



## Test Monitoring Center

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

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

MEMORANDUM: 19-005

DATE: April 8, 2019

TO: Kristijan Drlja, Chairman, L-60-1 Surveillance Panel

FROM: Dylan Beck *Dylan Beck*

SUBJECT: L-60-1 Reference Oil Testing from October 1, 2018 through March 31, 2019

Attached is a summary of testing activity this period.

DJB/djb/mem19-005.djb.doc

cc: Frank Farber

Jeff Clark

L-60-1 Surveillance Panel

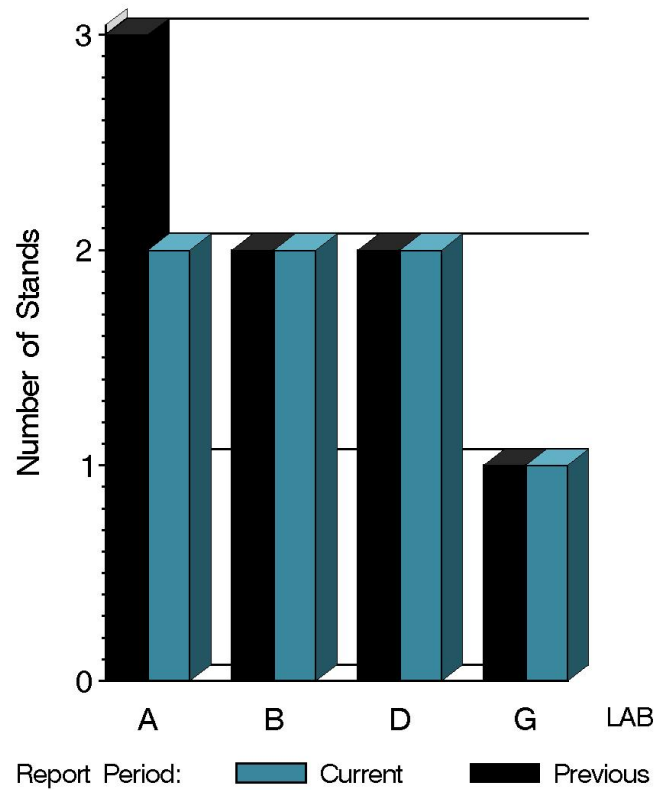
<http://www.astmtmc.cmu.edu/ftp/docs/gear/l601/semiannualreports/l601-04-2019.pdf>

Distribution: email

# L-60-1 (D5704)

	Reporting Data	Calibrated on 3-31-19
Number of Labs	4	4
Number of Stands	7	7

BY-LAB STAND  
DISTRIBUTION



9:14:00 04APR2019

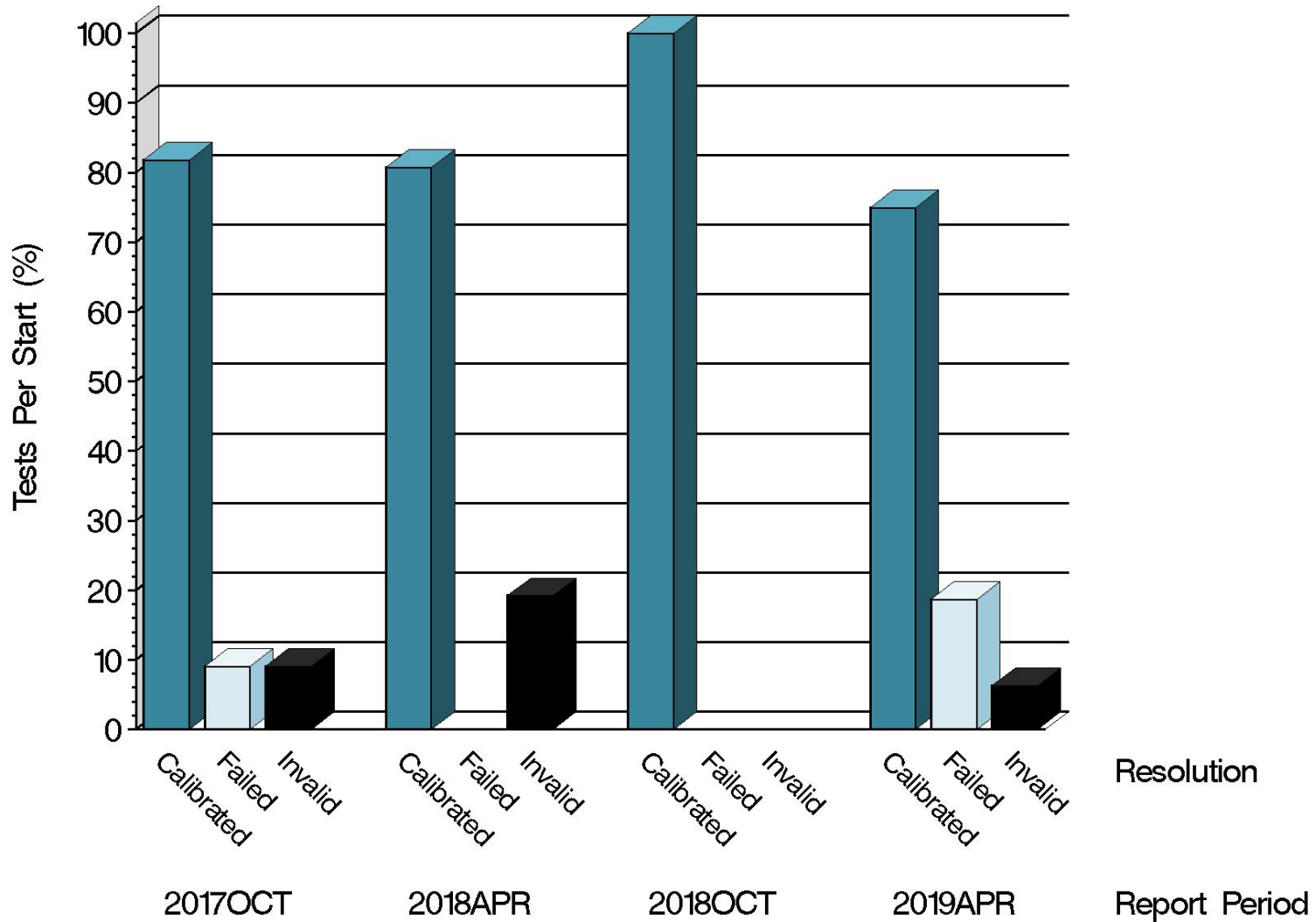
# L-60-1 (D5704)

## Test Distribution by Oil and Validity

				Totals	
		148-1	155-1	Last Period	This Period
Accepted for calibration	AC	6	6	14	12
Rejected (Mild)	OC	0	0	0	0
Rejected (Severe)	OC	1	2	0	3
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	3	3	2	6
Aborted info run	XI	2	0	0	2
Aborted	XC	0	1	0	1
<b>Total</b>		<b>12</b>	<b>12</b>	<b>16</b>	<b>24</b>

# L-60-1 (D5704)

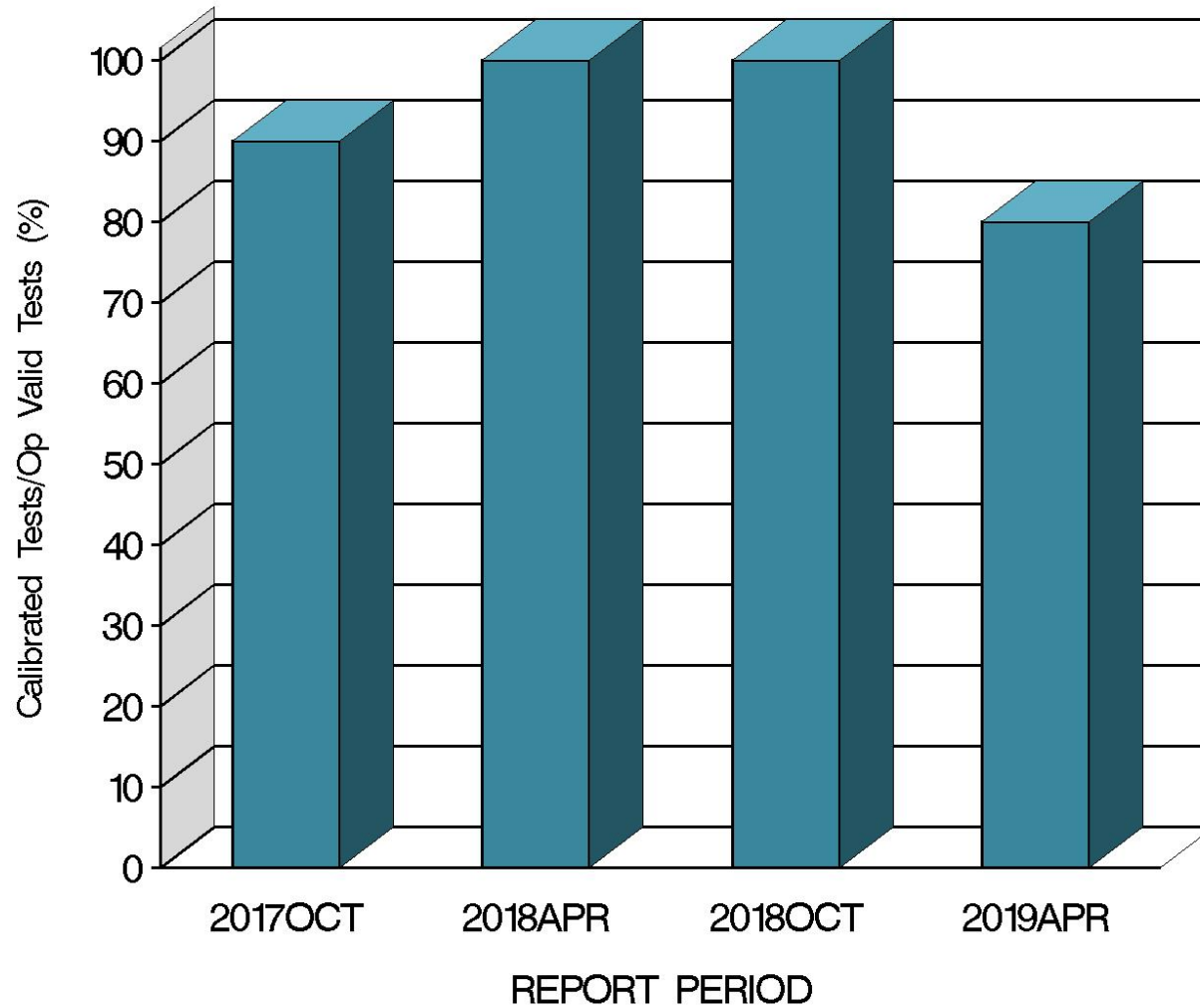
## CALIBRATION ATTEMPT SUMMARY



9:14:00 04APR2019

# L-60-1 (D5704)

OPERATIONALLY VALID TESTS  
MEETING ACCEPTANCE CRITERIA



9:14:00 04APR2019

# 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	24	4.2%
	Lost	0	0	0	0	1			
	Starts	12	12	24	24	24			
	%	0%	0%	0%	0%	4.2%			

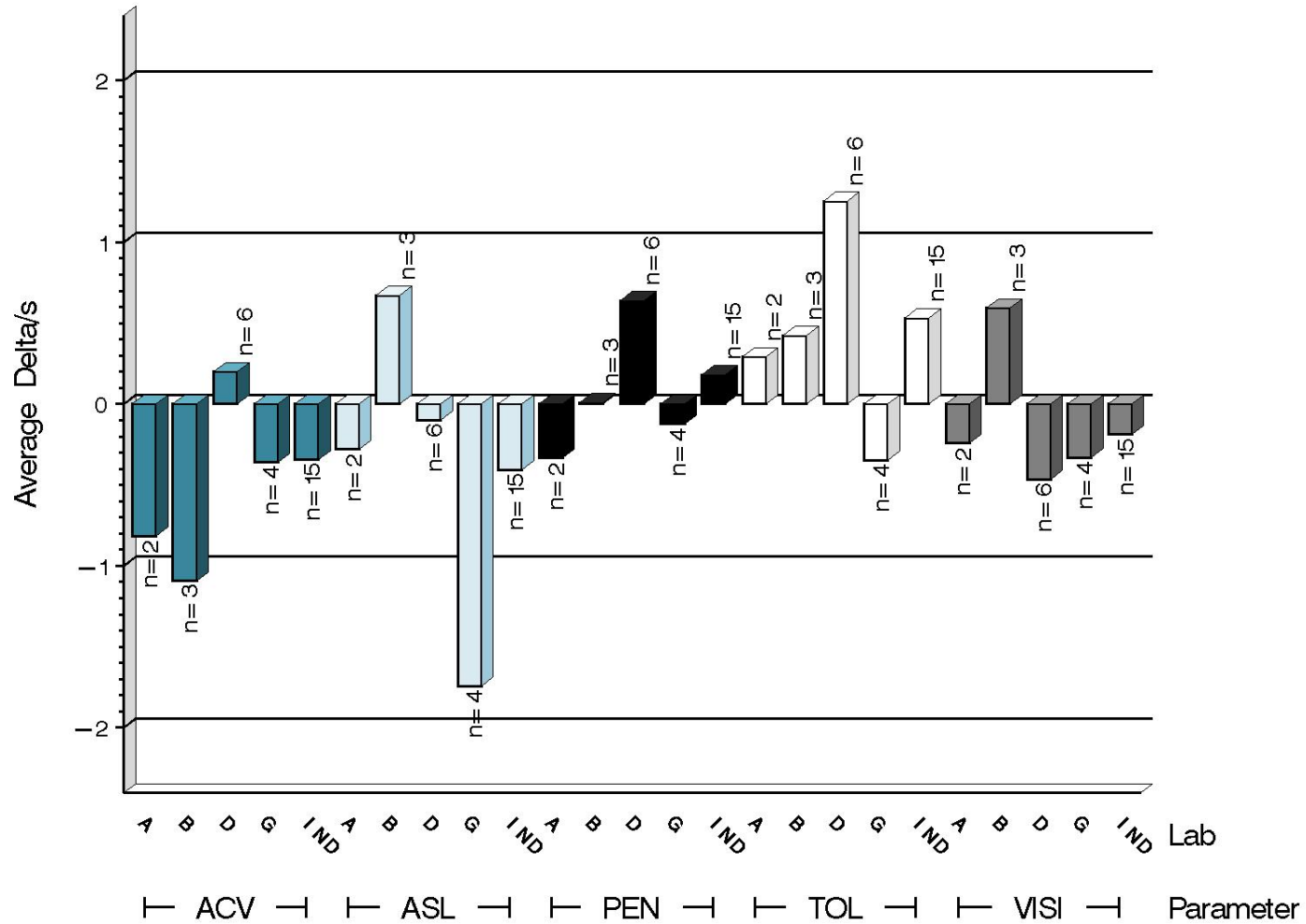
# L-60-1 (D5704)

Average $\Delta$ /s by Lab						
Lab	n	VISI	PEN	TOL	ACV	ASL
A	2	-0.2431	-0.334	0.291	-0.815	-0.280
B	3	0.594	0.010	0.424	-1.092	0.672
D	6	-0.466	0.639	1.255	0.200	-0.099
G	4	-0.331	-0.123	-0.347	-0.360	-1.742
Industry	15	-0.188	0.180	0.533	-0.343	-0.407
Shift*	15	-1.443%	0.074%	0.133%	-0.175 merits	-0.043 merit

\*computed using severity adjustment standard deviation. A correction factor was implemented for ACV on October 1, 2015 that is intended to return industry ACV performance to the level originally seen in the test.

# L-60-1 (D5704)

TEST SEVERITY  
DELTA/S BY LAB

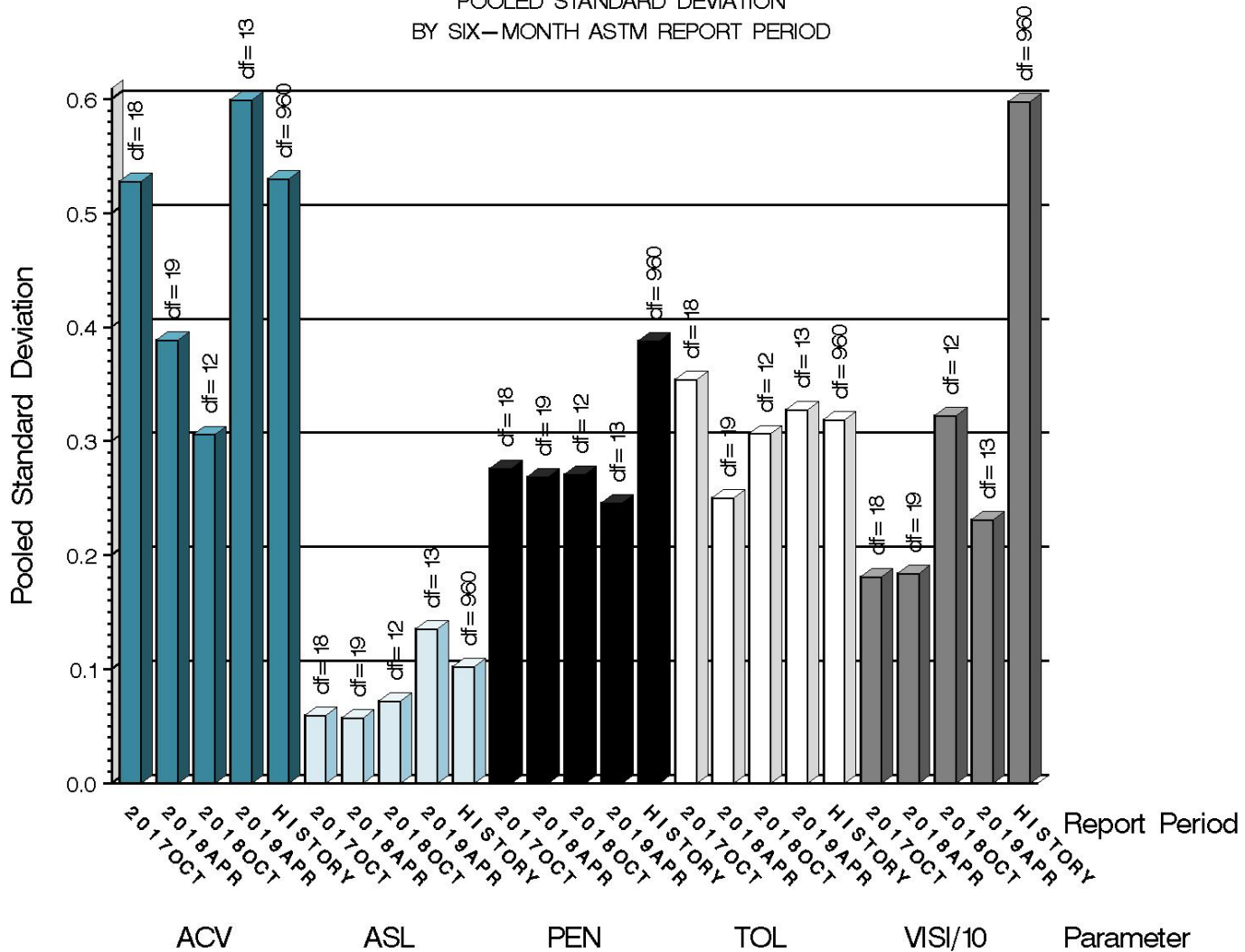


9:14:00 04APR2019



# 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

9:14:00 04APR2019

# L-60-1 (D5704)

## SUMMARY OF SEVERITY & PRECISION

### Severity

The Surveillance Panel implemented a correction factor for ACV on October 1, 2015 intended to return ACV to target. ACV has remained within limits this period. Severity for sludge briefly exceeded the limits the period but has since returned within line.

### Precision

Precision for all parameters remained within limits this period.

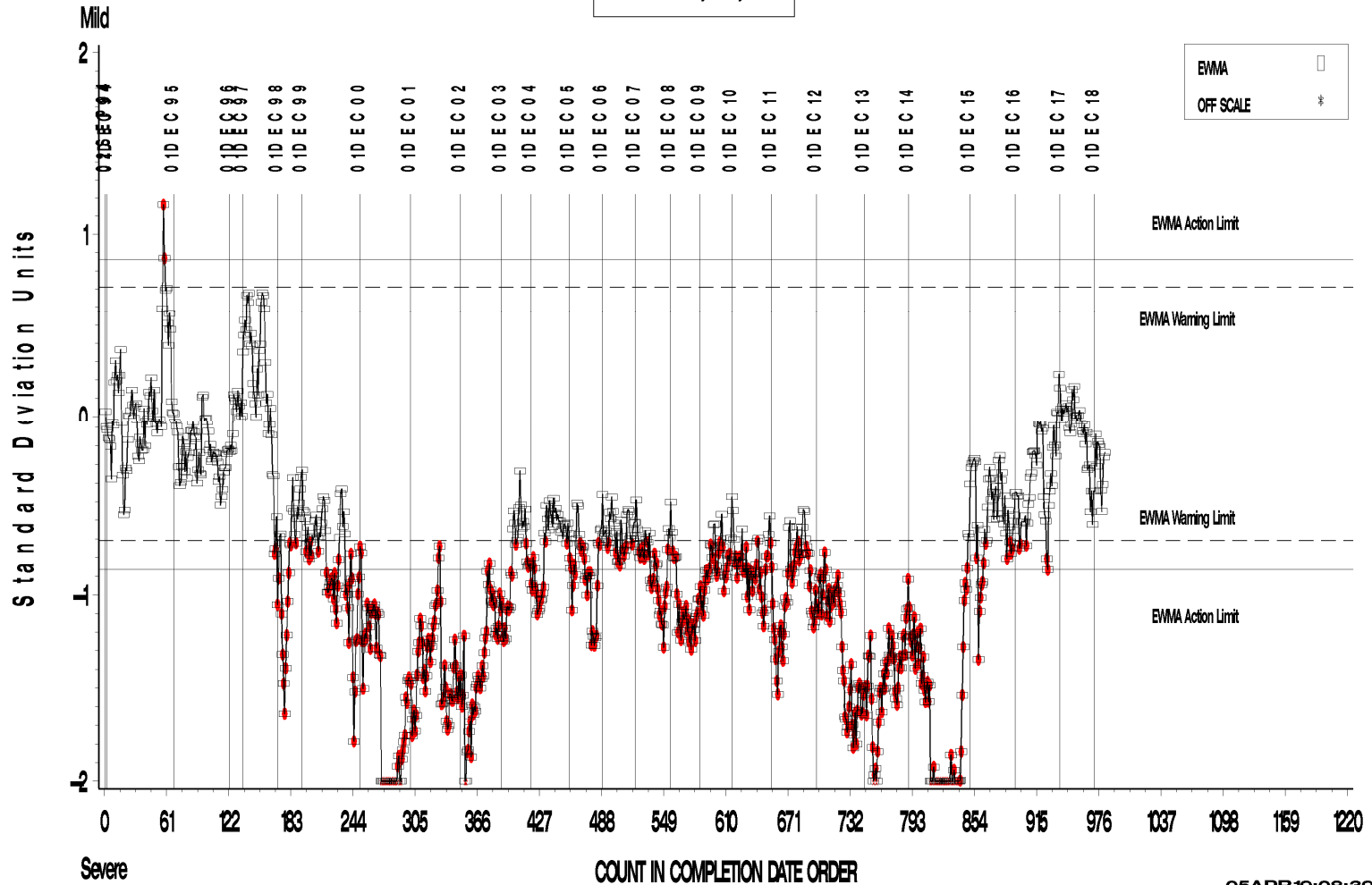
Industry control charts follow.

# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

LTMS Severity Analysis

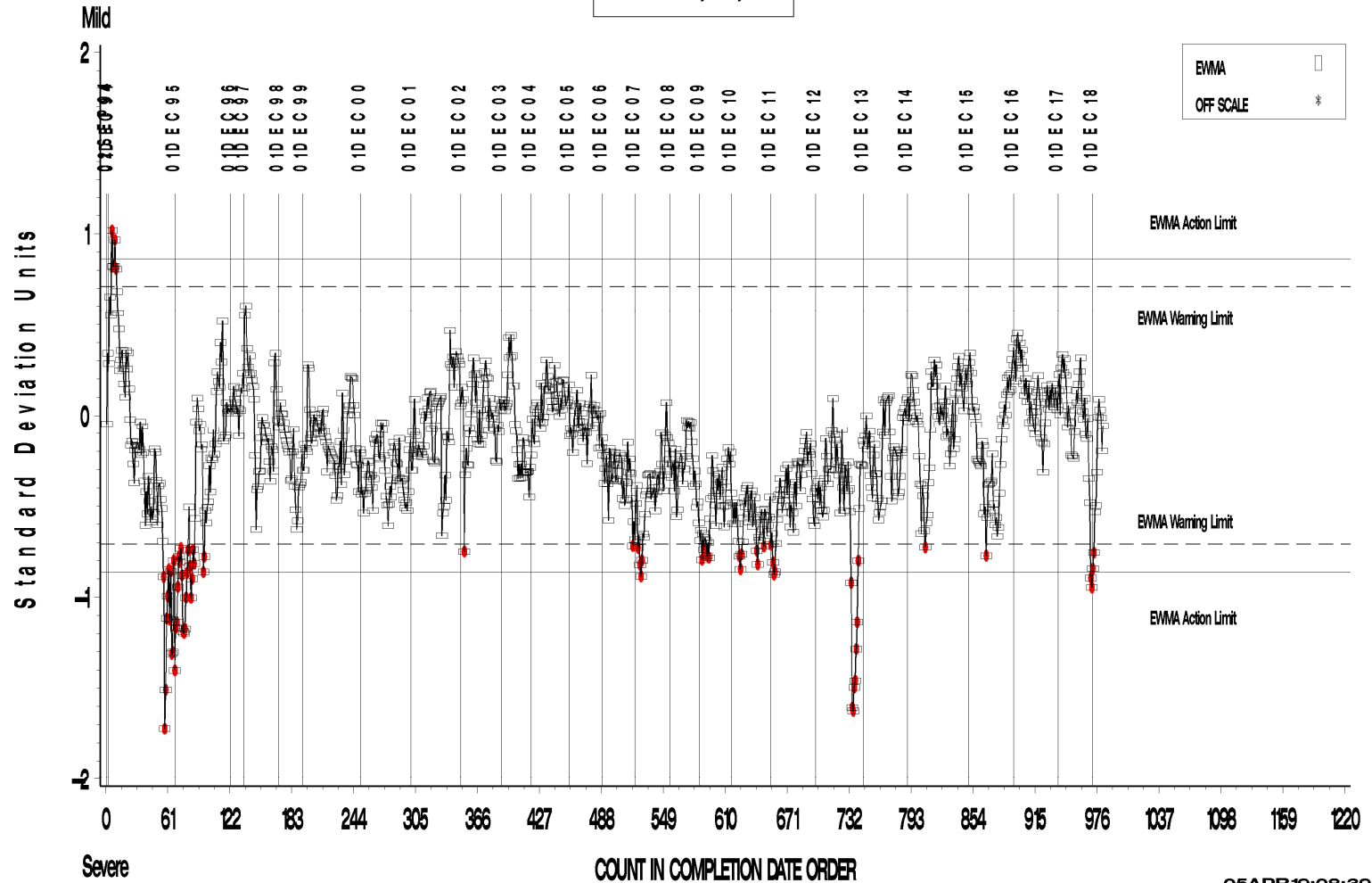


# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

LTMS Severity Analysis

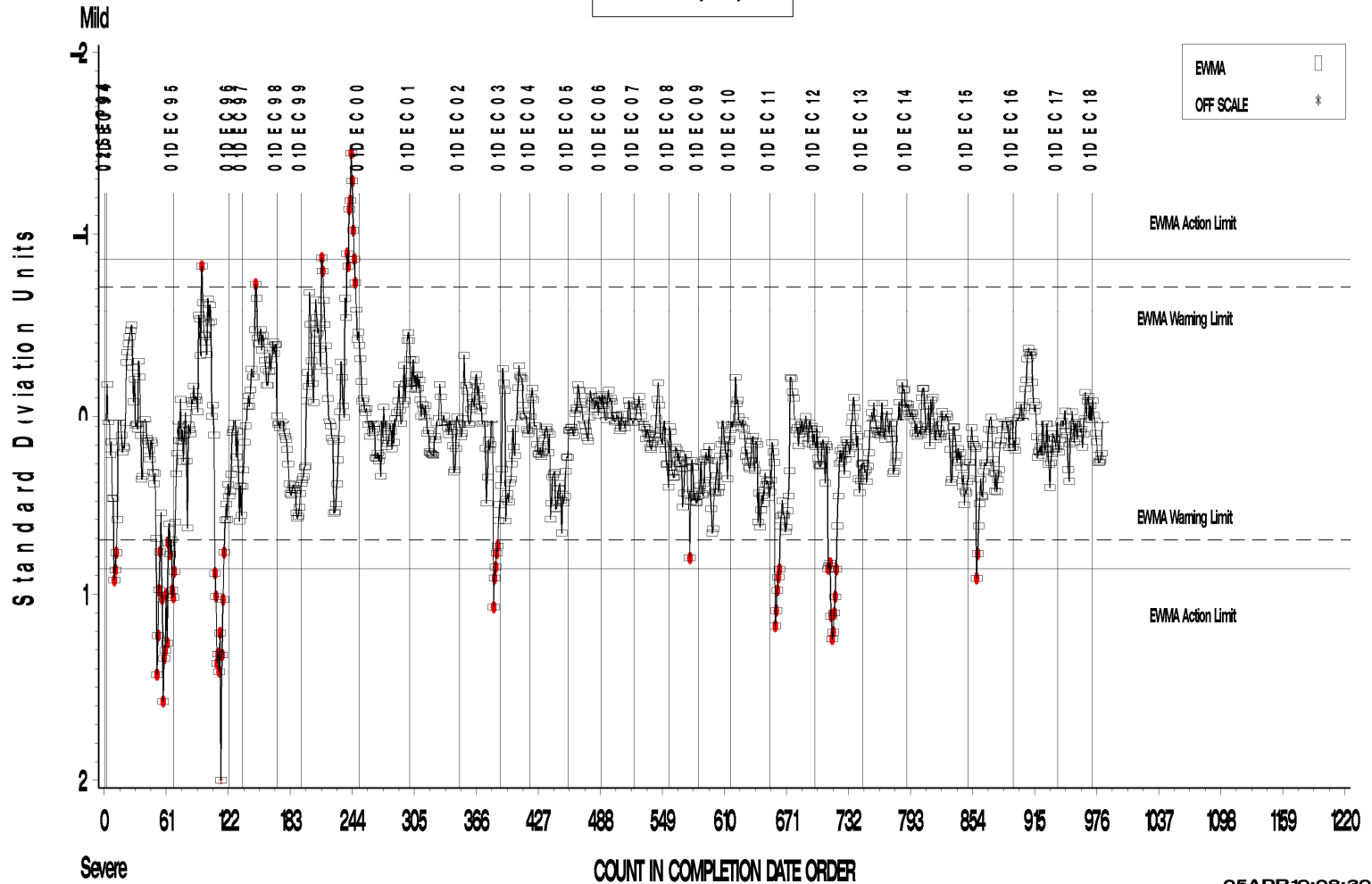


# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

LTMS Severity Analysis

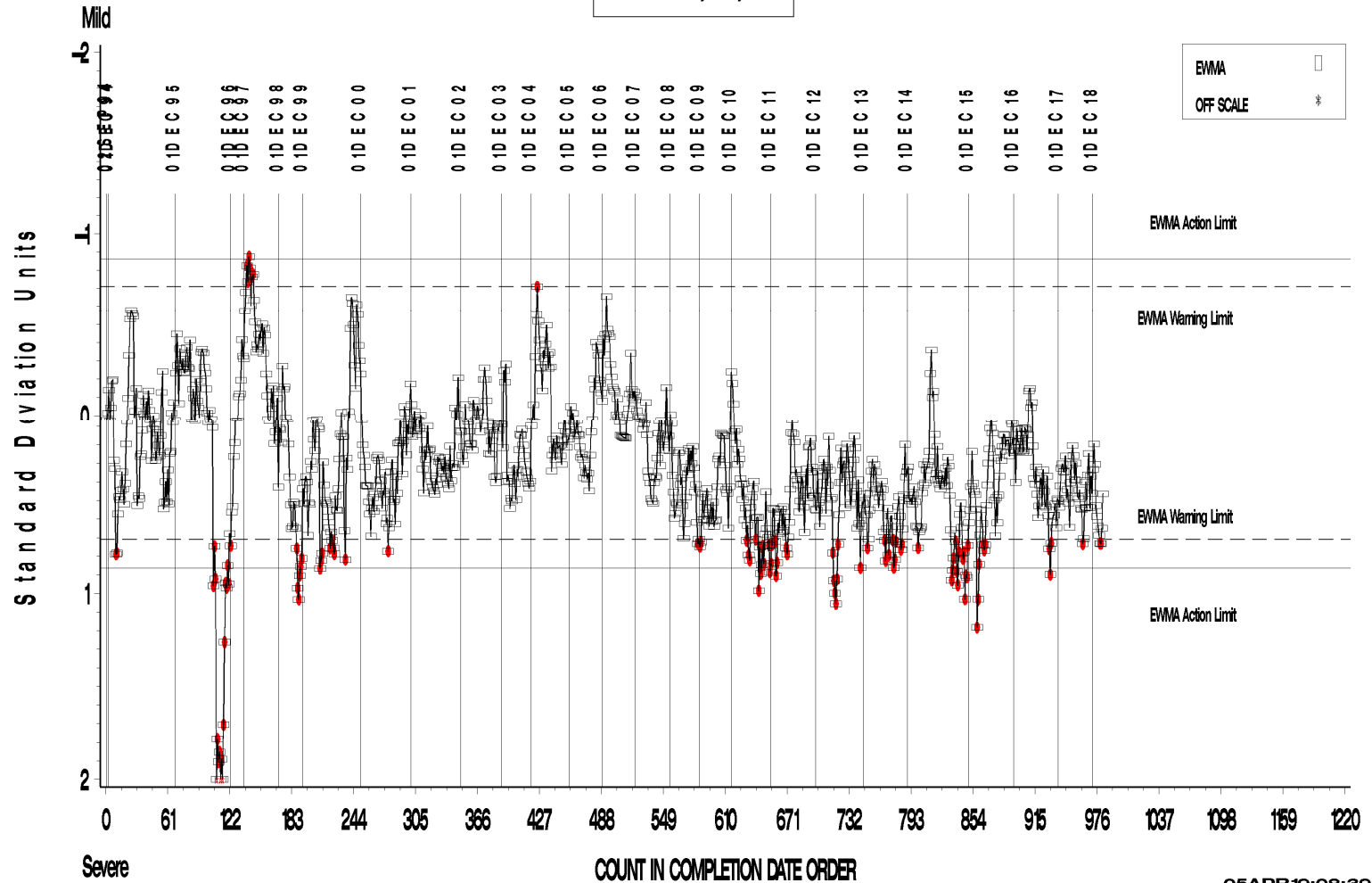


# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

LTMS Severity Analysis

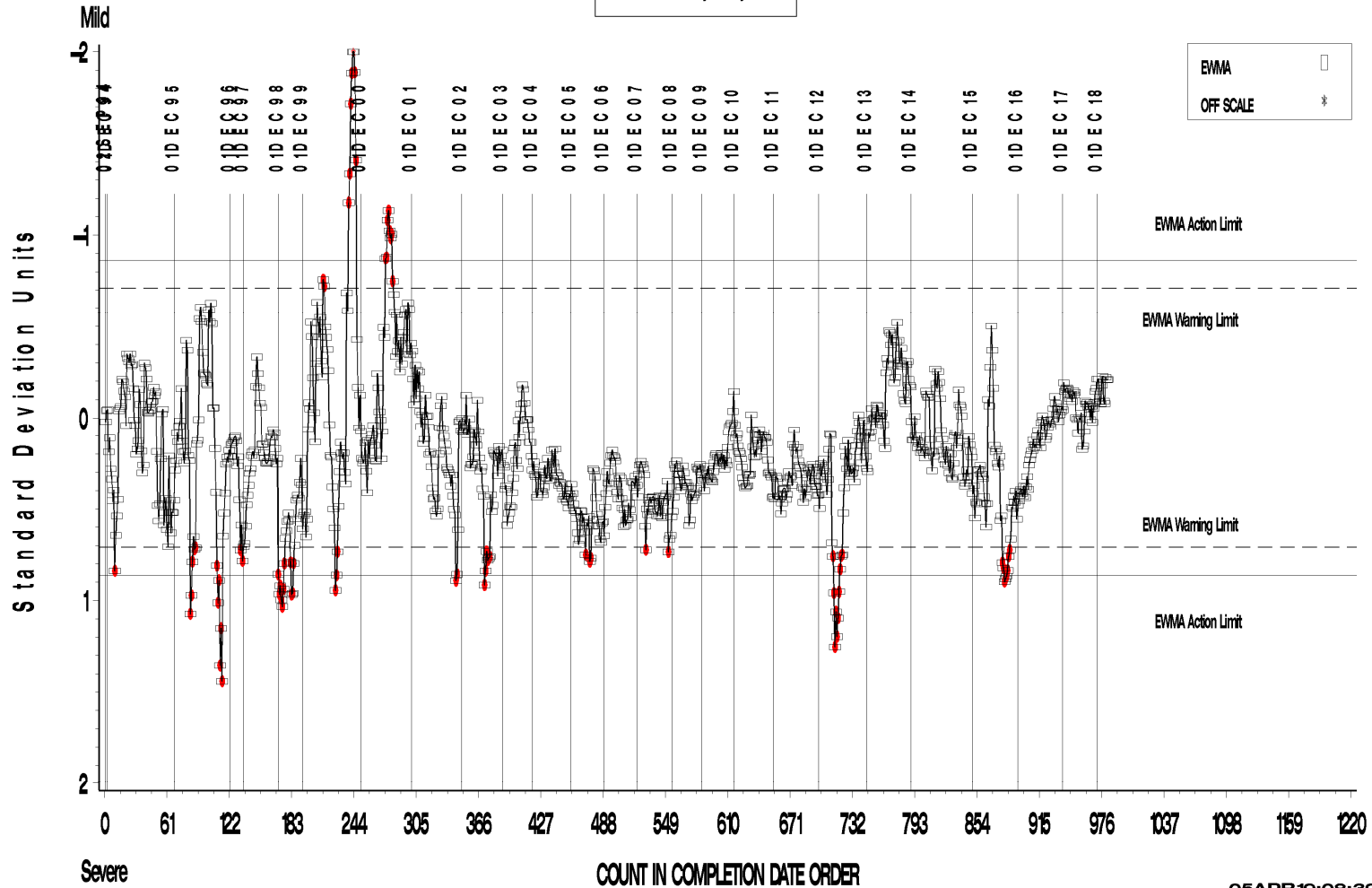


# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL VISCOSITY INCREASE

LTMS Severity Analysis

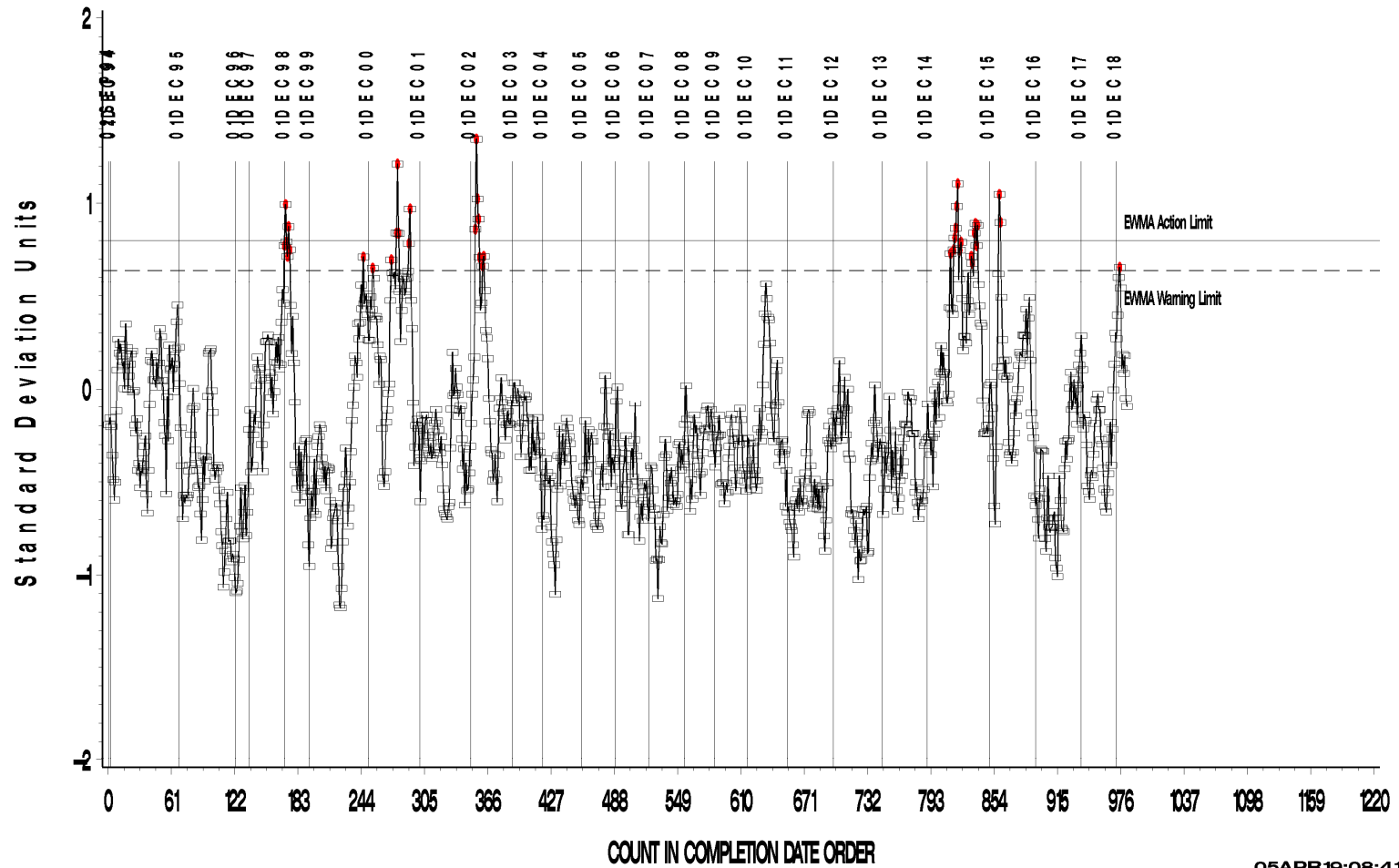


# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

LTMS Precision Analysis



05APR19:08:41

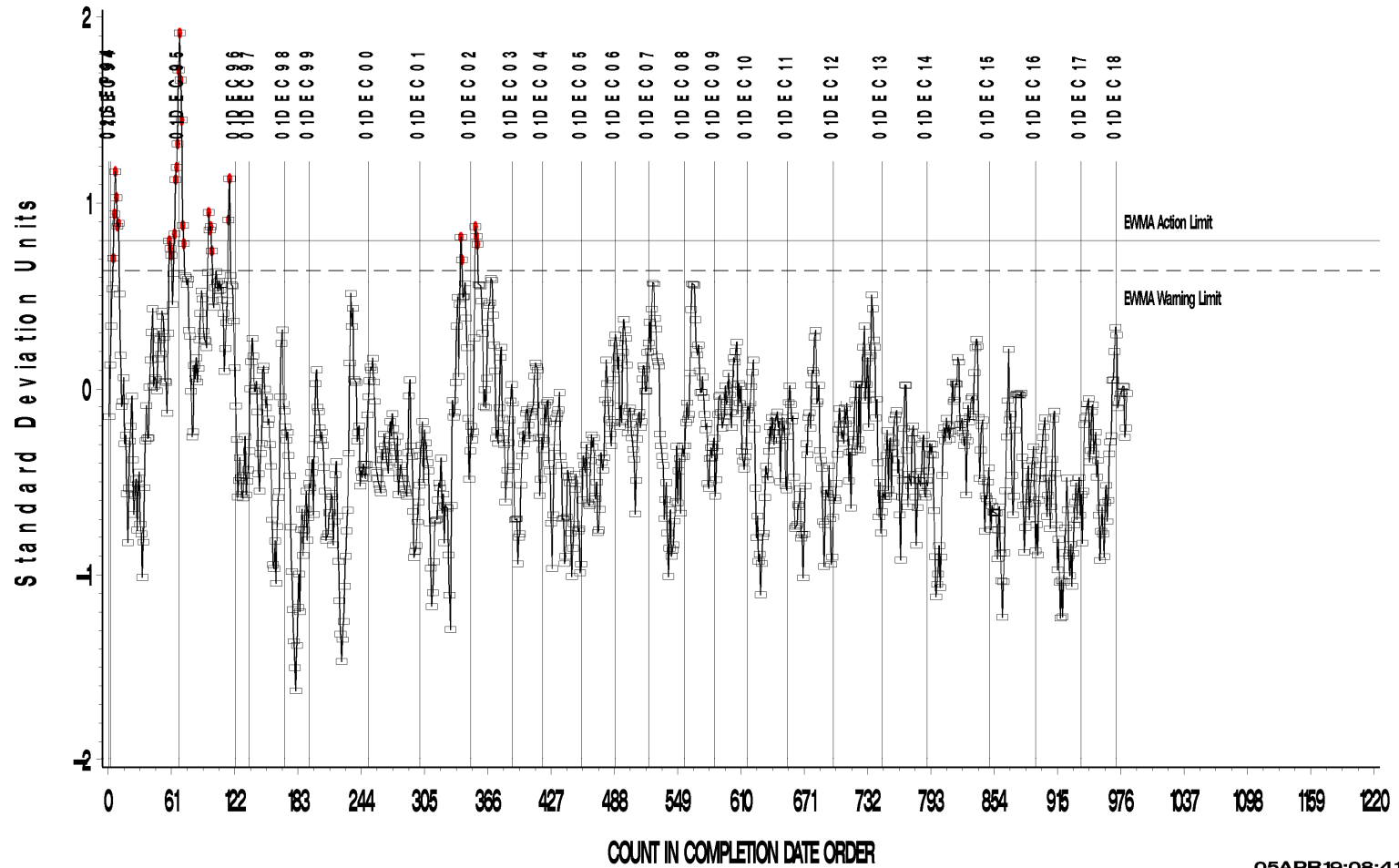


# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

LTMS Precision Analysis



05APR19:08:41

**Test Monitoring Center**  
<http://astmtmc.cmu.edu>



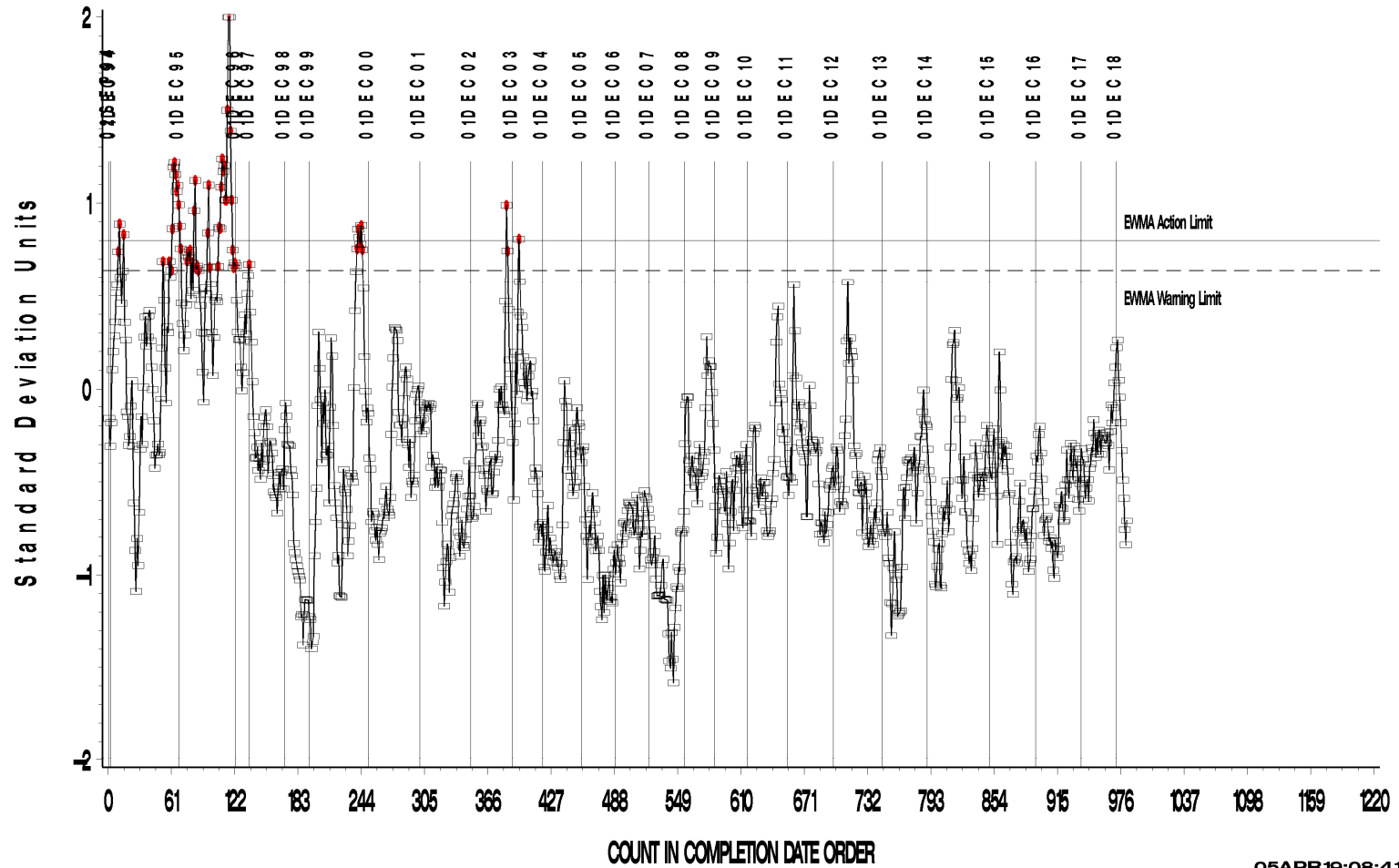
A Program of ASTM International

# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

LTMS Precision Analysis



05APR19:08:41

**Test Monitoring Center**  
<http://astmtmc.cmu.edu>



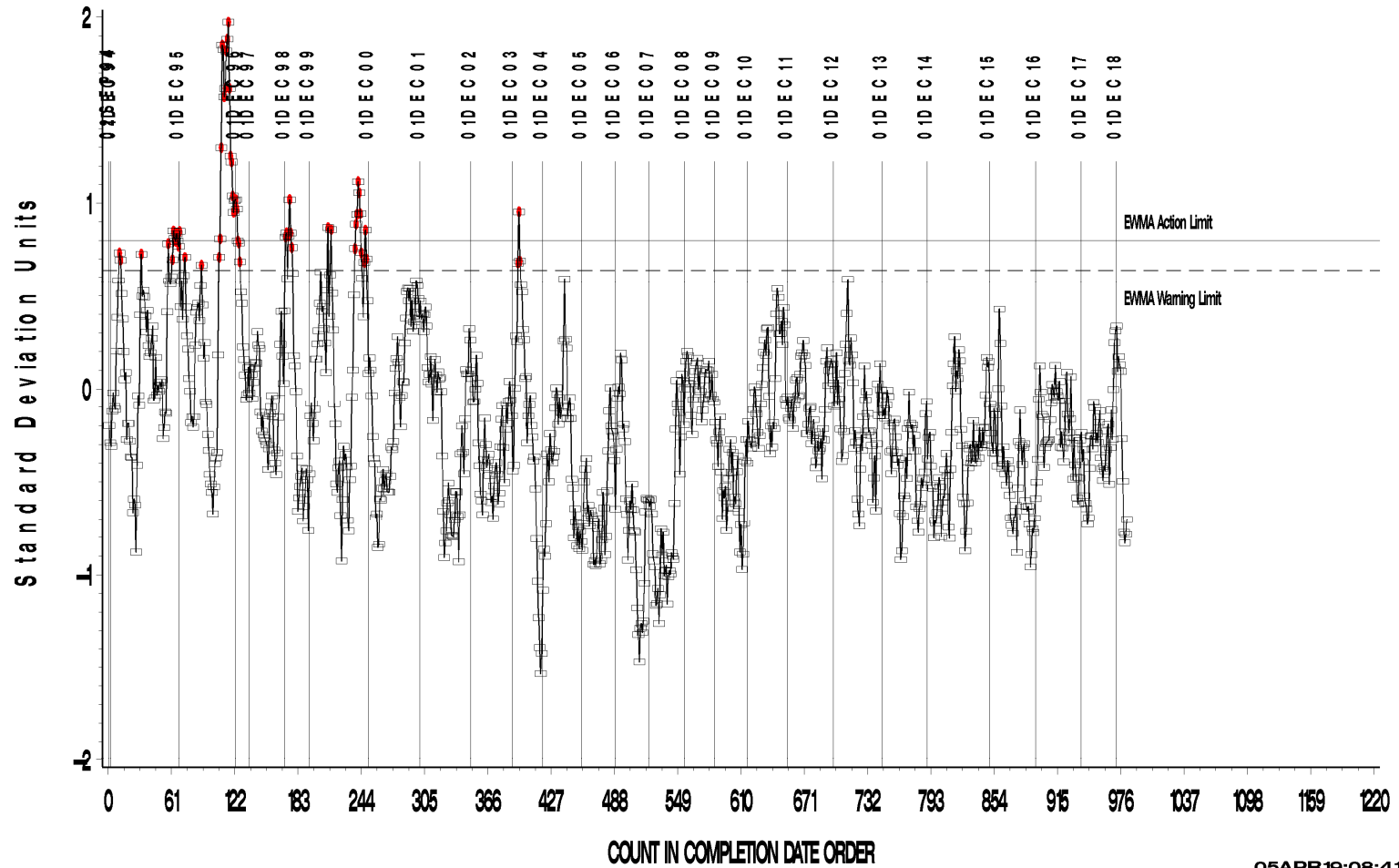
A Program of ASTM International

# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

LTMS Precision Analysis



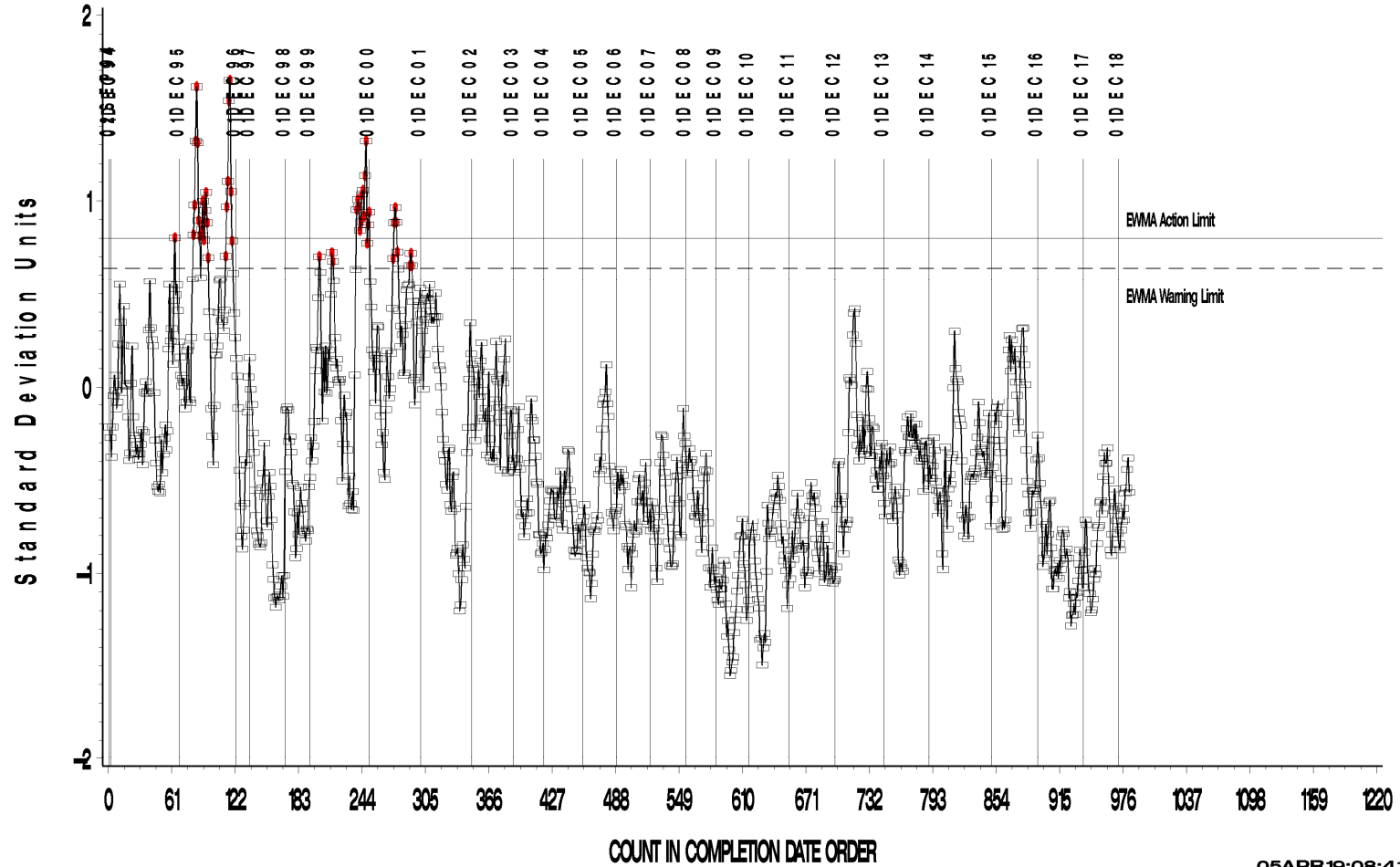
05APR19:08:41

# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL VISCOSITY INCREASE

LTMS Precision Analysis



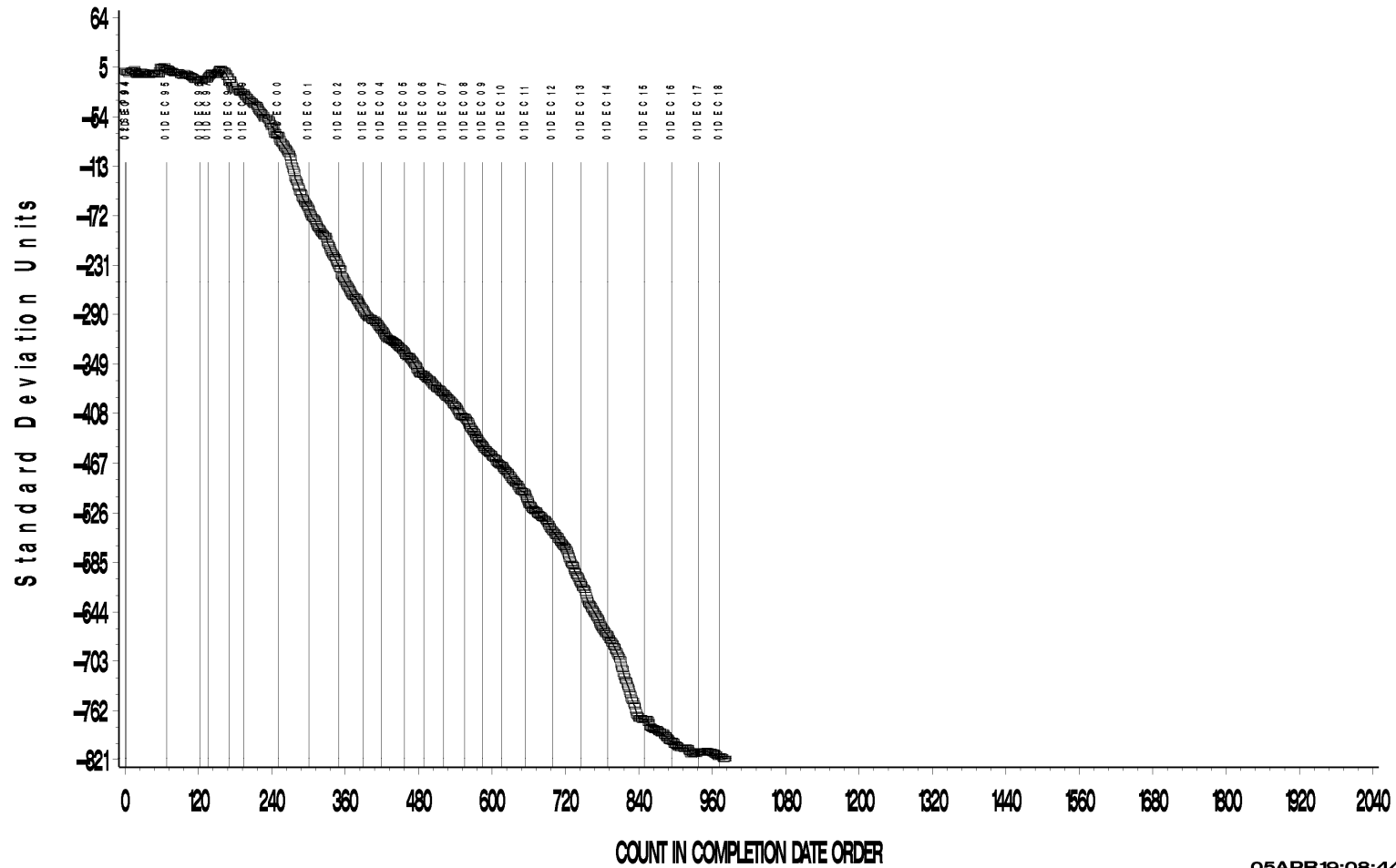
05APR19:08:41

# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

CUSUM Severity Analysis



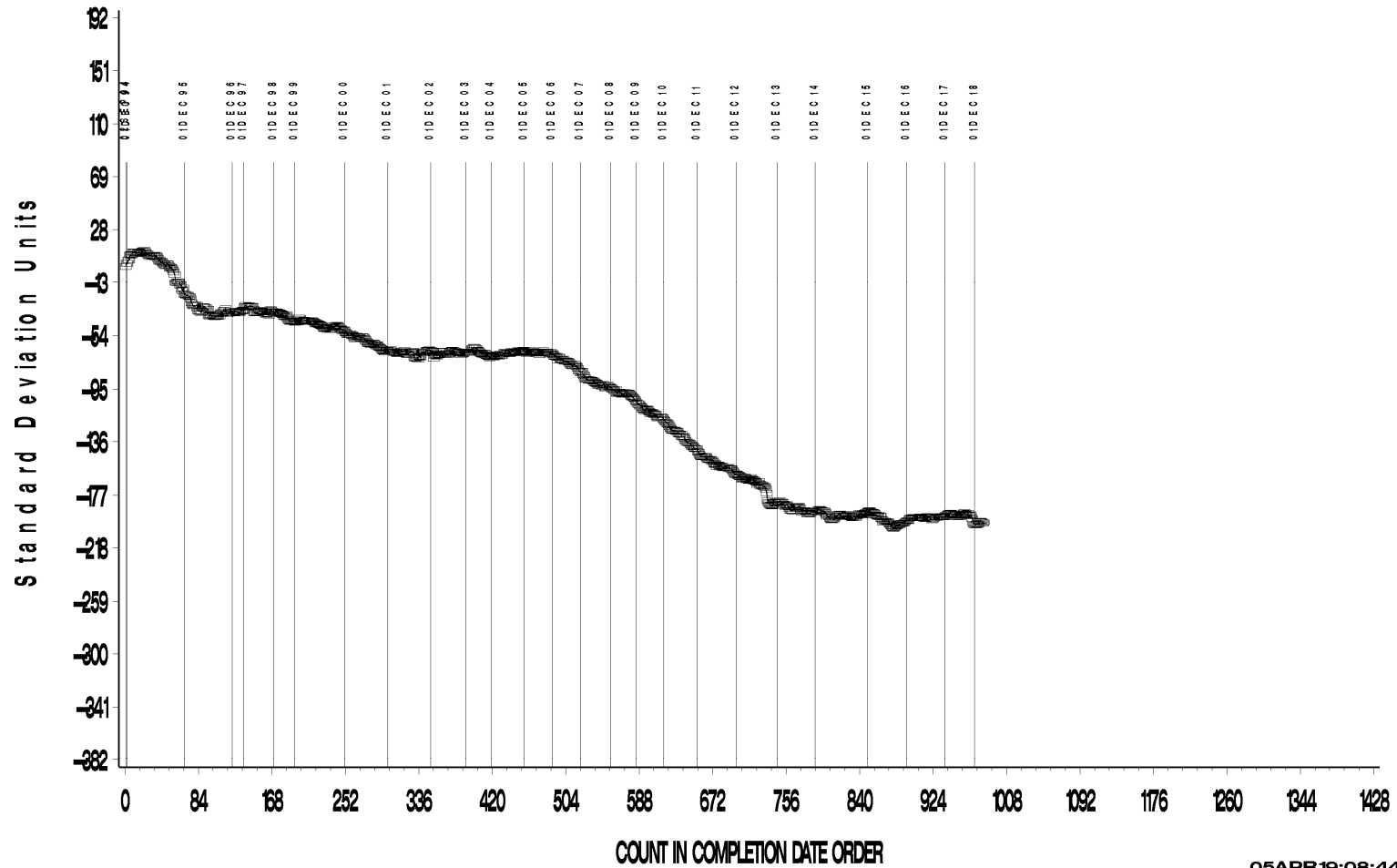
05APR19:08:44

# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

CUSUM Severity Analysis



05APR19:08:44

# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

CUSUM Severity Analysis



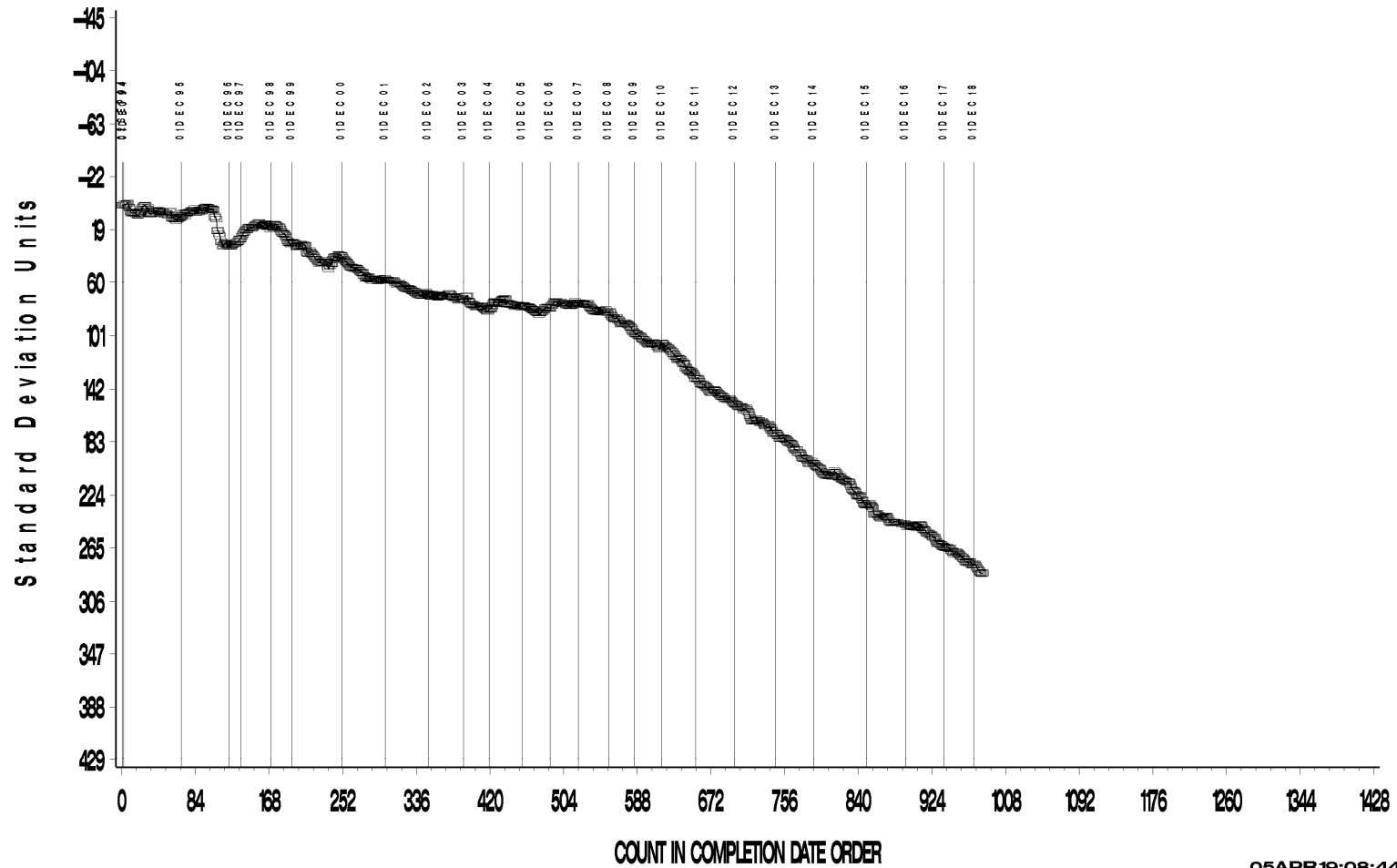
05APR19:08:44

# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

CUSUM Severity Analysis



05APR19:08:44



# L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL VISCOSITY INCREASE

CUSUM Severity Analysis



05APR19:08:44

# L-60-1 (D5704)

## TIMELINE ADDITIONS

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

# L-60-1 (D5704)

## LAB VISITS

One L-60-1 lab visit was conducted this period. All inspected aspects of test were found to be in compliance with the documented test procedure.

## 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	220	13.8
155-1	17	1642	102.6
Total	34	1862	116.4

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 186 gallons is available for use in other gear testing. Four hundred and one tests of oil 148-1 remain in TMC inventory; however, this is only 25 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.