



# Test Monitoring Center

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

MEMORANDUM: 09-059

DATE: November 23, 2009

TO: Galen Greene, Chairman, L-37 Surveillance Panel

FROM: Donald Lind *Donald Lind*

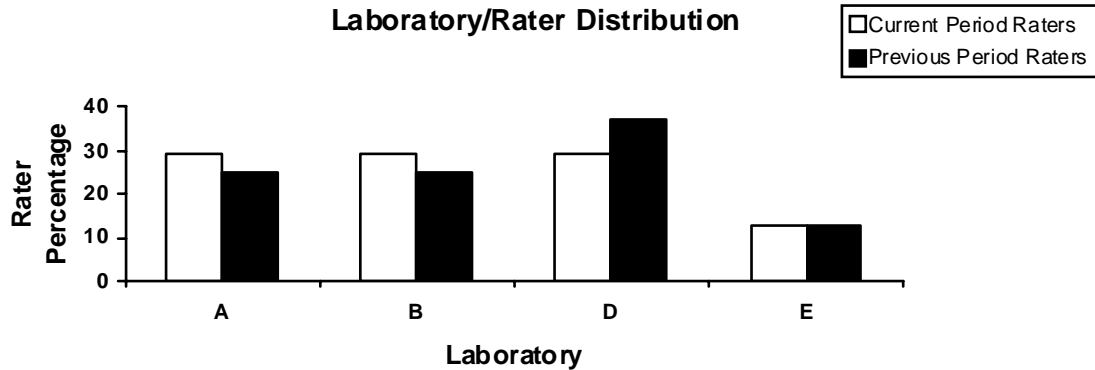
SUBJECT: L-37 Rater Calibration Status from April 1, 2009 through September 30, 2009

The following is a summary of the L-37 rater calibrations reported to the Test Monitoring Center during the period April 1, 2009 through September 30, 2009.

### Rater Summary

	Reporting Data	Calibrated as of 9/30/09
Number of Raters	7	7

The following chart shows the laboratory/rater distribution:



The following summarizes the status of the rater calibration tests reported to the TMC:

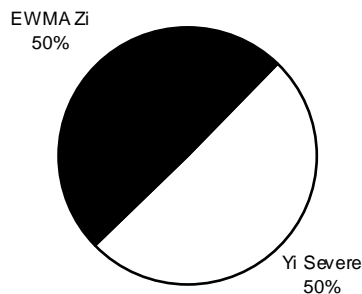
	TMC Validity Codes	No. of Calibrations
Statistically Acceptable	AC	7
Failed Acceptance Criteria	OC	1
Total		8

Summary

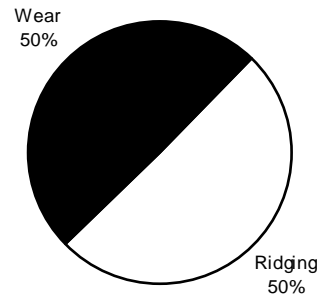
A total of eight L-37 rater calibration results from seven different raters were reported to the TMC this period. Six of the seven raters were within the acceptance criteria with their first set of pinions. One of the seven raters failed the acceptance criteria for wear severe with their first set of pinions and had their calibration period reduced to half (3 months) due to triggering a EWMA severity alarm for ridging with the second set of pinions. All seven of the raters are currently calibrated.

A detailed list of reasons tests failed the acceptance criteria are shown in Table 1. The following charts summarize these reasons with a breakdown by parameter of the failed tests.

**Distribution of RCMS Rater Alarms**



**Distribution of Rater Alarms by Parameter**



There were no RCMS deviations written this period.

Severity and Precision

For this period, the mean delta/s was -0.33 severe for Wear, 0.20 mild for Rippling, -0.30 severe for Ridging, and -0.07 severe for Spitting. Precision was 0.68 for Wear, 0.52 for Rippling, 0.67 for Ridging, and 0.42 for Spitting. A straight standard deviation of Yi was used because the number of ratings per pinion was too small to determine a pooled standard deviation. Below is a table illustrating rater severity for this report period:

Rater	Wear		Rippling		Ridging		Spitting	
	Yi	S.D. *	Yi	S.D. *	Yi	S.D. *	Yi	S.D. *
B	0.03	0.23	0.00	0.58	0.07	0.21	-0.02	0.18
E	-0.04	0.77	0.20	0.50	-0.22	0.33	0.22	0.59
H	-0.33	0.67	0.06	0.22	-0.62	0.38	0.03	0.14
I	-0.90	0.00	-0.07	0.64	-0.55	0.33	-0.07	0.09
K	0.35	0.48	-0.02	0.26	-0.17	0.78	0.03	0.14
M	-0.60	0.55	0.82	0.15	-0.30	1.46	-0.13	0.65
N	-0.56	0.82	0.29	0.61	-0.30	0.66	-0.33	0.53

\*A straight standard deviation of Yi was used as the number of ratings per pinion was too small to determine a pooled standard deviation.

### Industry Control Charts

Figures 1 through 4 are the L-37 rater industry control charts for pinion Wear, Rippling, Ridging, and Spitting, respectively. Figures 5 through 8 are the rater industry control charts of the last 30 test results for pinion Wear, Rippling, Ridging, and Spitting, respectively. Severity EWMA charts for pinion Rippling, Ridging, and Spitting were in control this report period. Severity EWMA charts for pinion Wear triggered one alarm. The alarm does not appear to be related to any one pinion or rater. Precision EWMA charts for pinion Wear, Rippling, Ridging, and Spitting were in control this report period.

### Attachments

c: L-37 Surveillance Panel  
L-37 Rater Task Force  
F. M. Farber  
<ftp://ftp.astmtmc.cmu.edu/docs/gear/l37rc/semiannualreports/l37rc-10-2009.pdf>

Distribution: Email

## **Listing of Tables and Figure Included as Part of This Report to the L-37 Rater Calibration Report**

Table 1 is a Detailed List Summarizing the Reasons for Failed Tests

Figure 1 is the L-37 Rater Industry Control Charts for Pinion Wear

Figure 2 is the L-37 Rater Industry Control Charts for Pinion Rippling

Figure 3 is the L-37 Rater Industry Control Charts for Pinion Ridging

Figure 4 is the L-37 Rater Industry Control Charts for Pinion Spitting

Figure 5 is the L-37 Rater Industry Control Chart of the last 30 test results for Pinion Wear

Figure 6 is the L-37 Rater Industry Control Chart of the last 30 test results for Pinion Rippling

Figure 7 is the L-37 Rater Industry Control Chart of the last 30 test results for Pinion Ridging

Figure 8 is the L-37 Rater Industry Control Chart of the last 30 test results for Pinion Spitting

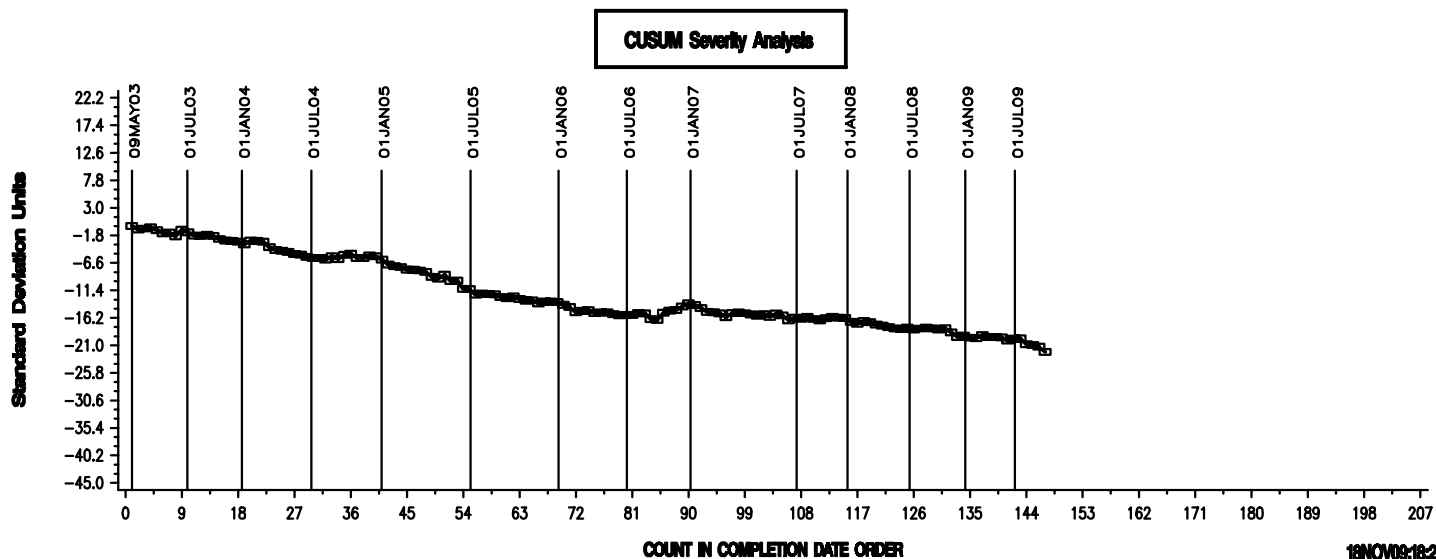
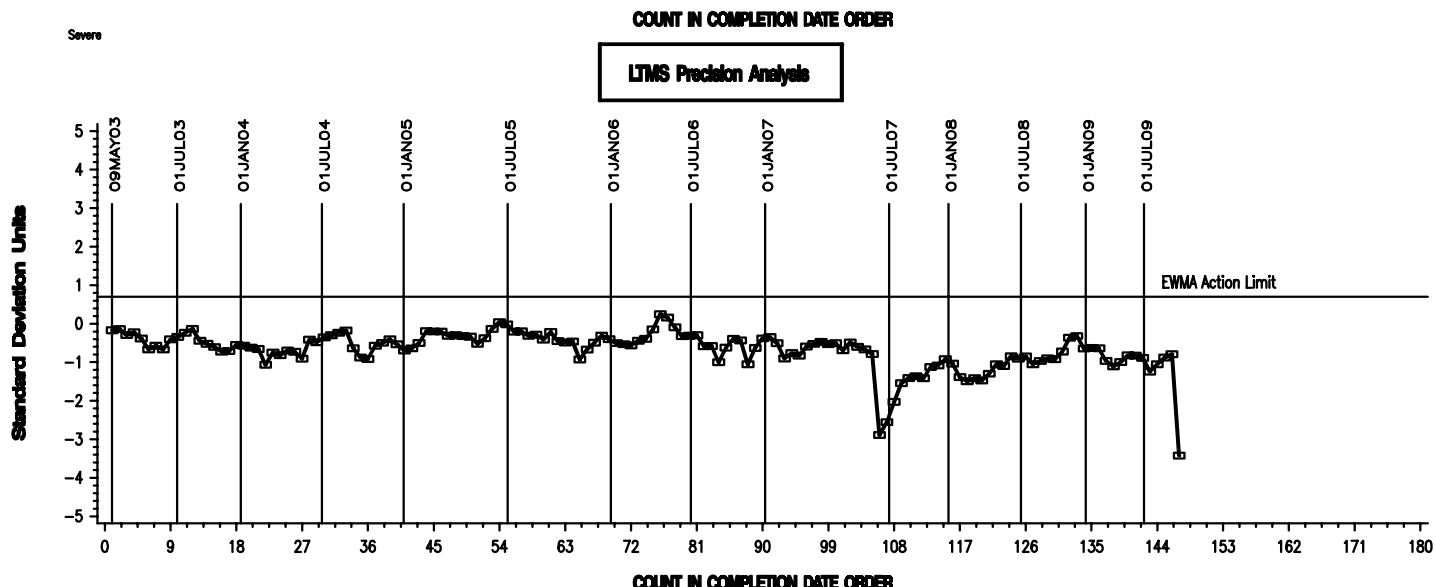
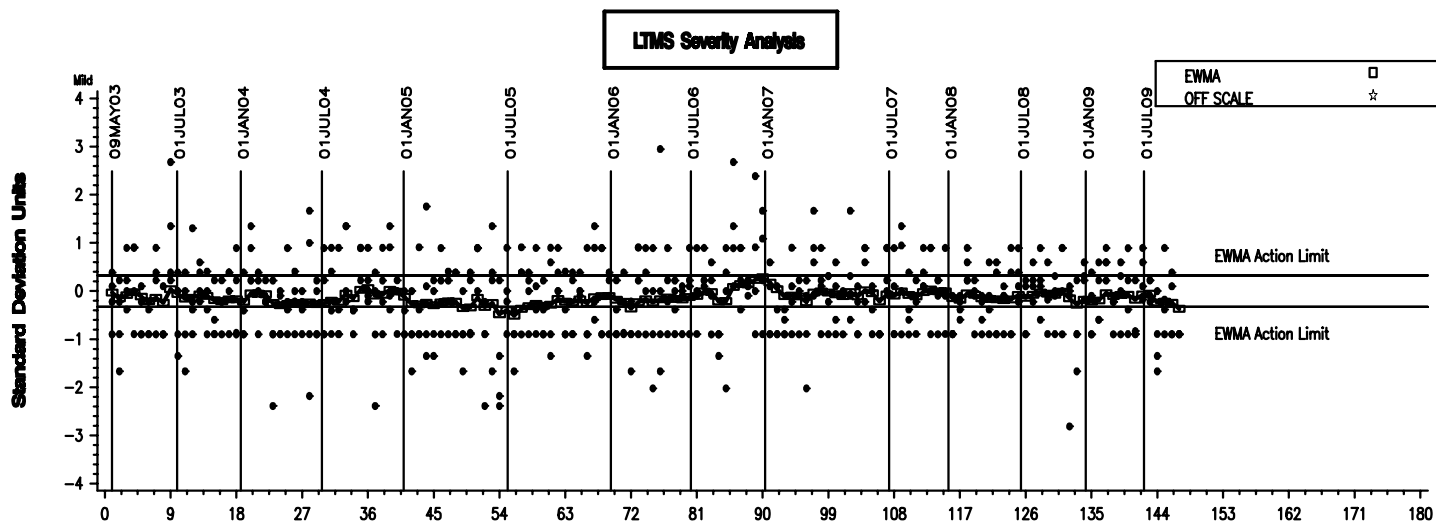
Table 1

Summary of Alarms This Period

Lab	Rater	Reason
B	N	Wear Severe
B	N	Ridging EWMA Severity (Calibration Period Reduced to Half, 3 Months)

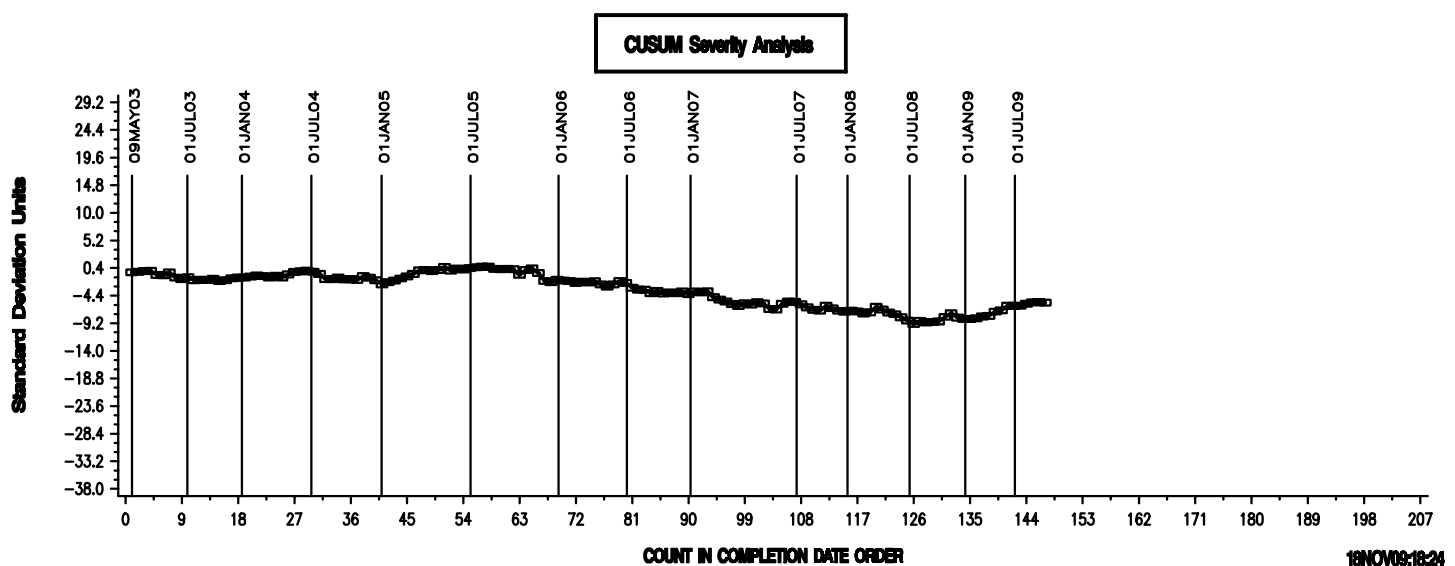
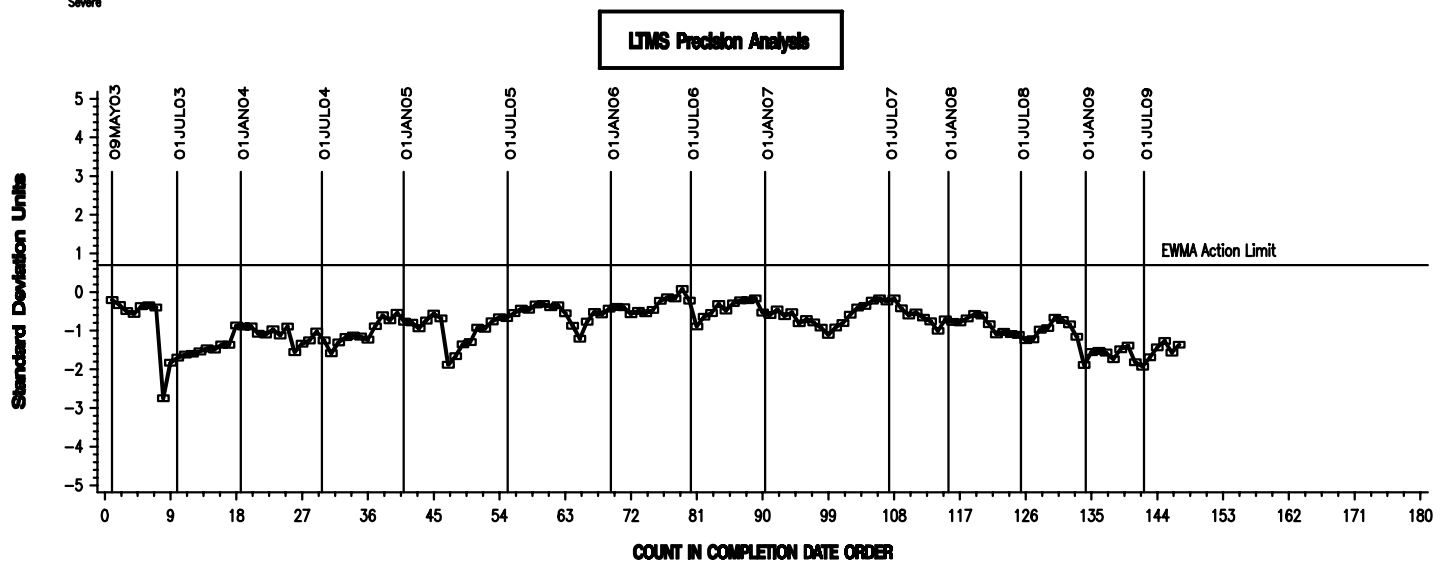
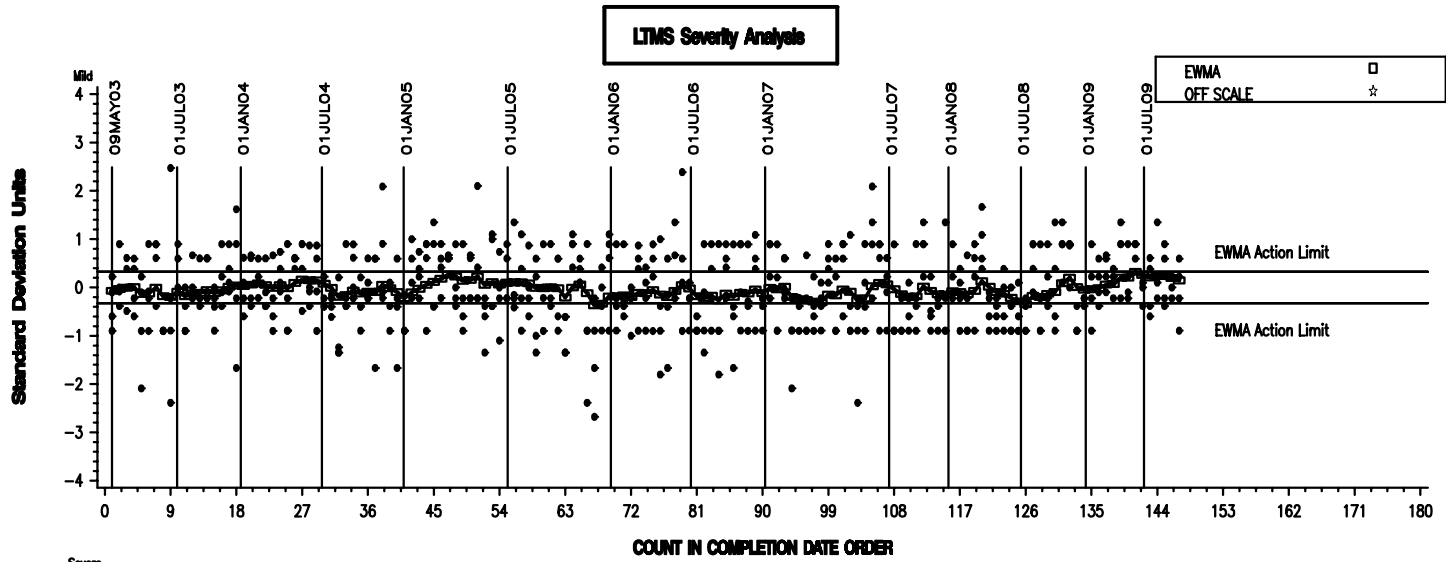
L-37 RATER CALIBRATION INDUSTRY OPERATIONALLY VALID DATA

WEAR



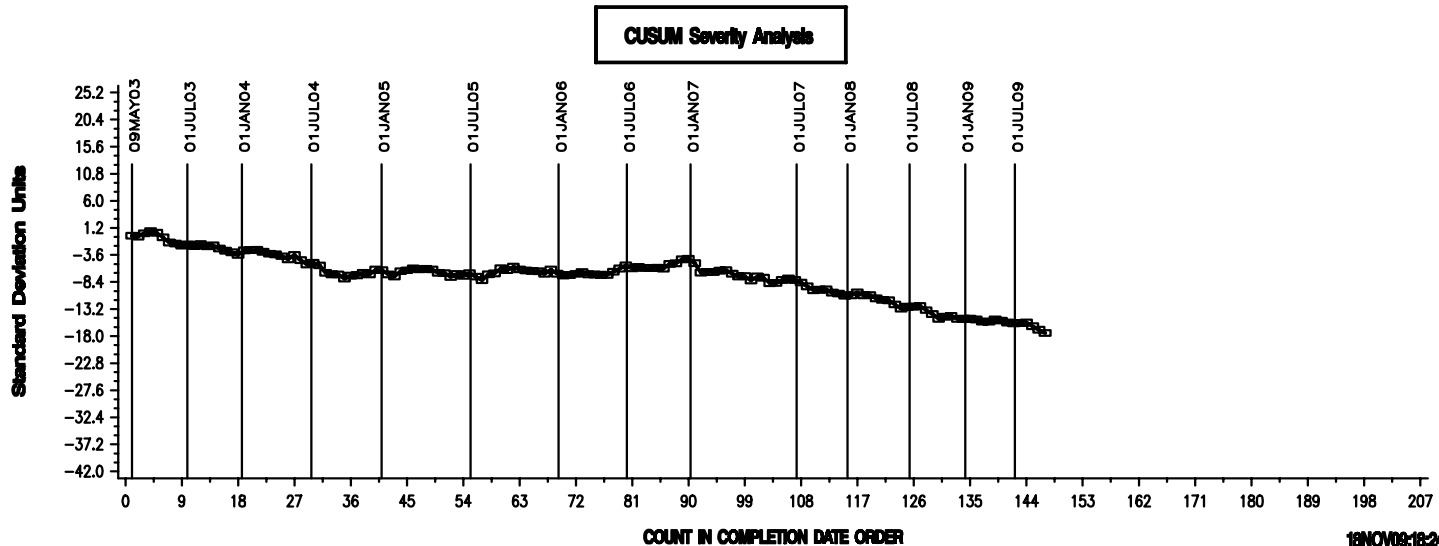
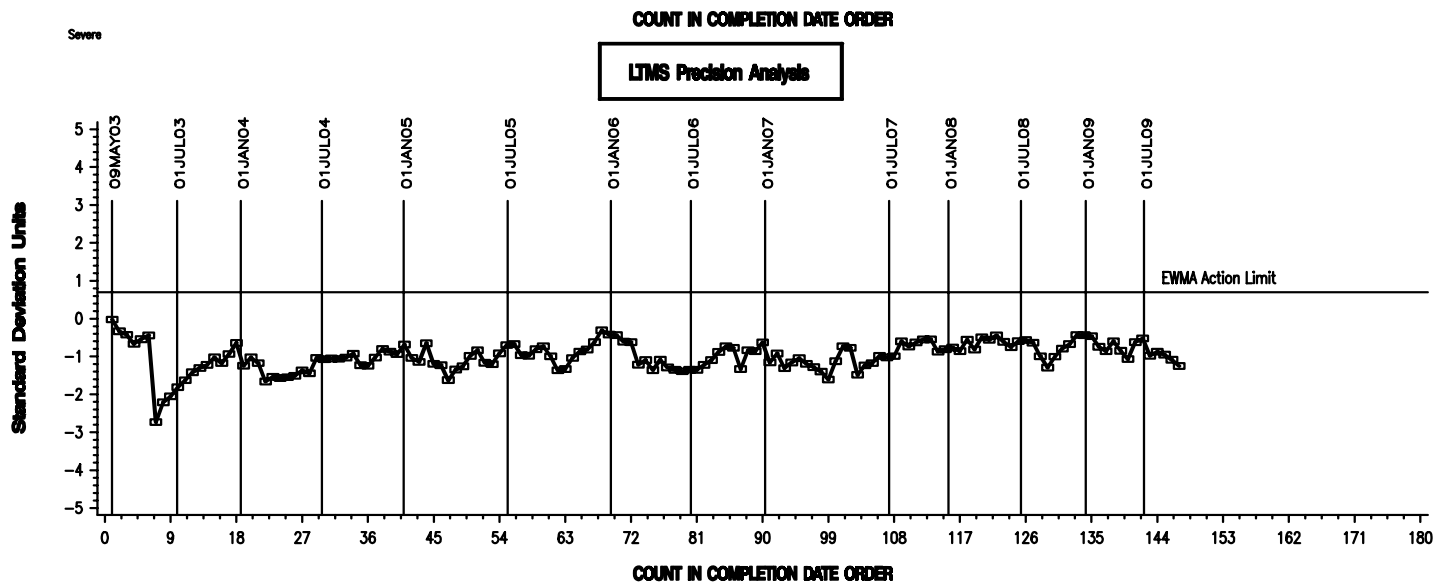
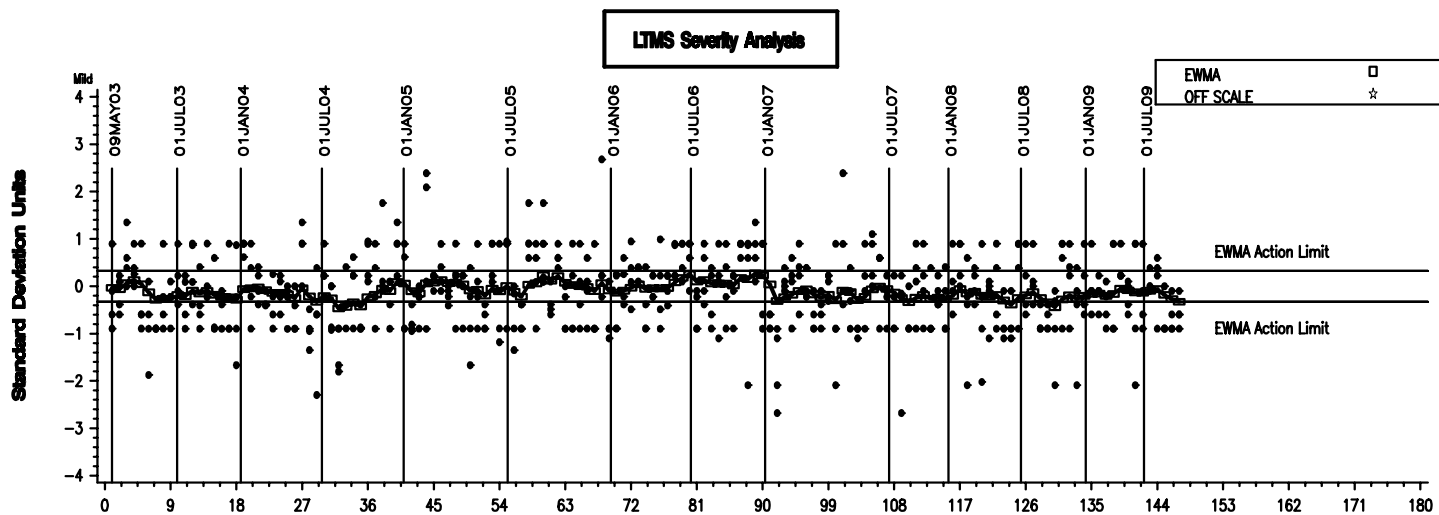
# L-37 RATER CALIBRATION INDUSTRY OPERATIONALLY VALID DATA

## RIPPLING



### L-37 RATER CALIBRATION INDUSTRY OPERATIONALLY VALID DATA

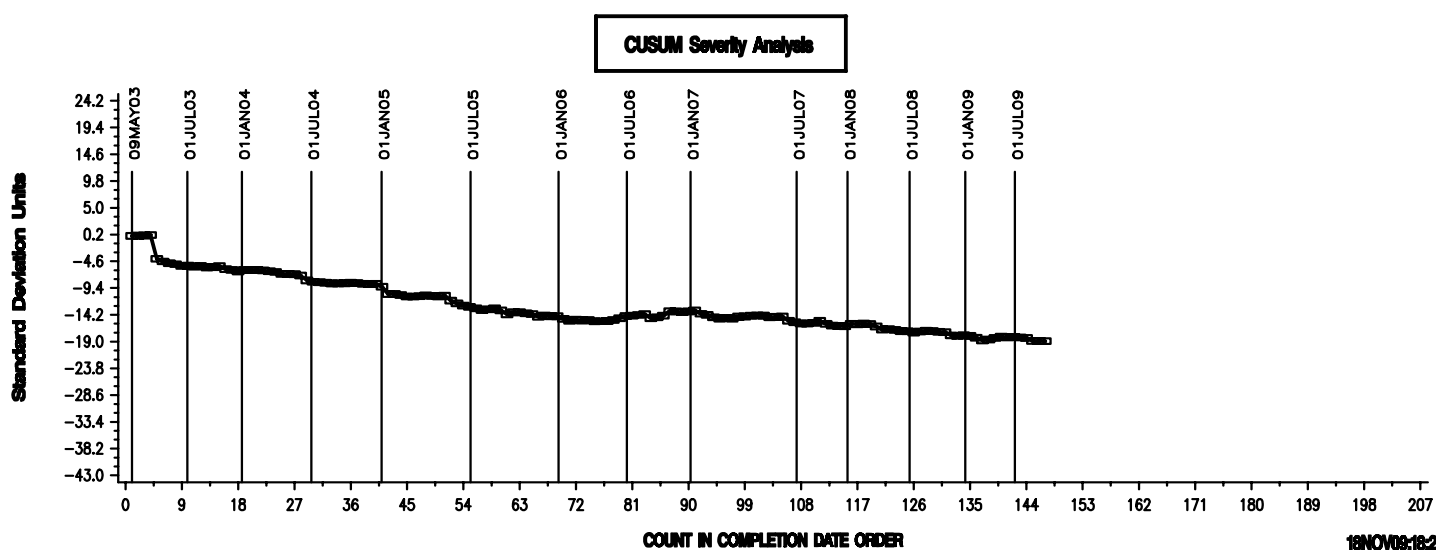
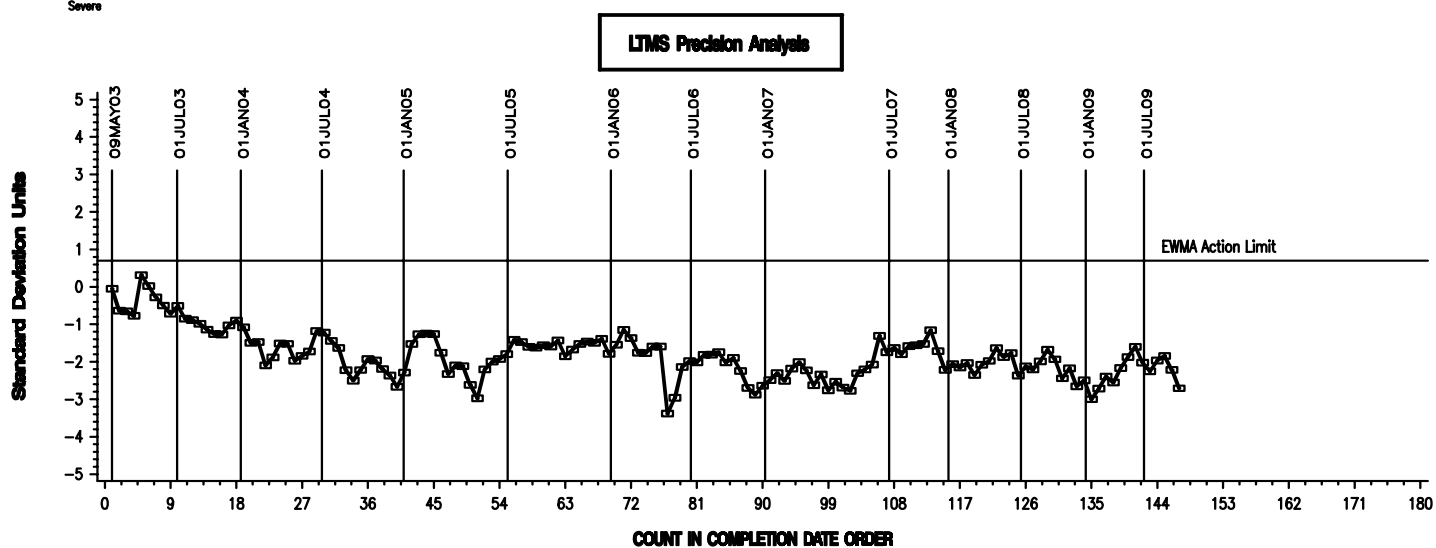
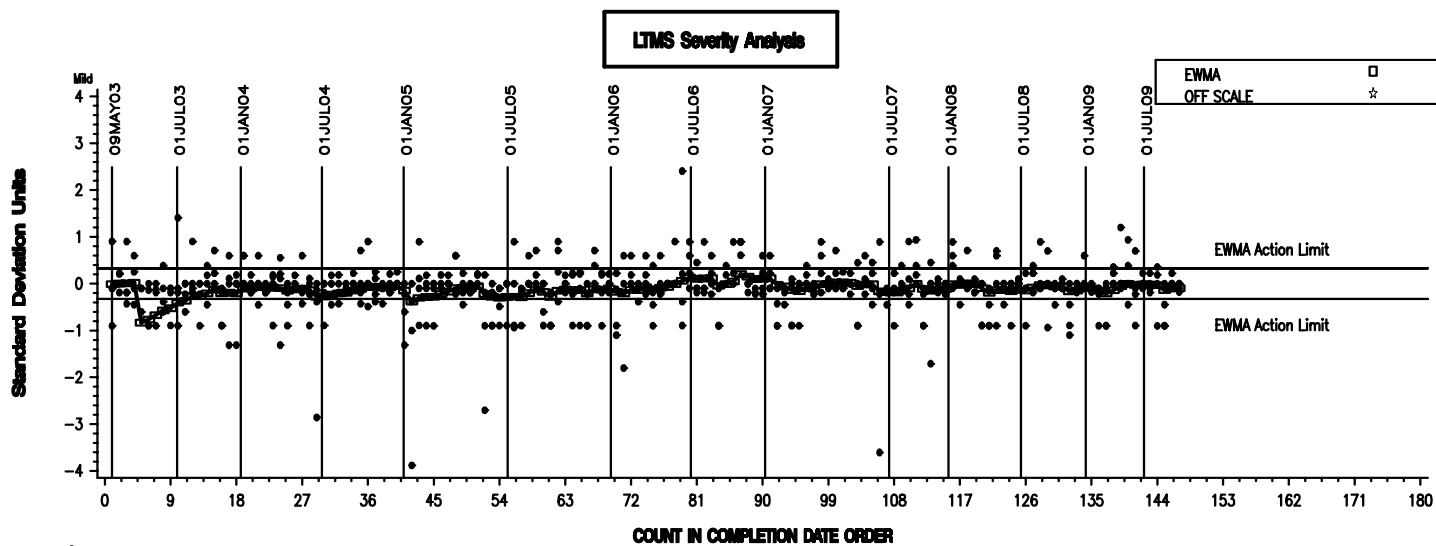
#### RIDGING





L-37 RATER CALIBRATION INDUSTRY OPERATIONALLY VALID DATA

SPITTING

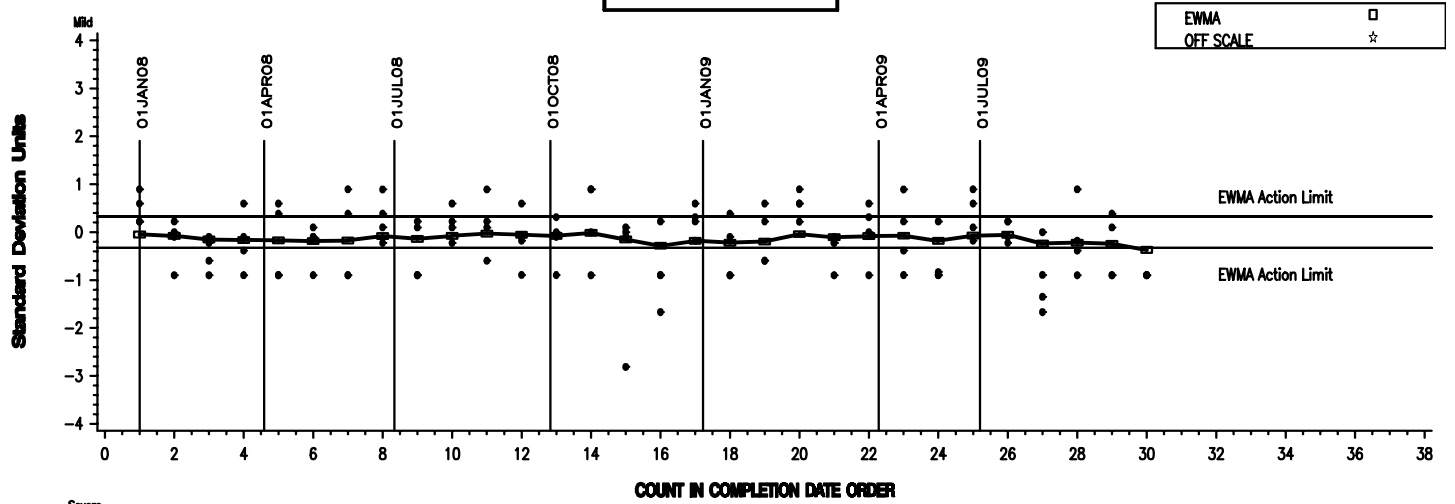


L-37 RATER CALIBRATION INDUSTRY OPERATIONALLY VALID DATA

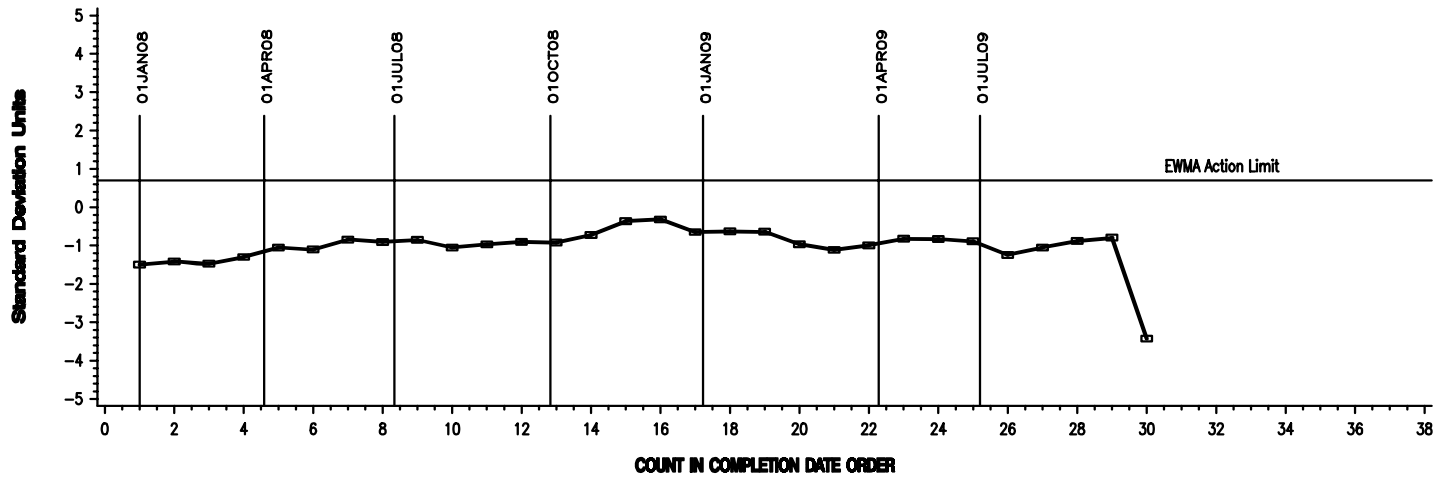
Last 30 Test Results

WEAR

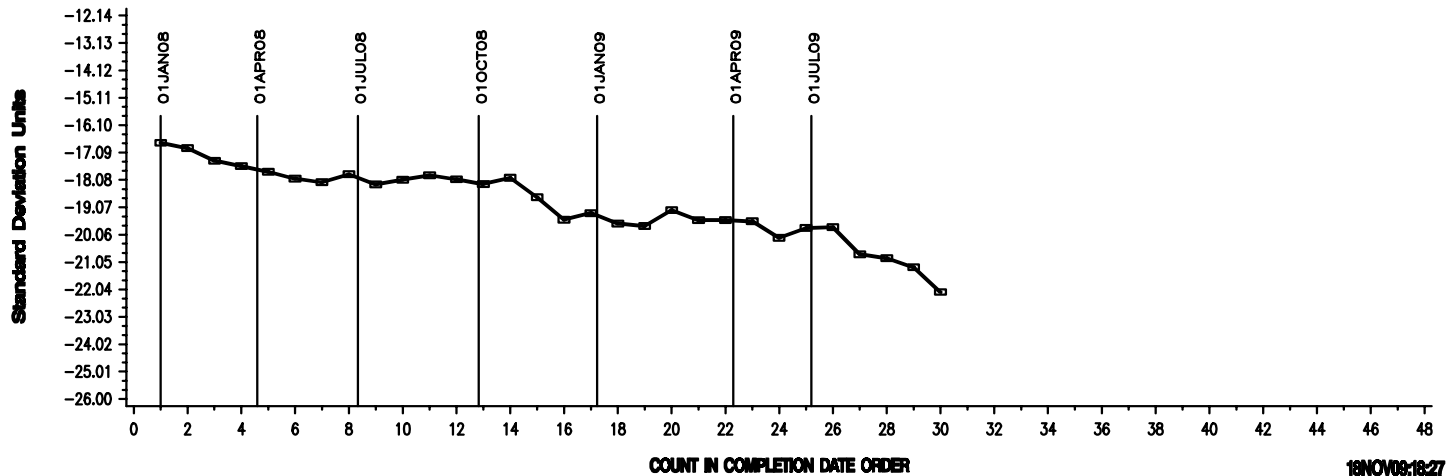
LTMS Severity Analysis



LTMS Precision Analysis

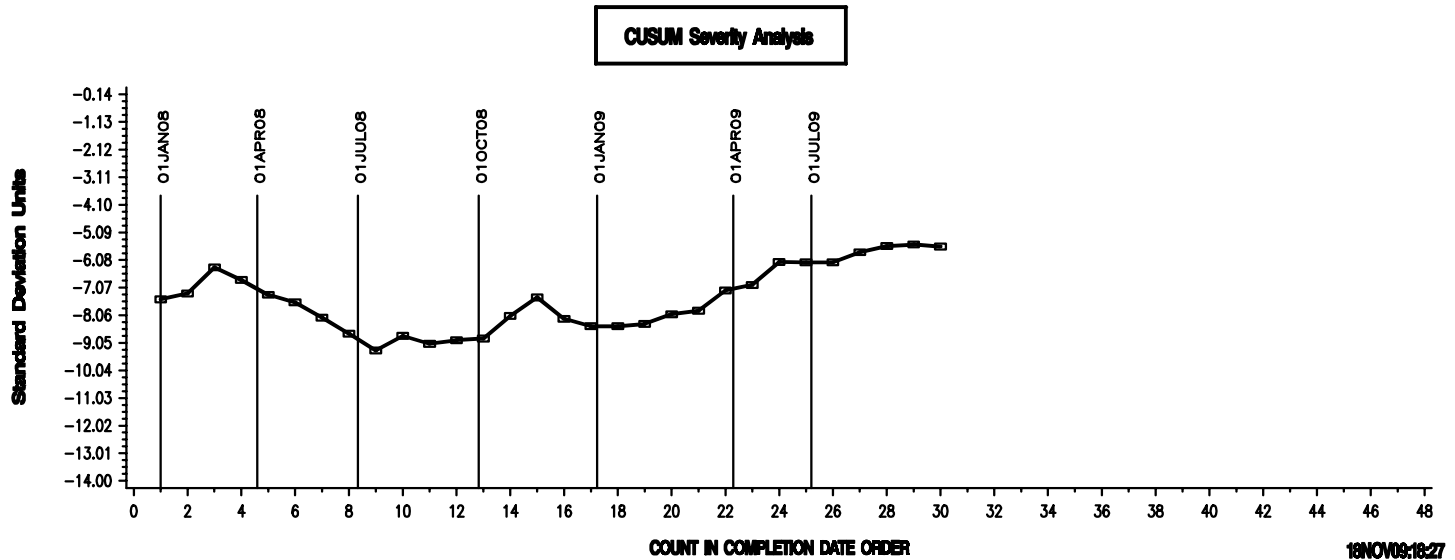
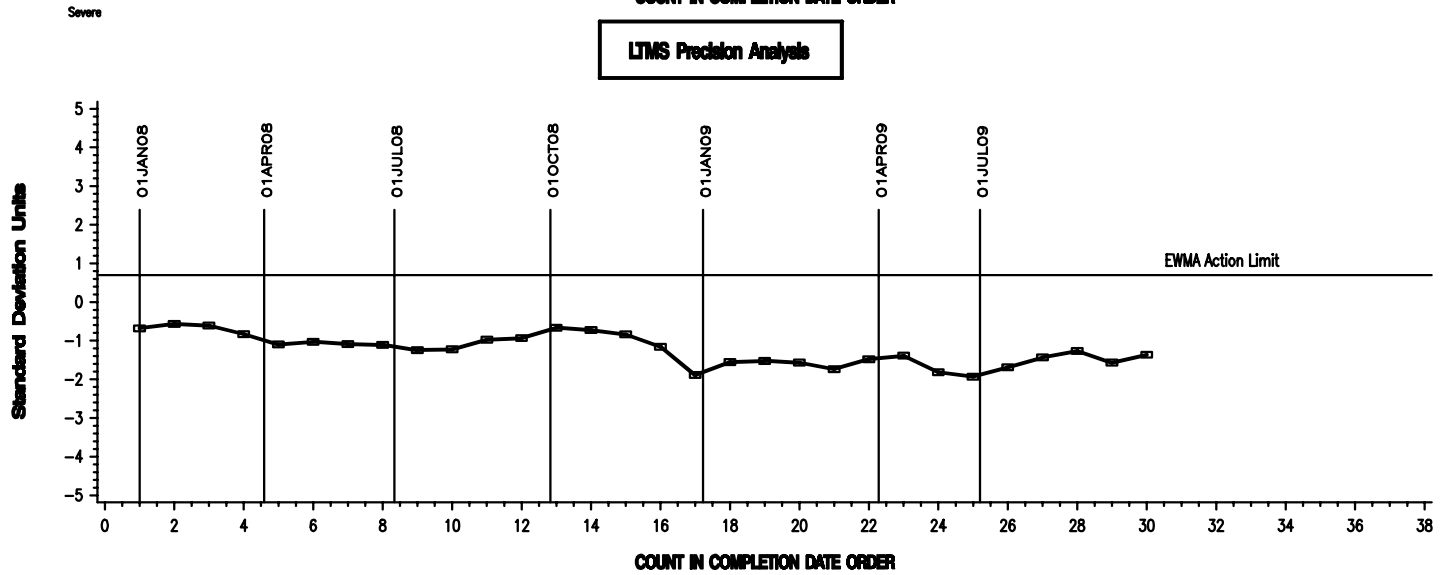
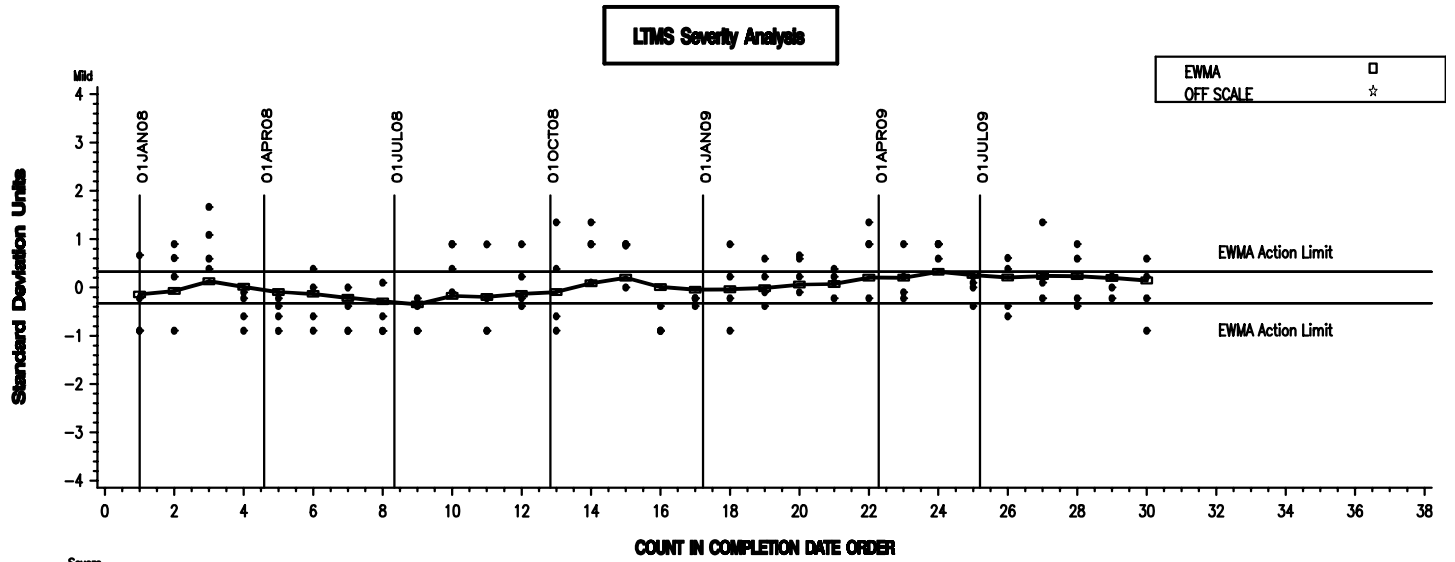


CUSUM Severity Analysis



L-37 RATER CALIBRATION INDUSTRY OPERATIONALLY VALID DATA

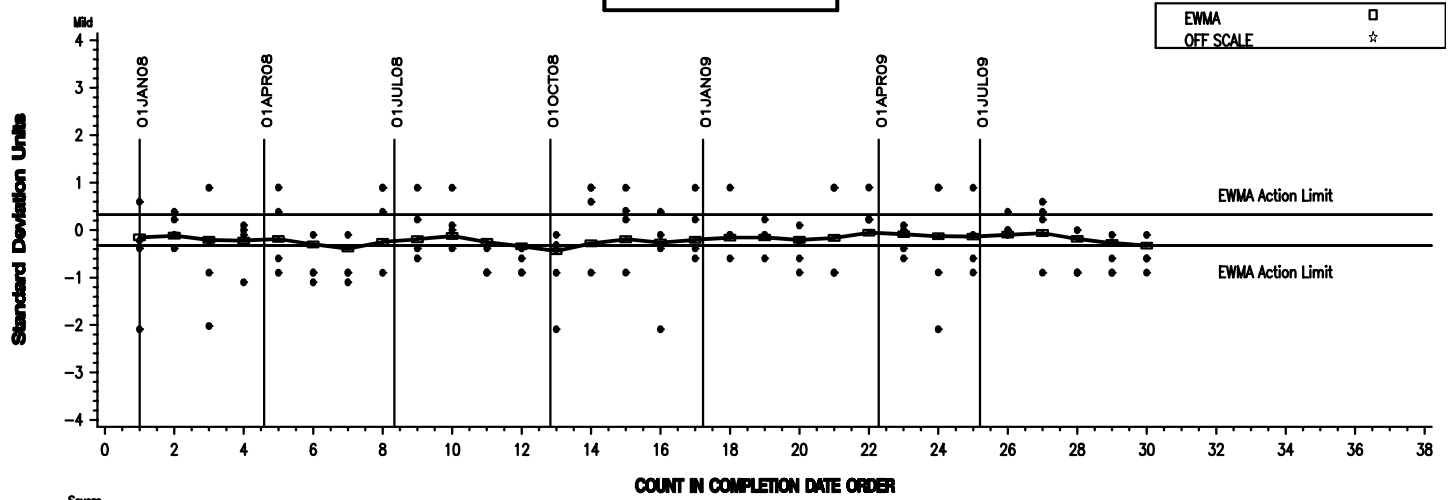
Last 30 Test Results  
RIPPLING



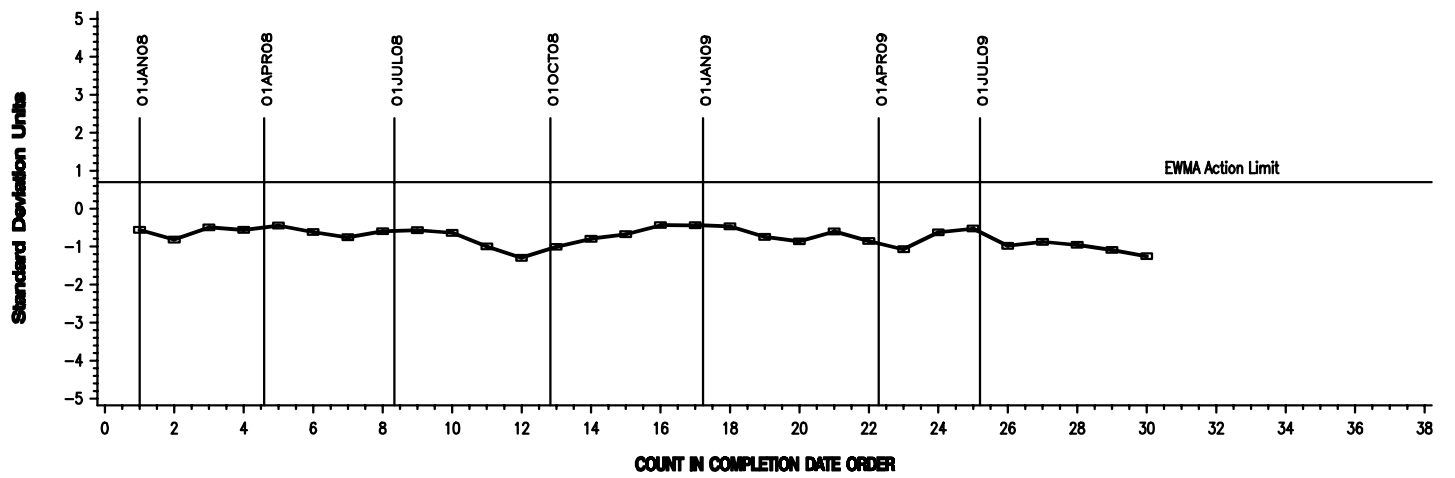
L-37 RATER CALIBRATION INDUSTRY OPERATIONALLY VALID DATA

Last 30 Test Results  
RIDGING

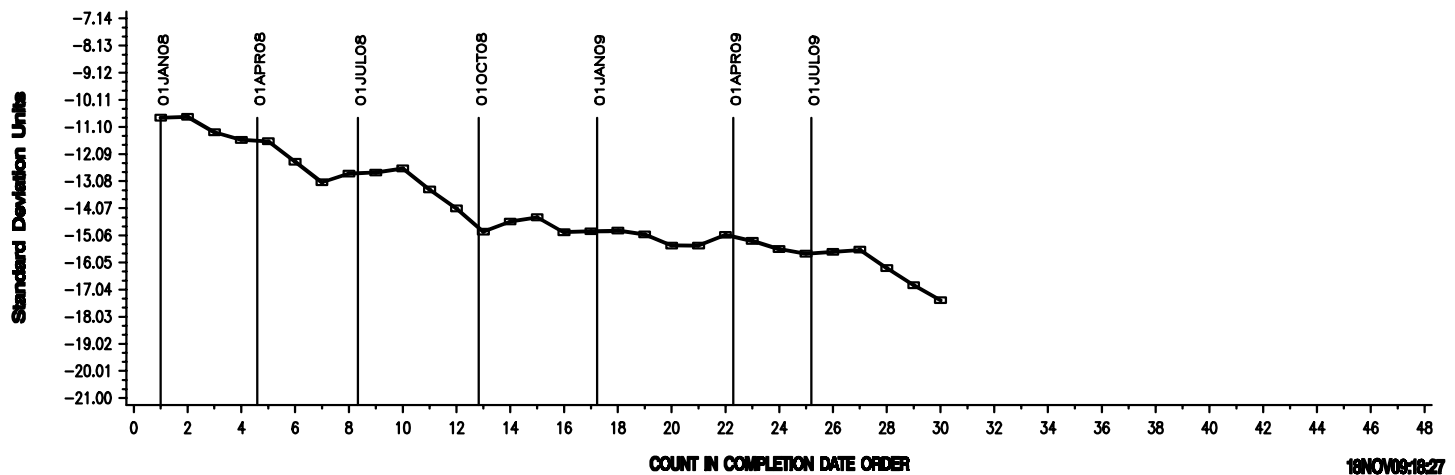
LTMS Severity Analysis



LTMS Precision Analysis



CUSUM Severity Analysis

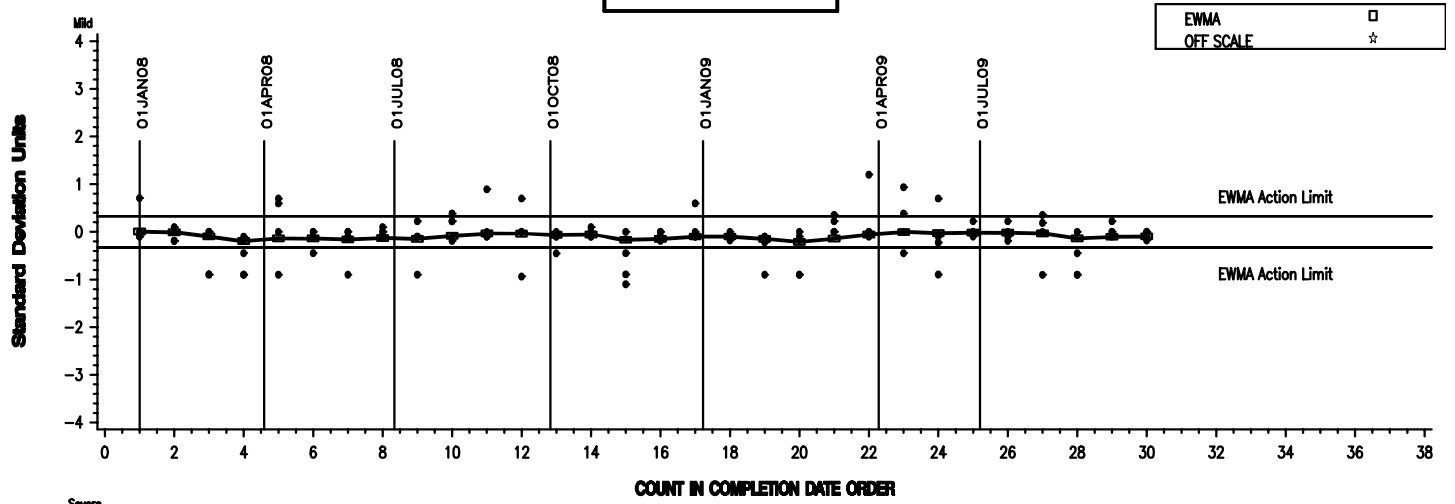


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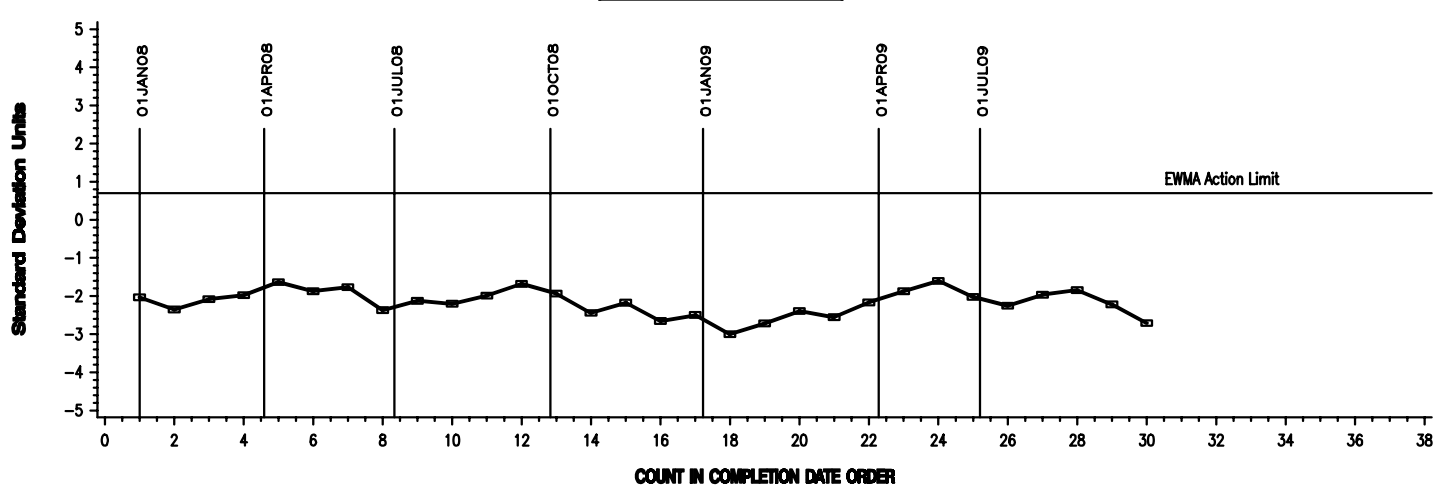
Last 30 Test Results

SPITTING

LTMS Severity Analysis



LTMS Precision Analysis



CUSUM Severity Analysis

