



# Test Monitoring Center

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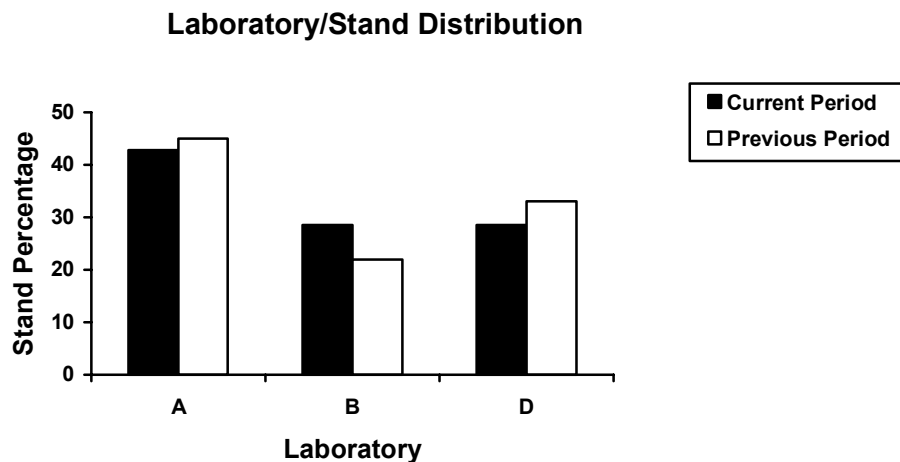
MEMORANDUM: 04-085  
DATE: October 18, 2004  
TO: Chris Schenkenberger, Chairman, L-60-1 Surveillance Panel  
FROM: Donald Lind  
SUBJECT: L-60-1 Reference Test Status from April 1, 2004 through September 30, 2004

The following is a summary of the L-60-1 reference oil tests that were reported to the Test Monitoring Center during the period April 1, 2004 through September 30, 2004.

## Lab/Stand Distribution

	Reporting Data	Calibrated as of 9/30/04
Number of Laboratories	3	3
Number of Stands	7	5

The following chart shows the laboratory/stand distribution:

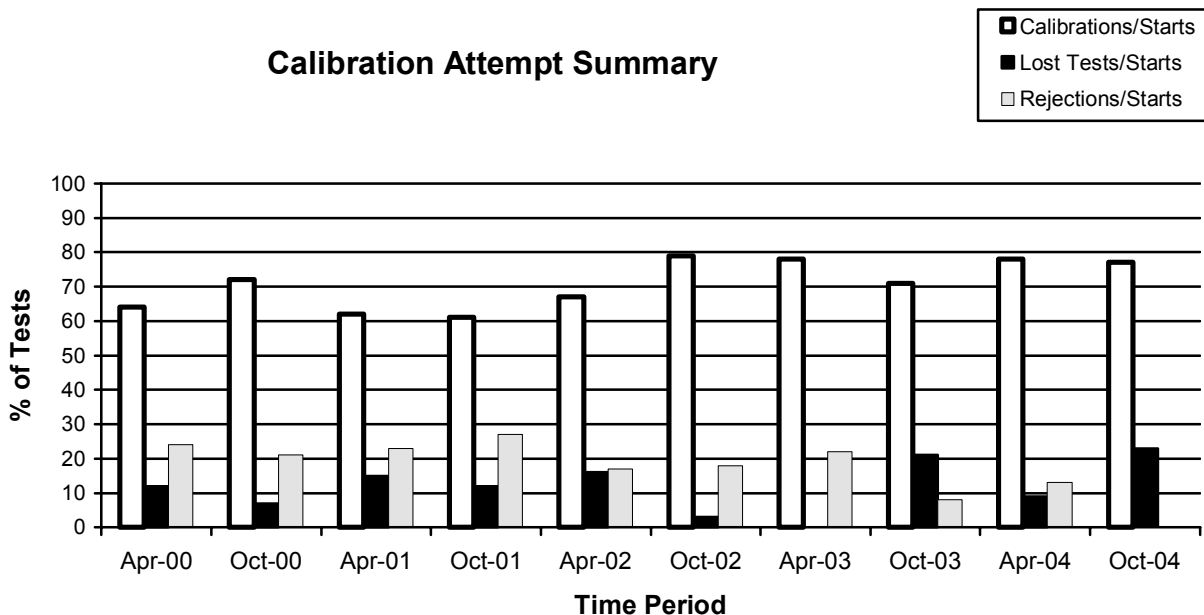


The following summarizes the status of the reference oil tests reported to the TMC:

	TMC Validity Codes	No. of Tests
Operationally and Statistically Acceptable	AC	13
Statistically Invalid Calibration Test	OC	0
Operationally Invalid, Laboratory Judgment	LC	2
Operationally Invalid, (Laboratory & TMC Judgment)	RC	0
Aborted	XC	2
<b>Total</b>		<b>17</b>

There were three additional tests conducted this report period. These tests were conducted for the used oil viscosity matrix.

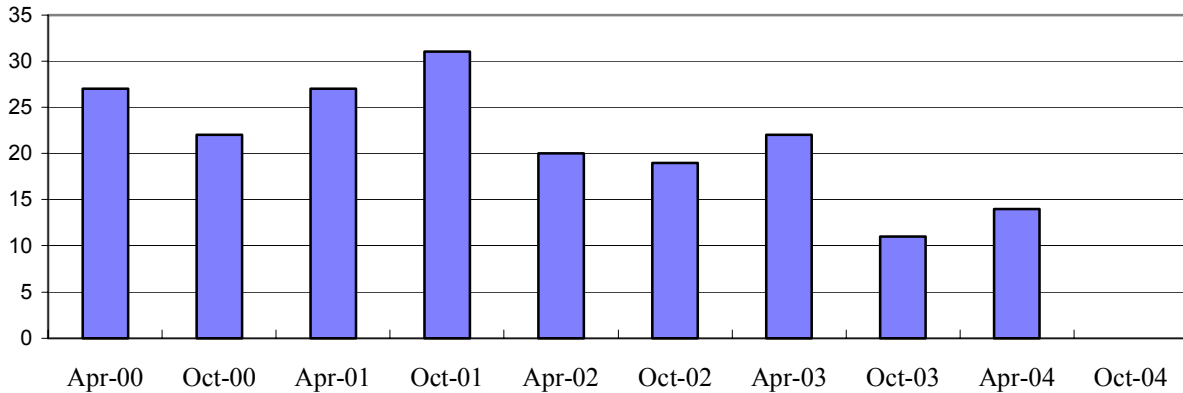
Calibrations per start, lost tests per start and rejection per start rates are summarized below:



The calibration per start and rejected test per start rates have decreased when compared to the previous period. The lost test per start rate increased with respect to the previous period.

The operationally valid statistically rejected test rate, as shown below, indicates a decrease with respect to the previous period. There were no statistically rejected tests this report period.

Rejection Rate



Severity and Precision

For this period, the mean delta/s was 0.036 severe (0.54 %) for Viscosity Increase, 0.168 severe (0.39 % wt.) for Pentane Insolubles, 0.392 severe (0.68 % wt.) for Toluene Insolubles, -0.165 severe (-0.14 merits) for Average Carbon/Varnish and -0.592 severe (-0.06 merits) for Average Sludge. Below are tables illustrating laboratory severity and pooled s:

Laboratory Severity for This Report Period					
Lab	Viscosity	Pentane	Toluene	Carbon Varnish	Sludge
A	-0.57	-0.42	-0.24	0.57	-0.44
B	0.22	-0.01	0.57	-0.02	-0.53
D	0.38	0.78	0.75	-0.87	-0.76

Pooled Standard Deviation Table			
Parameter	Report Period Pooled s (All Oils)	Historical Pooled s (All Oils)	Pooled s Values Used for Severity Adjustment Calculations
Viscosity	0.06	0.14	0.15
Pentane	0.17	0.37	0.73
Toluene	0.11	0.48	0.75
Carbon Varnish	0.29	0.41	0.45
Sludge	0.11	0.22	0.16

### Industry Control Charts

Figures 1 through 5 show the industry control charts through September 30, 2004. The industry alarms triggered this report period are detailed below.

#### Pentane Insolubles

There were no industry EWMA severity or precision alarms this report period.

#### Toluene Insolubles

There were no industry EWMA severity or precision alarms this report period.

#### Viscosity Increase

There were no industry EWMA severity or precision alarms this report period.

#### Sludge

There were no industry EWMA severity or precision alarms this report period.

#### Carbon Varnish

There were no industry EWMA severity or precision alarms this report period.

### TMC Lab Visits

There was one lab visit this report period. During the lab visit five discrepancies were noted. The discrepancies are listed below:

1. A sieve other than the required 150-um (No. 100) sieve for D 893 was used.
2. The stopper for the centrifuge tube and the wire for dislodging the insolubles at the bottom of the centrifuge tube were not washed back into the tube as outlined in Test Method D 893, Sections 9.2, 9.3, 9.4, 9.8, and 9.9.
3. Section 9.3 of Test Method D 893 requires the user to add 10 mL of pentane to the tube, dislodge the insolubles, and wash off the stopper and wire with pentane back into the tube, filling the tube to the 50 mL mark. The lab was filling the tube to the 50 mL mark and then dislodging the insolubles.
4. Section 12.3.1 of Test Method D 445 requires that the user charge two viscometers. The lab was only charging one.
5. Section 12.5.1 requires that the two kinematic viscosity results must agree within a stated determinability and then averaged for the final kinematic viscosity result that is reported. This could not be accomplished since the lab was only charging one tube.

Information Letters

There was one information letter issued this report period. Information Letter 04-02, Sequence Number 28 was issued on July 19, 2004. Items changed with this information letter are documented in the L-60-1 timeline (Table 1).

Reference Oil Status

The following is a listing of oils used for calibration testing along with the expected number of tests remaining at the Test Monitoring Center and at the testing laboratories. L-60-1 reference oils are shipped in quantities of 1/2 pint per test.

Oil	Number of Tests Remaining			
	Lab A	Lab B	Lab D	TMC
133	6	5	4	1680
148-1	8	6	7	720
151-2	8	4	8	*
151-3	4	4	6	**

\* 16 Gallons (Multiple test area usage)

\*\* 143 Gallons (Multiple test area usage)

## Attachments

c: J. L. Zalar  
F. M. Farber  
L-60/L-60-1 Surveillance Panel  
<ftp://ftp.astmtmc.cmu.edu/docs/gears/l601/semiannualreports/l601-10-2004.pdf>

Distribution: Email

**Listing of Tables and Figures Included as Part of This Report to the L-60-1 Surveillance Panel**

Table 1 is the L-60-1 Industry Timeline.

Figure 1 is the Industry Control Chart for L-60-1 Pentane Insolubles.

Figure 2 is the Industry Control Chart for L-60-1 Average Sludge.

Figure 3 is the Industry Control Chart for L-60-1 Toluene.

Figure 4 is the Industry Control Chart for L-60-1 Carbon/Varnish.

Figure 5 is the Industry Control Chart for L-60-1 Viscosity Increase.

Table 1

## L-60-1 Timeline

Effective Date	Topic	IL#
19950901	Test Stand Motor Speed Change	95-1
19950901	Alternator Part Number Change	95-1
19950901	Air Box Heater Part Number Correction	95-1
19951115	Transforms./Correction Factors	95-1
19951103	Report Forms and Dictionary Version 19950912	95-1
19951026	Alternator Load Circuit Schematic Addition	95-2
19960122	Severity Adjustment Calculation Method	96-1
19960430	TMC One Page Addition	96-2
19960430	TMC New Address	96-2
19960531	Perfect Seal Gasket Maker Use	96-3
19960531	Gear Case Drawing (Lip Seal Use)	96-3
19960531	Report Forms and Dictionary Version 19960408	96-3
19970530	Added Percent Out Validity Criteria, Report Forms and Data Dictionary Changes (Version 19970411), Reporting of "Zero Value" Date	97-1
19970605	Revision of Primary Air Flow Spec, Removal of Air Pressure Specification	97-2
19970829	Added Average Air Box Temperature to Report Forms and Data Dictionary (Version 19970611)	97-2
19971107	Revised Precision and Bias Statement, Report Forms and Data Dictionary (Version 19970902)	97-3
19980612	Air Flow Calibration Requirement	98-1
19980623	Cleaning Agent Revision (Toluene)	98-2
19981123	Air Flow Calibration Requirement	98-3
19990100	Gear Problem (Manufacturer changed steel to lead-free metallurgy)	
19990101	Addition of CRC Gear Rating Workshop Training Requirement	98-3
19990215	Revised Gear Case Disassembly Procedure	99-1
19990301	Air Supply Line Note Addition	99-2
19990301	Data Logging Requirement	99-2
19990301	Strip Chart Requirement	99-2
19990301	Repeatability Term Change	99-2
19990609	Definition of Acceptable gears for testing due to severe ACV severity	99-3
19991016	Test Method for Pentane and Toluene Insolubles	99-4
20000427	Testing With Used Gears Discontinued	00-1
20000427	New Gear Batch 7-99 Introduced	
20020501	CRC Rating Manual 20	02-1
20020501	Report Forms and Data Dictionary	02-1
20020710	Test Gear Preparation	02-2
20020710	Shaft Oil Lip Seal	02-2
20020710	Speedi-Sleeve	02-2
20020710	Joint Radial Seal (V Ring)	02-2
20020710	End of Test Oil Drain	02-2
20020710	Instrument Calibration Frequency	02-2

Table 1 (Continued)

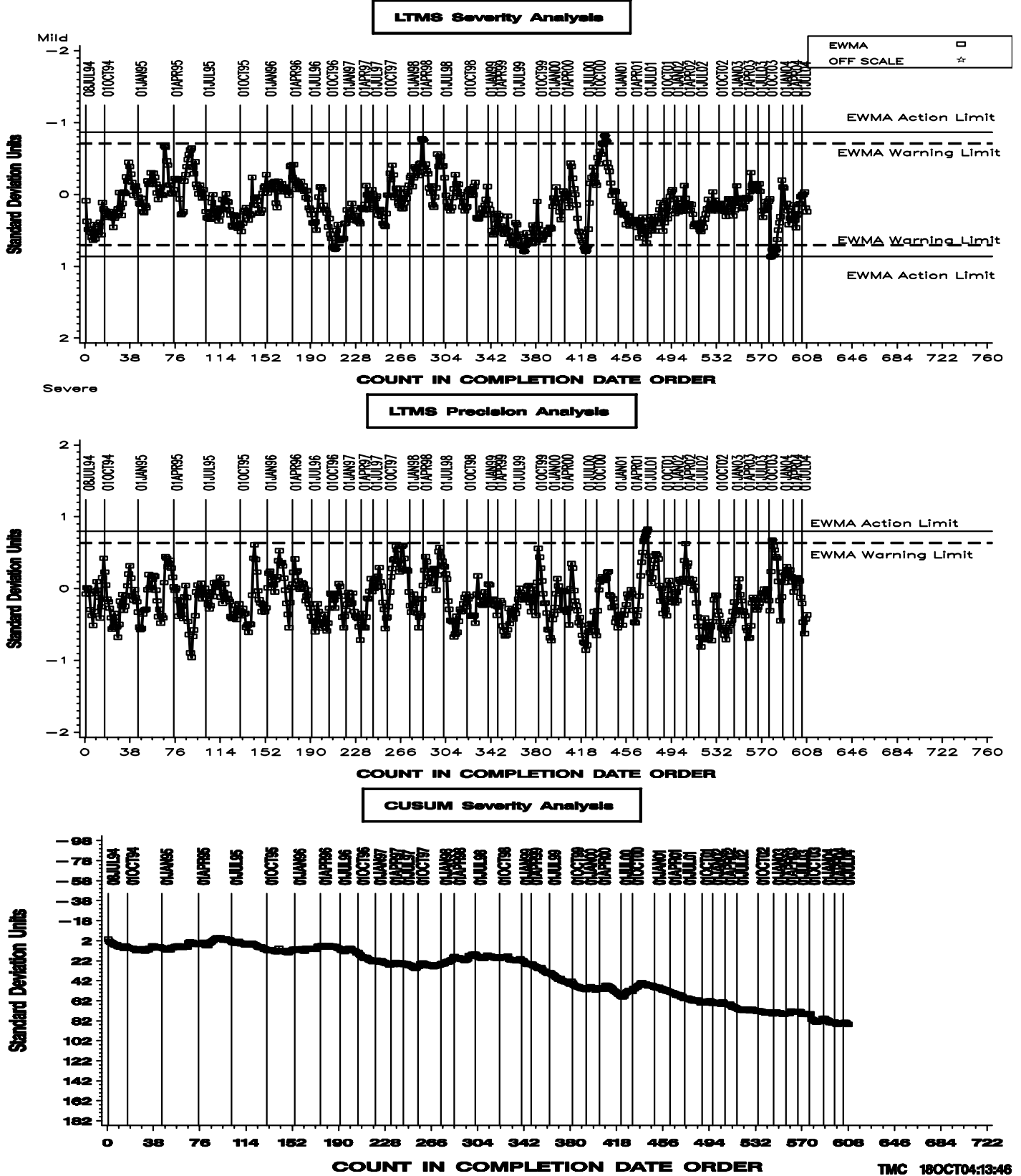
## L-60-1 Timeline

Effective Date	Topic	IL#
20021201	Revised End of Test Oil Drain Procedure	03-1
20021201	Pre-Test Gear Preparation	03-1
20030205	Revised End of Test Oil Drain Procedure	03-2
20030430	Heater Blower Air Output	03-2
2003	Digital Manometer	03-3
2003	Revised Heater Blower Air Output Verification	03-3
20030506	Non-interpretable Tests	03-3
20030506	Revisions to the Use of Warning Statements	03-3
20030801	Revised Heater Blower Air Output Verification	03-4
20030801	Preso Low Loss Venturi Meter and Dwyer Digital Manometer Calibration	03-4
20040101	Cleaning Solvent Specification	03-5
20040401	Revised Gear Case Cleaning Procedure	04-1
20040401	Revised Carbon Depth Rating Guidelines	04-1
20040401	Editorial Changes to Precision Statement	04-1
20040630	Air Flow Controller Calibration Standard Model Number Addition	04-2
20040630	Revised Precision Statement	04-2



# L-60-1 INDUSTRY OPERATIONALLY VALID DATA

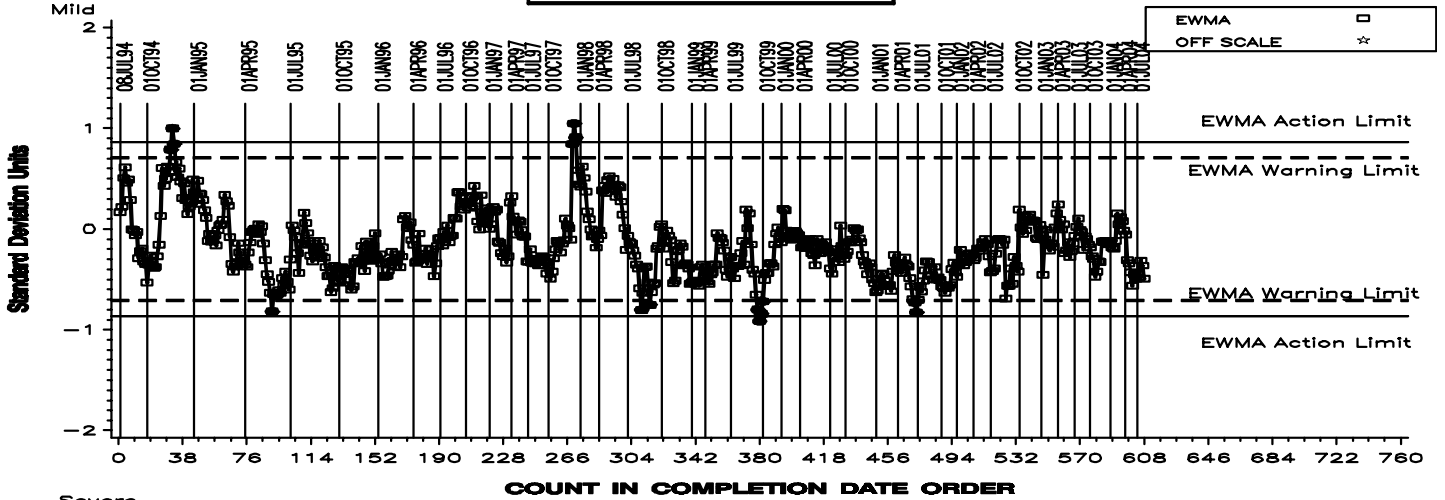
## REFERENCE FINAL PENTANE (% Weight)



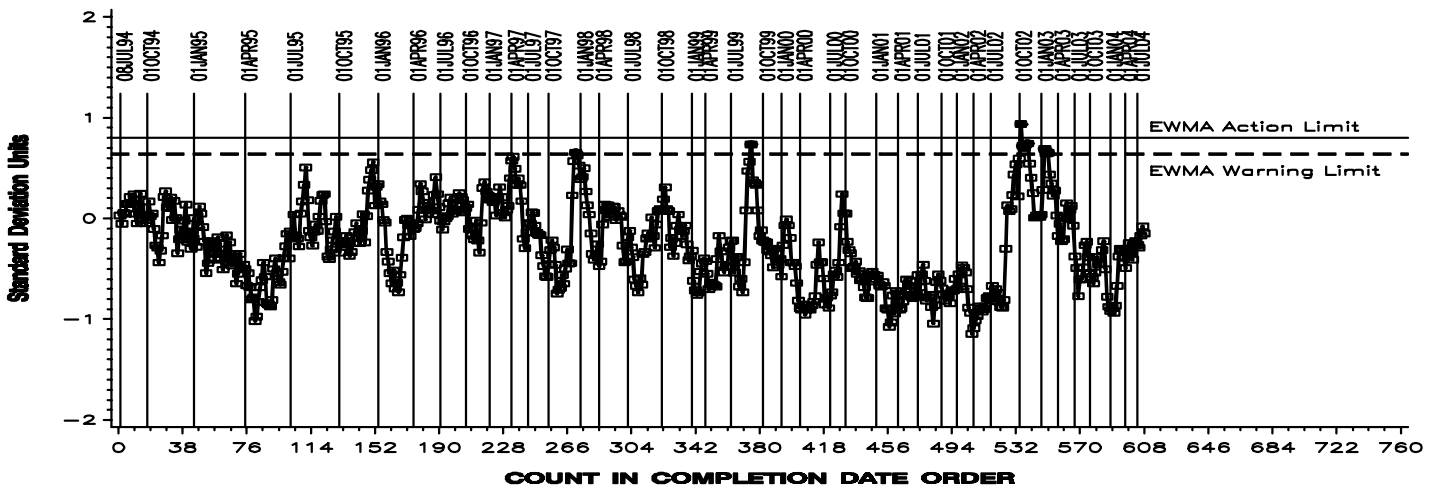
# L-60-1 INDUSTRY OPERATIONALLY VALID DATA

## REFERENCE FINAL SLUDGE (MERITS)

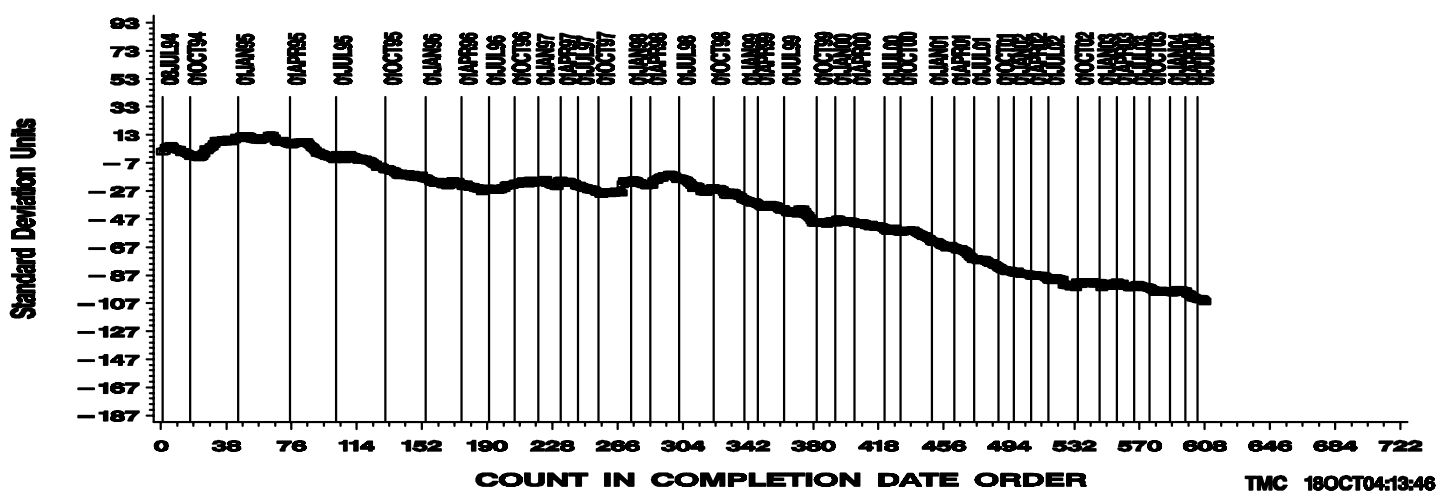
**LTMS Severity Analysis**



**LTMS Precision Analysis**

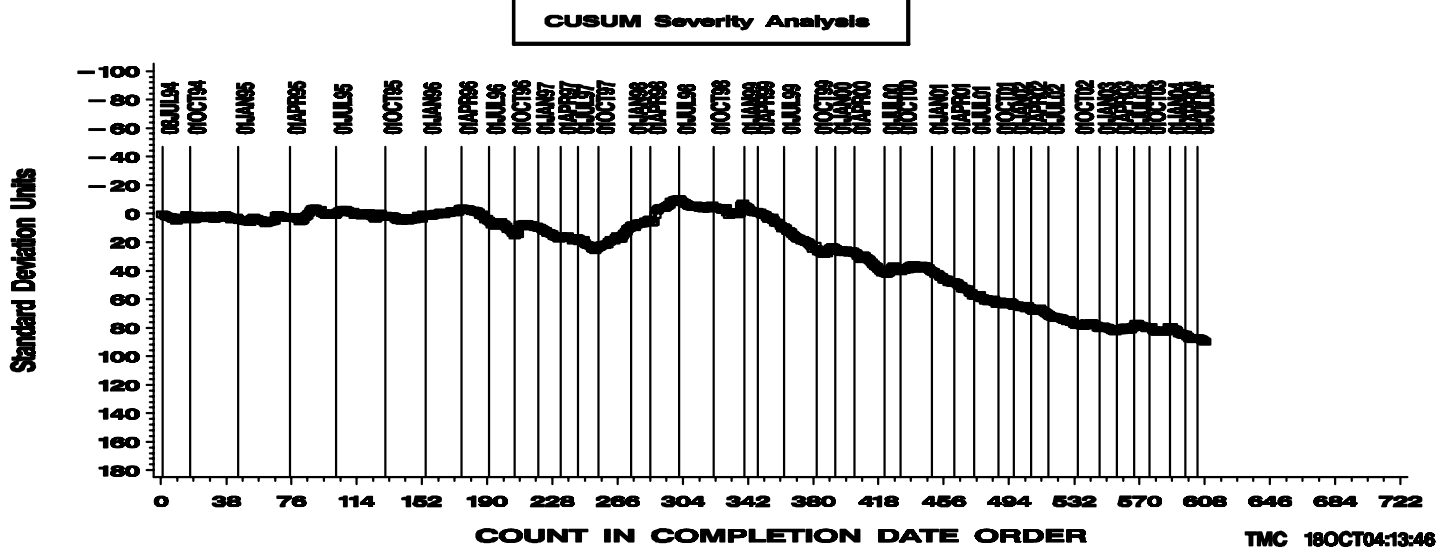
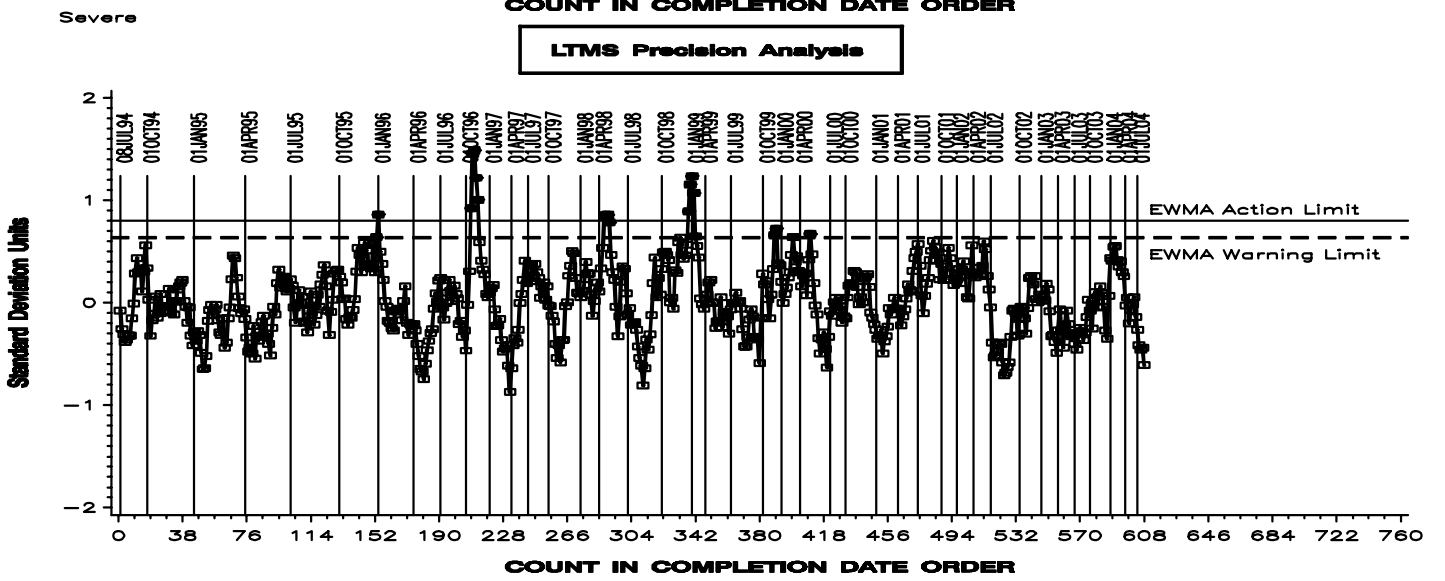
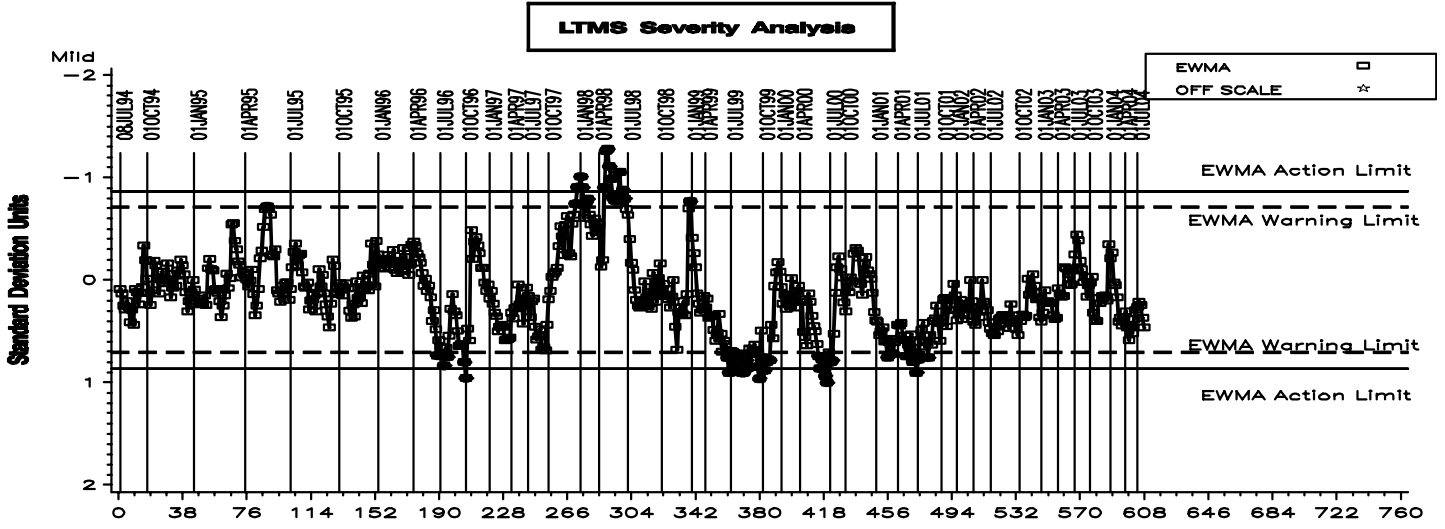


**CUSUM Severity Analysis**



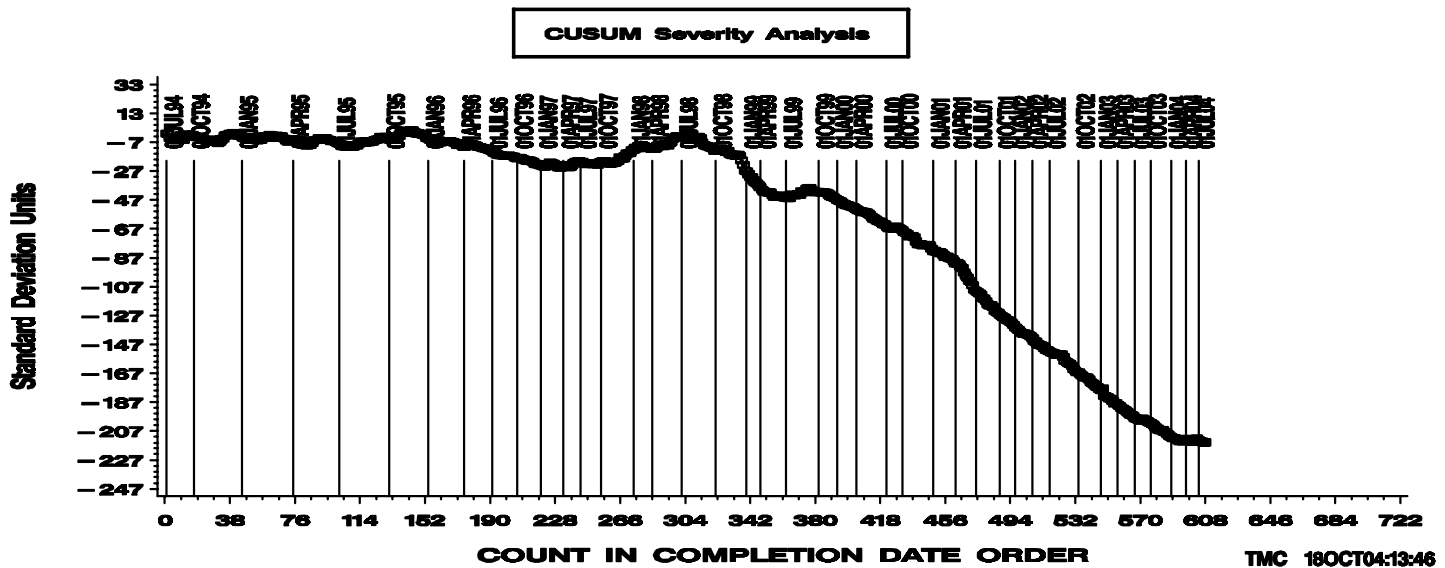
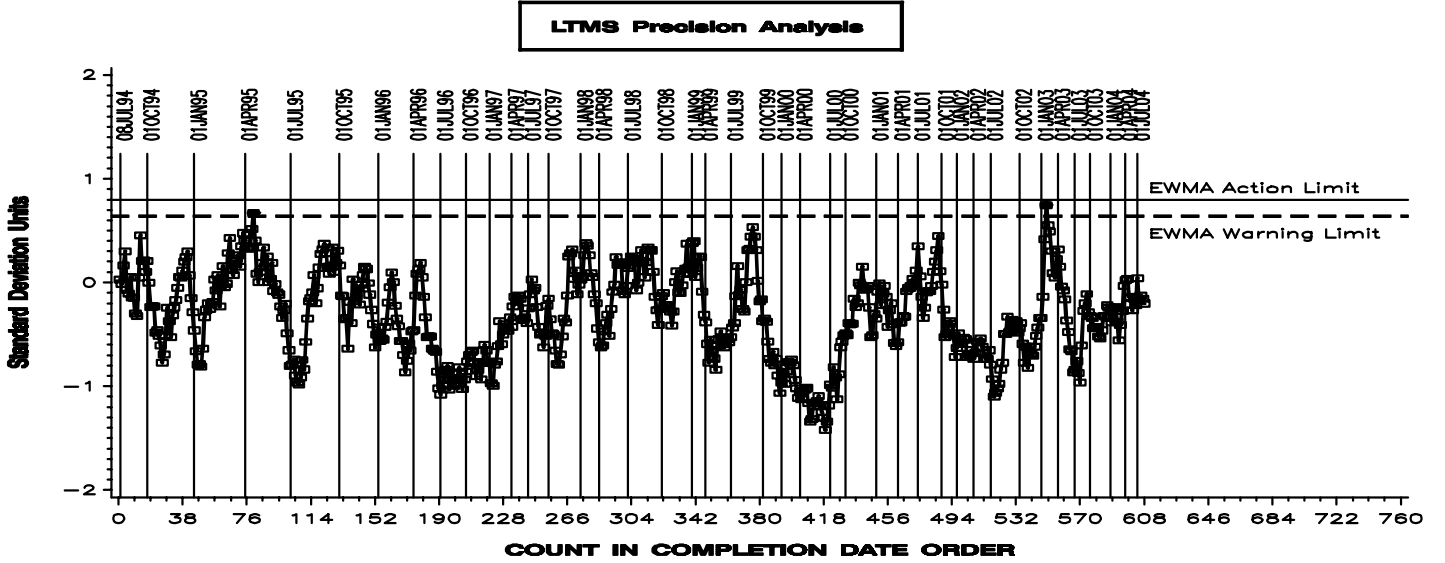
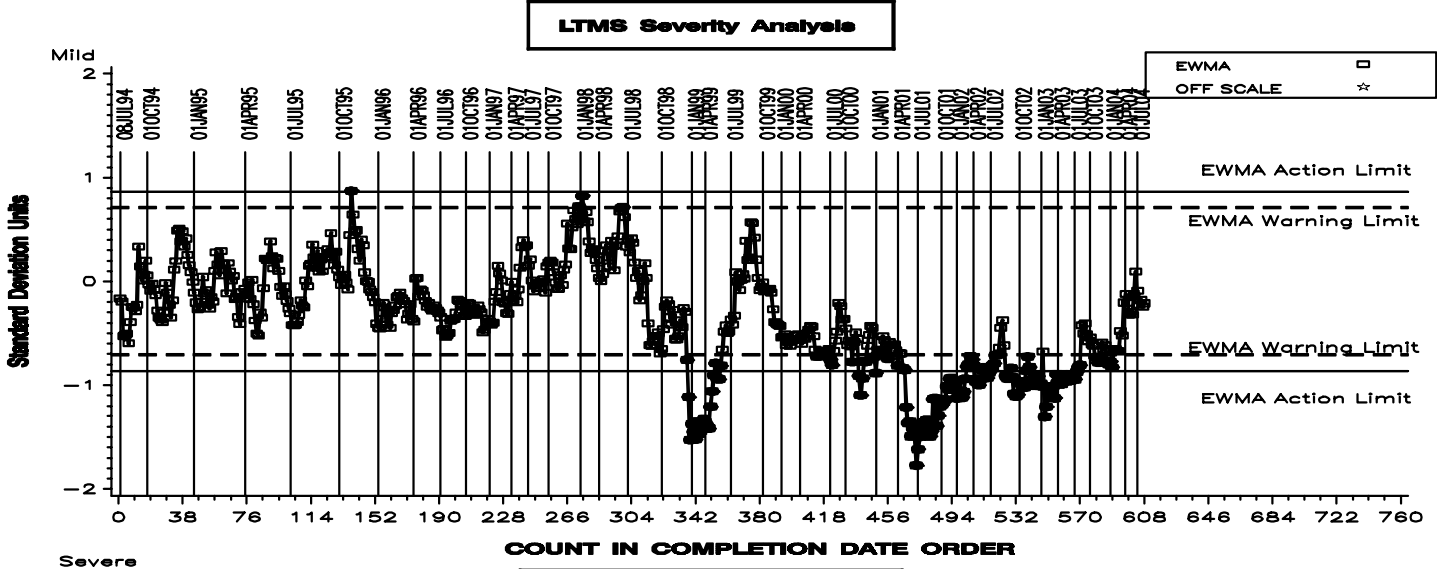
# L-60-1 INDUSTRY OPERATIONALLY VALID DATA

## REFERENCE FINAL TOLUENE (% WEIGHT)



# L-60-1 INDUSTRY OPERATIONALLY VALID DATA

## REFERENCE FINAL CARBON VARNISH (MERITS)



# L-60-1 INDUSTRY OPERATIONALLY VALID DATA

## REFERENCE FINAL VISCOSITY (% INCREASE)

