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Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

www.astmtmc.org
412-365-1000

MEMORANDUM: 22-038
DATE: November 15, 2022
TO: Robert Slocum, Chairman, L-60-1 Surveillance Panel
FROM: Dylan Beck *Dylan Beck*
SUBJECT: L-60-1 Reference Oil Testing from April 1, 2022 through September 30, 2022

Attached is a summary of testing activity this period

DJB/djb/mem22-038.djb.doc

cc: Jeff Clark

Sean Moyer

L-60-1 Surveillance Panel

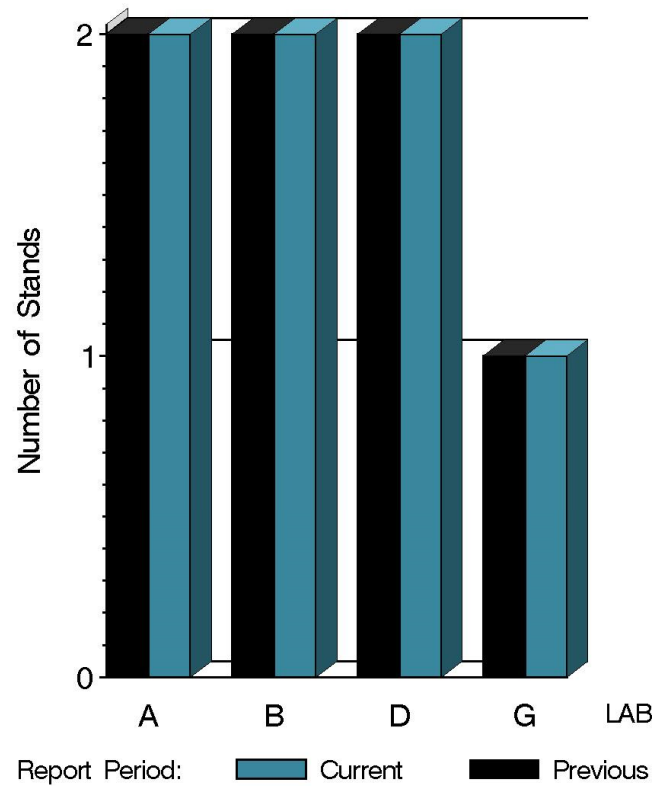
<https://www.astmtmc.org/ftp/docs/gear/l601/semiannualreports/l601-10-2022.pdf>

Distribution: email

L-60-1 (D5704)

	Reporting Data	Calibrated on 9-30-22
Number of Labs	4	4
Number of Stands	7	7

BY-LAB STAND
DISTRIBUTION



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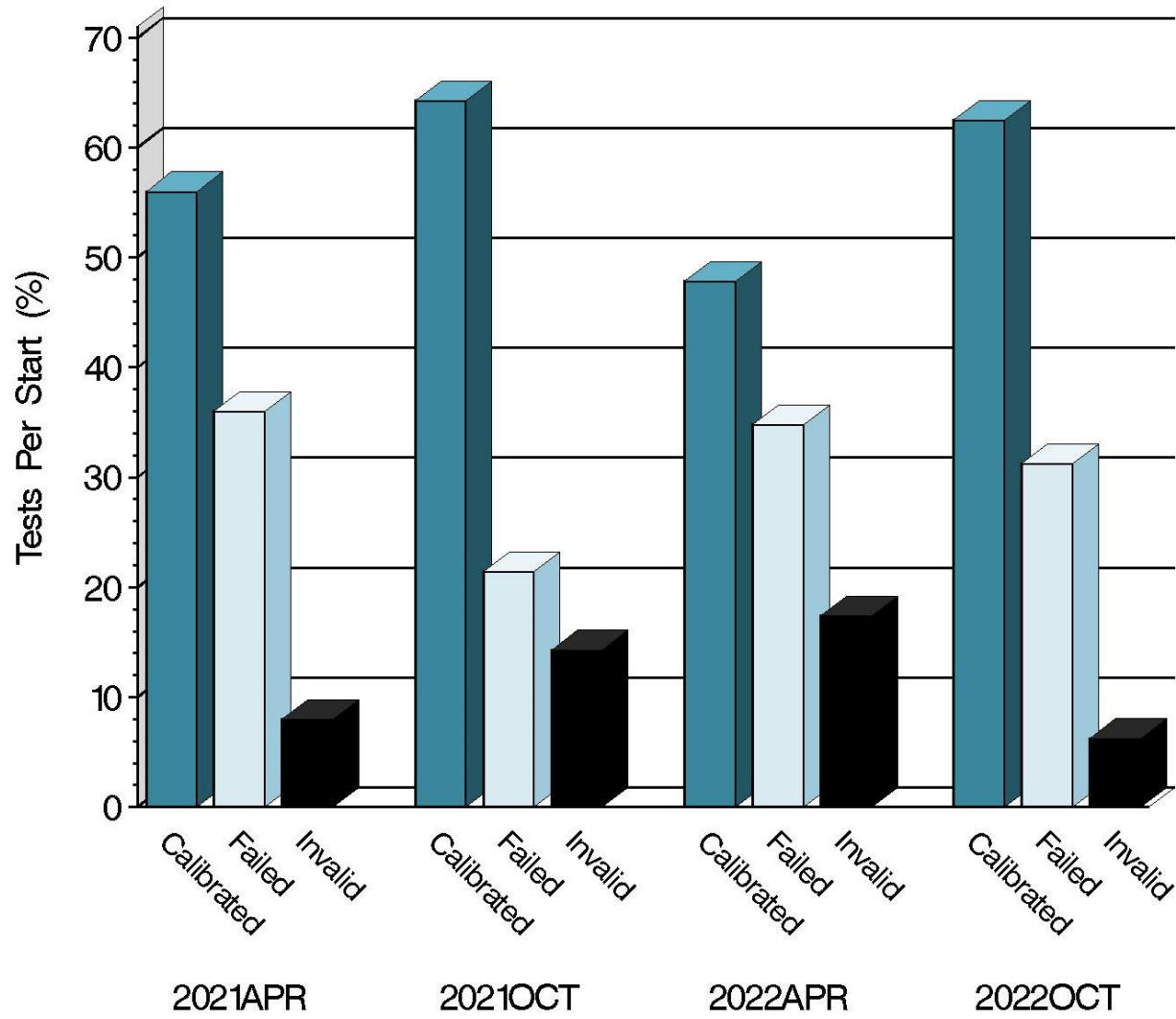
L-60-1 (D5704)

Test Distribution by Oil and Validity

		Totals			
		148-1	155-1	Last Period	This Period
Accepted for calibration	AC	5	5	11	10
Rejected (Mild)	OC	0	0	2	0
Rejected (Severe)	OC	3	1	5	4
Rejected (Combination)	OC	0	0	0	0
Rejected (Precision)	OC	1	0	1	1
Invalidated calibration	RC	1	0	3	1
Acceptable info run	NI	4	1	0	5
Aborted	XC	0	0	2	0
Total		14	7	24	21

L-60-1 (D5704)

CALIBRATION ATTEMPT SUMMARY



Resolution

Report Period

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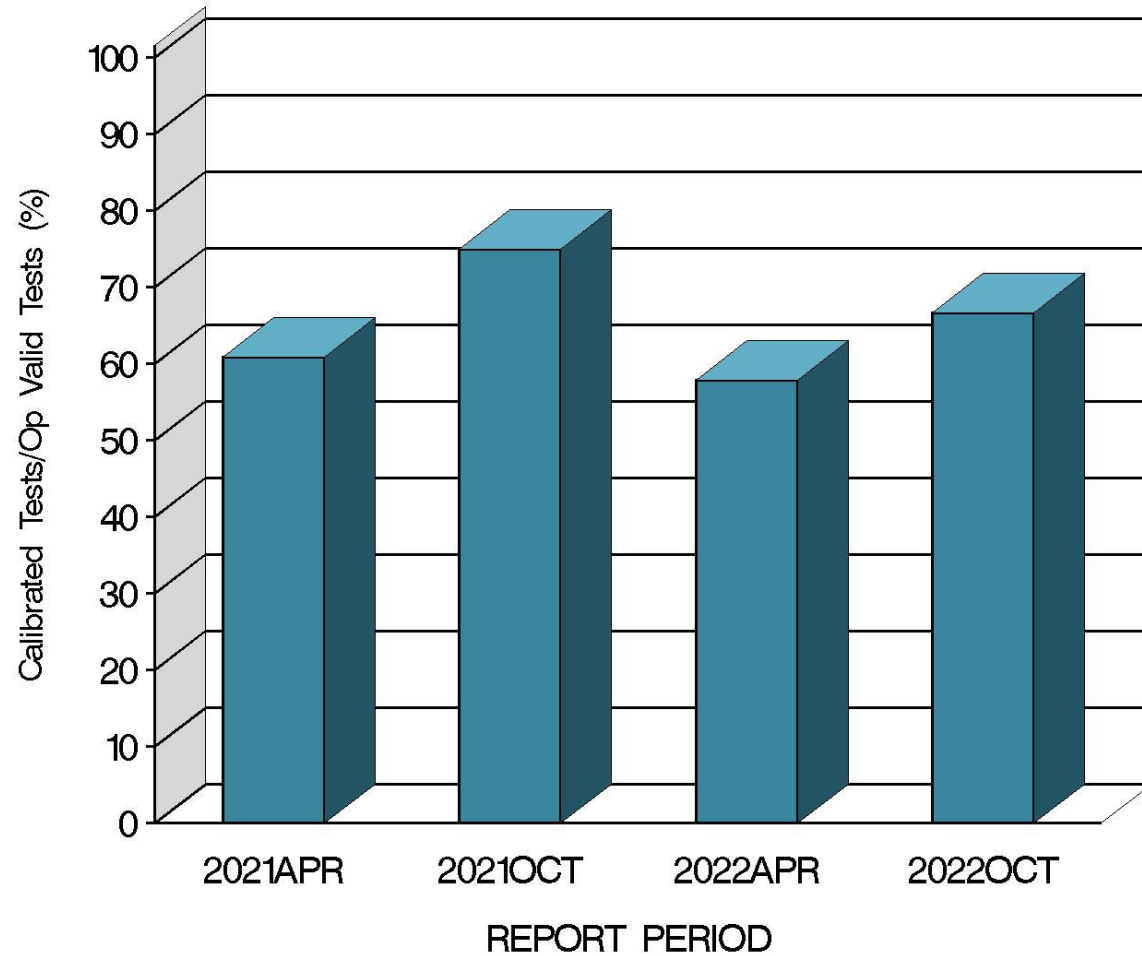
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L-60-1 (D5704)

OPERATIONALLY VALID TESTS
MEETING ACCEPTANCE CRITERIA



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CAUSES FOR LOST TESTS

		Oil		Validity			Loss Rate		
Lab	Cause	148-1	155-1	LI	RC	XC	Lost	Starts	%
D	Oil weight loss greater than 20%	●			●		1	5	20%
	Lost	1	0	0	1	0			
	Starts	12	0	0	21	0			
	%	8.3%	0%	0%	4.8%	0%			

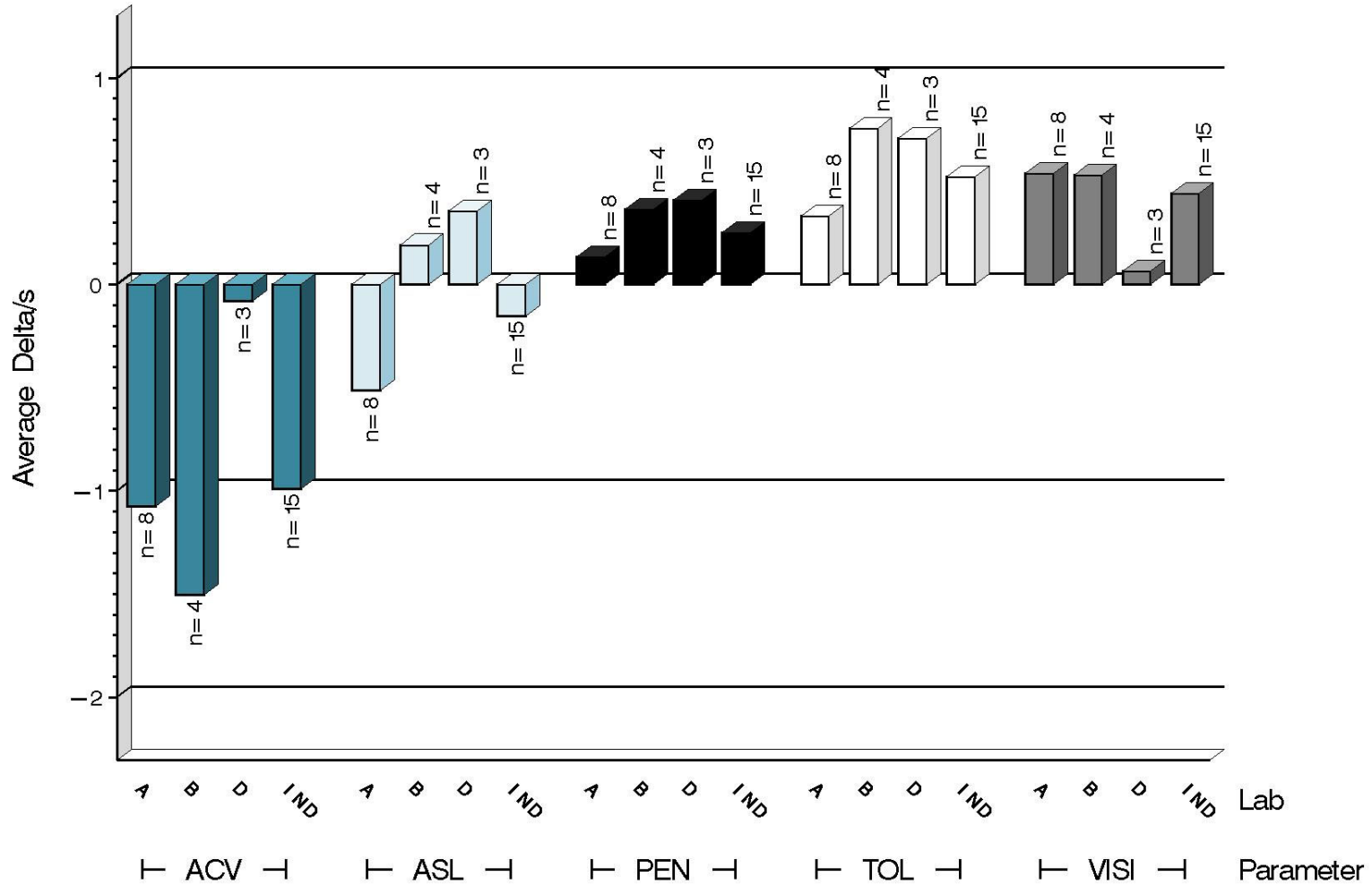
L-60-1 (D5704)

Average Δ /s by Lab						
Lab	n	VISI	PEN	TOL	ACV	ASL
A	8	0.539	0.134	0.332	-1.076	-0.515
B	4	0.531	0.363	0.756	-1.504	0.192
D	3	0.065	0.410	0.708	-0.082	0.357
<i>Industry</i>	15	0.442	0.250	0.520	-0.991	-0.152
<i>Shift*</i>	15	3.385	0.103	0.13 %	-0.507 merits	-0.016 merits

*computed using severity adjustment standard deviation.

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TEST SEVERITY
DELTA/S BY LAB



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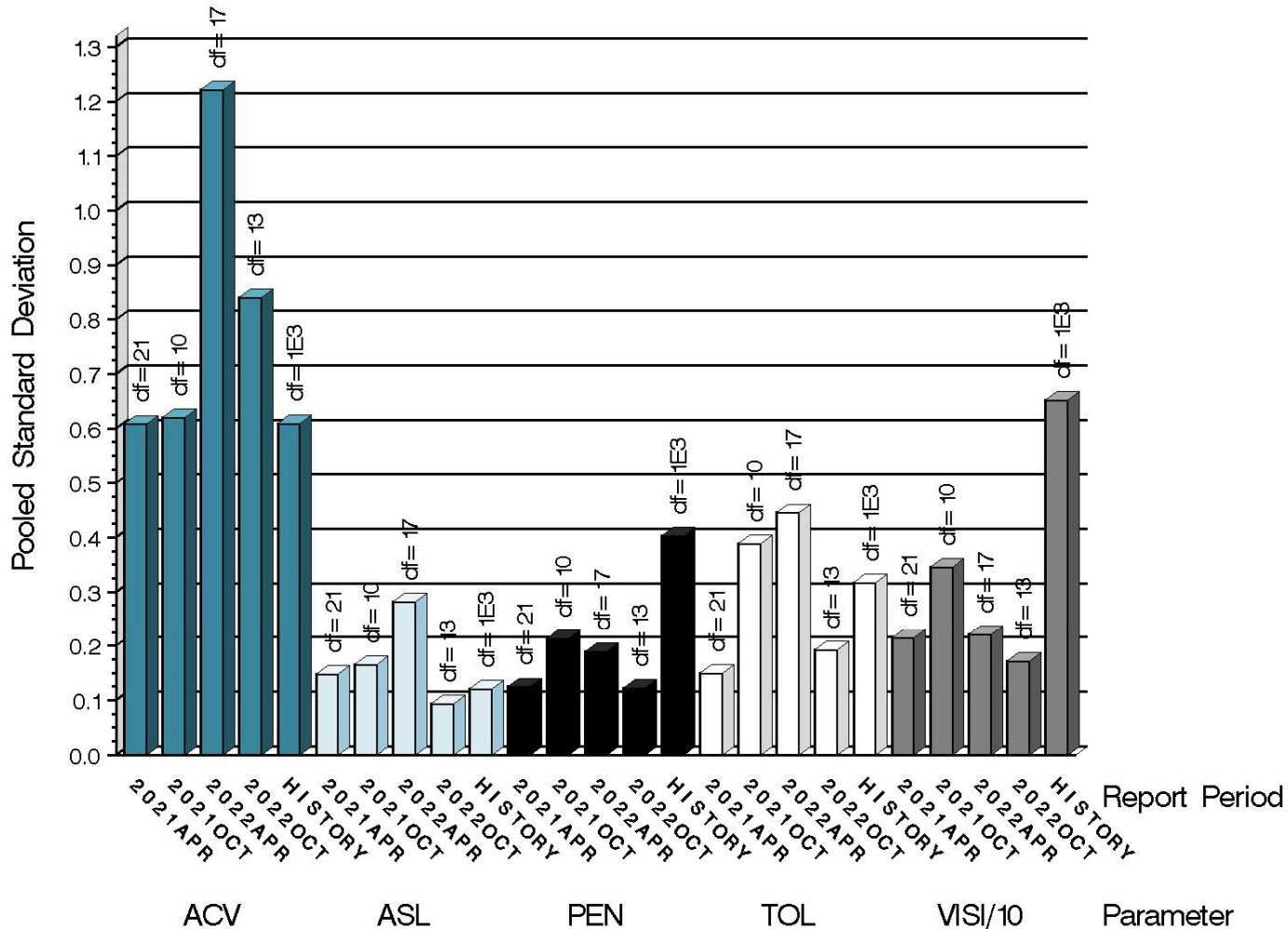


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L-60-1 (D5704)

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

ASL exceeded the action limit in the severe direction this period but is only exceeding the warning limit with the latest test.

TOL exceeded the severity warning limit this period but is now within limits.

Precision

ACV exceeded the action limit this period but is only exceeding the warning limit with the most recent test.

ASL exceeded the action limit this period but has since returned within limits.

Industry control charts follow.



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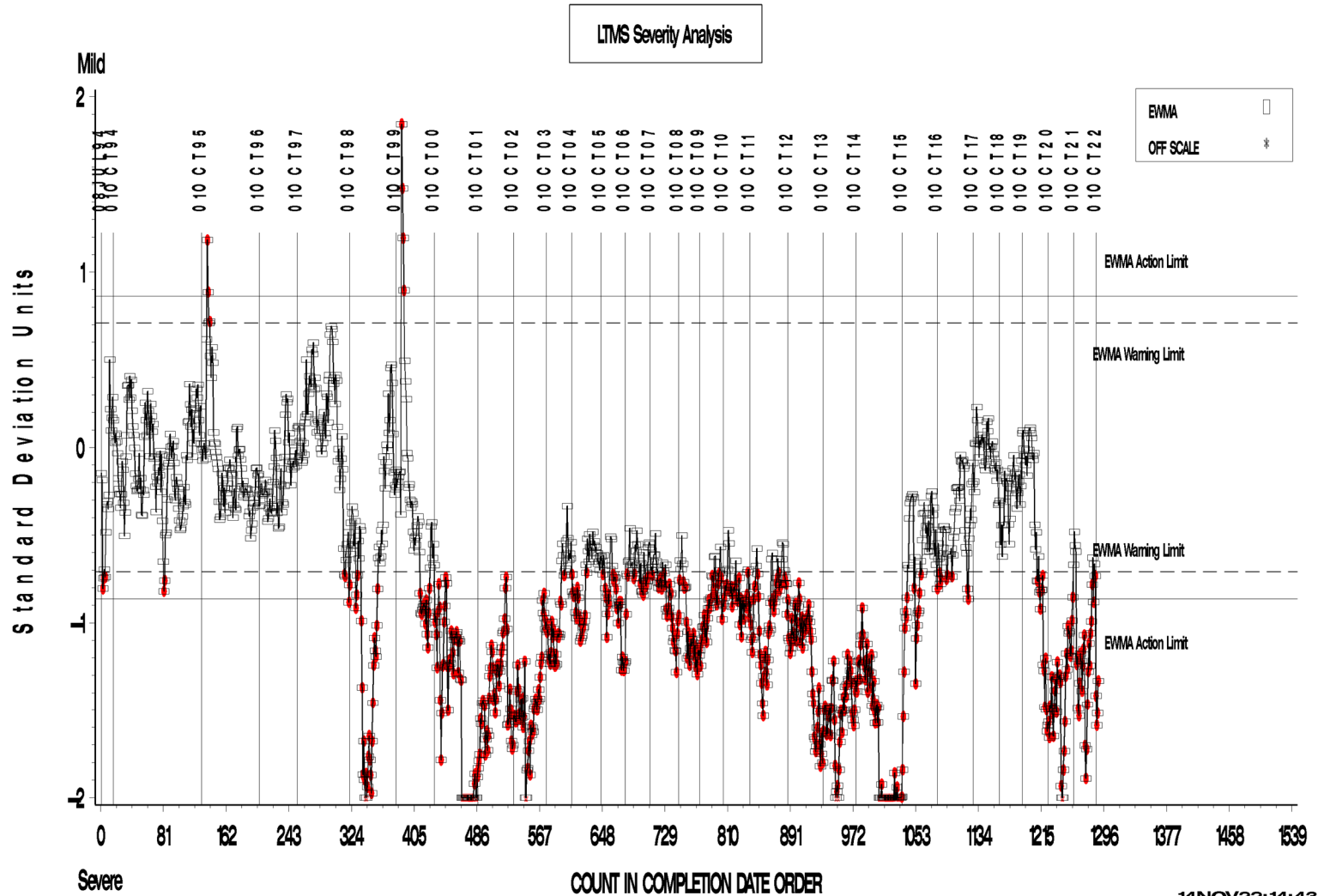
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

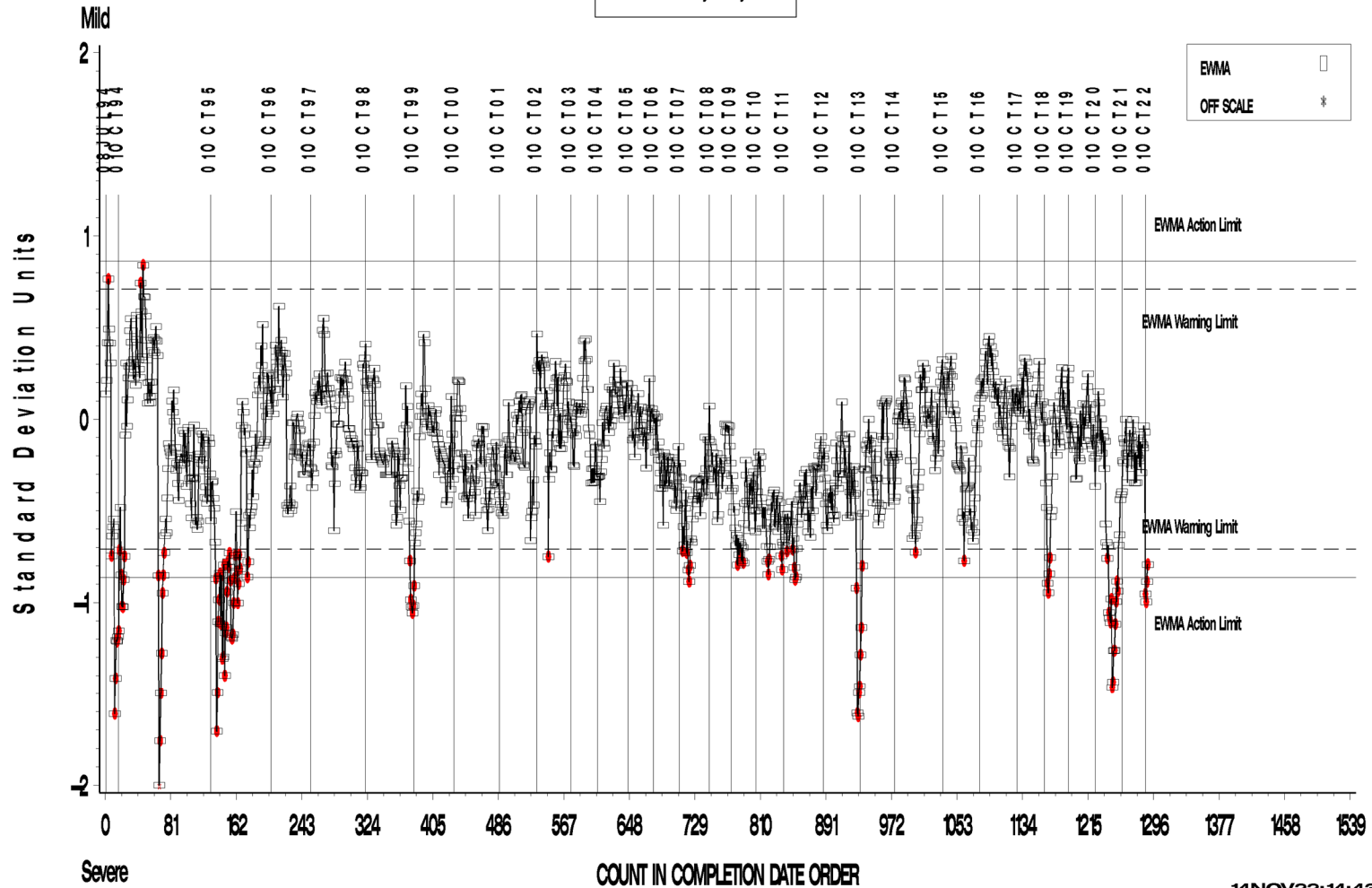


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L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

LTMS Severity Analysis



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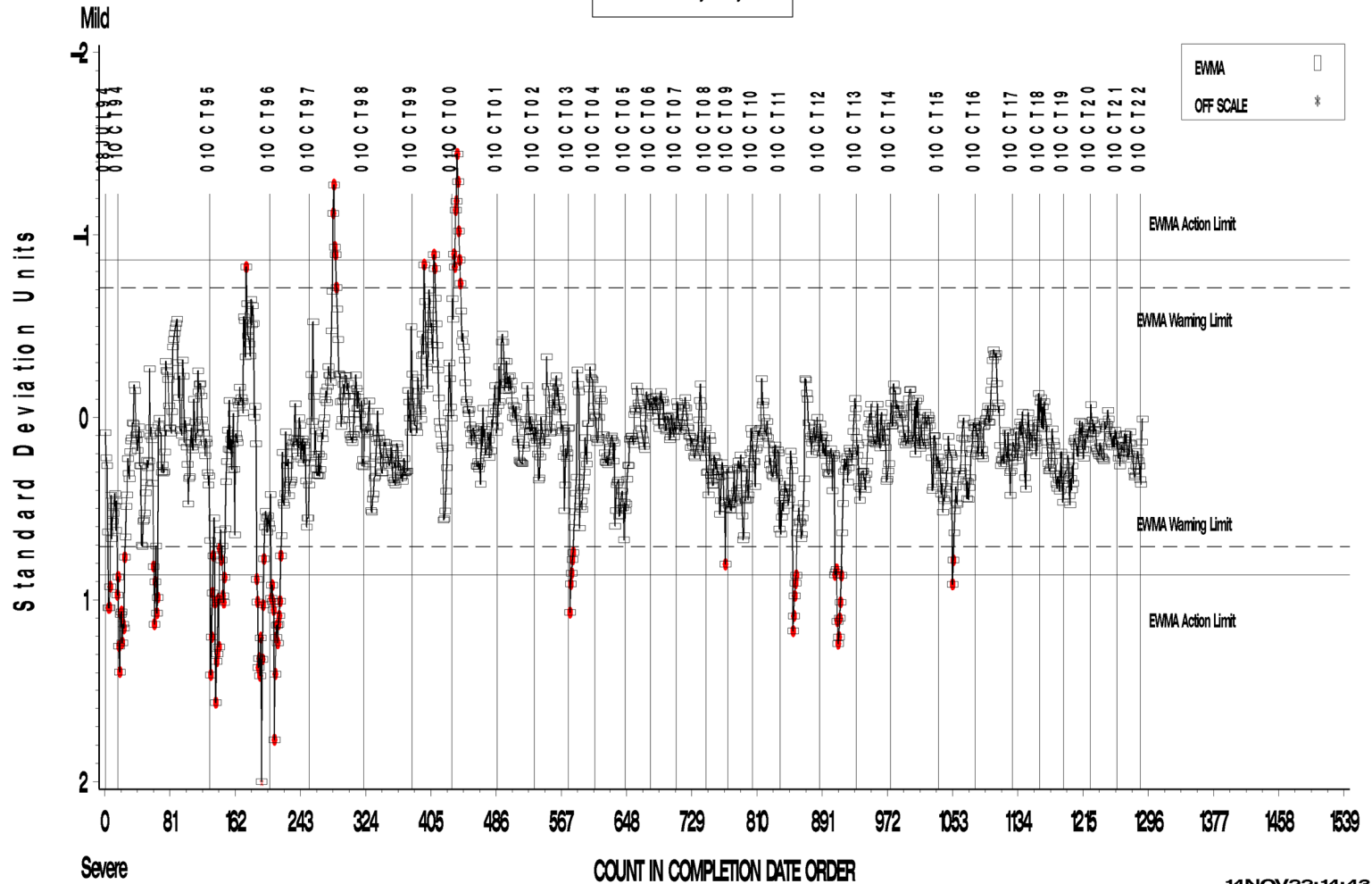
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

LTMS Severity Analysis



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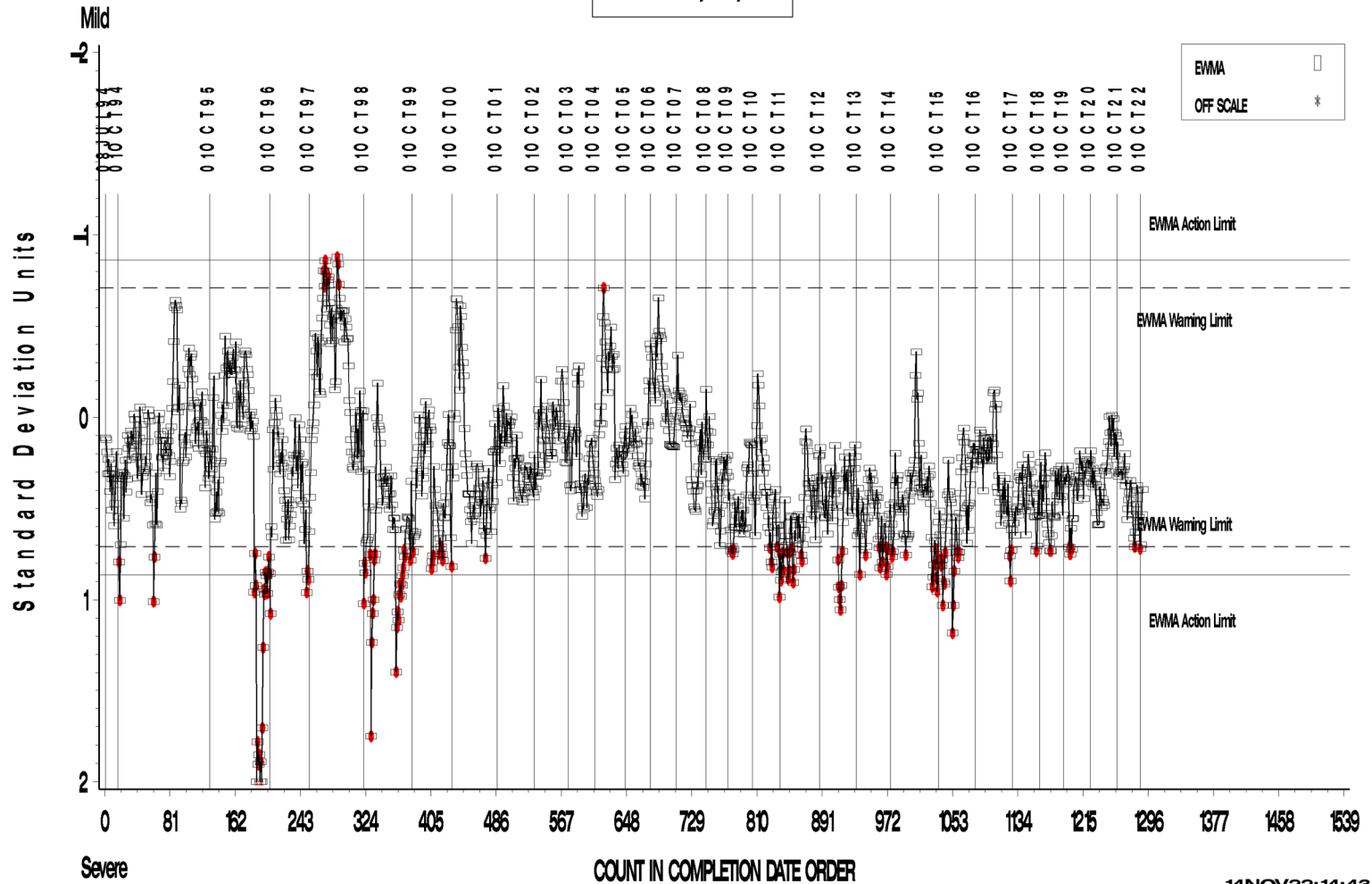
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

LTMS Severity Analysis



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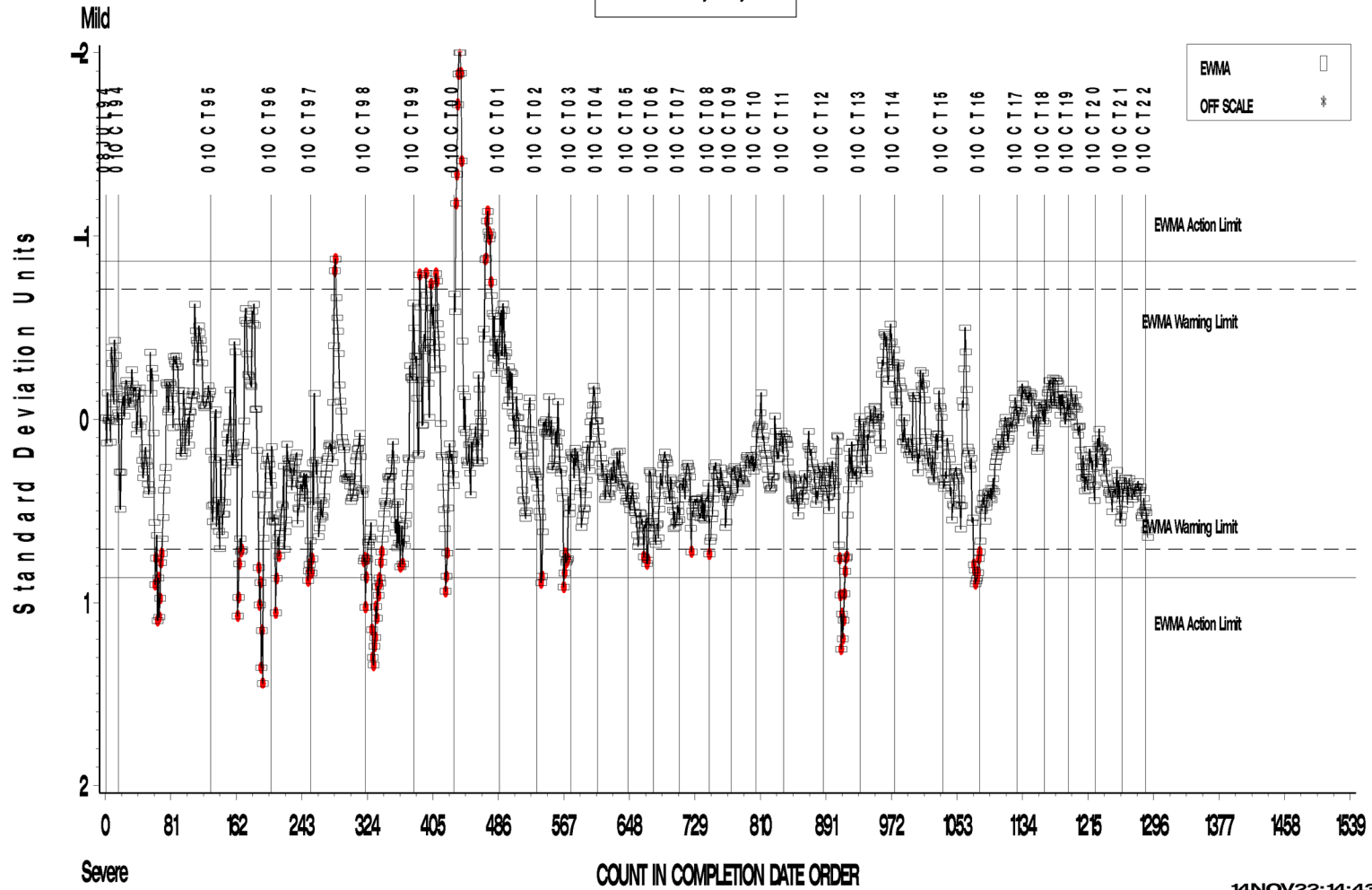
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL VISCOSITY INCREASE

LTMS Severity Analysis



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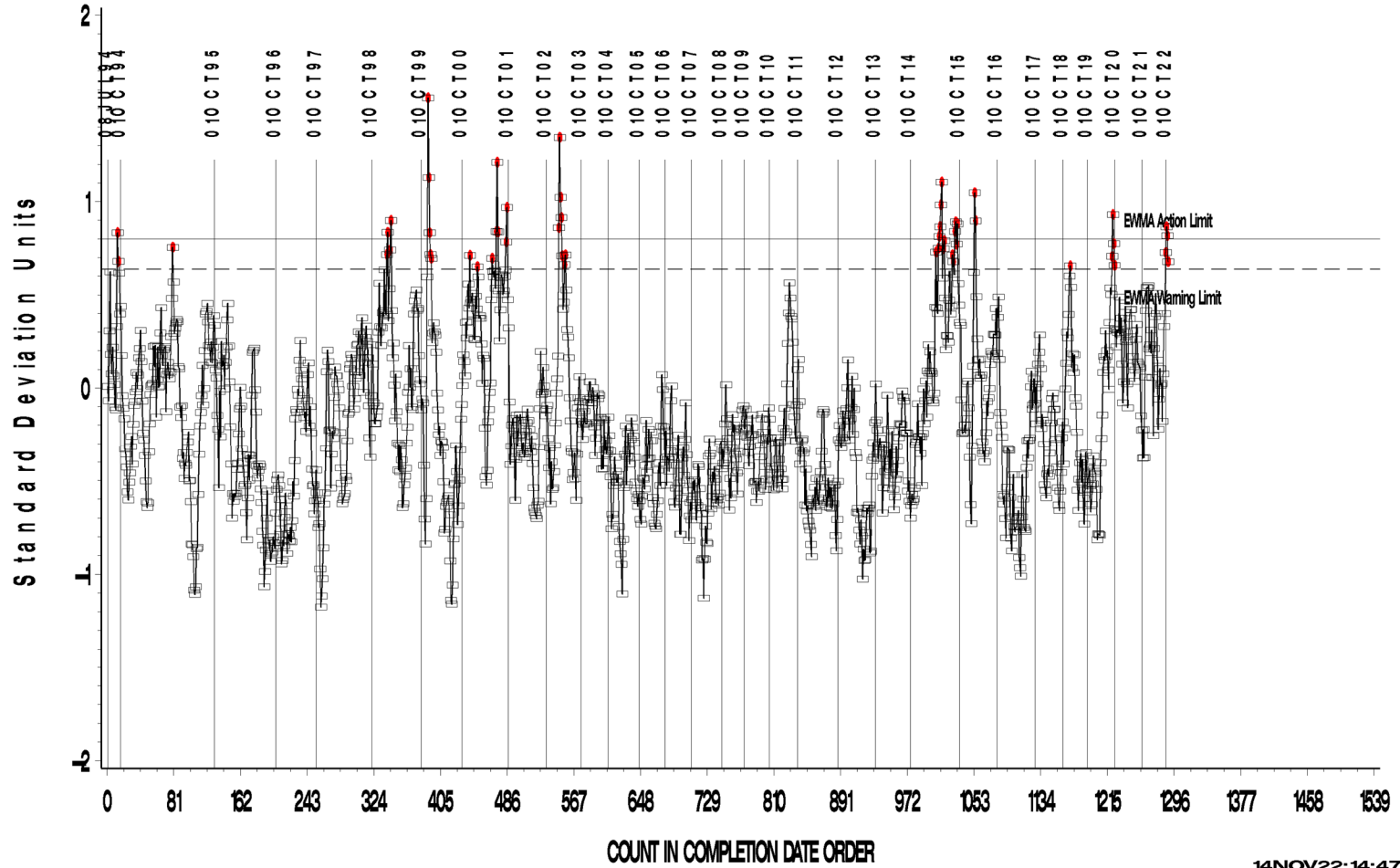
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

LTMS Precision Analysis



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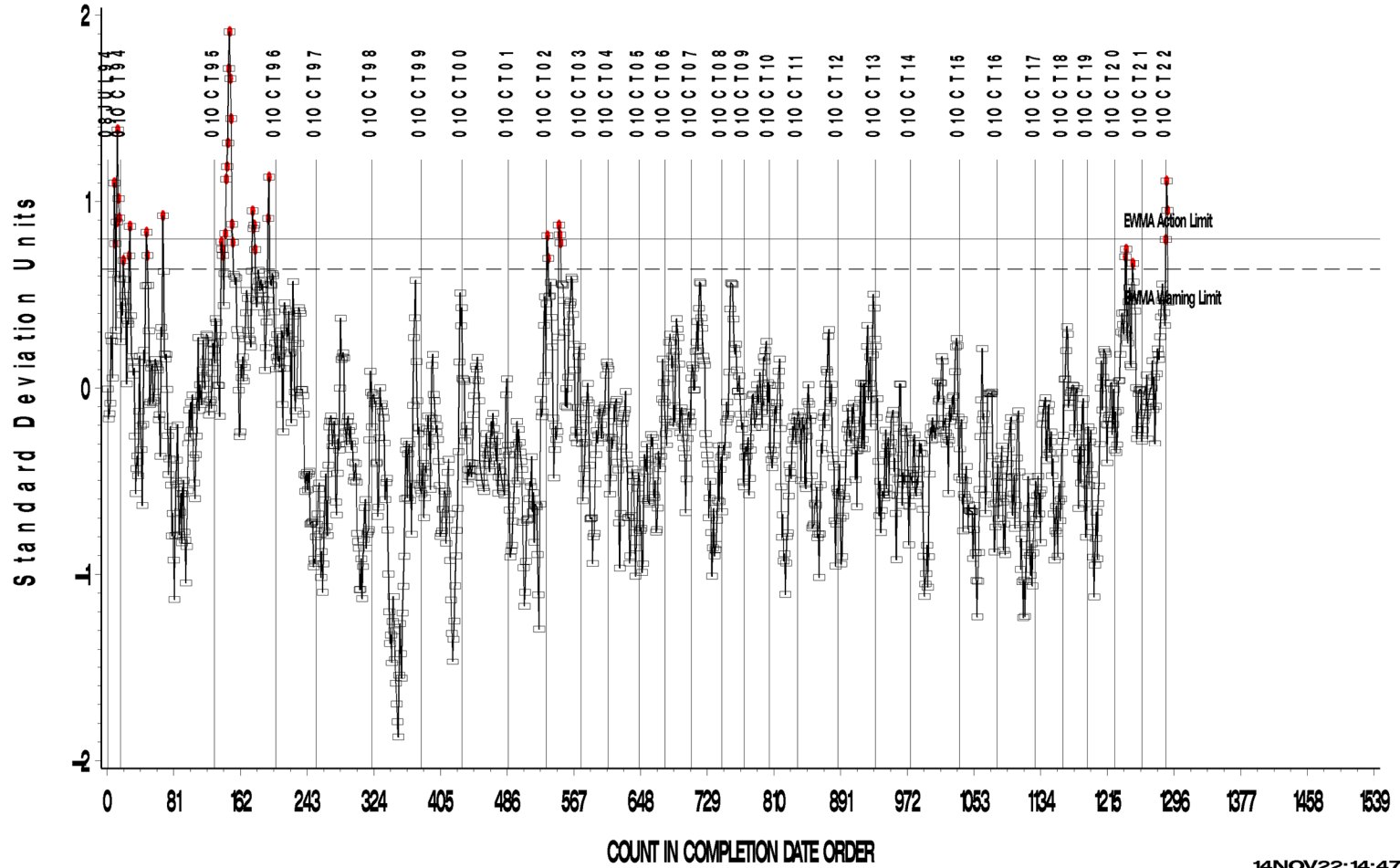
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L-60-1 (D5704)

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REF. FINAL AVERAGE SLUDGE

LTMS Precision Analysis



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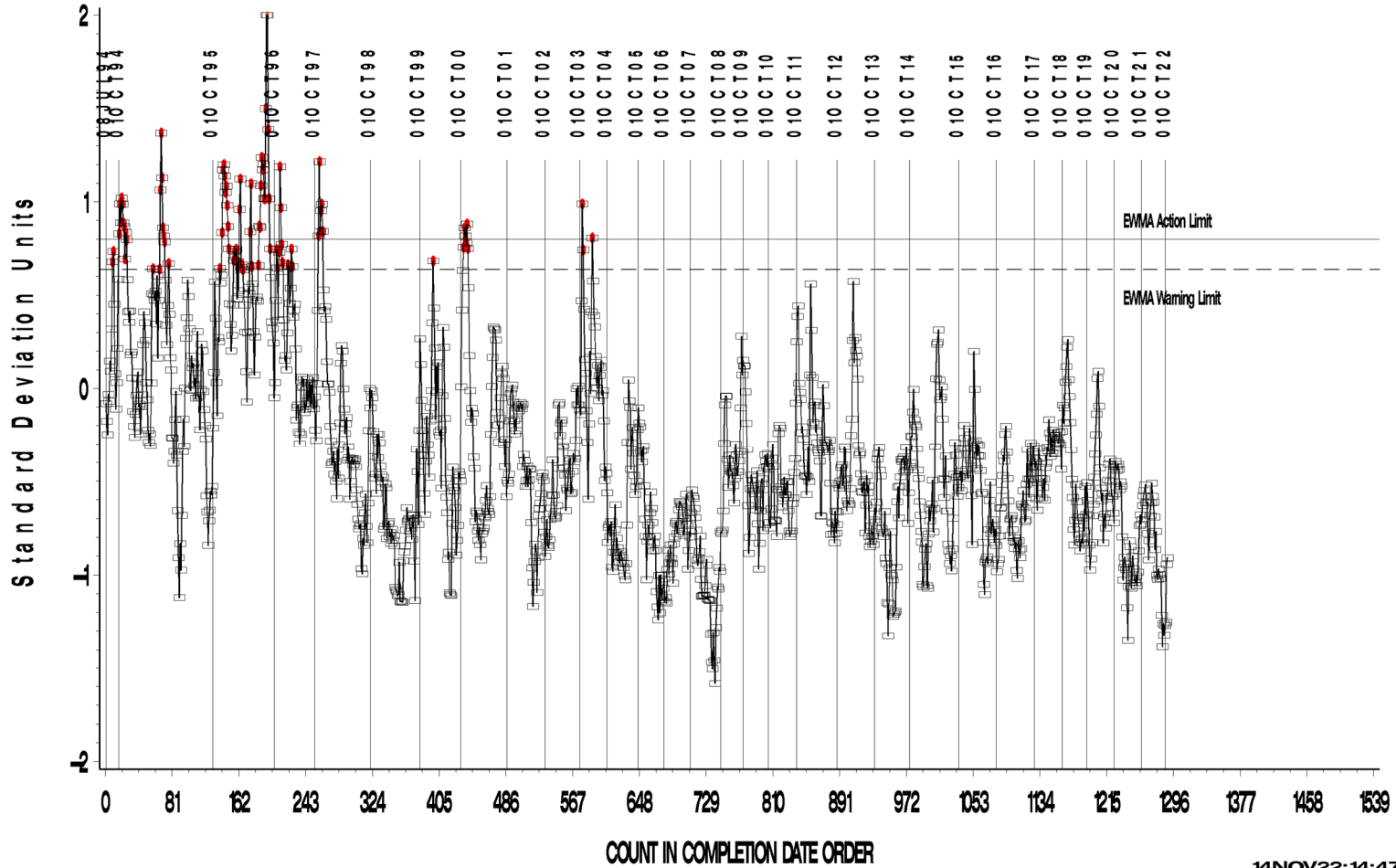
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

LTMS Precision Analysis



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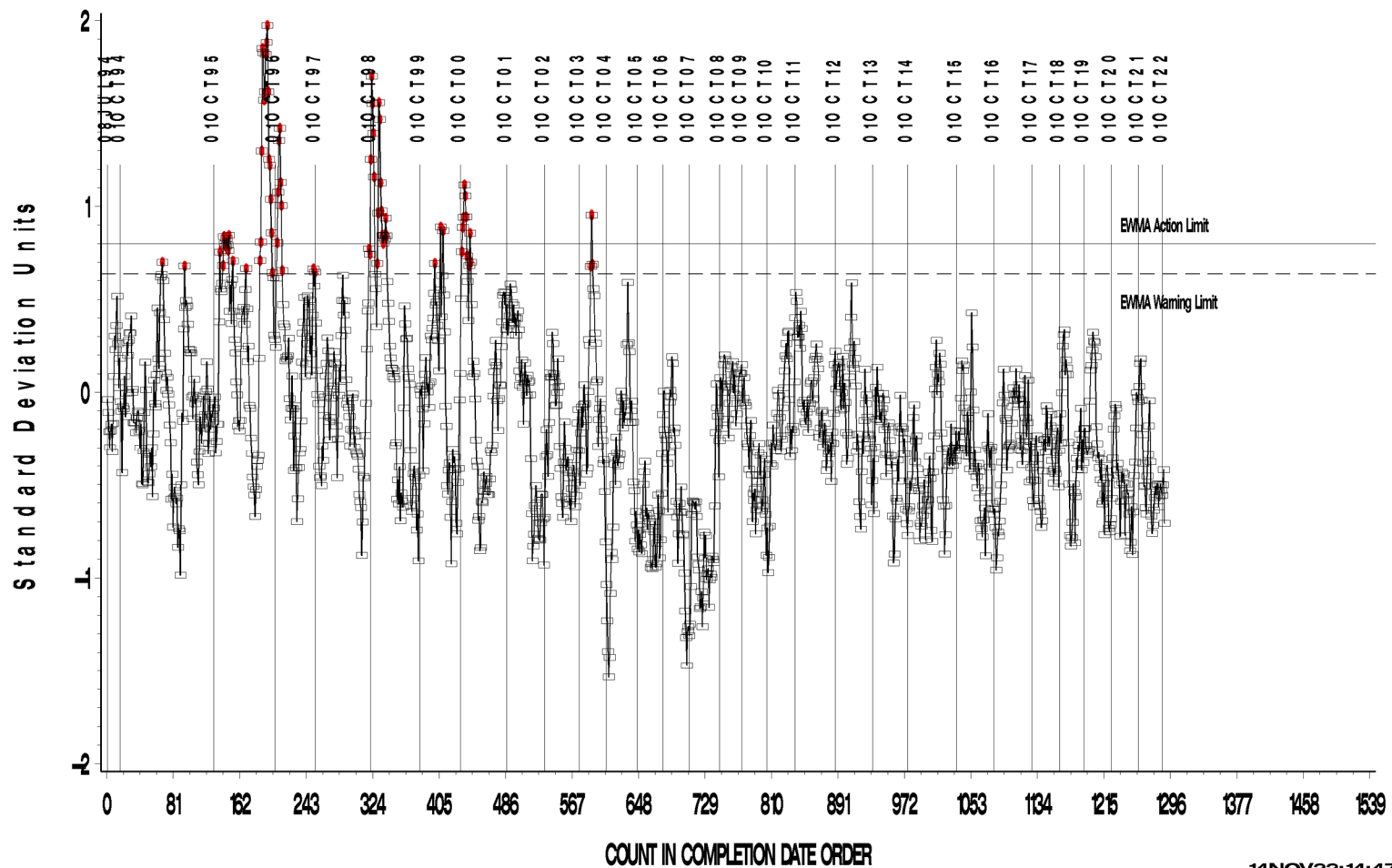
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

LTMS Precision Analysis



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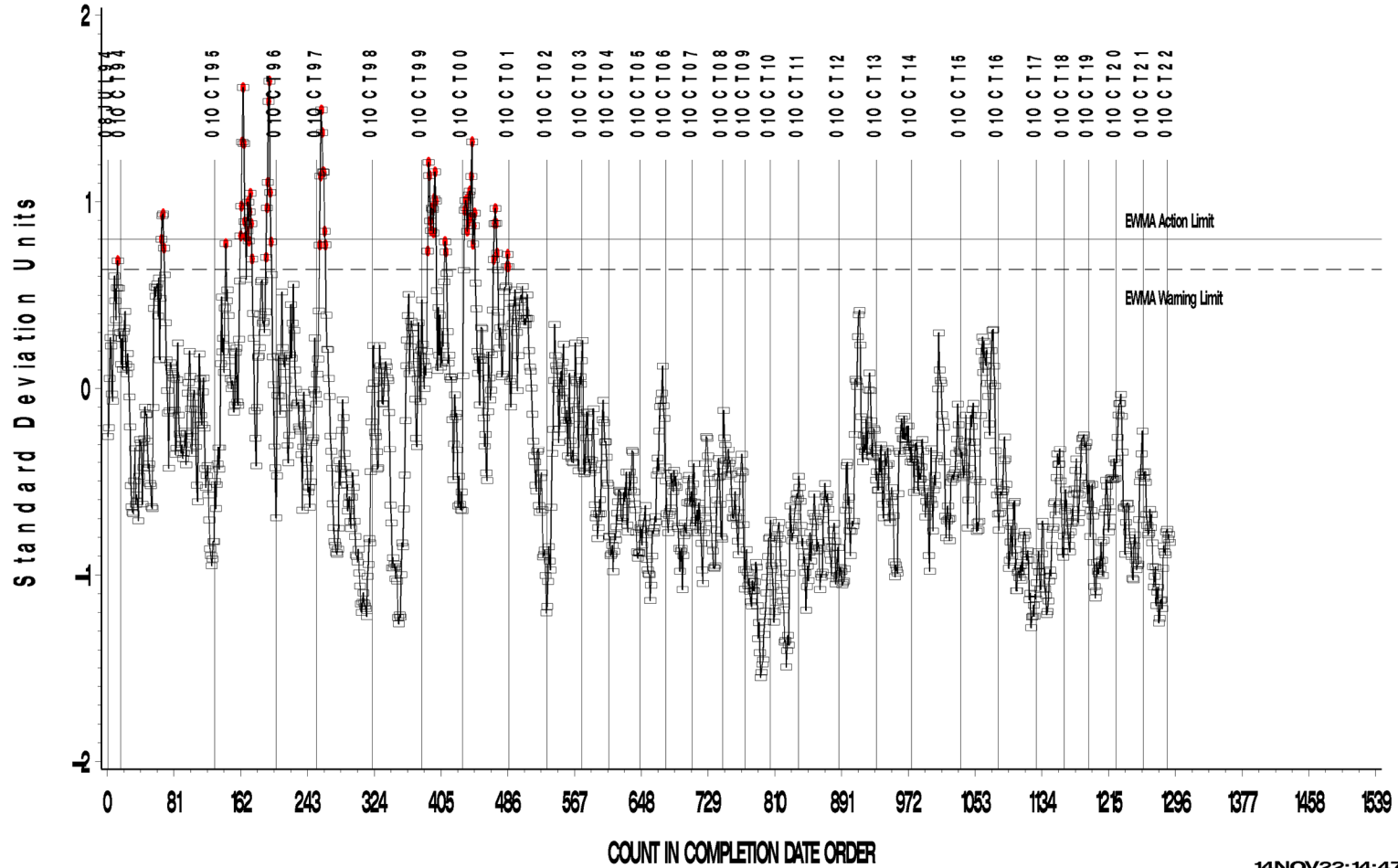
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LTMS Precision Analysis



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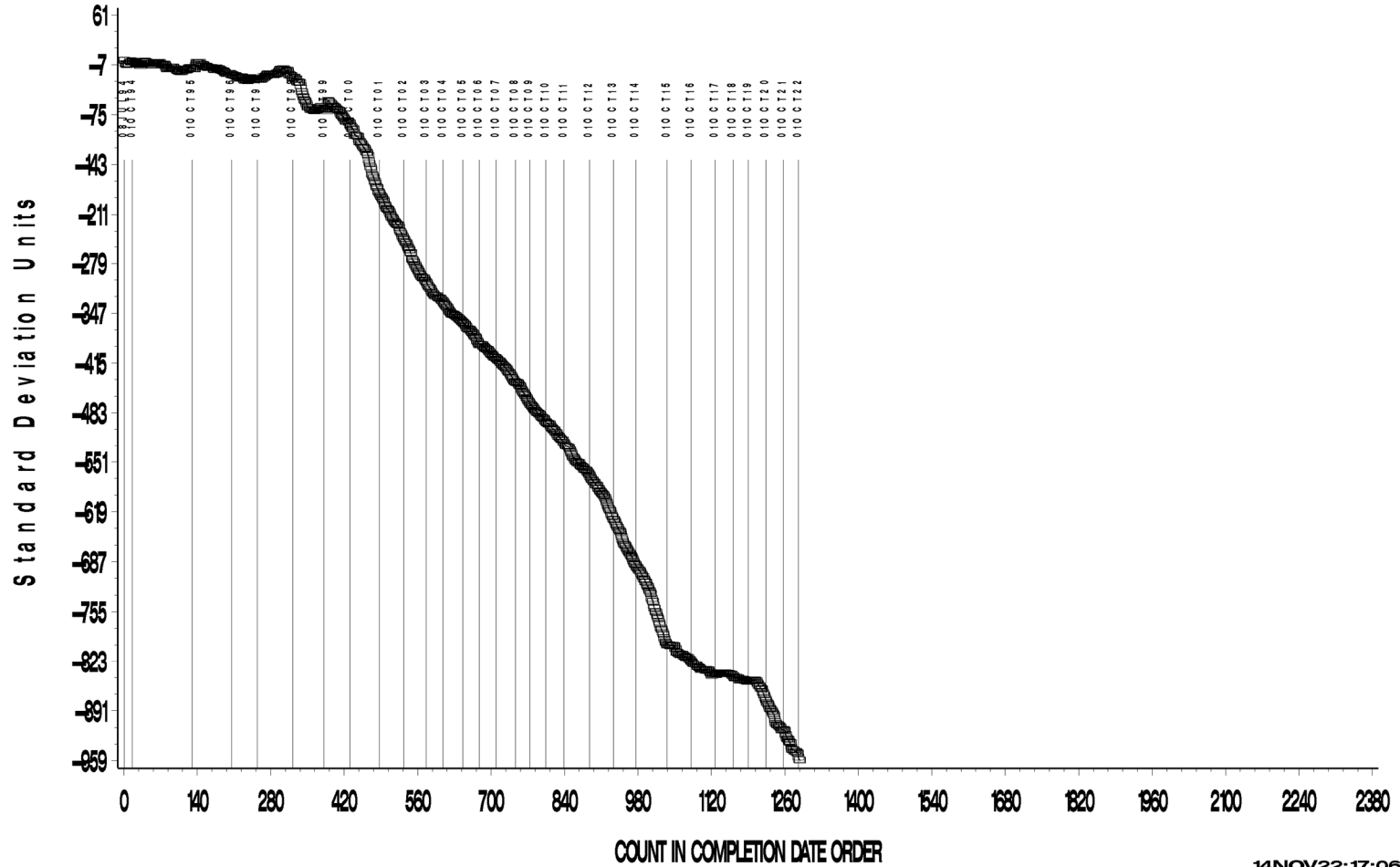
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L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

CUSUM Severity Analysis



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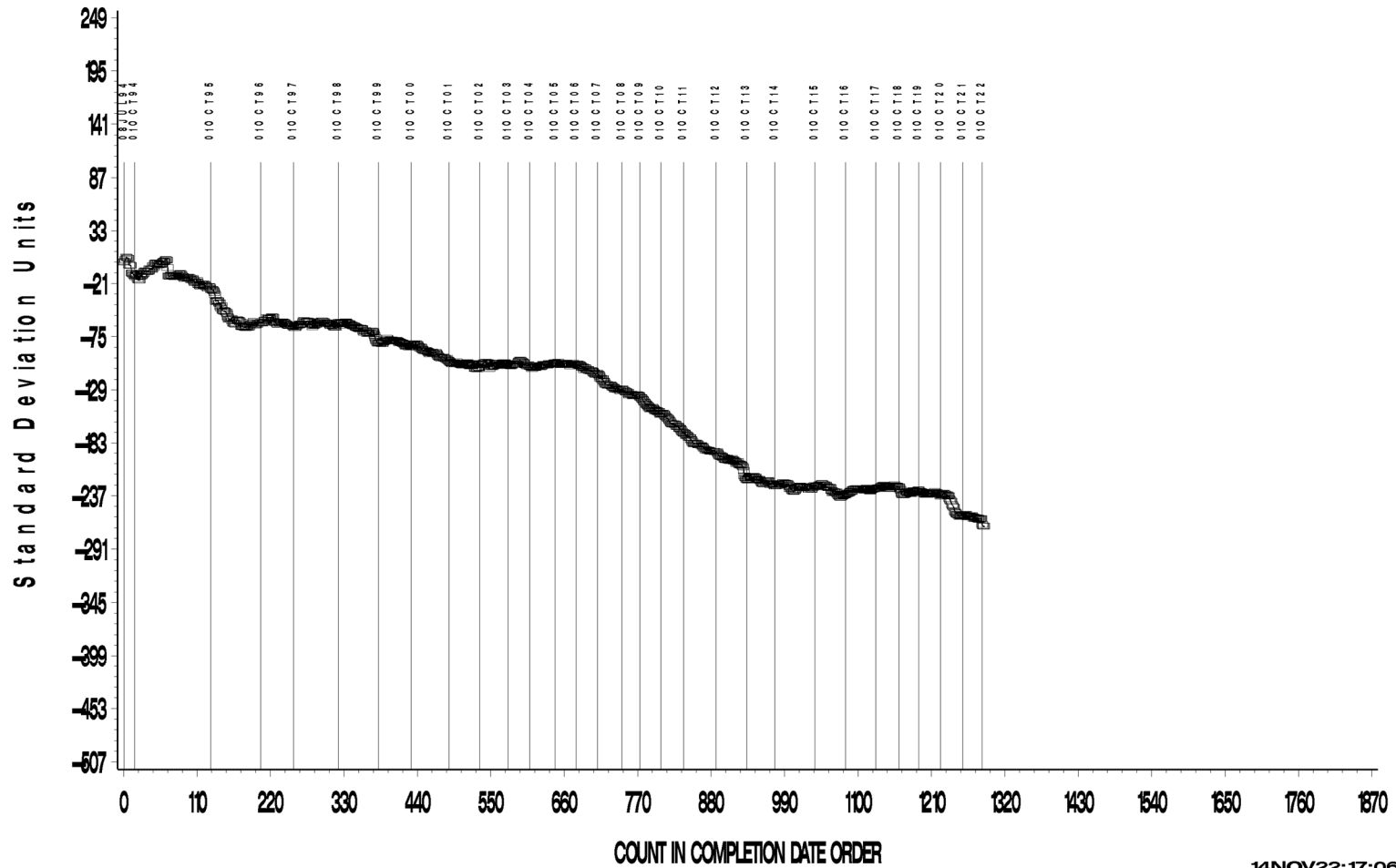
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

CUSUM Severity Analysis



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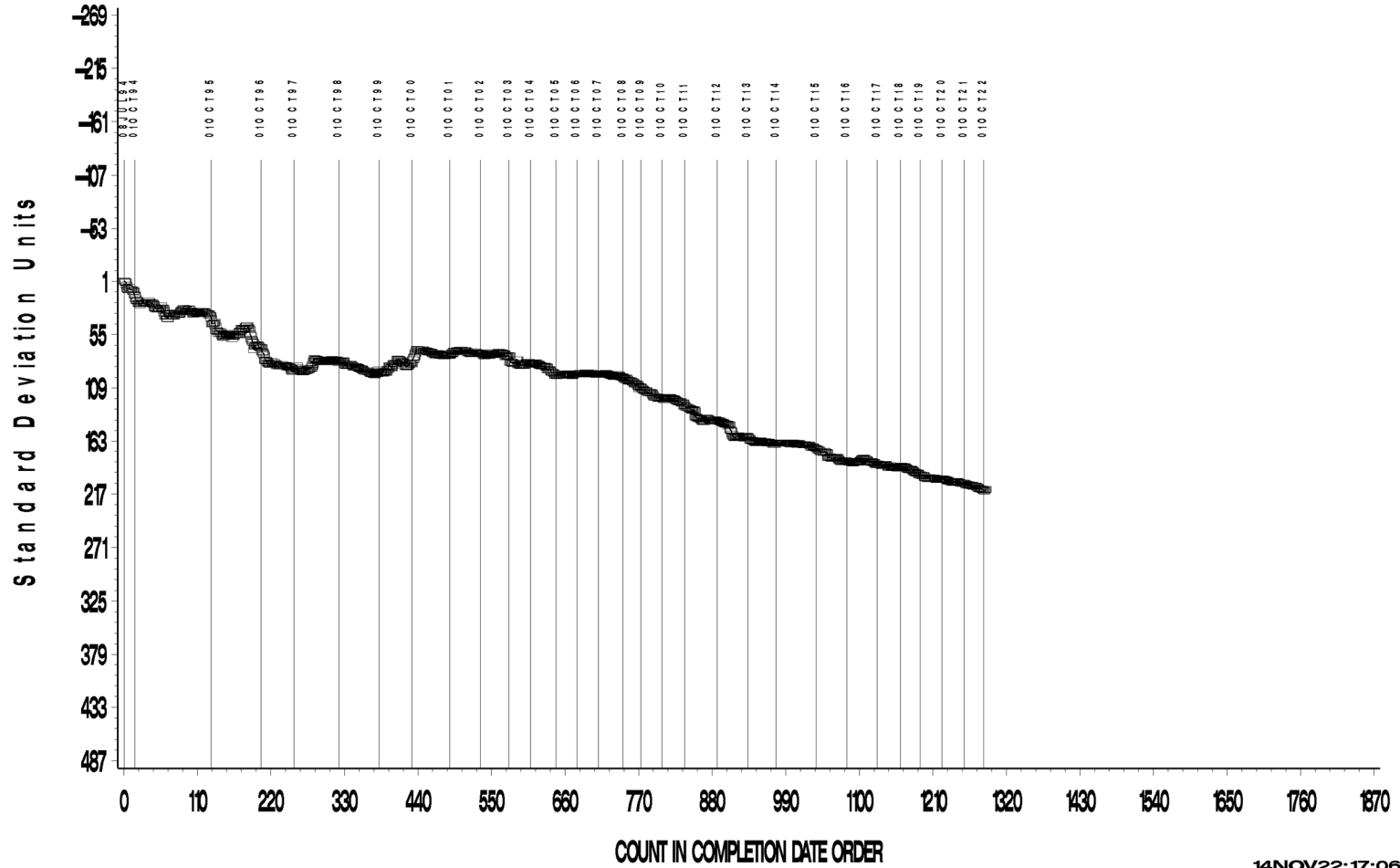
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

CUSUM Severity Analysis



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CUSUM Severity Analysis



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CUSUM Severity Analysis



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L-60-1 (D5704)

TIMELINE ADDITIONS

Effective Date	Information Letter	Event
May 20, 2022	21-02	Added wording to section 11.3.3 to allow LED or fluorescent lighting for L-60-1 rating.
August 29, 2022	22-03	Eliminate a single source for cleaning and calibrating test instruments.

L-60-1 (D5704)

LAB VISITS

Two L-60-1 lab visits were conducted during this period. All inspected areas of the test type were found to be in accordance with the test procedure.

INFORMATION LETTERS

Information letter 21-02 added the option for raters to use either fluorescent or LED lighting.

Information letter 22-03 was also issued to eliminate a single source laboratory for cleaning and calibrating instruments used for L-60-1 testing. The single source laboratory had a lead time of several months. Other options were needed to not delay the testing schedule.

L-60-1 (D5704)

STATUS OF REFERENCE OIL SUPPLY

Oil	Cans @ Labs	@ TMC	
		Cans	Gallons
148-1	25	129	8.1
155-1	22	366	22.9
155-2	9	4084	255.3
Total	56	4579	286.3

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 30.6 gallons is available for use in other gear testing. The panel has begun the process of approving 155-2 as a replacement for oil 155-1.

(129) tests of oil 148-1 remain in TMC inventory; however, this is less than 9 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.