



Test Monitoring Center

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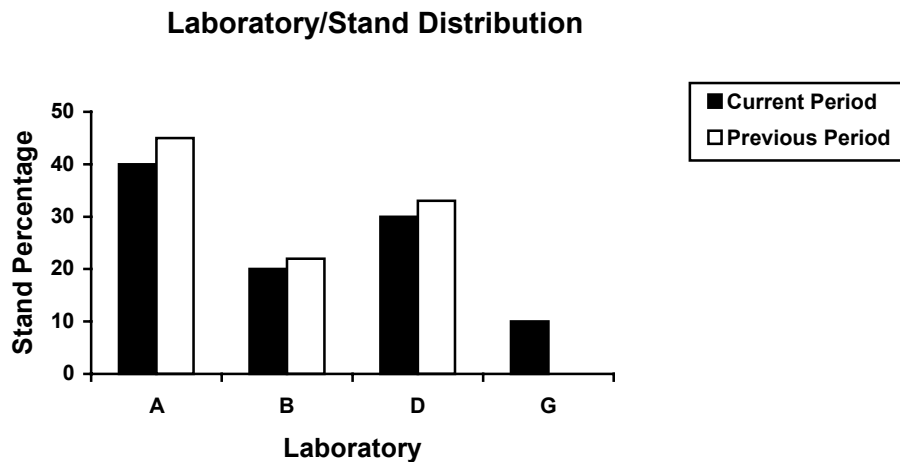
MEMORANDUM: 01-048
DATE: May 9, 2001
TO: Jerry Gropp, Chairman, L-60-1 Surveillance Panel
FROM: Donald Lind
SUBJECT: L-60-1 Reference Test Status from October 1, 2000 through March 31, 2001

The following is a summary of the L-60-1 reference oil tests that were reported to the Test Monitoring Center during the period October 1, 2000 through March 31, 2001.

Lab/Stand Distribution

	Reporting Data	Calibrated as of 3/31/01
Number of Laboratories	4	3
Number of Stands	10	9

The following chart shows the laboratory/stand distribution:

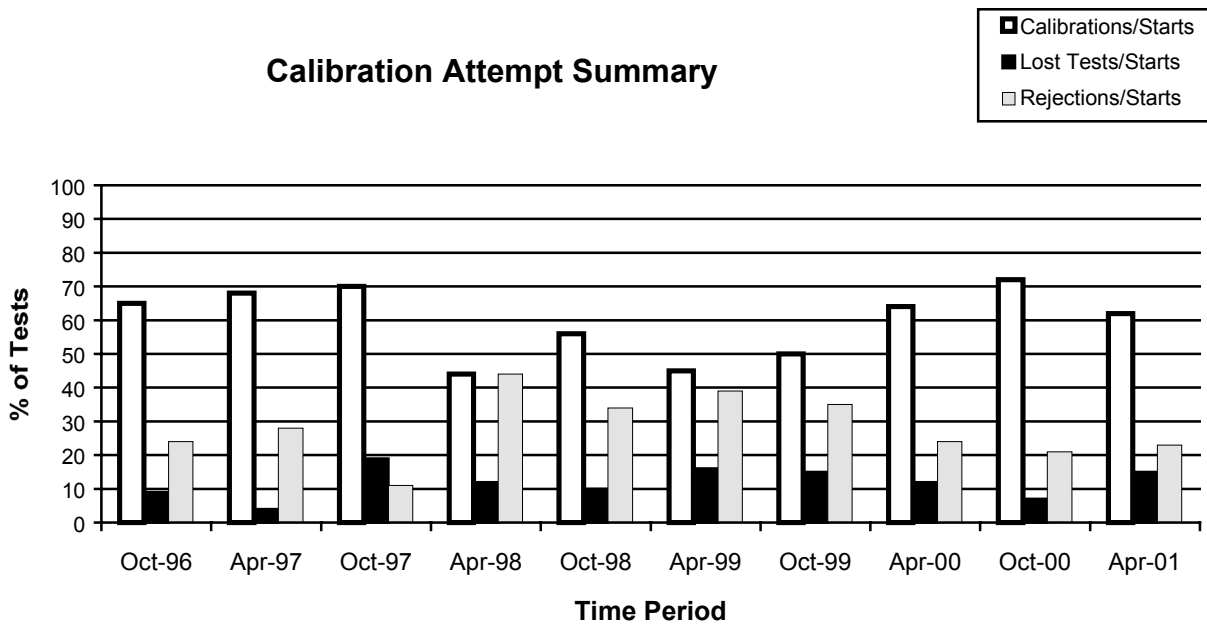


The following summarizes the status of the reference oil tests reported to the TMC:

	TMC Validity Codes	No. of Tests
Operationally and Statistically Acceptable	AC	24
Statistically Invalid Calibration Test	OC	9
Operationally Invalid, Laboratory Judgment	LC	6
Operationally Invalid, (Laboratory & TMC Judgment)	RC	0
Aborted	XC	0
Total		39

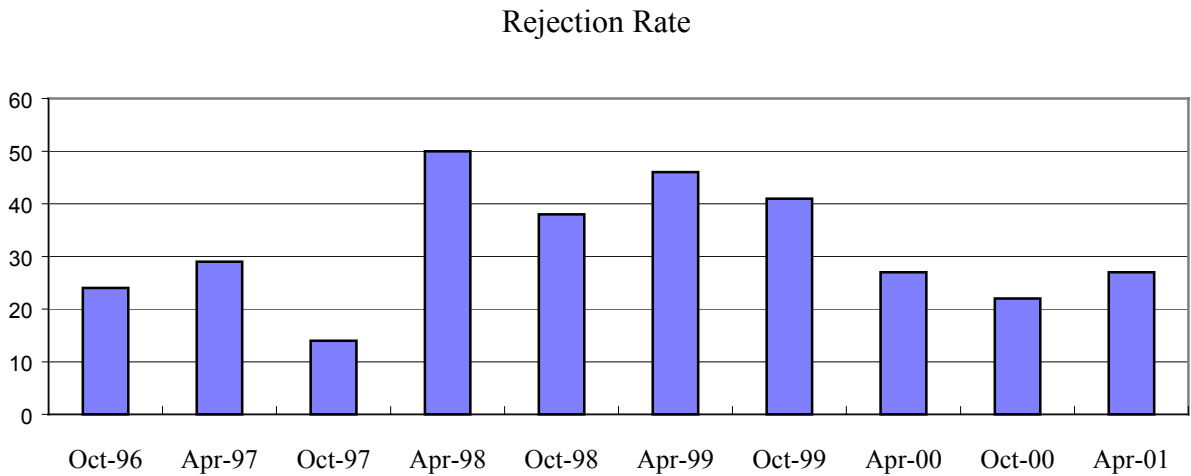
Additionally there were 19 tests conducted to evaluate a new gear batch. There was also six tests conducted to evaluate test stands.

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



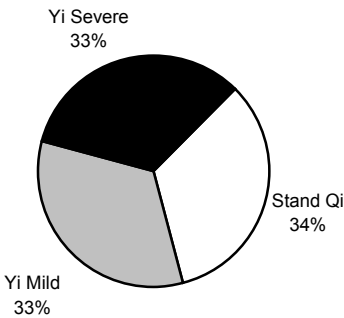
The calibration per start rate has decreased when compared to the previous period. The rejected test per start rate and lost test per start rate have increased with respect to the previous period.

The operationally valid statistically rejected test rate, as shown below, indicates an increase with respect to the previous period.

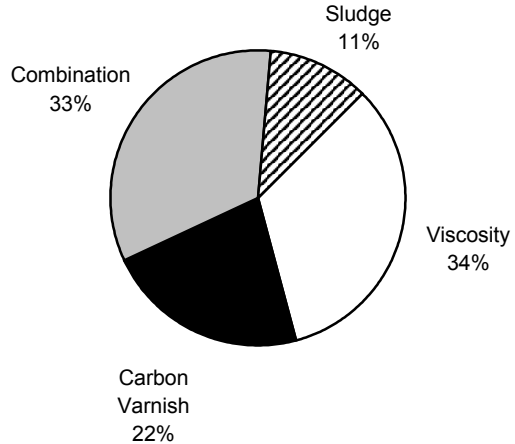


A detailed list of reasons tests failed the acceptance criteria is shown in Table 1. The following charts summarize these reasons with a breakdown by parameter of the failed tests:

Distribution of LTMS Stand Alarms

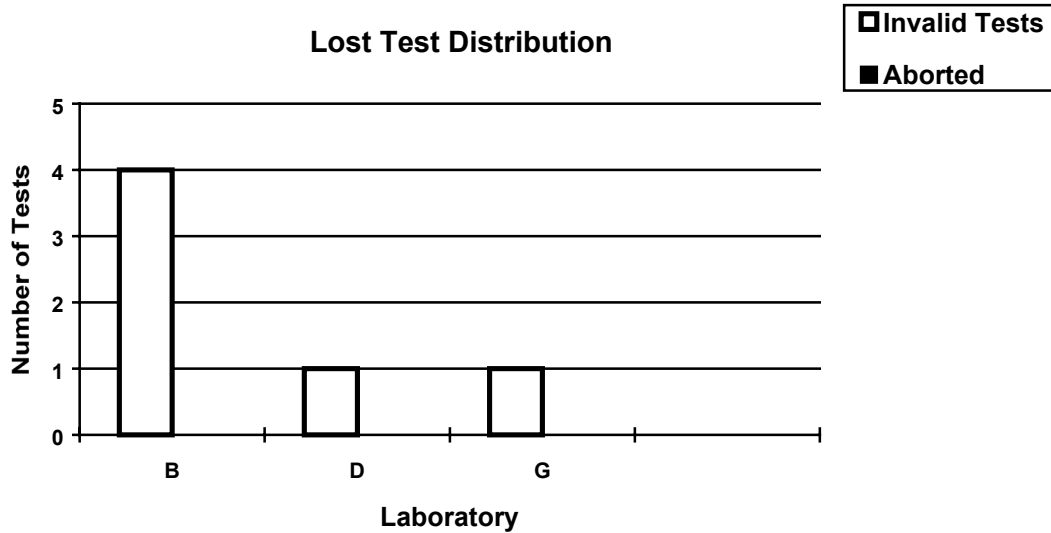


Distribution of Stand Alarms by Parameter



No LTMS deviations were written this period. There have been no LTMS deviations written in previous report periods.

A detailed list of reasons for aborted and operationally invalid tests is shown in Table 2. The following chart summarizes the lost test distribution by lab:



Severity and Precision

For this period, the mean delta/s was -0.184 severe (-2.72 merits) for Viscosity Increase, 0.028 severe (0.06 merits) for Pentane Insolubles, 0.285 severe (0.48 merits) for Toluene Insolubles, -0.735 severe (-0.67 merits) for Average Carbon/Varnish and -0.465 severe (-0.05 merits) for Average Sludge. Pooled s values are shown in the following table.

Pooled Standard Deviation Table ¹

Parameter	Current Period		Historical Pooled s (all oils)
	Std. Dev. - SA ²	Pooled s (all oils)	
Viscosity	0.224 ³	0.181	0.150
Pentane	0.340 ⁴	0.188	0.390
Toluene	0.338 ⁴	0.271	0.508
Carbon/Var.	0.381 ⁵	0.370	0.410
Sludge	0.110 ⁵	0.109	0.239

¹ All values are in transformed units

² Standard Deviations shown are based on oils used to compute standard deviations which are used for severity adjustments

³ Reference Oils 131-3, 131-4, 133, 143 & 151-2

⁴ Reference Oils 131-3, 131-4 & 133

⁵ Reference Oils 143, 151-2 & 148

Industry Control Charts

Figures 1 through 5 show the industry control charts through March 31, 2001. The industry alarms triggered this report period are detailed below.

Pentane Insolubles

There were three industry EWMA severity warning alarms this report period. The alarms were not caused by any one lab, stand or reference oil.

Toluene Insolubles

There were two industry EWMA severity warnings this report period. The alarms were not caused by any one lab, stand or reference oil.

Viscosity Increase

There were eight industry EWMA severity alarms this report period (one warning and seven action). The alarms appear to be caused by test results conducted on reference oil 133. The surveillance panel has suspended the use of reference oil 133.

Sludge

There was one industry EWMA severity alarm this report period. This was attributed to a single test result of three standard deviations severe.

Carbon Varnish

There were ten industry EWMA severity alarms (six warning and four action) this report period. The alarms were not caused by any one lab, stand or reference oil.

TMC Lab Visits

There were no lab visits conducted this report period.

Information Letters

There were no information letters issued this report period.

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	Lab G	TMC
131-3	0	9	0	0	0
131-4	4	9	1	2	296
133	6	5	4	0	1696
143	0	0	0	1	0
148	8	2	6	5	90
151-2	8	7	5	3	*
151-3	4	4	6	0	**

* 24 Gallons (Multiple test area usage)

** 603 Gallons (Multiple test area usage)

Attachments

c: L-60/L-60-1 Surveillance Panel

<ftp://www.tmc.astm.cmri.cmu.edu/docs/gear/1601/semiannualreports/1601-04-2001.pdf>

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

Table 1 Summarizes the Reasons for Failed Tests.

Table 2 Summarizes the Reasons for Aborted and Operationally Invalid Tests.

Table 3 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
Summary of Reasons for Rejected Tests

Reasons	No. of Tests
Severe Carbon Varnish	2
Mild Viscosity Increase	3
Severe Sludge	1
Stand Shewhart Precision Alarm Viscosity Increase, Mild Pentane Insolubles, & Mild Viscosity Increase	1
Stand Shewhart Precision Alarm Viscosity Increase & Severe Carbon Varnish	1
Stand Shewhart Precision Alarm Viscosity Increase, Severe Viscosity Increase, & Mild Toluene Insolubles	1

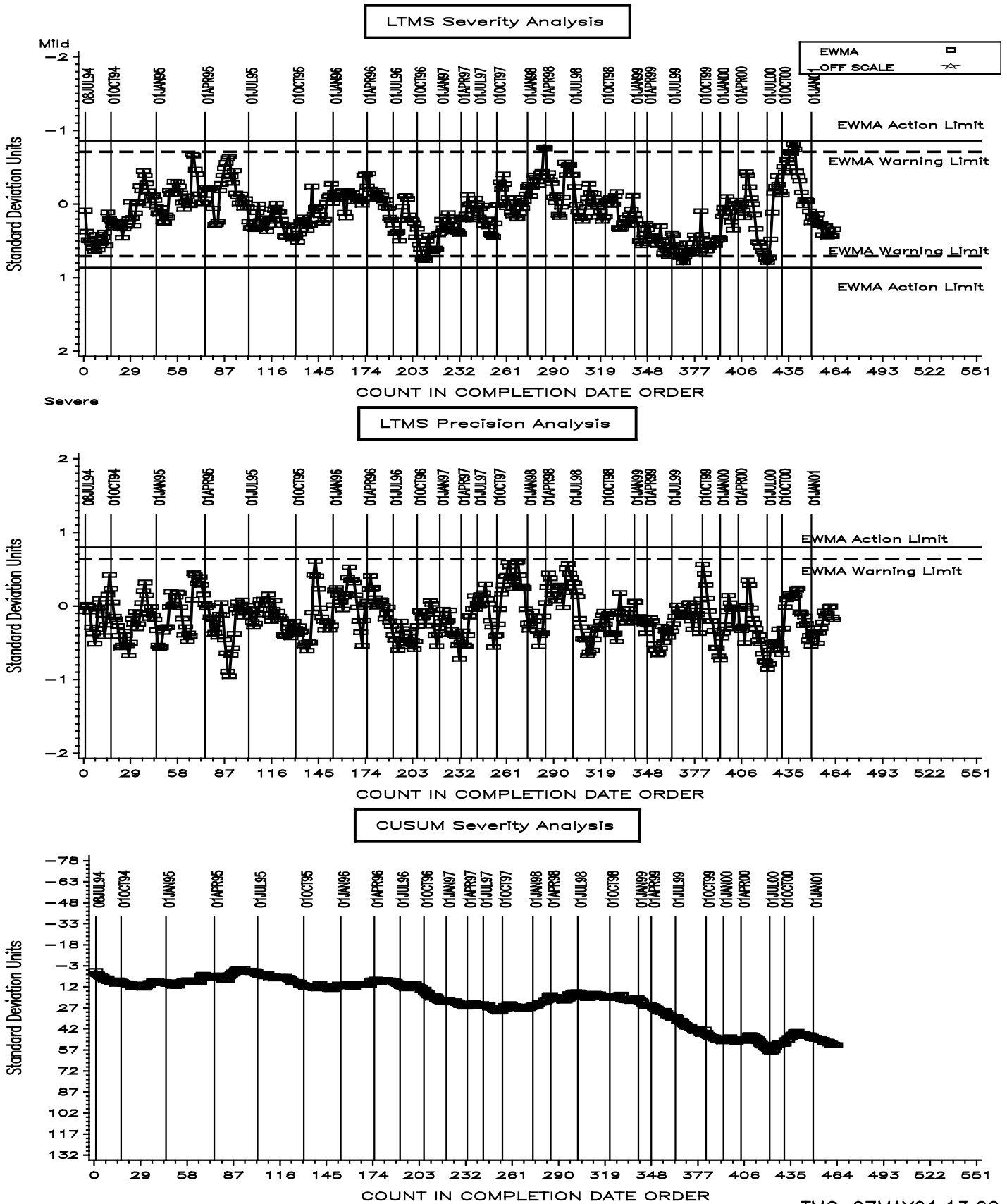
Table 2
Summary of Reasons for Aborted and Operationally Invalid Tests

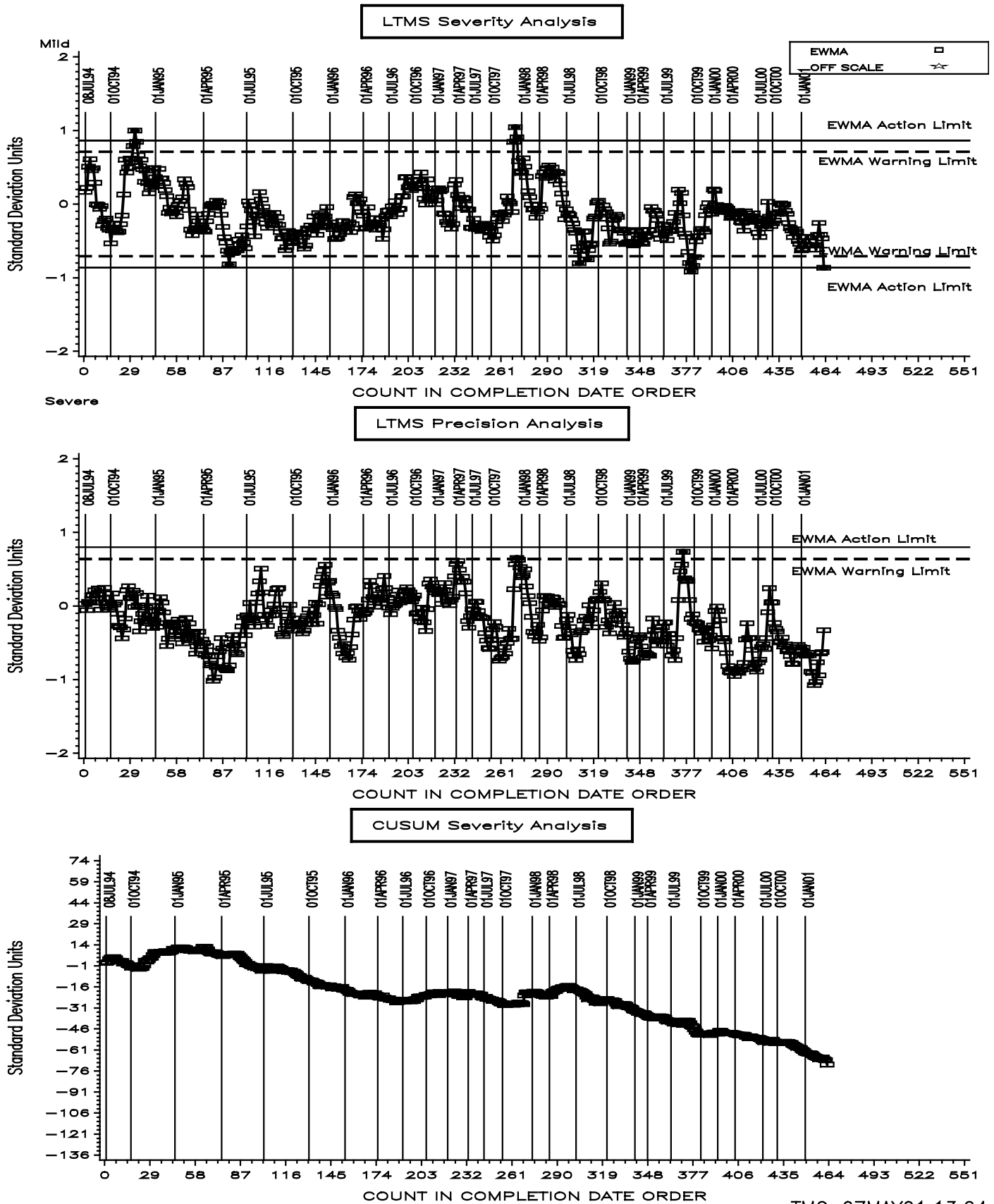
Reasons	No. of Tests
Oven Thermocouple Out of Position	3
Load Control Problem	1
Analytical Tests not completed within the 48 Hour Requirement	1
Oil Temperature Out of Specification	1

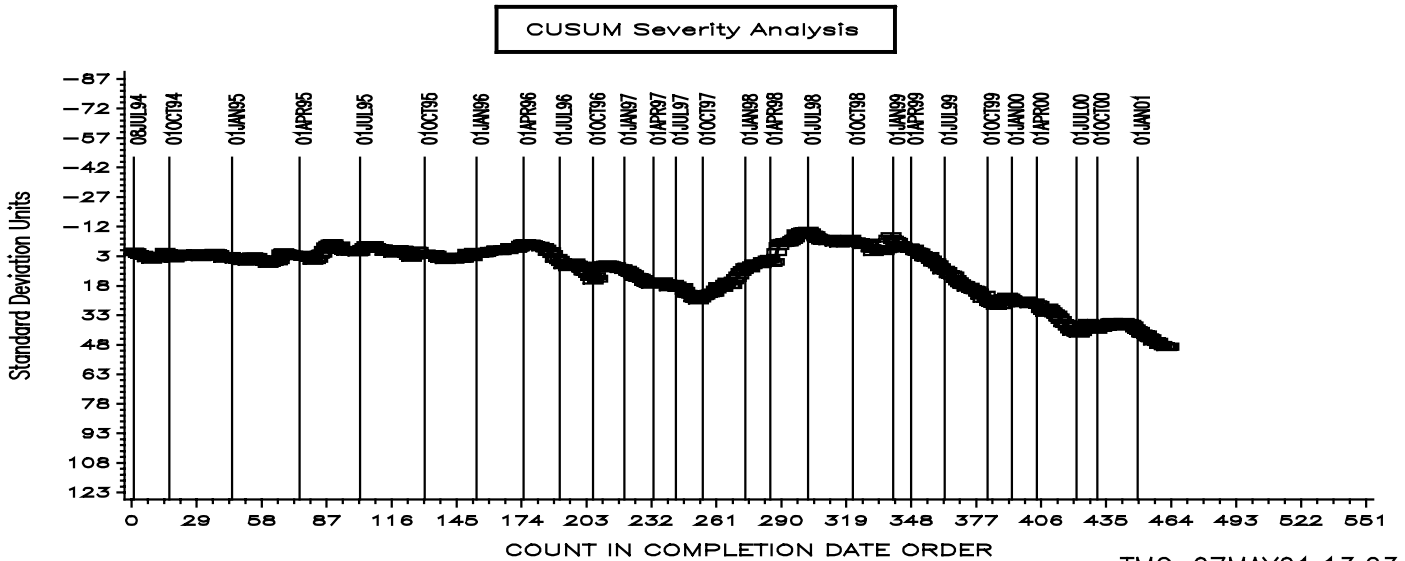
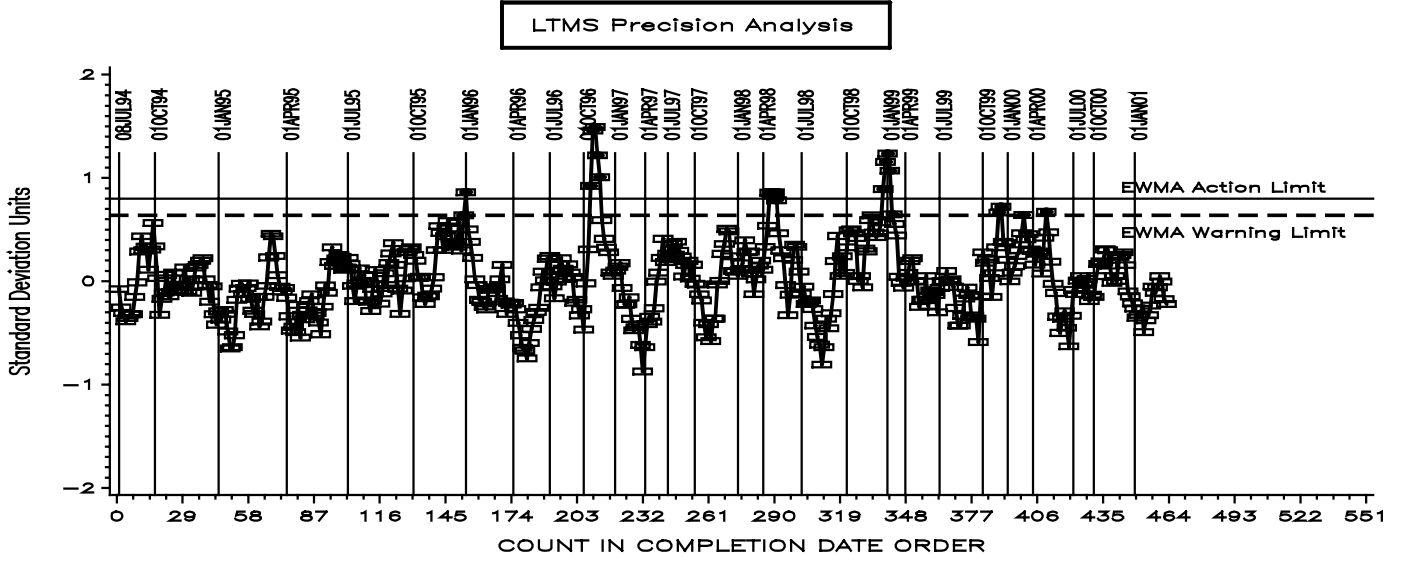
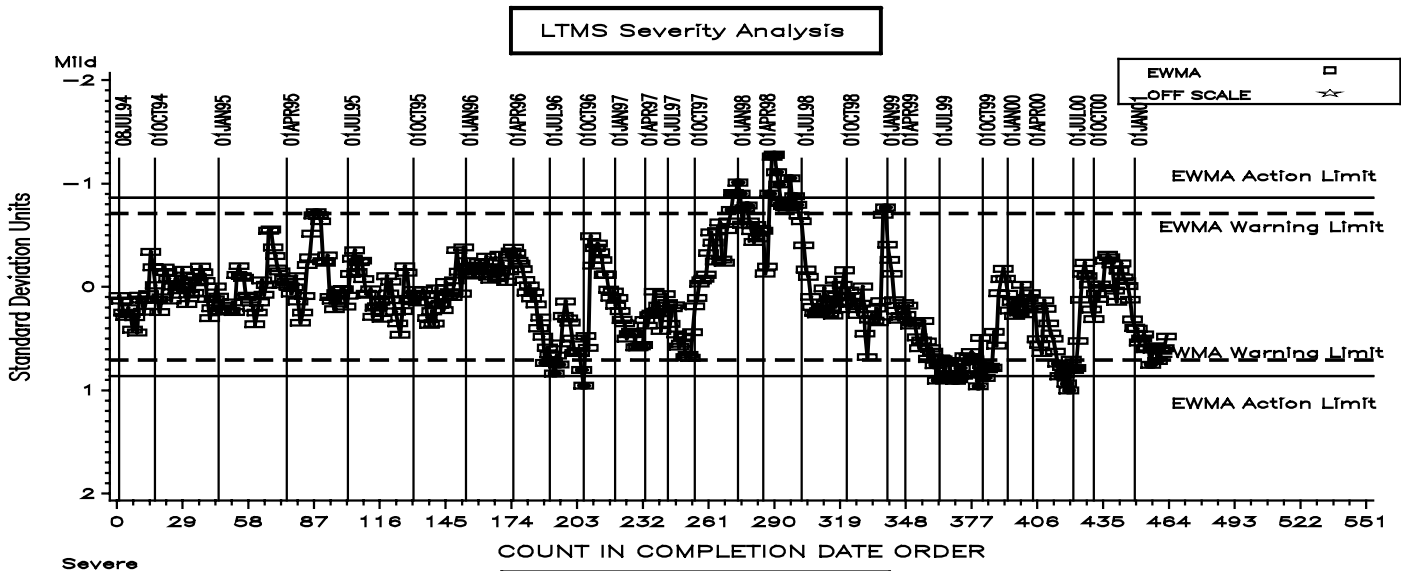
Table 3

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	







L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REFERENCE FINAL CARBON VARNISH (MERITS)

FIGURE 4

