



Test Monitoring Center

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

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

MEMORANDUM: 09-050
DATE: November 17, 2009
TO: Cory Koglin, Chairman, L-42 Surveillance Panel
FROM: Donald Lind *Donald Lind*
SUBJECT: L-42 Reference Test Status from April 1, 2009 through September 30, 2009

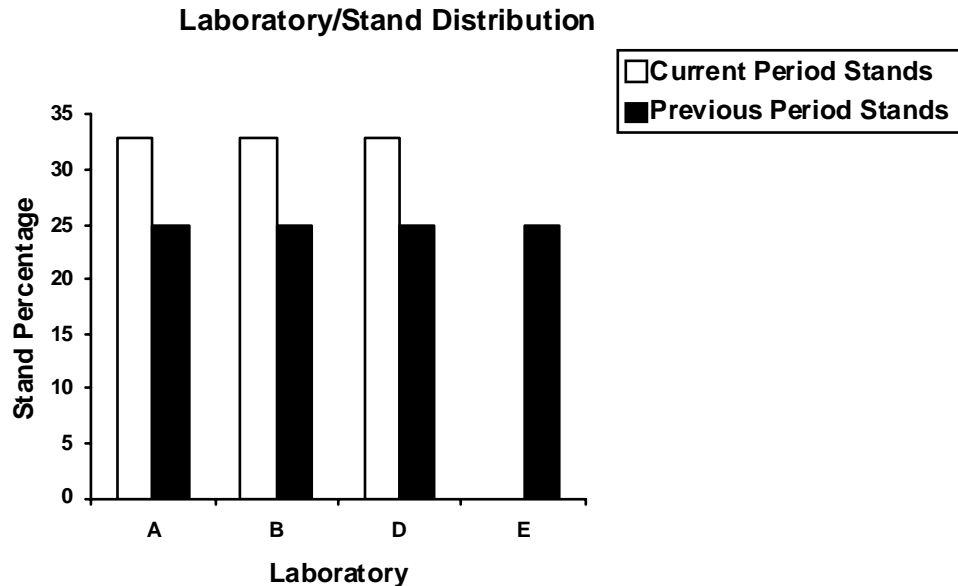
Summary

The following is a summary of the L-42 reference oil tests that were reported to the Test Monitoring Center during the period April 1, 2009 through September 30, 2009.

Lab/Stand Distribution

	Reporting Data	Calibrated as of 9/30/09
Number of Laboratories	3	3
Number of Stands	3	3

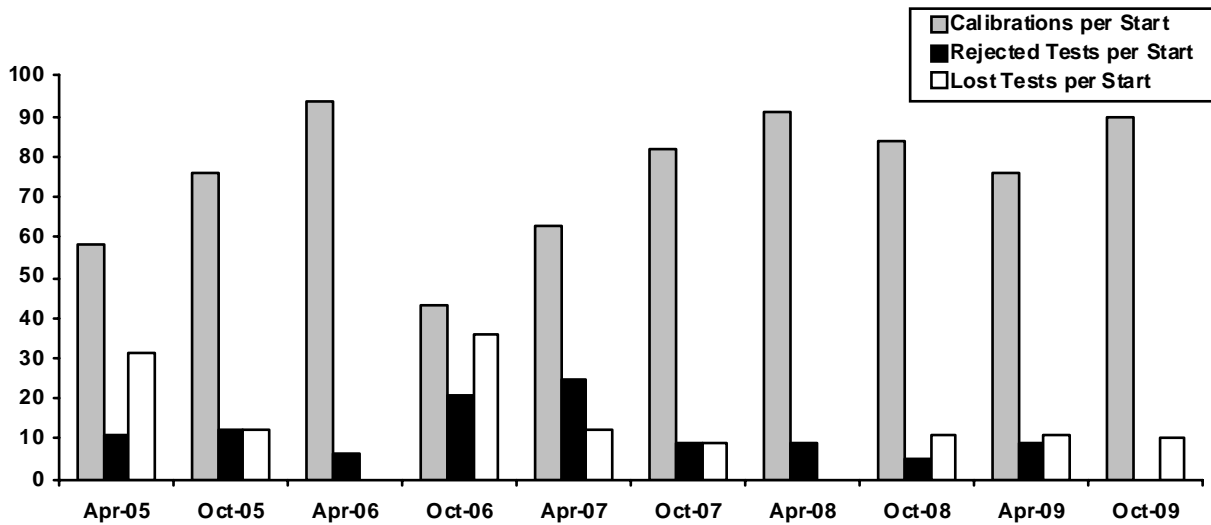
The following chart shows the laboratory/stand distribution:



A total of 18 operationally valid reference oil tests were conducted for stand calibration and reported to the TMC this report period. All of the 18 operationally valid reference oil tests were run on gear batch C1L446/P8L119. All 18 of the operationally valid tests were actually used to calibrate the stands. The following summarizes the status of the reference oil tests reported to the TMC:

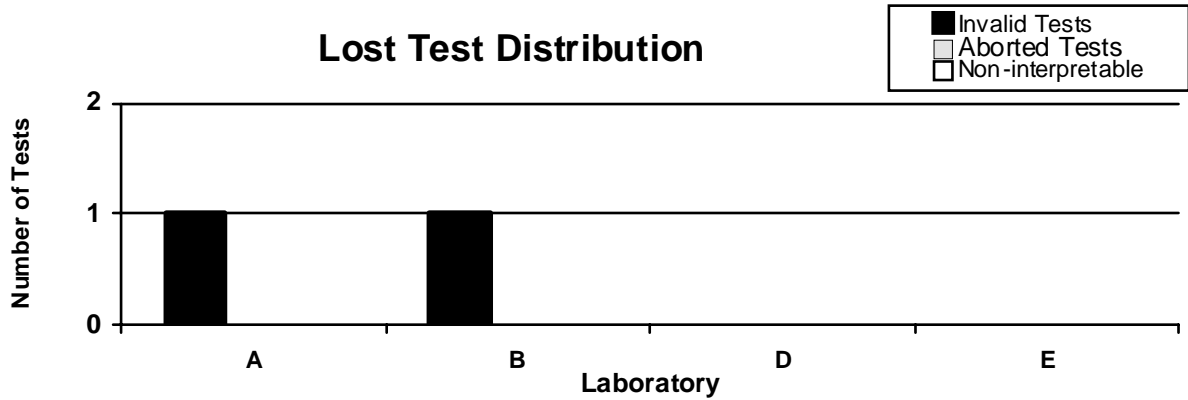
	TMC Validity Code	Number of Tests
Operationally and Statistically Acceptable (LTMS)	AC	18
Operationally Valid, Statistically Unacceptable	OC	0
Operationally Invalid Calibration Test-Lab Judgment	LC	2
Aborted Calibration Test	XC	0
Non-interpretable Tests	MC	0
Acceptable Discrimination Oil Test	AS	1
Unacceptable Discrimination Oil Test	MS	2
Operationally Invalid Discrimination Oil Test	LS	0
Aborted Discrimination Oil Test	XS	0
Donated Tests	AG	0
Aborted Donated Tests	XG	1
Non-blind Tests (Stand Evaluation)	NN	5
Total		29

Attempted calibration tests are depicted graphically below by report period.



The calibration per start rate has increased this report period when compared to the previous period. The rejected test per start rate has decreased this report period when compared to the previous period and the lost test per start rate has remained the same with respect to the previous period.

The laboratory distribution of lost tests is shown below. A detailed list of reasons for tests declared operationally invalid, aborted, or non-interpretable is shown in Table 2.



Severity and Precision

The average Δ/s for this period is 0.09 (0.32 % Scoring) slightly severe as illustrated in Figures 1 and 2. There was no EWMA severity or precision alarms this report period (see Figure 2). The means and standard deviations, by reference oil and gear batch for all operationally valid tests completed during this period, are tabulated below:

Oil	N	Gear Batch	Coast Side Pinion Scoring		
			Mean	Std. Dev.	Δ/s
116	14	C1L446/P8L119	23.6	3.50	0.10
116-1	4	C1L446/P8L119	23.3	4.27	0.05

The Δ/s and pooled standard deviations, by lab, are listed in the following table:

Lab	Coast Side Pinion Scoring Δ/s	Pooled Standard Deviation			
		df	Coast Side Pinion Scoring	Coast Side Ring Scoring	Shock Series 1 Coast Side Ring Scoring
A	-0.15	5	3.66	2.68	0.00
B	0.00	5	4.15	2.68	0.00
D	0.43	5	0.91	0.91	0.00

Information Letters

There were no information letters issued this report period

TMC Lab Visits

There were two lab visits performed this report period with no discrepancies to report.

Reference Oil Status

The following table quantifies the reference oil supply and the expected number of tests remaining at the Test Monitoring Center and at the testing laboratories. L-42 reference oils are shipped in quantities of 1/2 gallon per test.

Oil	Lab A	Lab B	Lab D	Lab E	TMC	Total
112-2	2	3	3	3	18	29
113	3	1	2	3	176	185
116	2	0	0	11	0	13
116-1	10	5	6	4	280	305

DML/dml

Attachments

c: L-42 Surveillance Panel

F. M. Farber

<ftp://ftp.astmtmc.cmu.edu/docs/gear/142/semiannualreports/142-10-2009.pdf>

Distribution: Email

Listing of Tables and Figures Included as Part of This Report to the L-42 Surveillance Panel

Table 1 is the L-42 Industry Timeline.

Table 2 Summarizes the Reasons for Lost Tests.

Figure 1 is the Industry Control Chart for L-42 Scoring.

Figure 2 is the Industry Control Chart of the last 50 test results for L-42 Scoring.

Table 1

Effective Date	L-42 Timeline	IL#
	Topic	
19940110	Test report form and data dictionary changes version number 19940106	1
19940401	In-Line Torque Meter Addition	2
19940401	Instrument Calibration Requirement	2
19940701	Report Forms and Data Dictionary Version 19940526	3
19940903	Report Forms and Data Dictionary Version 19940707	4
19940903	Recording of Torque Measurement using Inline Torque Meter	5
19950824	Report Forms and Data Dictionary Version 19950721	5
19960713	Test Break-in Procedure	96-1
19960713	Report Forms and Data Dictionary Version 19960607	96-1
19960923	Non-reference oil test Sequence 2 (15%) and Sequence 4 (10%) coast side torque limits.	96-2
19960923	Sequence 2 and Sequence 4 dynamometer synchronization torque specification	96-2
19970317	Revised Calibration Schedule, Discrimination Requirements, Coast Side Torque Limits, Report Forms and Data Dictionary Version 19970305	97-1
19980302	Report Forms and Data Dictionary Version 19971211	98-1
19980122	Backlash Settings Clarification	98-2
	Section 5.2.4 Editorial Correction	98-3
19990101	Addition of CRC Gear Rating Workshop Training	98-4
19990901	Reference test requirement: EOT pinion c.s. scoring => EOT ring c.s. scoring	99-1
20020211	Replacement of CRC Manual 17 with CRC Manual 21	02-1
20020401	Remove Report Forms and Data Dictionary from ASTM Procedure	02-1
20030101	Require the Use of a Himmelstein Torque Meter	03-1
20030101	Require the Use of a Himmelstein Model 701 or 711 Strain Gage Conditioner	03-1
20030415	Non-interpretable Tests	03-2
20030415	Complete Test Procedure Update	03-2
20040101	Revised Solvent Specification	03-3
20031114	Non-interpretable Tests for Drive Side Scoring	03-4
20041210	Revised Drive Shaft Specifications	04-1
20041210	Surveillance Panel Use of Donated Reference Oil Test Programs	04-1
20041210	Guidelines for Shortening or Lengthening Reference Oil Calibration Periods	04-1
20050221	Revised Solvent Specifications	05-1
20050426	Updated Test Precision	05-2
20050426	Rounding Test Results Using ASTM E 29	05-2
20050629	Low Temperature Test Annex	05-3
20060301	Addition of Alternative Power Train	06-1
20060509	Revised Procedure Includes Single Common Power Train, Common Throttle Control, and Revised Data Acquisition Requirements	06-2
20060713	Revised Procedure Includes Revisions to Test Length Requirements, Unscheduled Shutdowns, Backlash Measurements, and Pretest Contact Patterns.	06-3
20070115	Revised Wording for Backlash Measurements	06-4
20061215	Revised Wording for Coast Side Gear Contact Segment Time	06-4
20061215	Revised Wording for Unscheduled Shutdowns Engine Throttle Body Calibration Procedure	06-4
20061215	Engine Throttle Body Calibration Procedure	06-4
20070411	Revised Wording for Backlash Measurements	07-1
20070411	Revised Pretest Contact Pattern Procedure	07-1
20080624	Revised EOT Scoring Validity	08-1
20080724	Revised Conditioning Graphs	08-1
20090326	Revisions to Preparation of Apparatus Procedure	09-1
20090326	Revision to Percent Deviation Calculation	09-1

Table 2
Lost Tests Summary

Tests declared operationally invalid, aborted, or non-interpretable are summarized below by laboratory, reason, and number of lost tests.:

LAB	REASON	Tests Lost
A	Invalid due to condition 1 torque out of specification	1
B	Invalid, Shock series 2 ran in 5 th gear instead of 3 rd gear.	1

Figure 1

L-42 INDUSTRY OPERATIONALLY VALID DATA

FINAL END OF TEST PINION SCORING COAST SIDE

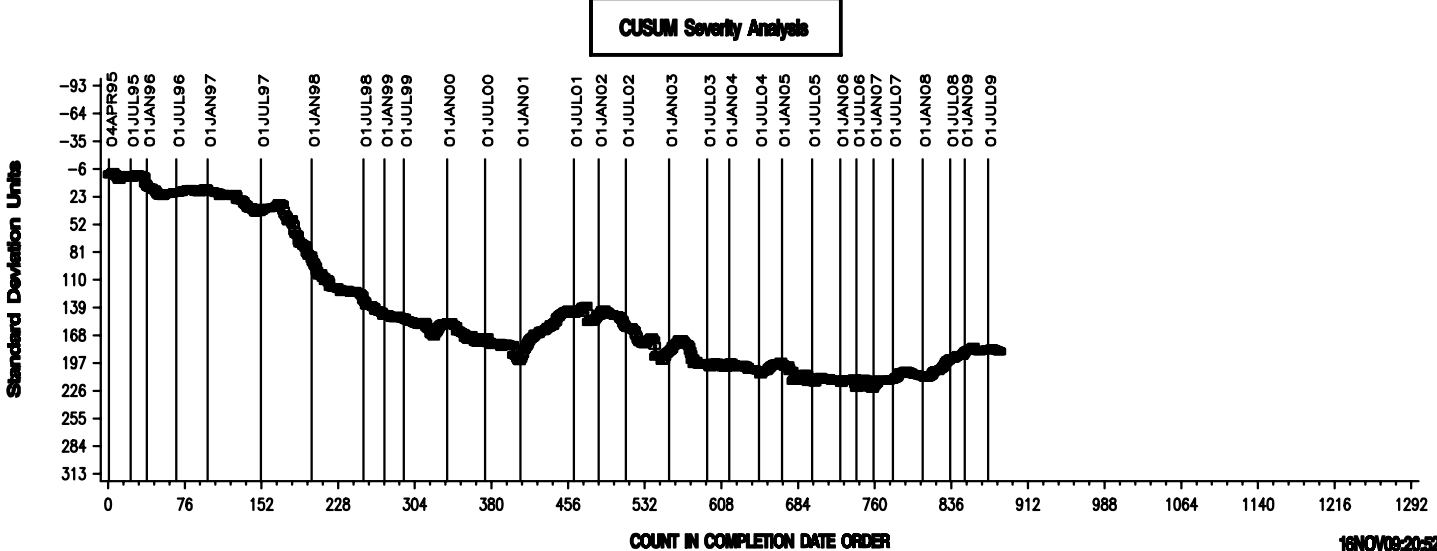
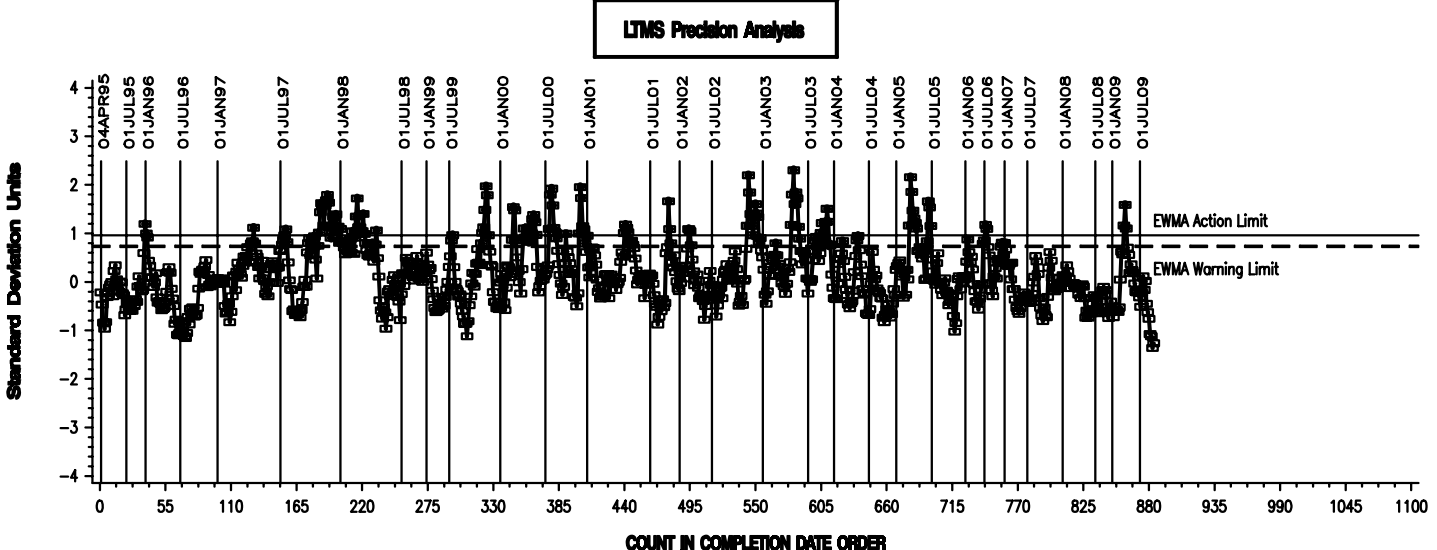
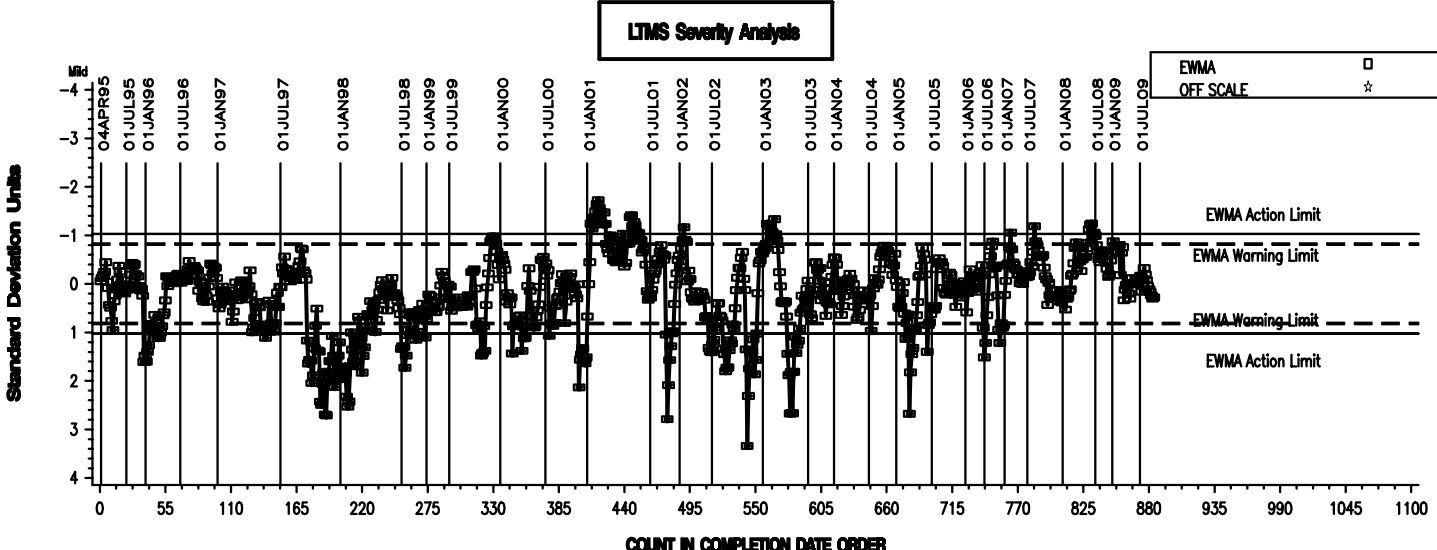


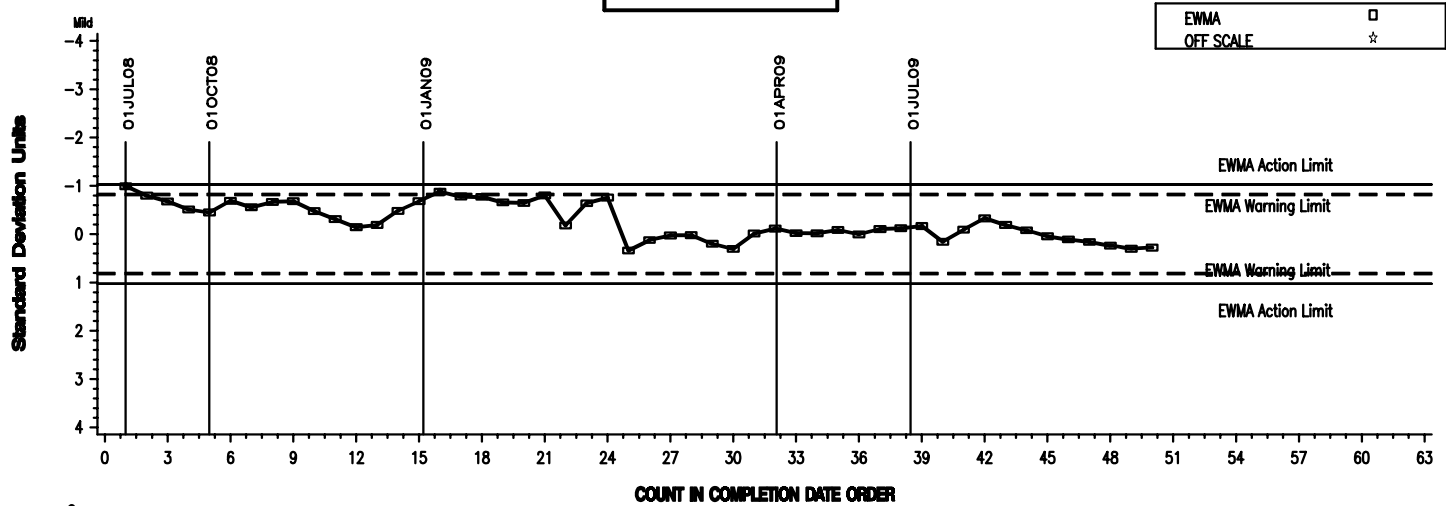
Figure 2

L-42 INDUSTRY OPERATIONALLY VALID DATA

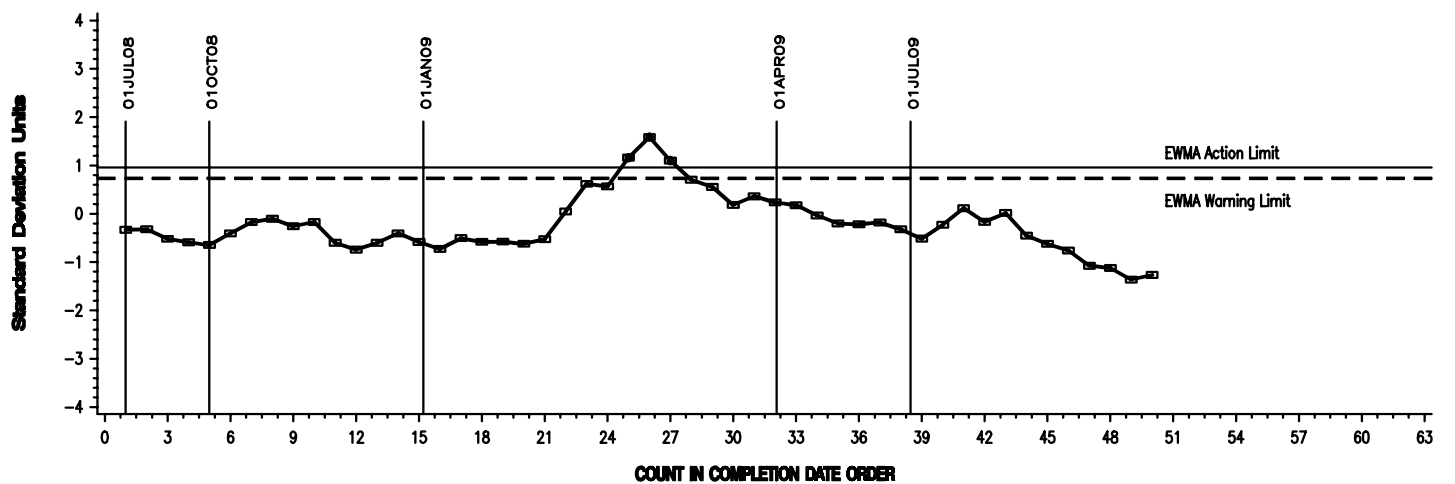
Last 50 test Results

FINAL END OF TEST PINION SCORING COAST SIDE

LTMS Severity Analysis



LTMS Prediction Analysis



CUSUM Severity Analysis

