



Test Monitoring Center

@ Carnegie Mellon University
6555 Penn Avenue, Pittsburgh, PA 15206, USA

<http://astmtmc.cmu.edu>
412-365-1000

MEMORANDUM: 19-042
DATE: October 11, 2019
TO: Kristijan Drlja, Chairman, L-60-1 Surveillance Panel
FROM: Dylan Beck *Dylan Beck*
SUBJECT: L-60-1 Reference Oil Testing from April 1, 2019 through September 30, 2019

Attached is a summary of testing activity this period.

DJB/djb/mem19-042.djb.doc

cc: Frank Farber
Jeff Clark

L-60-1 Surveillance Panel

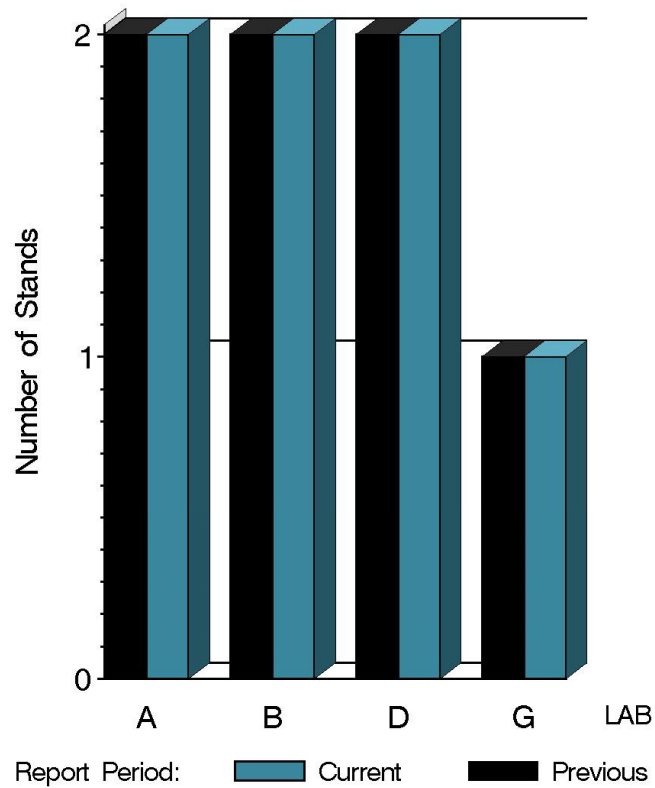
<http://www.astmtmc.cmu.edu/ftp/docs/gear/l601/semiannualreports/l601-10-2019.pdf>

Distribution: email

L-60-1 (D5704)

	Reporting Data	Calibrated on 9-30-19
Number of Labs	4	4
Number of Stands	7	7

BY-LAB STAND
DISTRIBUTION



14:59:59 10OCT2019

L-60-1 (D5704)

Test Distribution by Oil and Validity

				Totals	
		148-1	155-1	Last Period	This Period
Accepted for calibration	AC	6	8	12	14
Rejected (Mild)	OC	0	0	0	0
Rejected (Severe)	OC	0	0	3	0
Rejected (Combination)	OC	0	0	0	0
Rejected (Precision)	OC	0	0	0	0
Invalidated calibration	LC	1	0	0	1
Acceptable info run	NI	0	0	6	0
Aborted info run	XI	0	0	2	0
Aborted	XC	0	0	1	0
Total		7	8	24	15

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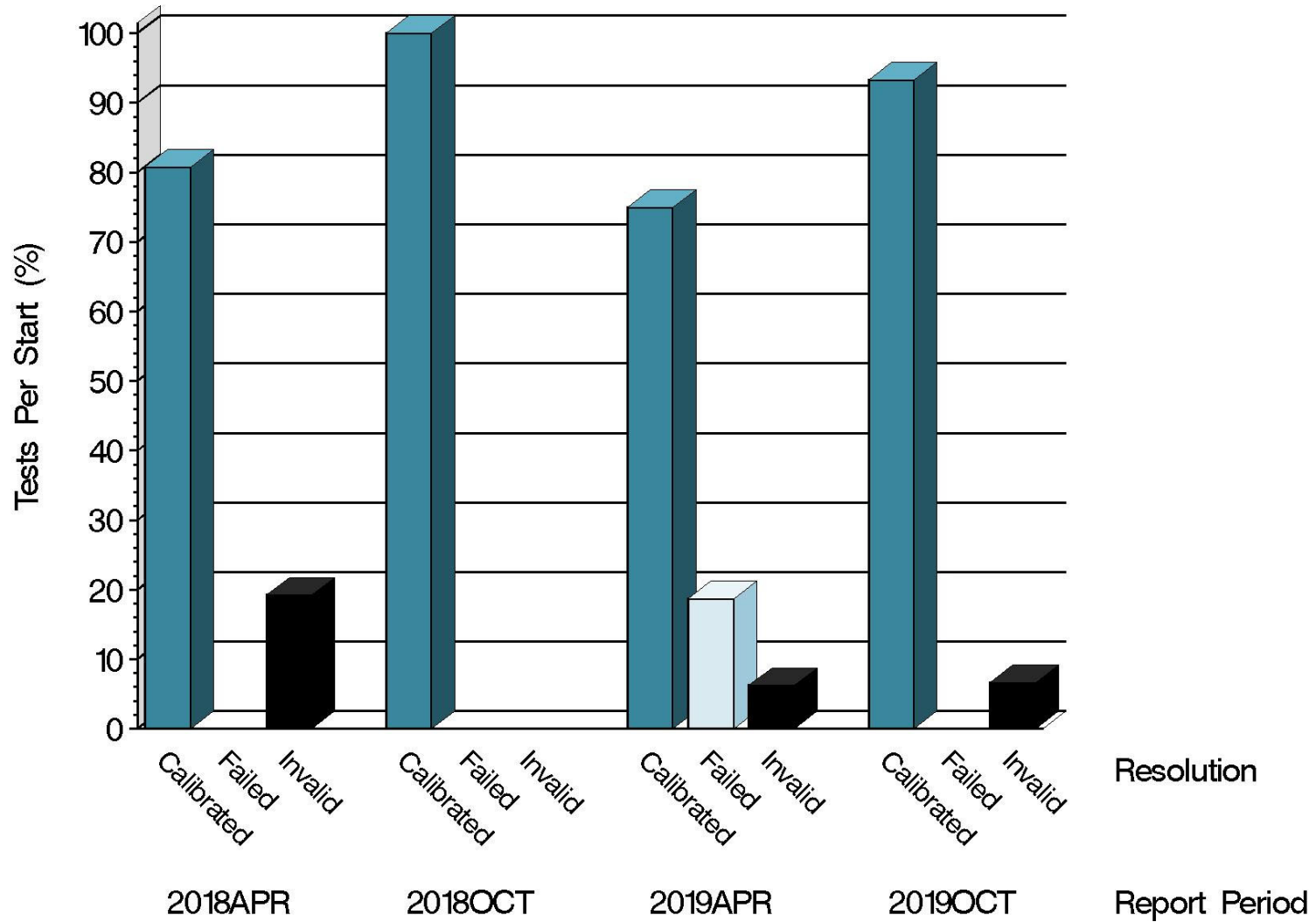
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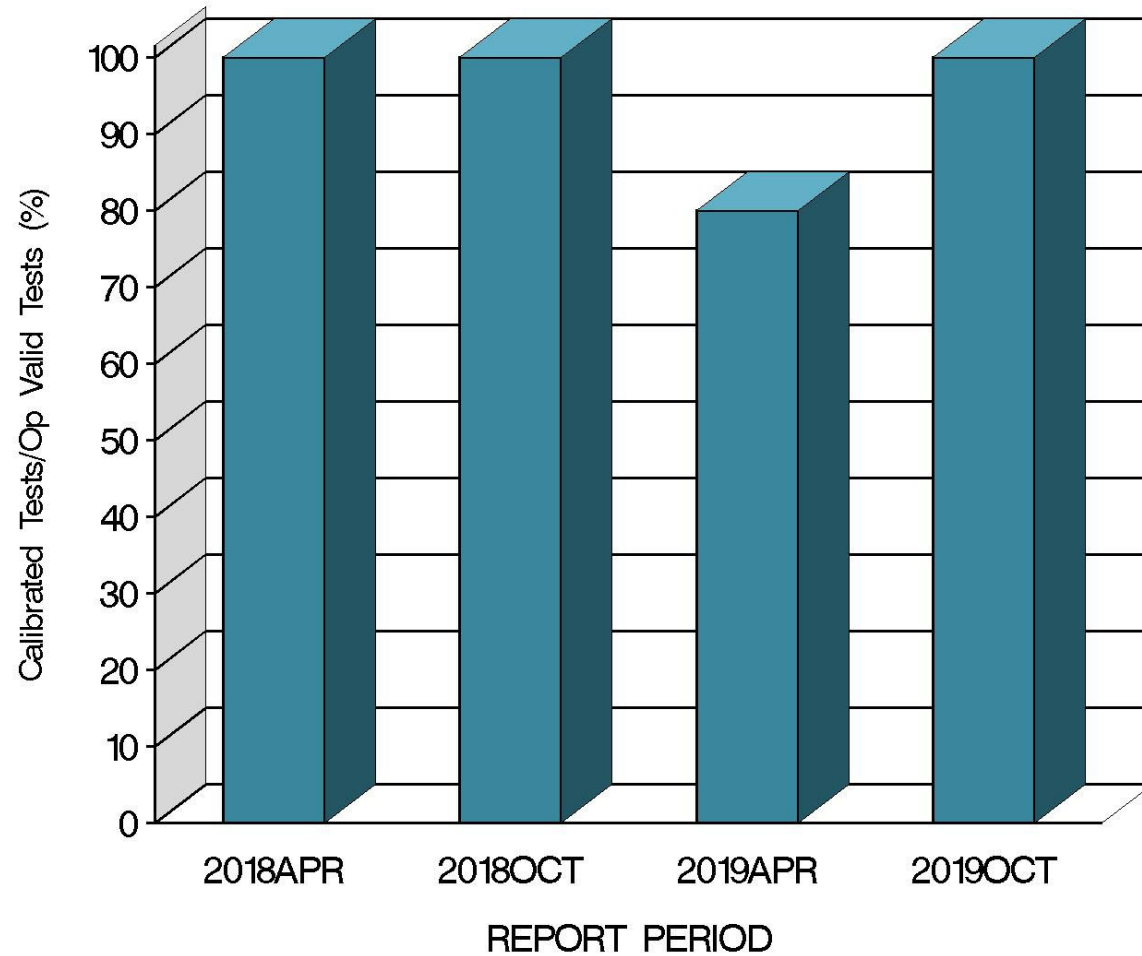
CALIBRATION ATTEMPT SUMMARY



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OPERATIONALLY VALID TESTS
MEETING ACCEPTANCE CRITERIA



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L-60-1 (D5704)

CAUSES FOR LOST TESTS

		Oil		Validity			Loss Rate		
Lab	Cause	148-1	155-1	RC	LC	XC	Lost	Starts	%
G	Oil Leak	●			●		1	15	6.7%
	Lost	1	0	0	1	0			
	Starts	7	8	15	15	15			
	%	14%	0%	0%	6.7%	0%			

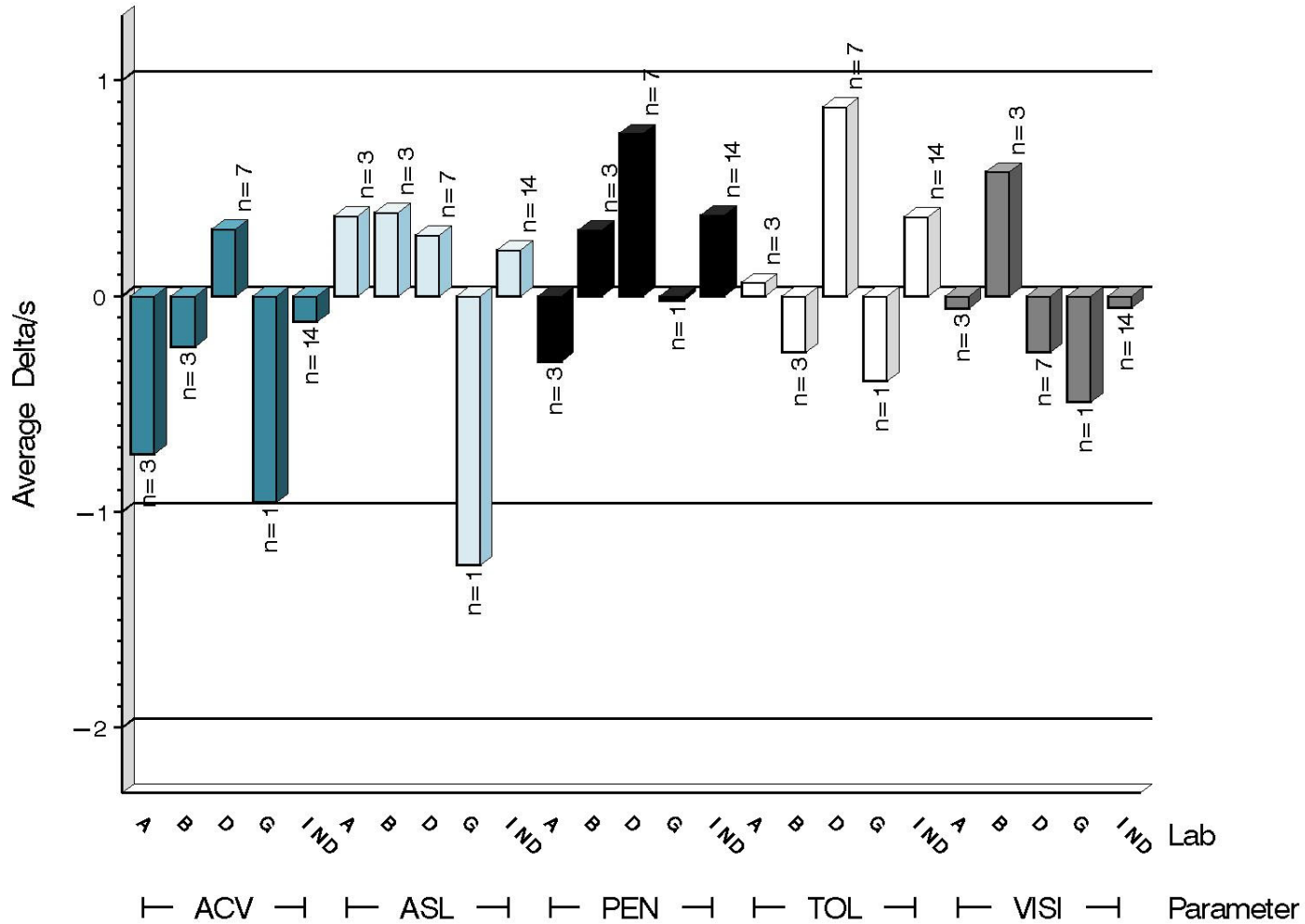
L-60-1 (D5704)

Average Δ /s by Lab						
Lab	n	VISI	PEN	TOL	ACV	ASL
A	3	-0.057	-0.303	0.062	-0.731	0.372
B	3	0.575	0.308	-0.260	-0.234	0.388
D	7	-0.260	0.753	0.877	0.312	0.283
G	1	-0.491	-0.021	-0.394	-0.956	-1.247
Industry	14	-0.054	0.376	0.368	-0.119	0.215
Shift*	14	-0.415%	0.155%	0.092 %	-0.061 merit	0.023 merit

*computed using severity adjustment standard deviation.

L-60-1 (D5704)

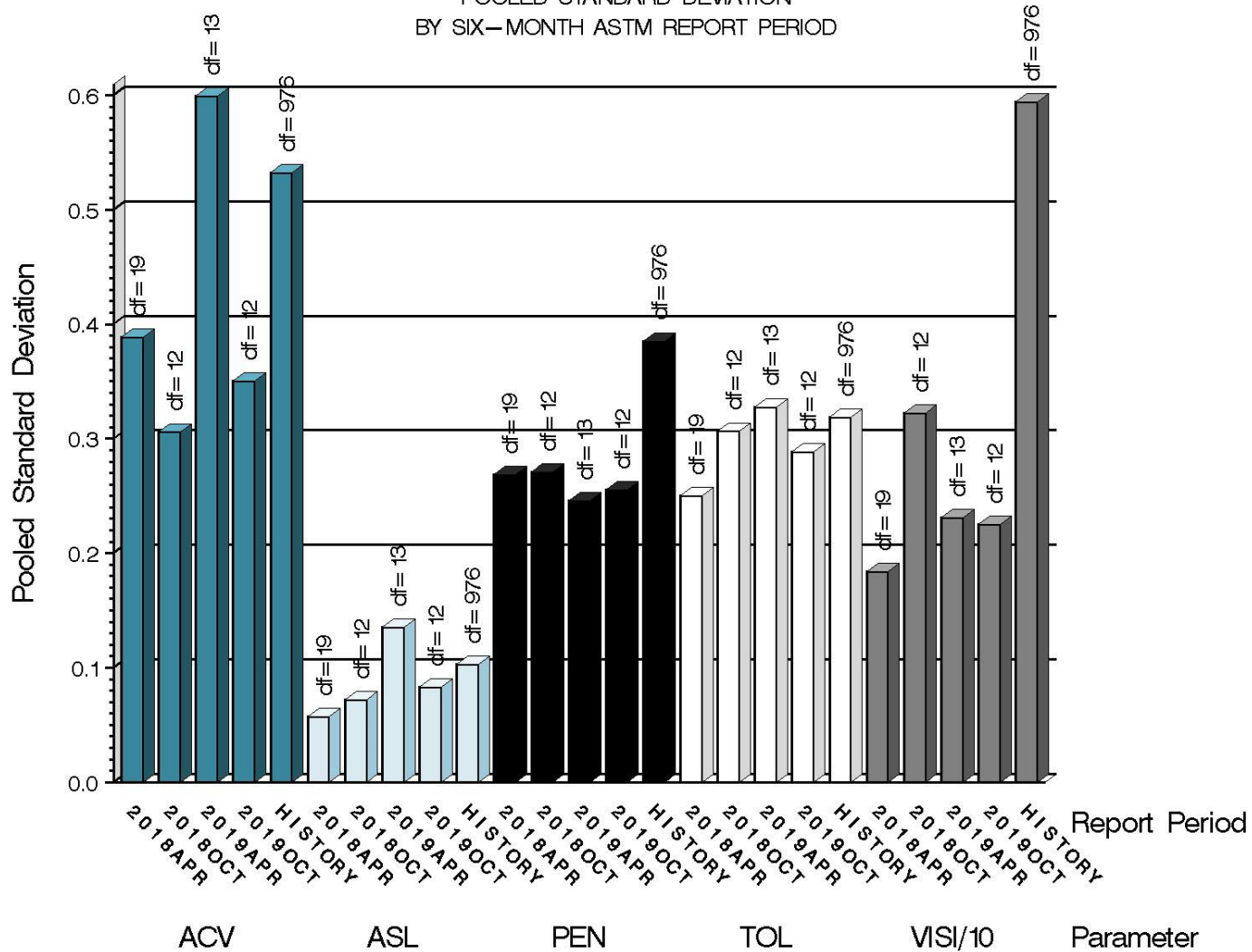
TEST SEVERITY
DELTA/S BY LAB



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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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L-60-1 (D5704)

SUMMARY OF SEVERITY & PRECISION

Severity

All parameters have remained within limits this period.

Precision

Precision for all parameters remained within limits this period.

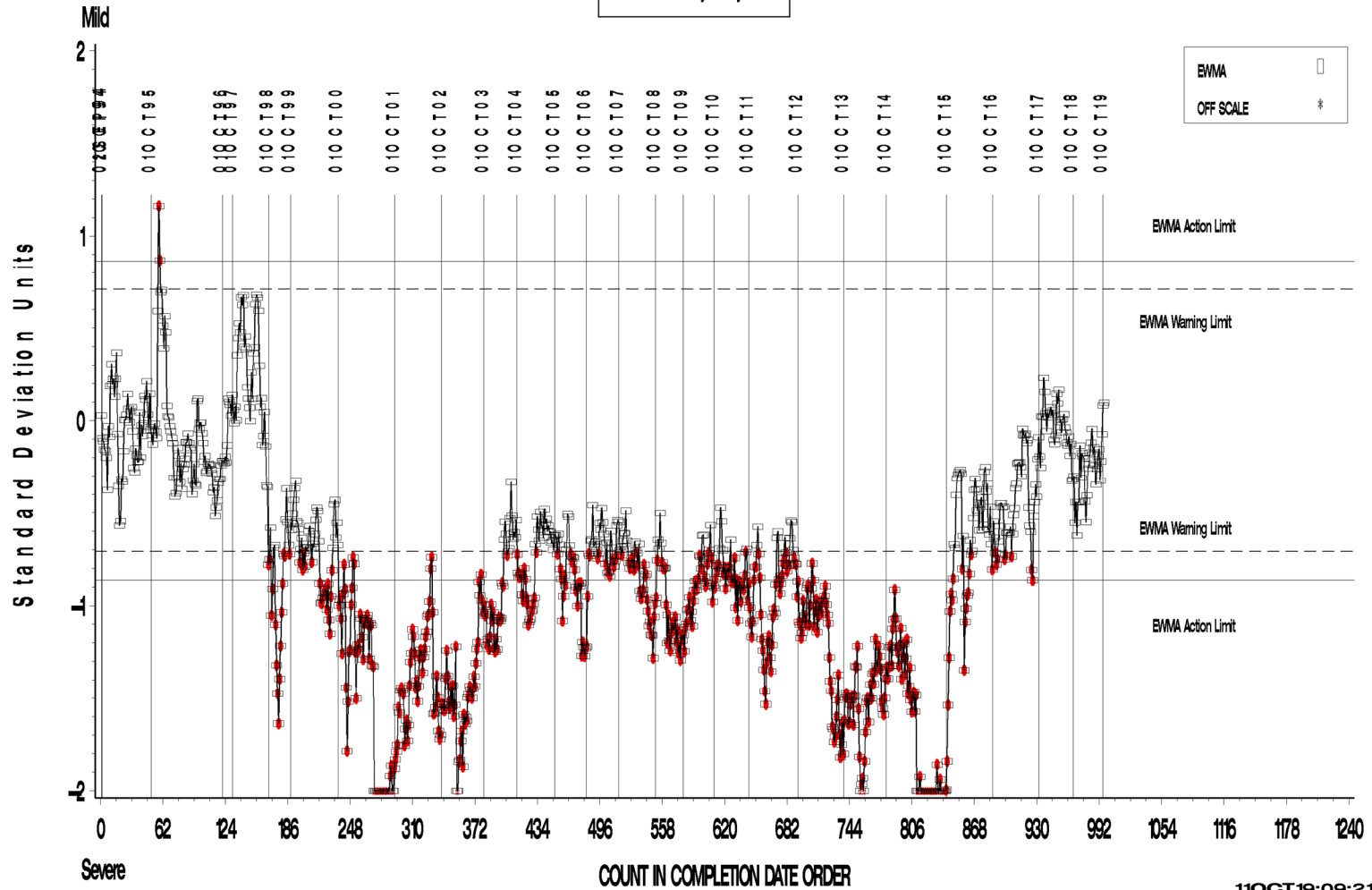
Industry control charts follow.

L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

LTMS Severity Analysis



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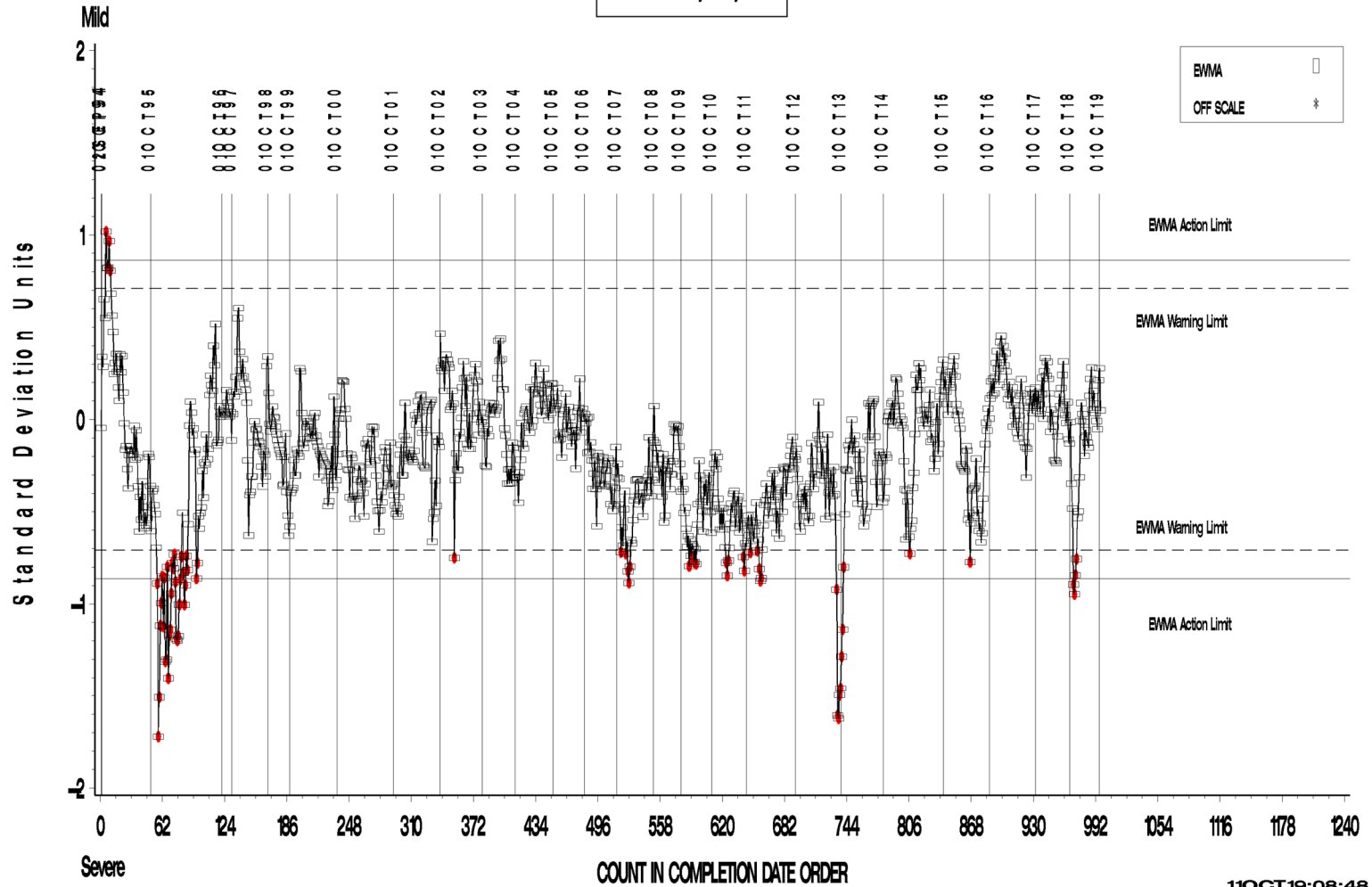
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L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

LTMS Severity Analysis



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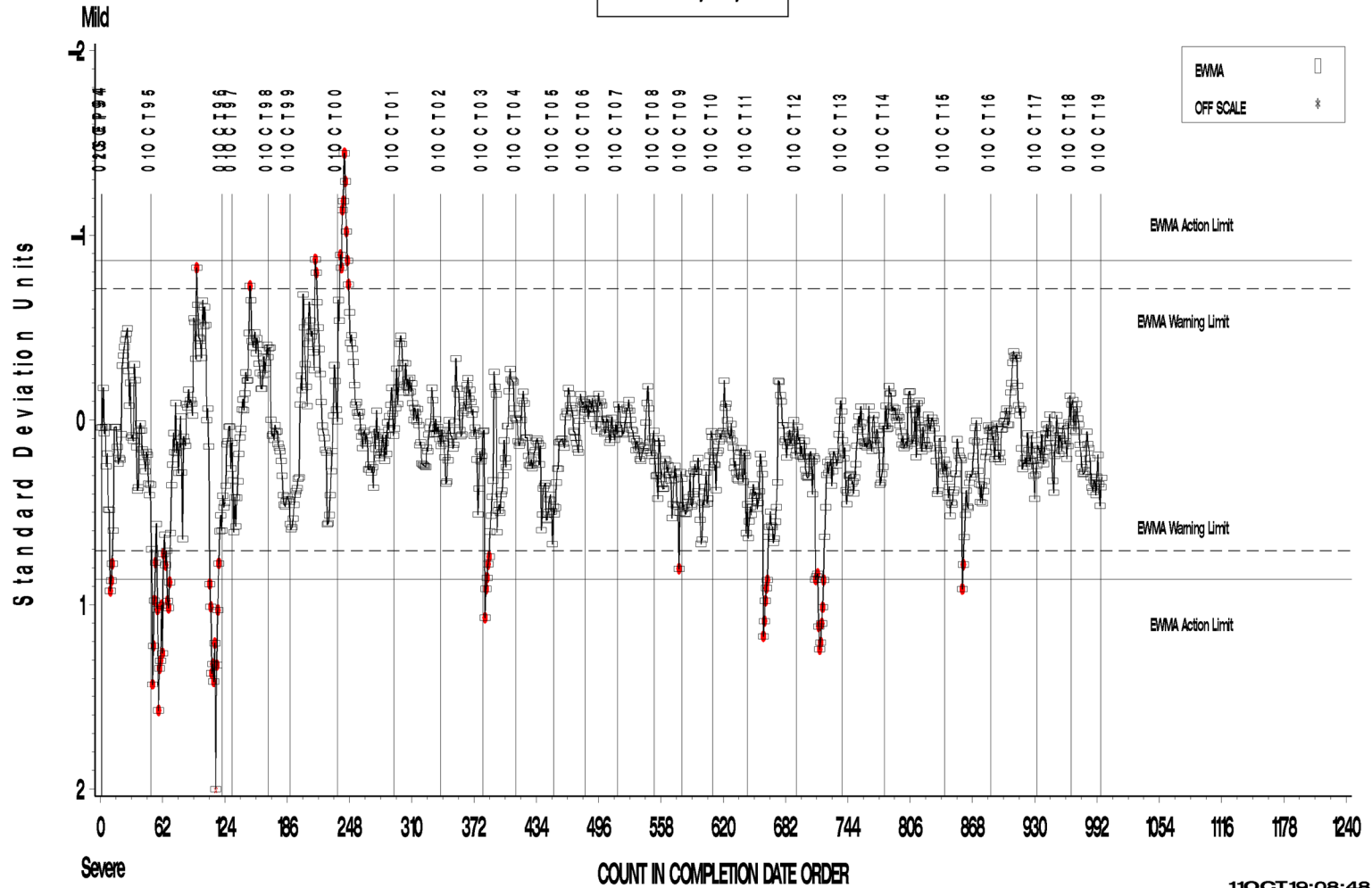
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

LTMS Severity Analysis



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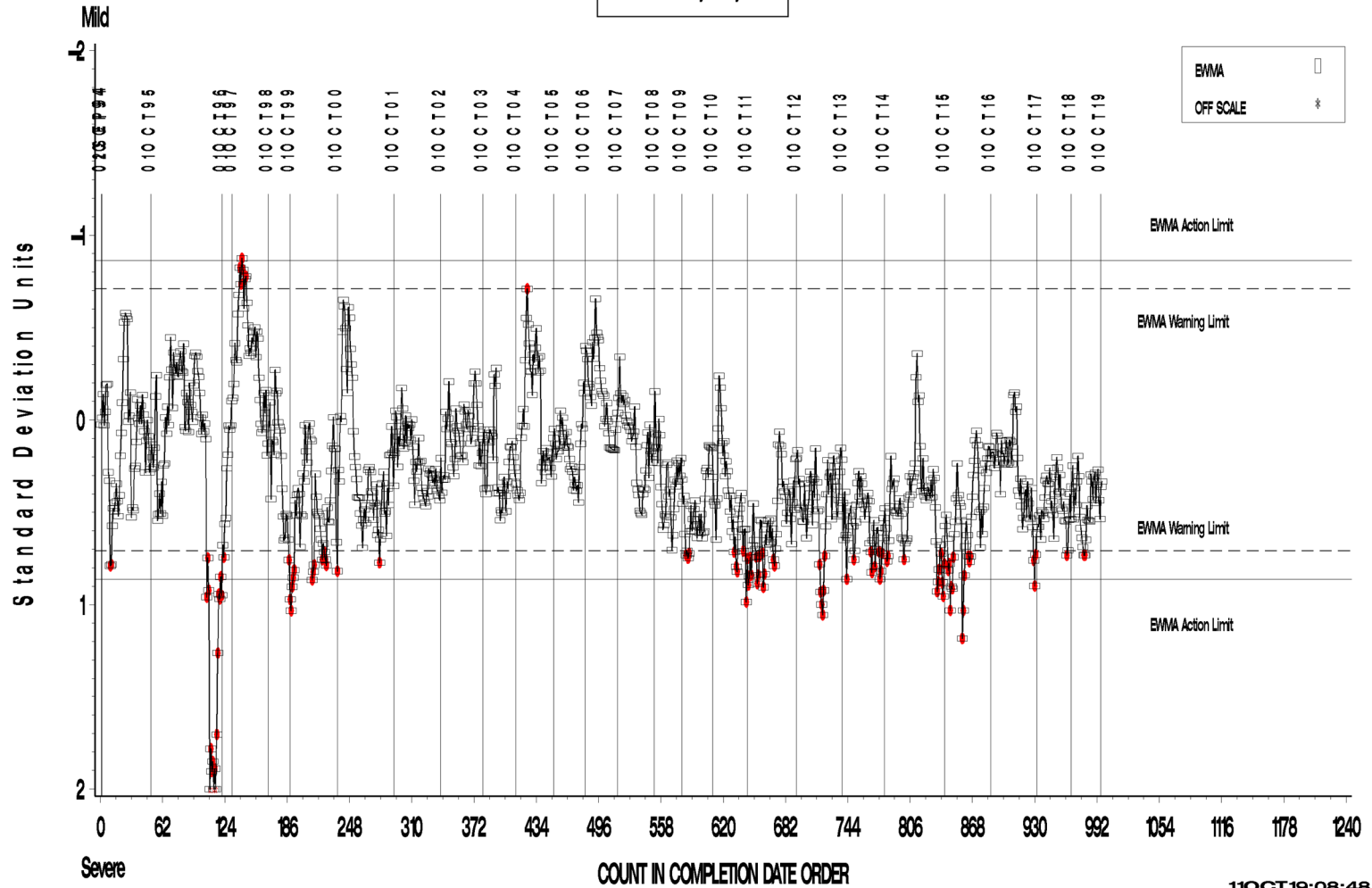
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L-60-1 (D5704)

L-60 → INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

LTMS Severity Analysis



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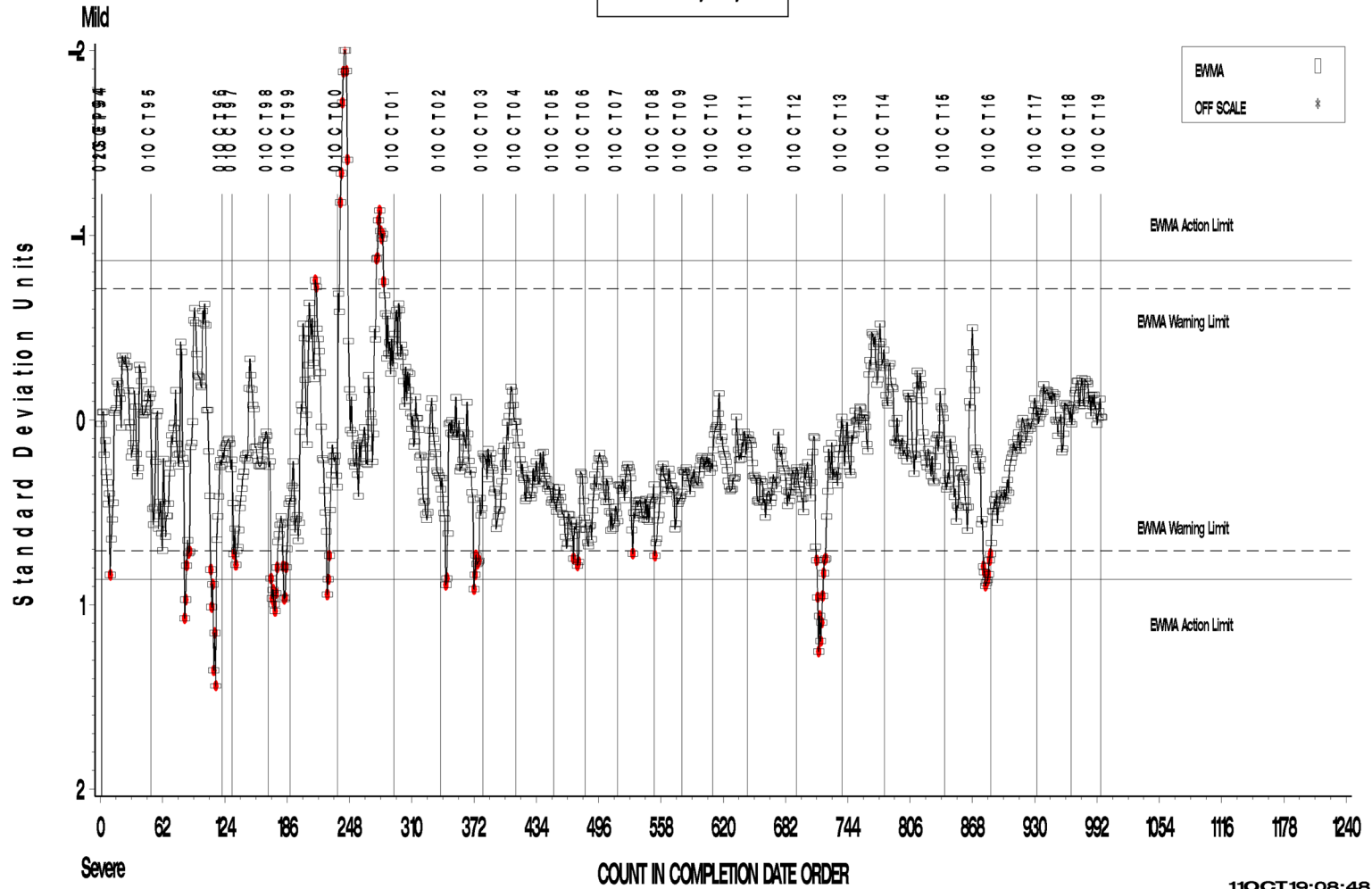
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L-60 → INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL VISCOSITY INCREASE

LTMS Severity Analysis



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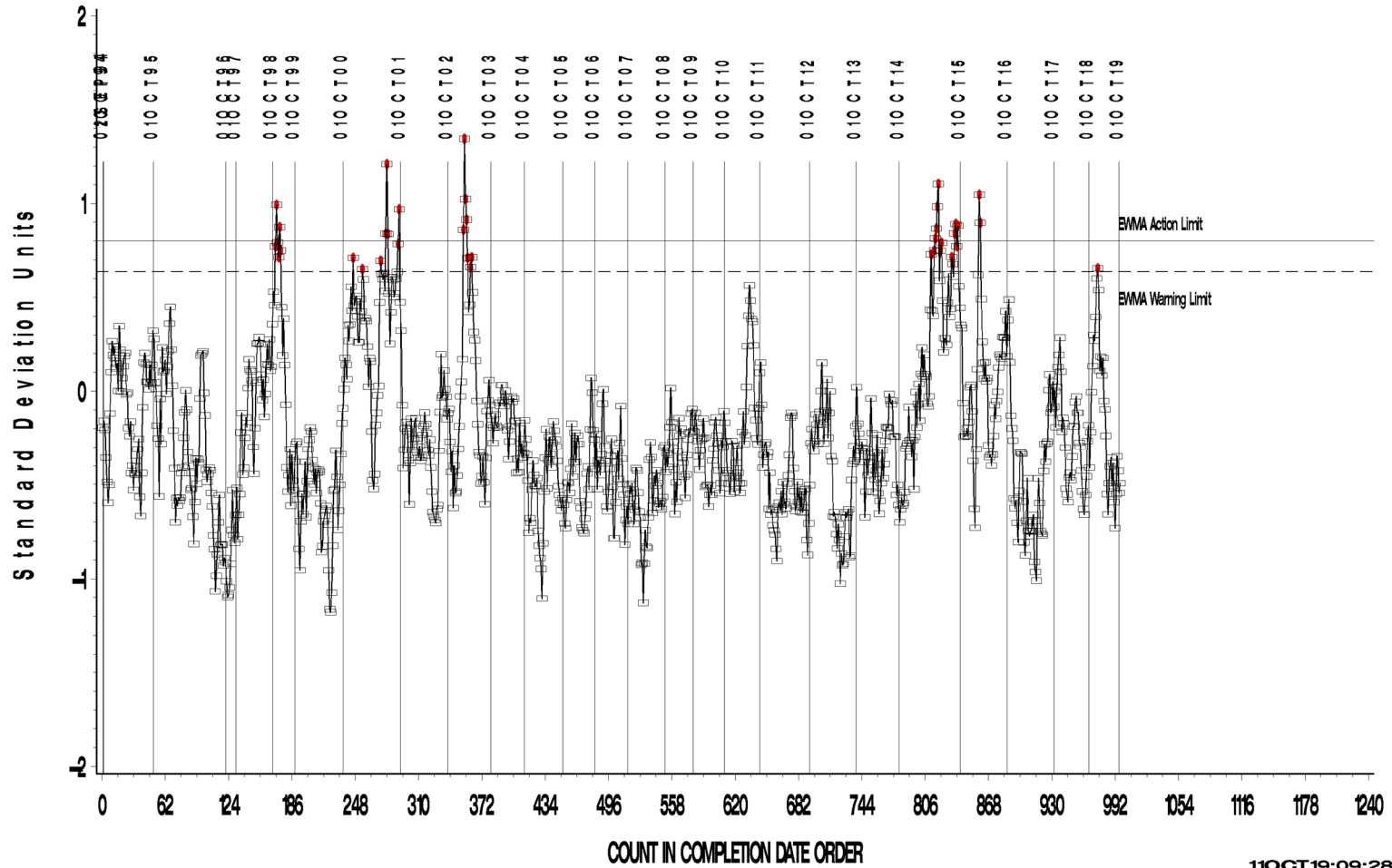
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

LTMS Precision Analysis



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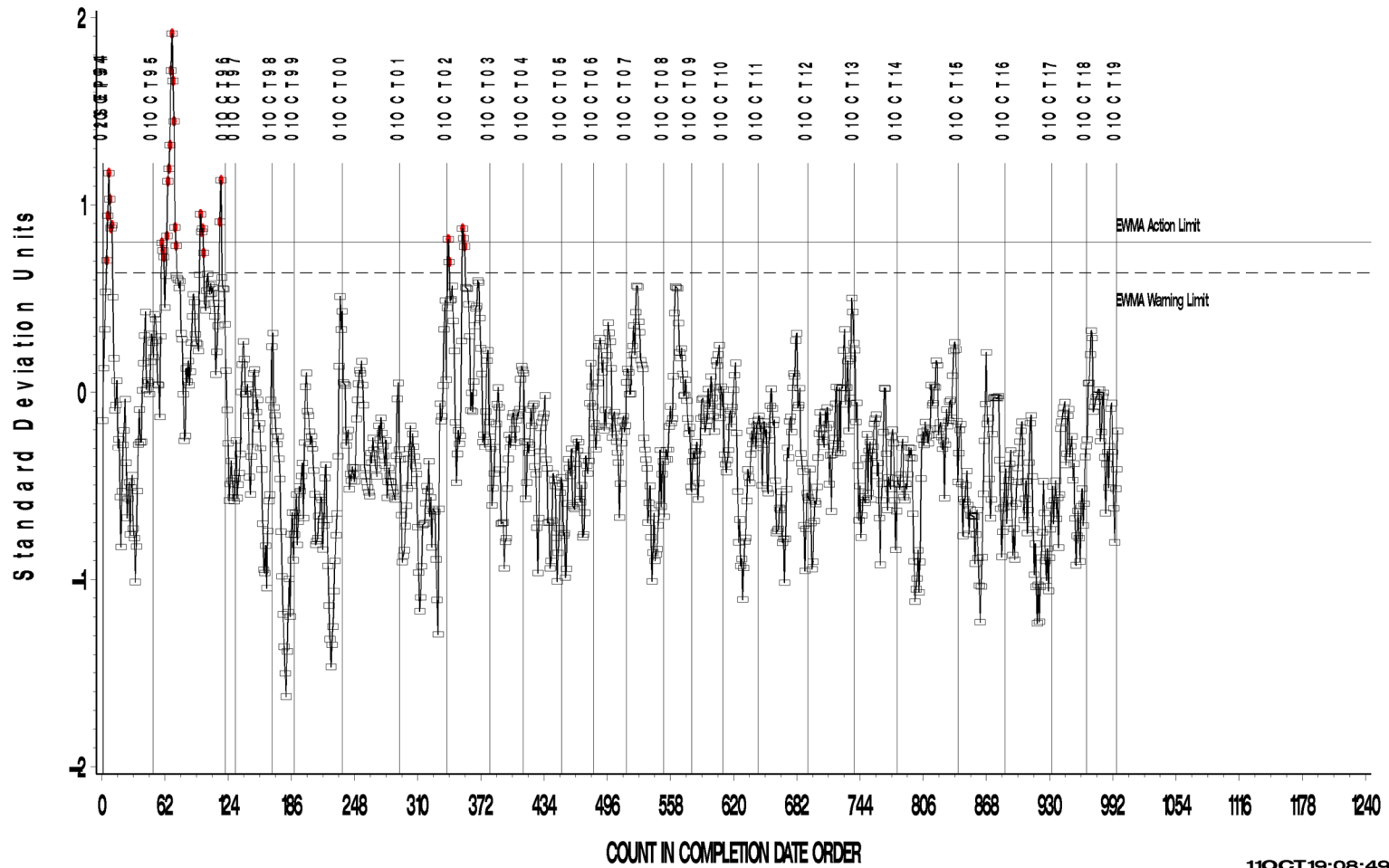
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L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

LTMS Precision Analysis



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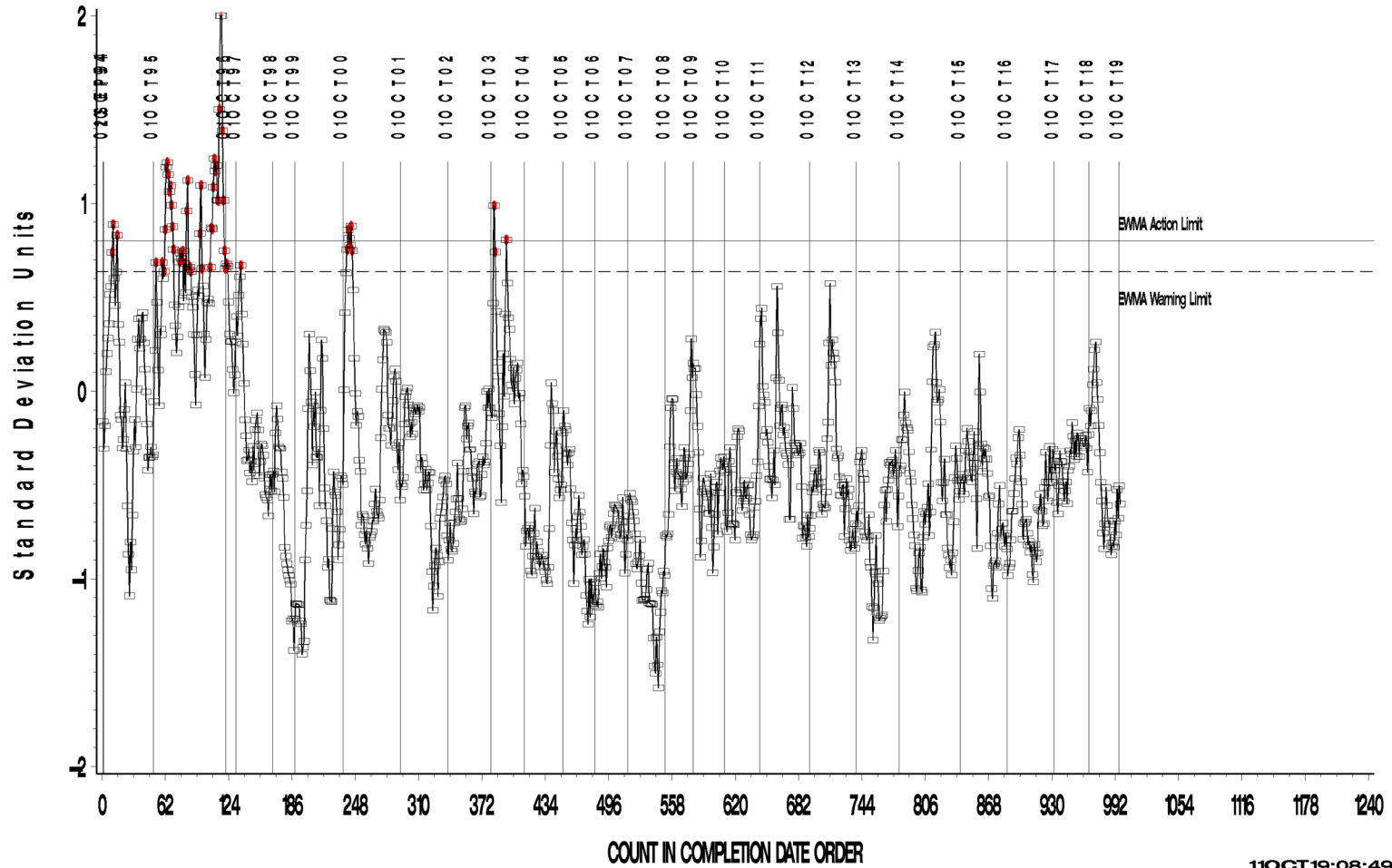
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

LTMS Precision Analysis



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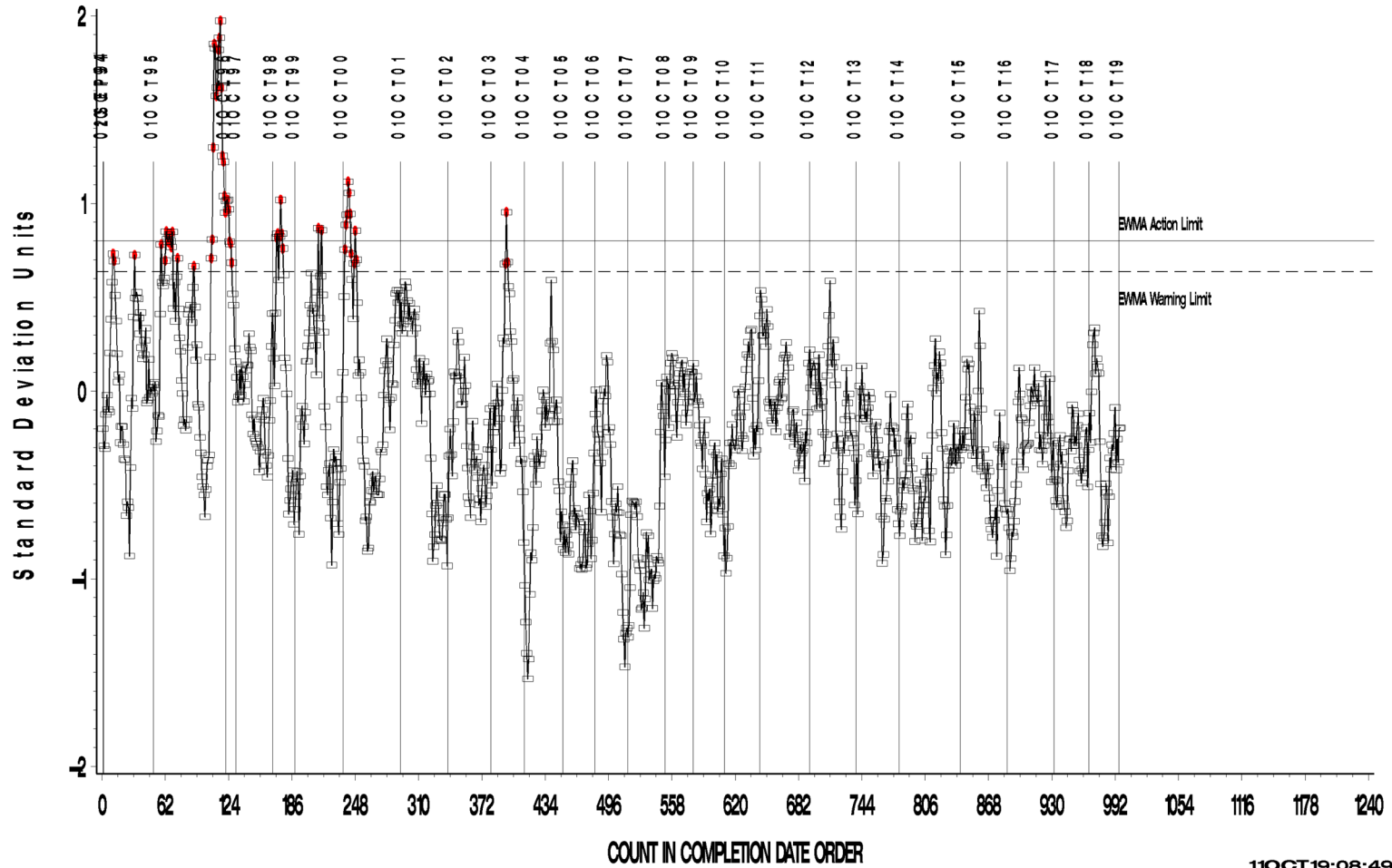
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

LTMS Precision Analysis



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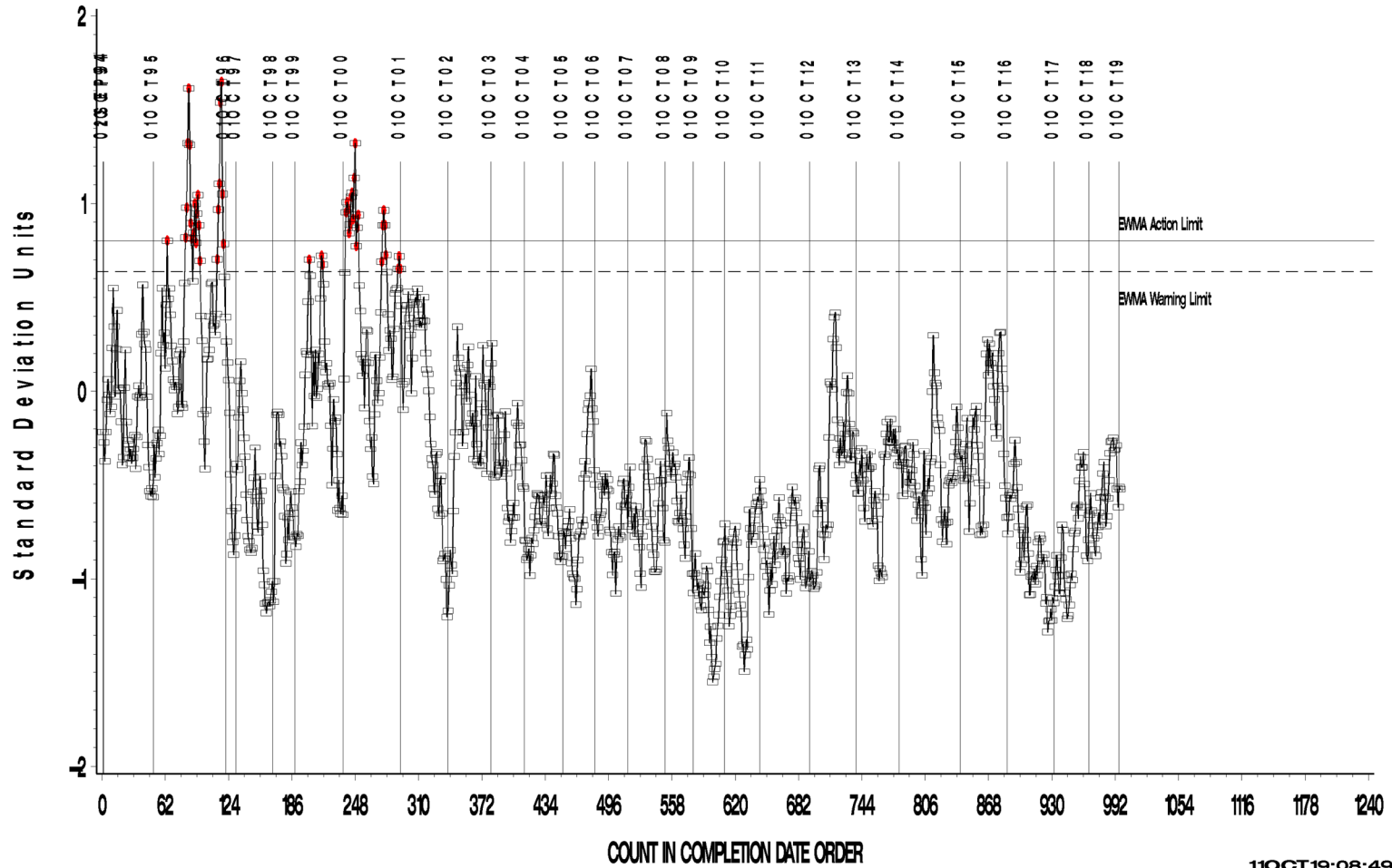
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L-60 — INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL VISCOSITY INCREASE

LTMS Precision Analysis



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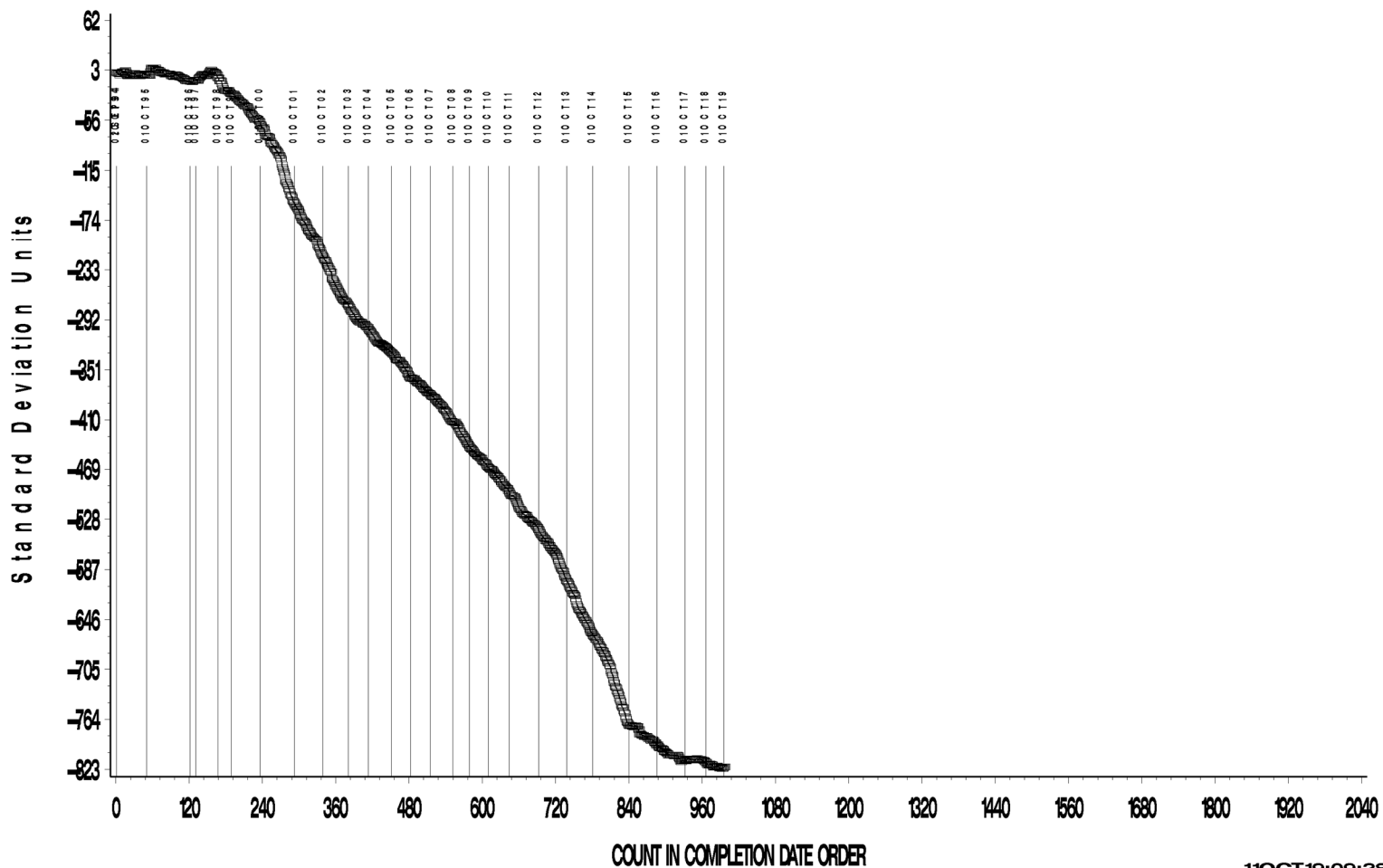
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L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

CUSUM Severity Analysis



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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

CUSUM Severity Analysis



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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

CUSUM Severity Analysis



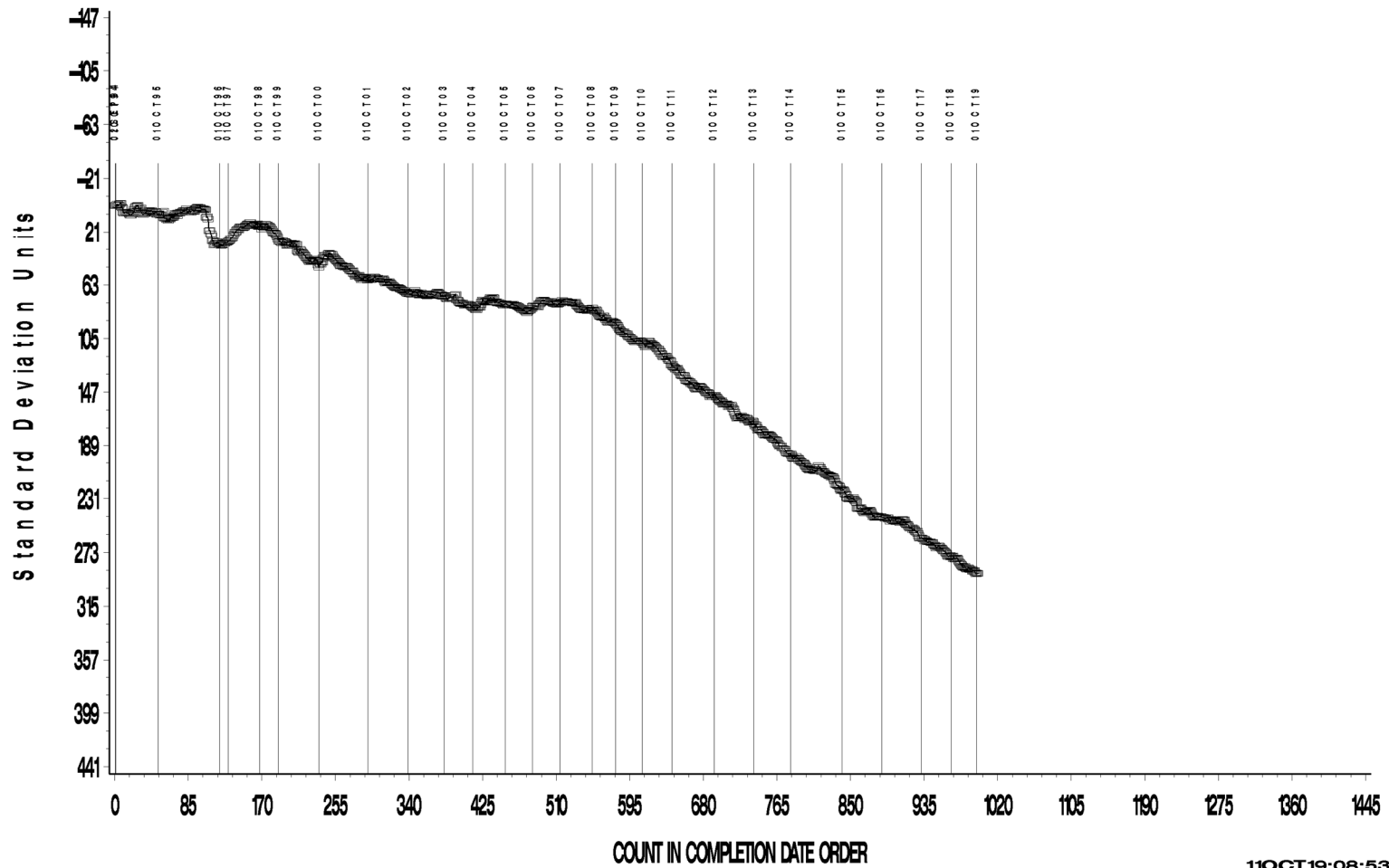
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

CUSUM Severity Analysis



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L-60-1 INDUSTRY OPERATIONALLY VALID DATA



REF. FINAL VISCOSITY INCREASE

CUSUM Severity Analysis



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L-60-1 (D5704)

TIMELINE ADDITIONS

Effective Date	Information Letter	Event
		No timeline additions were made this period.

L-60-1 (D5704)

LAB VISITS

No L-601 lab visits were conducted during this period.

INFORMATION LETTERS

No information letters were issued this period.

L-60-1 (D5704)

STATUS OF REFERENCE OIL SUPPLY

Oil	Cans @ Labs	@ TMC	
		Cans	Gallons
148-1	17	212	13.3
155-1	18	578	36.1
Total	35	790	49.4

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 80.83 gallons is available for use in other gear testing. 212 tests of oil 148-1 remain in TMC inventory; however, this is only 13 gallons. When the need arises, it will not be possible to obtain a reblend of this oil. The panel is advised to begin considering a possible replacement for this oil.