



Test Monitoring Center


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

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

MEMORANDUM: 15-011

DATE: April 27, 2015

TO: Larry Hamilton, Chairman, L-60-1 Surveillance Panel

FROM: Scott Parke 

SUBJECT: L-60-1 Reference Oil Testing from October 1, 2014 through March 31, 2015

Please find attached a summary of testing activity this period.

SDP/sdp/mem15-011.sdp.doc

cc: Frank Farber

Jeff Clark

L-60-1 Surveillance Panel

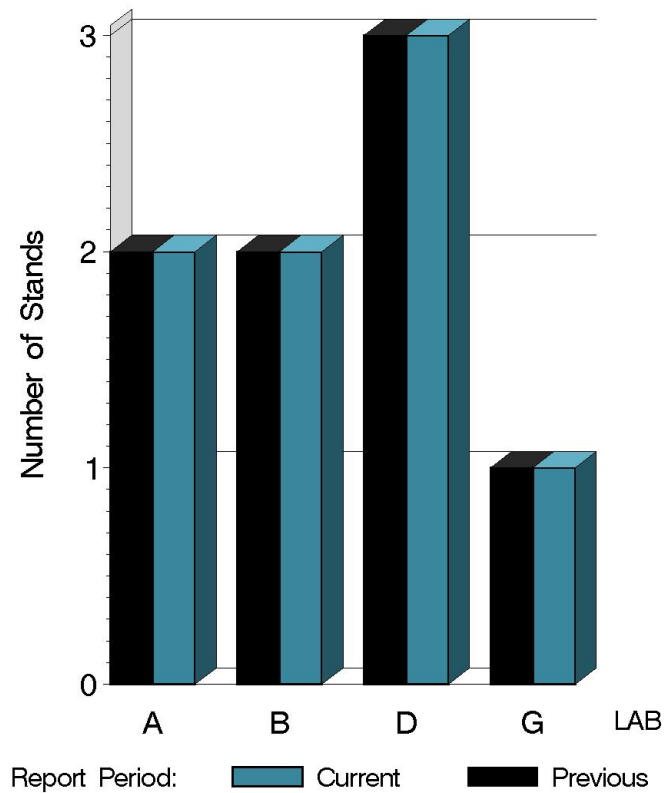
<ftp://ftp.astmtmc.cmu.edu/docs/gear/l601/semiannualreports/l601-04-2015.pdf>

Distribution: email

L-60-1 (D5704)

	Reporting Data	Calibrated on 3-31-15
Number of Labs	4	4
Number of Stands	8	8

BY-LAB STAND
DISTRIBUTION



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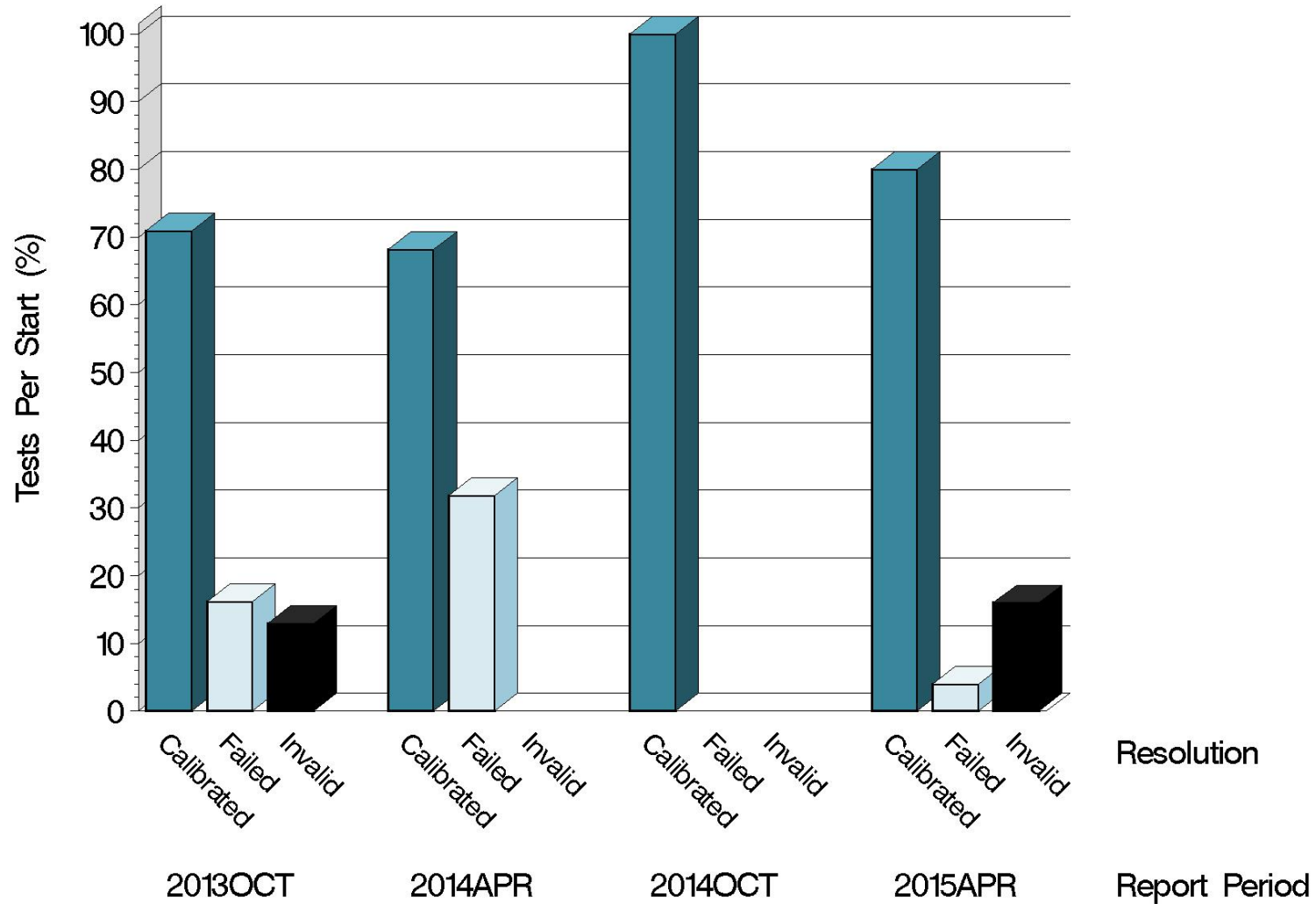
L-60-1 (D5704)

Test Distribution by Oil and Validity

					Totals	
		148-1	151-2	155-1	Last Period	This Period
Accepted for calibration	AC	11	9	0	20	20
Rejected (Mild)	OC	0	0	0	0	0
Rejected (Severe)	OC	1	0	0	0	1
Rejected (Precision)	OC	0	0	0	0	0
Invalidated calibration	LC	3	0	0	0	3
Acceptable info run	NI	0	0	11	6	11
Unacceptable info run	MI	0	0	1	0	1
Operationally invalid	RC	0	0	0	0	0
Aborted	XC	1	0	0	0	1
Total		16	9	12	26	37

L-60-1 (D5704)

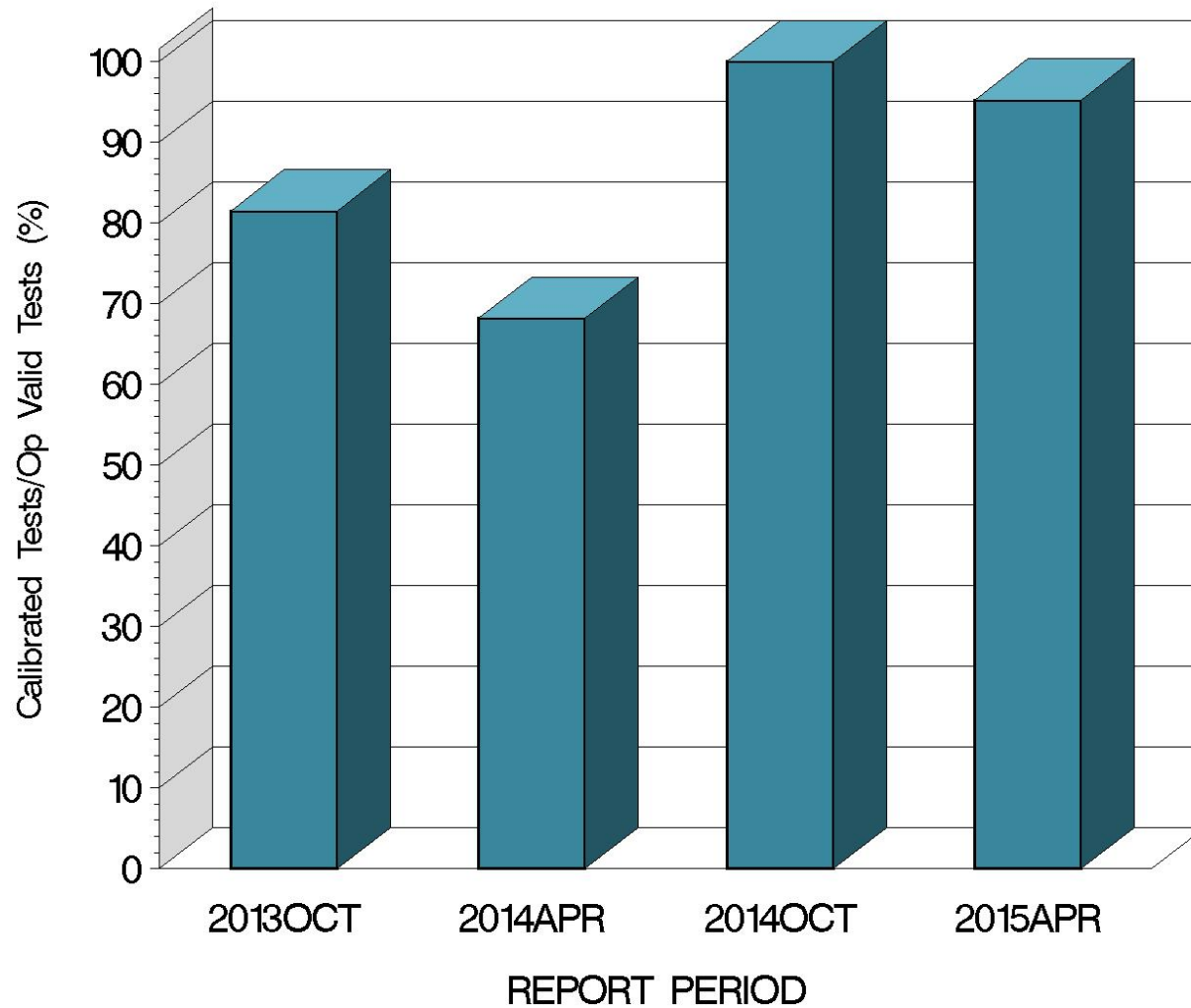
CALIBRATION ATTEMPT SUMMARY



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L-60-1 (D5704)

OPERATIONALLY VALID TESTS
MEETING ACCEPTANCE CRITERIA

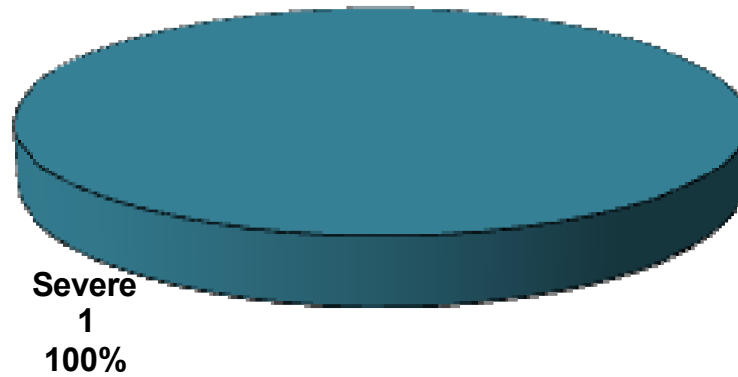


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L-60-1 (D5704)

CAUSES FOR FAILED TESTS

By Alarm Type



By Parameter



L-60-1 (D5704)

CAUSES FOR LOST TESTS

		Oil			Validity			Loss Rate		
Lab	Cause	148-1	151-2	155-1	RC	LC	XC	Lost	Starts	%
B	Oil loss > 20%	●				●		1	12	8%
D	Oil analysis not completed within specified time	●				●		1	11	9%
G	Oil loss > 20%	●				●		2	6	33%
	Alternator pulley came loose	●					●			
Lost		4	0	0	0	3	1			
Starts		16	9	12	37	37	37			
%		0%	0%	0%	0%	8%	3%			

Lab B also had one information run on oil 155-1 unusable due to oil loss greater than 20%.

L-60-1 (D5704)

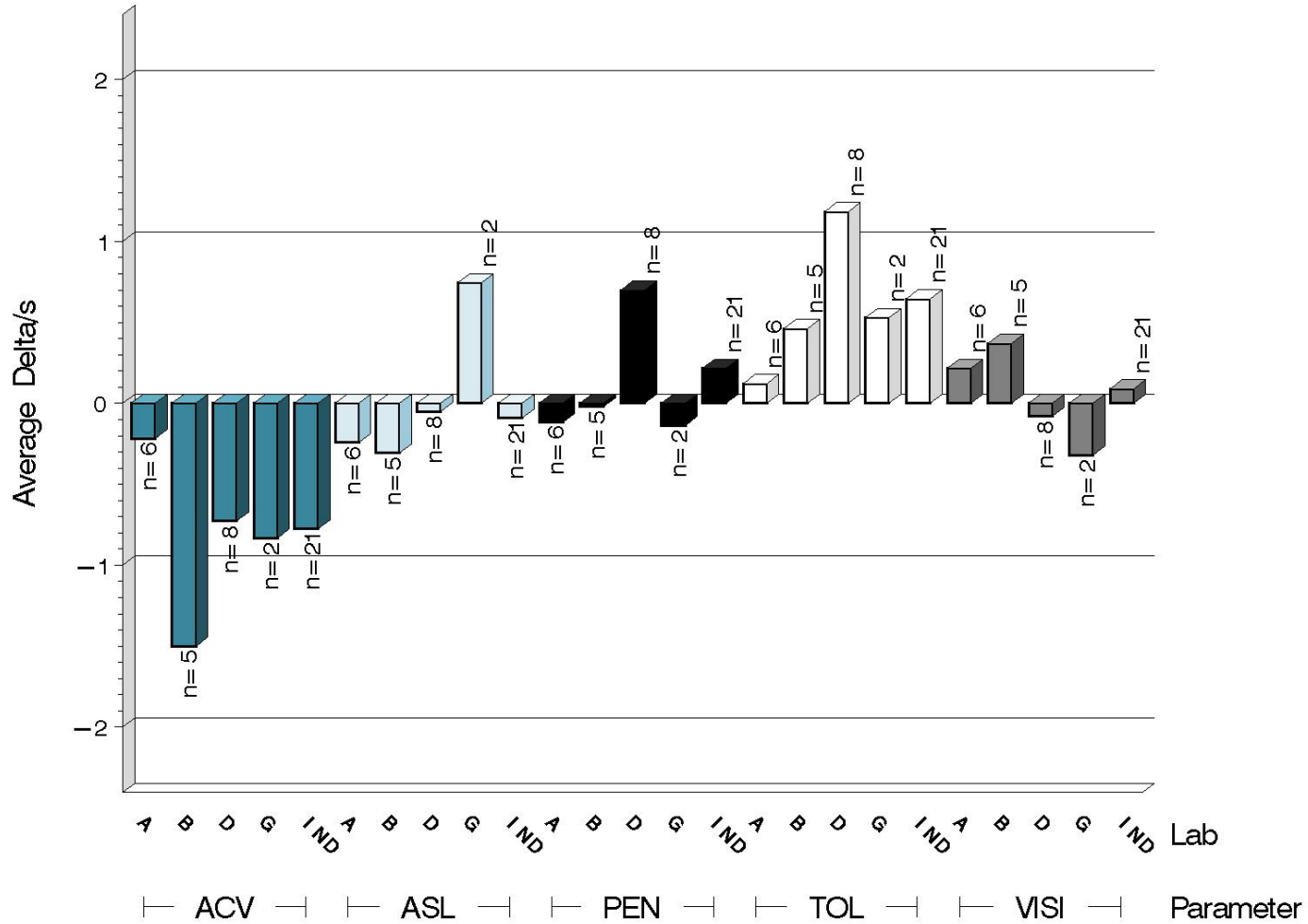
Average Δ /s by Lab						
Lab	n	VISI	PEN	TOL	ACV	ASL
A	6	0.217	-0.117	0.121	-0.216	-0.241
B	5	0.371	-0.022	0.462	-1.500	-0.306
D	8	-0.080	0.700	1.184	-0.728	-0.050
G	2	-0.320	-0.136	0.529	-0.832	0.744
Industry	21	0.089	0.215	0.646	-0.776	-0.090
Shift*	21	0.718%	0.132%	0.491%	-0.692 merits	-0.009 merits

*computed using severity adjustment standard deviation

L-60-1 (D5704)

TEST SEVERITY

DELTA/S BY LAB

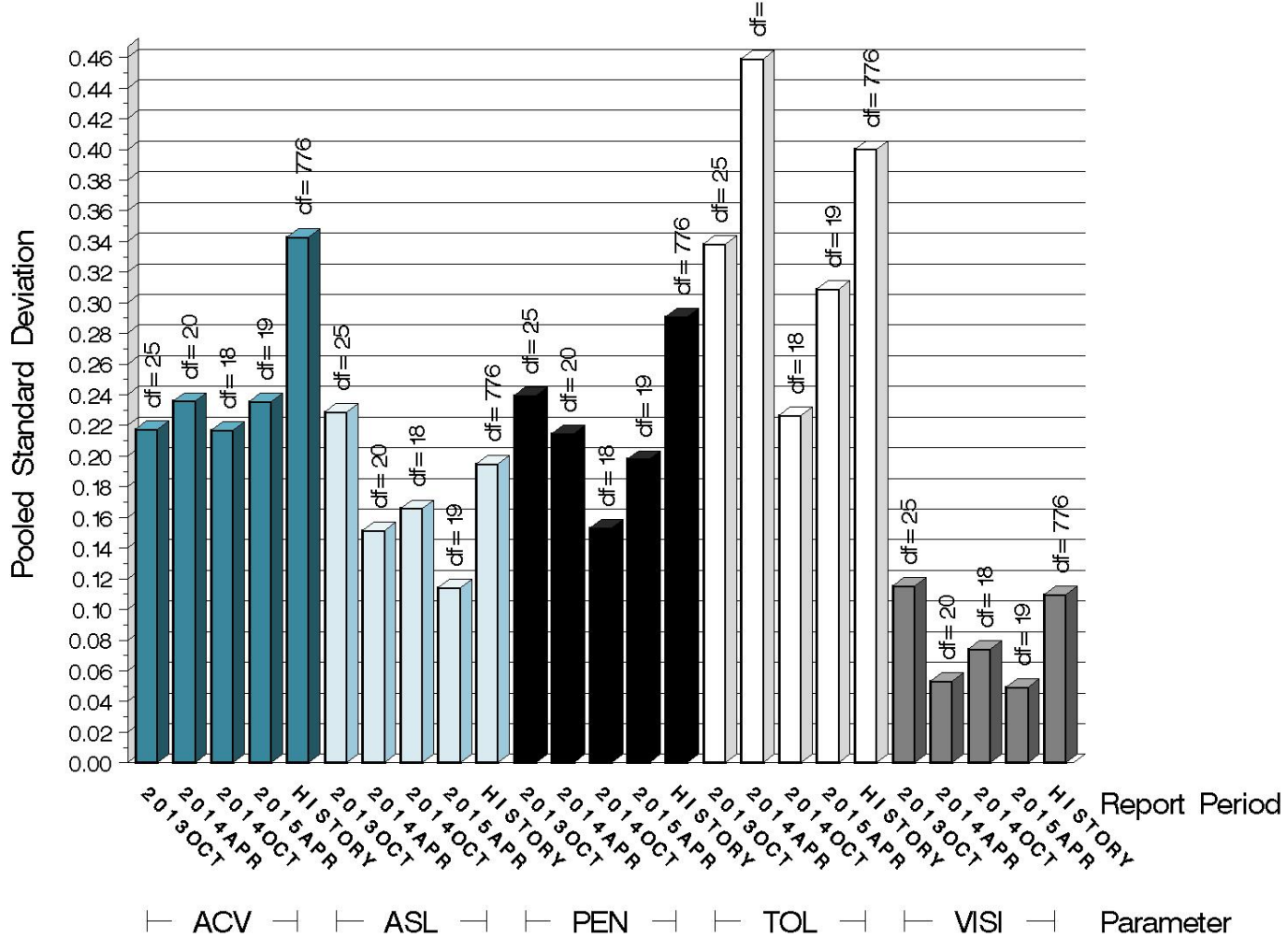


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L-60-1 (D5704)

TEST PRECISION

POOLED STANDARD DEVIATION
BY SIX-MONTH ASTM REPORT PERIOD



10:52:05 16APR2015

L-60-1 (D5704)

SUMMARY OF SEVERITY & PRECISION

Severity

TOL and ACV remain severe of target with ACV nearly continuously exceeding the control chart limit. The most recent ASL result exceeds the control chart severe warning limit.

On May 6, 2014, the surveillance panel held a day-long task force meeting to discuss several items for possible investigation but no changes have yet been made to the test.

Precision

Precision for all parameters continues to be good.

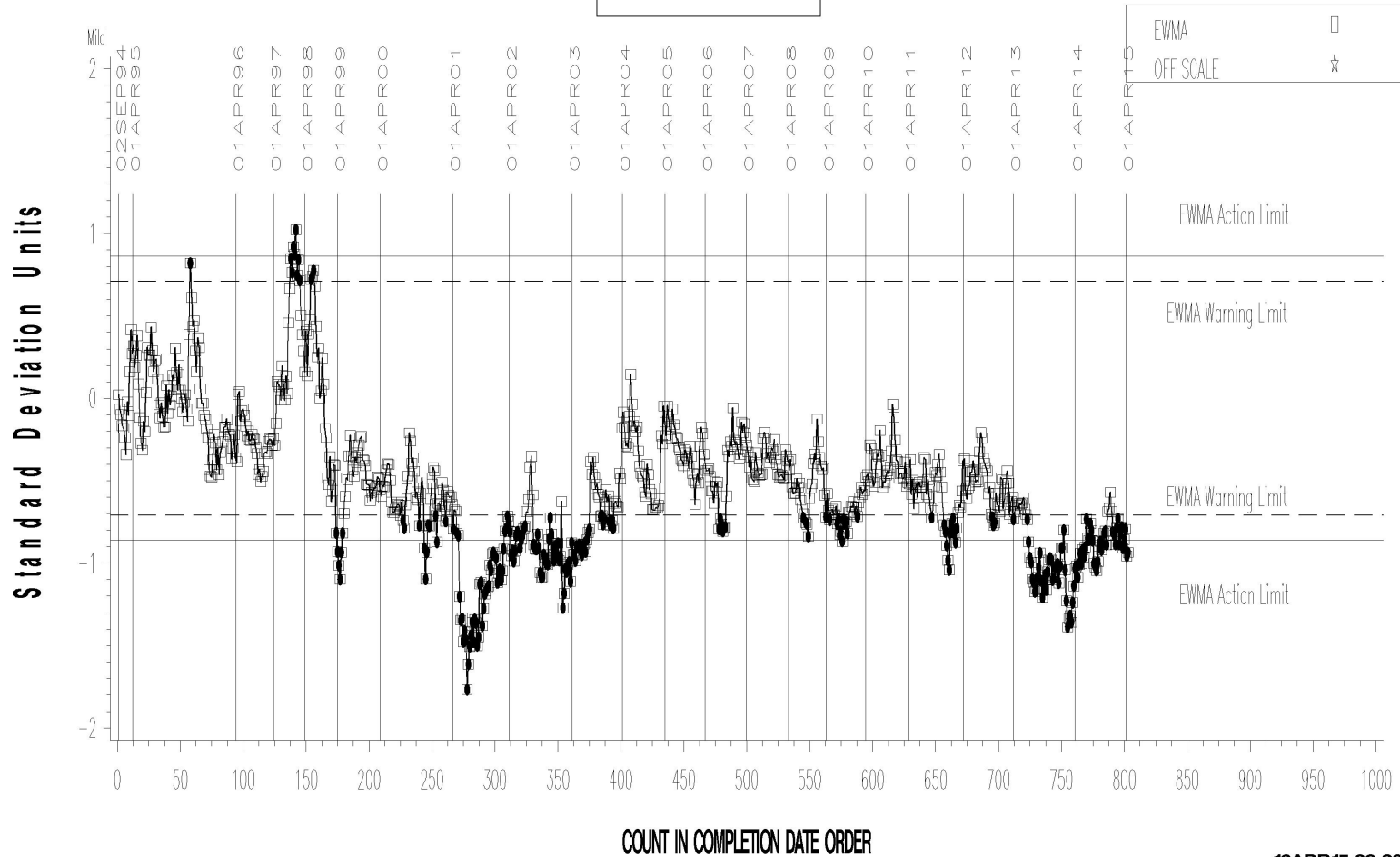
Industry control charts follow.

L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

LTMS Severity Analysis



Severe

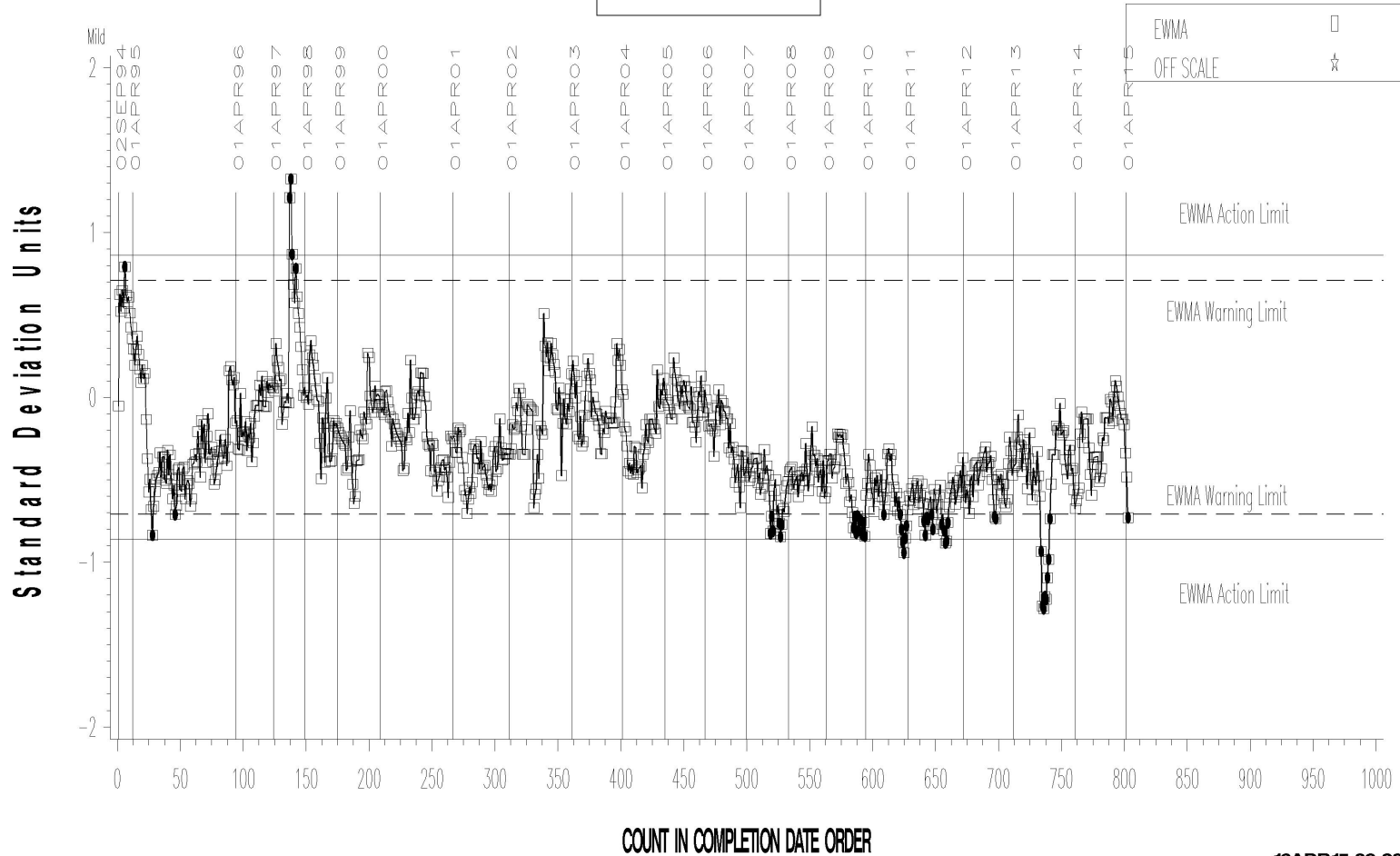
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

LTMS Severity Analysis



Severe

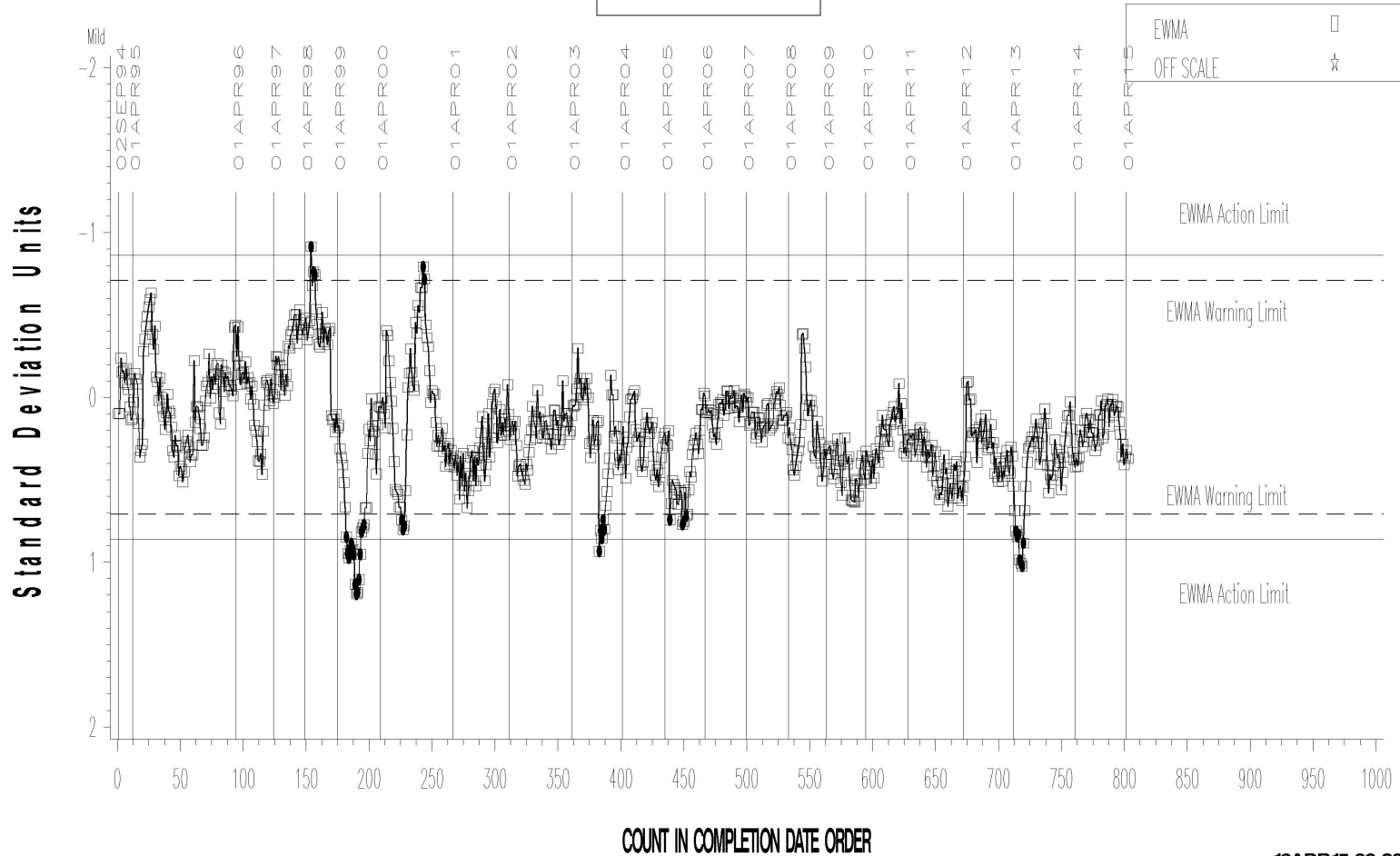
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

LTMS Severity Analysis



Severe

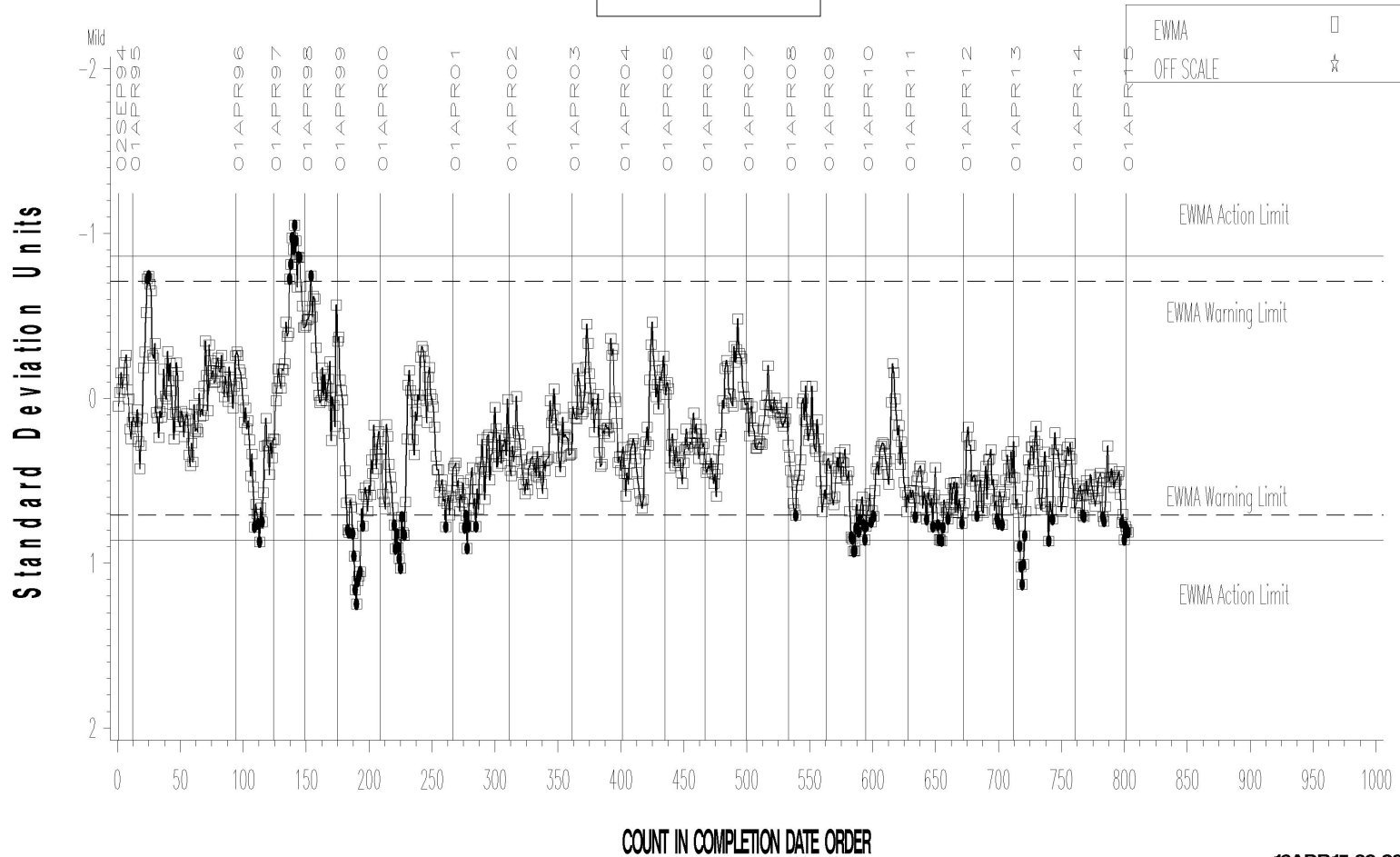
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

LTMS Severity Analysis

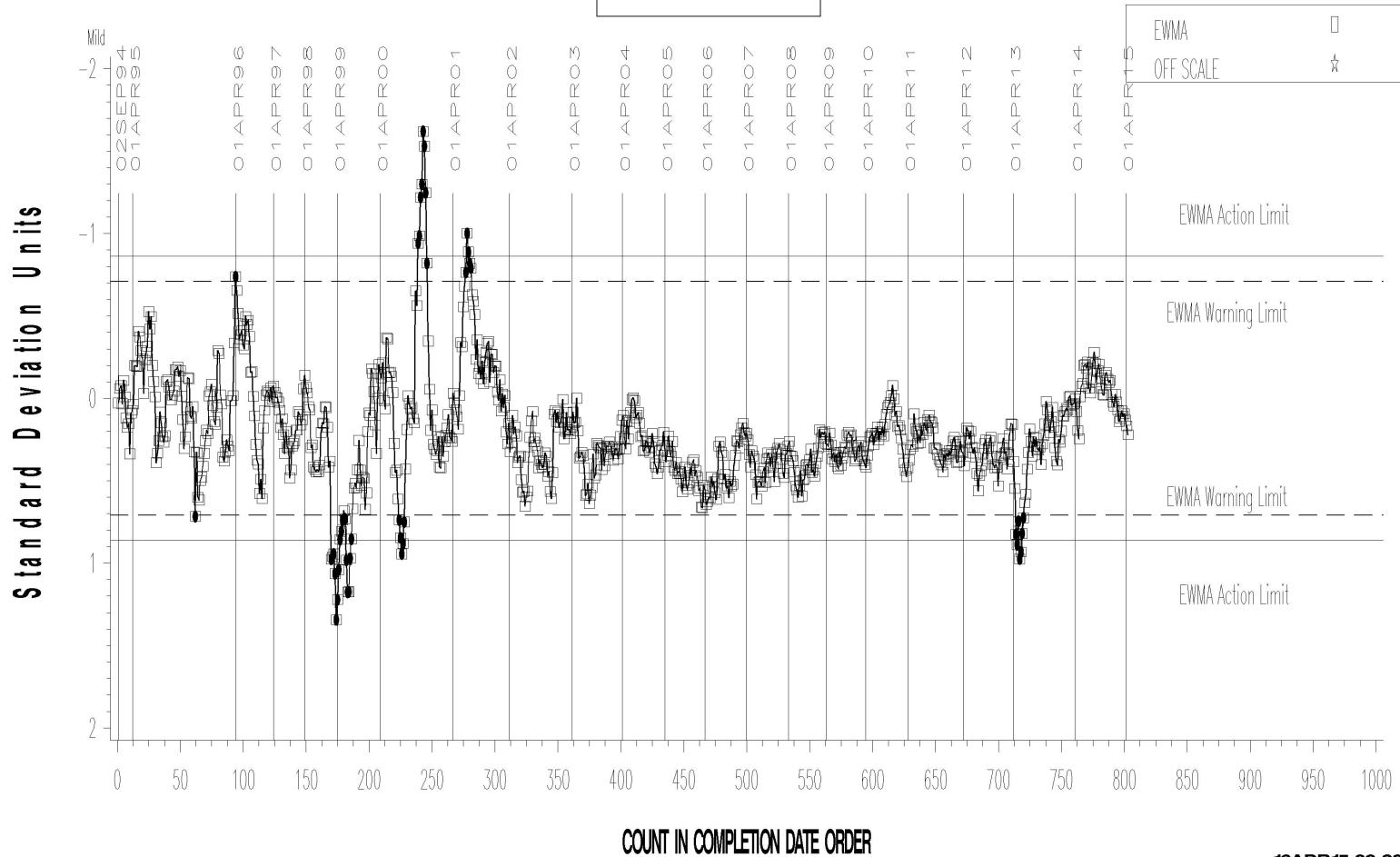


L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL VISCOSITY INCREASE

LTMS Severity Analysis



Severe

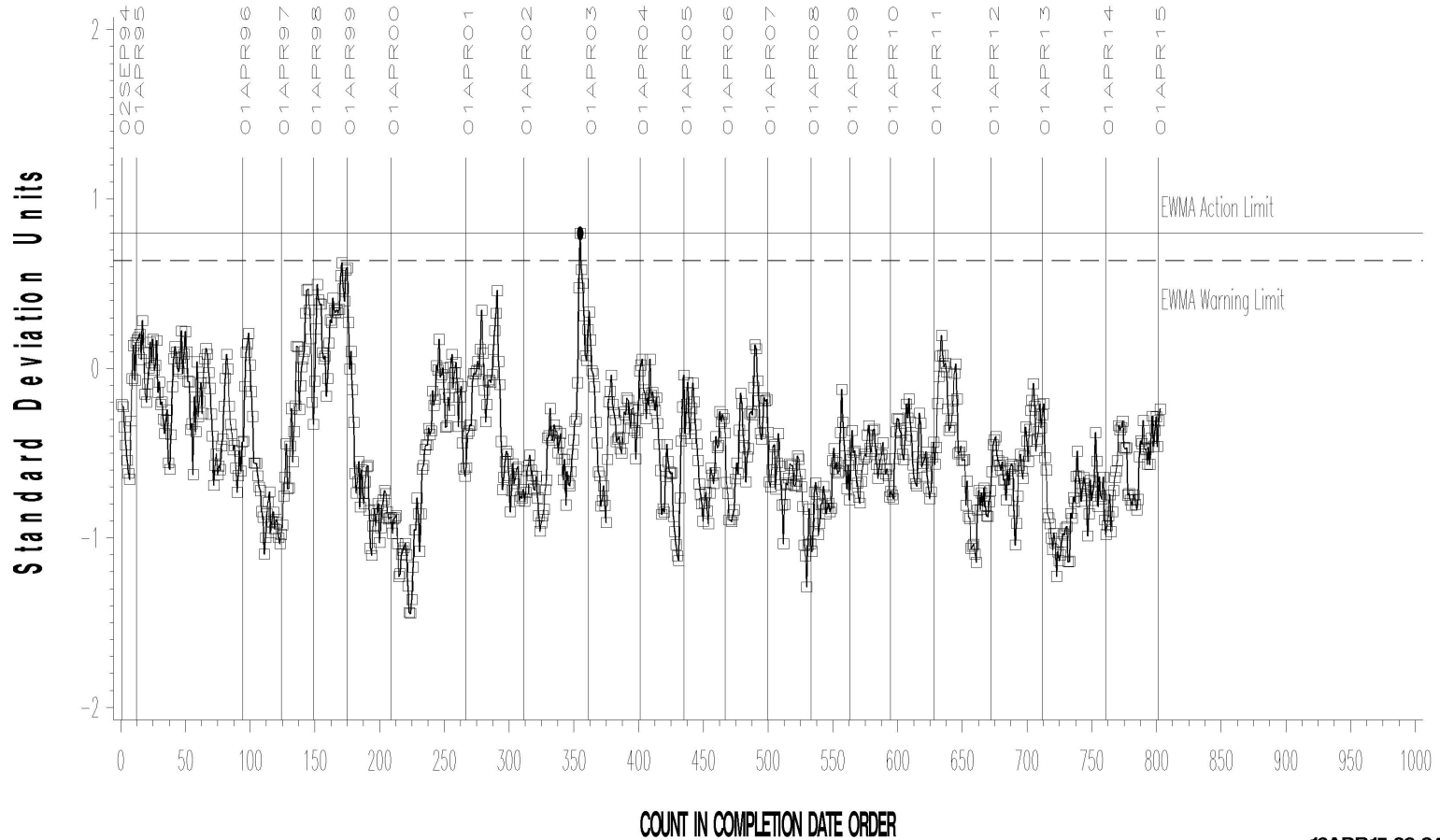
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

LTMS Precision Analysis



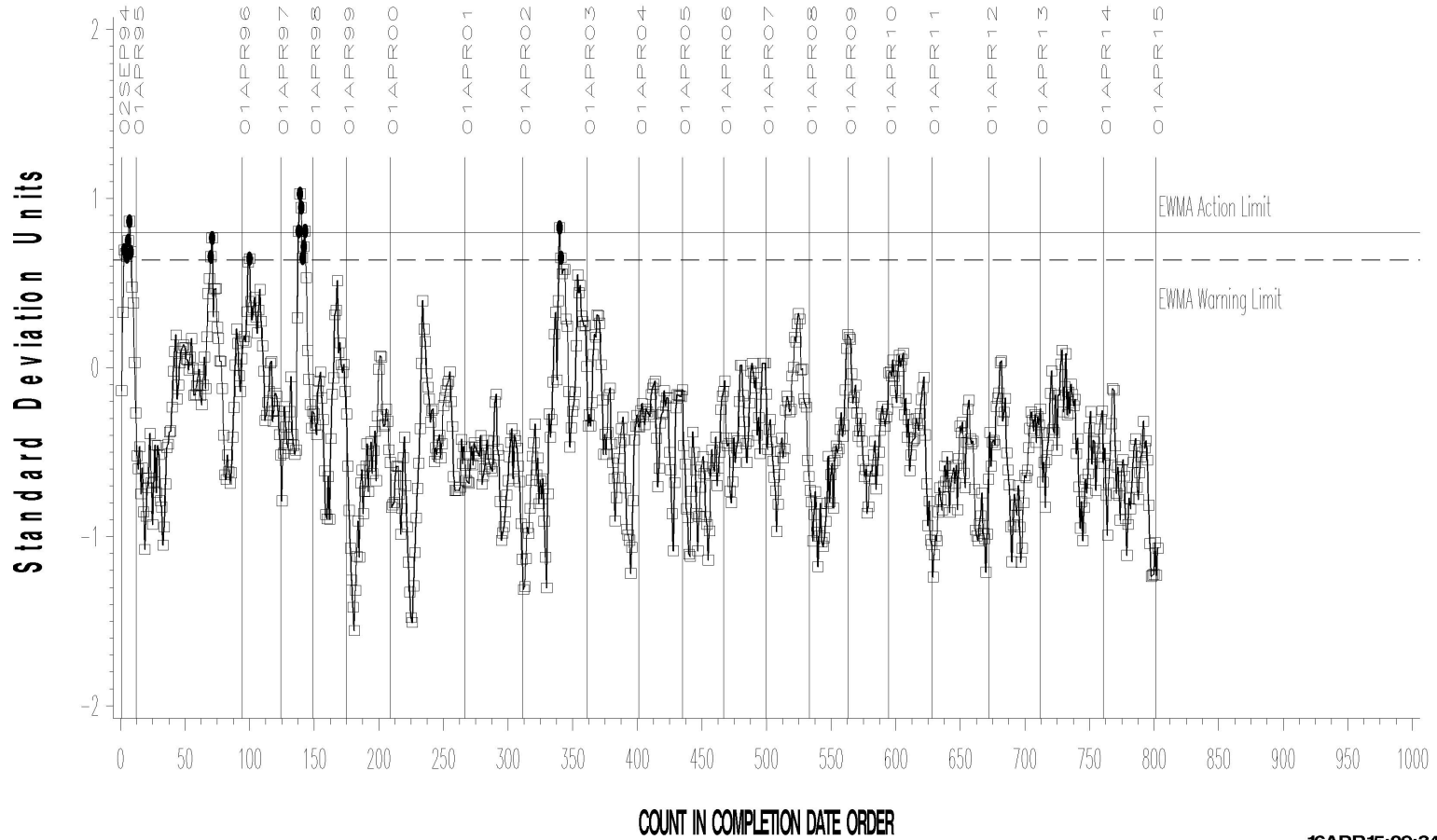
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

LTMS Precision Analysis



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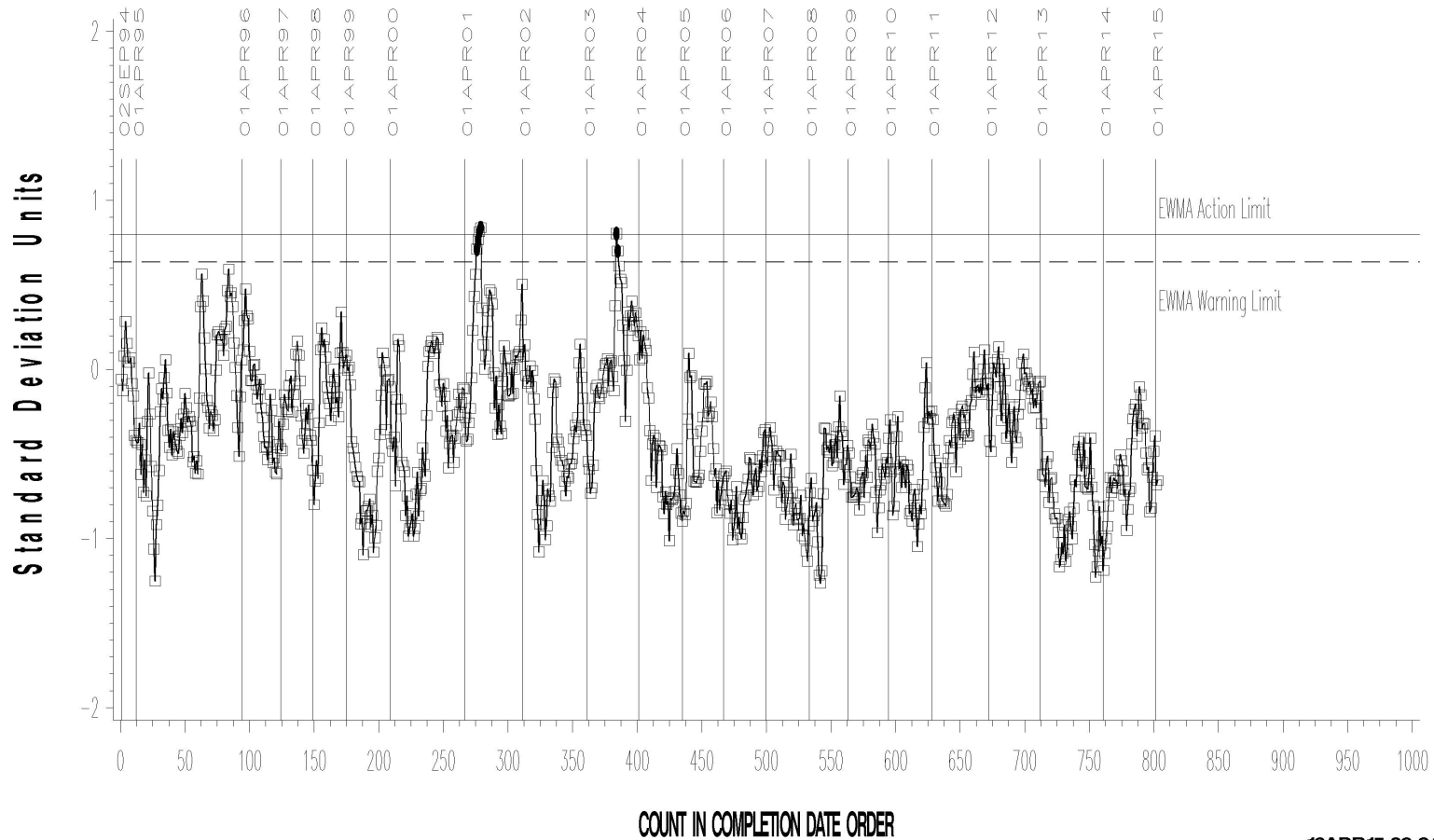


L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

LTMS Precision Analysis



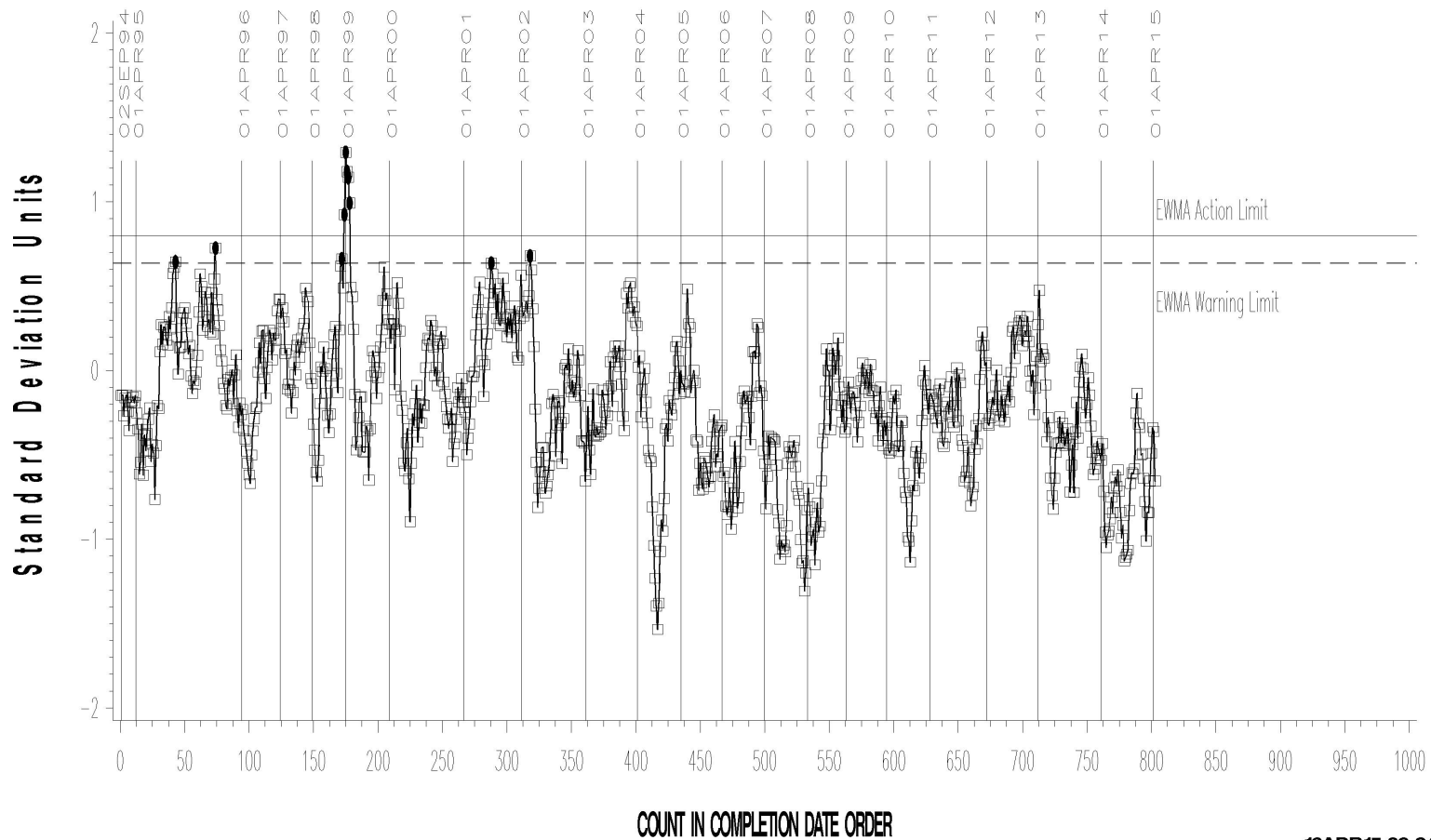
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

LTMS Precision Analysis



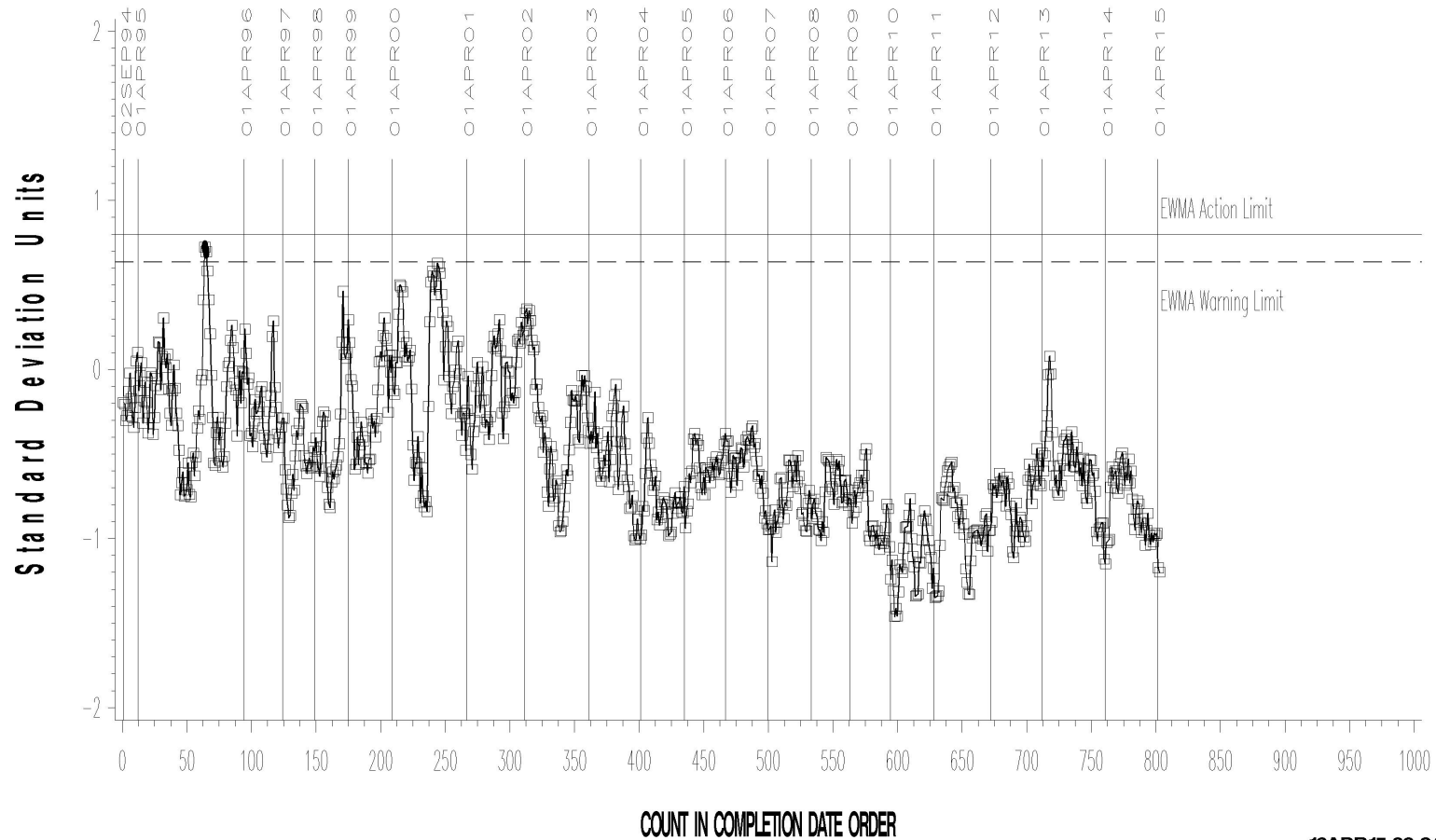
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL VISCOSITY INCREASE

LTMS Precision Analysis



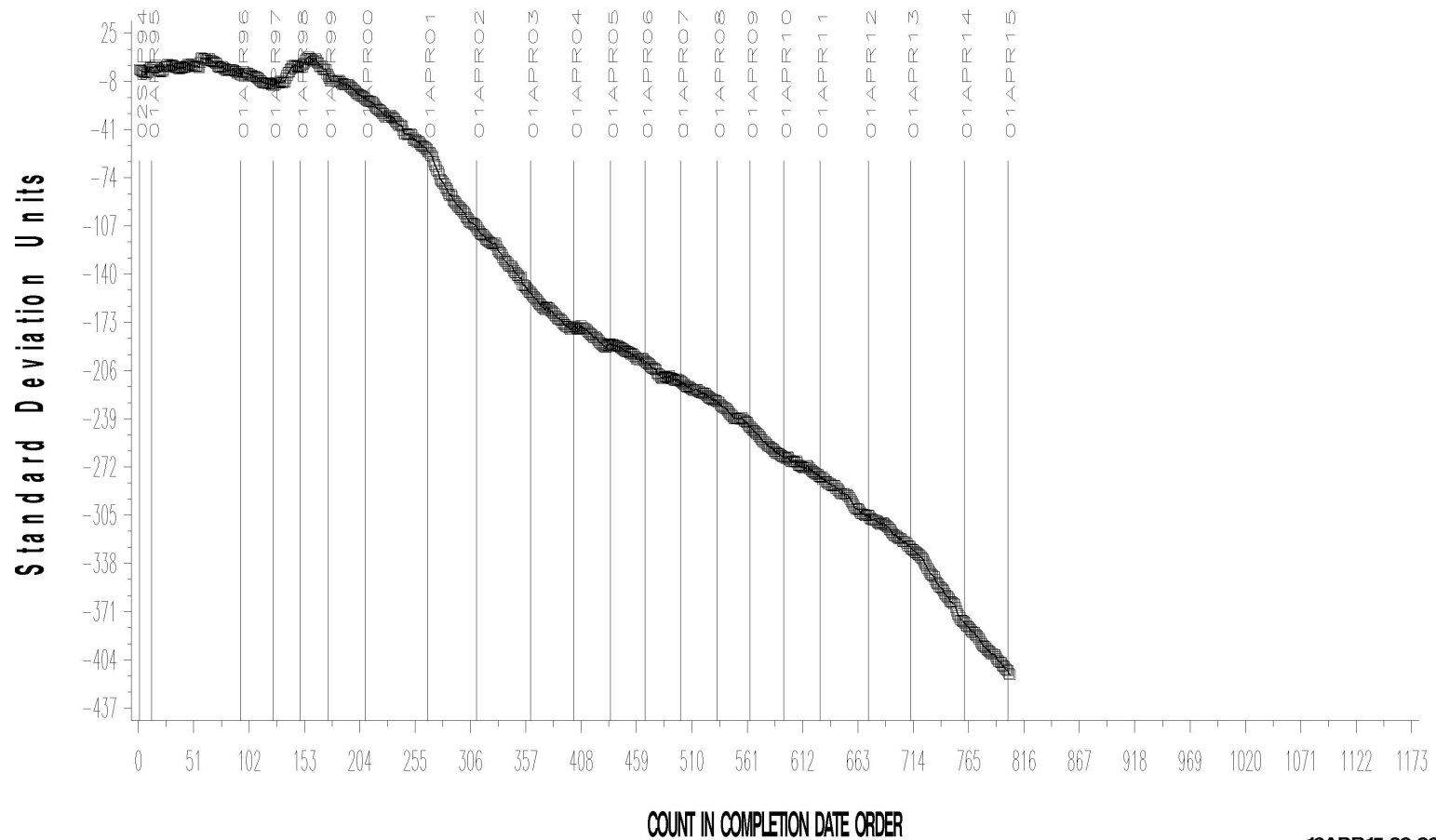
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

CUSUM Severity Analysis



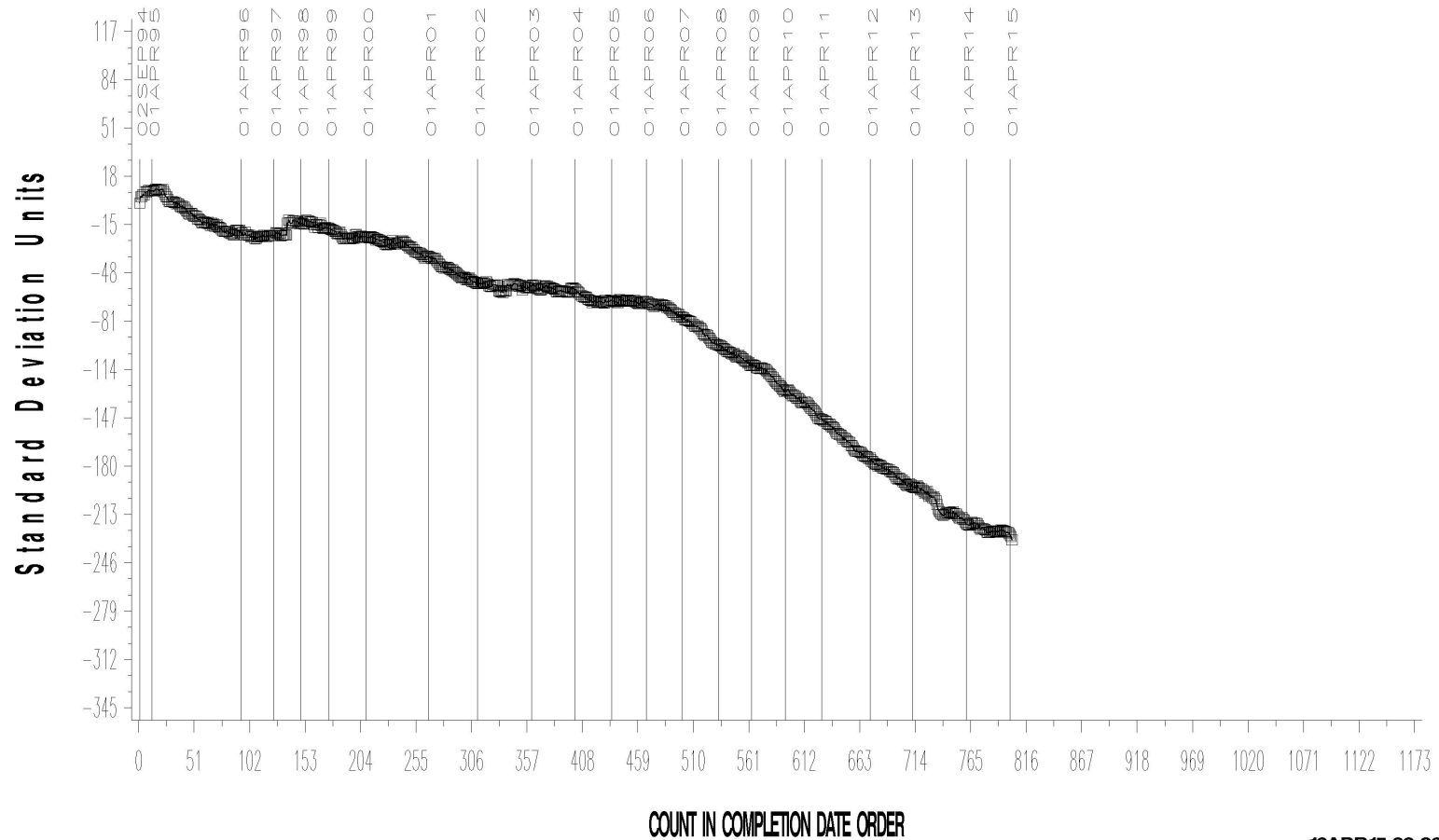
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

CUSUM Severity Analysis



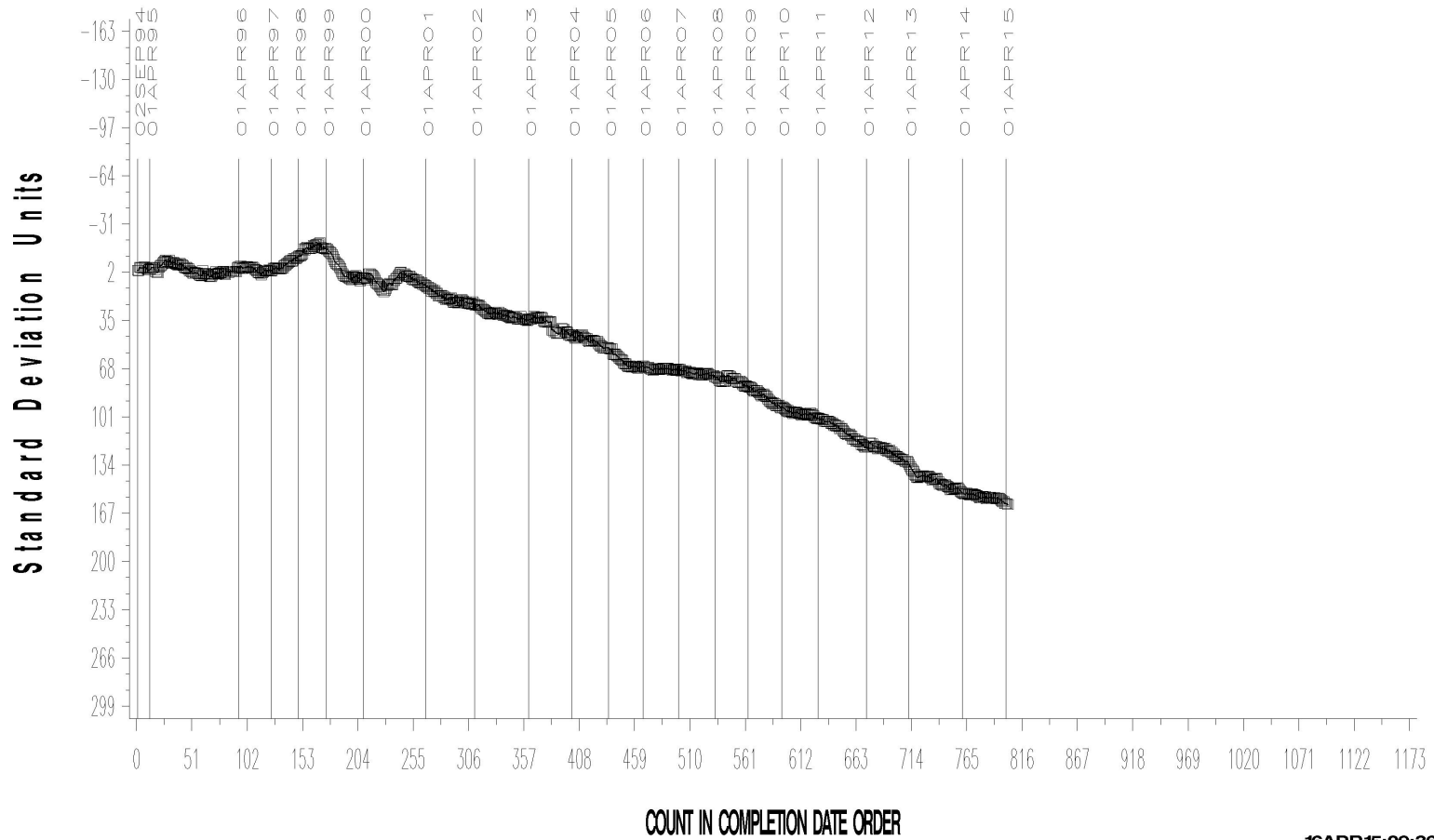
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

CUSUM Severity Analysis



16APR15:09:36

L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

CUSUM Severity Analysis



16APR15:09:36

L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL VISCOSITY INCREASE

CUSUM Severity Analysis



16APR15:09:36

L-60-1 (D5704)

TIMELINE ADDITIONS

Effective Date	Information Letter	Event
20150204	15-1	V-Ring seal assembly instructions
20150317	15-2	Wording regarding warmup time and test validity

L-60-1 (D5704)

LAB VISITS

One L-60-1 lab visit was completed this period. No procedural non-conformances were found.

INFORMATION LETTERS

Information Letter 15-1 was issued on February 4, 2015 to document installation of the v-ring groove seals.

Information Letter 15-2 was issued March 17, 2015 to simplify wording regarding the validity of tests not meeting warmup time limits.

L-60-1 (D5704)

STATUS OF REFERENCE OIL SUPPLY

Oil	Cans @ Labs	@ TMC	
		Cans	Gallons
133	5	1693	105.8
148-1	27	482	30.1
151-2	19	0	0.0
155-1	19	646	40.4
Total	70	2821	176.3

A reblend of 151-2 (151-3) was acquired by TMC in 1999 but has since been consumed in other test types. That oil was then replaced by 155 which is also now depleted. A 155 reblend (155-1) is on hand at TMC. The surveillance panel has asked that the TMC reserve a portion of that oil for L-60-1 testing. The TMC quantity shown for this oil is for that reserved portion. A separate quantity of 259 gallons is available for use in other gear testing.

Four hundred and eighty two tests of oil 148-1 remain in TMC inventory; however, this is only 30.1 gallons. When the need arises, it will not be possible to obtain a reblend of this oil. The panel may want to begin considering a possible replacement for this oil.