



## Test Monitoring Center

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

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

MEMORANDUM: 20-045  
DATE: October 12, 2020  
TO: Kristijan Drlja, Chairman, L-60-1 Surveillance Panel  
FROM: Dylan Beck *Dylan Beck*  
SUBJECT: L-60-1 Reference Oil Testing from April 1, 2020 through September 30, 2020

Attached is a summary of testing activity this period.

DJB/djb/mem20-045.djb.doc

cc: Frank Farber  
Jeff Clark

L-60-1 Surveillance Panel

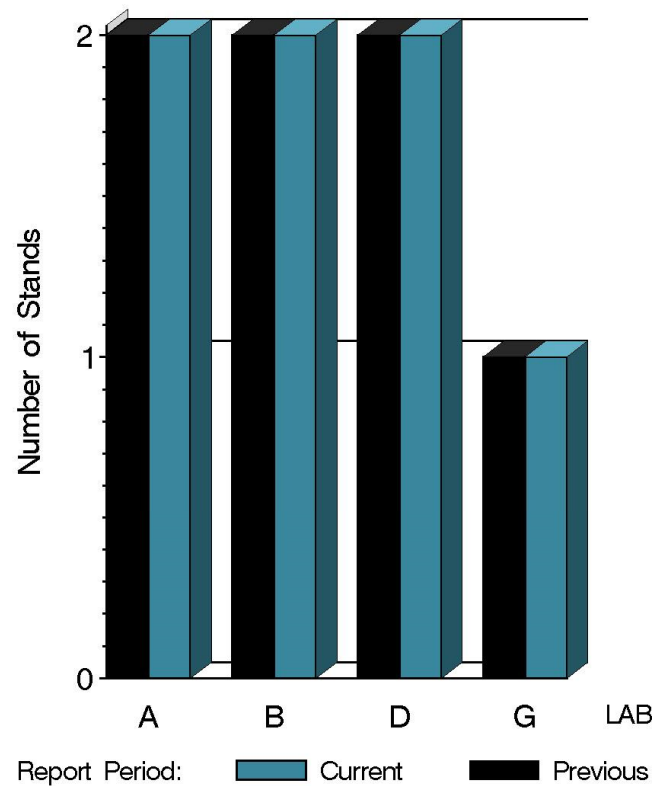
<http://www.astmtmc.cmu.edu/ftp/docs/gear/l601/semiannualreports/l601-10-2020.pdf>

Distribution: email

# L-60-1 (D5704)

	Reporting Data	Calibrated on 9-30-20
Number of Labs	4	4
Number of Stands	7	7

BY-LAB STAND  
DISTRIBUTION



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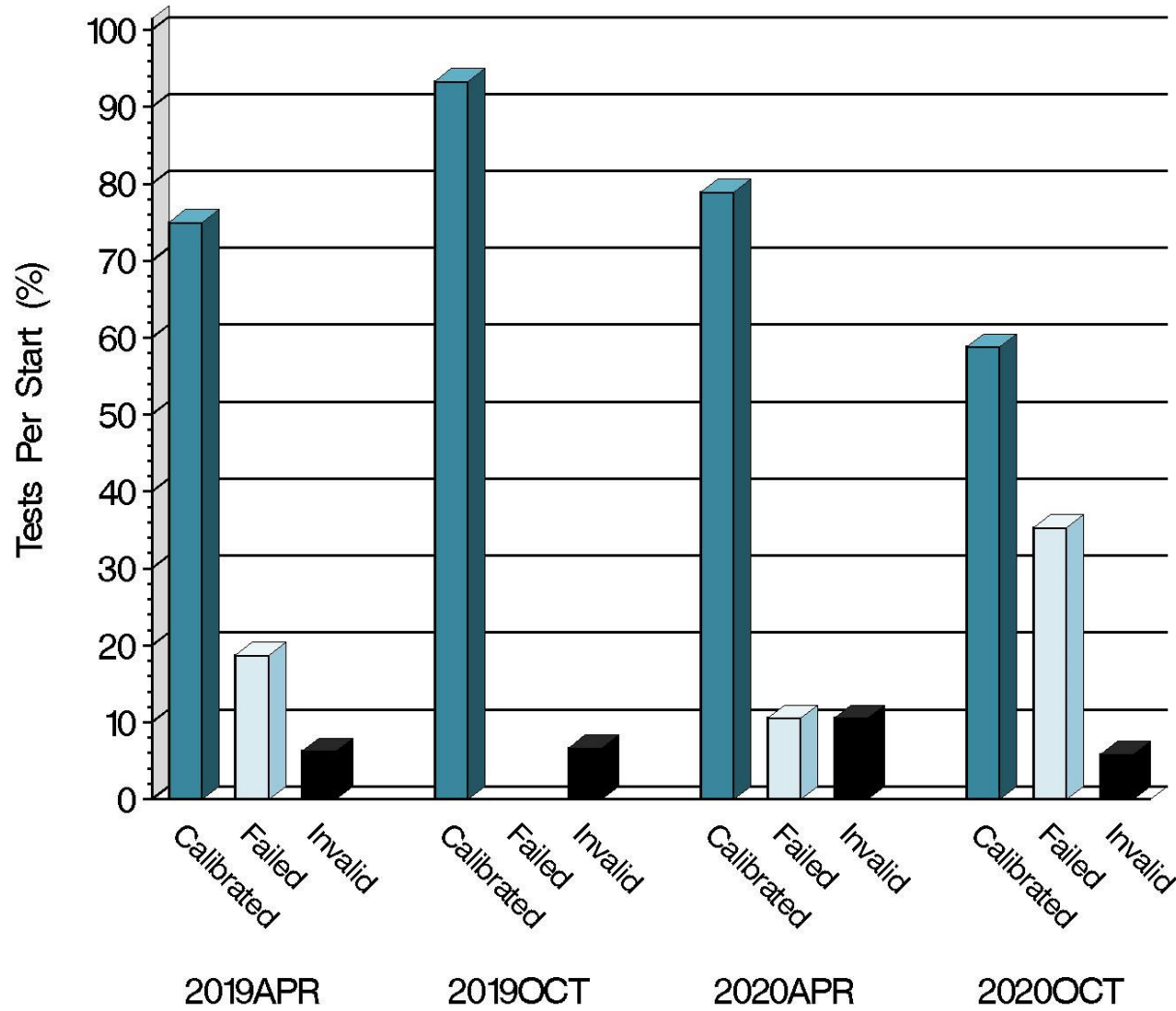
# L-60-1 (D5704)

## Test Distribution by Oil and Validity

				Totals	
		148-1	155-1	Last Period	This Period
Accepted for calibration	AC	5	5	15	10
Rejected (Mild)	OC	0	1	0	1
Rejected (Severe)	OC	1	4	2	5
Rejected (Combination)	OC	0	0	0	0
Rejected (Precision)	OC	0	0	0	0
Invalidated calibration	LC	0	0	0	0
Acceptable info run	NI	0	0	0	0
Aborted info run	XI	0	0	0	0
Aborted	XC	0	1	2	1
<b>Total</b>		<b>6</b>	<b>11</b>	<b>19</b>	<b>17</b>

# L-60-1 (D5704)

## CALIBRATION ATTEMPT SUMMARY



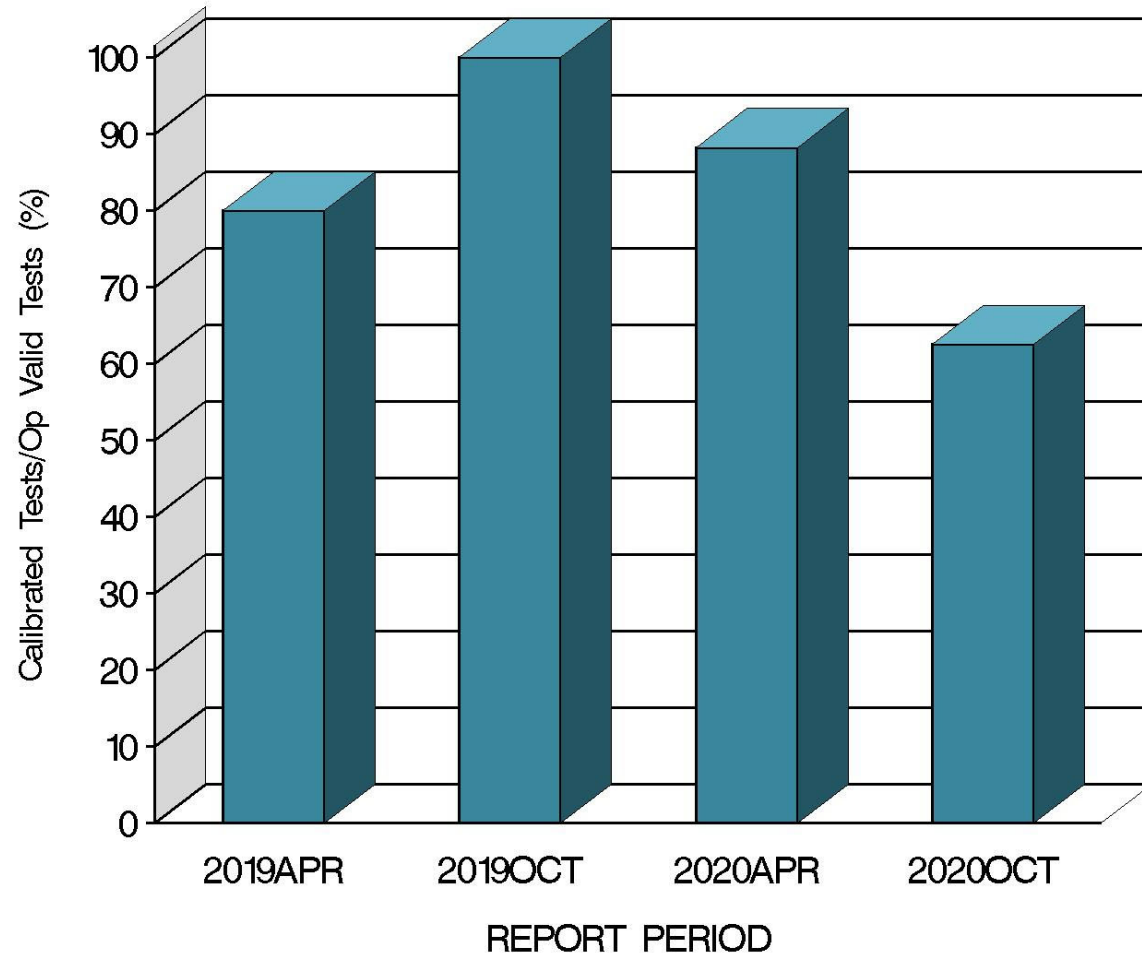
Resolution

Report Period

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# L-60-1 (D5704)

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	%
A	Stand instrumentation not calibrated		●			●	1	4	25%
	Lost	0	1	0	0	1			
	Starts	6	11	17	17	17			
	%	0%	9%	0%	0%	6%			

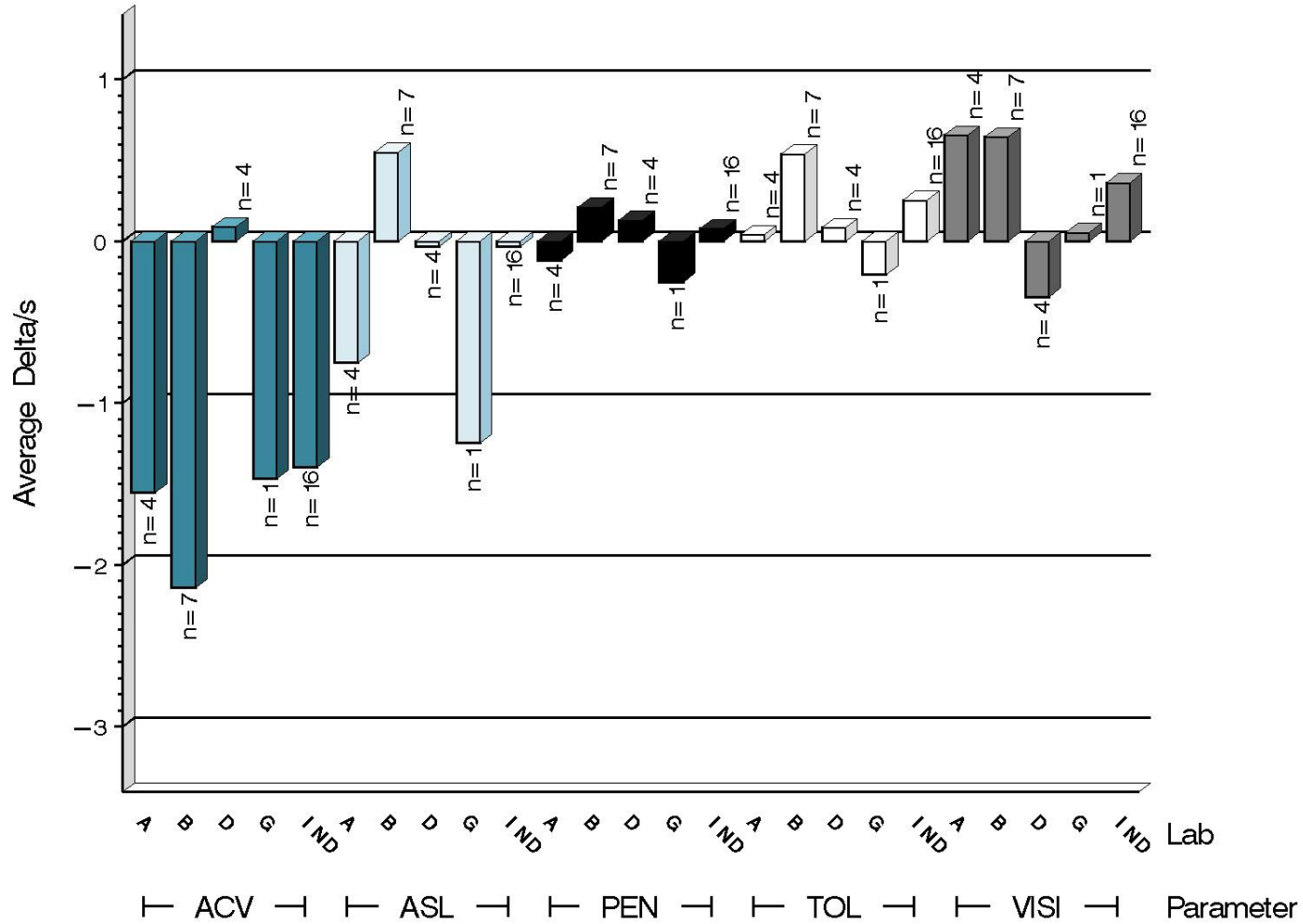
# L-60-1 (D5704)

Average $\Delta$ /s by Lab						
Lab	n	VISI	PEN	TOL	ACV	ASL
A	4	0.655	-0.117	0.043	-1.555	-0.752
B	7	0.645	0.212	0.540	-2.142	0.552
D	4	-0.344	0.129	0.084	0.090	-0.032
G	1	0.054	-0.251	-0.206	-1.468	-1.247
Industry	16	0.363	0.080	0.255	-1.395	-0.032
Shift*	16	2.78	0.033%	0.063%	-0.713 merits	-0.003 merits

\*computed using severity adjustment standard deviation.

# L-60-1 (D5704)

TEST SEVERITY  
DELTA/S BY LAB

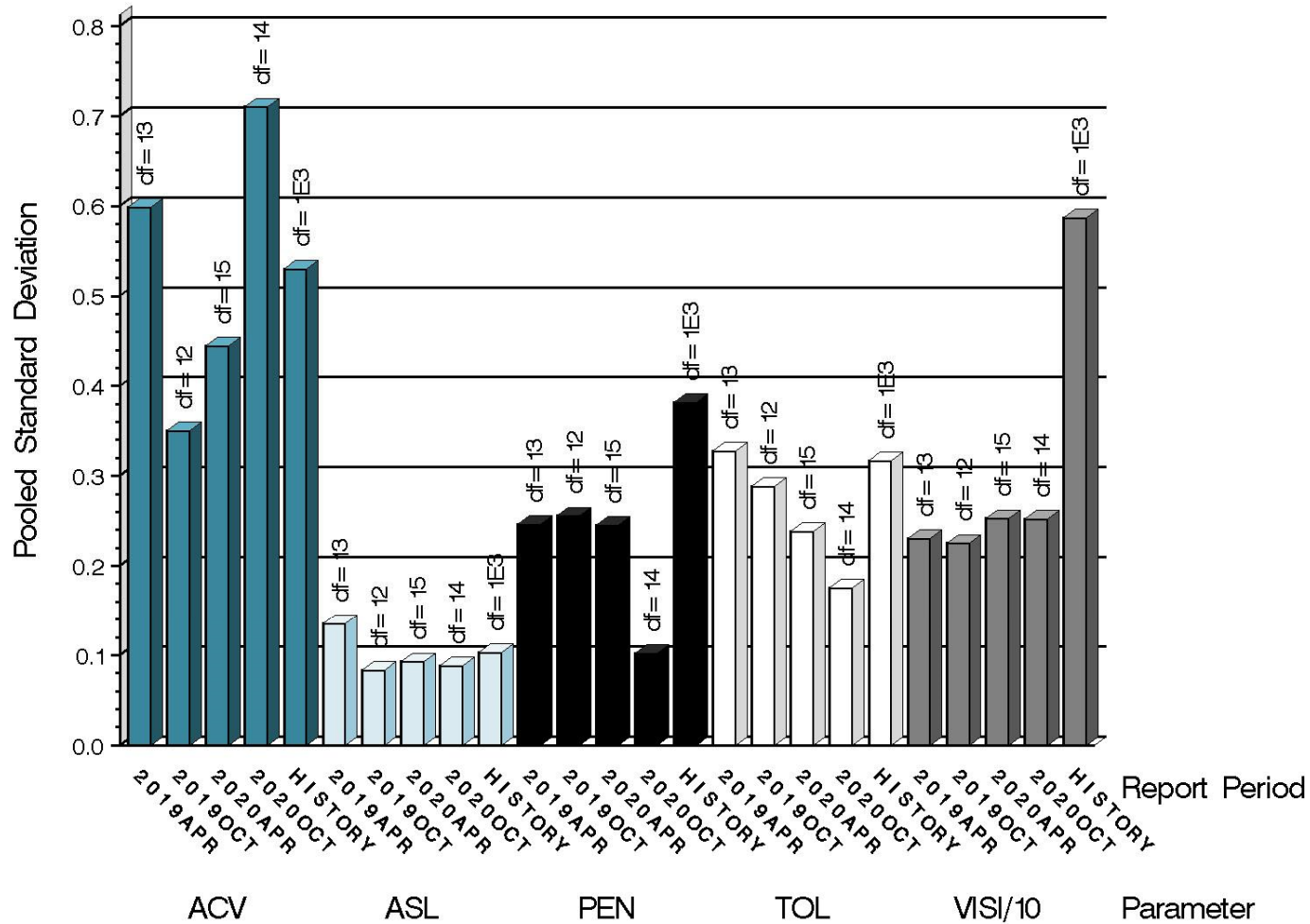


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# L-60-1 (D5704)

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

ACV is currently outside of the limits in the severe direction. All other parameters remained within limits during this period.

### Precision

ACV was outside the limits this period but has returned with the most recent test. All other parameters remained within limits during this period.

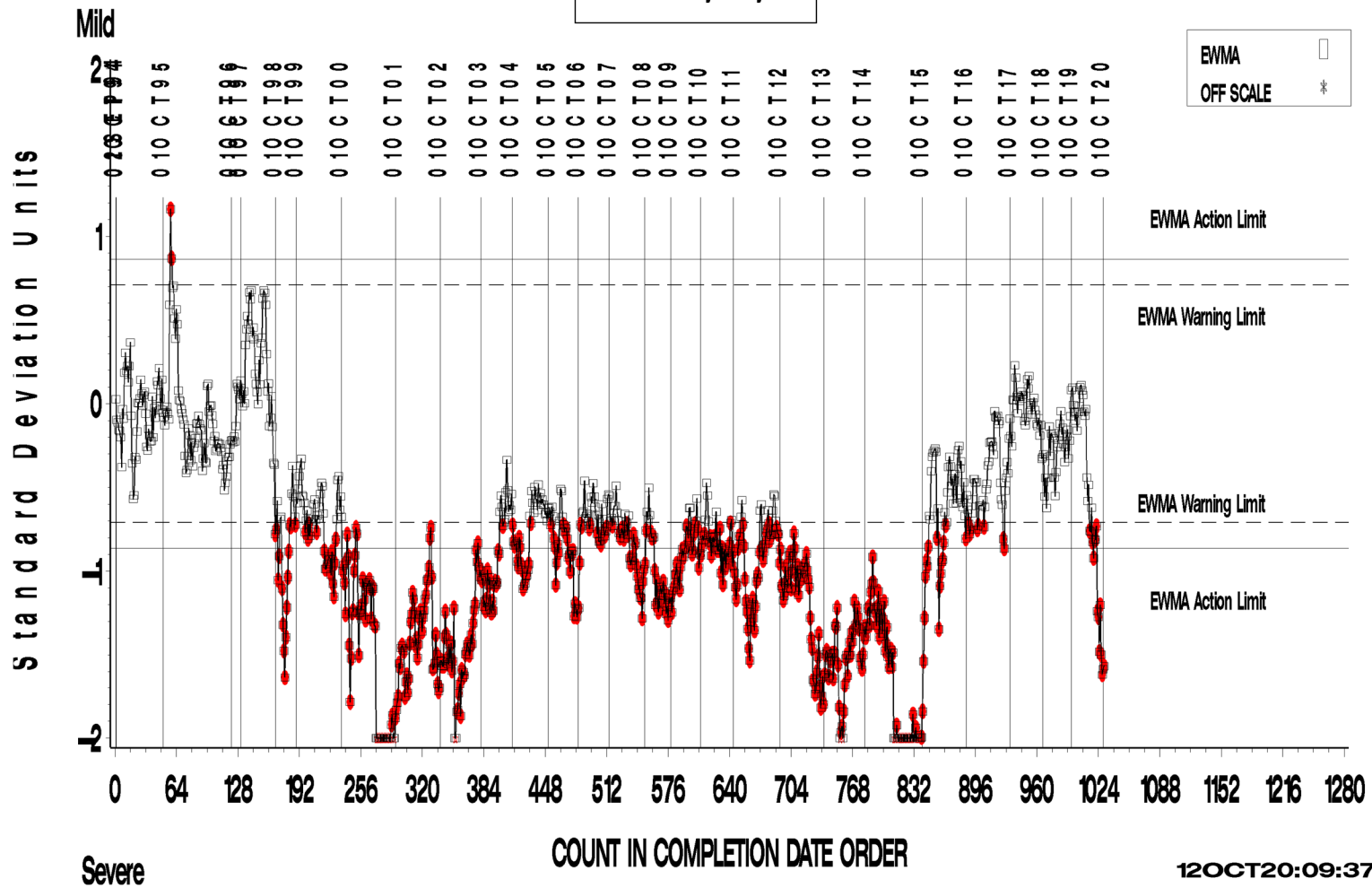
Industry control charts follow.

# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

LTMS Severity Analysis



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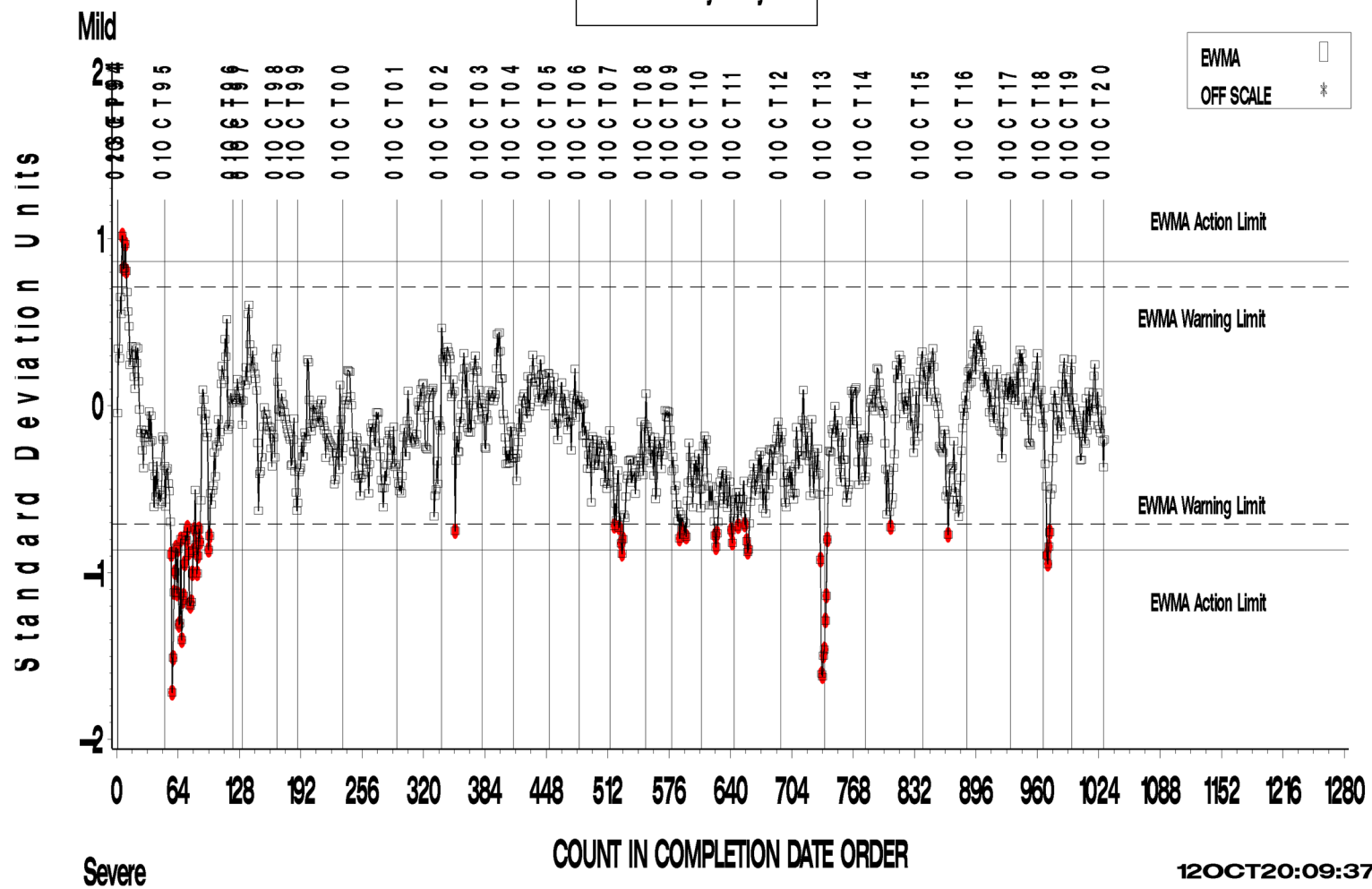
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# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

LTMS Severity Analysis

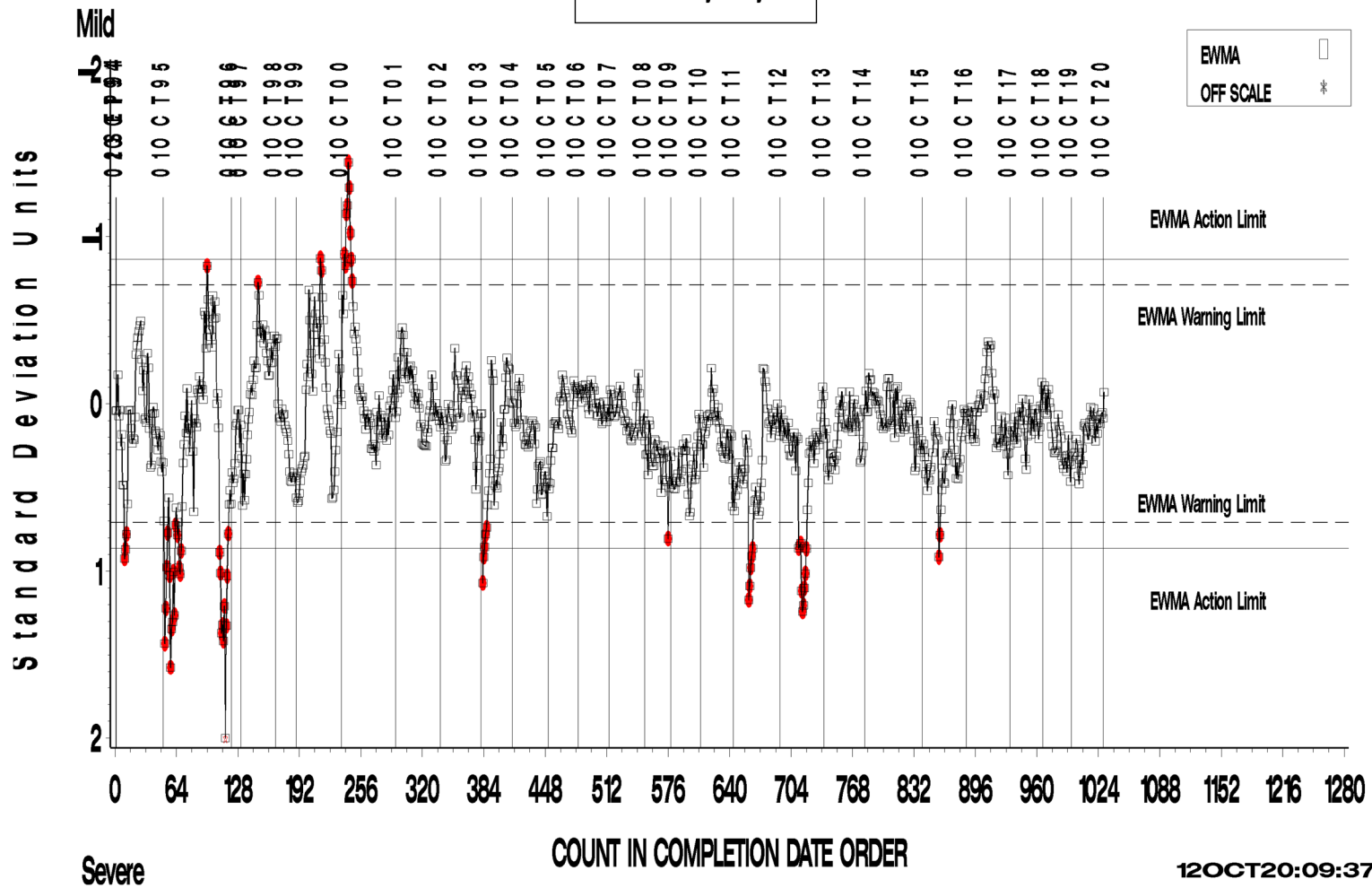


# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

LTMS Severity Analysis

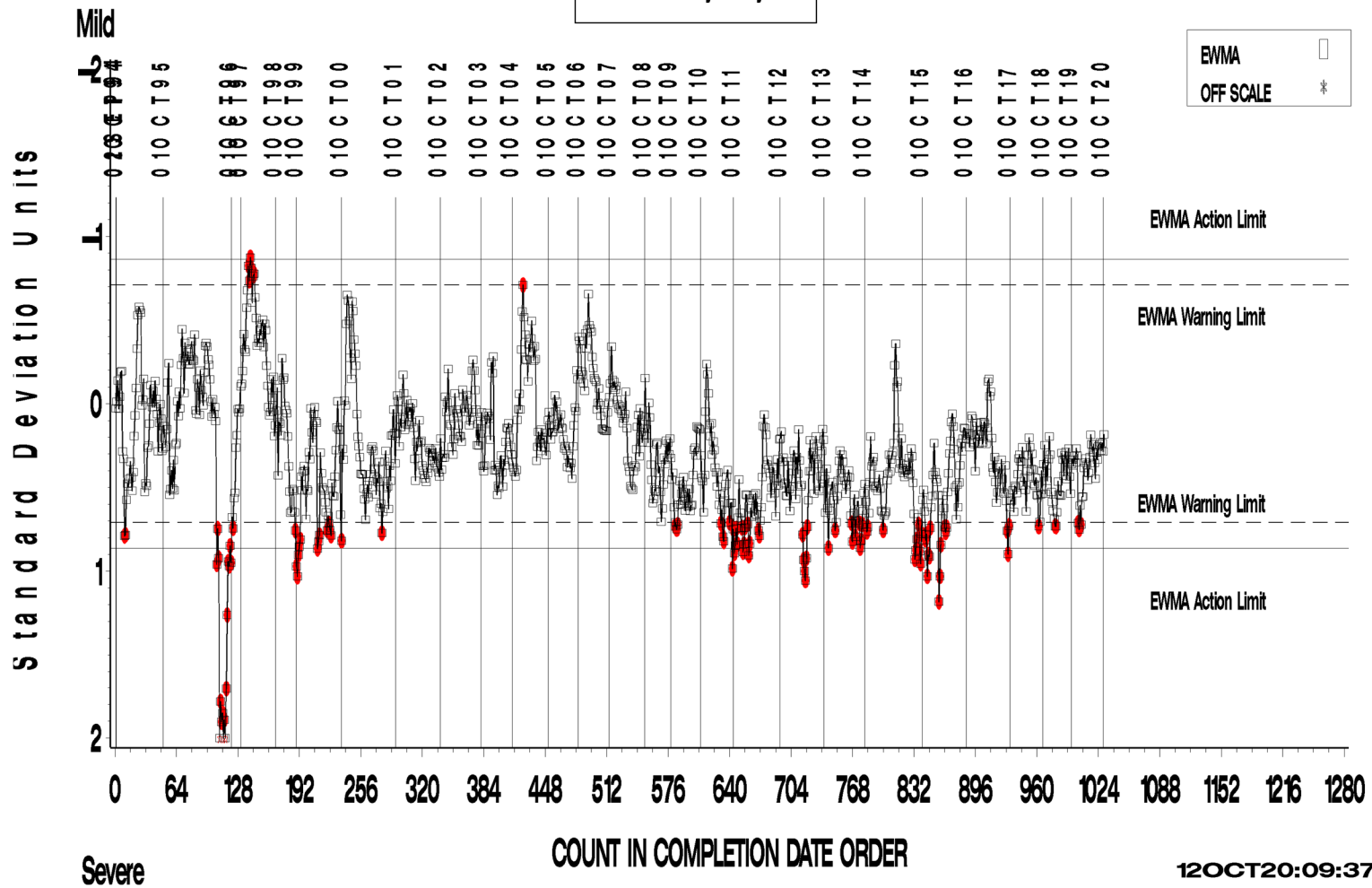


# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

LTMS Severity Analysis



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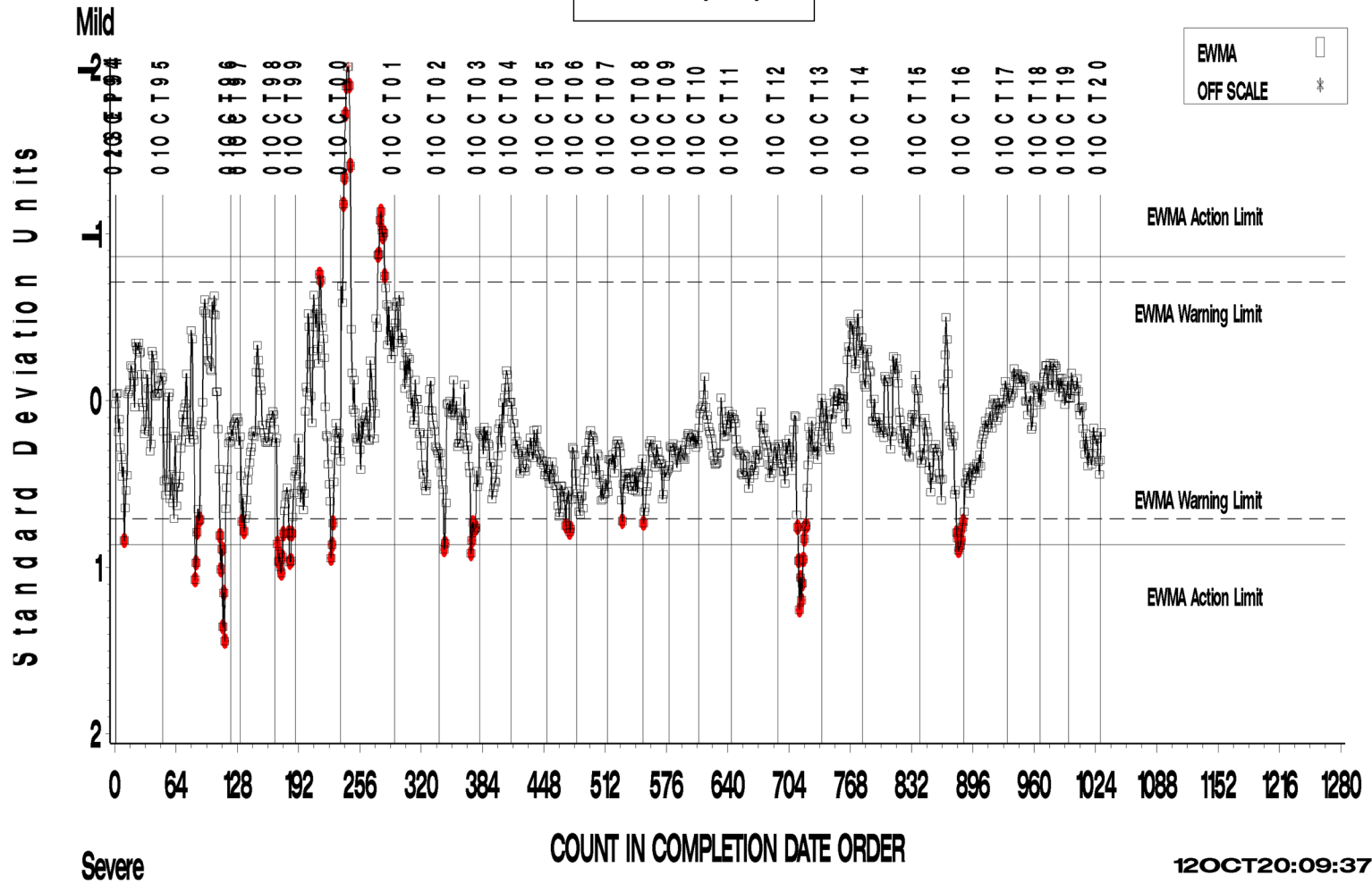
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# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL VISCOSITY INCREASE

LTMS Severity Analysis



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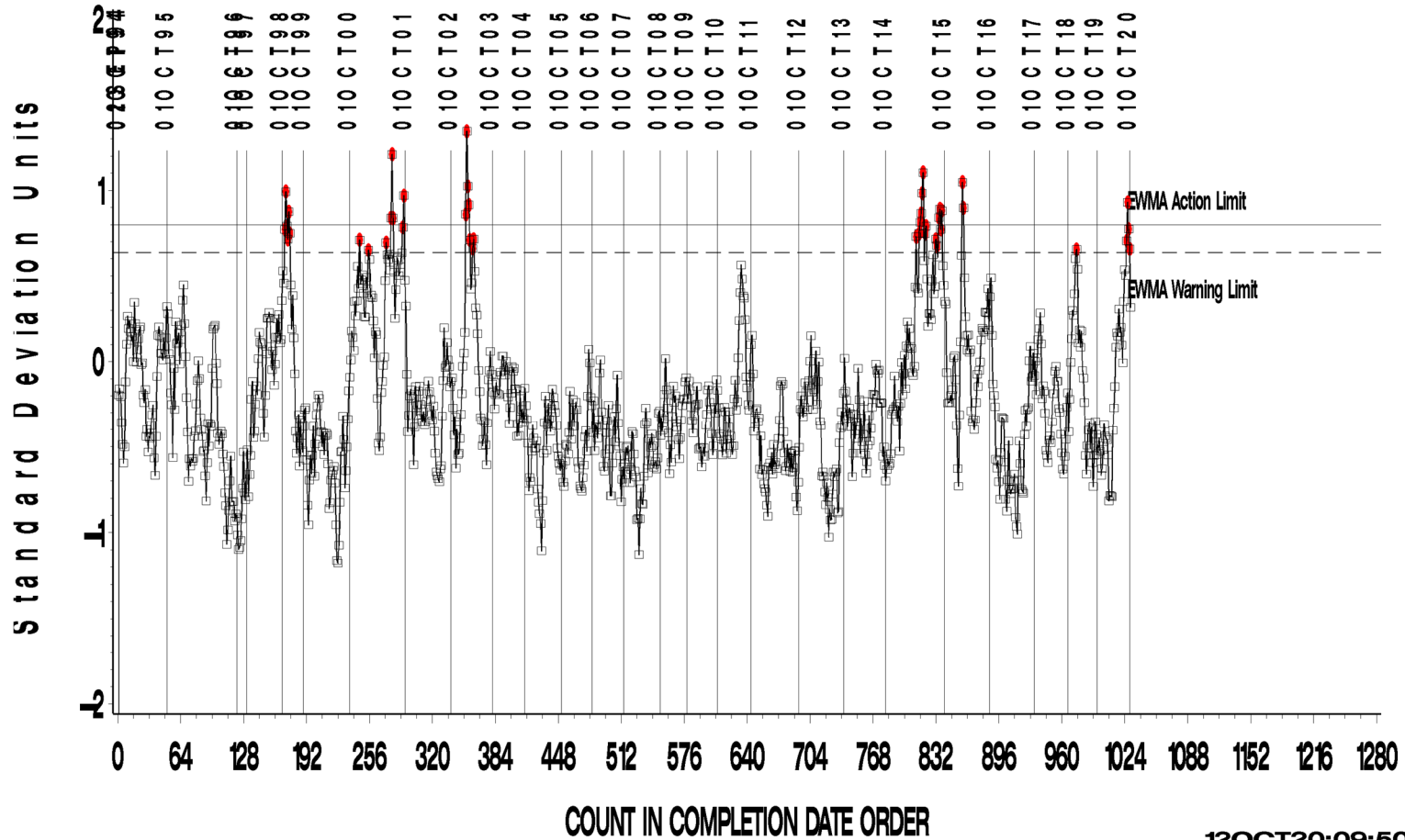
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# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

LTMS Precision Analysis



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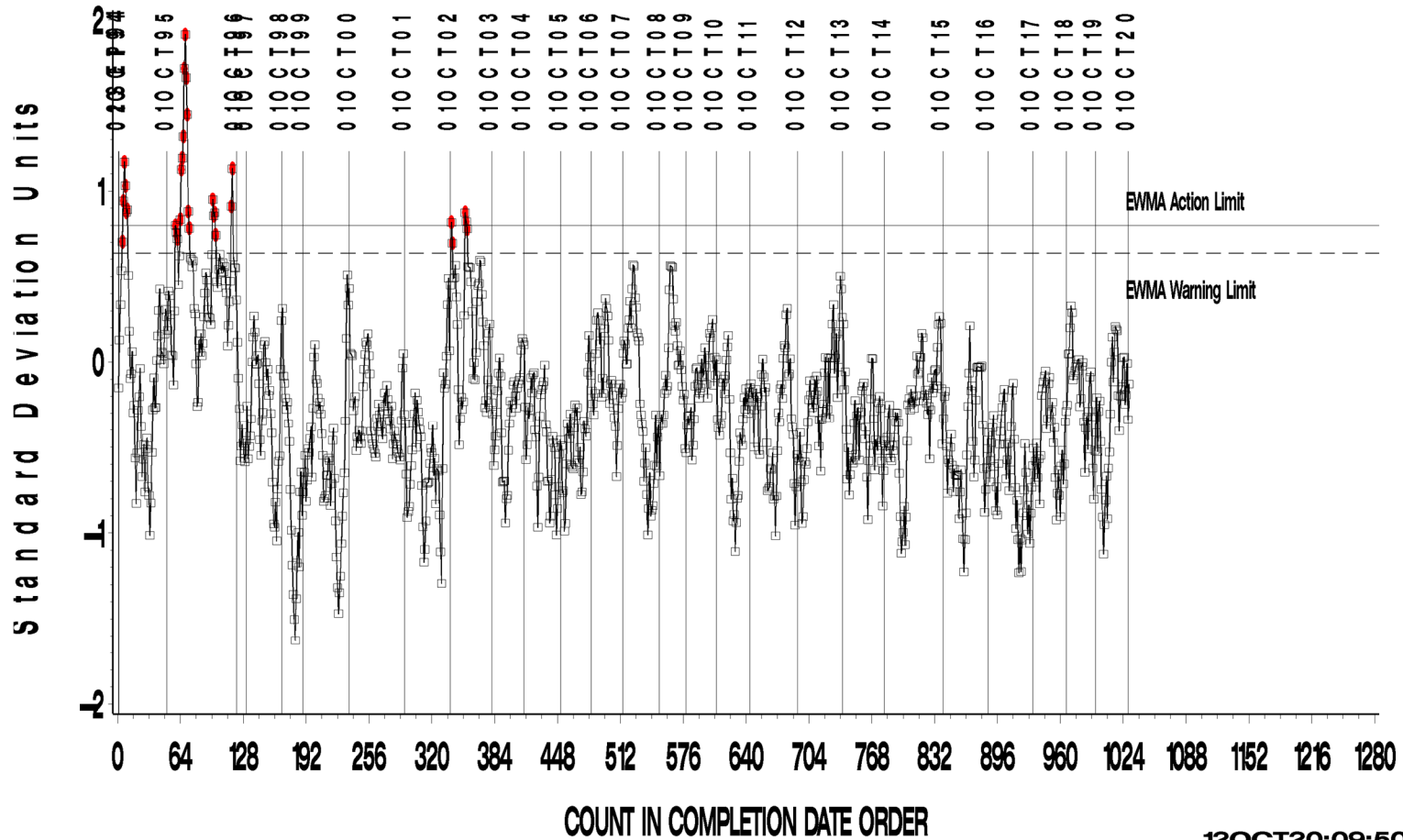


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L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

LTMS Precision Analysis



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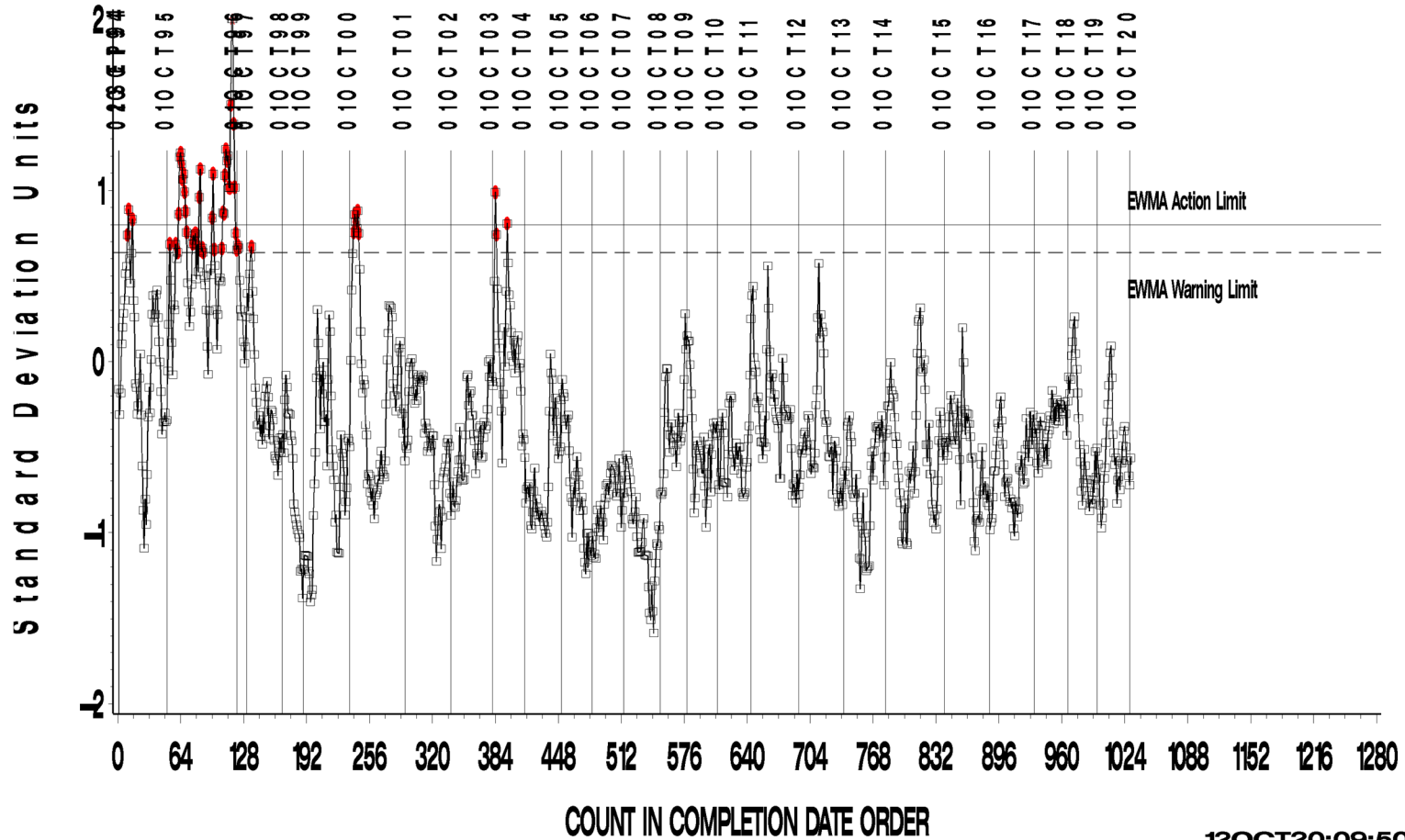
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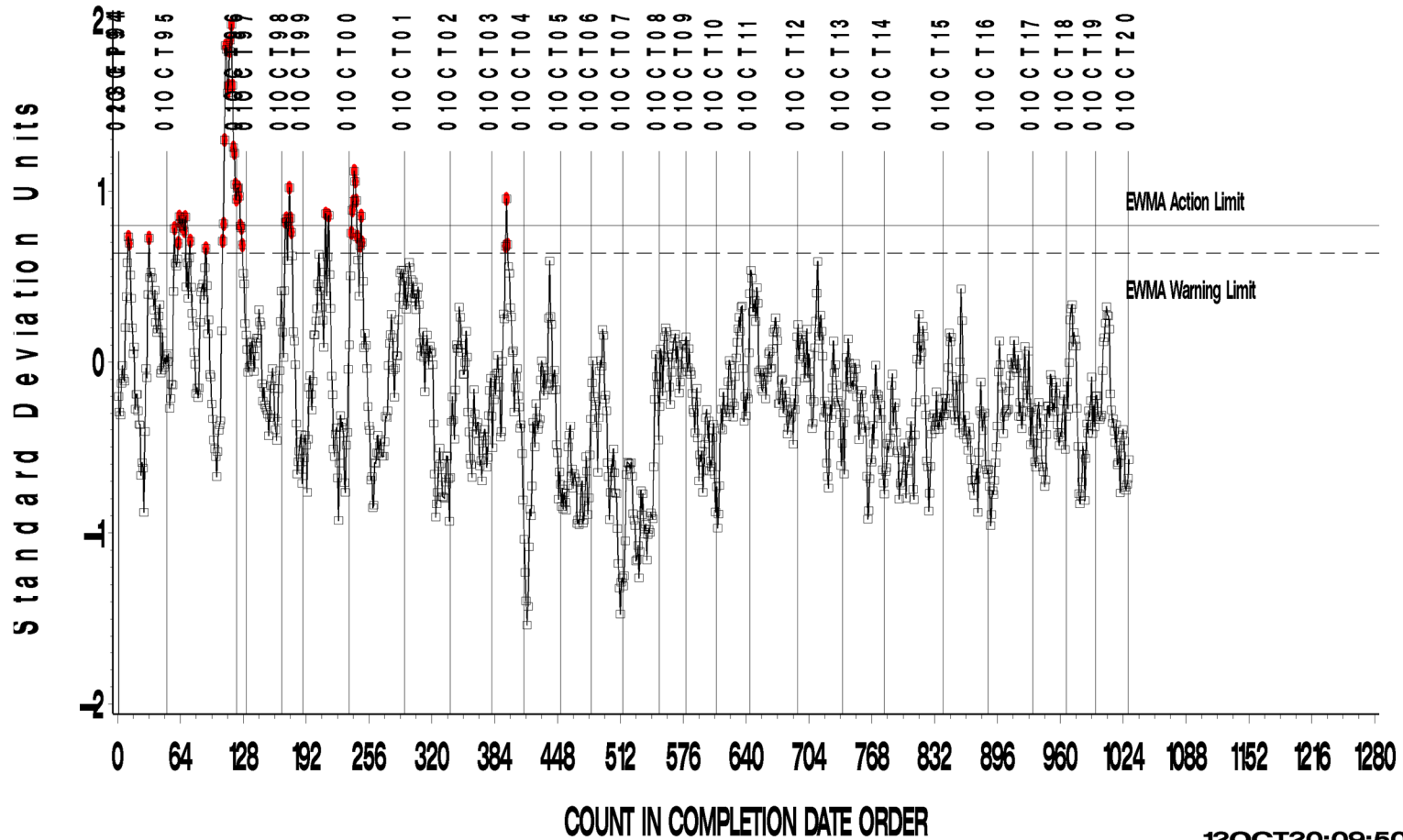
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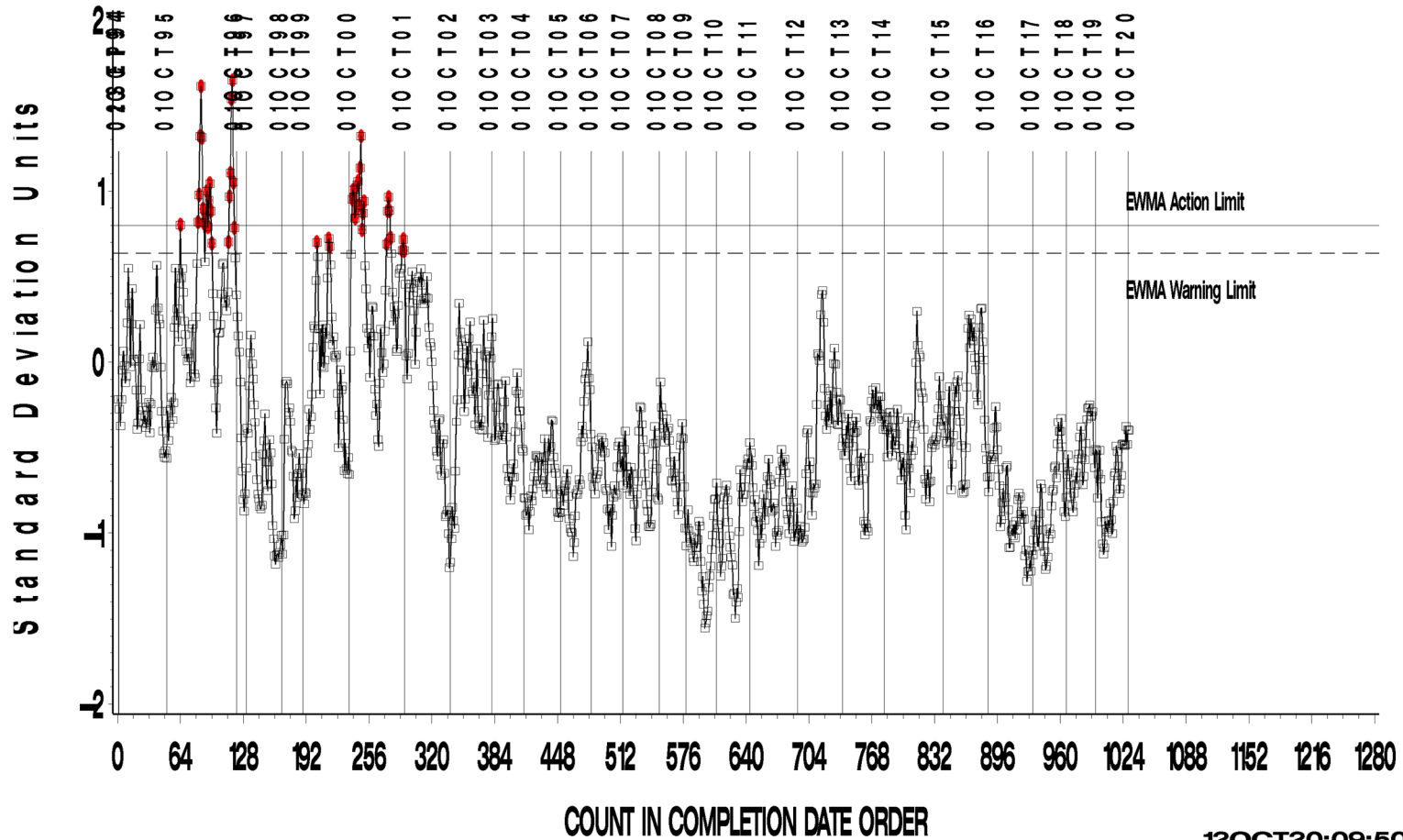
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LTMS Precision Analysis



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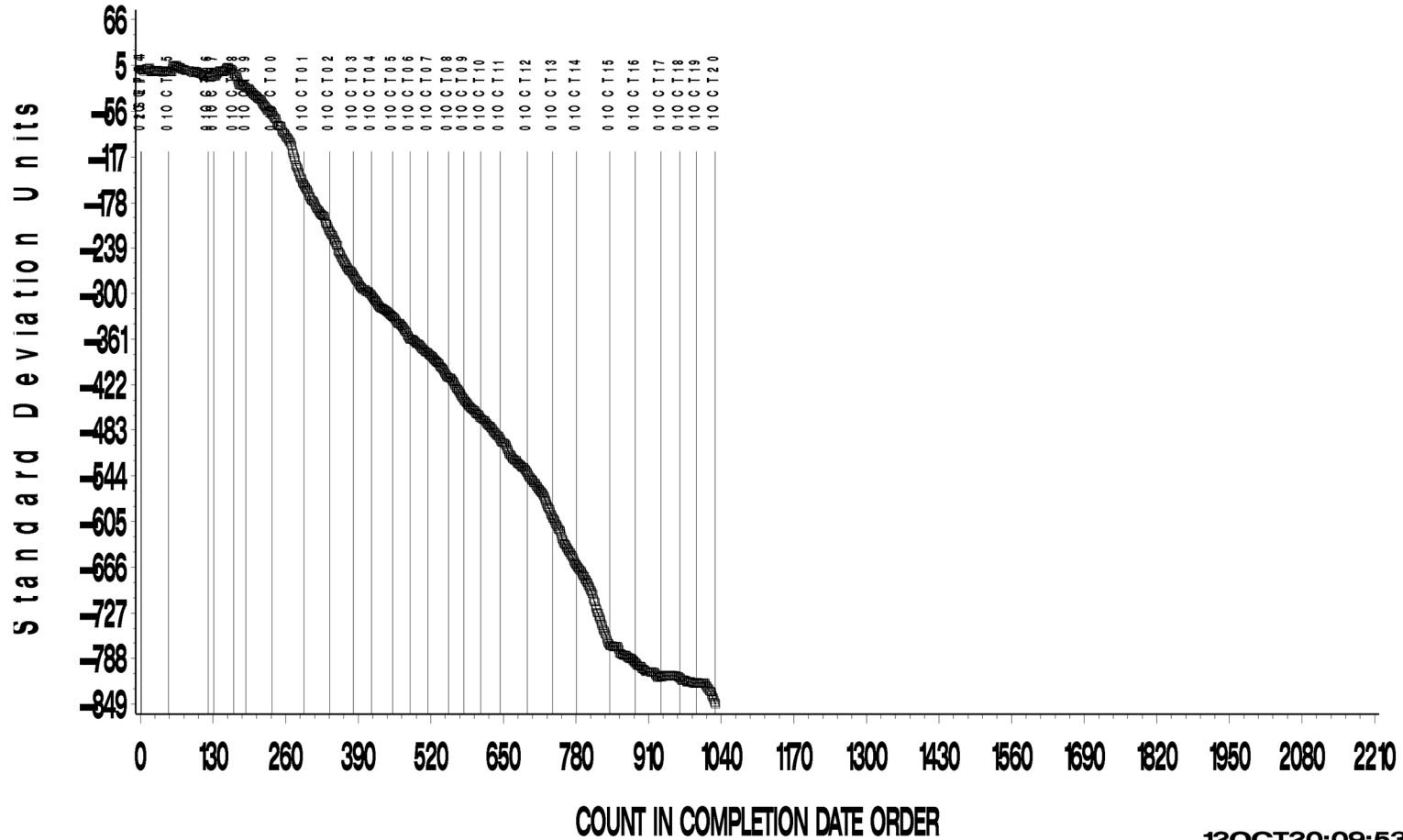
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# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

CUSUM Severity Analysis



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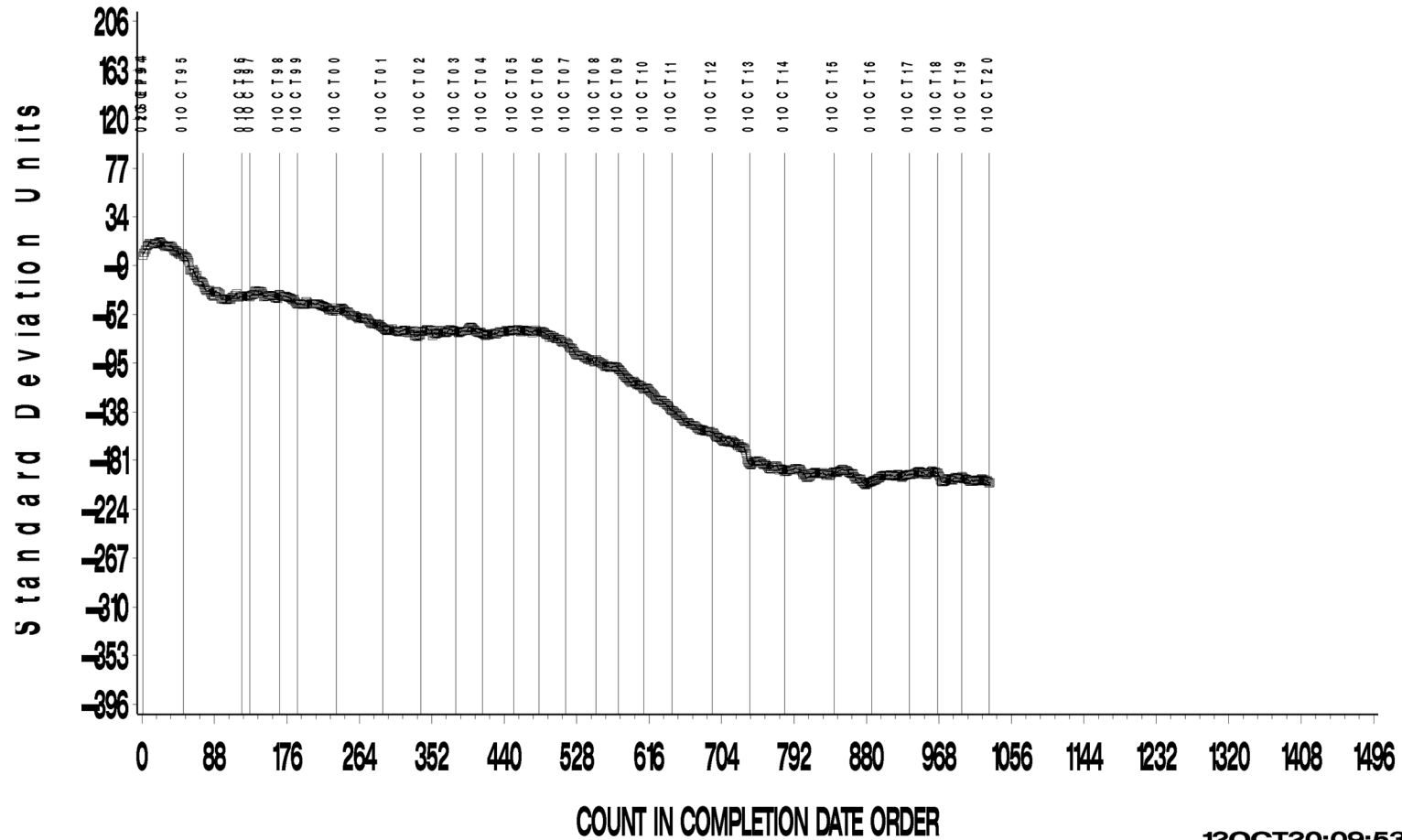
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# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

CUSUM Severity Analysis



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**Test Monitoring Center**

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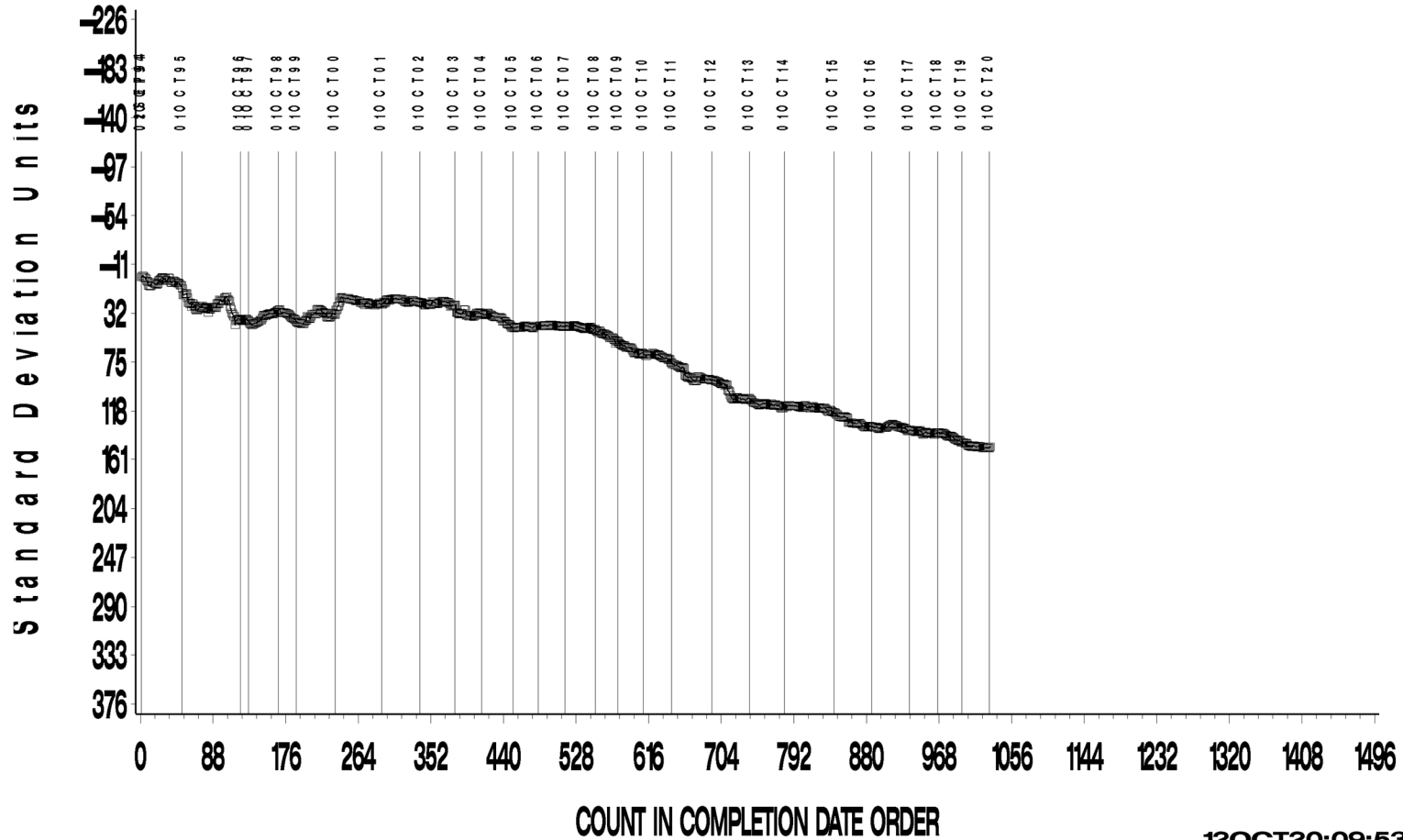
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L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

CUSUM Severity Analysis



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**Test Monitoring Center**

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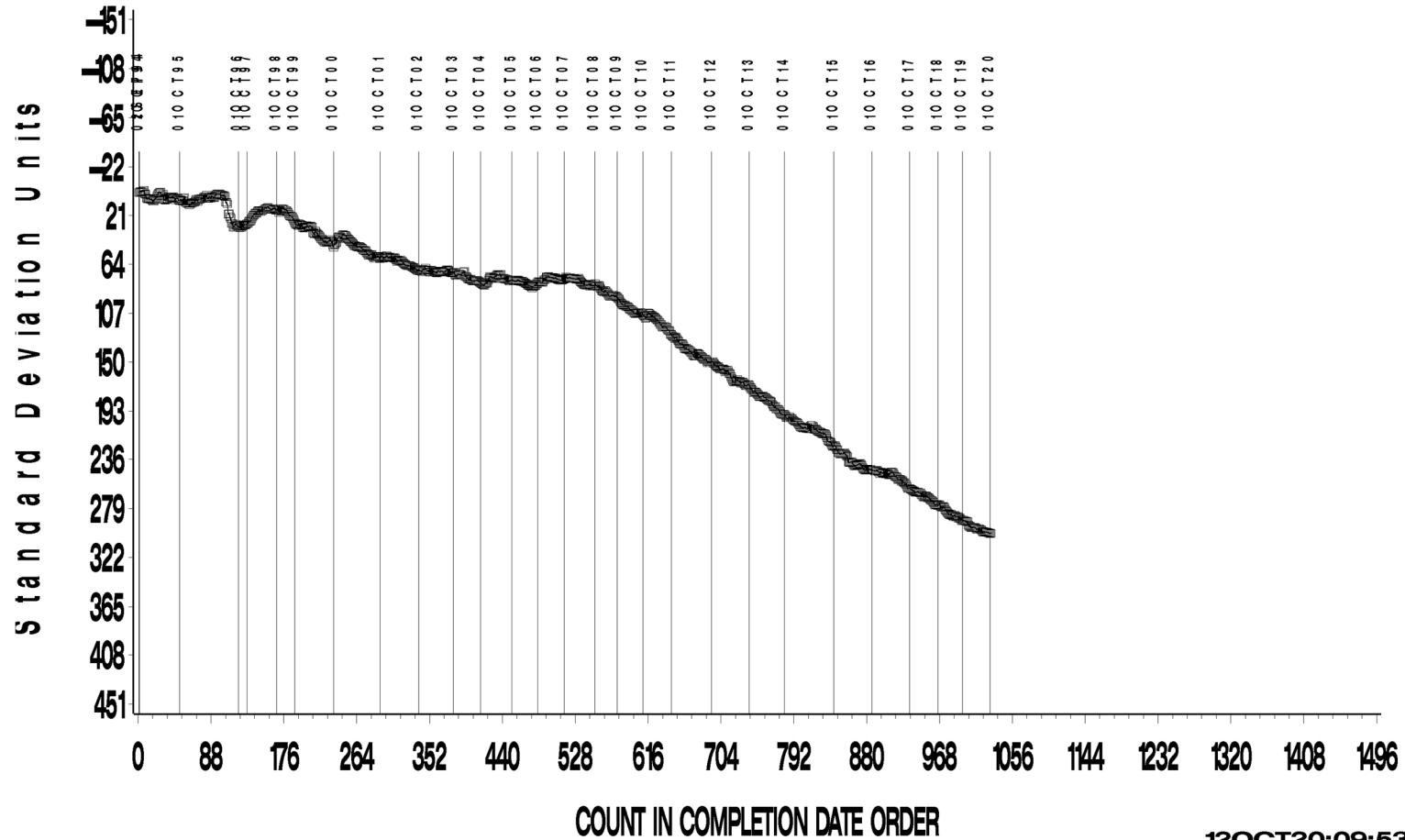
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L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

CUSUM Severity Analysis



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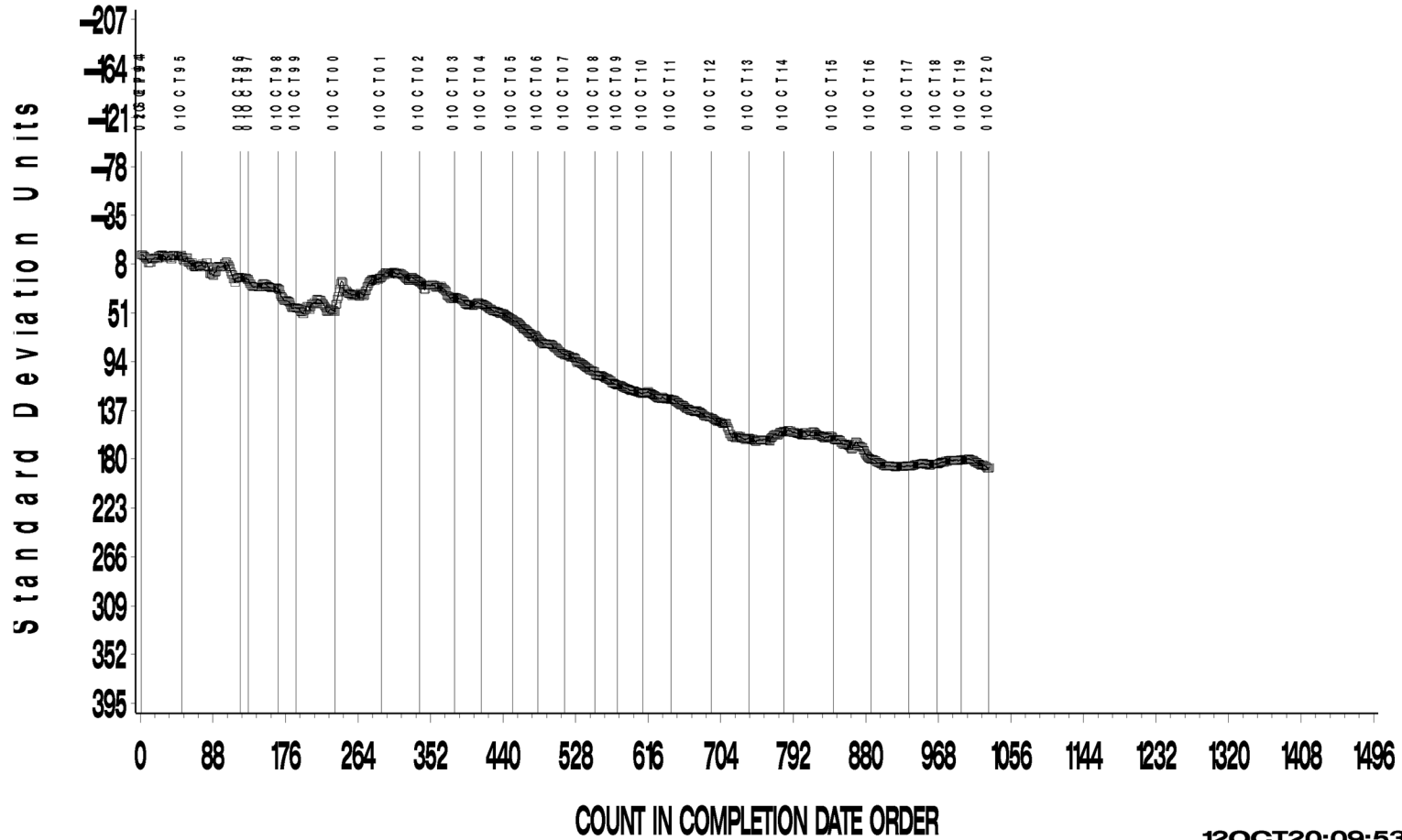
# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA



REF. FINAL VISCOSITY INCREASE

CUSUM Severity Analysis



# L-60-1 (D5704)

## TIMELINE ADDITIONS

Effective Date	Information Letter	Event
		No information letters issued during this period.

# L-60-1 (D5704)

## LAB VISITS

No L-60-1 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	25	185	11.6
155-1	22	564	35.3
Total	47	749	46.9

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 65.46 gallons is available for use in other gear testing. 185 tests of oil 148-1 remain in TMC inventory; however, this is only 11 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.