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Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

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412-365-1000

MEMORANDUM: 21-042
DATE: October 26, 2021
TO: Robert Slocum, Chairman, L-60-1 Surveillance Panel
FROM: Dylan Beck *Dylan Beck*
SUBJECT: L-60-1 Reference Oil Testing from March 1, 2021 through September 30, 2021

Attached is a summary of testing activity this period.

DJB/djb/mem21-042.djb.doc

cc: Frank Farber
Jeff Clark

L-60-1 Surveillance Panel

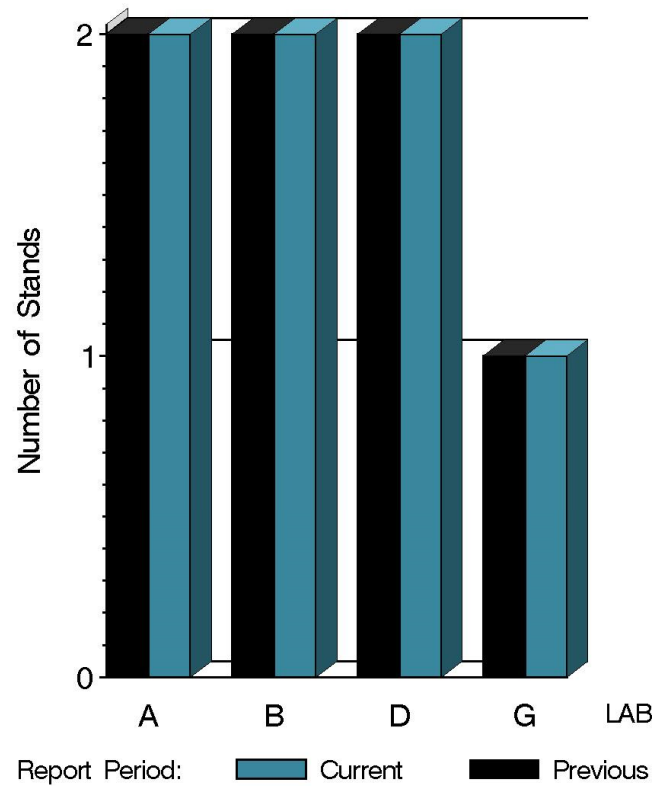
<https://www.astmtmc.org/ftp/docs/gear/l601/semiannualreports/l601-10-2021.pdf>

Distribution: email

L-60-1 (D5704)

	Reporting Data	Calibrated on 9-30-21
Number of Labs	4	4
Number of Stands	7	7

BY-LAB STAND
DISTRIBUTION



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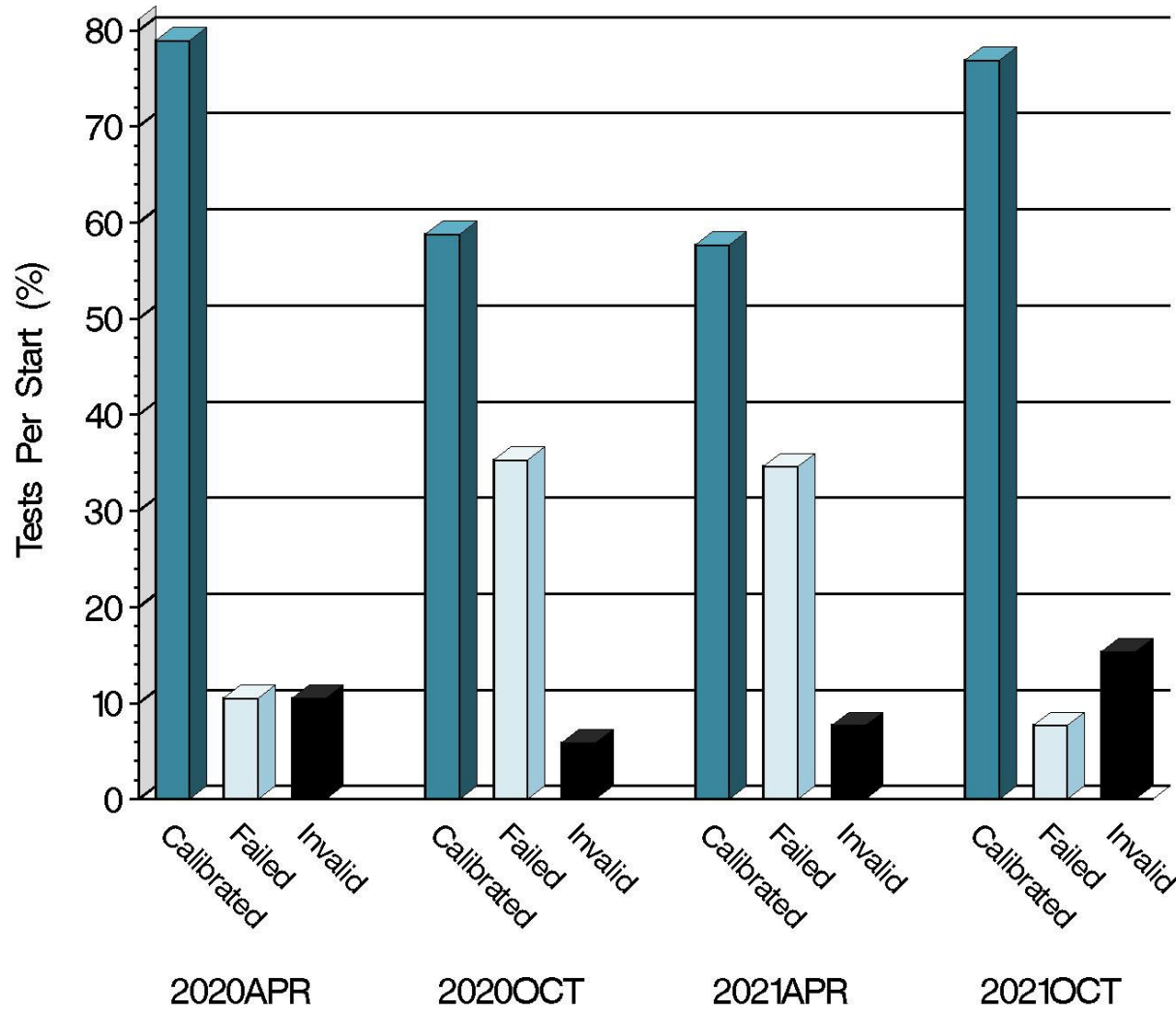
L-60-1 (D5704)

Test Distribution by Oil and Validity

				Totals	
		148-1	155-1	Last Period	This Period
Accepted for calibration	AC	6	4	15	10
Rejected (Mild)	OC	0	0	0	0
Rejected (Severe)	OC	0	1	5	1
Rejected (Combination)	OC	0	0	0	0
Rejected (Precision)	OC	0	0	2	0
Invalidated calibration	LC	1	1	2	2
Acceptable info run	NI	4	4	3	8
Aborted info run	XI	0	0	0	0
Aborted	XC	0	0	0	0
Total		11	10	27	21

L-60-1 (D5704)

CALIBRATION ATTEMPT SUMMARY



Resolution

Report Period

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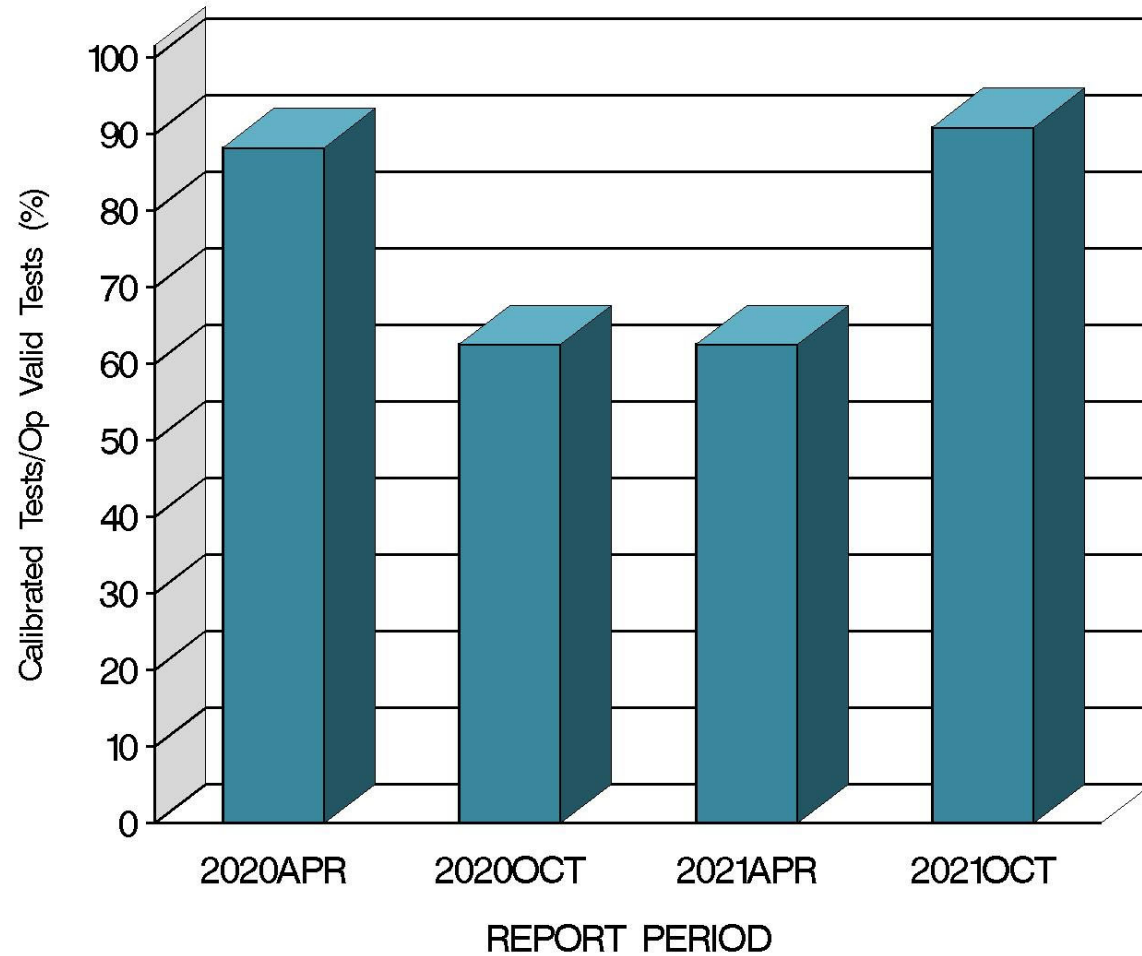
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OPERATIONALLY VALID TESTS
MEETING ACCEPTANCE CRITERIA



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CAUSES FOR LOST TESTS

		Oil		Validity			Loss Rate		
Lab	Cause	148-1	155-1	RC	LC	XC	Lost	Starts	%
G	Bad alternator		●		●		1	10	10%
	Alternator load outside of limits	●			●		1	10	10%
Lost		1	1	0	2	0			
Starts		11	10	21	21	21			
%		9.1%	10%	0%	9.5%	0%			

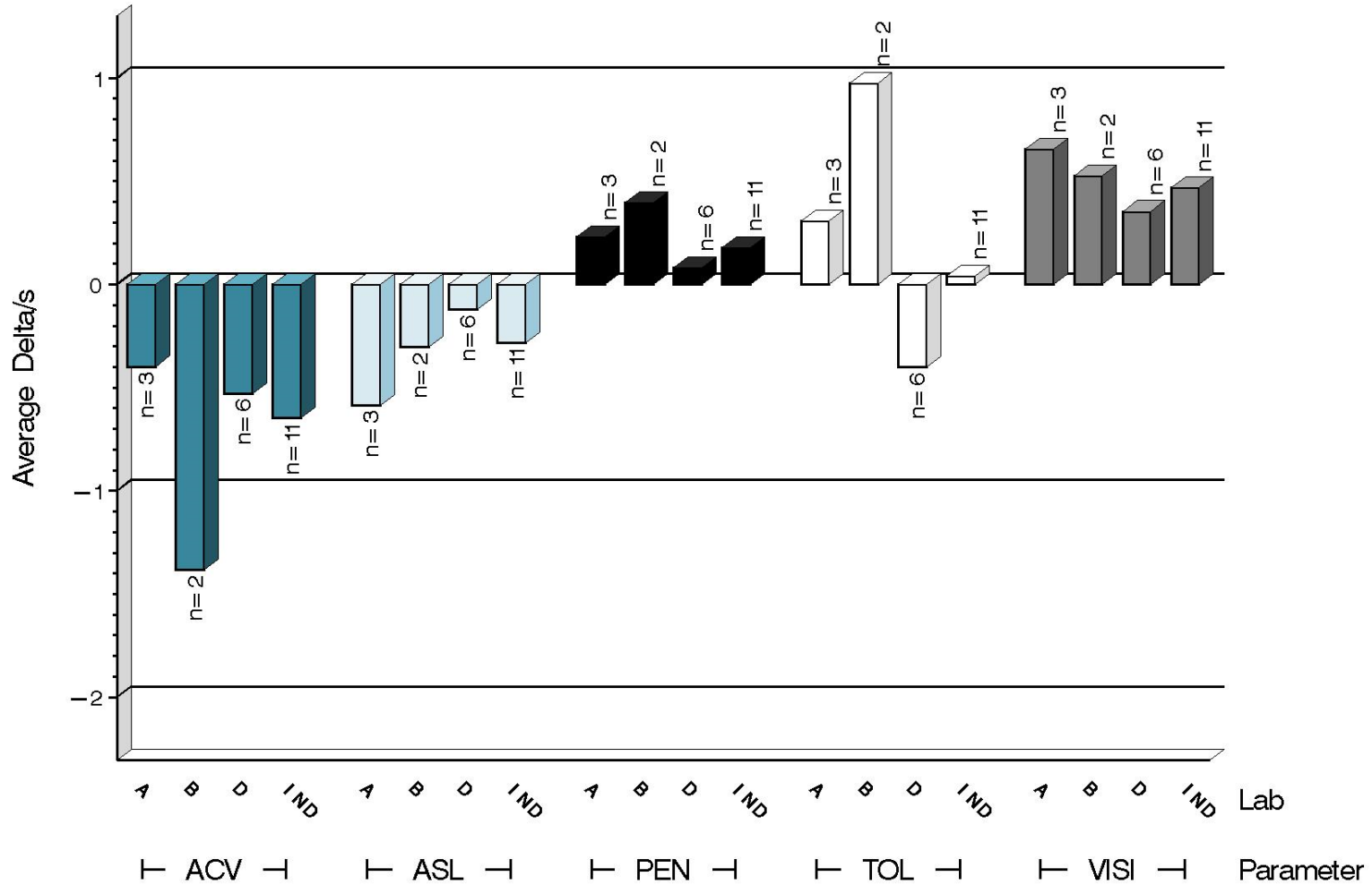
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Average Δ /s by Lab						
Lab	n	VISI	PEN	TOL	ACV	ASL
A	3	0.655	0.231	0.306	-0.398	-0.587
B	2	0.527	0.395	0.976	-1.382	-0.302
D	6	0.354	0.080	-0.402	-0.528	-0.122
<i>Industry</i>	11	0.467	0.178	0.042	-0.648	-0.282
<i>Shift*</i>	11	3.580	0.074	0.01 %	-0.331merits	-0.030merits

*computed using severity adjustment standard deviation.

L-60-1 (D5704)

TEST SEVERITY
DELTA/S BY LAB



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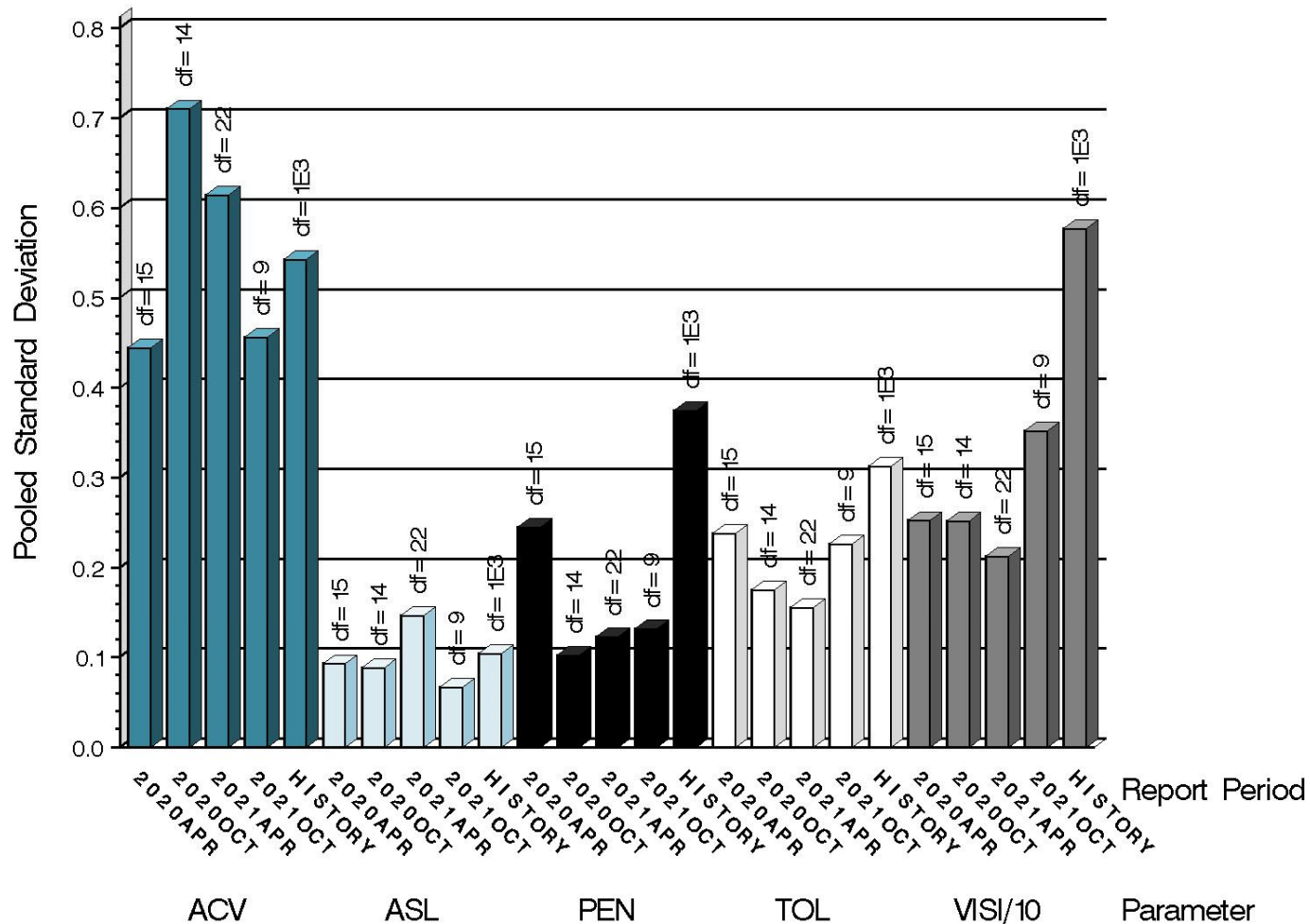


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TEST PRECISION
 POOLED STANDARD DEVIATION
 BY SIX-MONTH ASTM REPORT PERIOD



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 and ASL both started the period outside of the limits in the severe direction but have since returned within limits. All other parameters remained within limits during this period.

Precision

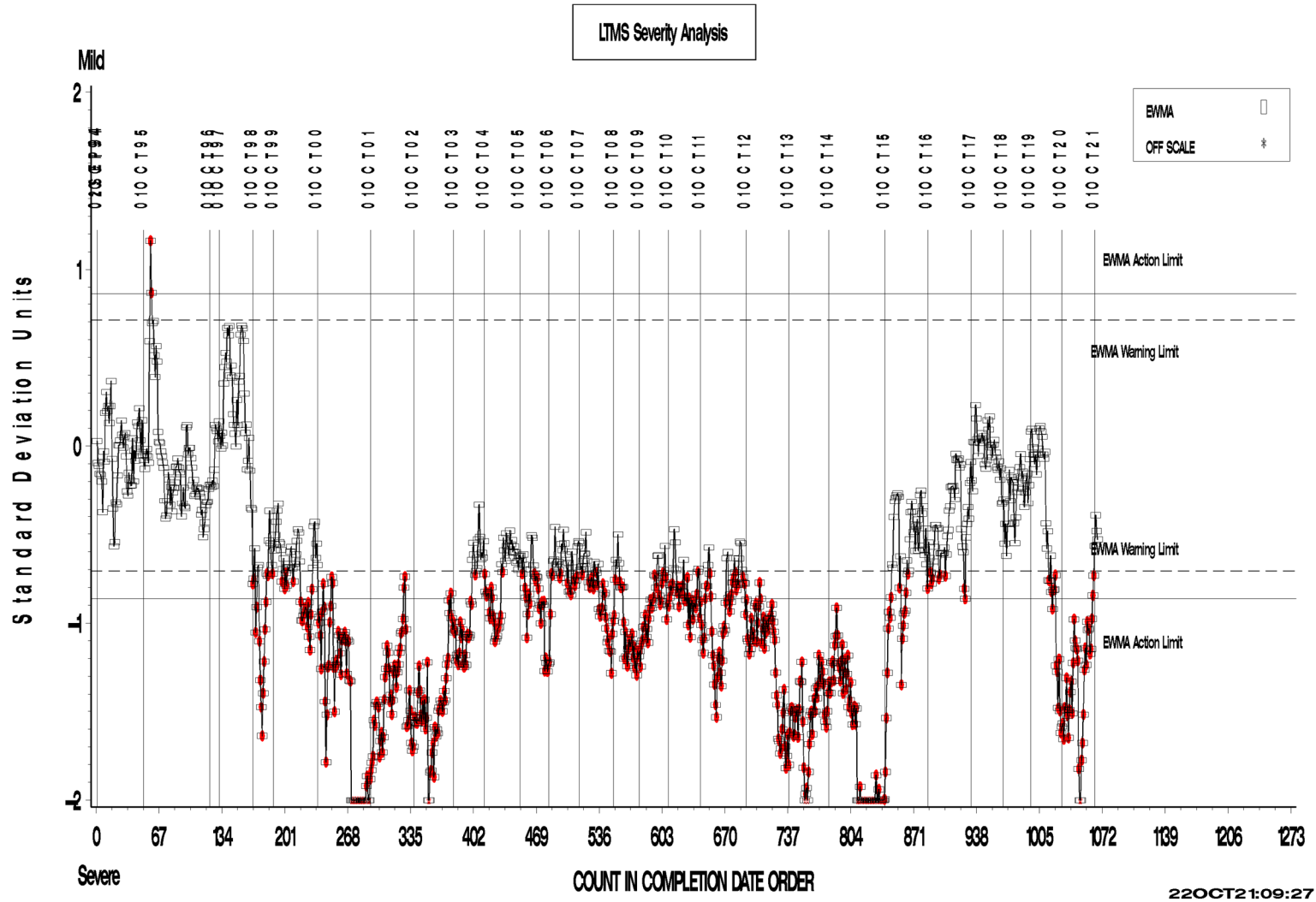
All parameters remained within limits during this period.

Industry control charts follow.

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L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH



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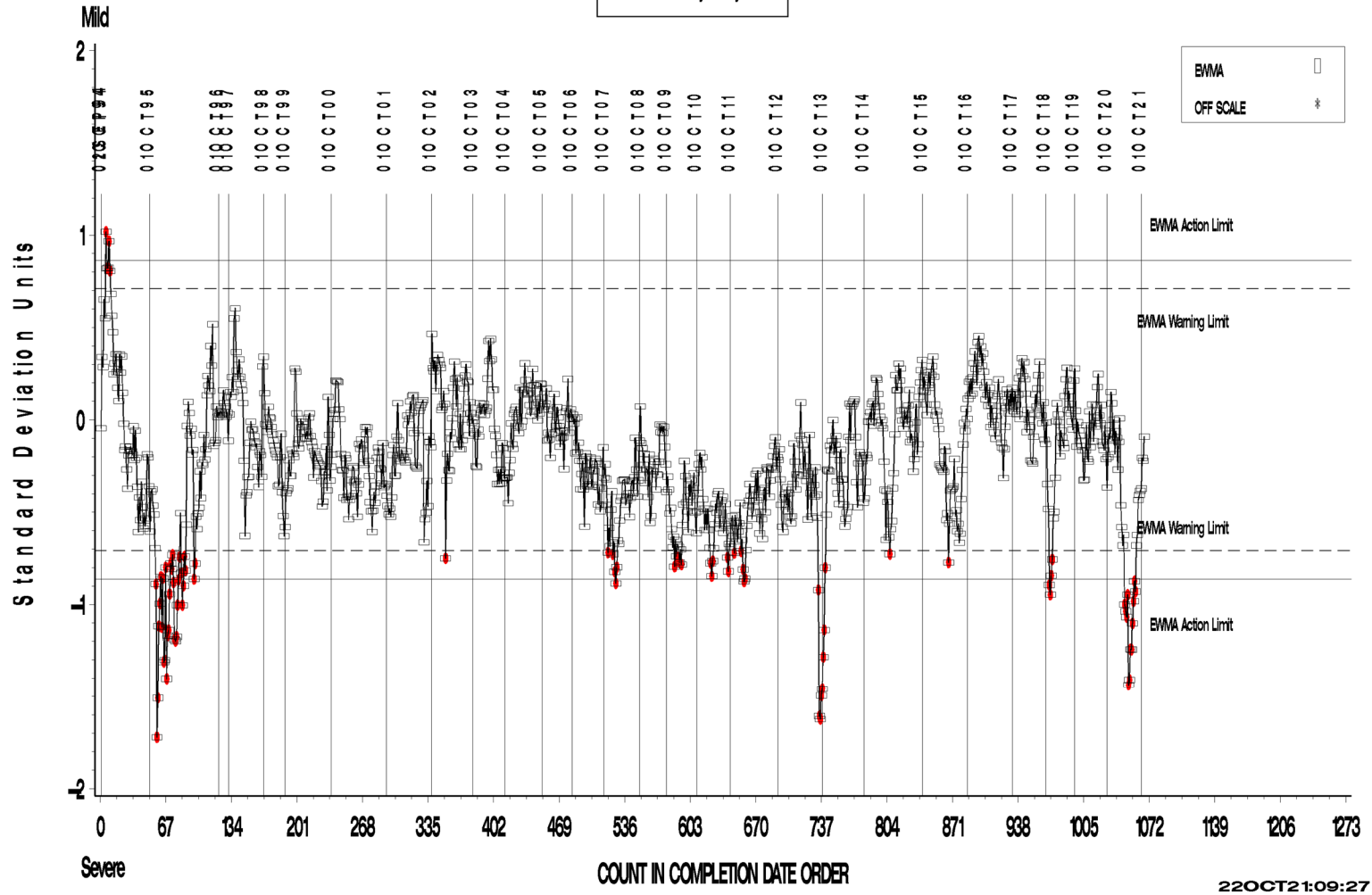
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L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

LTMS Severity Analysis



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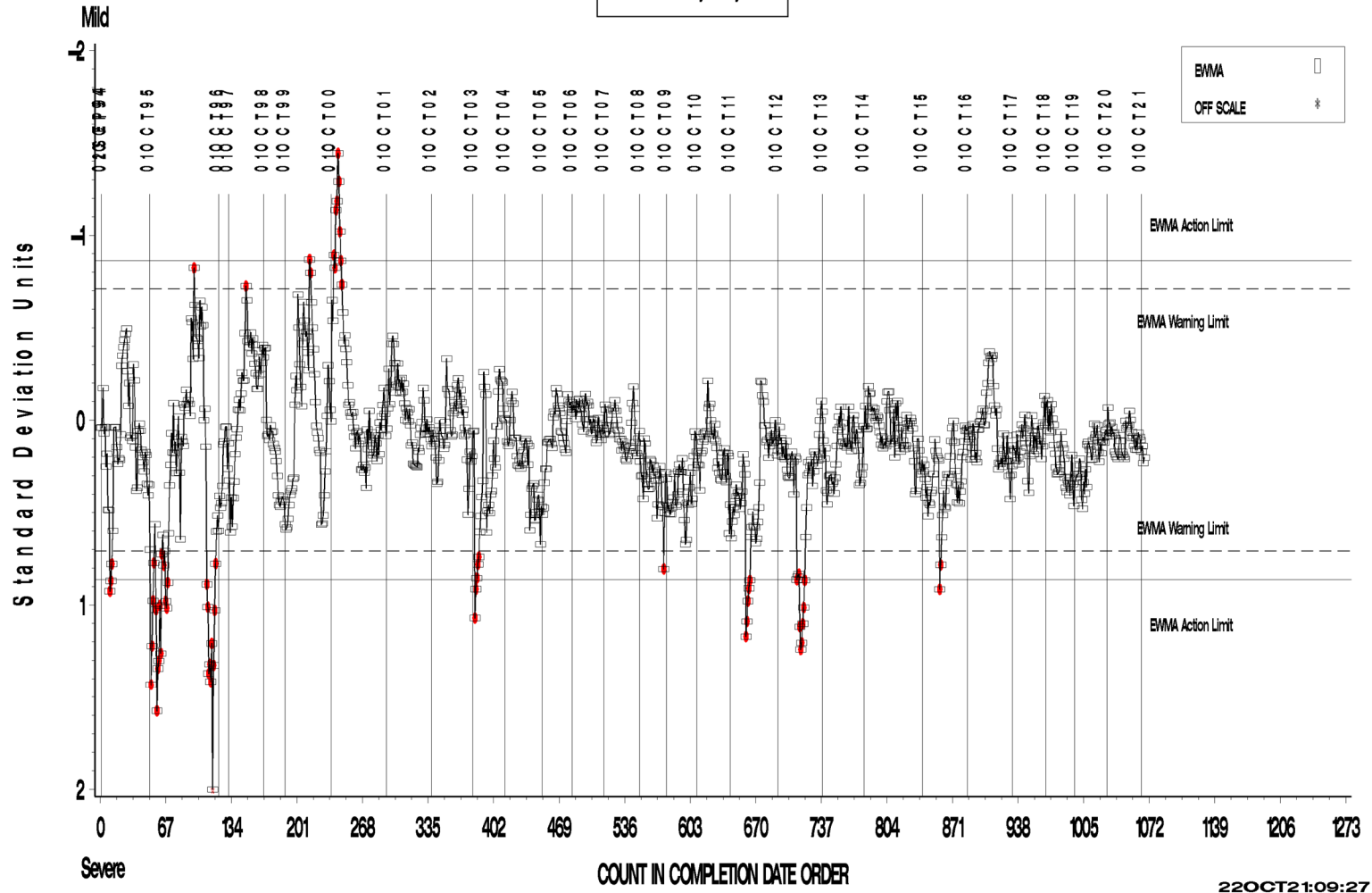
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

LTMS Severity Analysis



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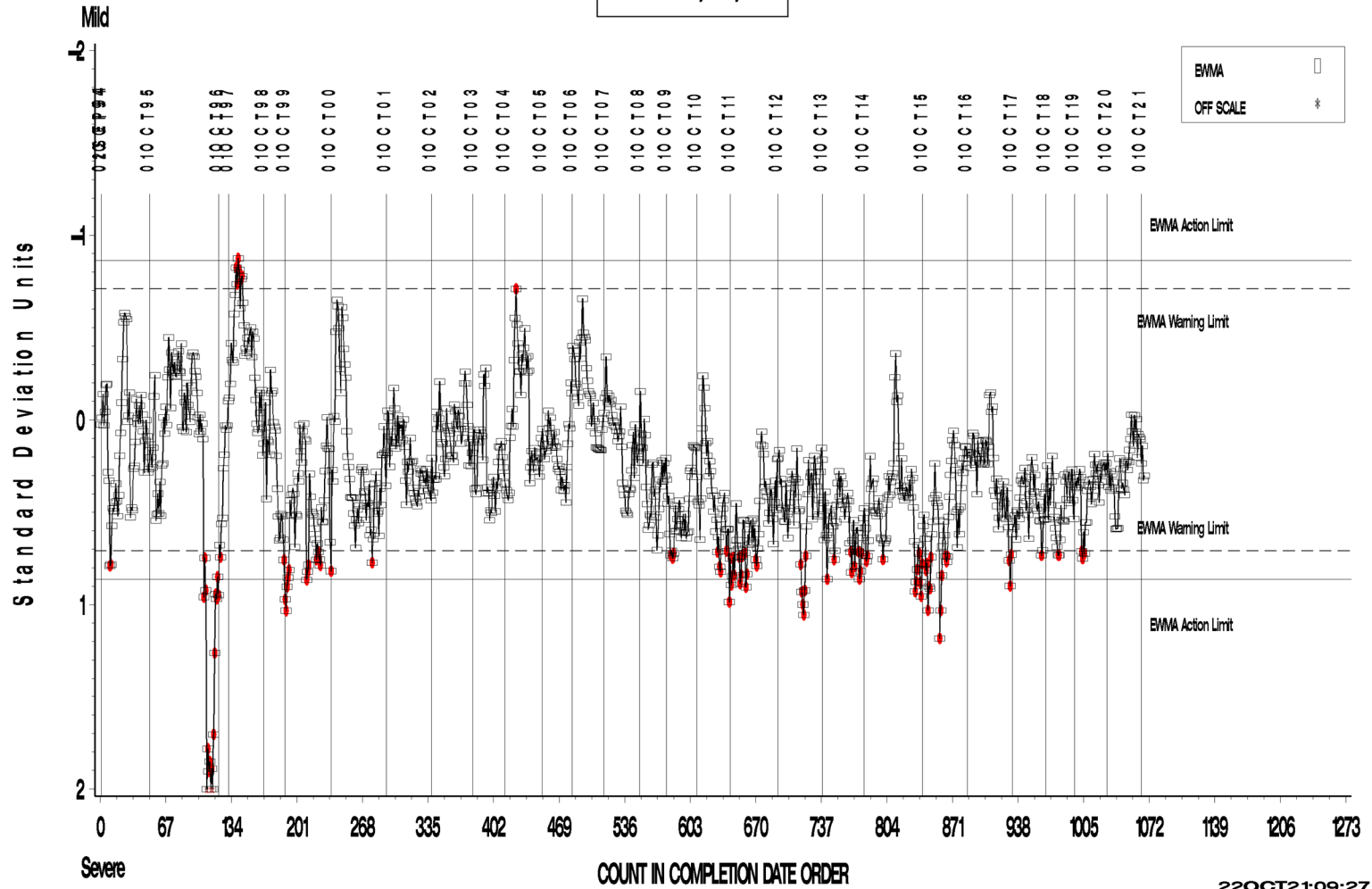
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

LTMS Severity Analysis



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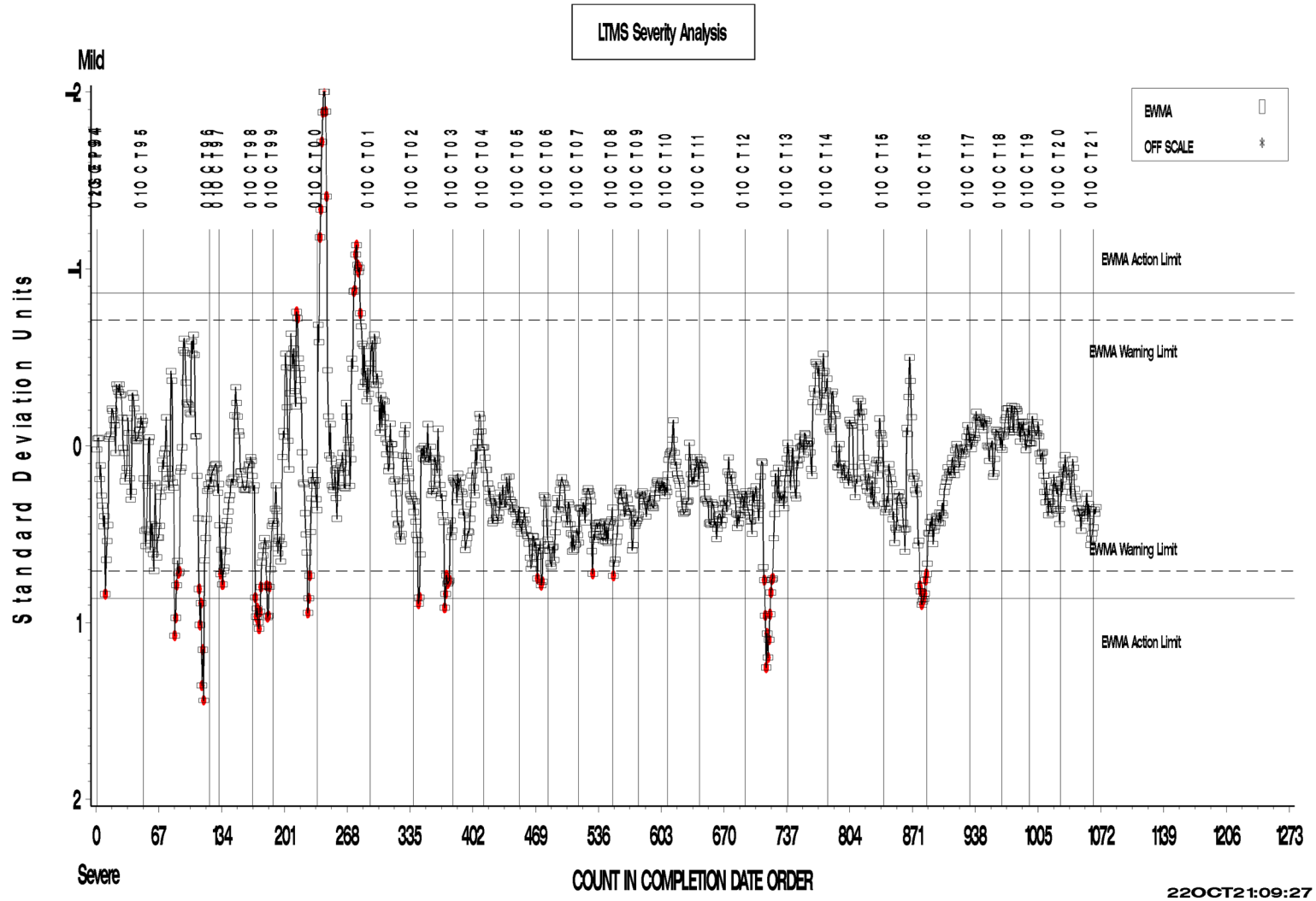
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L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL VISCOSITY INCREASE



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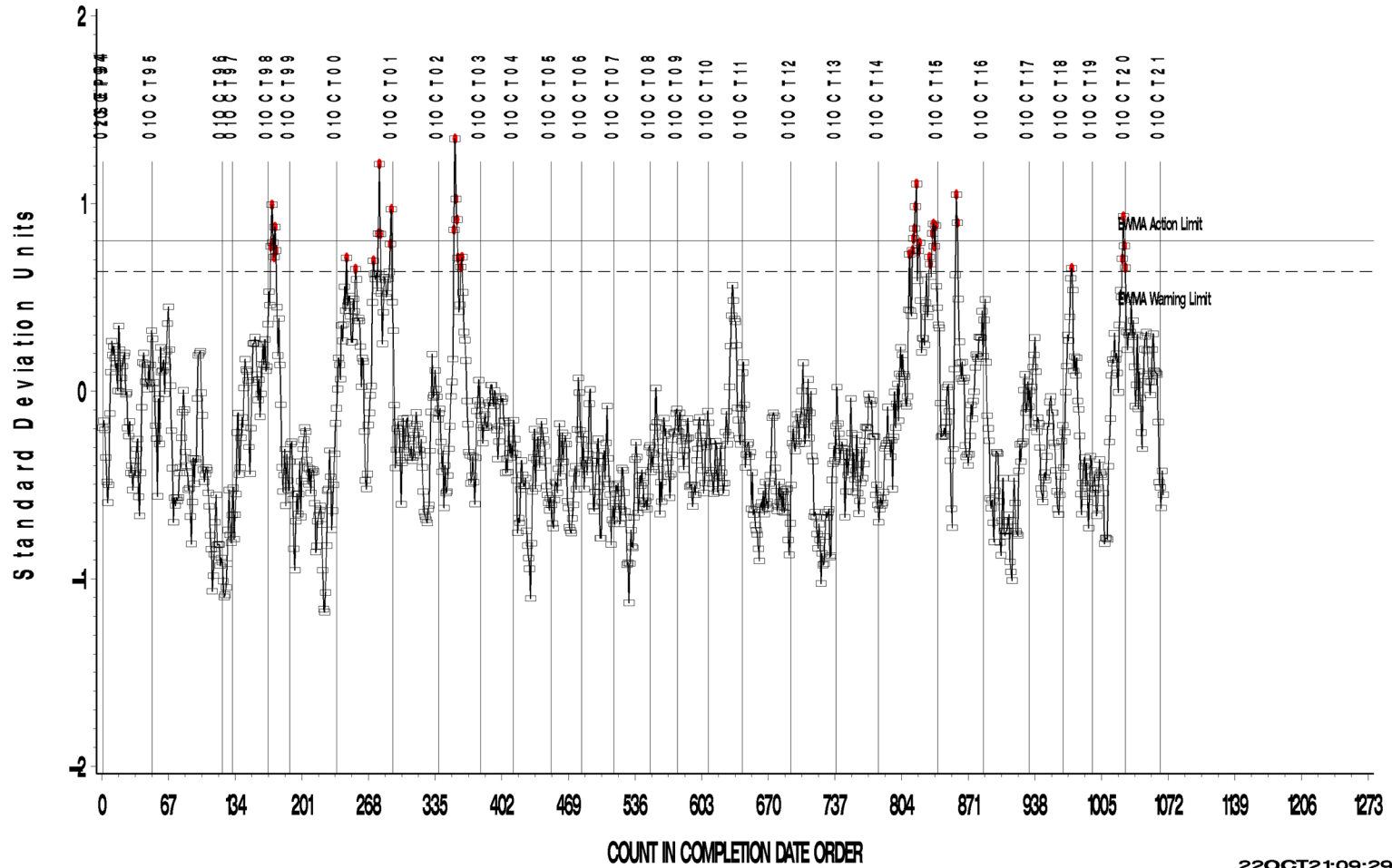
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

LTMS Precision Analysis



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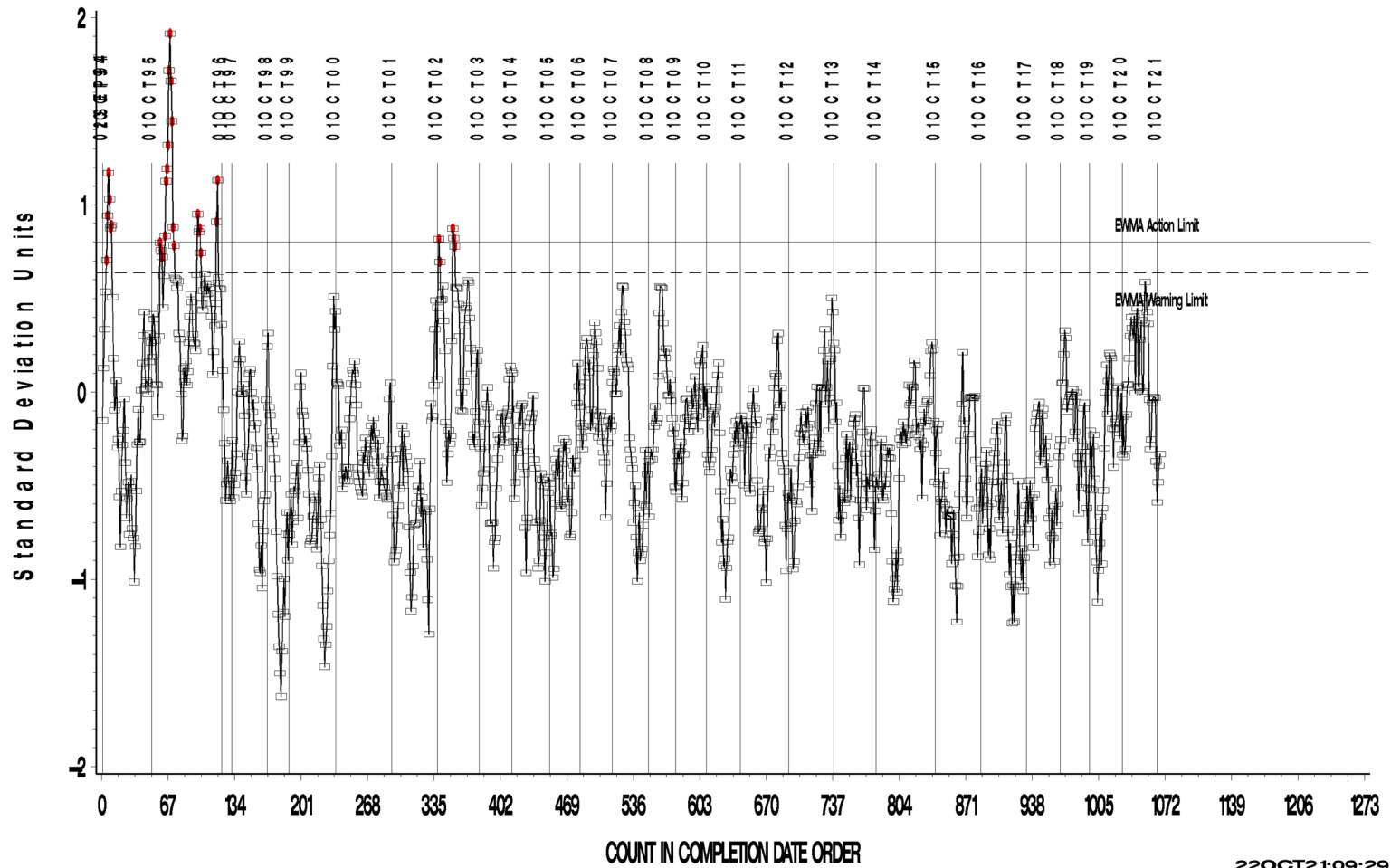
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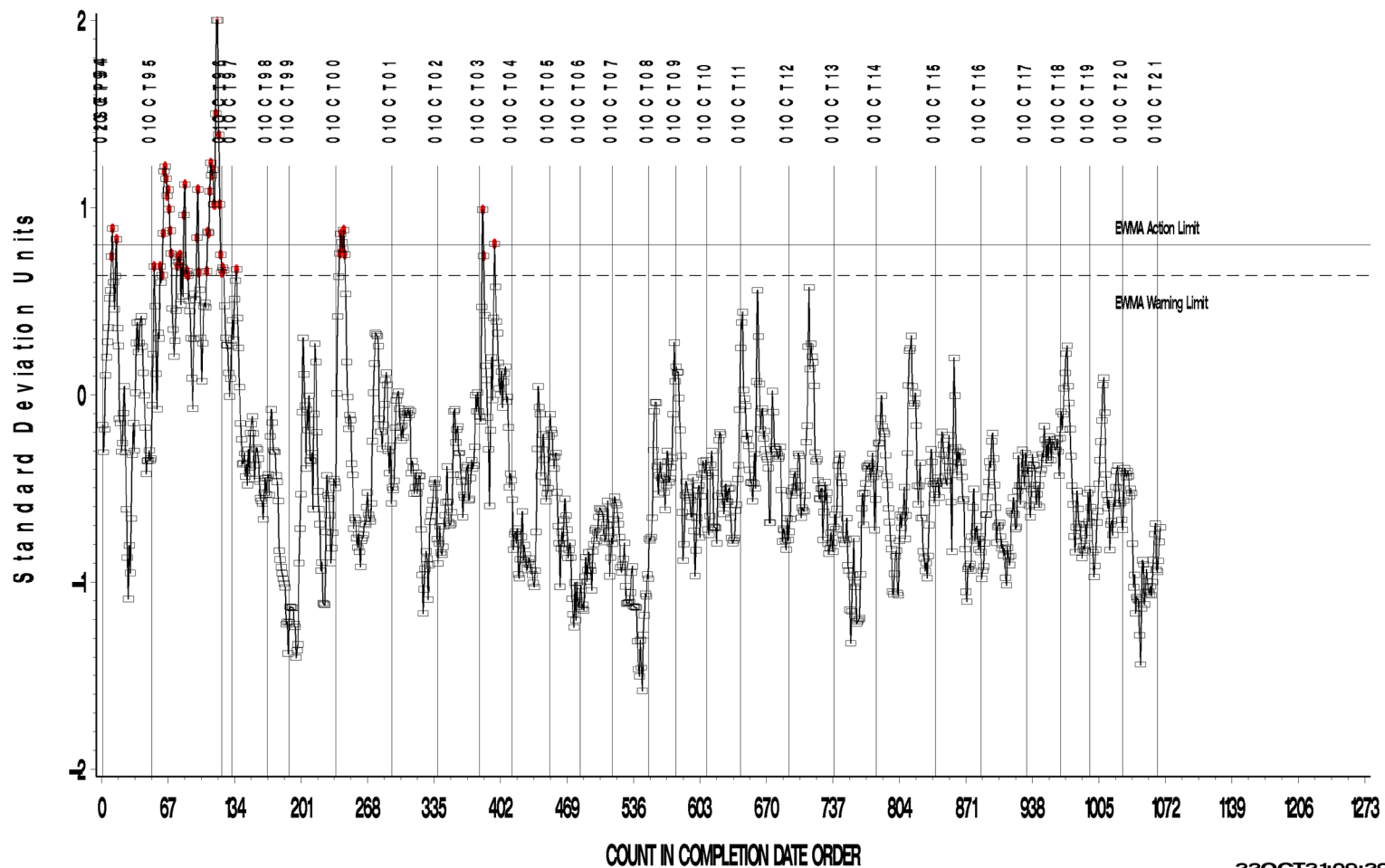
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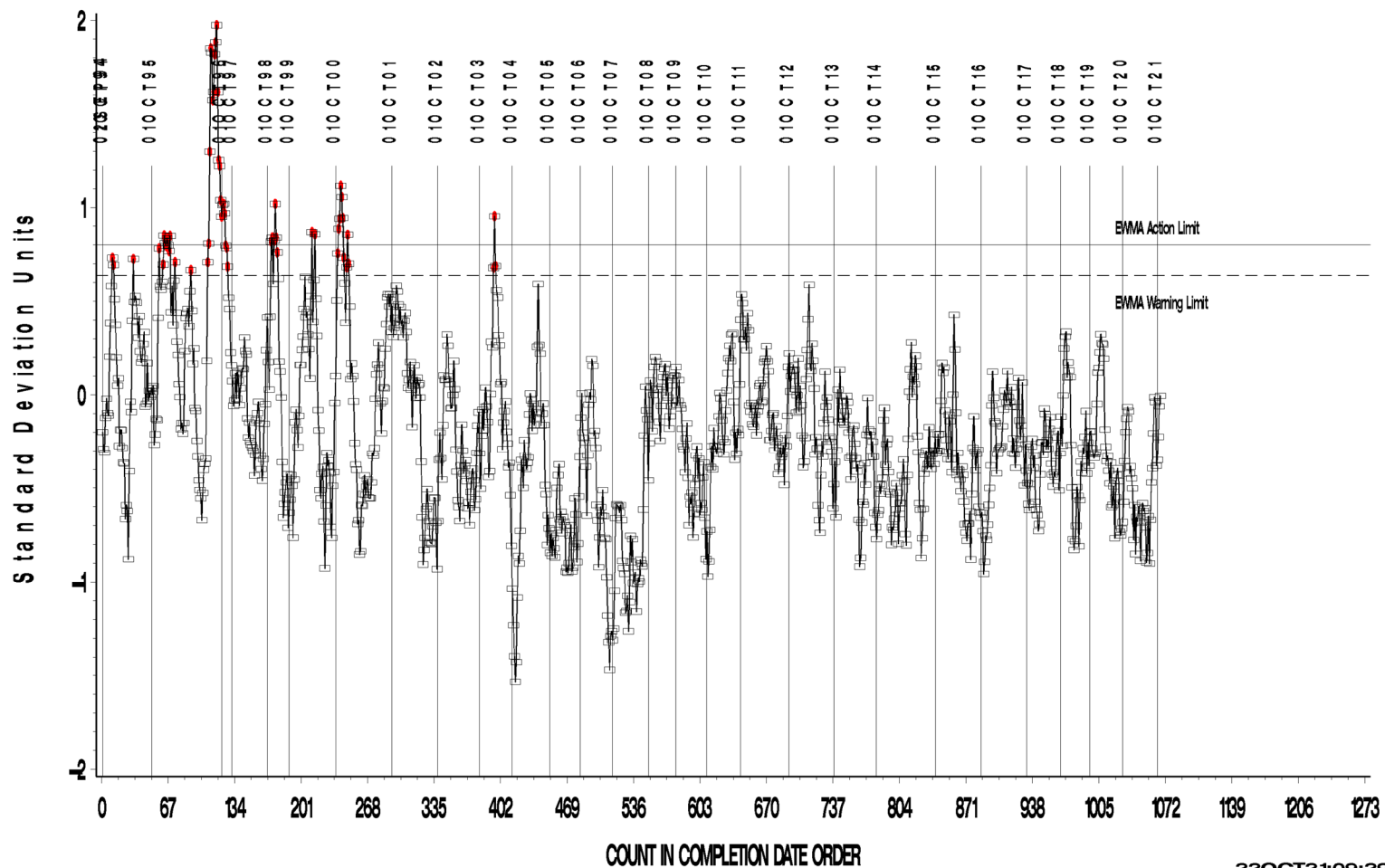
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REF. FINAL TOLUENE INSOLUBLES

LTMS Precision Analysis



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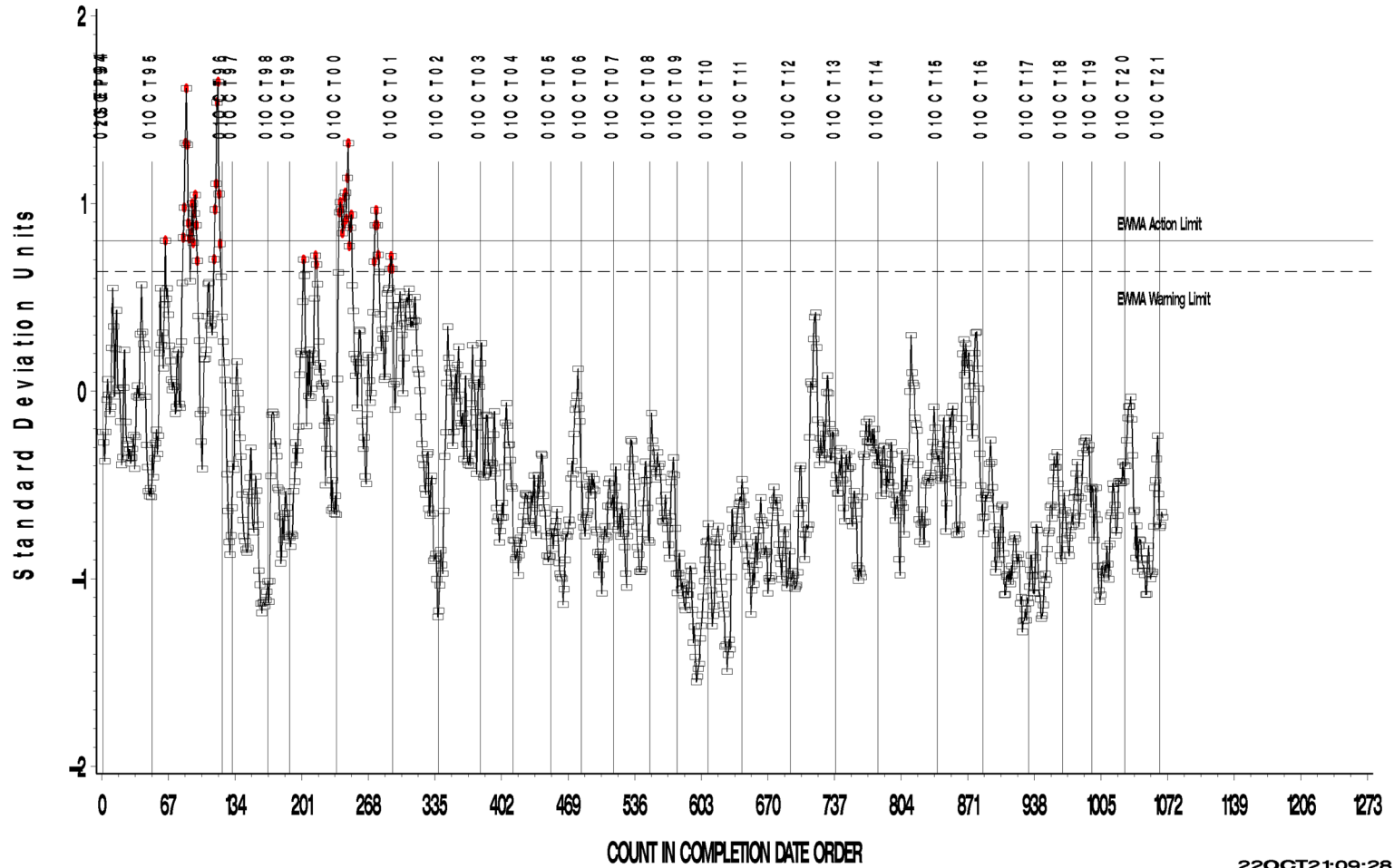
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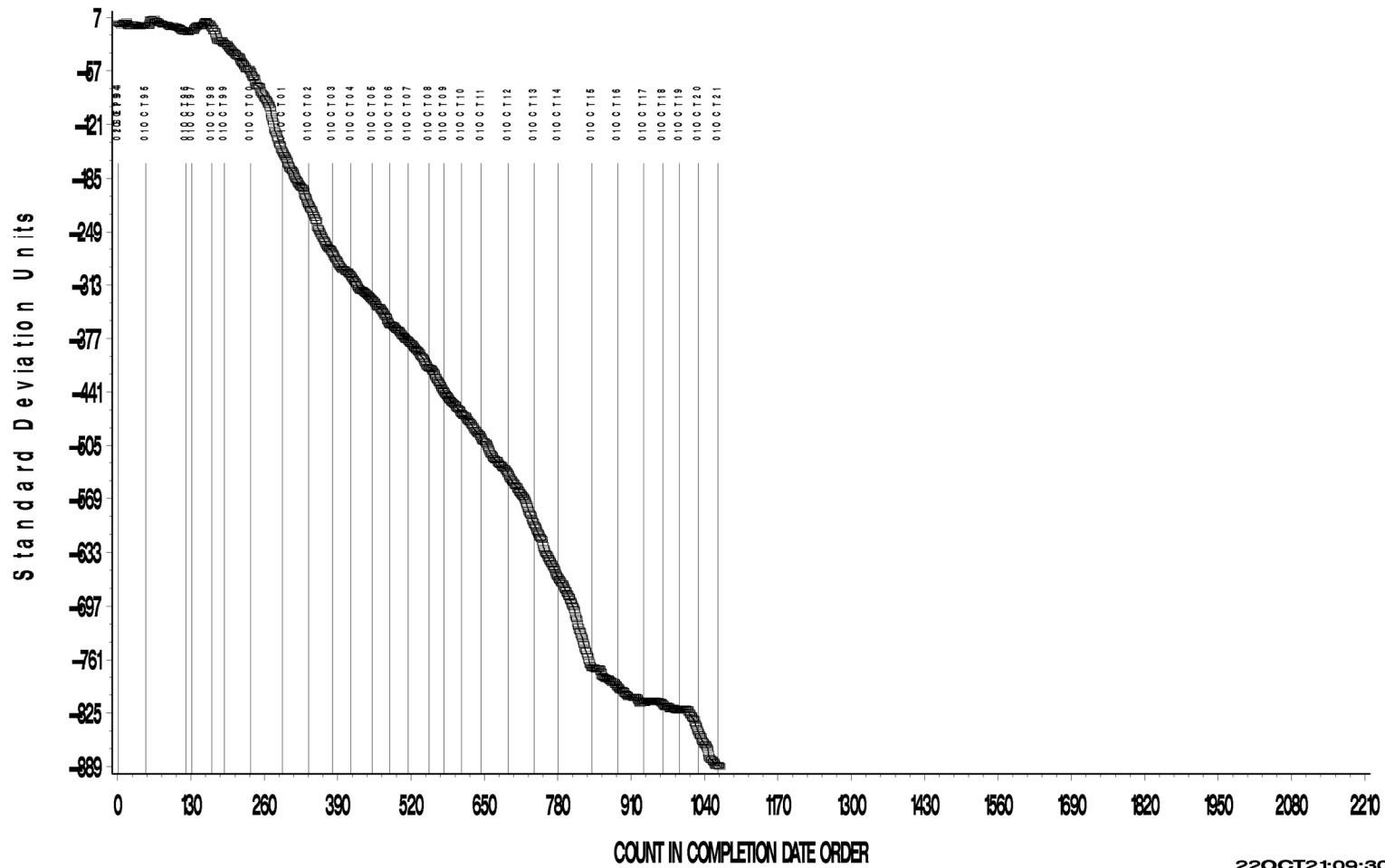
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L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

CUSUM Severity Analysis



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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

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
		No timeline additions during this period.

L-60-1 (D5704)

LAB VISITS

One L-60-1 lab visit was conducted during this period. During the lab visit the lab engineer was asked if reference oil samples were shaken before being poured into the test fixture. It was then pointed out that there is no instruction to shake the reference oils in the test procedure and the only instruction is a “shake well before using” sticker on the bottle. As a result, the TMC proposed to the L-60-1 surveillance panel the addition of a shake before use instruction into the test procedure. This proposal was made during the August SP meeting and will continued to be discussed during the November meeting. The TMC will continue to add the “shake well before using” sticker to all reference oil bottles.

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	30	152	9.5
155-1	31	481	30.1
155-2	9	4112	257.0
Total	70	4745	296.6

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 32.75 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.

(152) tests of oil 148-1 remain in TMC inventory; however, this is only 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.