



# Test Monitoring Center

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

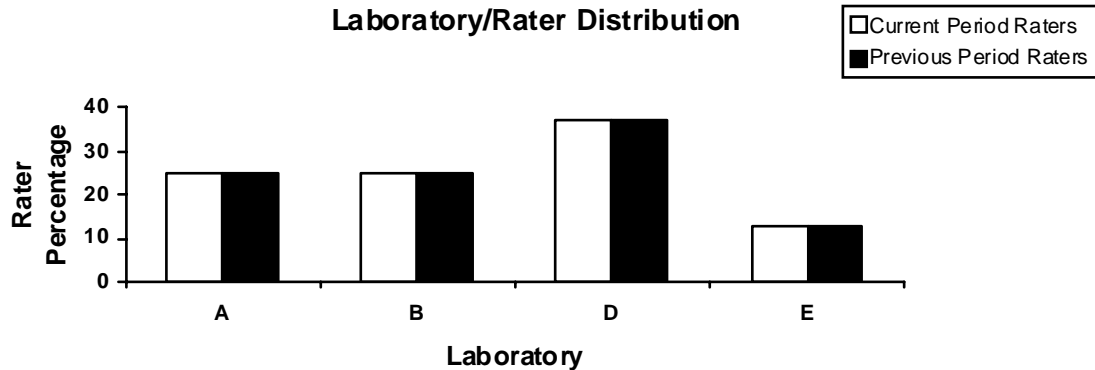
MEMORANDUM: 09-016  
 DATE: April 14, 2009  
 TO: Galen Greene, Chairman, L-37 Surveillance Panel  
 FROM: Donald Lind  
 SUBJECT: L-37 Rater Calibration Status from October 1, 2008 through March 31, 2009

The following is a summary of the L-37 rater calibrations reported to the Test Monitoring Center during the period October 1, 2008 through March 31, 2009.

### Rater Summary

	Reporting Data	Calibrated as of 3/31/09
Number of Raters	8	7

The following chart shows the laboratory/rater distribution:



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

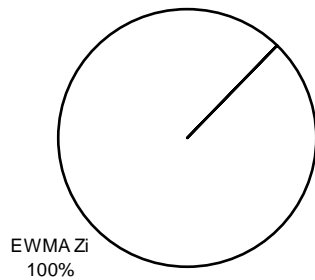
	TMC Validity Codes	No. of Calibrations
Statistically Acceptable	AC	9
Failed Acceptance Criteria	OC	1
Total		10

Summary

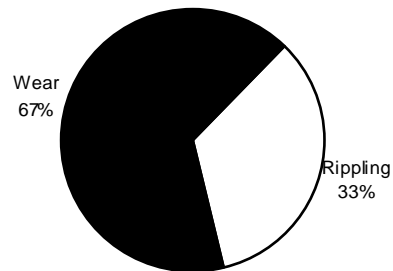
A total of ten L-37 rater calibration results from eight different raters were reported to the TMC this period. All eight raters were within the acceptance criteria with their first set of pinions. Two of the eight raters had their calibration period reduced to half (3 months) due to triggering a EWMA severity alarm. One of the raters that had their calibration reduced to half triggered a wear EWMA severity alarm for a fourth consecutive time. This requires the rater to seek additional training before requesting additional pinions for calibration. Seven of the eight 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 -0.15 severe for Wear, 0.18 mild for Rippling, -0.10 severe for Ridging, and -0.12 severe for Spitting. Precision was 0.75 for Wear, 0.67 for Rippling, 0.76 for Ridging, and 0.41 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	-0.09	0.60	0.08	0.42	-0.14	0.34	-0.33	0.38
D	-0.27	0.55	0.03	0.83	-0.41	0.85	-0.13	0.14
E	-0.70	1.41	0.67	0.44	0.16	0.76	-0.61	0.49
H	-0.36	0.36	0.12	0.26	0.00	1.03	0.15	0.18
I	-0.40	0.79	-0.02	0.93	-0.08	0.89	0.10	0.45
K	0.24	0.32	-0.26	0.08	0.03	0.67	0.10	0.33
M	0.22	0.86	0.81	0.52	0.37	0.86	-0.02	0.09
N	0.58	0.28	0.35	0.36	-0.40	0.44	-0.47	0.49

\*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 and Spitting were in control this report period. Severity EWMA charts for pinion Wear and Ridging triggered one alarm each. The alarms do 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

J. L. Zalar

F. M. Farber

[ftp://ftp.astmtmc.cmu.edu/docs/rater\\_calibration/137rc-04-2009.pdf](ftp://ftp.astmtmc.cmu.edu/docs/rater_calibration/137rc-04-2009.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

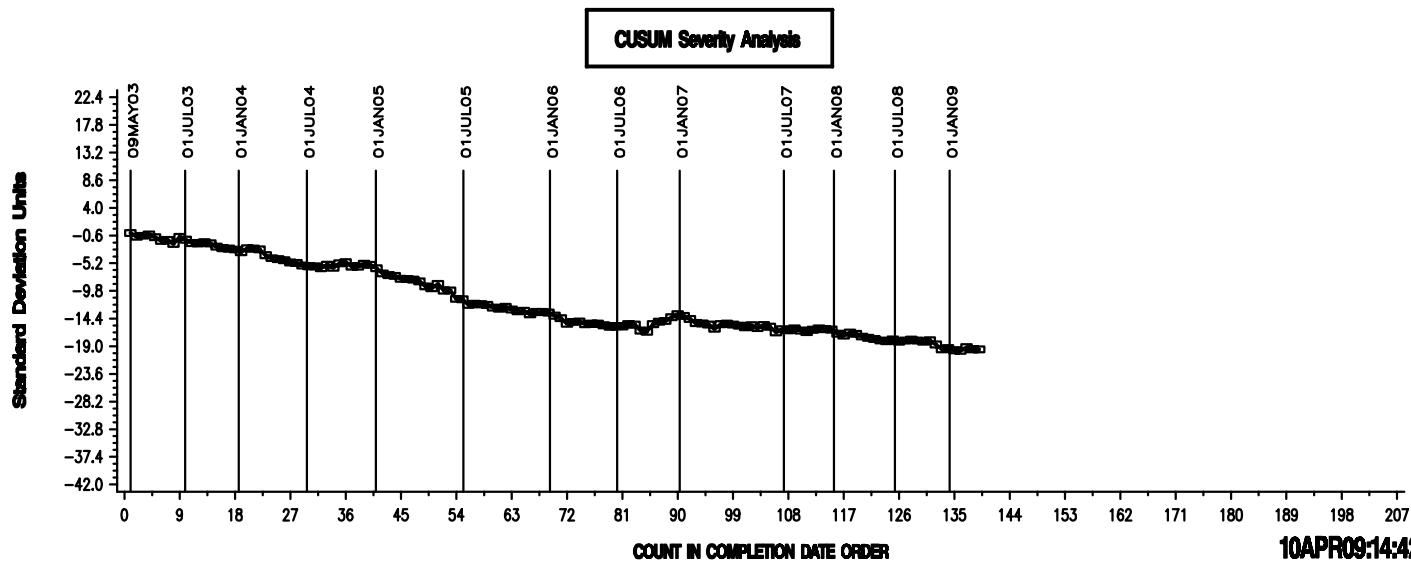
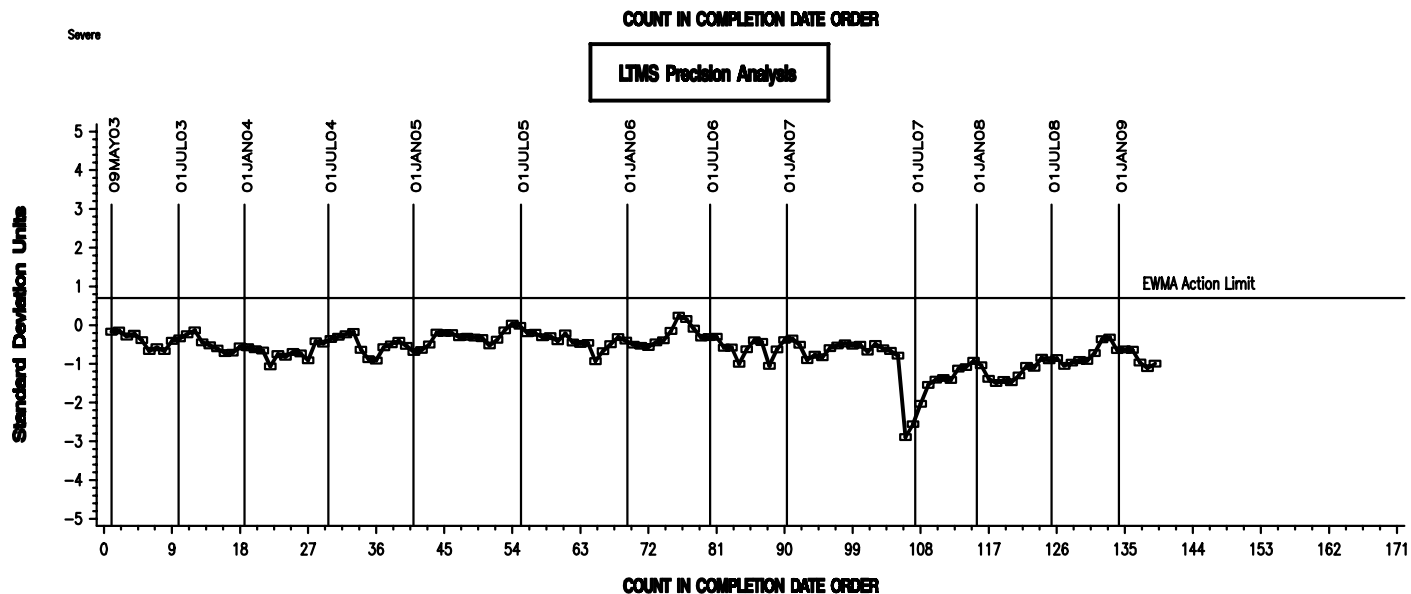
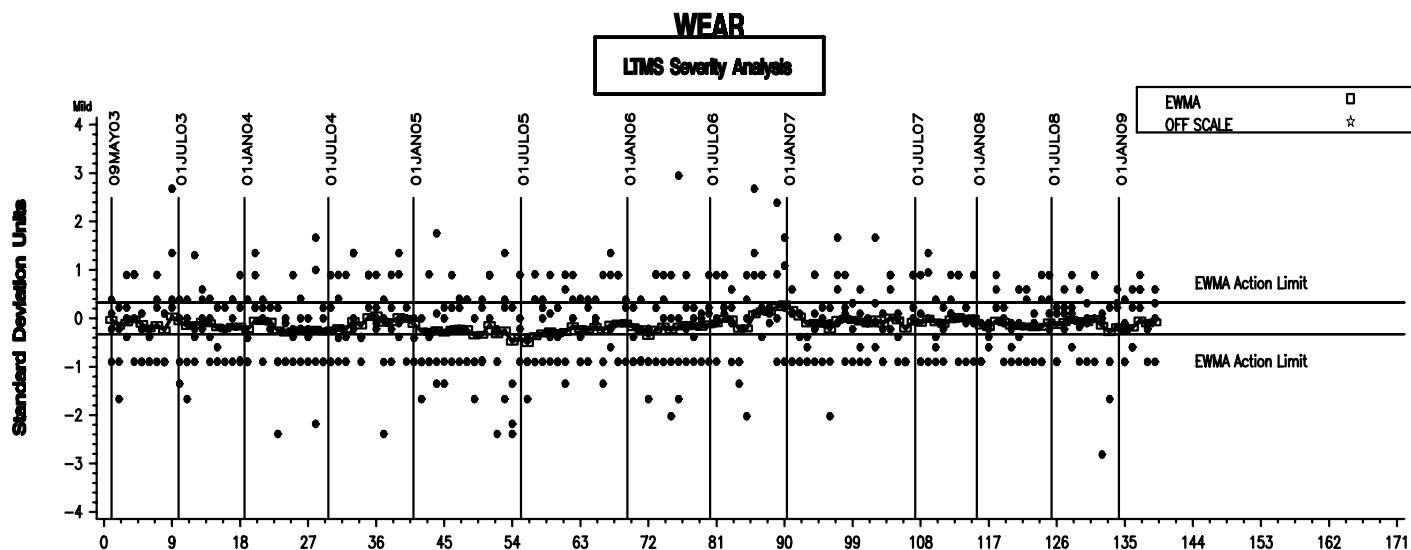
Figure 8 is the L-37 Rater Industry Control Chart of the last 30 test results for Pinion Spitting

Table 1

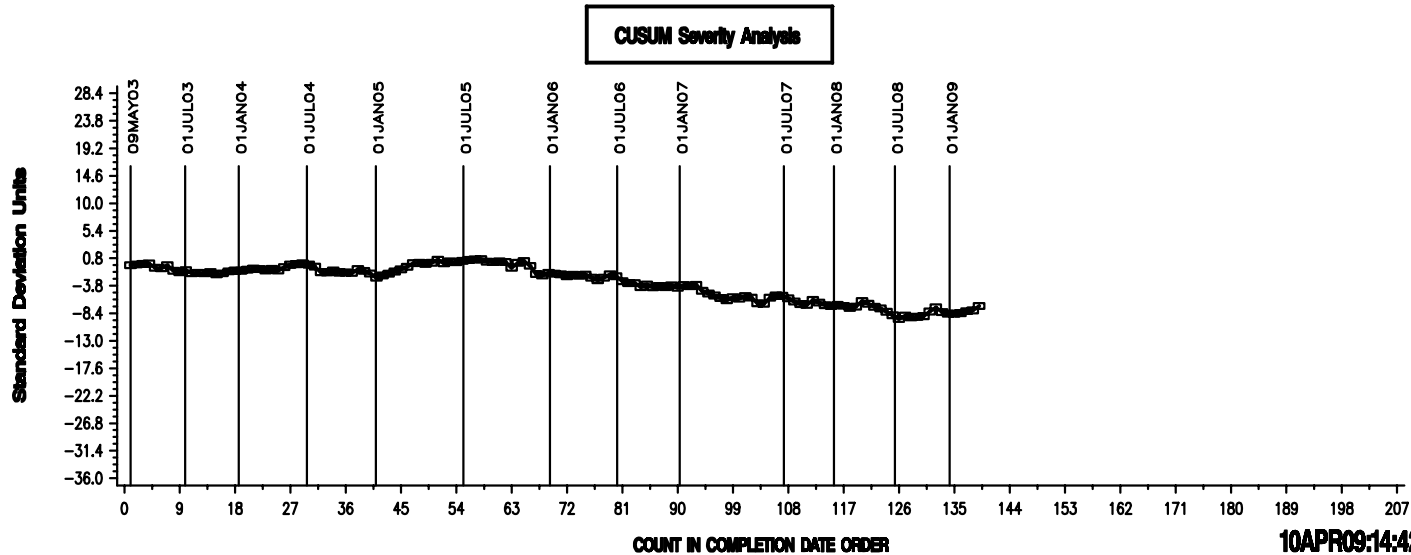
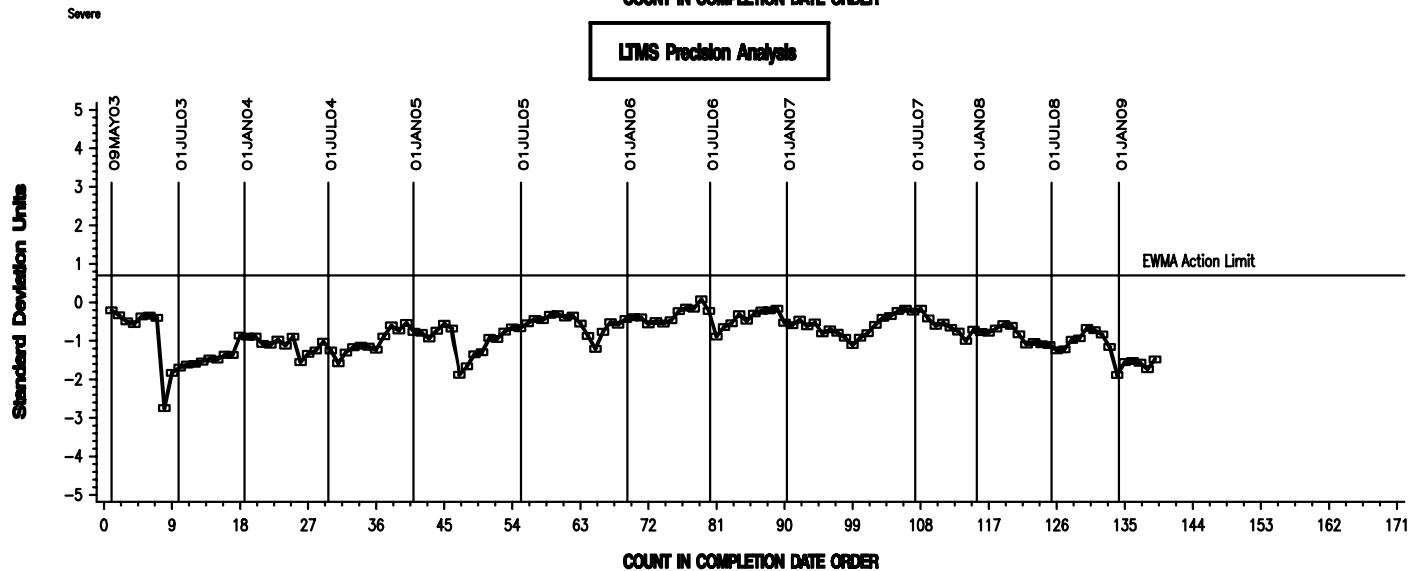
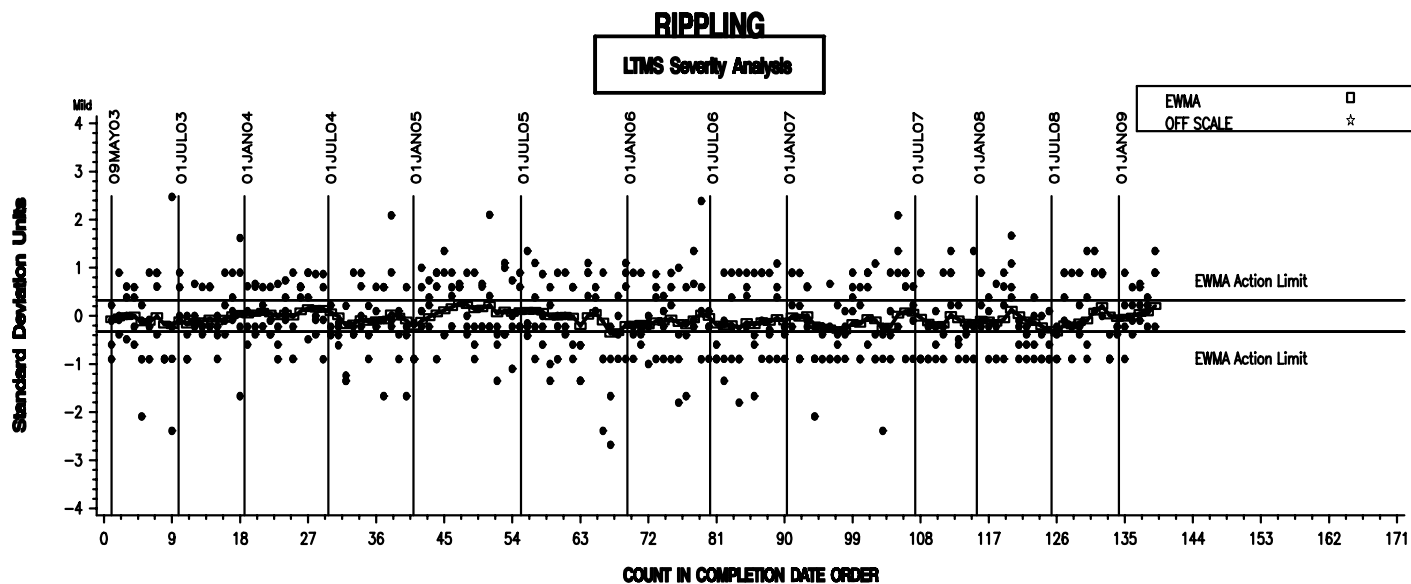
## Summary of Alarms This Period

Lab	Rater	Reason
A	I	Rippling EWMA Severity (Calibration Period Reduced to Half, 3 Months)
D	D	Wear EWMA Severity (Calibration Period Reduced to Half, 3 Months)
D	D	Wear EWMA Severity (Triggered alarm for a fourth consecutive time, calibration revoked).

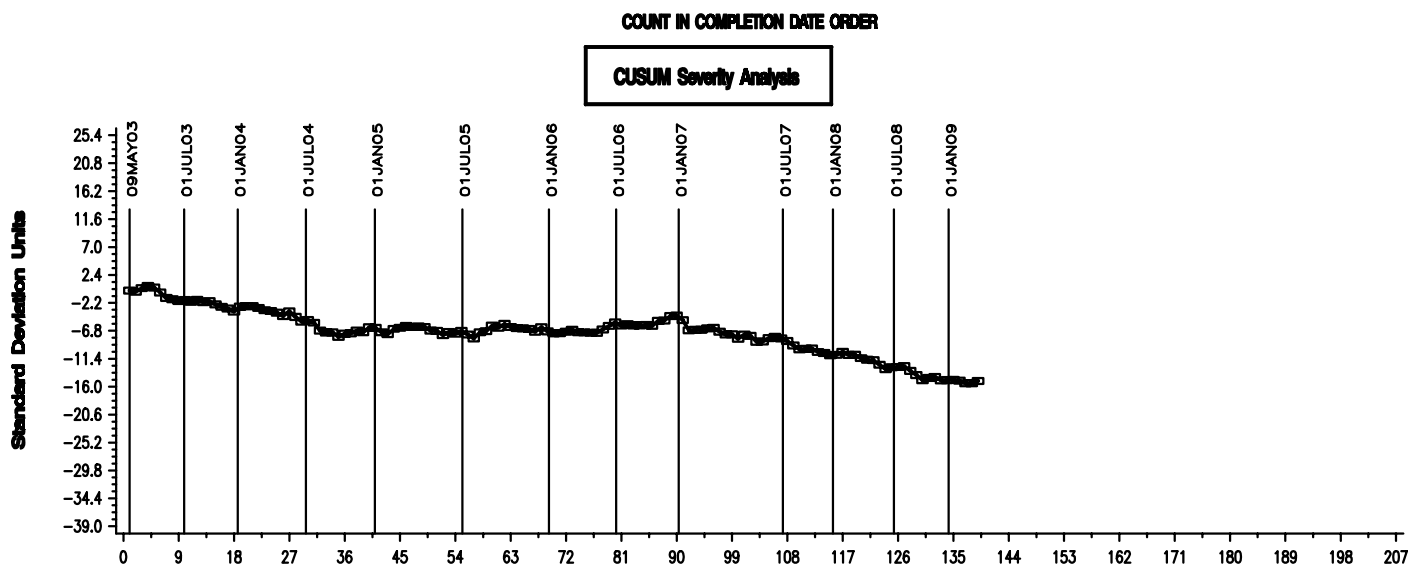
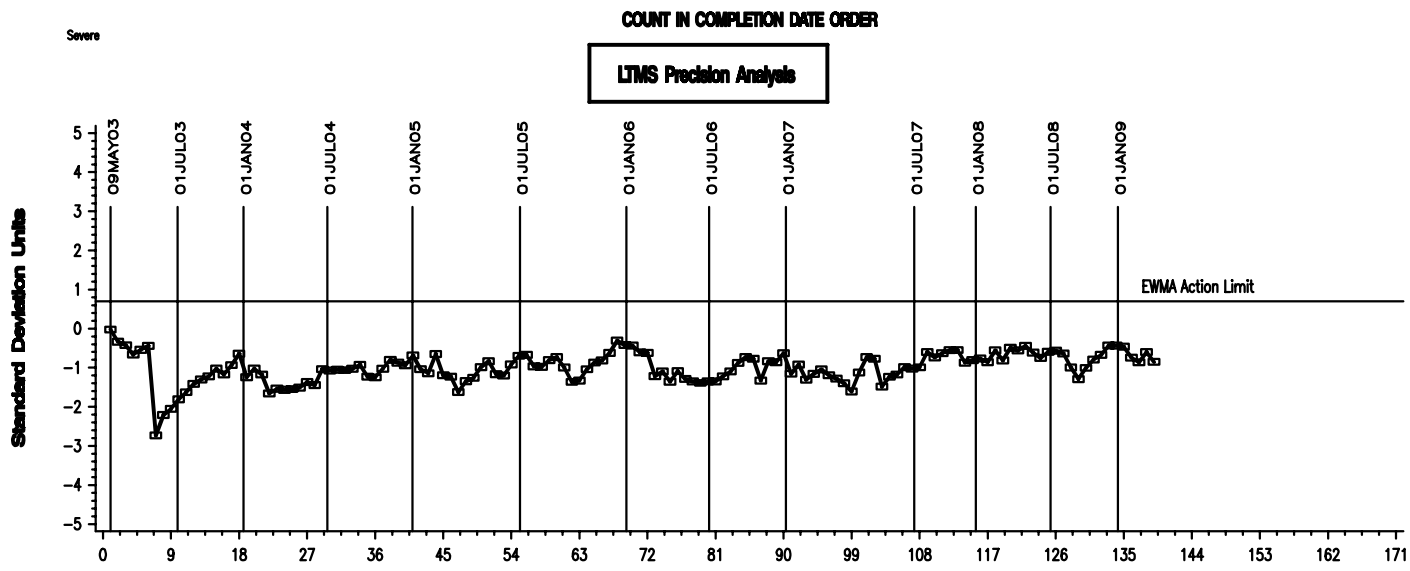
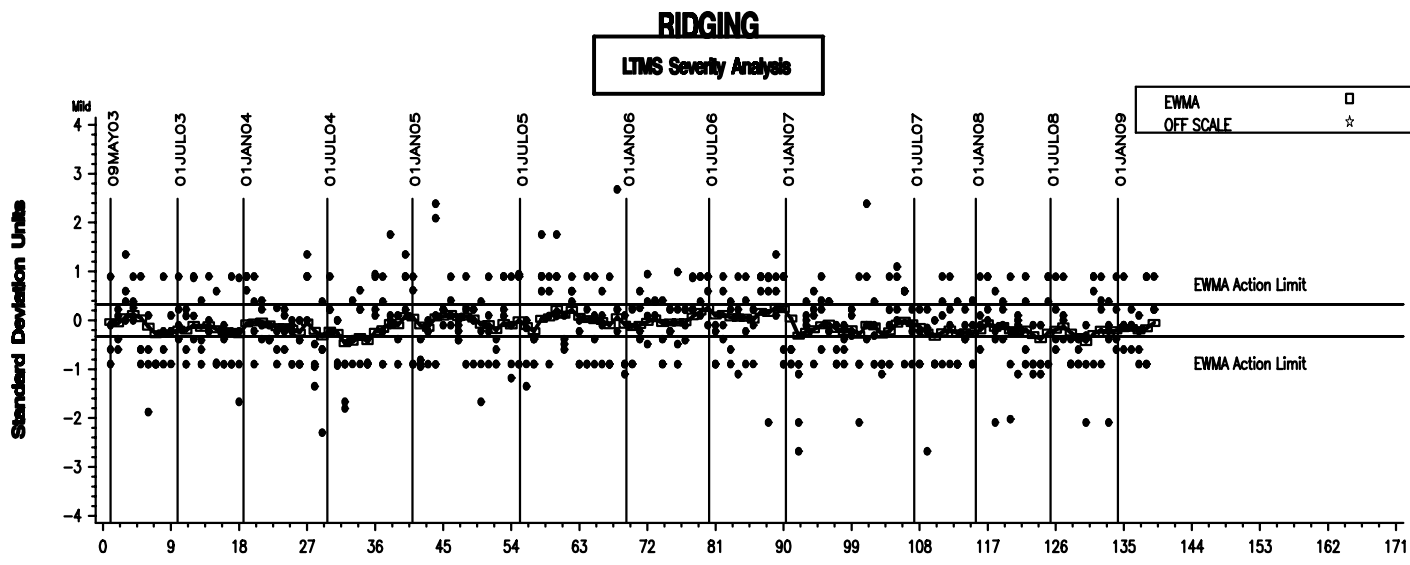
# L-37 RATER CALIBRATION INDUSTRY OPERATIONALLY VALID DATA



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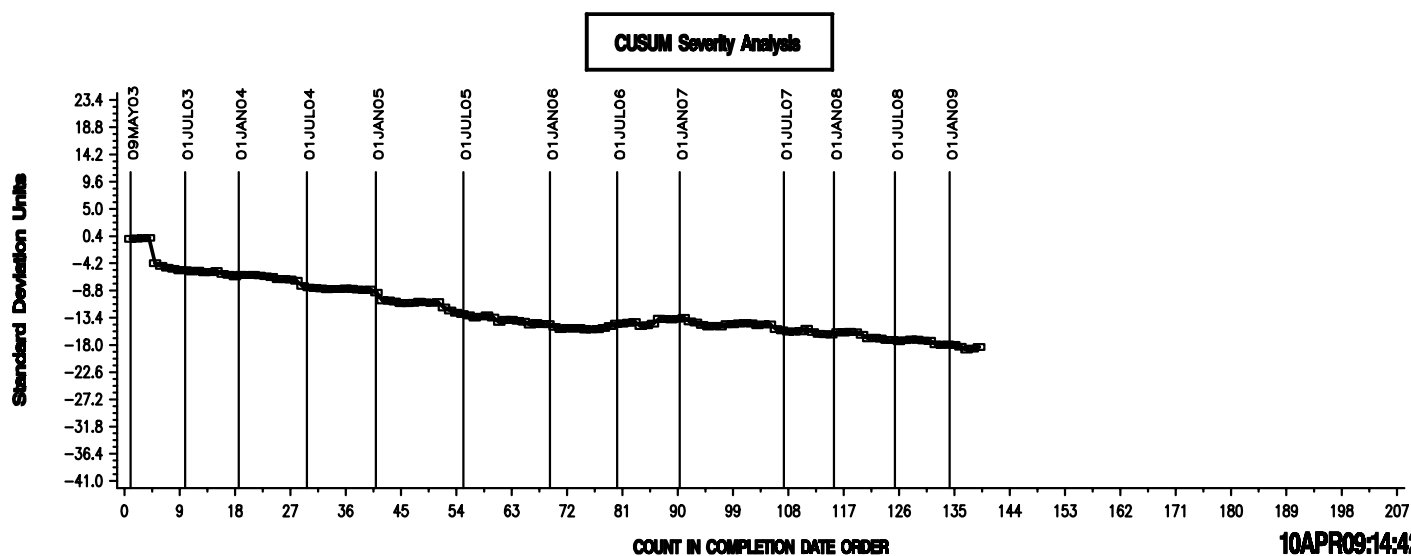
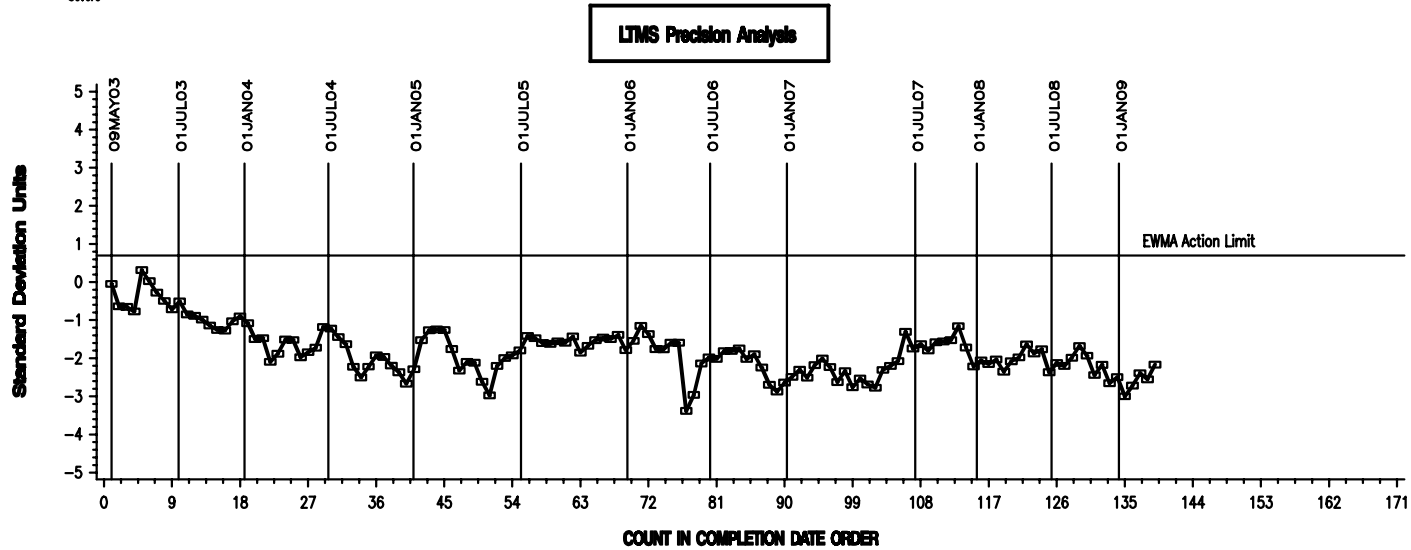
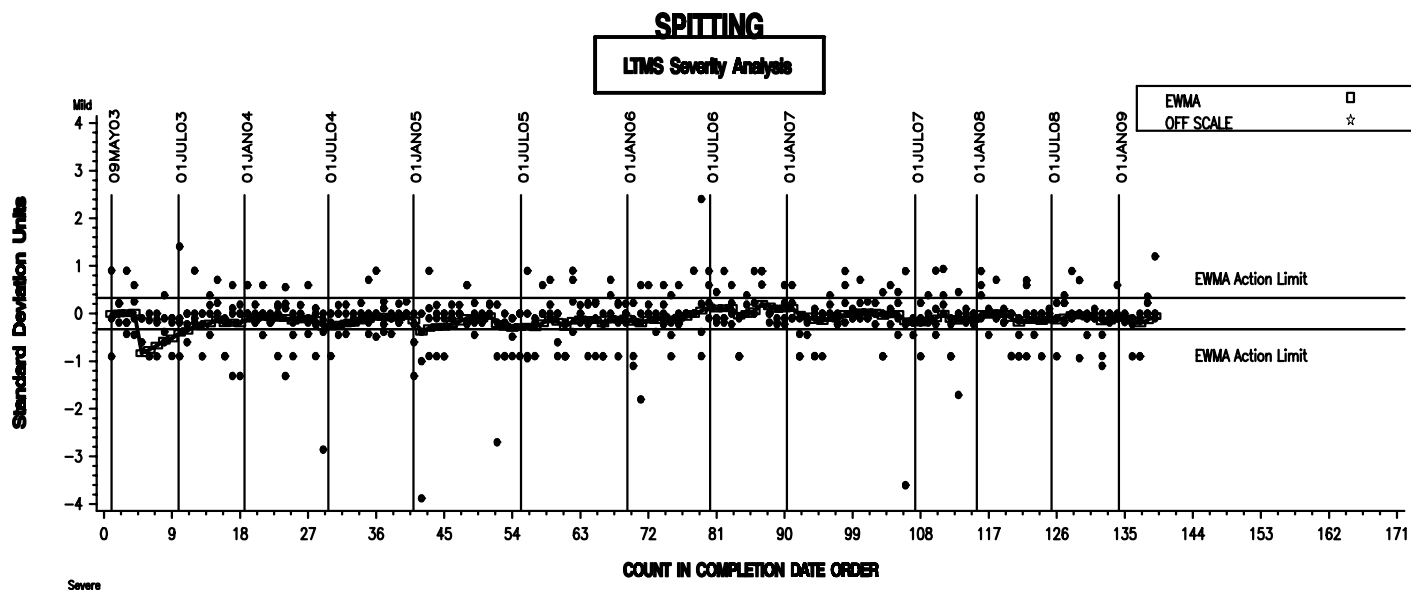


# L-37 RATER CALIBRATION INDUSTRY OPERATIONALLY VALID DATA





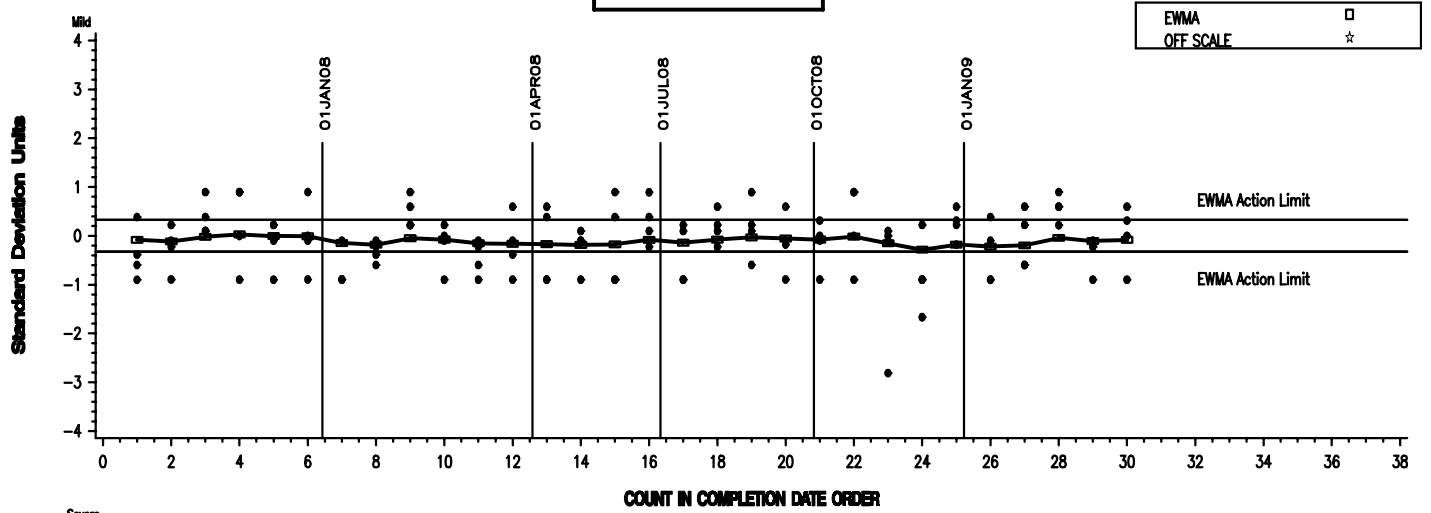
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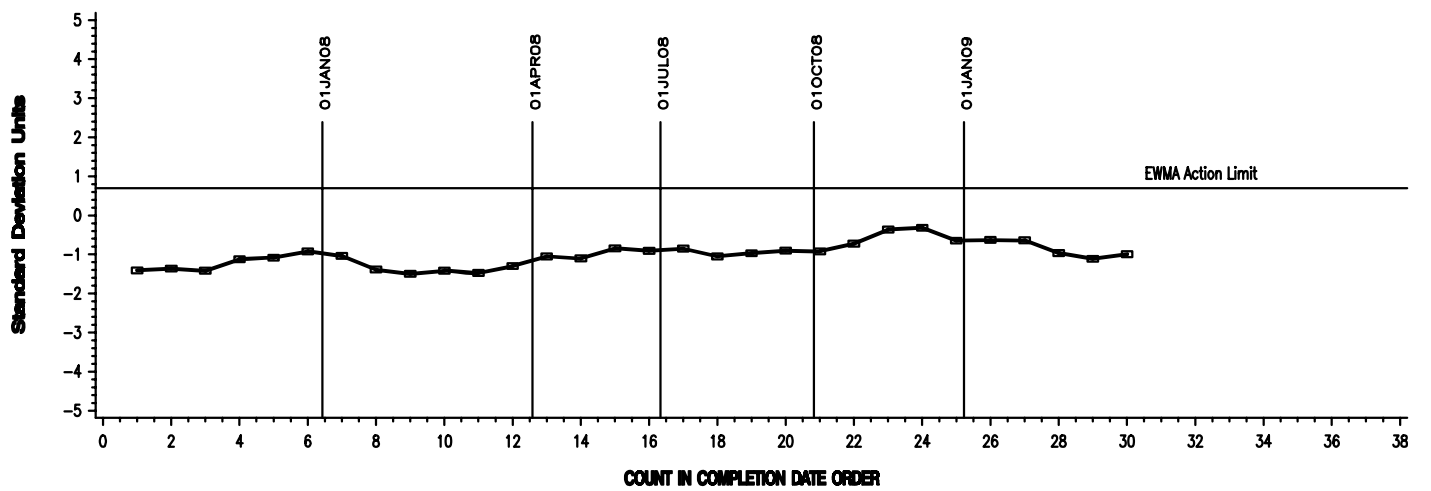
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## Last 30 Test Results

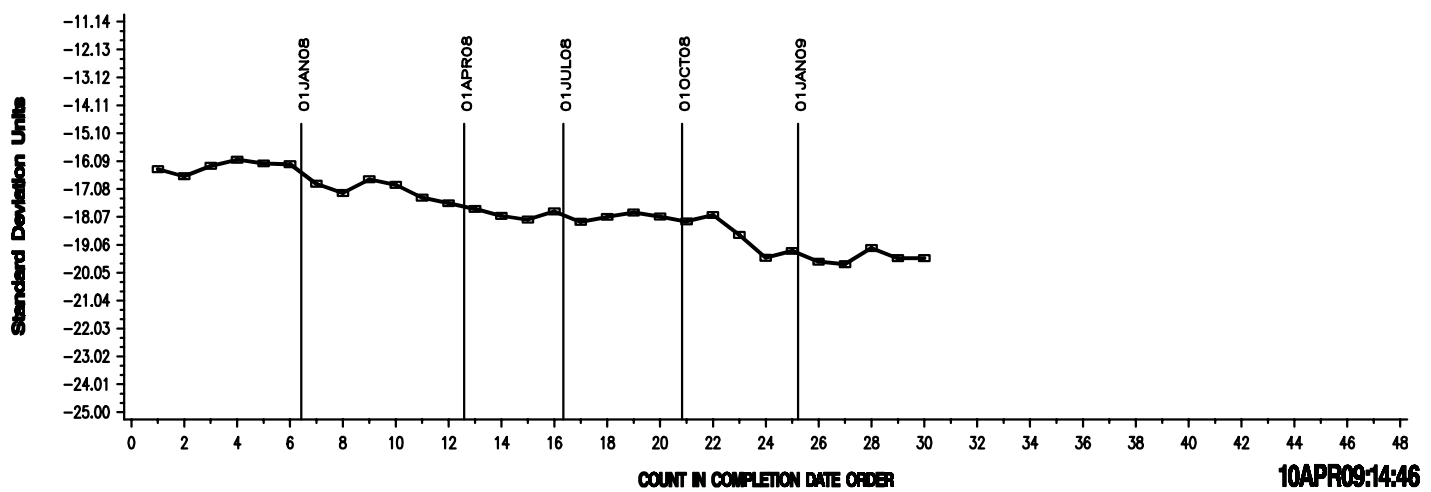
**WEAR**  
LTMS Severity Analysis



**LTMS Precision Analysis**



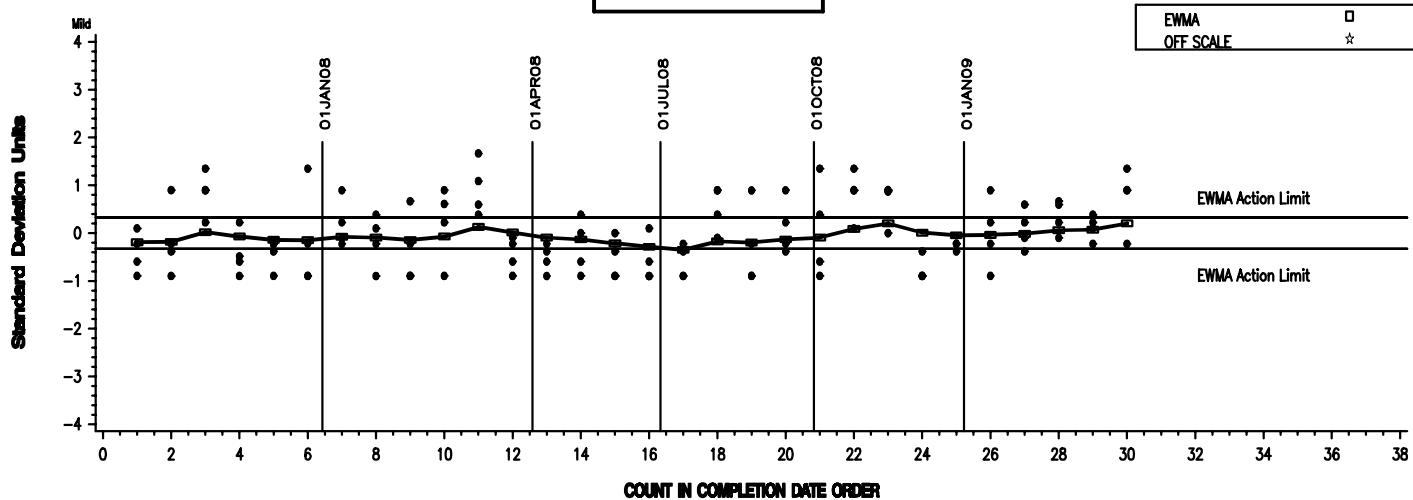
**CUSUM Severity Analysis**



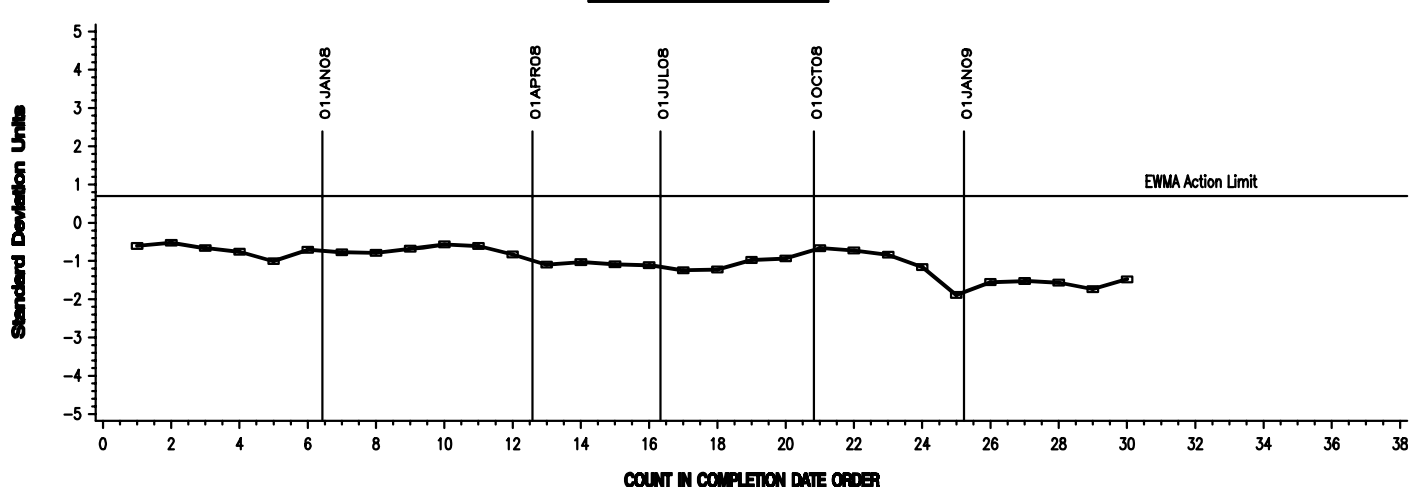
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Last 30 Test Results

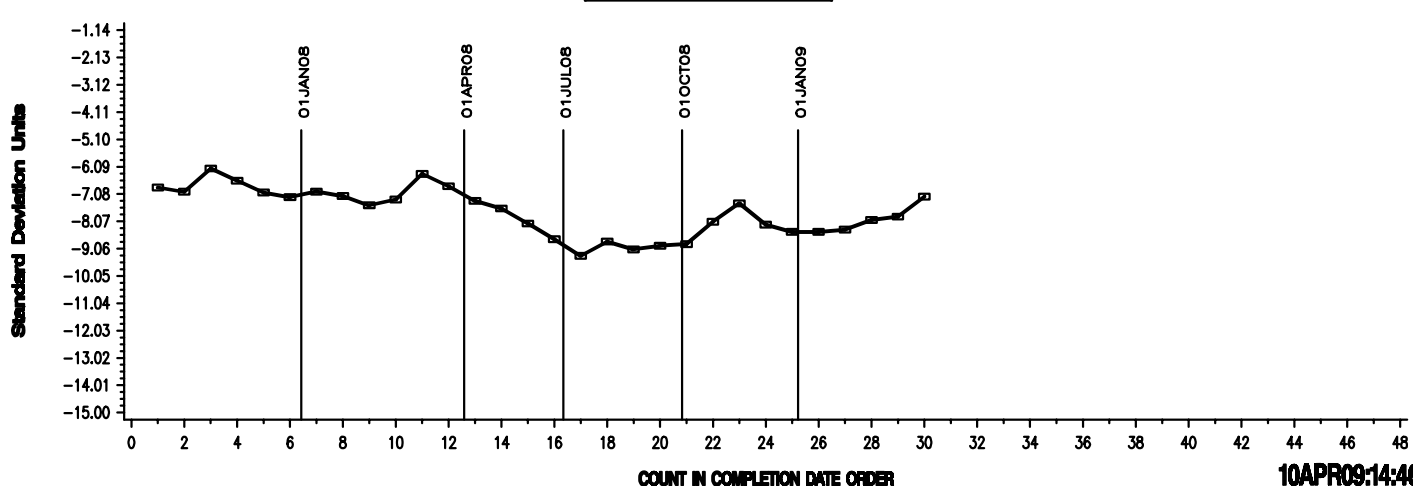
**RIPPLING**  
LTMS Severity Analysis



**LTMS Precision Analysis**



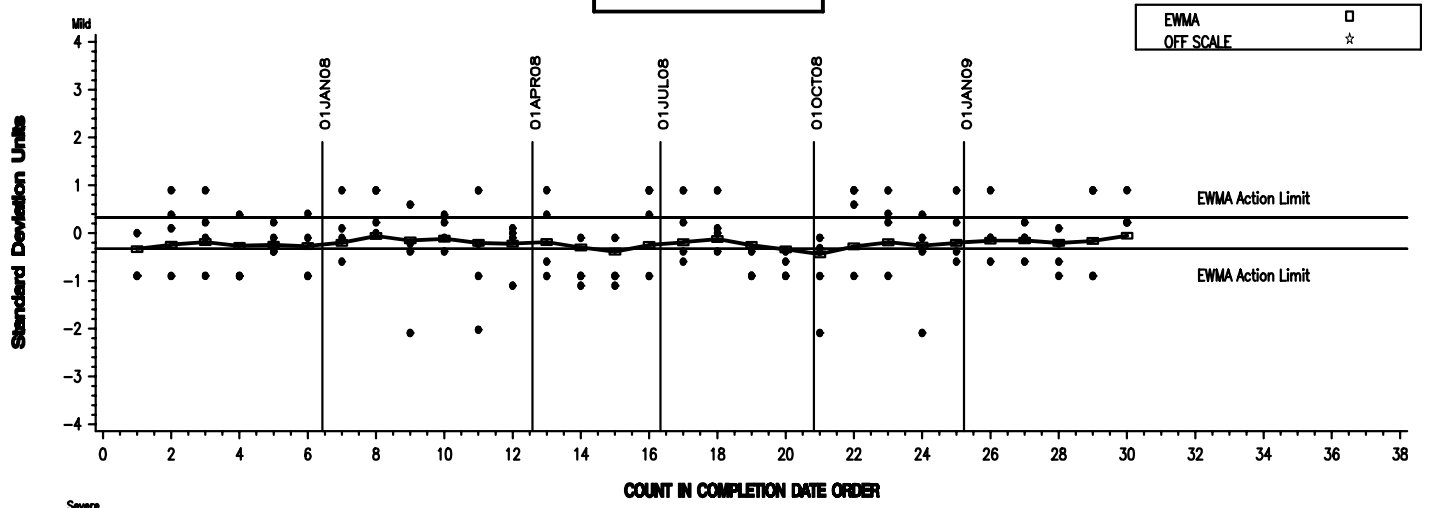
**CUSUM Severity Analysis**



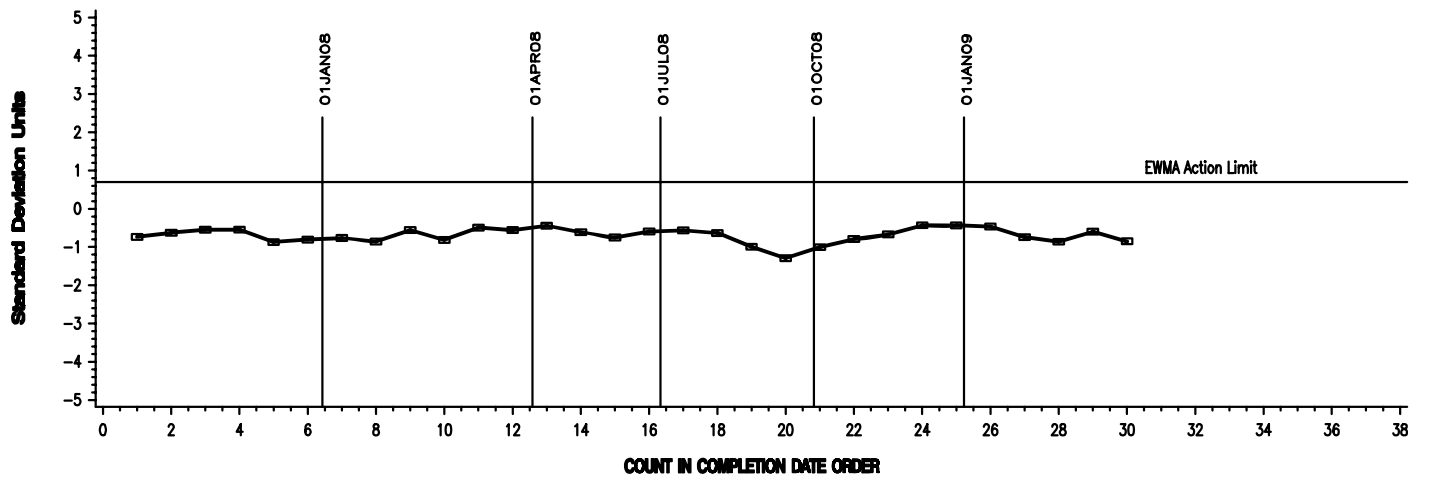
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## Last 30 Test Results

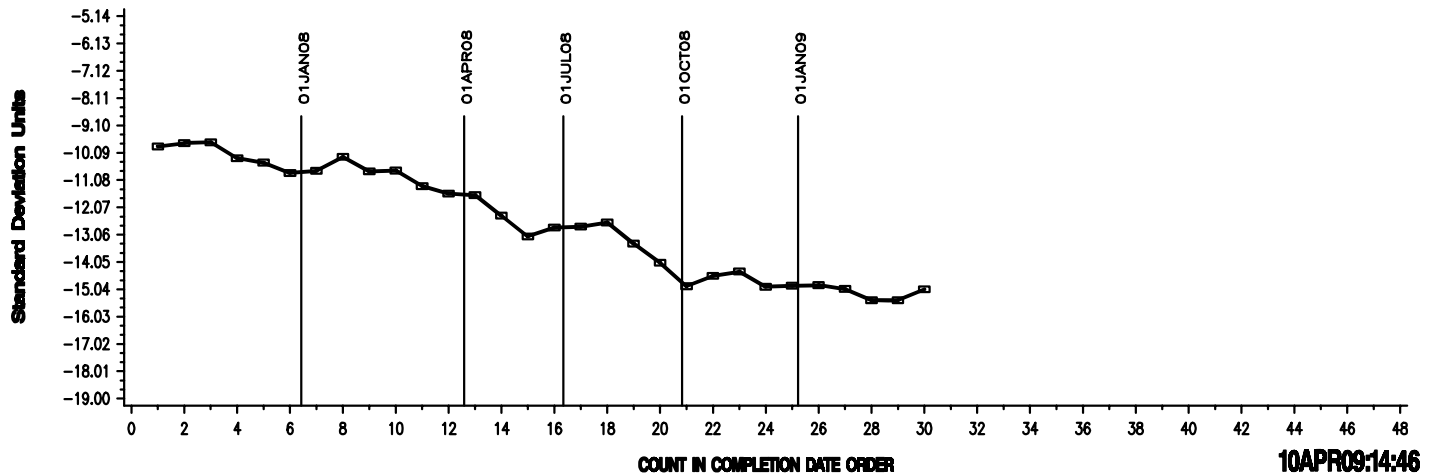
**RIDGING**  
LTMS Severity Analysis



**LTMS Precision Analysis**



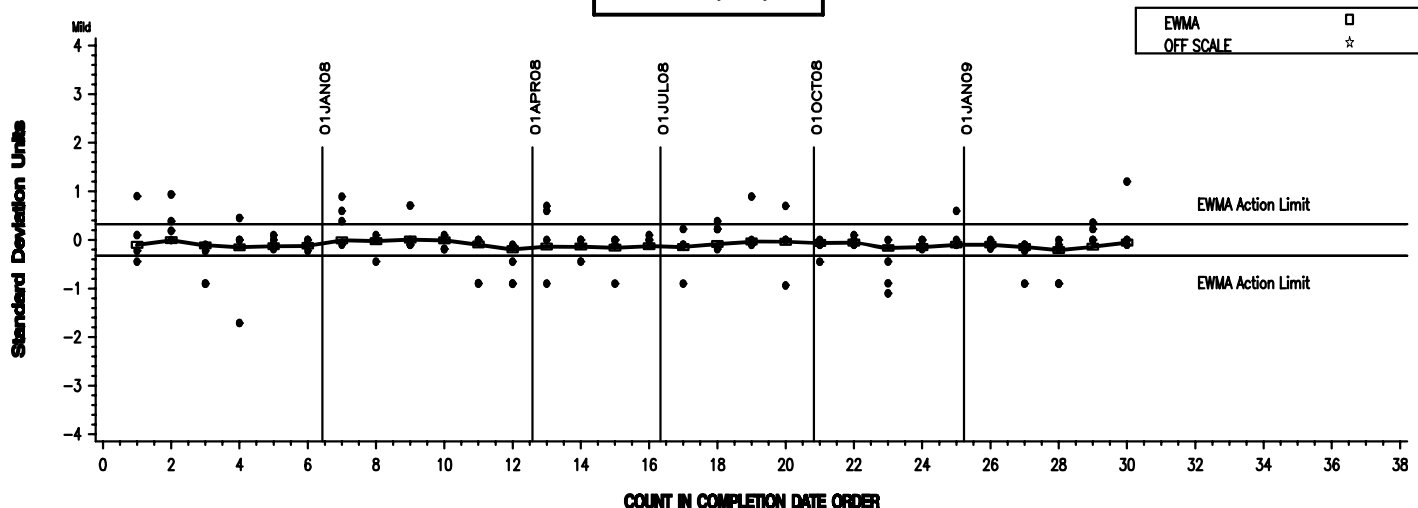
**CUSUM Severity Analysis**



# L-37 RATER CALIBRATION INDUSTRY OPERATIONALLY VALID DATA

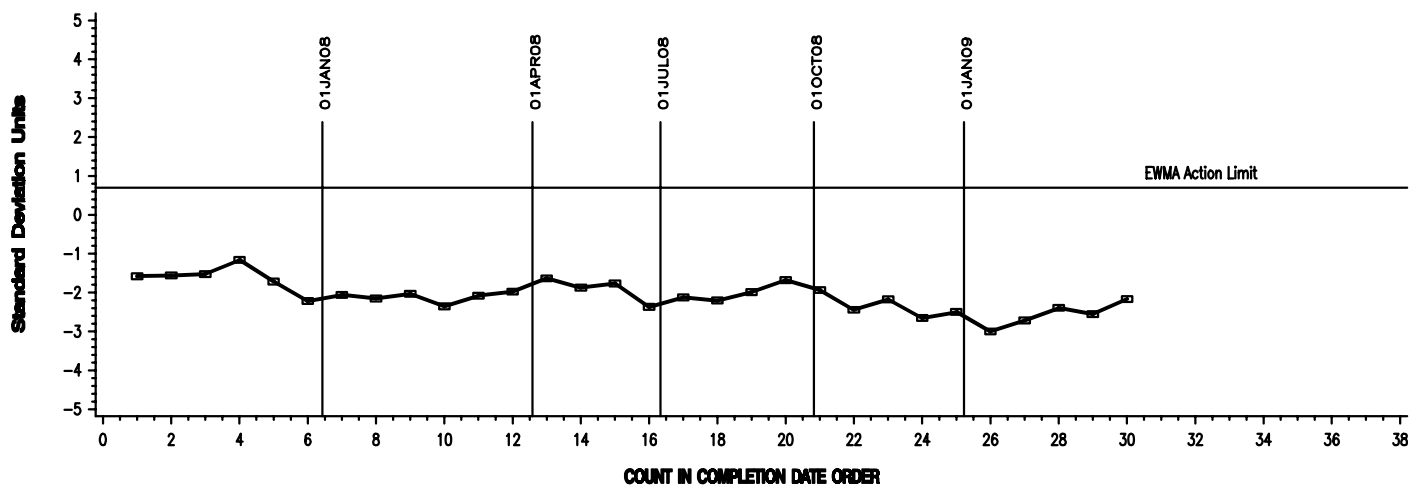
## Last 30 Test Results

**SPITTING**  
LTMS Severity Analysis



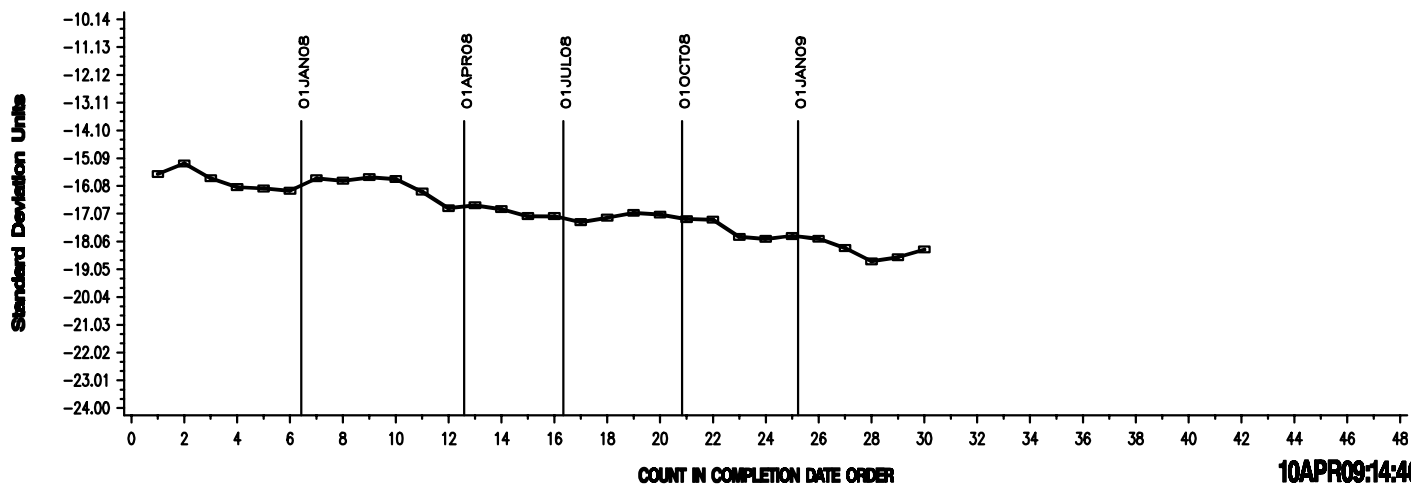
COUNT IN COMPLETION DATE ORDER

**LTMS Precision Analysis**



COUNT IN COMPLETION DATE ORDER

**CUSUM Severity Analysis**



COUNT IN COMPLETION DATE ORDER