



Test Monitoring Center


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

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

MEMORANDUM: 15-040

DATE: November 20, 2015

TO: Brad Bubonic, Chairman, L-60-1 Surveillance Panel

FROM: Scott Parke 

SUBJECT: L-60-1 Reference Oil Testing from April 1, 2015 through September 30, 2015

Please find attached a summary of testing activity this period.

SDP/sdp/mem15-040.sdp.doc

cc: Frank Farber

Jeff Clark

L-60-1 Surveillance Panel

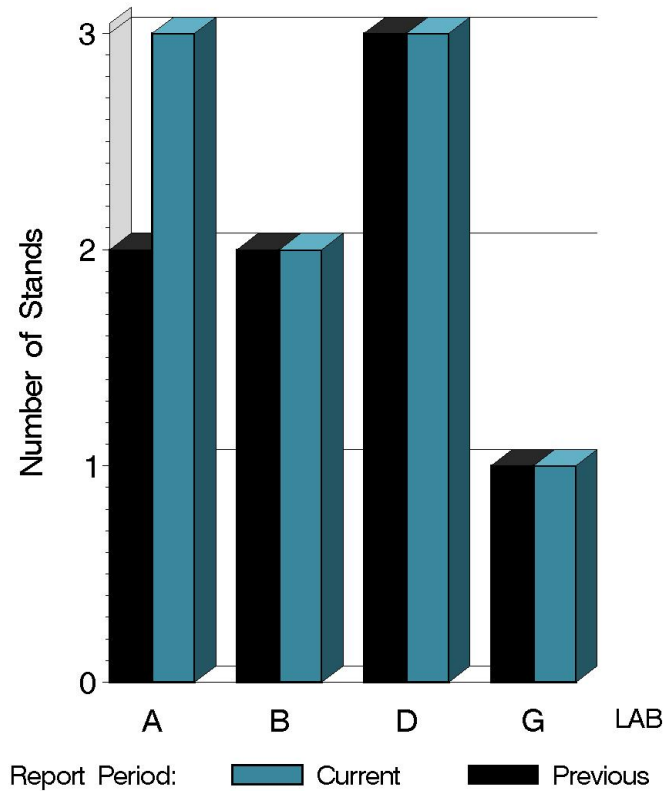
<ftp://ftp.astmtmc.cmu.edu/docs/gear/l601/semiannualreports/l601-10-2015.pdf>

Distribution: email

L-60-1 (D5704)

	Reporting Data	Calibrated on 9-30-15
Number of Labs	4	4
Number of Stands	9	8

BY-LAB STAND DISTRIBUTION



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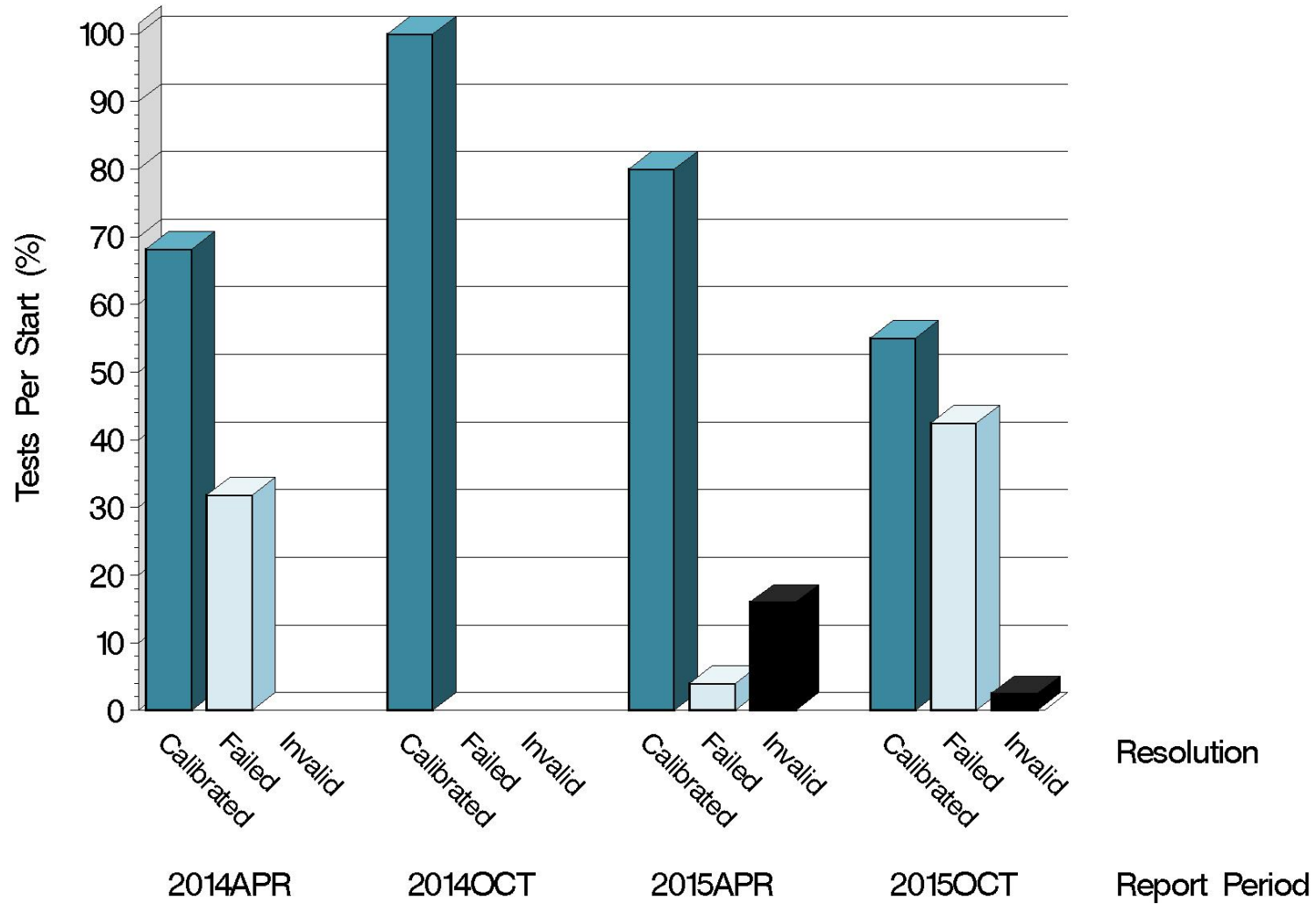
L-60-1 (D5704)

Test Distribution by Oil and Validity

					Totals	
		148-1	151-2	155-1	Last Period	This Period
Accepted for calibration	AC	13	9	0	20	22
Rejected (Mild)	OC	0	1	0	0	1
Rejected (Severe)	OC	8	6	0	1	14
Rejected (Precision)	OC	2	0	0	0	2
Invalidated calibration	LC	0	0	0	3	0
Acceptable info run	NI	0	0	0	11	0
Unacceptable info run	MI	0	0	0	1	0
Operationally invalid	RC	0	0	0	0	0
Aborted	XC	1	0	0	1	1
Total		24	16	0	37	40

L-60-1 (D5704)

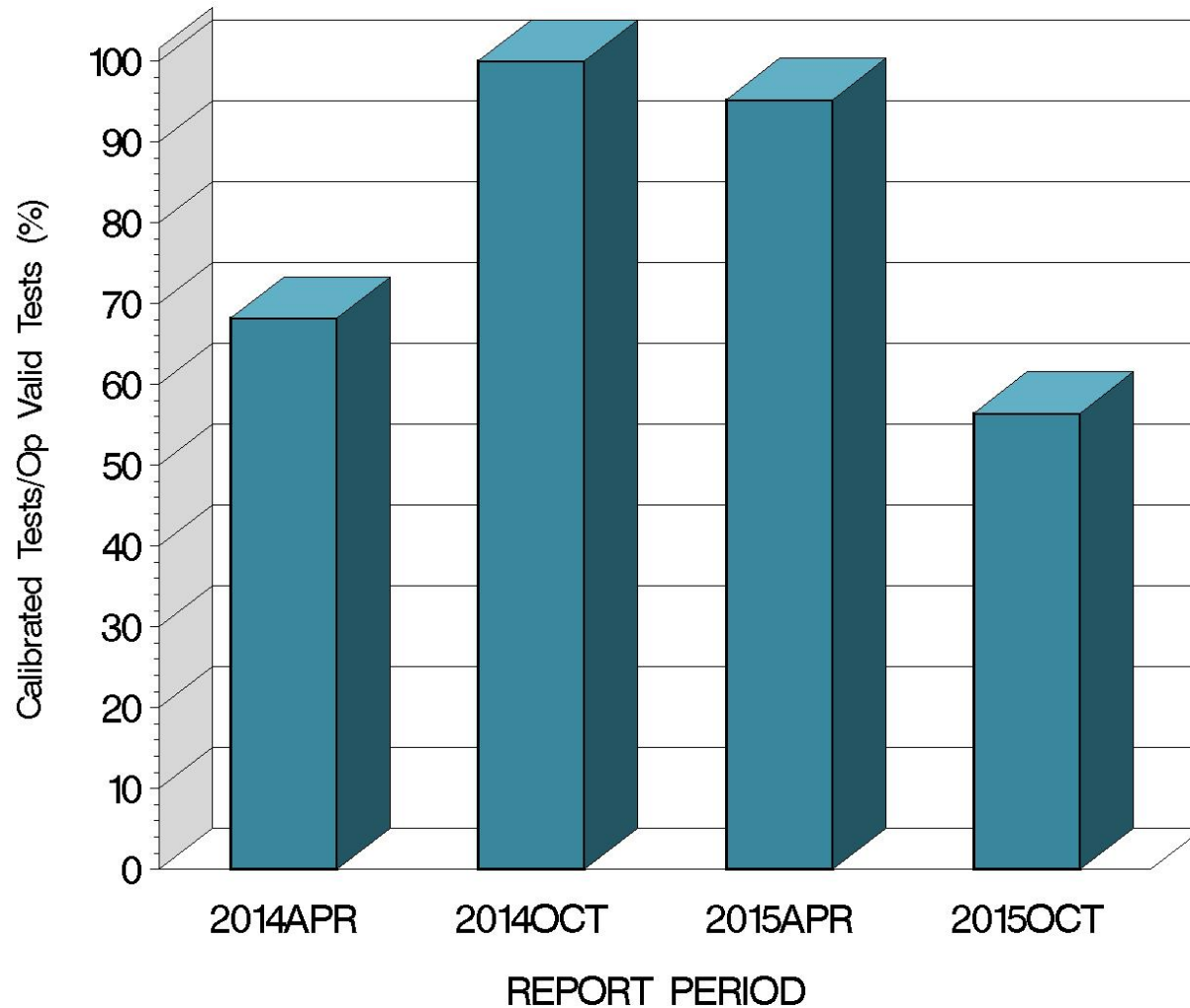
CALIBRATION ATTEMPT SUMMARY



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L-60-1 (D5704)

OPERATIONALLY VALID TESTS
MEETING ACCEPTANCE CRITERIA

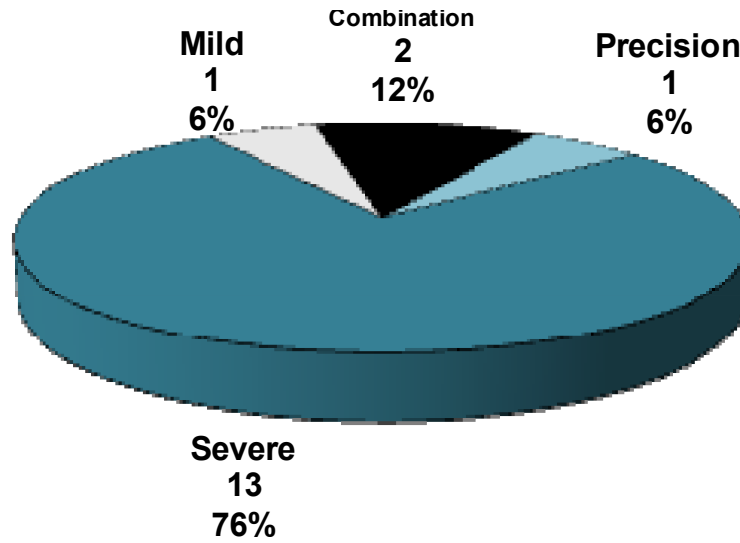


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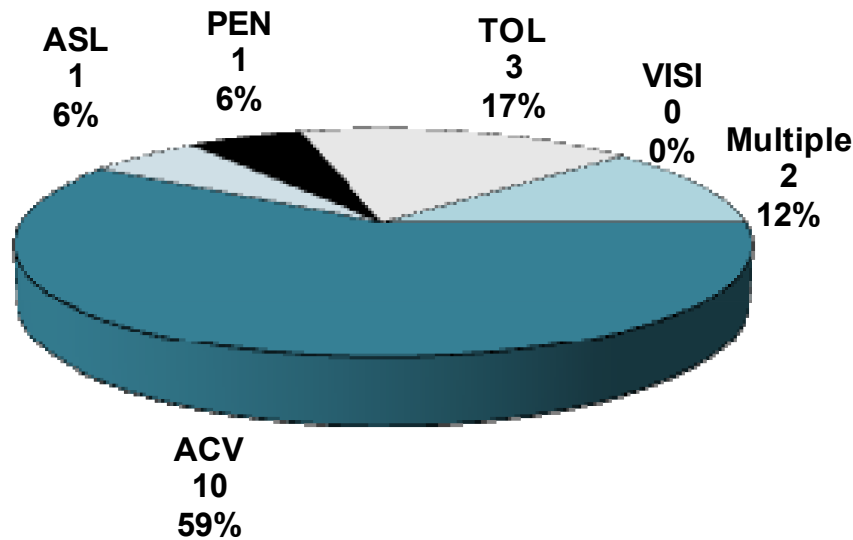
L-60-1 (D5704)

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	%
D	Aborted during warmup	●					●	1	13	8%
	Lost	4	0	0	0	0	1			
	Starts	24	16	0	40	40	40			
	%	17%	0%	0%	0%	0%	3%			

L-60-1 (D5704)

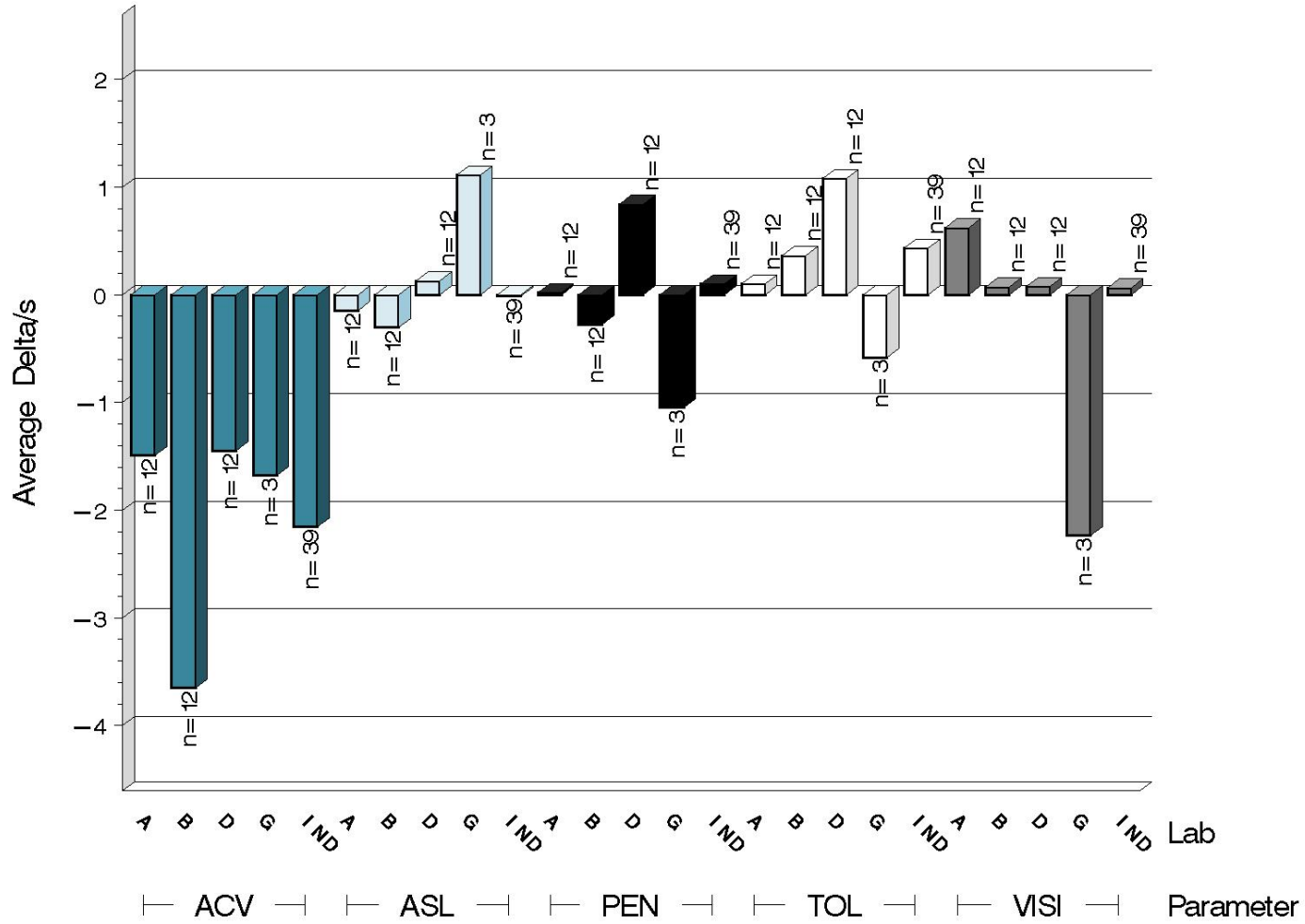
Average Δ /s by Lab						
Lab	n	VISI	PEN	TOL	ACV	ASL
A	12	0.625	0.020	0.102	-1.491	-0.145
B	12	0.073	-0.275	0.365	-3.652	-0.302
D	12	0.077	0.839	1.081	-1.447	0.131
G	3	-2.234	-1.046	-0.581	-1.678	1.113
Industry	39	0.067	0.100	0.432	-2.157	-0.012
Shift*	39	0.510	0.041	0.107	-1.102	-0.001

*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

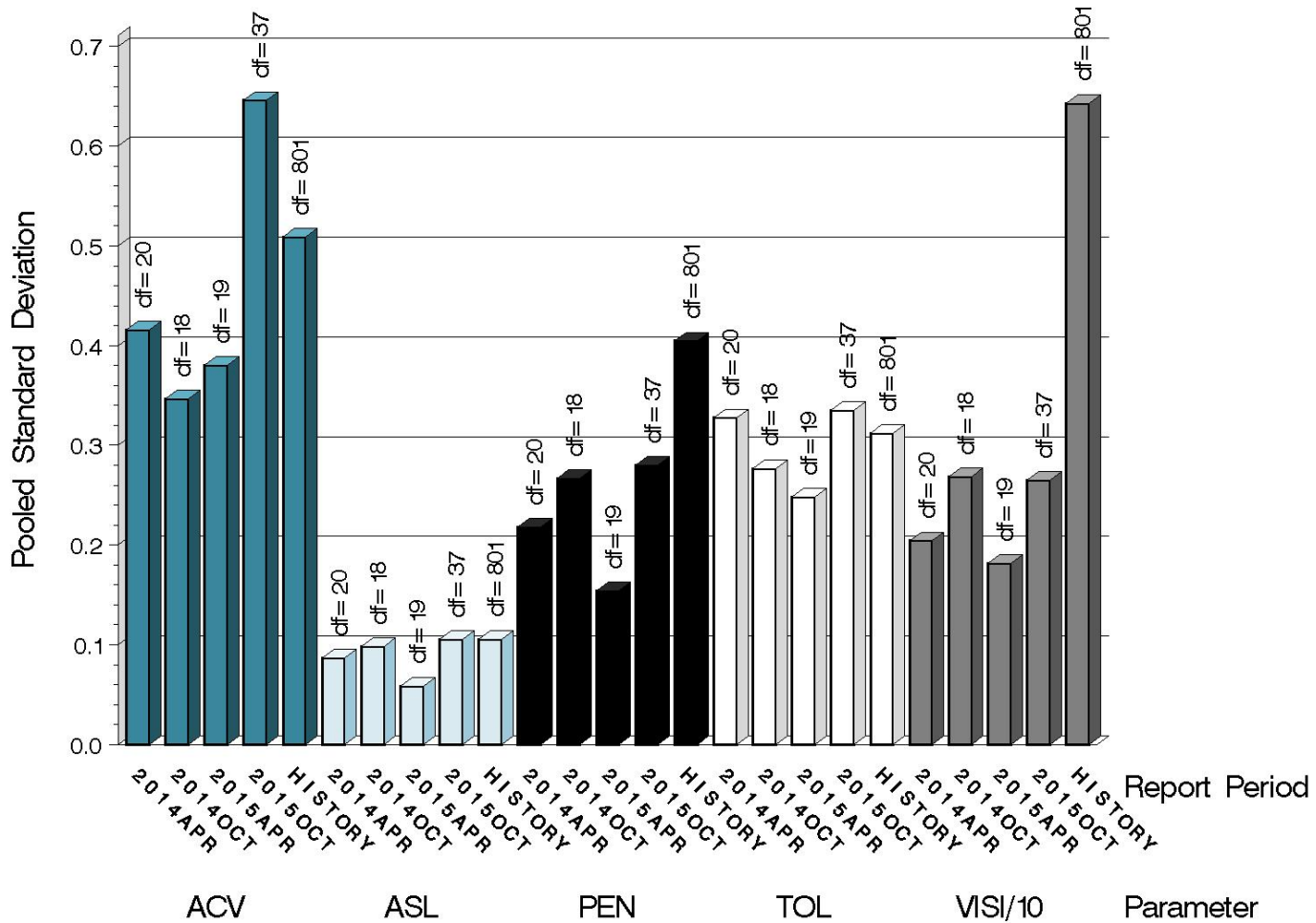


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L-60-1 (D5704)

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

11:04:54 15NOV2015

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 Surveillance Panel enacted a correction factor for ACV on October 1, 2015 that is expected to restore severity to target.

TOL severity appears to be driven by one lab that experienced a shift in 2008. That lab has begun investigating a cause for the shift.

Along with the ACV correction factor, the panel eliminated transformations which has altered the appearance of the severity charts but not the overall trends historically shown.

Precision

Precision for all parameters continues to be good.

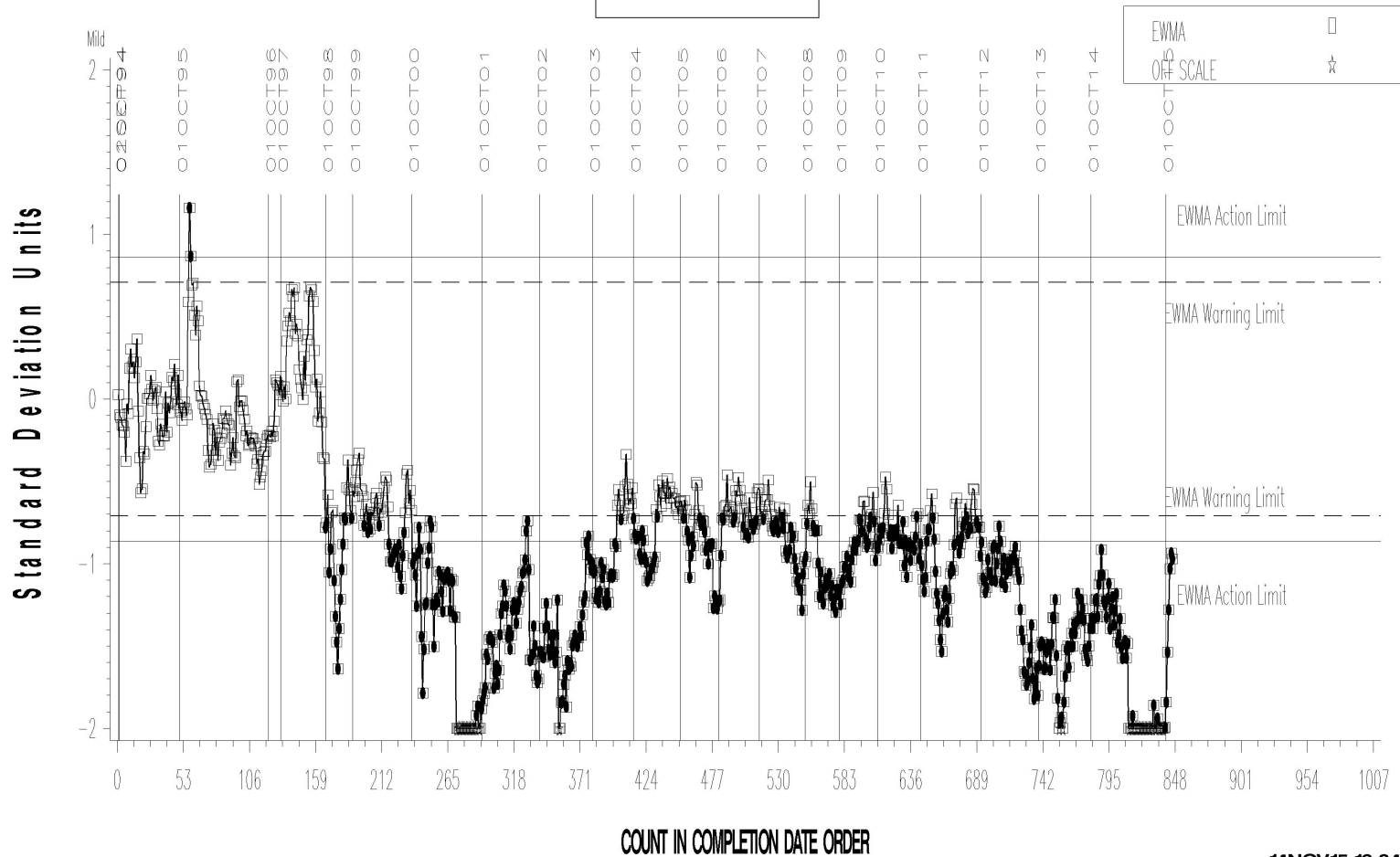
Industry control charts follow.

L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

LTMS Severity Analysis



SPURP

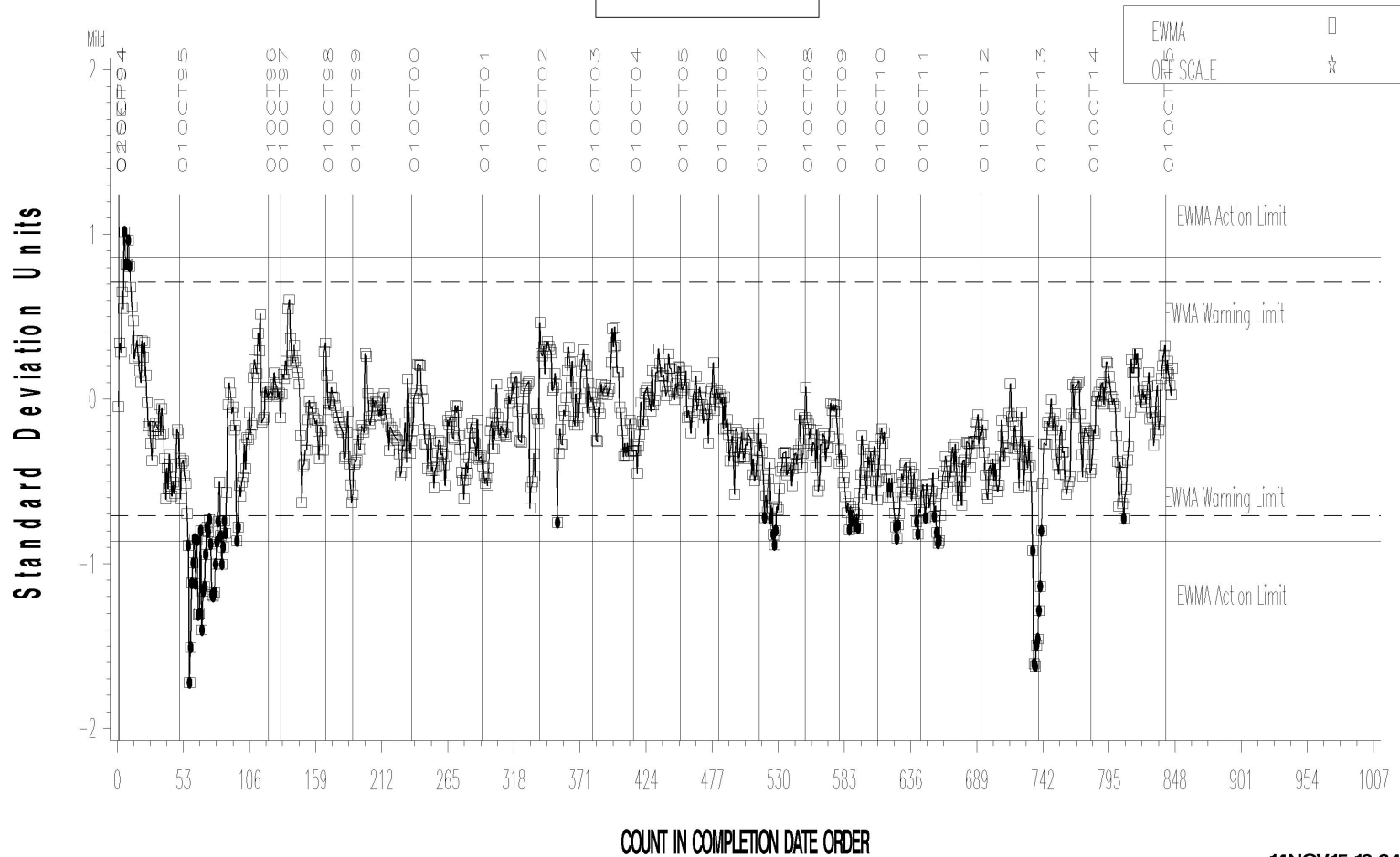
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

LTMS Severity Analysis



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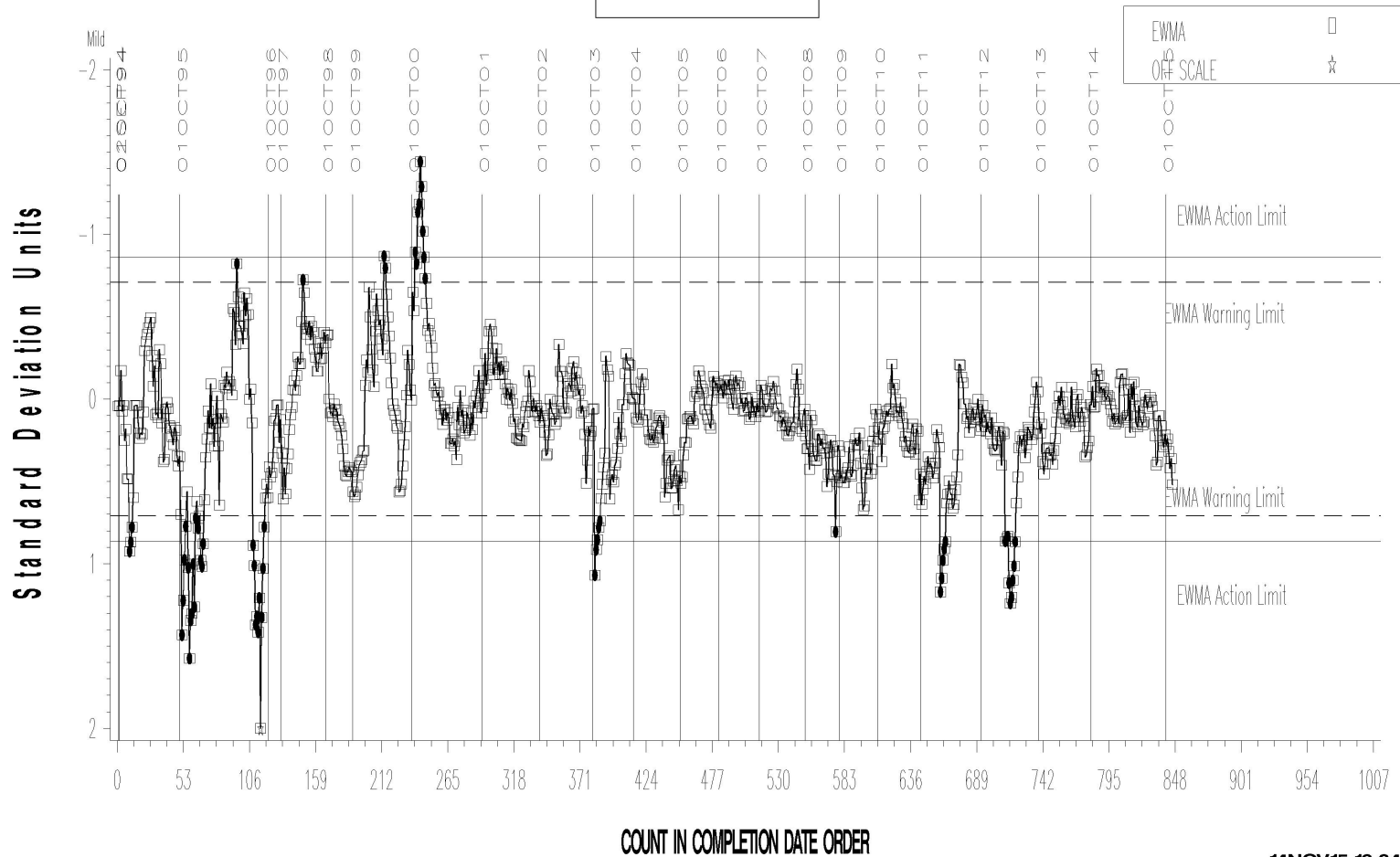
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

LTMS Severity Analysis



SPURP

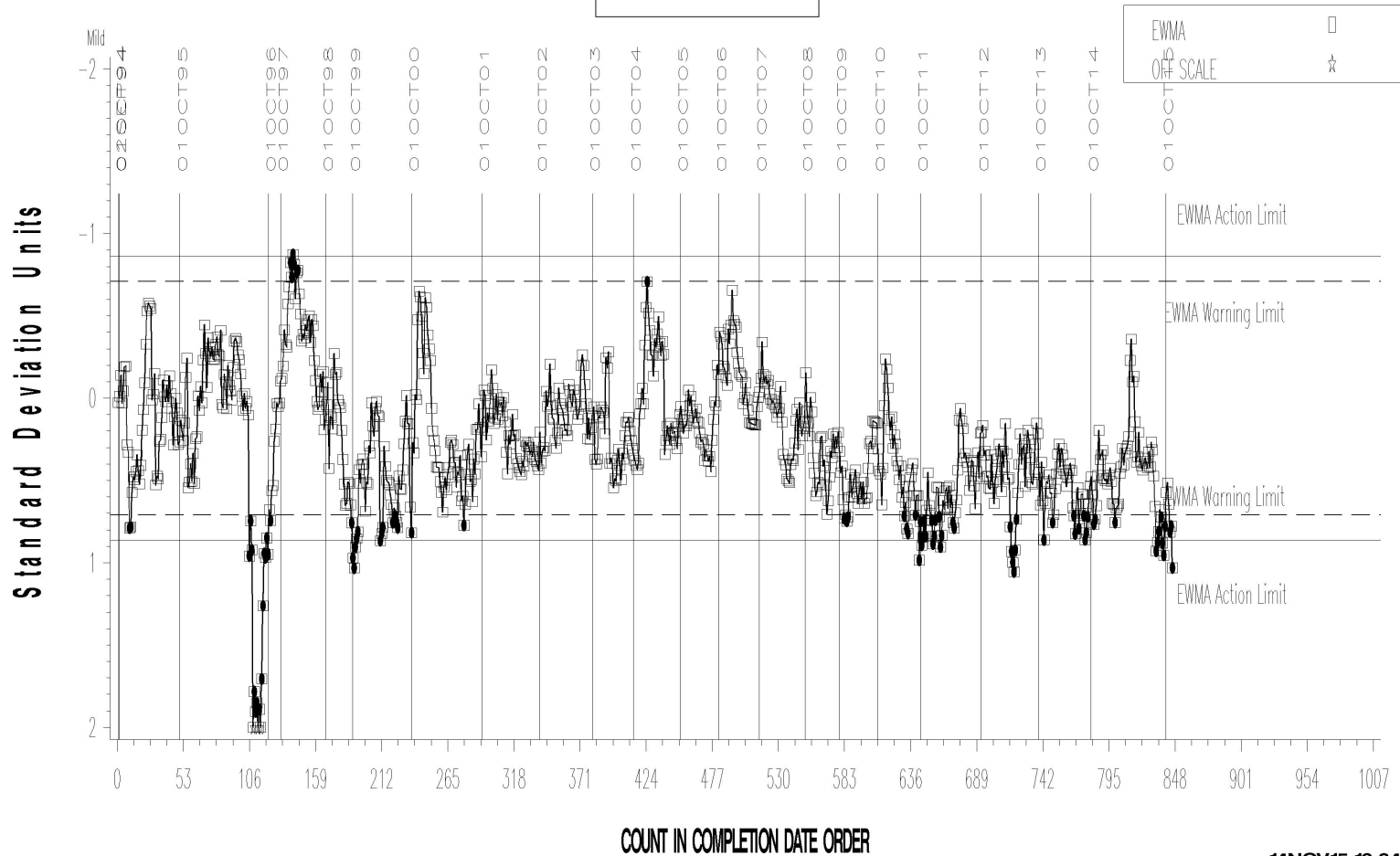
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

LTMS Severity Analysis



SPURP

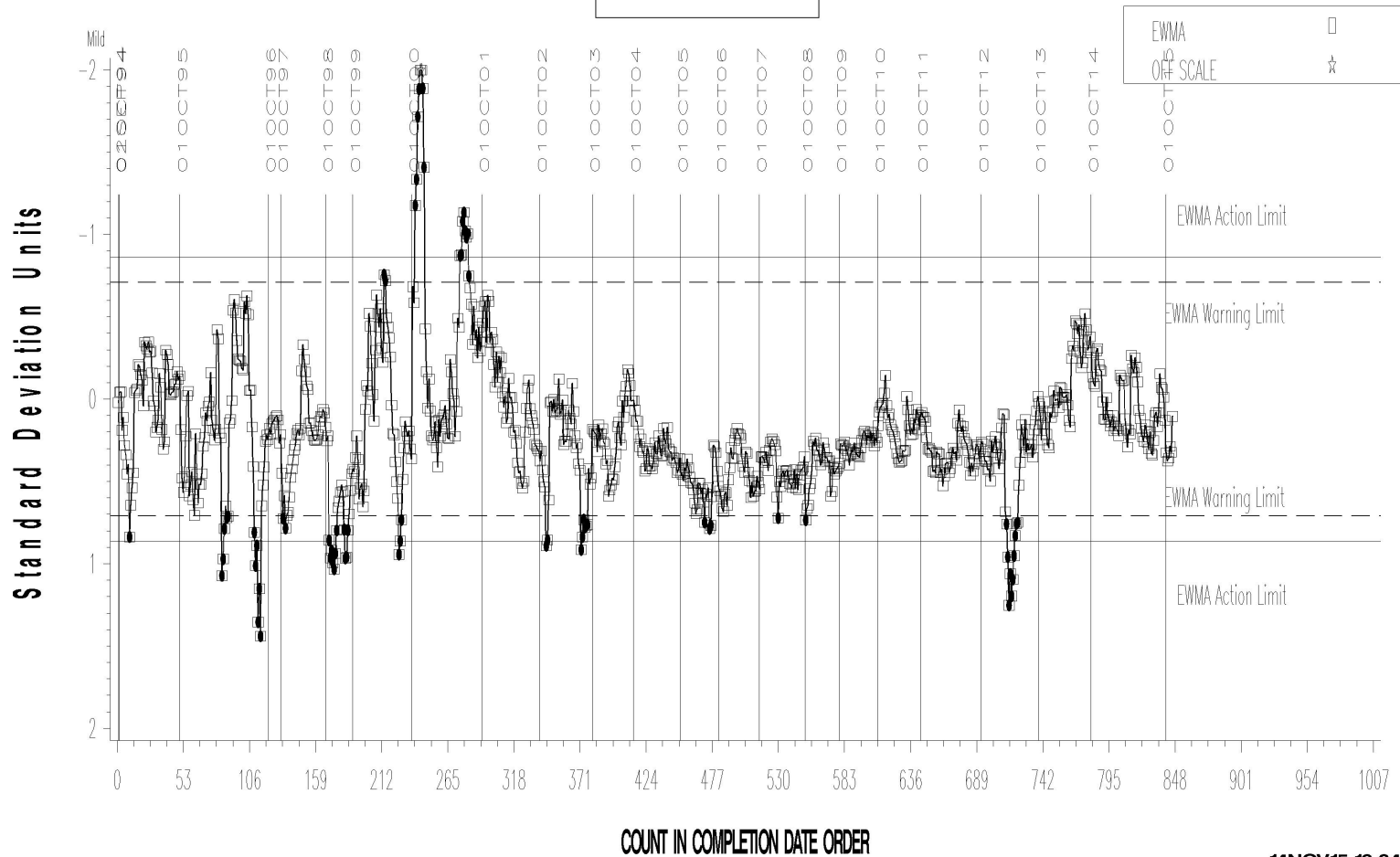
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL VISCOSITY INCREASE

LTMS Severity Analysis



SPURP

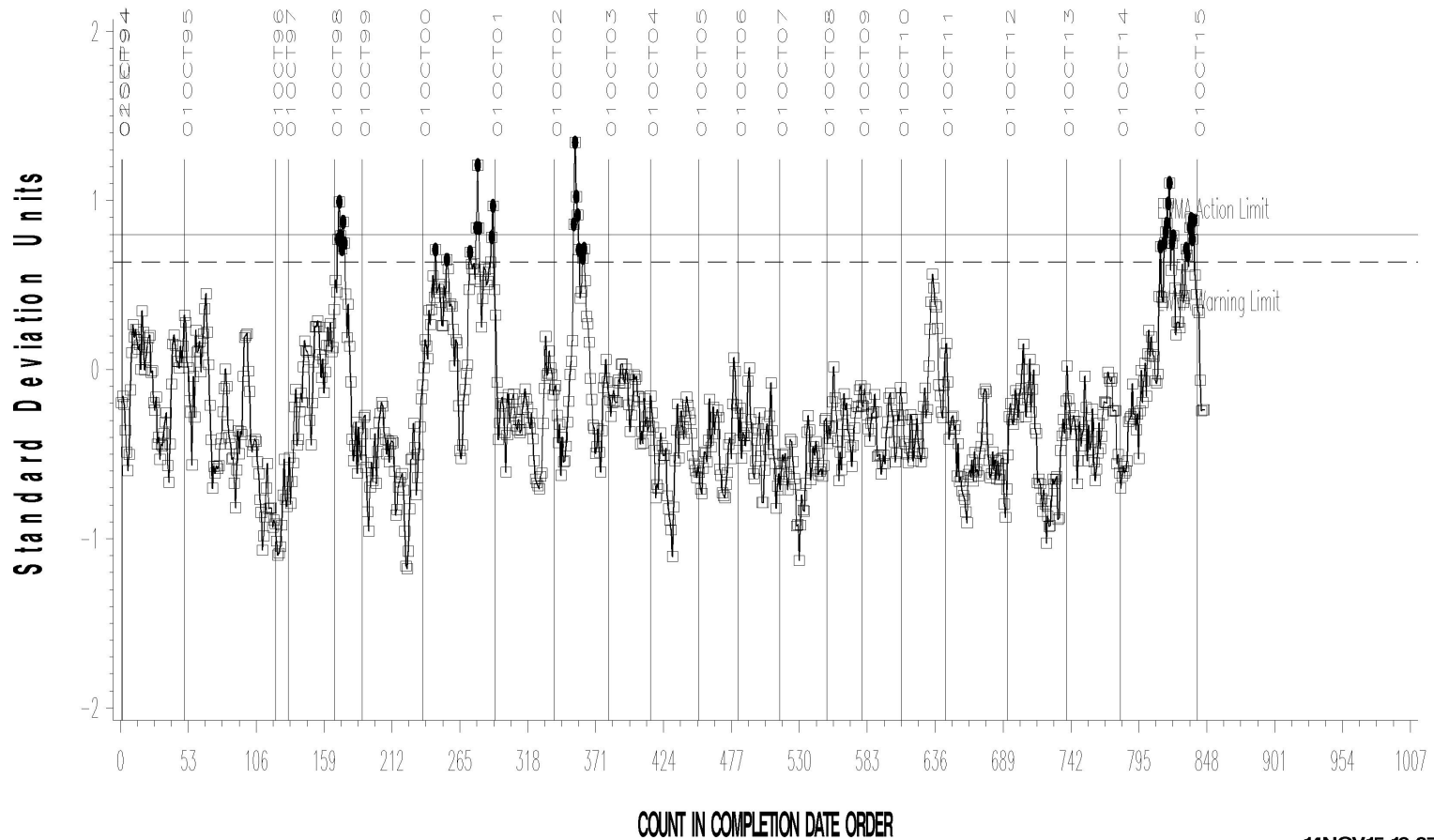
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

LTMS Precision Analysis



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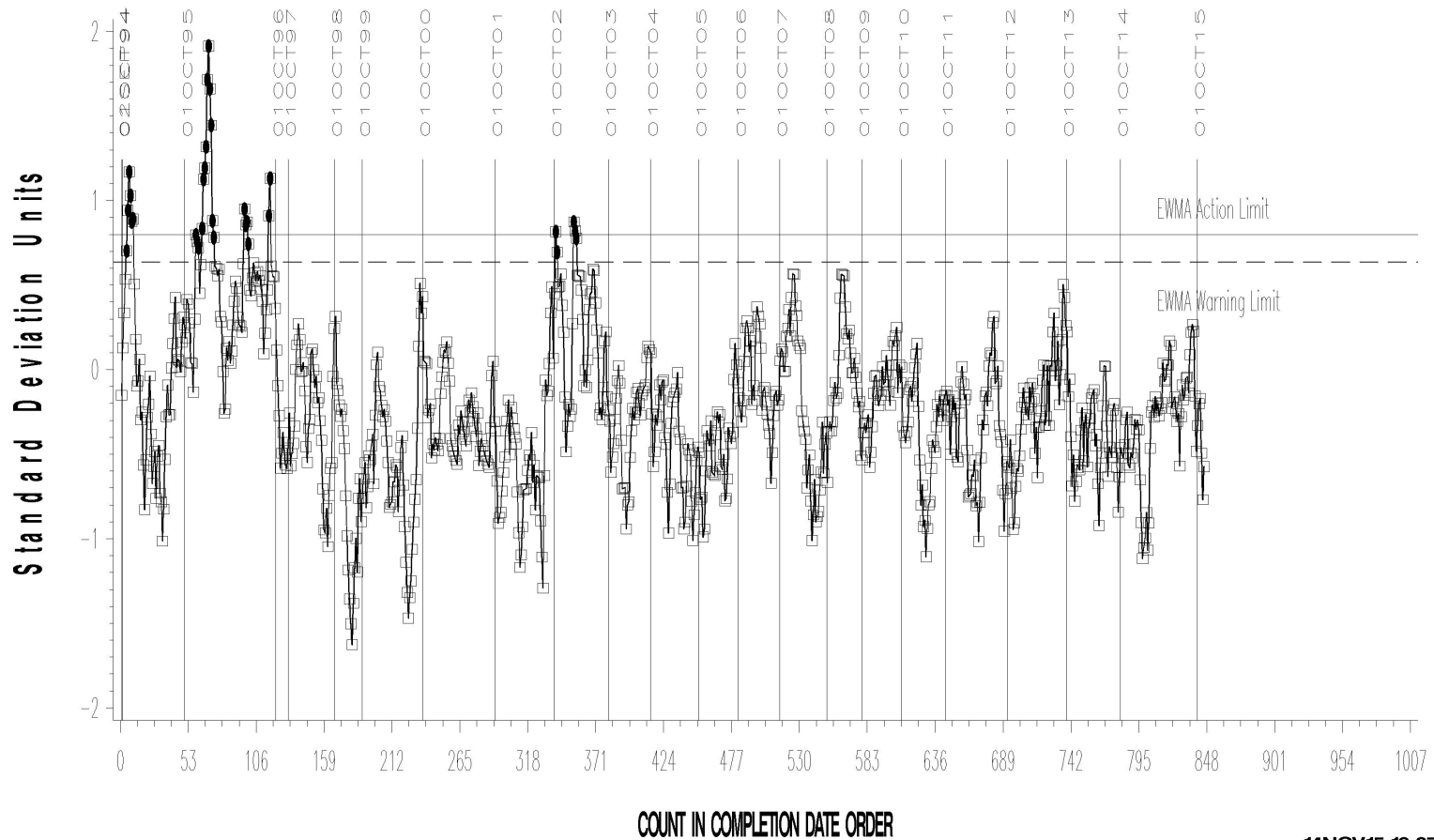


L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

LTMS Precision Analysis



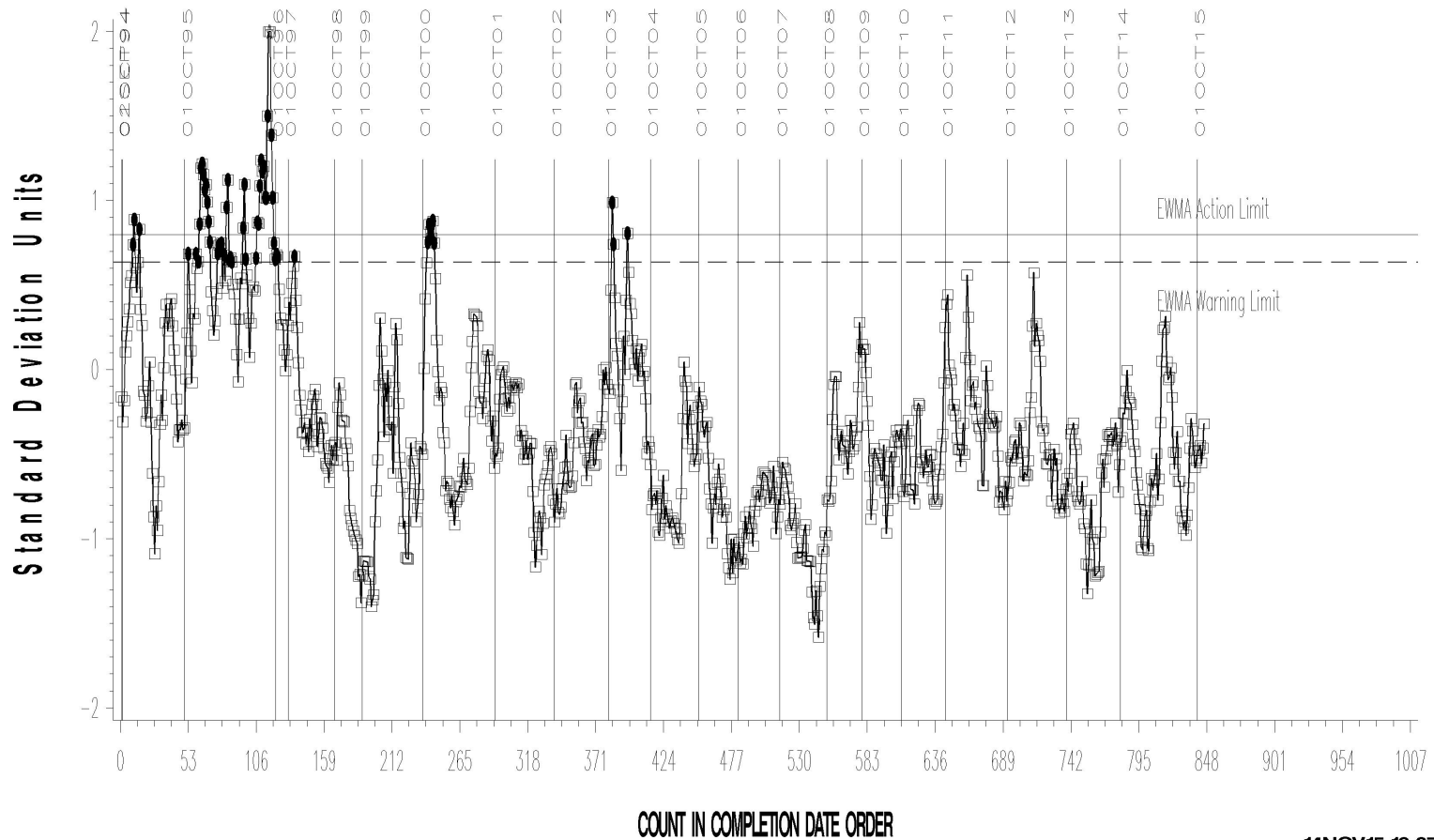
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

LTMS Precision Analysis



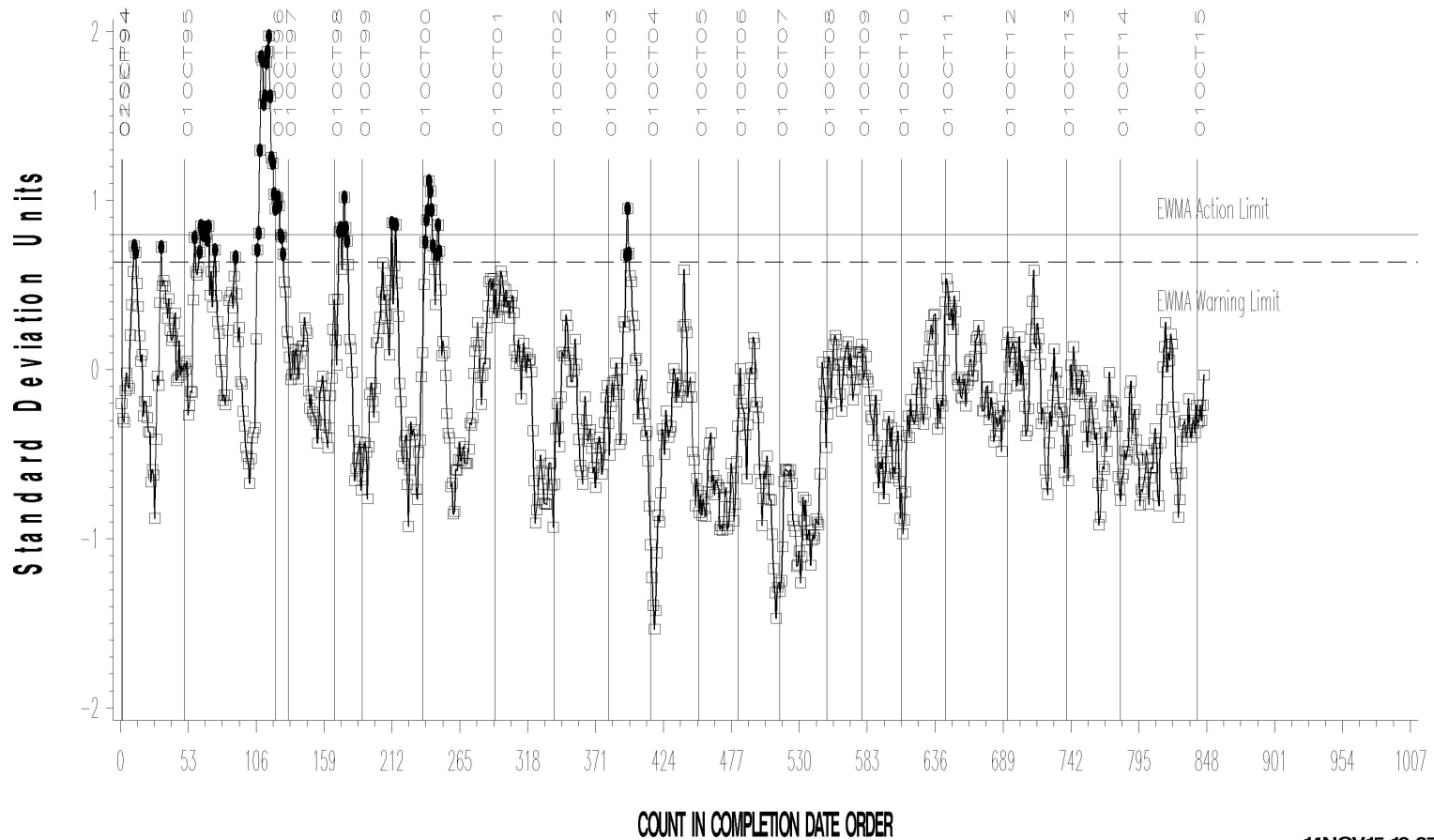
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L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

LTMS Precision Analysis



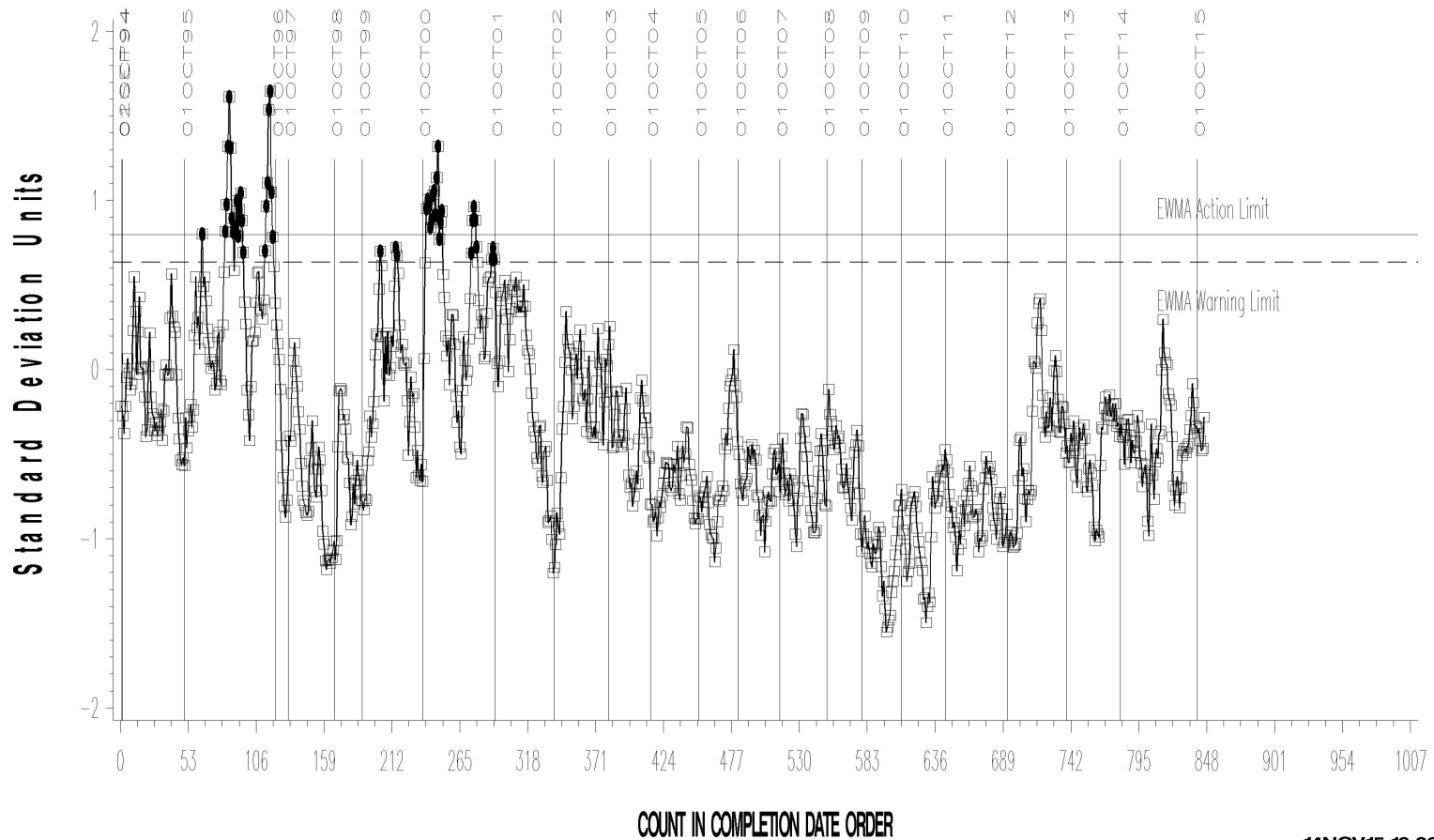
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL VISCOSITY INCREASE

LTMS Precision Analysis



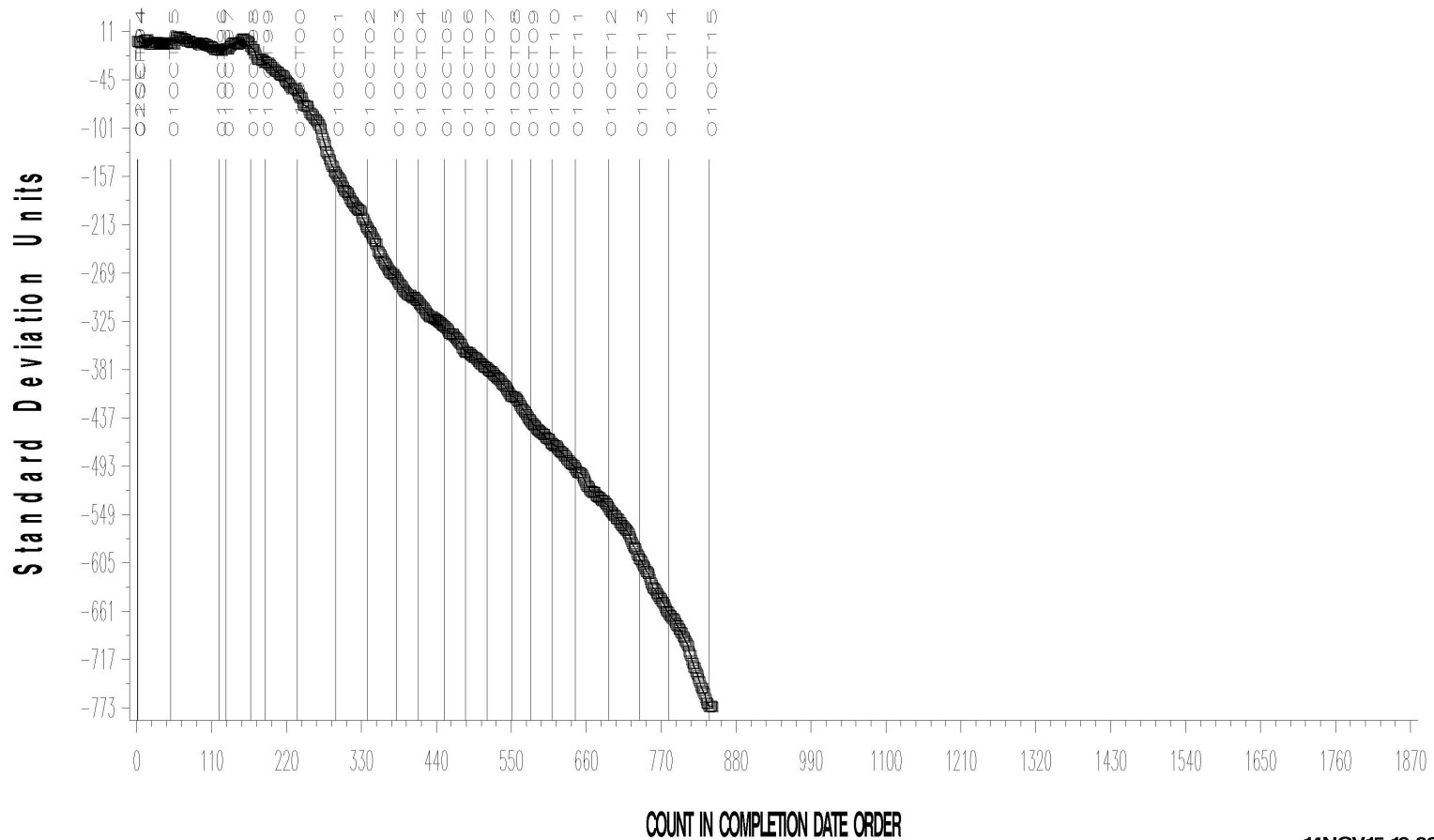
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

CUSUM Severity Analysis



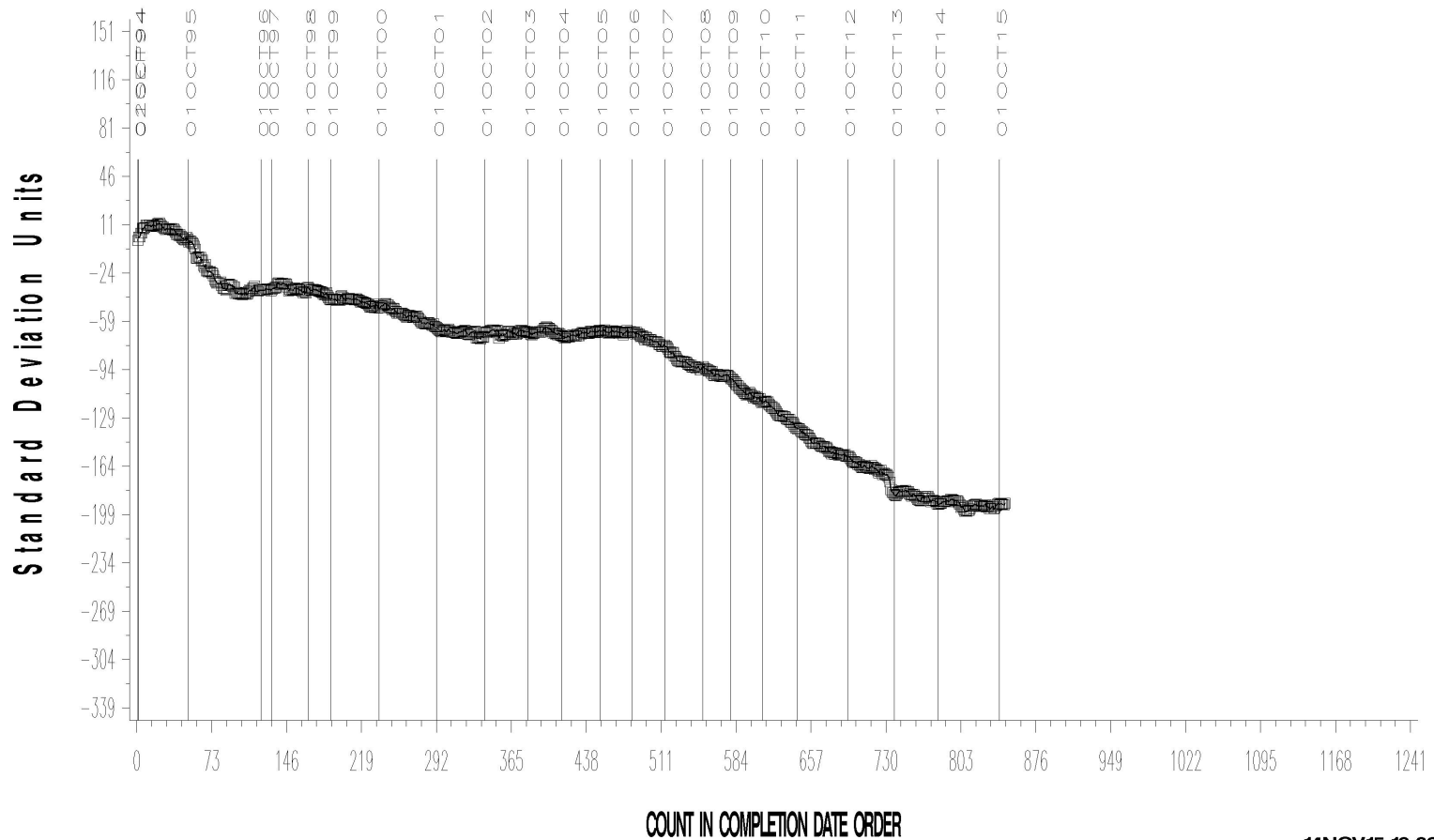
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

CUSUM Severity Analysis



14NOV15:19:09

L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

CUSUM Severity Analysis



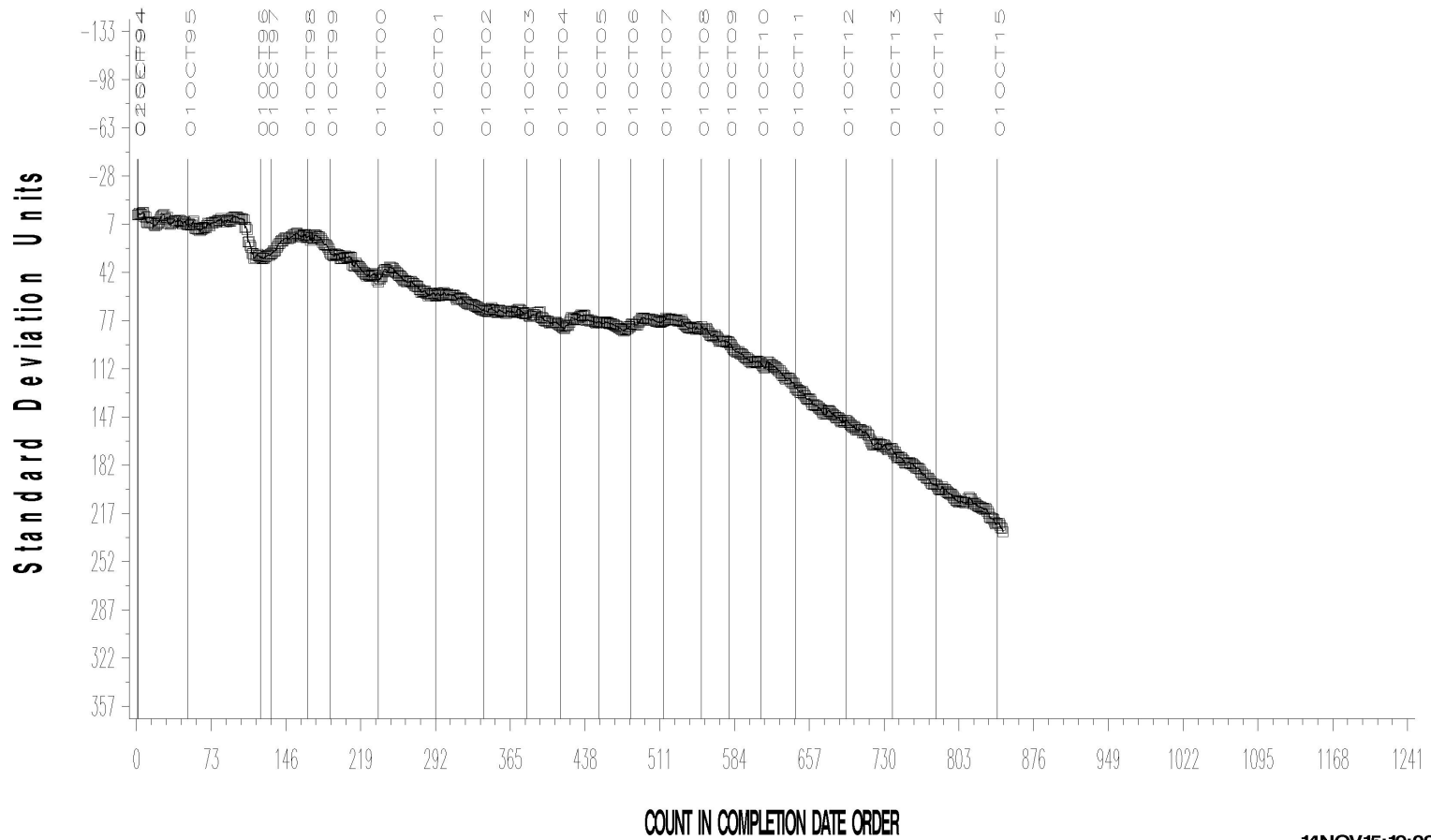
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

CUSUM Severity Analysis



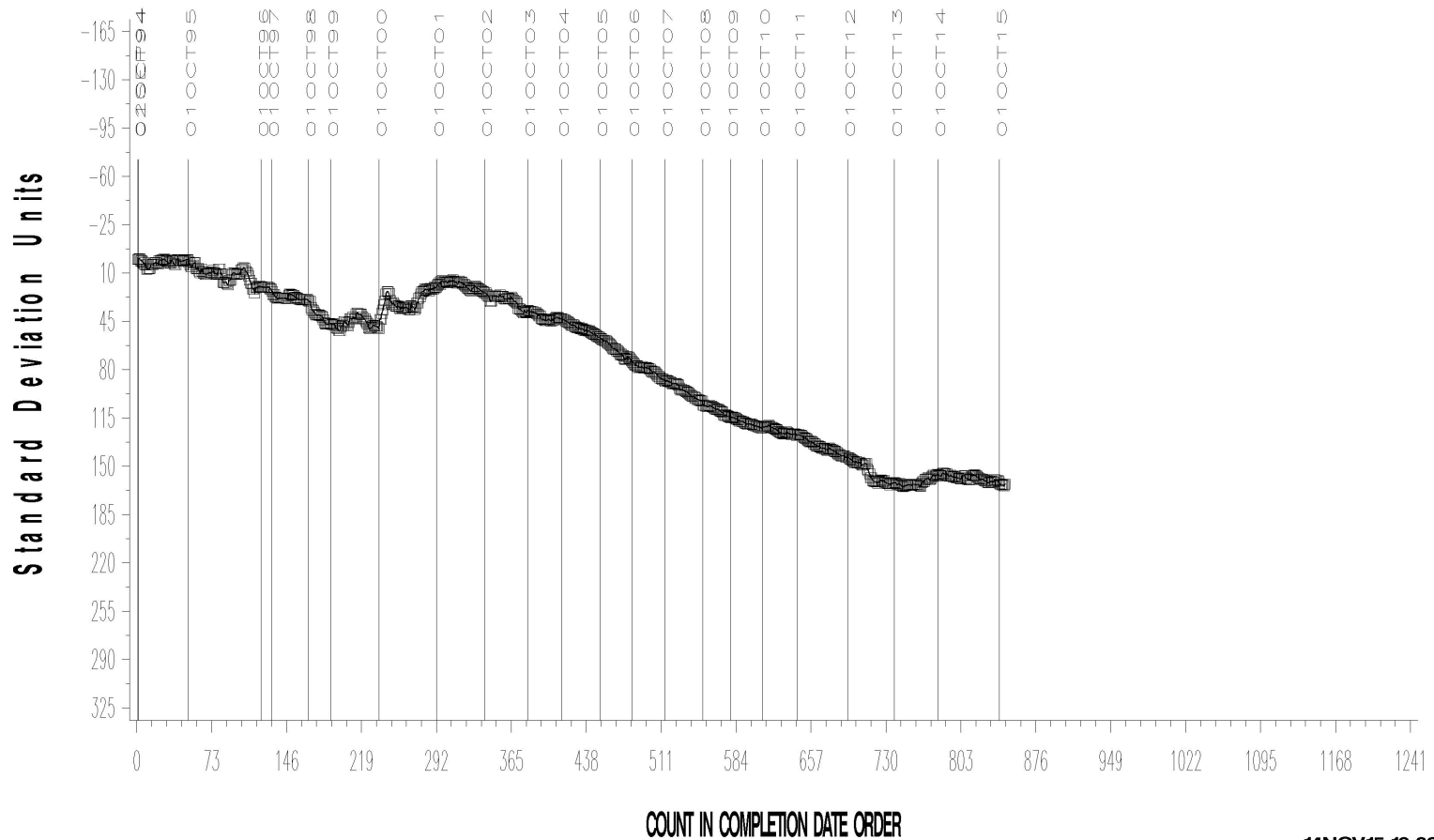
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL VISCOSITY INCREASE

CUSUM Severity Analysis



14NOV15:19:09

L-60-1 (D5704)

TIMELINE ADDITIONS

Effective Date	Information Letter	Event
20150618	15-3	Clarification regarding when stand calibration expires

L-60-1 (D5704)

LAB VISITS

No L-60-1 lab visits were conducted this period.

INFORMATION LETTERS

Information Letter 15-3 was issued on June 18, 2015 to clarify when the stand calibration expires. Candidate tests are permitted to start up until the end of the final day of the calibration period.

L-60-1 (D5704)

STATUS OF REFERENCE OIL SUPPLY

Oil	Cans @ Labs	@ TMC	
		Cans	Gallons
148-1	19	464	29.0
151-2	3	0	0.0
155-1	19	646	40.4
Total	41	1110	69.4

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 243 gallons is available for use in other gear testing.

Four hundred and sixty four tests of oil 148-1 remain in TMC inventory; however, this is only 29 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.