



## Test Monitoring Center

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

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

MEMORANDUM: 21-009  
DATE: April 14, 2021  
TO: Kristijan Drlja, Chairman, L-60-1 Surveillance Panel  
FROM: Dylan Beck *Dylan Beck*  
SUBJECT: L-60-1 Reference Oil Testing from October 1, 2020 through March 31, 2021

Attached is a summary of testing activity this period.

DJB/djb/mem21-009.djb.doc

cc: Frank Farber  
Jeff Clark

L-60-1 Surveillance Panel

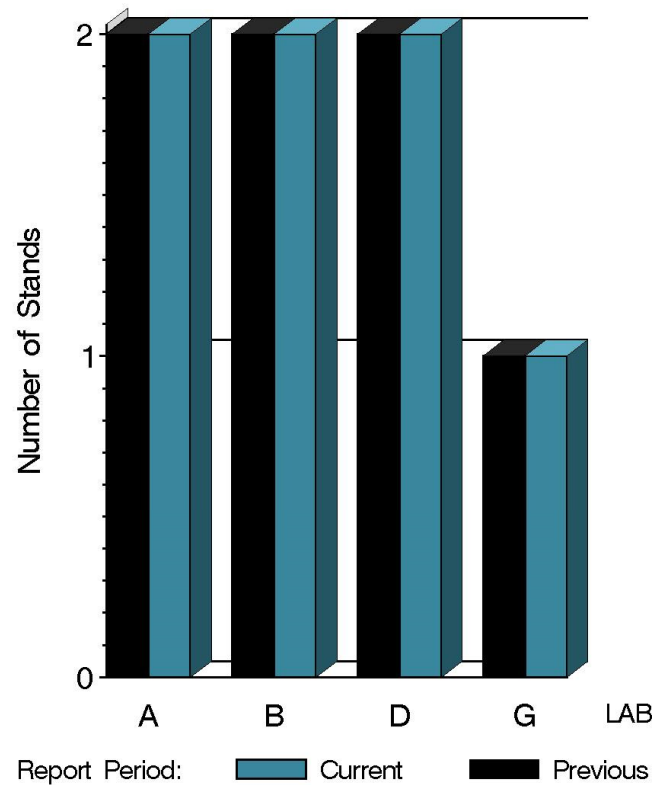
<http://www.astmtmc.cmu.edu/ftp/docs/gear/l601/semiannualreports/l601-04-2021.pdf>

Distribution: email

# L-60-1 (D5704)

	Reporting Data	Calibrated on 3-31-21
Number of Labs	4	4
Number of Stands	7	7

BY-LAB STAND  
DISTRIBUTION



14:06:15 12APR2021

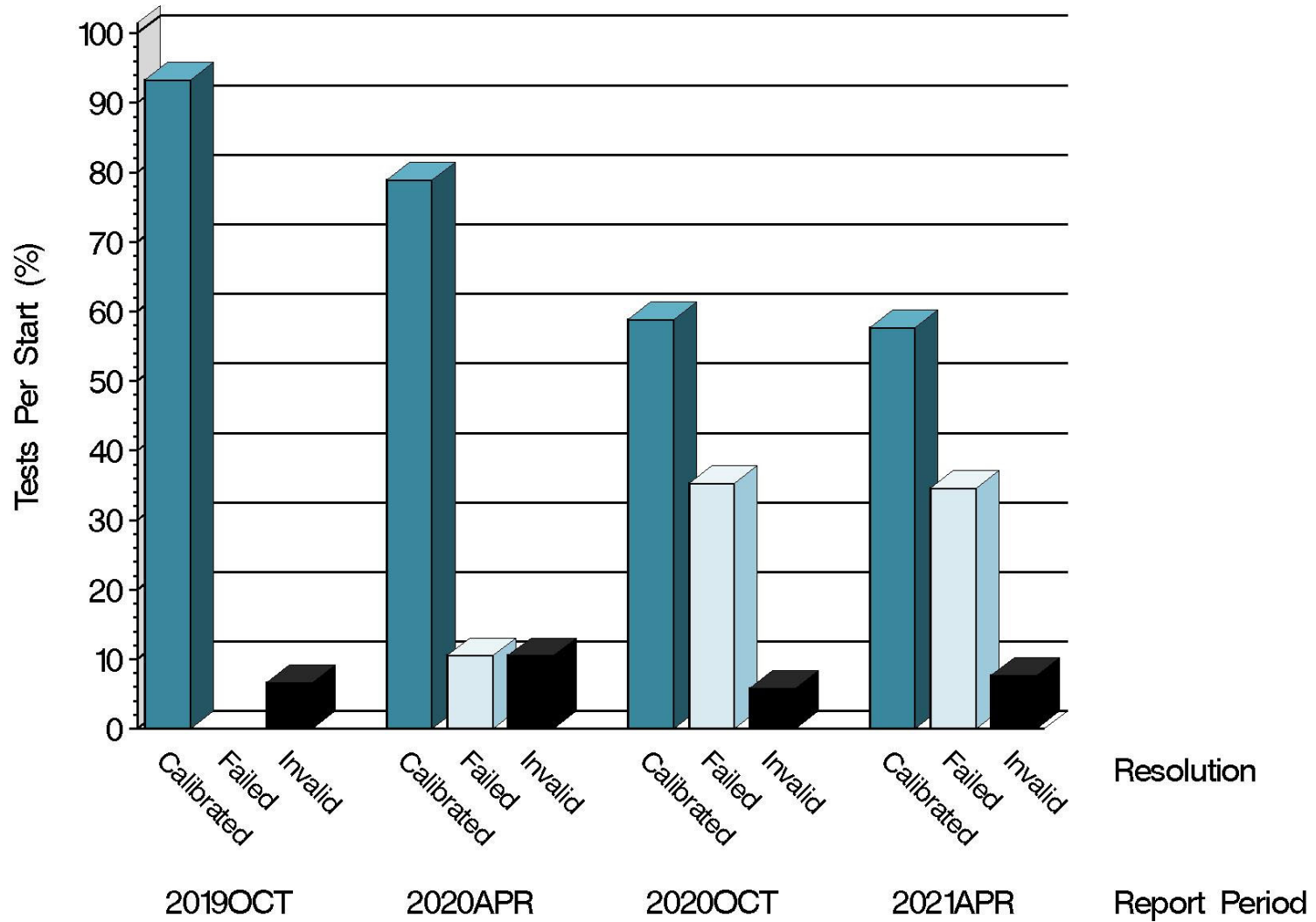
# L-60-1 (D5704)

## Test Distribution by Oil and Validity

				Totals	
		148-1	155-1	Last Period	This Period
Accepted for calibration	AC	8	7	10	15
Rejected (Mild)	OC	0	0	1	0
Rejected (Severe)	OC	5	0	5	5
Rejected (Combination)	OC	0	0	0	0
Rejected (Precision)	OC	2	0	0	2
Invalidated calibration	LC	1	1	0	2
Acceptable info run	NI	1	2	0	3
Aborted info run	XI	0	0	0	0
Aborted	XC	0	0	1	0
<b>Total</b>		<b>17</b>	<b>10</b>	<b>17</b>	<b>27</b>

# L-60-1 (D5704)

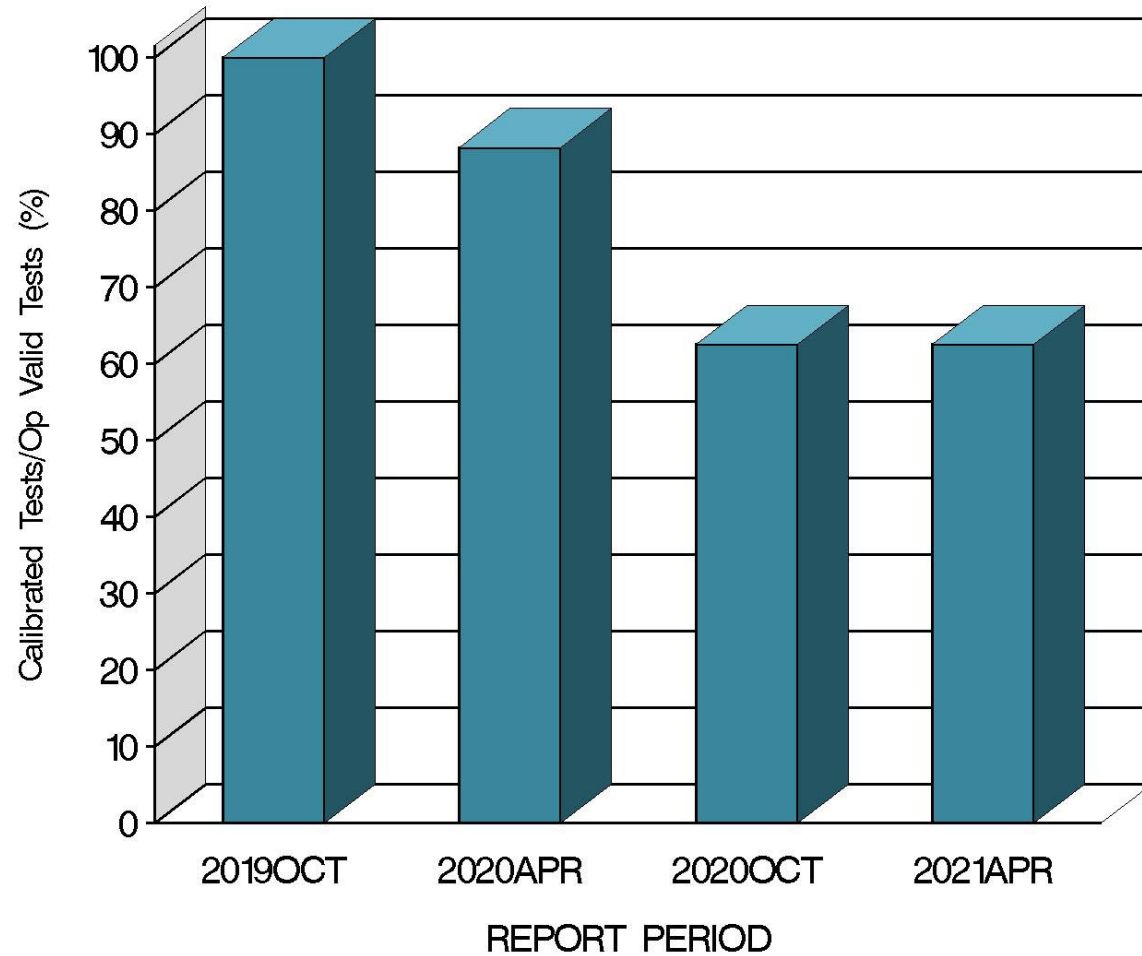
## CALIBRATION ATTEMPT SUMMARY



15:07:12 12APR2021

# L-60-1 (D5704)

OPERATIONALLY VALID TESTS  
MEETING ACCEPTANCE CRITERIA



15:07:12 12APR2021

# L-60-1 (D5704)

## CAUSES FOR LOST TESTS

		Oil		Validity			Loss Rate		
Lab	Cause	148-1	155-1	RC	LC	XC	Lost	Starts	%
A	Gear installed backwards		●		●		1	9	11%
B	Oil loss greater than 20%	●			●		1	11	9%
	Lost	1	1	0	2	0			
	Starts	17	10	27	27	27			
	%	6%	10%	0%	7%	0%			

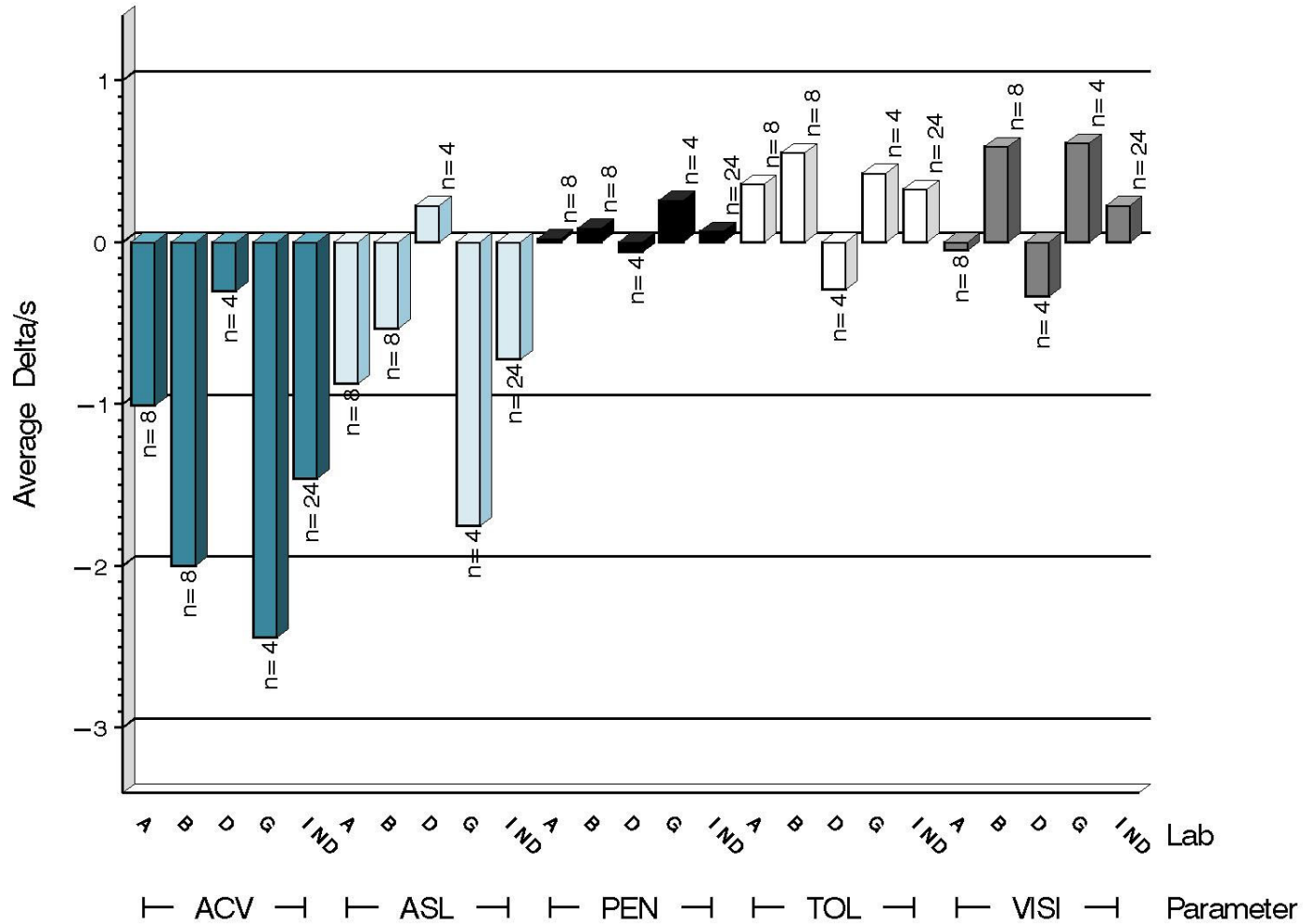
# L-60-1 (D5704)

Average $\Delta$ /s by Lab						
Lab	n	VISI	PEN	TOL	ACV	ASL
A	8	-0.050	0.022	0.359	-1.011	-0.875
B	8	0.592	0.086	0.553	-1.999	-0.532
D	4	-0.337	-0.062	-0.294	-0.300	0.226
G	4	0.613	0.260	0.426	-2.443	-1.753
Industry	24	0.227	0.069	0.326	-1.461	-0.723
Shift*	24	1.736	0.029	0.08%	-0.746 merits	-0.077 merits

\*computed using severity adjustment standard deviation.

# L-60-1 (D5704)

TEST SEVERITY  
DELTA/S BY LAB

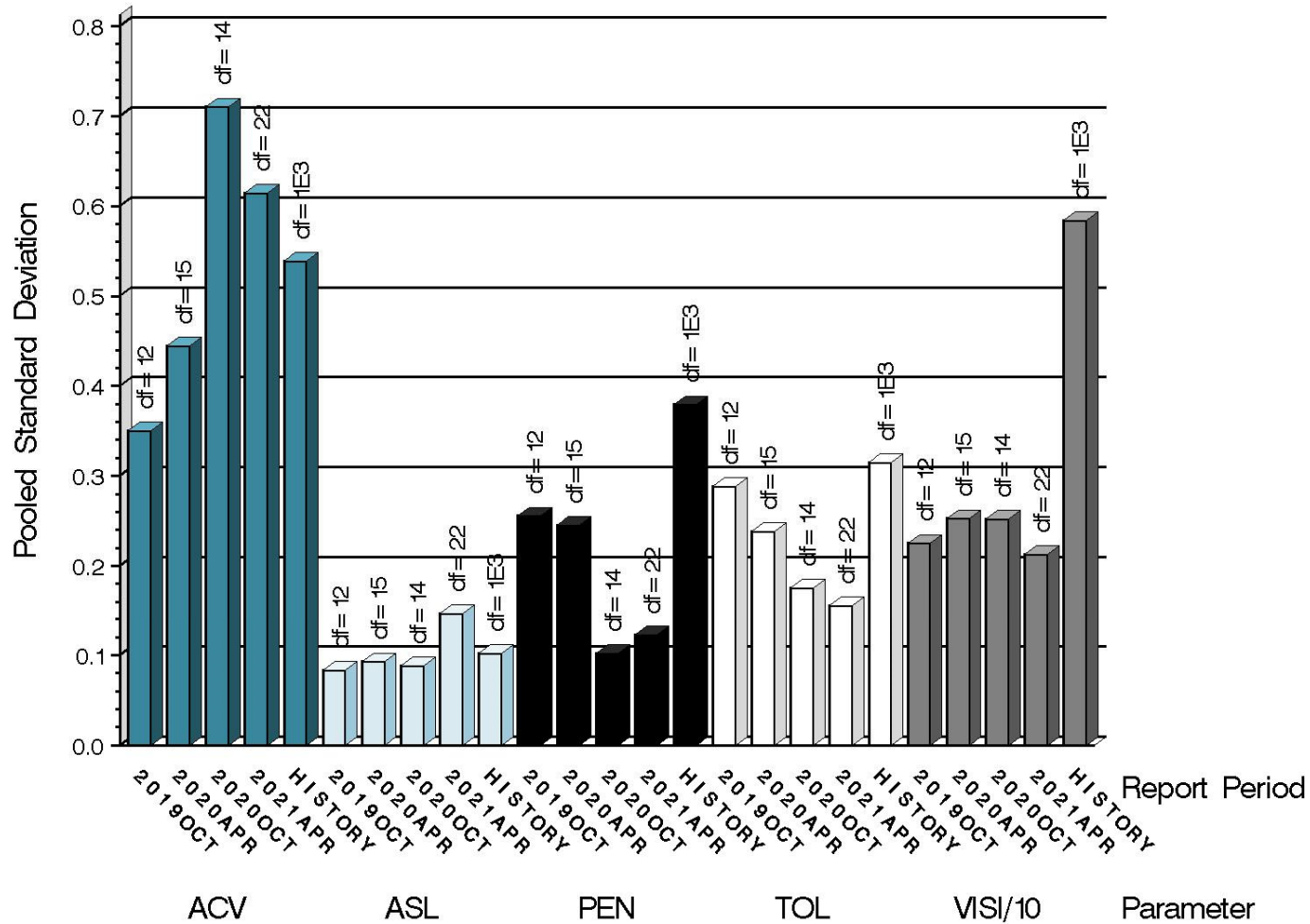


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# L-60-1 (D5704)

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

15:07:12 12APR2021

# L-60-1 (D5704)

## SUMMARY OF SEVERITY & PRECISION

### Severity

ACV and ASL are both currently outside of the limits in the severe direction. All other parameters remained within limits during this period.

The L-60-1 surveillance panel will discuss the severity trend for ACV and ASL at the upcoming May 2021 meeting.

### Precision

All parameters remained within limits during this period.

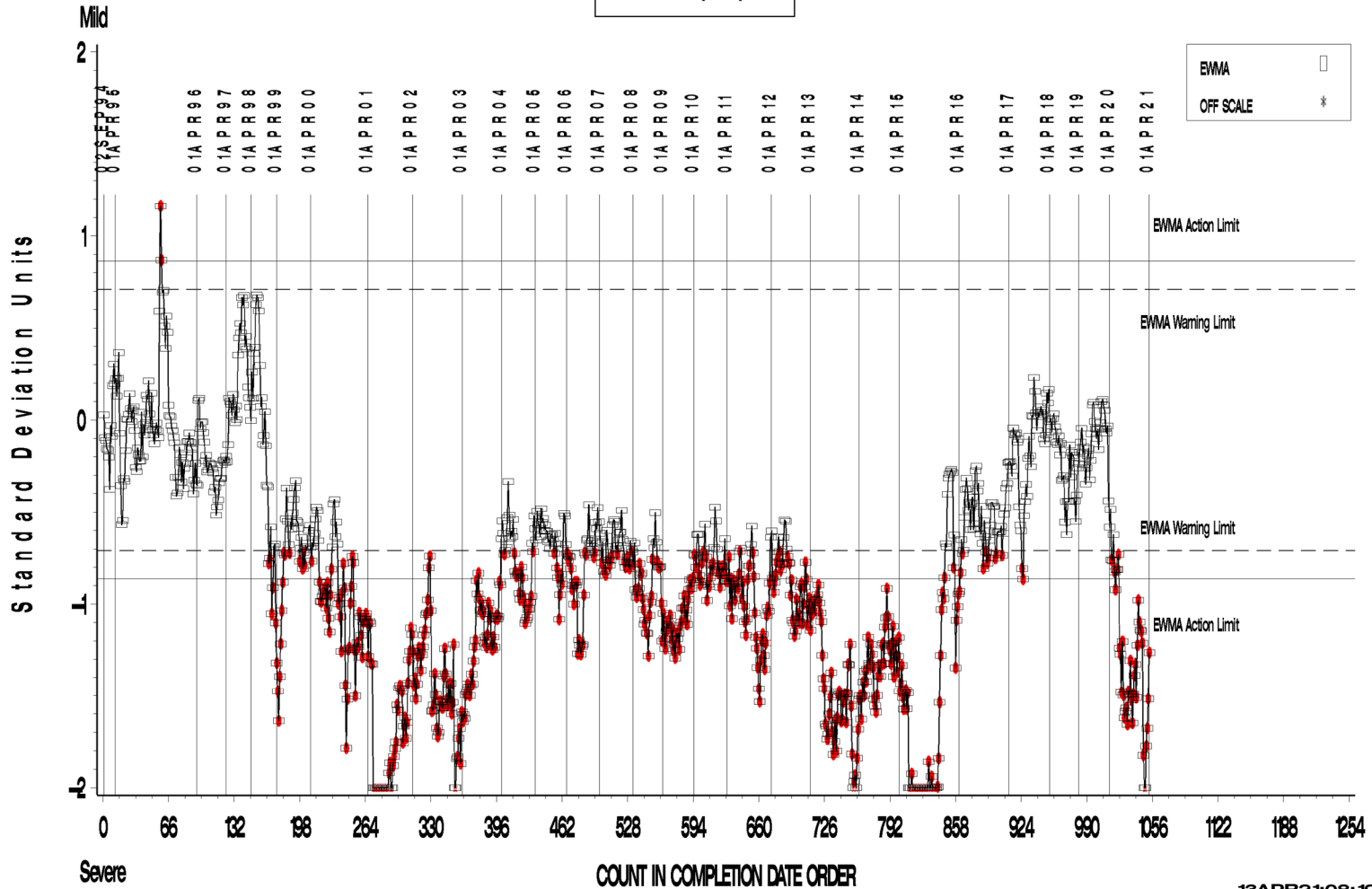
Industry control charts follow.

# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

LTMS Severity Analysis



13APR21:08:19

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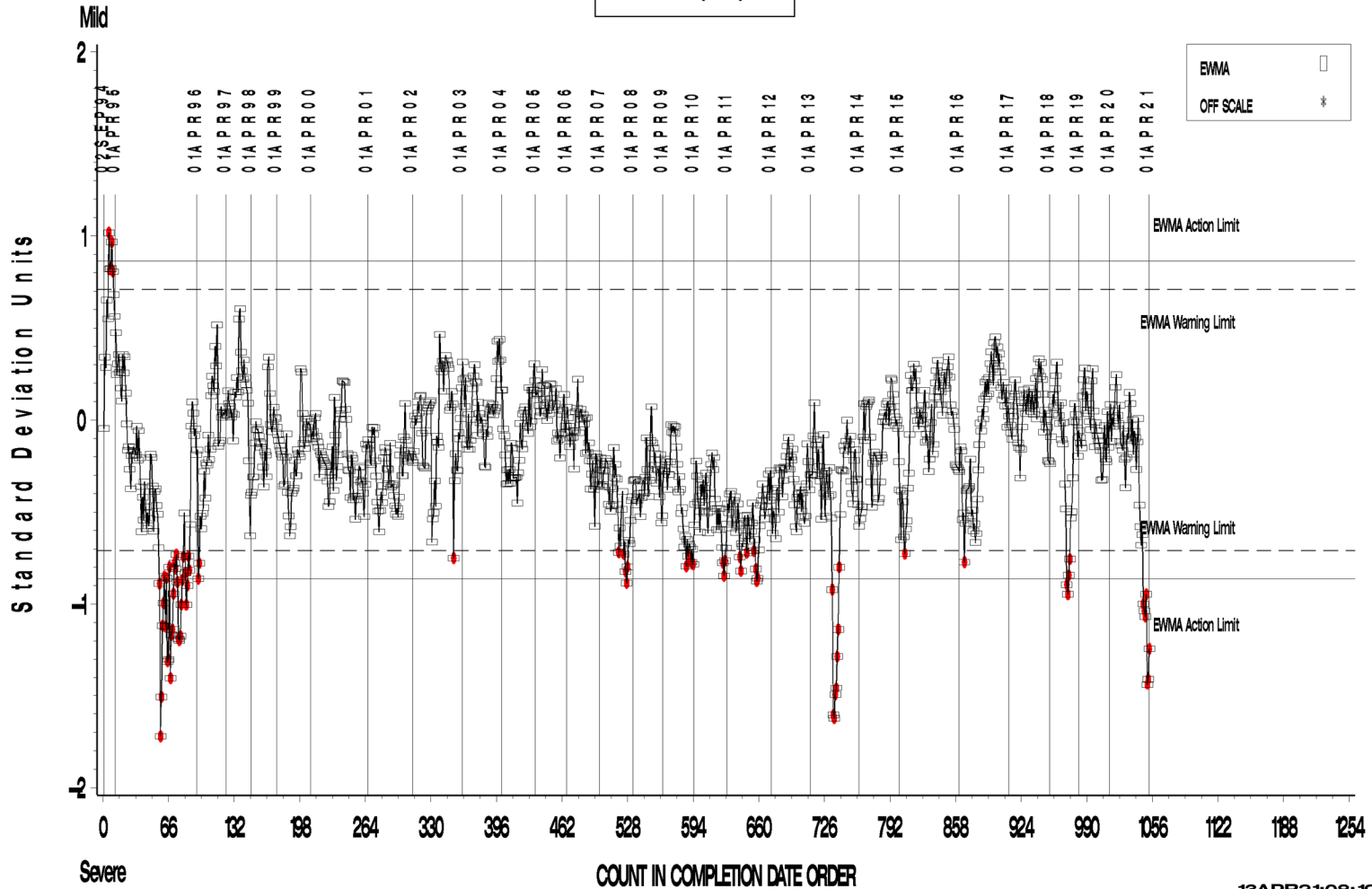
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# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

LTMS Severity Analysis



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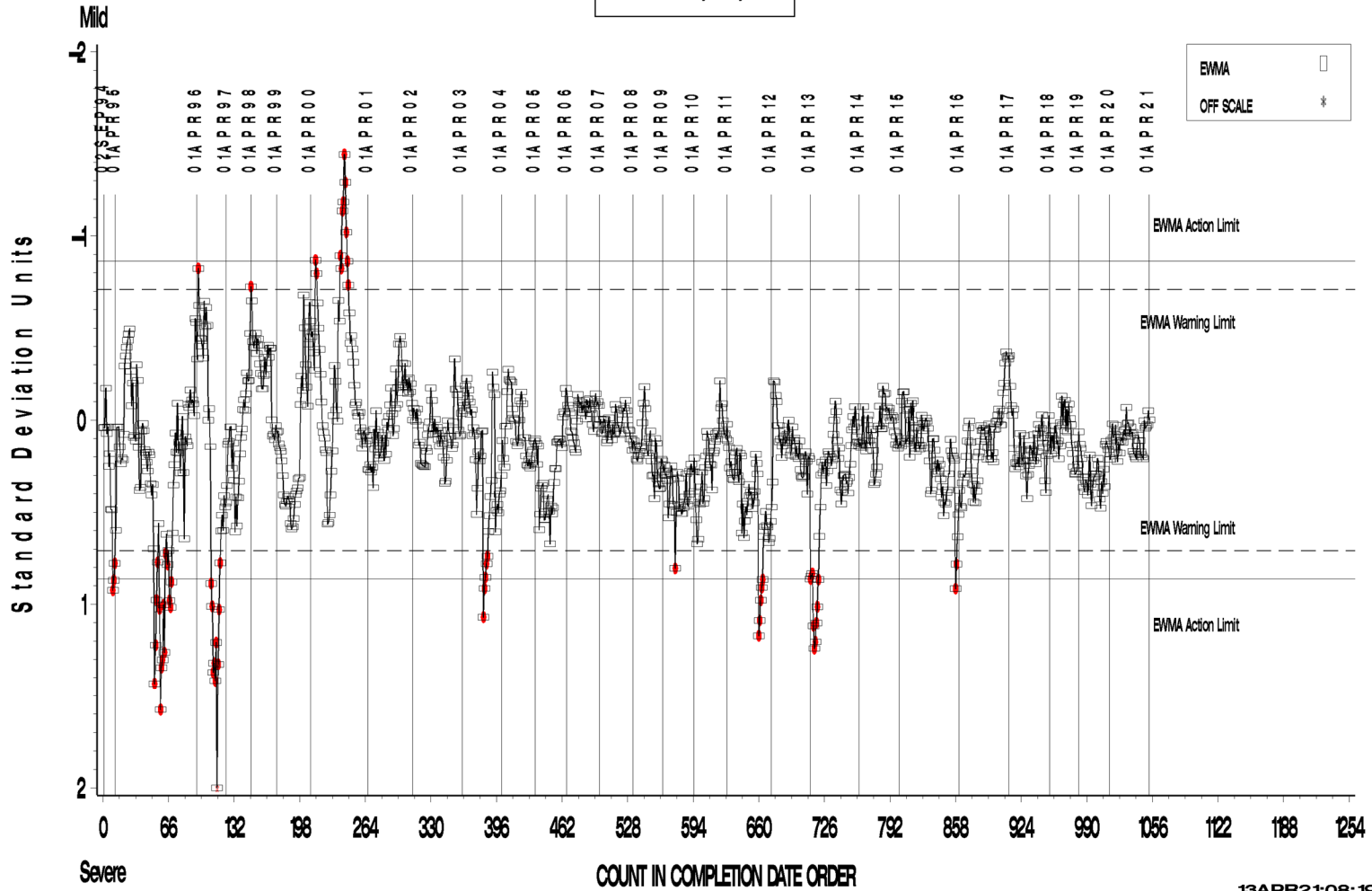
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# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

LTMS Severity Analysis



13APR21:08:19

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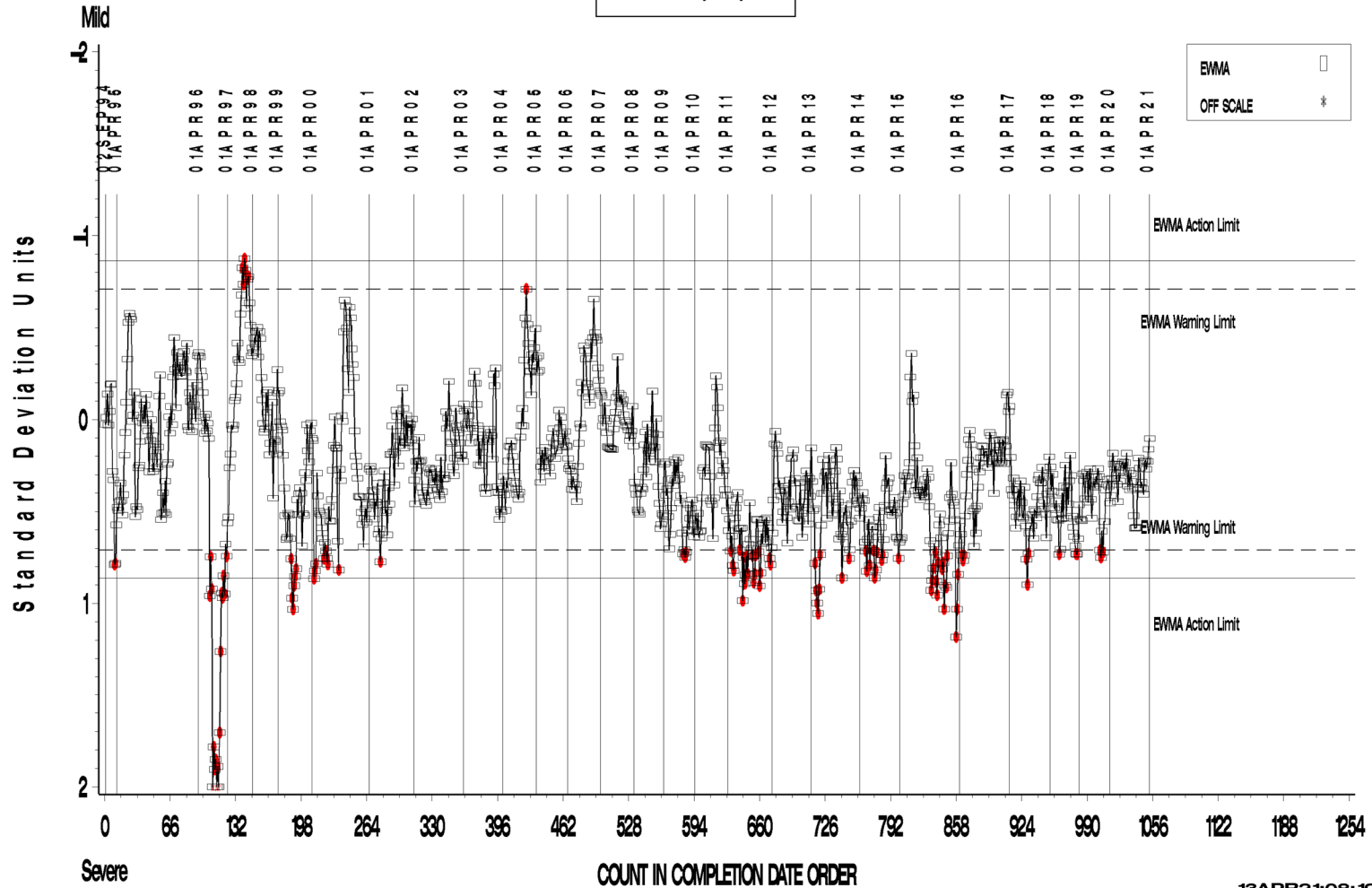
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# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

LTMS Severity Analysis



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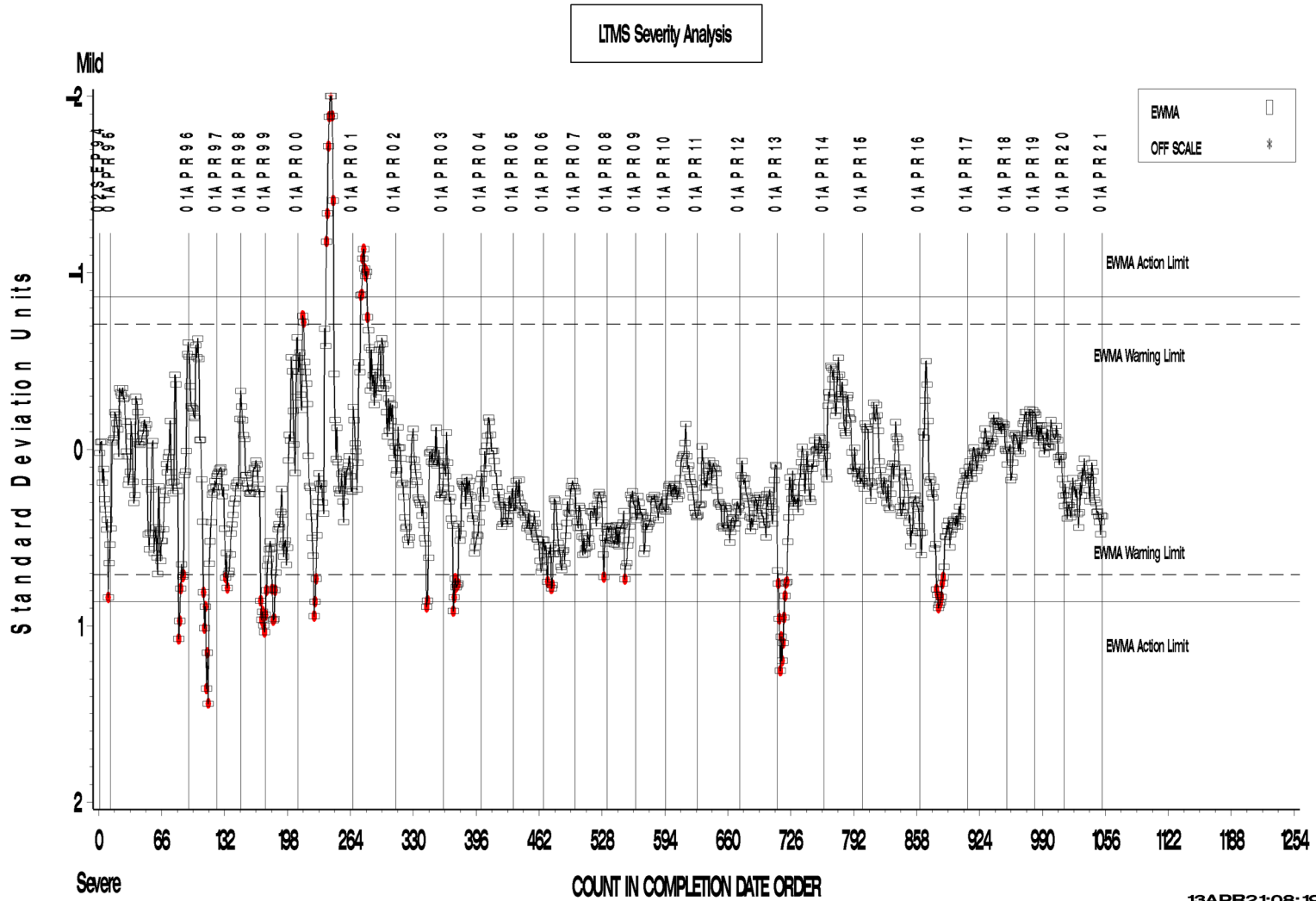


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# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL VISCOSITY INCREASE



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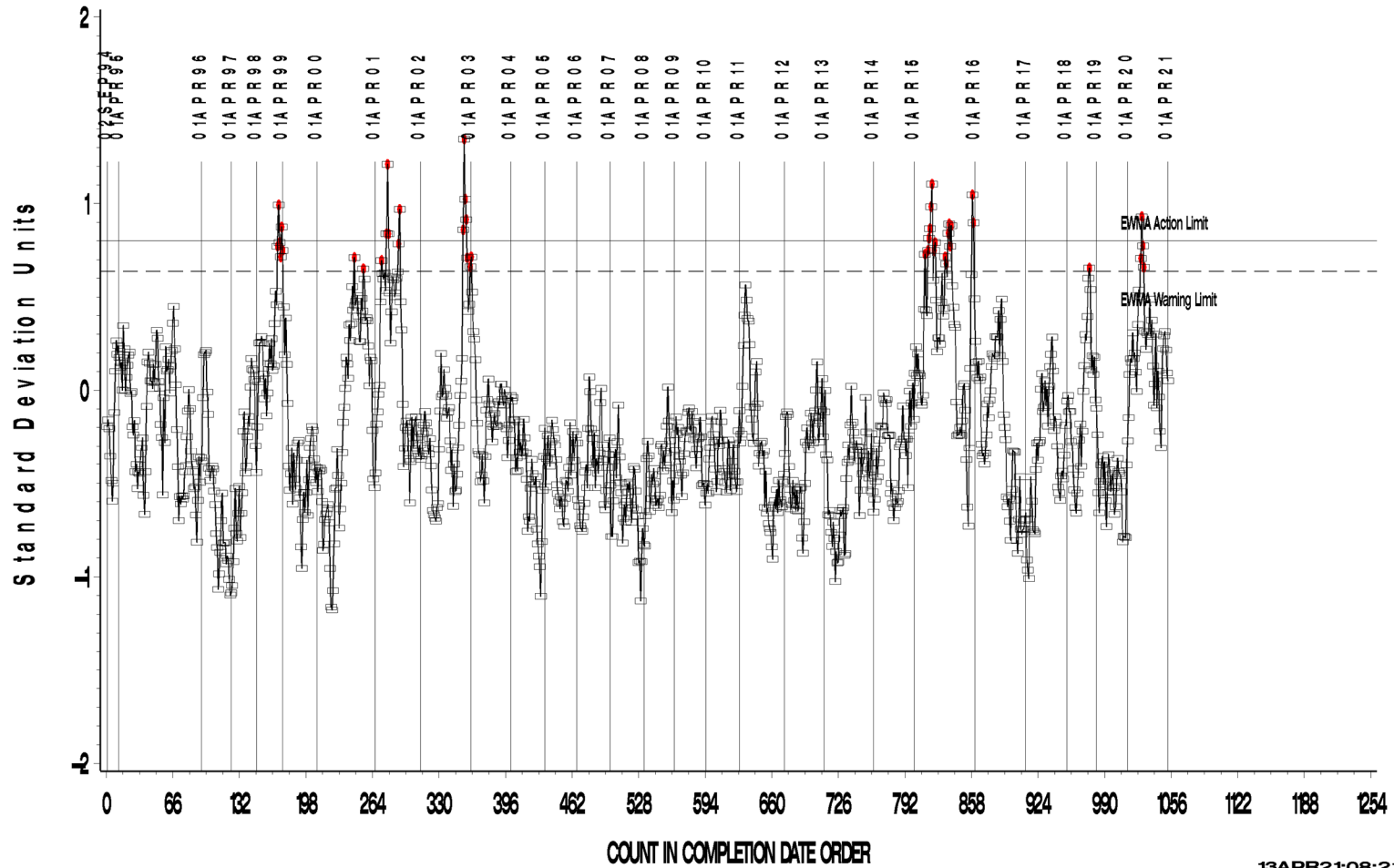
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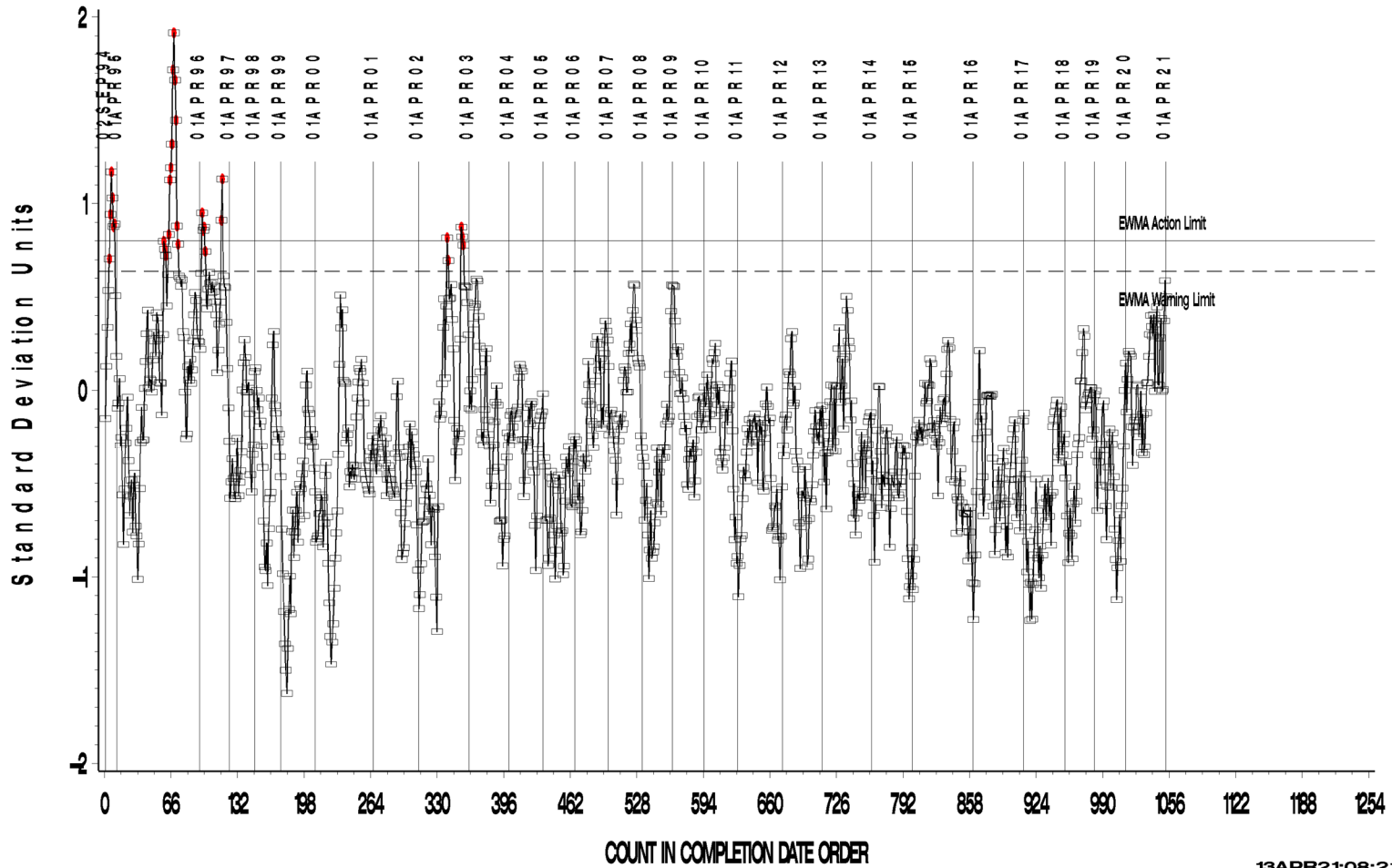


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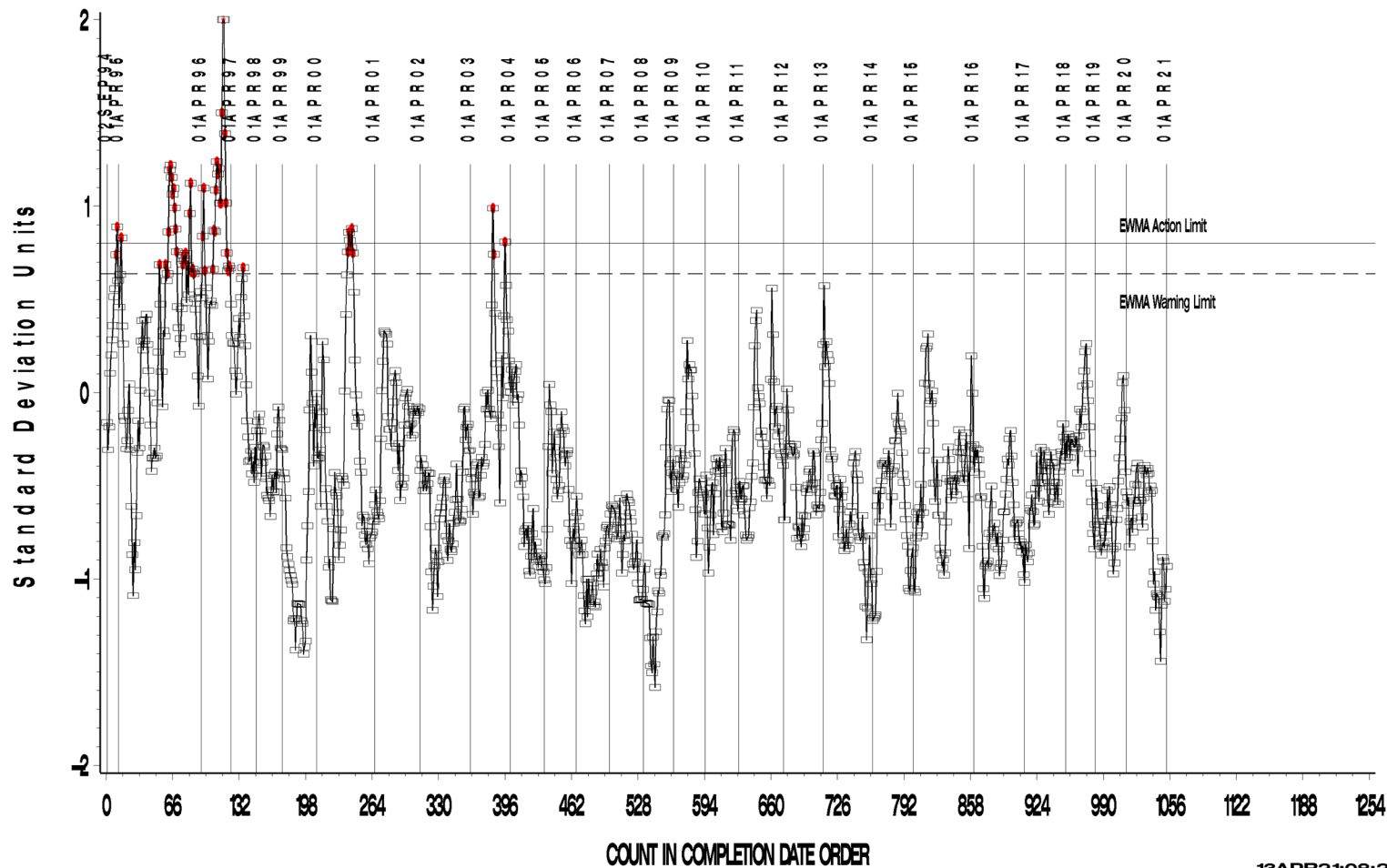
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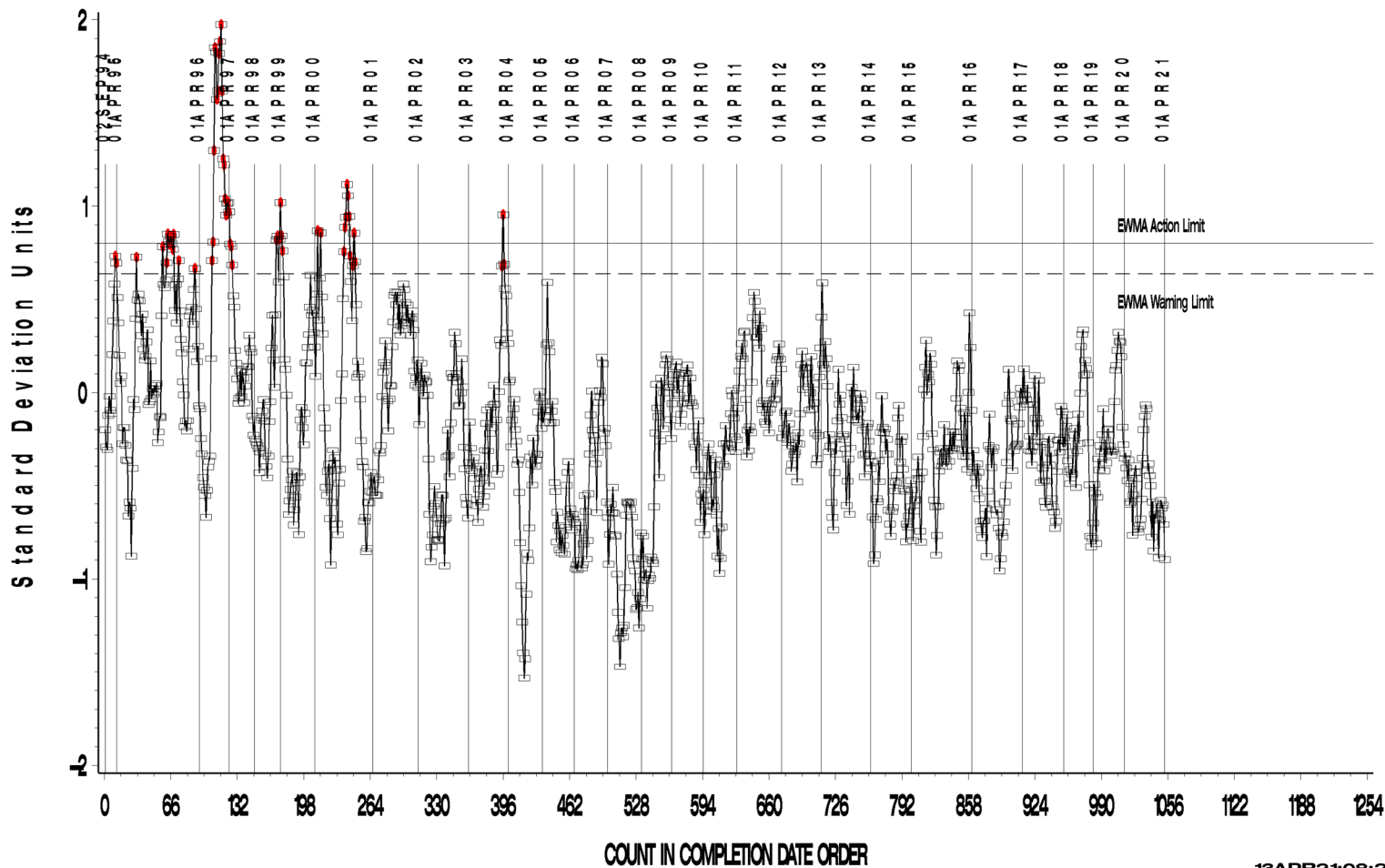
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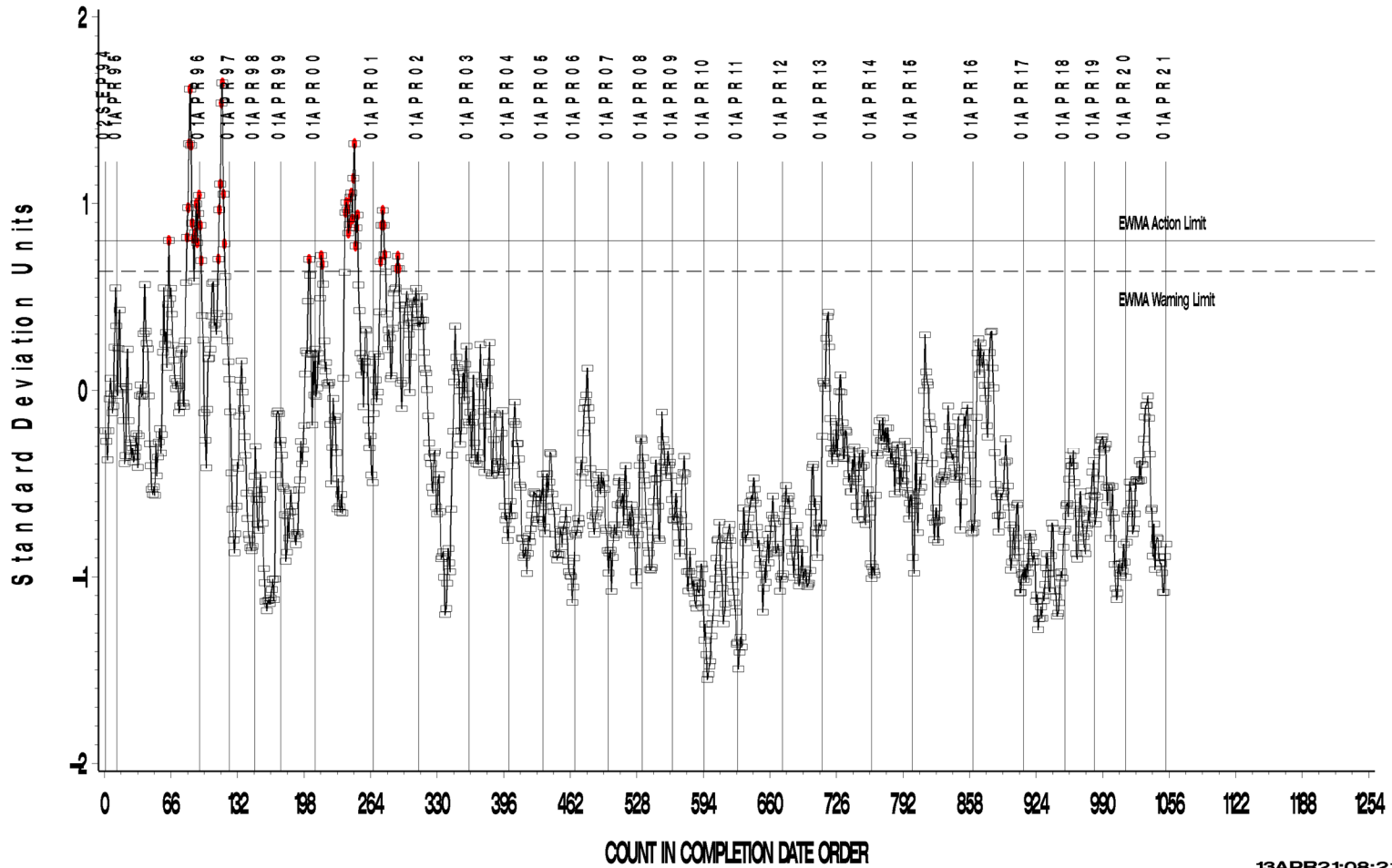
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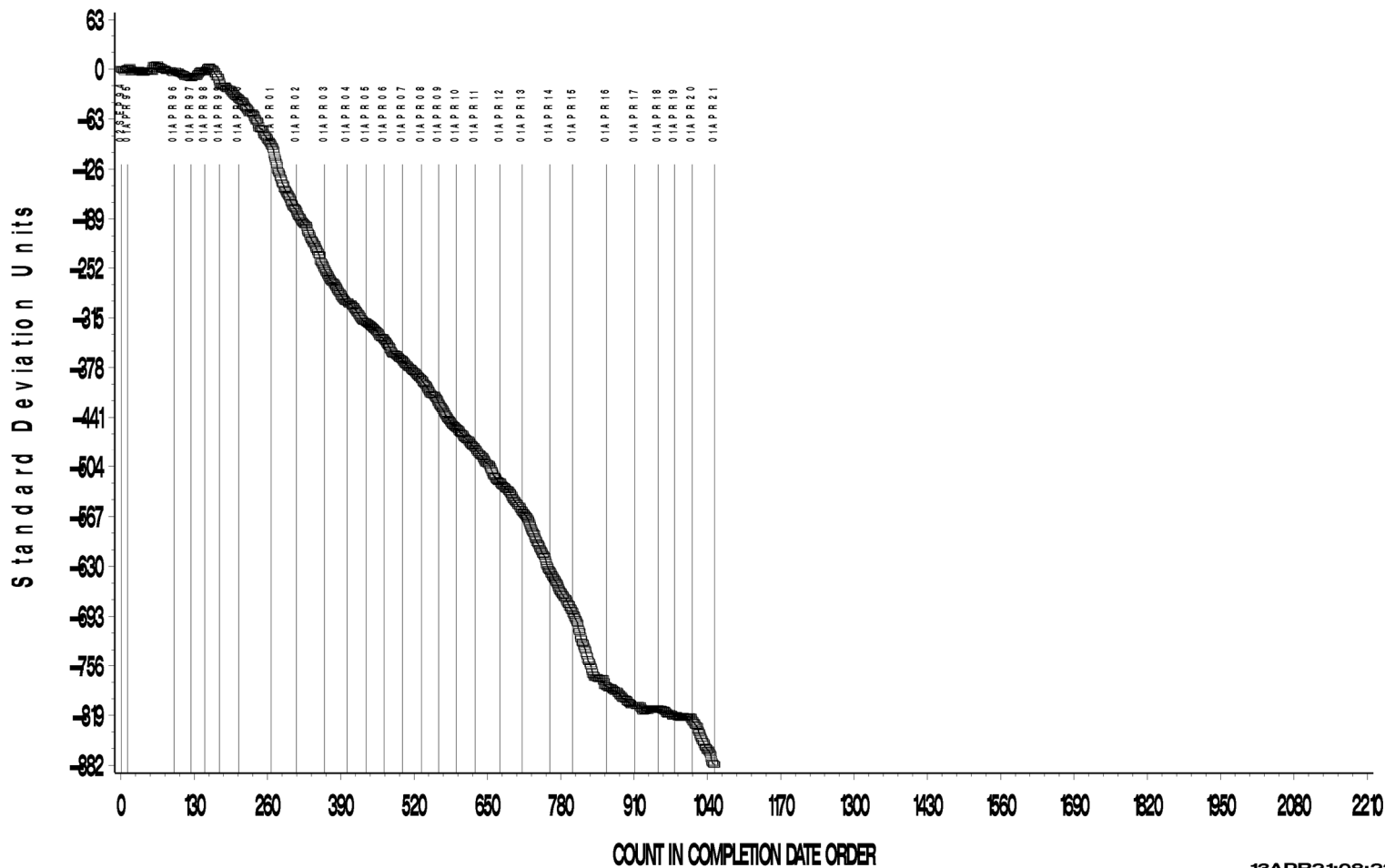
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# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

CUSUM Severity Analysis



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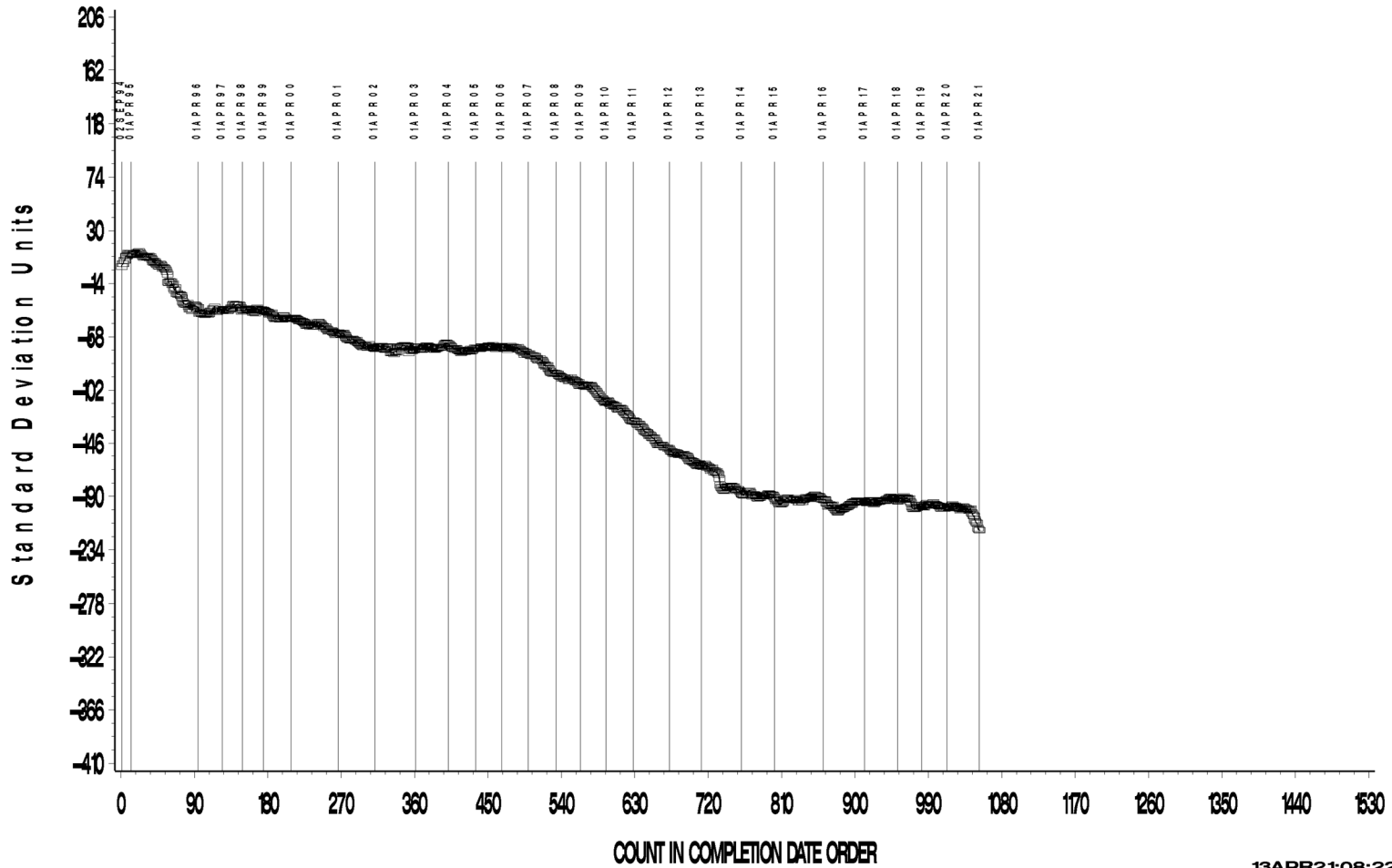
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# L-60-1 (D5704)

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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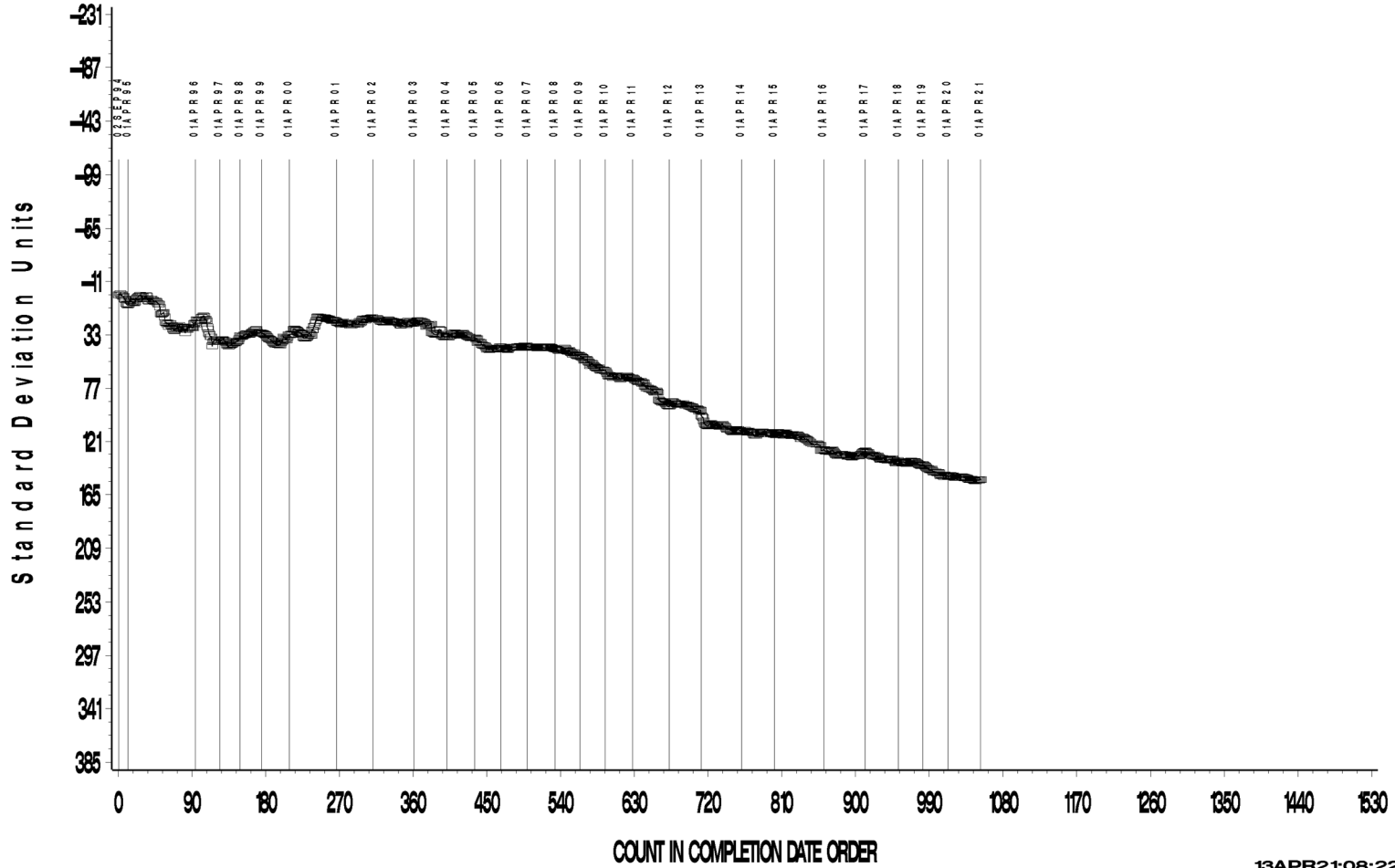
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L-60-1 INDUSTRY OPERATIONALLY VALID DATA

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CUSUM Severity Analysis



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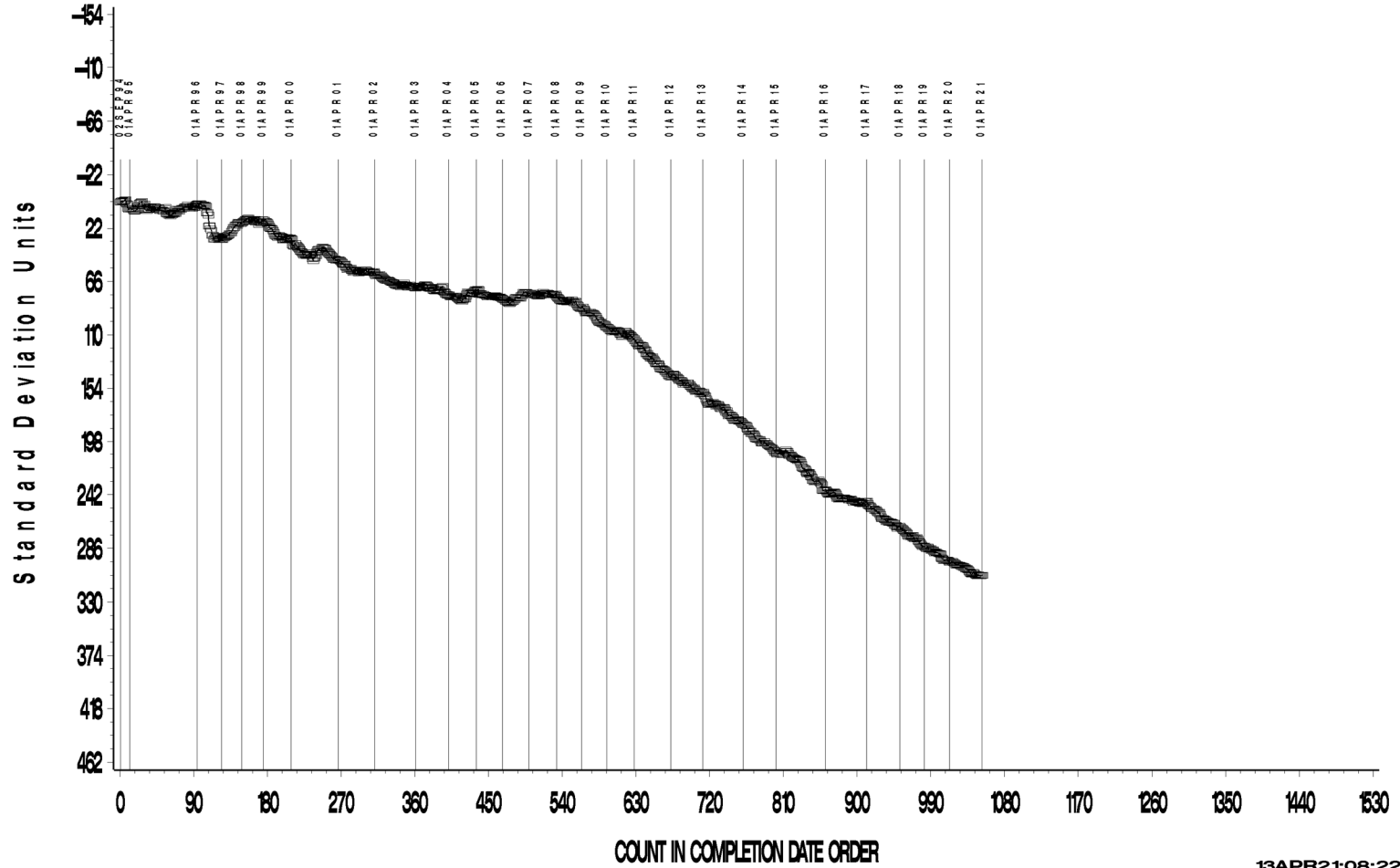
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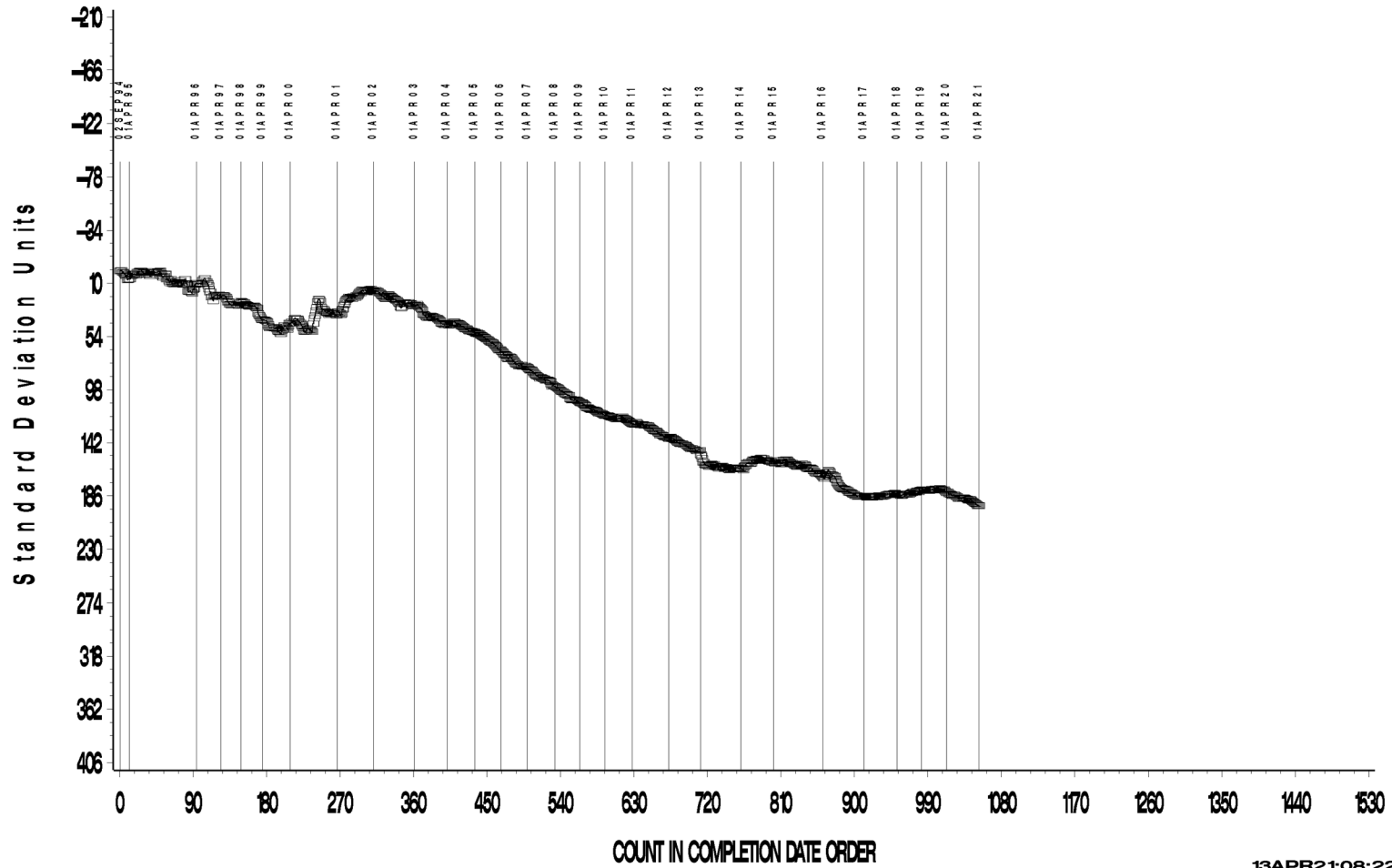
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CUSUM Severity Analysis



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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

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	22	169	10.6
155-1	21	554	34.6
Total	43	723	45.2

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 36.75 gallons is available for use in other gear testing. 169 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.