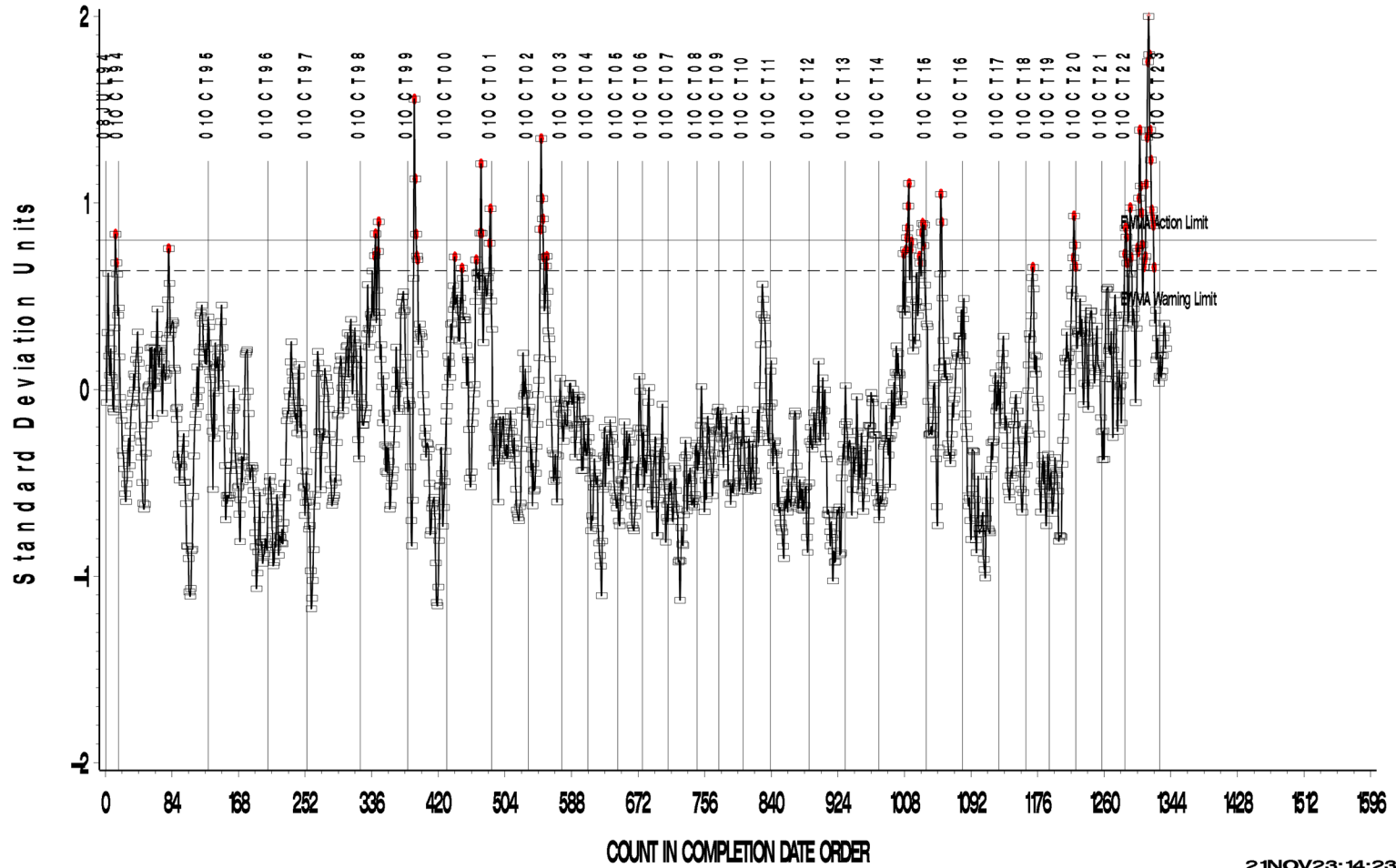
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L-60-1 INDUSTRY OPERATIONALLY VALID DATA

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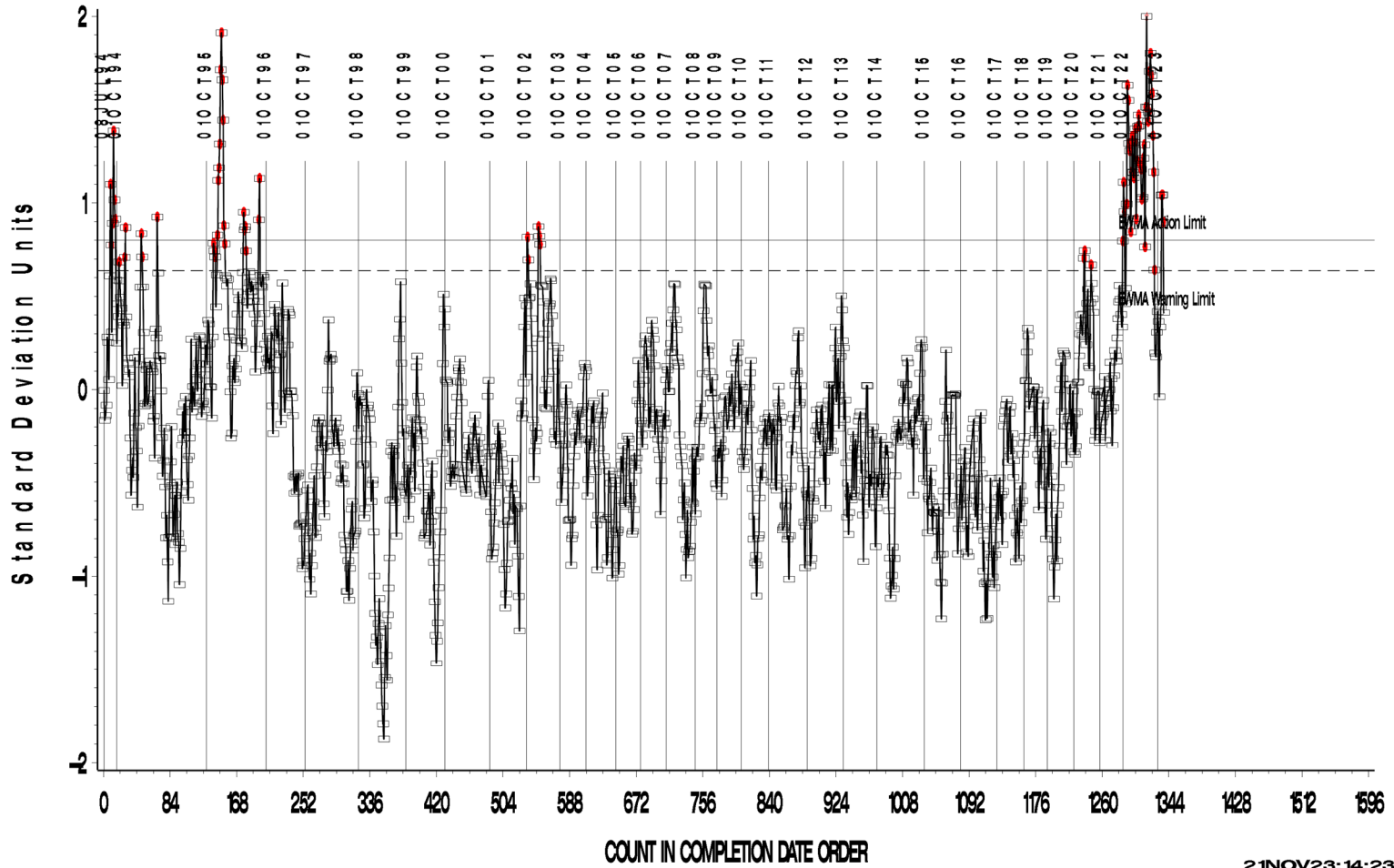
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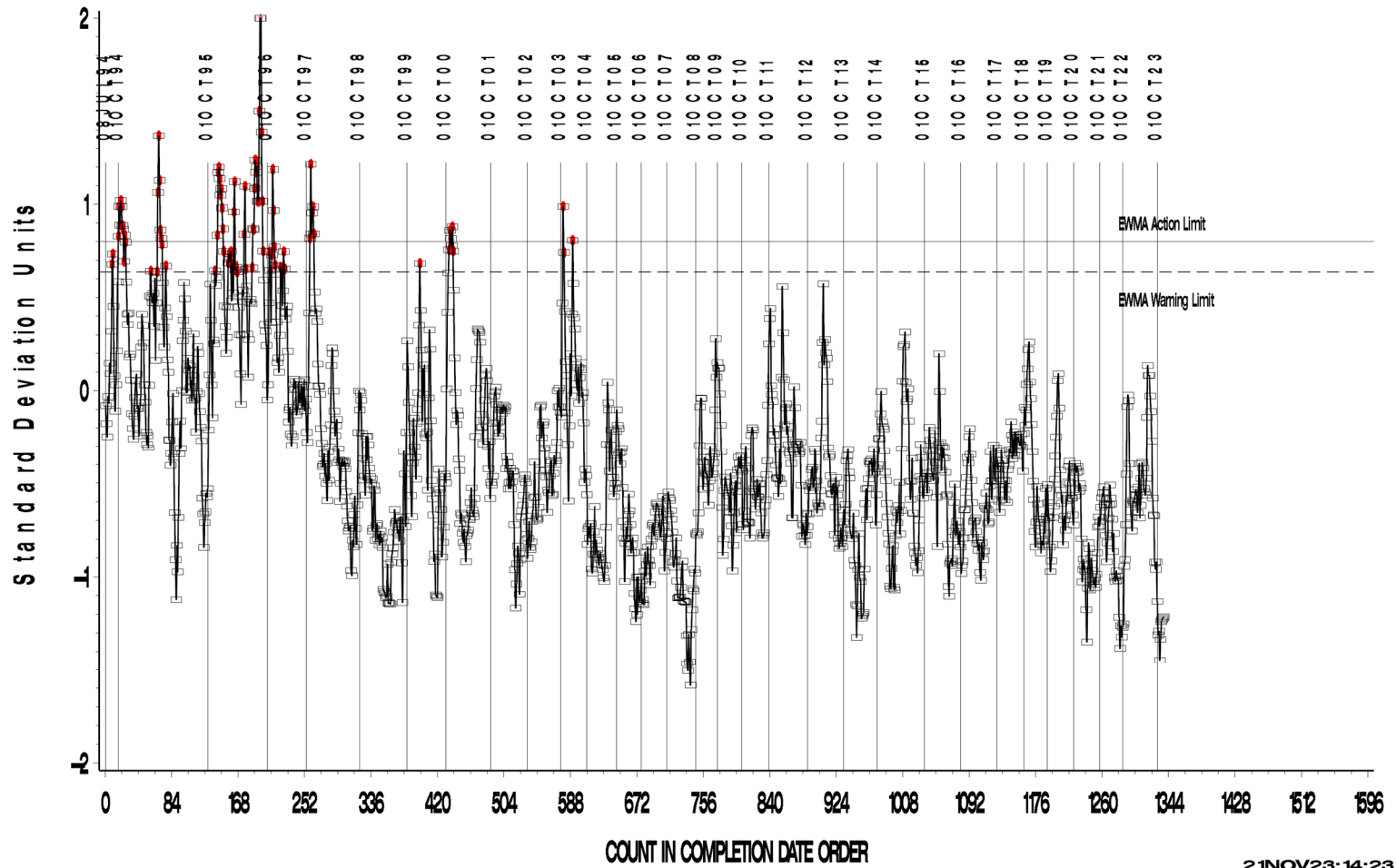
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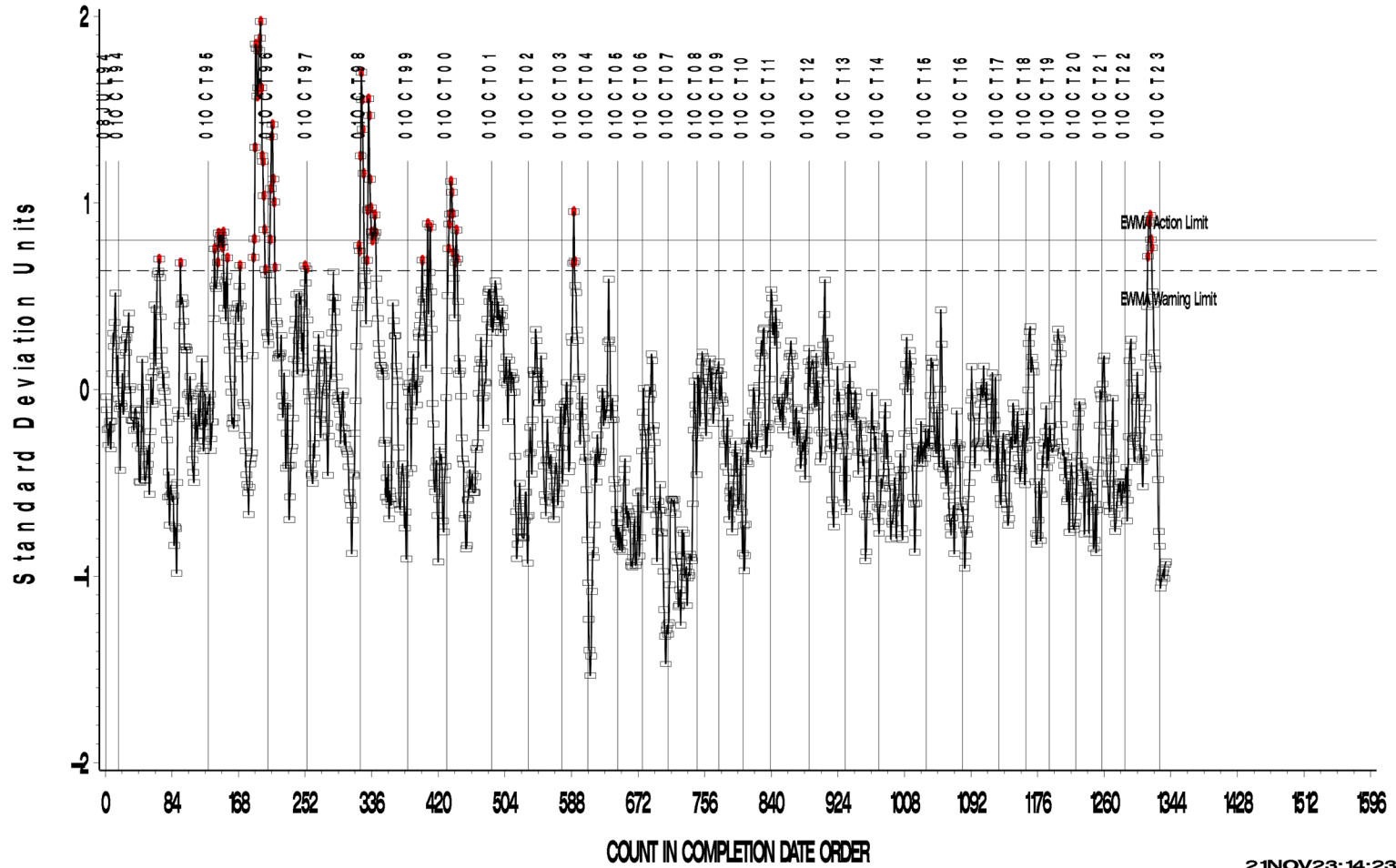
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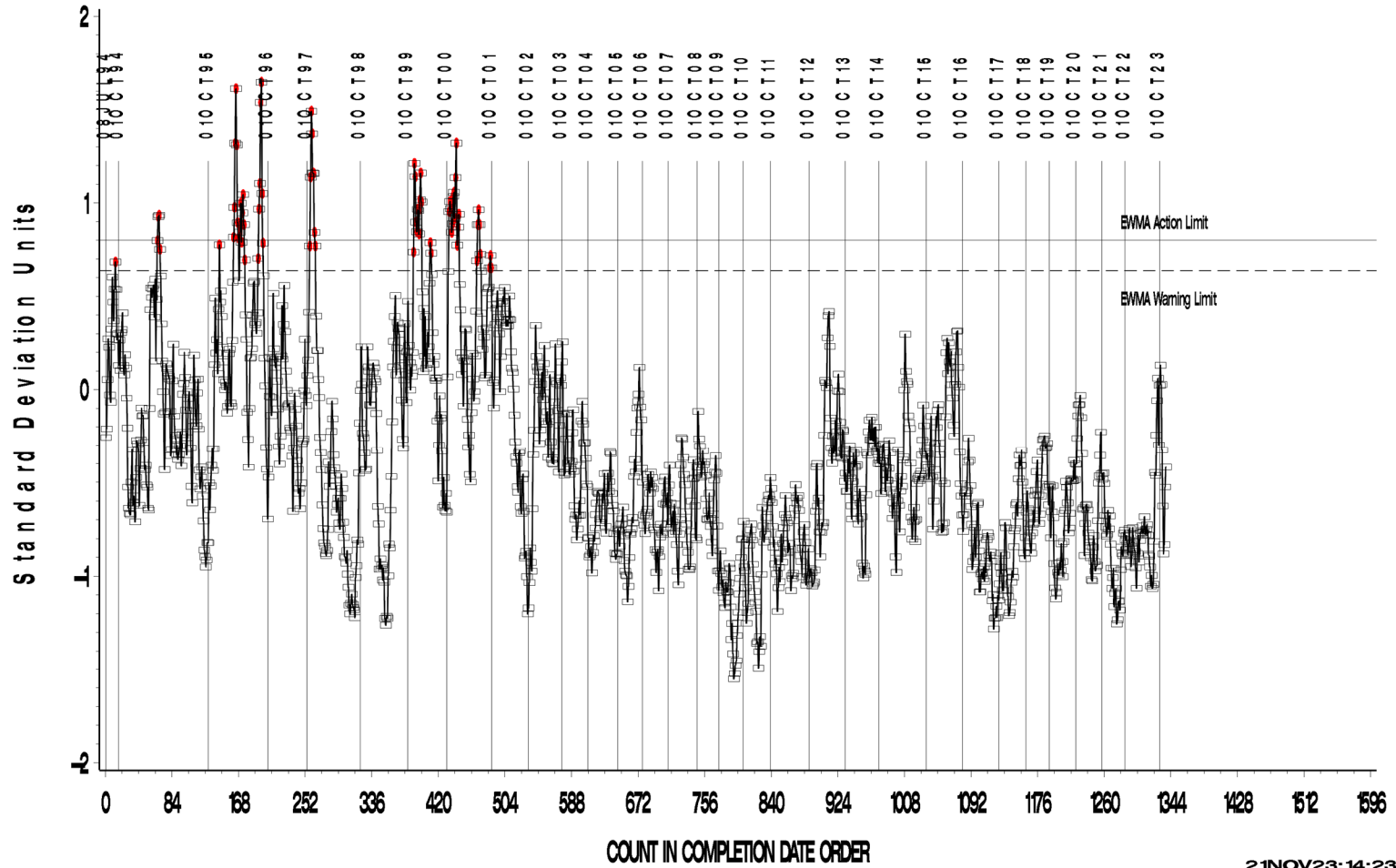
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L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

CUSUM Severity Analysis



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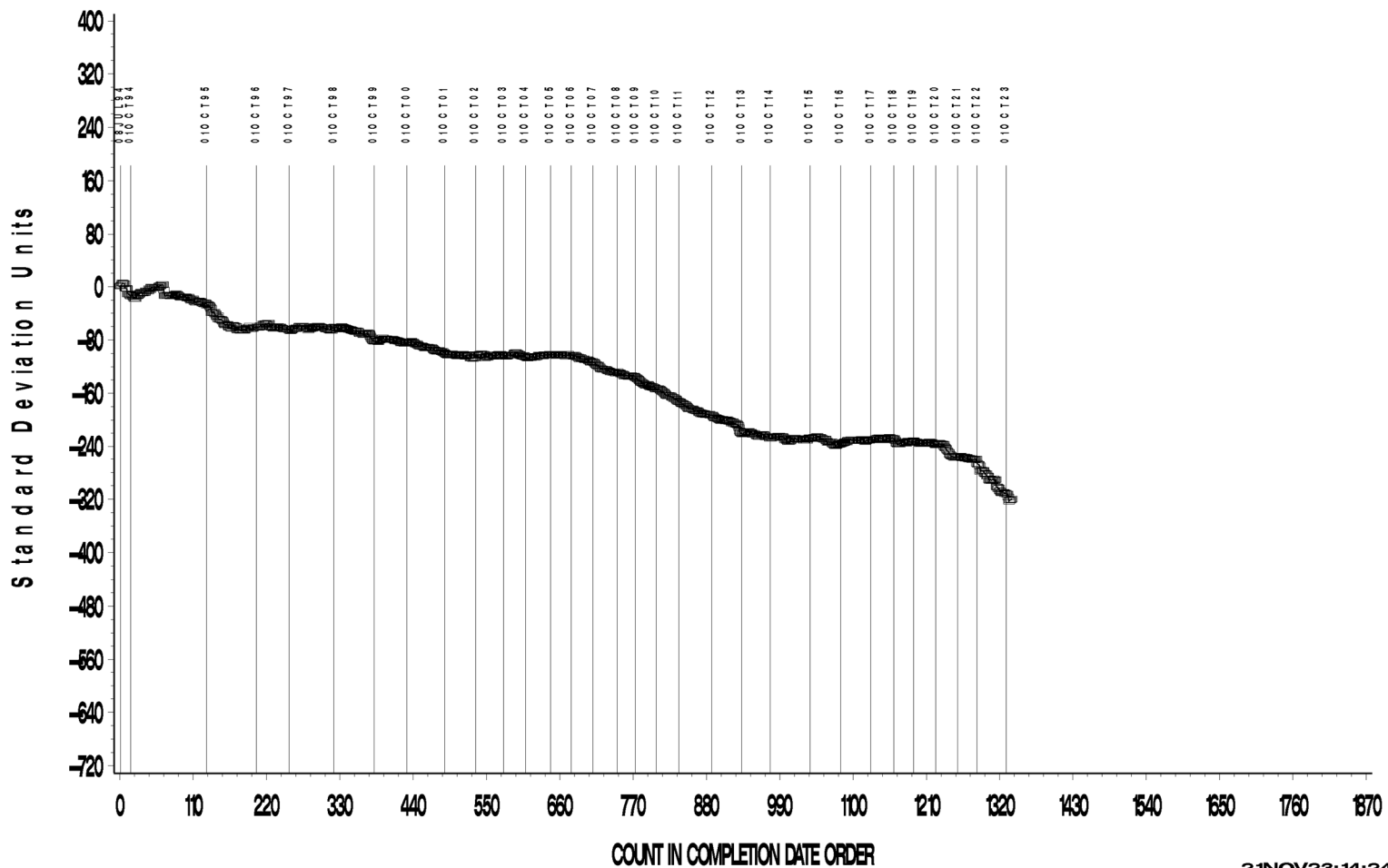
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L-60-1 INDUSTRY OPERATIONALLY VALID DATA

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CUSUM Severity Analysis



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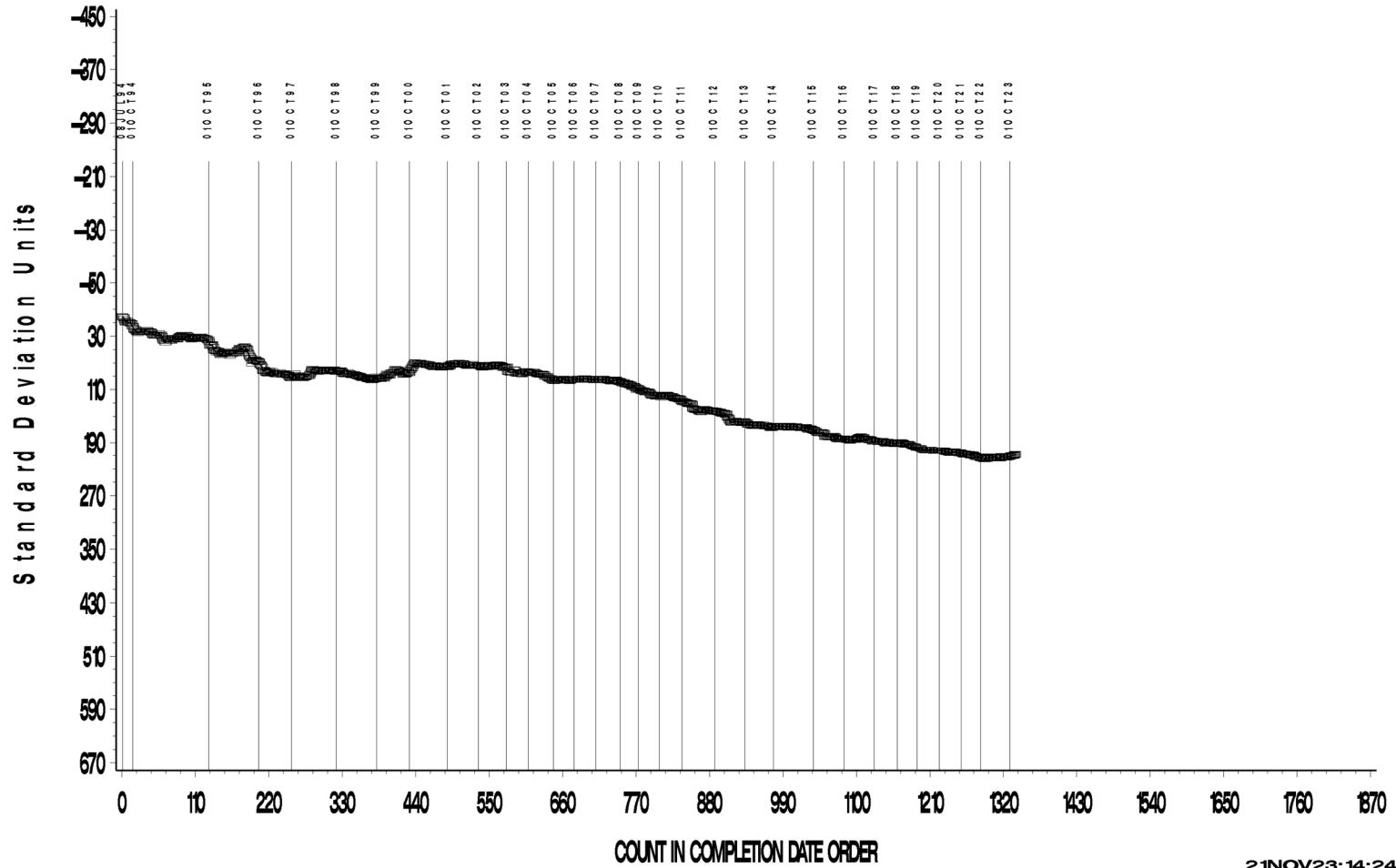
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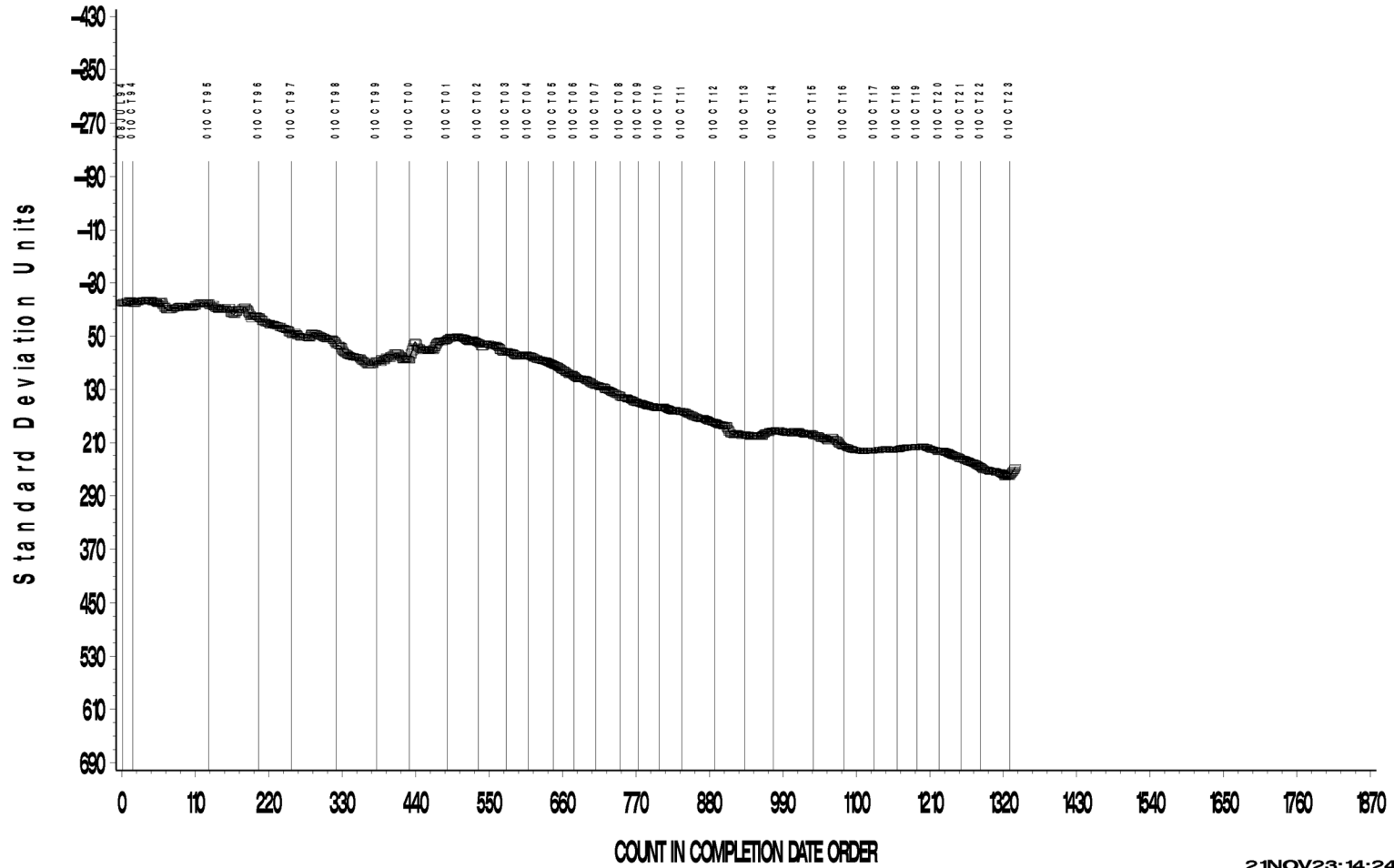
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L-60-1 (D5704)

TIMELINE ADDITIONS

| Effective Date | Information Letter | Event |
|----------------|--------------------|-----------------------------------------------------------|
| Sep 15, 2023 | TMC Memo 23-030 | Approval of reference oil 155-2 and removal of oil 155-1. |

L-60-1 (D5704)

LAB VISITS

No lab visits were conducted during this reporting period.

INFORMATION LETTERS

No information letters were issued during this reporting period.

L-60-1 (D5704)

STATUS OF REFERENCE OIL SUPPLY

| Oil | Cans @ Labs | @ TMC | |
|-------|-------------|-------|---------|
| | | Cans | Gallons |
| 148-1 | 32 | 90 | 5.7 |
| 155-1 | 19 | 215 | 13.5 |
| 155-2 | 16 | 3558 | 222.4 |
| Total | 67 | 3863 | 241.5 |

The surveillance panel has asked that the TMC reserve a portion of oil 155-1 for L-60-1 testing. The TMC quantity shown for this oil is for that reserved portion. A separate quantity of 15.6 gallons is available for use in other gear testing. The panel approved 155-2 as a replacement for 155-1 during this reporting period.

(90) tests of oil 148-1 remain in TMC inventory; however, this is less than 6 gallons. When the need arises, it will not be possible to obtain a reblend of this oil. The panel has begun the process of creating a possible replacement for this oil.